

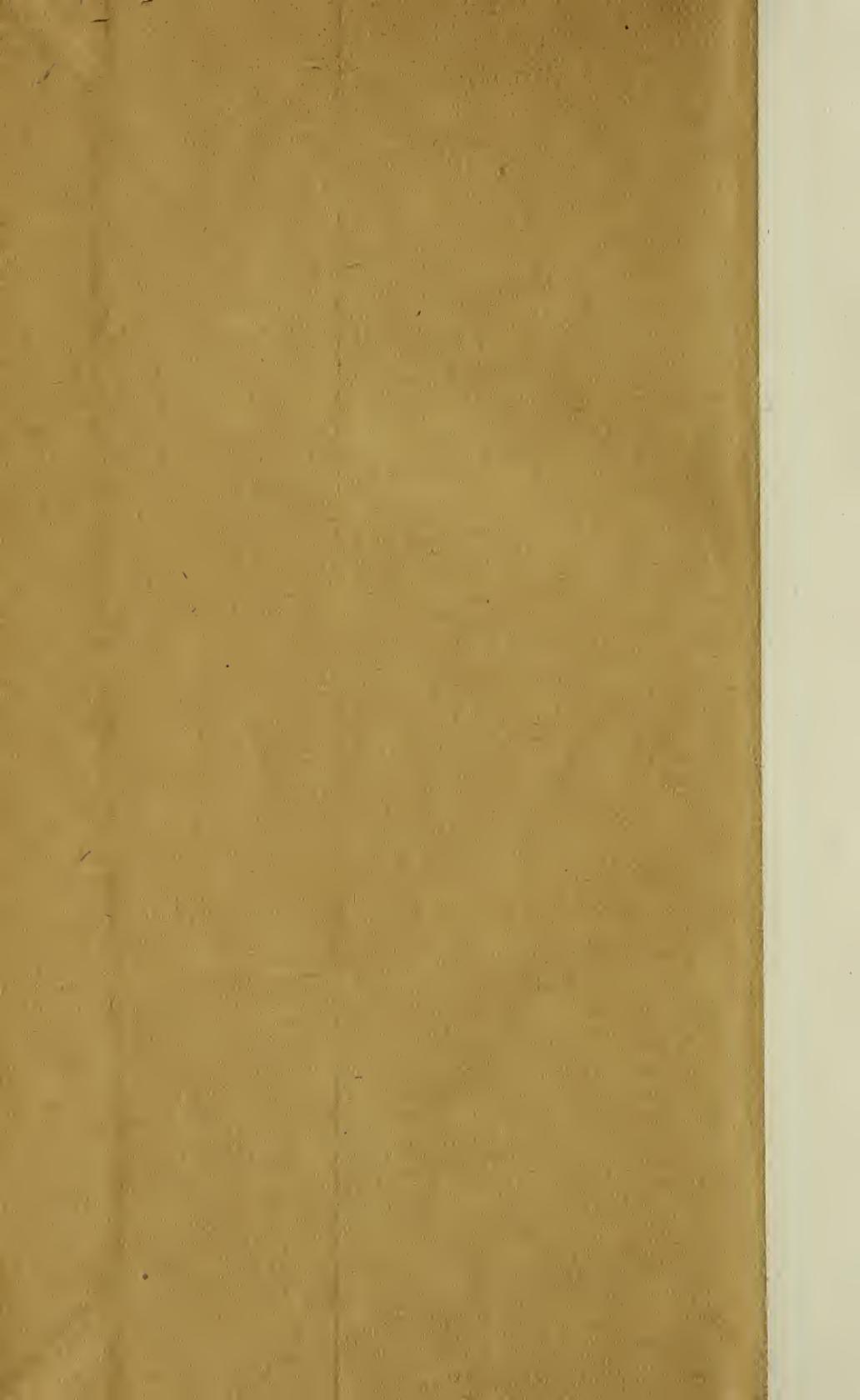
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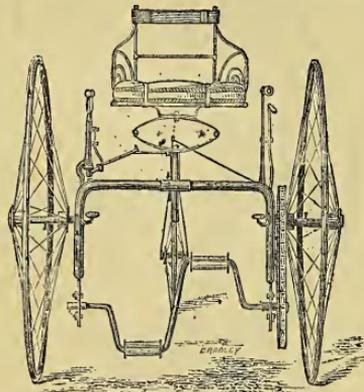
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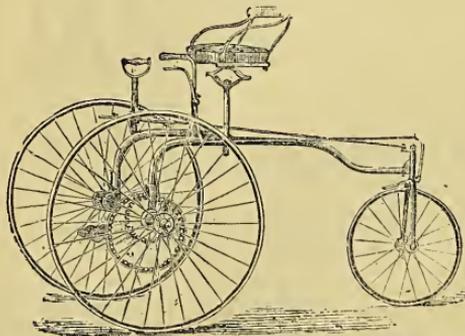
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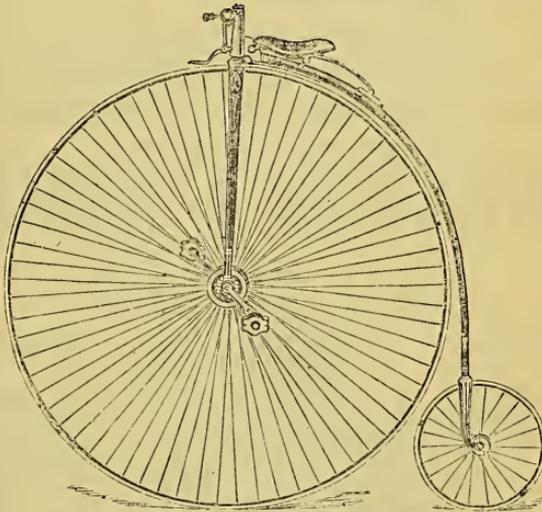
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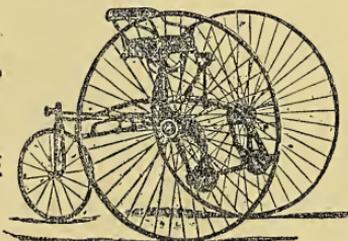
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PROFUSELY ILLUSTRATED.



COVENTRY:
PRINTED AND PUBLISHED BY ILIFFE AND SON, SMITHFORD STREET,
1881.

PREFACE.

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IN issuing this, the fourth Annual Edition of the “Indispensable,” I have found it necessary to eliminate from its columns a large number of obsolete parts of the bicycle—a list of which is appended at the end—in order to make room for the novelties introduced for the present season. This really makes the “Indispensable” more than ever a record of the bicycles of the present day, as the reader is not fogged over a multitude of parts which are now never made, and but rarely used.

The object and especial features of this work being so well known, and having been noted in previous editions, I need say no more, but send it forth on its mission, to please and instruct those interested in the welfare of the “iron horse of the future.

H.S.

Coventry, August 1, 1881.





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INTRODUCTORY NOTES FOR 1881.



NOVELTY, change, improvement ! The present generation craves for change in the hope of finding perfection, and if the desideratum is not attained thereby novelty is at least the result. Thus once again the new season brings with it a host of novelties in the construction and detail of the two-wheeled steed, though whether or no they are all improvements is quite another question, which remains to be answered by the test of time. Taking things generally, the changes have been in but one or two directions, the chief differences appearing in the matter of springs, handles, and lamps, as well as the fastening of the forks, both front and back, to the bearings. The most noticeable feature of the season is, without doubt, the general craze after "insulation from metallic connection," and "non-vibration," which has been the means of bringing out quite a host of arrangements of India-rubber cushions to the bearings, spring ends, handles, &c., &c., as well as a formidable array of curious mechanical constructions uniting the back fork and rear wheel, which latter portion of the machine has never before received half so much attention as it has this season. Whether with all these elaborate arrangements the rigidity of the machine itself is in any way affected I am unable to say, but time will most certainly prove the case one way or the other, and by the end of the season the real use or otherwise of these wondrous constructions will be an established fact.

A general dropping of old patterns, even if they contained some cherished but useless "specialité" seems to be the leading feature with the majority of makers, who all seem gradually drifting towards a common pattern in most details, direct spokes and ball bearings being now almost universal as well as long handle-bars, double lever spoon brakes, saw steps, detachable cranks, suspension saddles, and broad and deep gunmetal hubs. Ball bearings to the pedals are gradually and surely working their way to the front, and vast strides have been made upon all sides in general finish, accurate fitting, and quality of material. Several of the old safety bicycles have died a natural death, but the elderly and nervous, who yet disdain the more steady going tricycle have still many varieties from which to select, for several new ones have this year made not only their appearance, but their mark in the cycling world.

Apart from machine construction the past season has witnessed many and important advances in the sport from more than one point of observation. At home new recruits join our ranks by hundreds daily, and the pastime of bicycling is rapidly striding into foremost position, and its votaries becoming a power in the land. Clubs continue to multiply on all sides, and it will not be long ere every town and hamlet will be thus represented. The Bicycle Union after a long struggle against captious opposition, now takes a position of real authority, whilst the other great institution, the Bicycle Touring Club, has now become the largest institution of any kind in connection with amateur sport, numbering in all nearly 4000 members from all parts of the globe, and having its consul and hotel in nearly every town of any size in the three kingdoms. In the racing world progress has been and still is the order of the day, Cortis, the demon rider has beaten time hollow all the way round, and the Union is rapidly putting the affairs of the path into "apple-pie order."

Abroad, cyclists and clubs increase and multiply; America, still taking the lead and going in for the wheel with spirit and determination, has now its L.A.W., or League of American Wheelmen, an institution combining for that country the objects of the B.T.C. and B.U., and already numbering 1000 members. The one periodical devoted to the wheel in the U.S.A. has become weekly, and now has another co-worker to help to keep the ball rolling.

The French are rapidly waking up and going into wheeling with zest, their clubs increase quickly, their one publication continues a success, and they now also have a Union of their own—l'U.V.F.—and have at last settled the French Amateur Question. In almost every other part of the World comes the pleasant news of progress, progress, progress, and a place may now almost be counted uncivilized that has not a bicyclist amongst its inhabitants.



SECTION I.

ANALYSIS OF THE MODERN BICYCLE.

WHEELS :—Tyres—Rims—Spokes—Hubs—Patent and Rigid Wheels—Crank—
—Pedals.—BEARINGS :—Plain—Coned—Parallel—Ball—Varieties of
each—Back Wheel Bearings.—FRAMEWORK :—Forks—Heads—
Handle-bar and Bracket—Handles—Backbone—Springs—Saddles—Steps.
—BRAKES :—Back Wheel—Front Wheel.—ACCESSORIES :—Span-
ners—Oil-Tin—Lubricators—Pouches—Valises—Lamps—Bells—Bugles—
Horns—Whistles.



THE bicycle, although to a casual observer seemingly a simple thing enough, has more in its construction than the majority of people would imagine. The competition amongst the manufacturers has led to an almost endless variation in detail, there being scarcely an item, however minute, that has not its alterations and varieties; all these being brought into existence for various purposes by the inventive genius of manufacturers and riders, who seek thereby with each several method or variation to obtain some desirable point which they consider it an advantage to gain. Simple as even the best brands appear, it may seem strange to the unobservant to be told that in the simplest machines of modern date, fully one hundred and fifty separate pieces of metal are called into requisition before the finished article is complete, whilst the most elaborate contain as many as 300, and in some cases even more. It is the consideration of these various parts and portions of the perfect bicycle which is my object in this chapter, and in doing so my plan is to describe first, those methods of obtaining the desired ends in general and common use, afterwards detailing the numerous patents and specialities, and commenting briefly upon their theoretical and practical advantages or otherwise.

Considered collectively, a bicycle is composed of two principal parts, viz., the Wheels and the Frame, the first of which, being the most actively important, I take first, and commencing upon the outside, find

The Tyres to be composed, not of iron, as with wagon and carriage wheels, but of india-rubber cords, which thus form a soft, yielding, silent, non-conducting medium of contact between the

actual machine and the road surface, whereby the jar and vibration, consequent upon passing over rough ground with an iron tyre is, if not entirely done away with, at least very perceptibly decreased, the rubber yielding to the inequalities of the ground, instead of the whole machine and its rider having to be raised bodily over the obstruction and dropped upon the other side. Rubber tyres are round in shape and red or grey in colour, the latter however being now but rarely used, owing to the popular taste preferring the other tint. They are of varying density and thickness, and should be pliable without being "quashy," a hard tyre being almost as bad as a wooden or metal one. As a rule the thickness of front wheel tyres is now $\frac{7}{8}$ -in. and that of the smaller wheels $\frac{3}{4}$ -in. for road work, whilst for racing purposes $\frac{1}{2}$ -in. and sometimes even $\frac{1}{4}$ -in. less are used, the same amount of increase being applied for rough roads and heavy riders, for the thicker the rubber, the less is the vibration and jolting of the road felt, as well as the machine rendered more lasting. It may here be well to mention that $\frac{1}{8}$ -in. difference in the thickness of a tyre adds to or takes from the weight of the machine some pounds, a fact of which comparatively few riders seem aware, as I have often seen orders given to manufacturers, requiring thick tyres and at the same time stipulating for very light weight. Rubbers are secured to the rim as a rule by being first stretched on and then stuck on with a special cement, and if properly done in this manner rarely come off. If stretched too much they cut easily and the gashes spread, consequently 6-in. allowance for stretch will be found to be ample. Some one or two makers use

Compressed Tyres which, instead of being stretched on and cemented, are made somewhat larger than the wheel and provided with a hole down their centre through which a wire passes, by which means they are drawn together and secured by screws and nuts, sometimes being also cemented for extra security. The advantages of this method are that, being compressed, they do not cut so easily, nor do the cuts spread, and that they thus last longer and cannot come off so long as the wire holds good. Should this snap, however, off they come directly, unless held firm by cement, and they are very slightly heavier, containing, as a matter of course, more rubber. Of patent tyres there have been many varieties, but comparatively few are now in use, as follows :—

Grout's Indestructible Vulcanised Tyres, moulded into the rim in a soft or "doughy" state, and then subjected to a steam pressure of 30lb. or 40lb. to the square inch in the vulcanizer, by which they are compressed, and also firmly secured to the metal. They are warranted never to come off, and being so compressed, do not cut easily.

The **Mechanically Fixed Tyre** is neither stretched nor compressed, but held firm by means of small screws placed

alternately between the spokes, and screwing into long pieces of metal inserted in the rubber for the purpose. Loosening is an impossibility, and by taking out the screws the whole or part may be removed, but as with the compressed variety, the steel cores form a hard surface against which a tyre is sometimes cut.

Sparrow's Leather Tyre consists of a strip of leather half an inch in width and an eighth in thickness, firmly cemented *on the top* of the ordinary rubber tyre (which is cut away flat to receive it). It is designed to overcome the tendency ordinary rubber has to slip on greasy roads, and thereby throw the rider. It makes riding much safer, but does not add to the appearance of the bicycle.

Hancock's Patent Non-slipping Tyres are also designed to gain the same end. They are "fluted," *i.e.*, constructed with alternate ridges and indentations lengthwise, the outer section of the tyre being made of a more tenacious quality of rubber, to prevent the easy tearing of the narrow ridges that would otherwise occur. I believe they really answer the purpose intended, though I have not tried them, and the fluting on the inner side tends to give a better hold to the cement than the smooth surfaced rubber.

The **RIMS** or **FELLOES**, those portions of the wheels which receive the tyres, are of two kinds, solid and hollow. Solid rims are of several patterns, the first of which is—

*The **V Rim**, composed of angle iron with a section similar to the letter V in shape. It is the oldest form in use, strong and heavy, and best suited for holding very large rubbers.

*The **U Rim** is of rolled steel, in shape somewhat resembling the letter U. It is very light and is neater in appearance, but does not possess the strength of the V section. It is now, however, little used, having been supplanted by—

The **Crescent Rim**, which is that most in favour at the present time; constructed of rolled steel, it resembles the U in shape, with this difference, that it is thicker in the middle and comes to a fine edge at the sides in the shape of a new moon or Turkish crescent. It is neat, light, and stronger than the U; by coming to an edge at the sides, also, the liability of the tyres being cut by getting nipped between the edge of the rim and any stones the rider may pass over, is obviated to a great extent.

These are the forms in common use, besides which we have as specialities :—

The **V U Rim**, an extremely neat form, appearing to possess considerable strength, resembling a crescent placed inside a V with a very sharp angle.

*Very little used.

The **Potential or Fluted Felloe** may be described as a crescent felloe with a fluting or **U** shaped depression in the centre. It is decidedly stronger than any other solid felloe in use, and would be more extensively used but for the difficulty experienced in manufacture. It is stronger vertically than sideways.

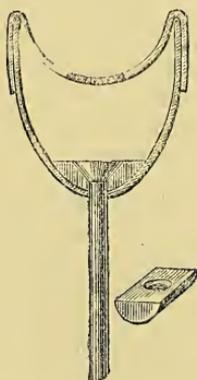


THE POTENTIAL RIM.

This is the last of the solid felloes, the other varieties being hollow. They have been coming much more into fashion lately, especially for light roadsters and racing machines, and are as follows:—

The **Club Hollow Felloe** constructed by passing a tube of round steel through rollers which bring it to a section similar to the ordinary crescent, but thicker in the middle and, of course, hollow. It is more rigid, and somewhat lighter than the same section of solid felloe.

The **Invincible Double Section Hollow Rim**, as shown in the accompanying illustration, is constructed of sheet steel rolled to a deep **U** section, on the top of which is brazed a second but shallower sheet, having two overlapping flanges. Its great depth



interferes but little with appearance, and besides being very light, it is so strong and rigid, that it will, even when unsupported by the spokes, bear the entire weight of a heavy person with scarcely any perceptible deflection, from which it will easily be seen that a "buckled," or untrue wheel is impossible.

The **Humber Hollow Rim** is the latest invention in rims, and is likewise constructed of rolled sheet steel, but in this case three and not two portions are used. The outer sheet forms a deep **U**,

with flanges turned inwards, and bearing upon the other two, the upper one of which is a shallow groove resting upon the inner one which, in shape very much resembling the Potential solid rim, supports and stiffens the other two. Like the previous one it is very light and rigid, and the spokes bearing upon the outer case tend to draw the whole together, and keep them from coming to pieces. From rims to

Spokes is but a step, and before noting their various differences, I may explain that the principle of a wheel is that the rim should be perfectly true (or, in other words, a perfect circle) when separate from the wheel; the spokes then act as stays, keeping the whole firm and true; they also act as suspension rods, for the weight of the rider rests upon the *centre* of the wheel, and is *suspended* from that part of the rim which happens to be uppermost, by means of the spoke then most perpendicular. Thus the weight is constantly shifted from spoke to spoke as the wheel revolves, and the whole of the spokes, being braced up tight, keep the rim from giving in with the weight.

Spokes are of various kinds. They are composed of either charcoal iron wire, or steel wire cut to the requisite length; a head is, as a rule, hammered at one end and the spokes passed through holes drilled at equal distances in the rim; they then proceed alternately to each side of the hub or centre of the wheel (which will be described presently), where they are secured in three ways. The first and most ancient of these being by means of—

Nipples, which are pieces of steel about 1-in. in length, having a worm or screw cut on one end, the other taking the form of a nut, with six or eight sides. Through the centre of this a hole is drilled longitudinally, the spoke is then passed through this, and a second head beaten on the other side; by screwing the nipple firmly down into the hub the spokes are secured, and may be tightened or loosened at will.

Lock-nutted Spokes are fitted in precisely the same manner, but with the addition of a nut working upon that portion of the worm of the nipple which remains above the flange; when the spoke is sufficiently secured by means of the nipple, the lock-nut is screwed down firmly on the hub.

Direct-action Spokes differ from these in having a worm cut on the lower ends of the spokes themselves, by which they are screwed into the hub and adjusted as required; the best kind having the end of the spoke upon which the worm is cut "upset" or thickened to nearly twice the diameter of the spoke itself. These are termed "butt-ended."

These are the three forms in common use on the generality of bicycles; now for their advantages and disadvantages.

The first two are claimed to be better than the latter, in that the spoke itself not being firmly fixed to the hub is able to rebound, as it were, into the space below it on going over a large stone, or in any other way receiving a forcible blow, whereas it is argued a direct spoke, not having this space, and being firmly secured to the hub, being therefore unable thus to give, would break off; which calamity, however, has now almost entirely been provided against by one or two makers by the use of the thick ended spoke just described.

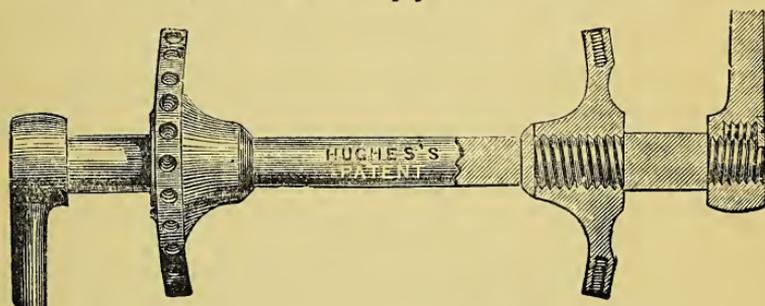
Again, this very thing proves a disadvantage in another way, for, the spokes being able thus to give, the wheel is more liable to "buckle" or double up into a figure of 8, with the concussion. So much for the relative advantages in principle. The lock-nutted spokes are firmer than those fastened with nipples only, the extra nut locking the nipple and so overcoming in a great measure the tendency that kind of spoke has to loosen. My idea of the proper number is "spokes for inches," to this, however, it is now almost universally the custom to add 10—*i.e.*, a 40-in. wheel to have 50 spokes, and so on in proportion to 60-in., which would have of course 70. The more the spokes the thinner is the wire used, so that more spokes do not necessarily mean more weight; but it must be remembered that more surface is presented to the air, which means so much more labour, especially in a high wind; also, more spokes take more time to clean, and, being closer together, give much more trouble, on account of the difficulty of getting the hand and cleaning cloth between them; with spokes to the inch it is close work, with more of course this difficulty is increased, as well as being next to impossible to clean the hub, or use a hub lamp. So much for the spokes.

Now for the **HUB** itself. This portion, as before remarked, forms the solid centre of the wheel from which the spokes radiate. It is composed of two parts, *viz.*—the axle. and the collars or flanges: the former is a stout bar of steel or iron, forming the true centre of the wheel; it varies from $\frac{1}{2}$ -in. to 1-in. in thickness, and should not be less than 10-in. in length. The collars are circular plates of metal, varying in thickness from $\frac{3}{16}$ -in. to $\frac{1}{2}$ -in. at the edges, and from $\frac{3}{4}$ -in. to 2-in. in the centre; these are firmly secured to the axle by different methods. In some makes both collars and axle are in one solid piece; but most are constructed separately, and are firmly united by brazing; increased facilities being thereby obtained for case hardening the axle. For nutted spokes the collars are generally of steel or iron, wide at the edges in order to take the width of the nipple, but when direct action spokes are used, they are usually of gun-metal or brass—some few use steel, thin at the edges and gradually spreading out inwards, until they reach the axle; this is in order to give a large surface against the axle, as unless a firm hold is obtained and the brazing well done they are

apt to work loose. These gun-metal flanges have—or ought to have—the exterior lower portion recessed to the depth of about $\frac{1}{2}$ -in., the indentation extending some $1\frac{1}{2}$ -in. around the axle, and the holes for the spokes drilled right through; by this means the spokes may easily be tapped out in case of breakage on the worm and a portion remaining in the hub. The pedals are also brought closer together without decreasing the distance between the flanges, which should never, unless on very small wheels, be less than 6-in apart, as, with a less amount of “dish” as it is called, the wheel is liable to buckle.

The hubs for the back wheel are usually constructed solid of either steel, iron, or gun-metal, but occasionally they are complex. They are hollow, simply having a hole drilled longitudinally through them for the reception of the back wheel pin. If composed of gun-metal or brass they should have a steel core to receive the friction, or they will soon wear out.

Hughes Detachable Hubs are designed to provide a rapid and easy means of taking off the flanges in case the axle gets broken or bent, when a new one can be cheaply refitted instead of an entirely



HUGHES DETACHABLE HUBS.

new hub being requisite. They are very simple in construction, being merely screwed on up to a shoulder turned on the axle, and kept from shifting by the bearing and crank.

Such, then, are the plans upon which all wheels are constructed, except such as are patent or made specialities of. These are as follows:—

The **Club Spoke**, constructed by securing a piece of metal to one end of it, and on this cutting a worm, so that it resembles a spoke with the nipple all in one. It is screwed into the hub in the same way as a direct spoke, and when adjusted is secured by a small and very neatly fitted lock-nut. The advantage gained by the plan is very much the same as the thickened form of direct spokes.

Carver's Hollow Spokes are in outward appearance exactly similar to the ordinary direct-action spokes, and indeed the principle

of the wheel is identical, the difference being that the spokes are hollow instead of solid. They are constructed of steel ribbon formed longitudinally into a tube, and having a couple of inches of stouter tube, bearing the head and worm respectively, brazed on to the ends of the tube, which are supported by the insertion of an equal length of solid wire in the interior. In theory they are weaker than the solid when bearing the tensional strain, or in other words are more liable to elongate when the weight is brought to bear upon them; like many other things however, theory and practice do not agree on this point, for the contrary has been proved by experiments. In being more rigid than solid spokes when taking the transverse strain, *i.e.*, in transmitting the power from the hub to the rim, they quite agree with theoretical deductions. They possess a disadvantage in their mode of construction which the solid do not, that is, that the brazing of the ends entails much extra work. They are somewhat lighter than solid spokes *of the same size*, but as these latter are now made very fine, the difference in most wheels is scarcely noticeable. Their transverse rigidity makes a wheel very stiff.

In **Palmer's Safety Nipples** the arrangement is very simple; into the holes in the hub flanges small nipples screw down flush with the edge. These are drilled and tapped centrally and hold the spokes—ordinary direct-action ones. Should a spoke snap off in the hub, all that has to be done is to unscrew the safety nipple with a screw-driver, and it brings the broken part out with it. The same idea is carried out in

The **Stanley Spoke**, in which a very neat nipple is made use of, tapped internally, and provided with hexagonal head fitting neatly the spoke which thus outwardly resembles the "Club" spoke, the tops of the nipples being bevelled off and graduated to the size of the spoke.

The **Acme Self-Adjusting Spokes** screw directly into the hub, as do ordinary direct-action spokes. In the rim is a "button-hole," about $\frac{1}{2}$ -in. in length, having a circular opening at one end. Into this the spoke head is passed; it is then pushed to the other end of the slot, when the head slips down into a hole sunk for its reception. The only advantage derived from this is that the rubber (which is vulcanised) need not be disturbed to replace a broken spoke.

Stassen's Screwless Spokes resemble the direct-action in outward appearance; they are however, secured to the hub—the collars of which are very thick—without screws of any kind.

Starley's Safety Wheel is an ordinary direct spoke wheel, and the hubs are constructed in the ordinary manner, but have small holes drilled through them at right angles, crossing the holes drilled

for the reception of the spokes. In these holes small plugs are fitted, and the spoke-holes drilled through them, the tapping (or screw) being only made through the body of the plug. The spokes are then screwed in, in the ordinary way, and the wheel completed. The advantage of this plan is that, should the spoke snap off at the worm and a part remain in the hub, the broken portion is easily removed by driving out the plug. Somewhat similar at first sight appears to be—

The Interlocking Hub. With this the spokes are also direct, and, similarly, we find holes drilled at right angles to the spokes, but a further inspection shows that these are drilled *a little on one side of the spokes*, the holes only trespassing on each other some $\frac{1}{32}$ of an inch. The plugs also take the form of round-headed screws. The spokes are first screwed in and the wheel properly "made up," the cross-holes are then tapped through, the tapping of course cutting a little into the sides of the spokes; the plugs then, on being screwed in, cross and interlock themselves with the spokes, thus effectually preventing their loosening. It is a good idea and well carried out.

The Arab Self-Adjusting Spokes also require a specially constructed hub; this is of gun-metal hollowed out very much on the outside, so as to leave a considerable thickness around the edge of the flange. Holes are then drilled around this as for ordinary spokes; they pass right through to the inner side of the secondary flange, and are then tapped the reverse way, so as to receive neatly made nipples, which grip the spokes and draw them tight as required. The chief advantage claimed for this style of spoke is, that the tension of the spoke tends rather to tighten the nipple than otherwise, thus almost entirely preventing the possibility of a loose spoke.

Bagshaw's Patent Hub is somewhat akin to this. The flanges are deeply recessed, and the overlapping flange thus formed is drilled right through all round, the spokes passing through the holes and screwing into small cubical metallic blocks fitting neatly around the flange. When the wheel is "made up" a couple of semi-circular caps screw on over all to hide the blocks and give the whole a neat appearance. The advantage gained by this method is that the spokes are not so liable to break off at the hub, and should they do so they can be renovated without trouble.

In the **Registered Clamp Wheel** the spokes used are the ordinary direct action ones. The hub has a series of grooves upon its outer face in number according to the number of spokes, and holes are drilled in continuance of the grooves. Into these then the spokes screw as in an ordinary wheel, and when set up true and firm, a clamp with corresponding grooves is screwed on. In this wheel a new spoke is not easily fitted, but a loose one can be re-adjusted.

This concludes the category of wheels, which have no special arrangement to secure rigidity, so now for the

Rigid Wheels. First as to their object. The power of propulsion is applied by the feet in the first place to the centre, *i.e.*, the hub of the wheel, and transmitted from thence through the spokes to the rim; with ordinary wheels it is found that there is a certain amount of spring or rebound in the hub whenever any extra power is applied, or in other words the hub partly revolves before the power reaches the rim, and, as soon as the pressure is released, springs back again; consequently a certain amount of power is expended uselessly at every revolution. This will be easily seen by firmly securing the rim of an ordinary wheel to something solid and fixed at two or three places, and then applying full power to the crank. To obviate this defect, several expedients have been resorted to by different makers, taking the form of these "rigid wheels." Although at one time very numerous, there are but two patterns in use, the ordinary wheels being now so much improved in manufacture that the advantage is more theoretical than practical.

The Tangent Wheel. In this the spokes, of the ordinary direct action class, instead of meeting the hub in the direction of its centre, do so at a tangent—whence the name—and thus have a direct pull upon the rim, without any actual lateral strain. There are two sets of spokes, the first screwing into the hubs in one direction, and the second in the opposite direction. Thus the wheel is kept perfectly rigid either way, and the power communicated directly to the rim.

The Invincible Wheel is constructed with the hollow felloe previously mentioned as possessing such strength. The hubs are pierced with small holes near the edges, and through these are lengths of pianoforte wire twice the length of an ordinary spoke, and headed at both ends. Each length forms two spokes, which are carried alternately to the rim and there secured by means of small nipples. Being so thin the spokes are very light, and also offer little resistance to the wind, whilst by reason of the peculiar arrangement the power is carried to the rim direct, which, being of itself so stiff, requires little assistance from lateral spokes.

Wood's Narrow Wheel is quite a novelty and differs from both classes in many ways. About a foot from the rim a broad strip of sheet steel forms a ring all round; this being provided with stiffening flanges and perforated centrally for lightness and windage. To the edges of this the spokes run from the rim in alternate order being then some 2-in apart, they then run directly downwards to the hub flanges where they are secured in the ordinary manner (Fig. 1) being however but $2\frac{1}{4}$ -in. apart instead of 6-in. thus narrowing the tread tremendously. The steel band makes it sufficiently stiff to withstand most of the tendency of a narrow wheel to "buckle." It is made in two ways, in the other (Fig. 2) the spokes crossing after leaving the stay ring and being secured to opposite sides of the hub, which

arrangement makes it almost a matter of absolute impossibility to buckle the wheel, and yet allows it to be made so narrow.

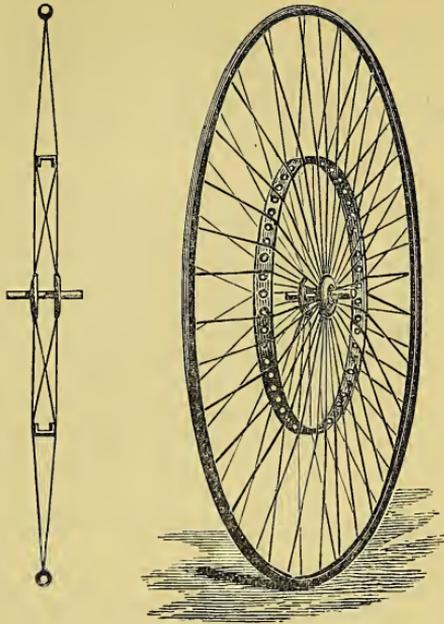


Fig. 2.

Fig. 1.

WOOD'S NARROW WHEEL.

Having now fully discussed the question of the wheels themselves we come to their immediate adjuncts, and take first the small levers by means of which the motive power is applied. These are

The **CRANKS**, which are of two kinds, viz., fixed and detachable. The crank itself is a flat iron or steel bar, from 5-in. to 6-in. in length; in thickness it graduates from some $\frac{3}{4}$ -in. at the axle, to $\frac{1}{2}$ -in. at the end; for the first four inches or so it is about $\frac{3}{4}$ -in. in width, after which it widens suddenly out to 1-in.; in the centre of this wide part, a slot $\frac{1}{2}$ -in. wide and 2-in. in length is cut; this receives the pedal, which by this means may be placed at any distance within the length of the slot, to suit the rider. Some few makers still adhere to the old plan, of having from two to four circular holes pierced in the crank at given distances, instead of the slot. Both methods have their points, for and against; with the former the pedal can be adjusted to a greater nicety, and looks better: but is liable, if the securing nut does not bite well, to slip up and down the slot, which it cannot do when secured in holes.

The difference between fixed and detachable cranks lies in the mode of attachment to the axle; the usual method for fixed cranks

is to secure them by means of a "key," or thin tapering bar of metal, which is driven in between the axle and crank, fitting into slots cut for the purpose, the crank being first shrunk on, to give it a firm hold independent of the key. It is no uncommon thing, however, for this key to work loose, in which case the rider has, perforce, if it be lost, to walk, or ride with one pedal, until he reaches a smithy, or is obliged repeatedly to dismount and knock it in, if he has luck enough to discover it in time. In order to get over this difficulty

The **Detachable Crank** has been invented. In detail, it is the same as any other, but is fixed to the axle in the following manner:— At its base, the end or "boss" is suddenly widened out to about 1-in. in thickness; this is divided edgeways, and a portion removed, leaving a space about $\frac{1}{4}$ -in. broad, reaching nearly to the shaft of the crank. The end of the axle has a flat cut in it, and the crank put on; a space will then be found left between the axle and the crank shaft, into which is driven a long tapering wedge-shaped piece of metal, called a cotter; this has a thread cut on its smaller end, which is rounded for the purpose; on this a nut is fixed, and the cotter being firmly driven in, the nut is tightened, and the whole secured. This is the original and most general plan (Starley's); but amongst other methods, the following are also used:—

The **Centaur Crank** is first screwed up to a shoulder on the axle with right and left-handed threads, so that the pressure of the foot tends to make it all the more secure; whilst, to prevent its loosening by "back-pedalling," a slightly tapered conical pin is driven through both crank and axle, and secured with a nut.

In the **Triumph Crank** the end of the boss is split and provided with small flanges through which a bolt passes, making all secure; the axle is D shaped, and the crank fitted to correspond. A neatly fitted nut on the outside prevents it from slipping off sideways.

In **Hughes' Patent Detachable Crank** a worm is cut upon the axle, and the collar screwed on up to a shoulder, a steel hardened cylinder next screws on to form a good bearing surface, and the crank is screwed tight up to it, the latter being then secured by means of a small screw driven in by the side of the axle, the thread of which interlocks with the thread on the axle.

The **Timberlake Crank** has the shaft split up centrally for some 3 inches; this allows the sides to be drawn together by the cotter, thus obtaining a better grip on the axle.

Hillman's Patent Crank differs from Starley's in that both the flat on the axle and the slot in the crank are cut longitudinally, the latter being somewhat longer than usual and cut right through to the axle for about half way; the back of the slot slightly tapers, and the key is somewhat in the shape of a hammer-head; it passes

through the crank and is secured and tightened by means of a nut on the shaft behind the crank, one end intruding very slightly upon the hole cut for the axle, into the flat on which it fits, holding all secure. The advantage of this method lies in its neatness and easy adjustment, and in its having no projecting ends to catch the trousers when riding with them.

There are a few other varieties, but the difference between them is very trifling.

The different varieties of this class of crank have no very special advantages or disadvantages over the others, except what I have mentioned: they all gain the same end, and possess equally an advantage over the fixed style; as, in case of their loosening, they can be quickly tightened with the wrench. They can also as readily be taken off for the purpose of cleaning the bearings, and for the same reason are more easily straightened when bent by a fall. On the other hand, it must be remembered that unless very carefully fitted—hence avoid them on “cheap” machines—they frequently work loose. They are specially adapted for use with roller, ball, and parallel bearings.

The mediums of application of power to the cranks are—

The **PEDALS**, which are secured to the crank ends by fitting into the slots or holes, as the case may be, where they are firmly fastened with nuts. They are of various kinds—some patented—that most in favour for general use at present being the

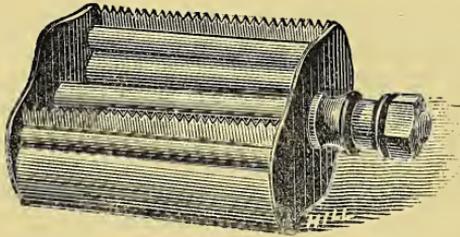
Rubber Bar Pedal. This consists of a metal tube some four inches in length, at both ends of which a flat oblong piece of steel is set at right angles; these are widened out in the middle to keep the foot from slipping off sideways, and the ends connected by small steel rods running parallel to the central tube; on these, bars of 1-in. rubber are secured, upon which the foot rests.

This gives a firm, soft hold to the foot, but is rather slippery in wet weather. The whole revolves on a steel pin passing through the central tube; this pin is now mostly fitted with conical ends, one being fixed, the other moveable, so that when worn, by screwing up the outer cone, compensation can be made for wear. This effectually prevents rattle, but the plain pin, when well lubricated, runs easiest. Great diversity exists in the construction of the pedal itself, and quite a rush has lately been made in the manufacture of pedals working upon balls upon which I shall speak shortly.

The **Rat-trap Pedal** in general construction is the same as the bar pedal, but the rubber bars are replaced by two flat pieces of steel, having serrated edges like the teeth of a rat-trap. They give a very firm hold to the feet, and are much lighter than the others, but are prone to wear out the boots.

These two form the kind of pedal in common use, the latter are in favour with makers of light machines. The following varieties, being patent, are specialities.

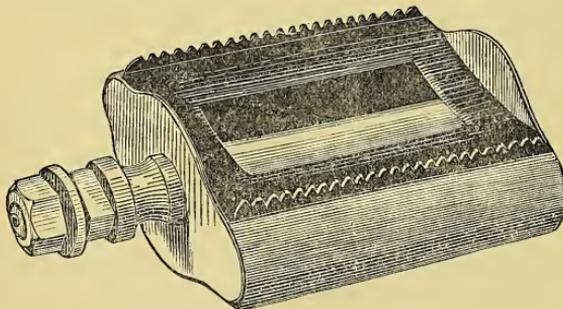
Settle's Patent consists in using two bars upon each side upon which to secure the rubber, which is constructed specially for the purpose, the two bars in one piece, which makes it a matter of absolute impossibility for the rubber to slip round upon the bar, and thus throw the foot off.



SIMPSON'S COMBINED PEDAL.

Simpson's Combined Pedal consists of an ordinary rubber pedal with thin rat-trap bars secured as well, in such a manner that on one side the pedal presents the appearance of a rubber, and on the other that of one of the rat-trap class. It is one of the best in use and is a fast increasing favourite, as the rat-trap side can be used in greasy weather, and the more comfortable and less destructive rubber utilised for ordinary purposes. It is perfectly balanced.

The **A B C Balanced Pedal** is constructed somewhat after the above pattern, having rubber on one side and flat diamond-cut plates on the other, the whole being so delicately balanced that the pedal is always in position to receive the foot.



BUTLER'S PEDAL SLIPPER.

(Fitted to an ordinary pedal).

Butler's Pedal Slipper can be applied to any ordinary rubber pedal, and consists of a light steel plate, the usual width and length of a rubber pedal; its outside edges are turned up and serrated, and the centre has two spring cheeks in a downward direction.

These latter grip the central cylinder, and hold the "slipper" firm upon the rubber, thus converting one side of an ordinary pedal into a rat-trap one, the plate being easily removable at any moment.

Garrood's Grip Pedal is the latest introduction in this line, and is designed not only to effectually prevent that calamity known as "slipping the pedal," but to enable the rider to utilize the upward motion of his foot in pulling for propulsion. To the sides of an ordinary pedal, flexible steel plates are attached, which can be so adjusted by means of small screws at the sides as to grip any boot thrust into them with sufficient tenacity for the purpose desired, yet not with sufficient power as to prevent the disengagement of the foot in case of a fall. It is likely to have a large sale amongst racing men this season.

Andrews' Pedal is a variety in construction only, the side bars being screwed to the ends instead of the whole being headed up. This allows new rubbers to be put on at any time when needed by the veriest novice without difficulty.

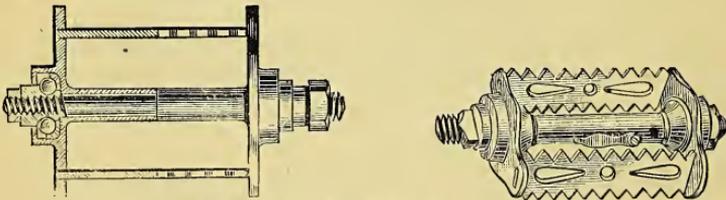
The speciality in **Granger's Pedal** is also in point of construction, it being an ordinary rubber one, having a neat brass cylinder over the central pin; this cylinder has a milled ring at each end, by which means it may be easily and quickly turned round and ingress obtained for the oil for lubrication. It has a very neat appearance and answers its purpose well.

The **Eccentric Pedal** has an elliptical rat-trapped upper surface, from which the sides—of brass—fall away perpendicularly some three inches. At each end a 2 in. ring is fitted, and the bearings for the pedal-pin placed on one side, just within the circumference of these, the rat-trapped top being kept in position by leaden weights at the bottom. Its use enables a man to ride a machine a couple of inches larger than he could otherwise reach, to drive with a longer crank-throw, or, using the same throw, to do so with less leg action. It has a tendency to turn over and throw off the feet when going fast, and I fancy cannot gain in power, notwithstanding the increased crank leverage obtainable thereby. Its chief use is to enable small men to ride large machines.

Hancock's Pedals are formed entirely of gun-metal, and are of a neat and novel shape, being, as it were, "looped" at the edges, and provided with a spike at the corner of each "loop." They are neat, light, and hold fairly well.

As I have said before, the great majority of these run either upon a plain lubricated pin, or upon one with coned ends; latterly, however, more attention has been given the matter, and the pedal—which is perhaps, subjected to more strain than any other part of the machine—has been made to run upon balls.

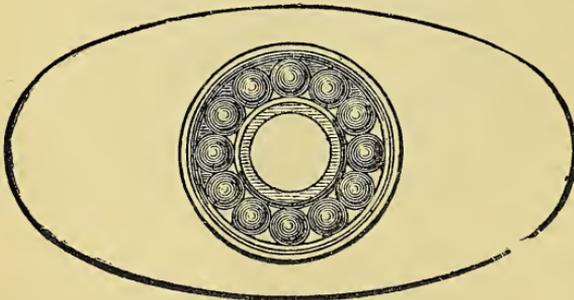
Ball Pedals therefore, are very much in vogue this season, and and will be if I mistake not the pedal of the future, not the least advantage gained by their use being the absence of the continuous oiling up requisite with cones or plain pin, as balls only require oiling at comparatively rare intervals. Nearly every maker now makes his own, the balls being placed in a recess or case in the pedal ends in such a manner that they separate the pedal from the pin, and take all the wear. The best are provided with dust-caps, covering in the whole on the outside, and the ball cases should not be placed upon the outside of the pedal, or they oblige a greater width of tread. Although there exists practically but little difference in any, there are a few varieties deserving of prominent notice, these being :—



BOWN'S ADJUSTABLE BALL PEDAL.

Bown's Adjustable Ball Pedal, which has the cases for the balls placed outside the pedal plates, and conical surfaces both upon the inner sides of the pedal pin and ball cases. The balls are placed between these and, as shown in the illustrations, a cone working on a worm at the pin-end screws up and adjusts for wear, being firmly secured by a lock-nut when properly adjusted.

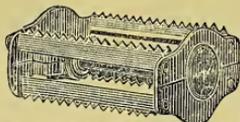
Rudge's Ball Pedals have a grooved case or box on the inner side of each footplate, in which a number of steel balls are placed, and the pin is provided with a grooved cone by which they can be adjusted.



THE QUEEN BALL PEDAL.

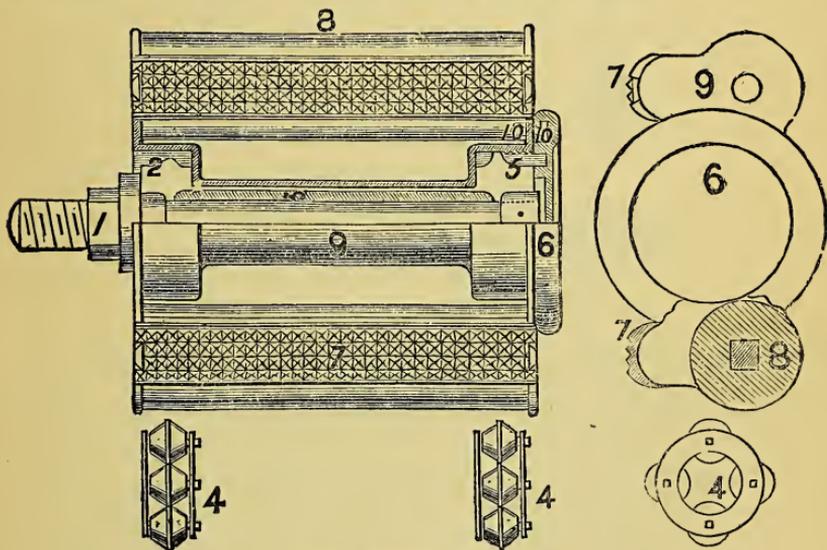
The **Queen Ball Pedals** have the balls placed in a case constructed neither one side nor the other of the footplate, being made in it as it were ; this makes a very neat pedal, but

Harrington's "Arab" Pedal is by far the neatest I have yet come across, the balls being very small and placed in cases so neatly constructed in the pedal ends that one can hardly believe their existence unless actually taken apart and the balls seen.



HILLMAN HERBERT & COOPER'S
"PATENT BALL PEDAL."

Hillman's Ball Pedal is likewise an excessively neat unadjustable pedal, but differs from all the others in having not a single row but a double one at each end. These run in grooves, very much resembling those cut in the axle for double ball bearings (described further on). All the balls are inside the pedal ends, beyond which no nut projects, a neat plate being fitted which covers all in and most effectively keeps out the dust, making at the same time one of the neatest, most useful, and effective pedals in use.



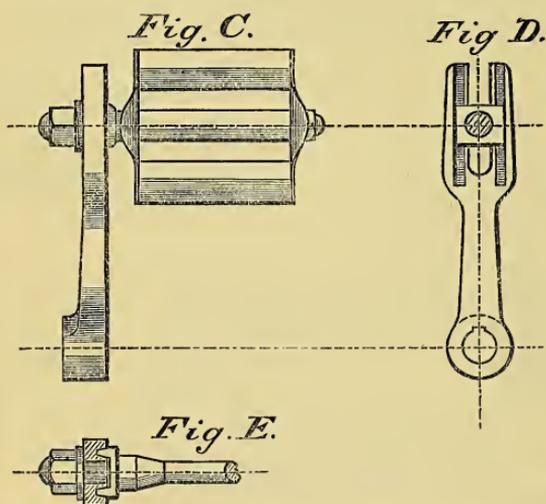
A B C BOWL PEDALS.

The A B C Bowl Pedals have cases on the outside, instead of the inside of the footplates, and in each of these cases two collars are placed, between which four "bowls" run upon separate spindles. These "bowls" may be termed very short conical rollers, and they are capable of very accurate adjustment, as both sides of the inner cones of the case are brought together when requisite for tightening.

Before leaving the subject of cranks and pedals, I must not omit descriptions of some improvements in which alterations are made more or less in both. These are:—

Carver's Safety Pedal, which has the face of the crank cut with eight or nine grooves, and the flat of the pedal pin fitted with corresponding protruberances. By this arrangement it is impossible for the crank to slip up or down the slot when not quite tightly secured.

The **Coventry Machinists' Co.'s Safety Pedal** is somewhat similar, having the same object in view; in it the grooves are replaced by a series of small holes drilled in the face of the crank on each side of the slot, and the pedal pin is provided with a couple of pins to fit. Both are equally good.



MOTHERSILL'S PATENT DETACHABLE PEDAL.

Mothersill's Patent Detachable Pedal is clearly shown in the accompanying illustrations. (Fig. C) The slot of the crank is carried right through to the end, thus much resembling a tuning fork. (Fig. D) This allows the pedal to be removed in an instant, by simply slackening the nut a half turn, and slipping it out. In order to prevent the forked crank from opening with the pressure of the foot and thus dropping the pedal, both sides are grooved and the face of the pedal-pin fitted to correspond, thus holding the open ends together. (Fig. E) It is very useful to those who are short of room and find the pedals always getting in the way.

Having examined the various parts and accessories of the wheels, we come to the medium of connection with the framework, viz. :

THE BEARINGS.

These are very important and contain more varieties than any other part of the machine. They are, or rather ought to be, constructed of steel in all cases, and should be made as hard as possible,

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The great end sought for in bearings is to obtain the minimum amount of friction; for, the greater the friction, the greater the useless expenditure of power, and consequently harder work in propulsion. With more friction there is more wear; it is for this reason the bearings should be well hardened, and, as no bearing can run without friction, they should be readily tightened to compensate for this inevitable result. It must also be borne in mind that "simplicity is a virtue," as the greater the complication the more points of friction there are. Bearings may be divided into two great classes, viz., Simple and Compound, each with numerous subdivisions. Beginning then with the **SIMPLE**, they may be subdivided into three classes, viz., Plain, Coned, and Parallel.

Plain Bearings consist of two semi-circular surfaces of hardened steel, resembling the two halves of a cylinder about 1 in. in length; one half fitting on the top of the axle, the other below it. The upper part is a forging solid with the end of the fork, and is fitted with two projections, one on each side: the lower bearing is similar in shape and is secured to the upper by means of two screws and nuts in the projections. With plain bearings there is less friction than with many other forms, they are also very simple; but their disadvantage is that they cannot be tightened when much worn with use. If however, both surfaces are well fitted and deeply hardened they will wear for a long time with very little detriment.

Improvements on the plain bearings are

Whitehouse's Self-lubricating Bearing, in which the centre of the bearing has a deep groove all round. This holds a large quantity of oil, consequently the necessity of frequently "oiling up" is saved.

The **North of England Bearing** has a wide and deep groove, and on the axle a collar is turned which exactly fits the groove. By this means dirt is kept out very fairly, the oil is retained, and much of the side-shake, consequent upon wear, taken away. It is good.

Warman's Double-circle Thrust Bearing consists of a steel hardened collar, on which two semi-circular ridges are turned at a short distance from either end. These ridges resemble broad rings sunk half in the collar; the bearing box has corresponding grooves into which these fit. The rings take all the wear, and allow of a slight adjustment by tightening the case sides. They are said to run very freely. The next class comprises

***Coned Bearings**, of which there are two varieties as regards the bearing itself, besides numerous methods of adjustment and fixing. In the generality of coned bearings the axle is turned out in the centre so as to appear as if a hollow truncated cone had been slipped

*Very little used now.

on at each end, the bearings being bevelled at their edges to fit these. This is the common kind; the other is just the reverse, the cones being turned *on* the spindle; *i.e.* with the bases touching each other, and the bearings hollowed out conically to fit. The advantage of cones over plain bearings consists in their adjustability to compensate for wear, but there is much increase of friction. The second plan has several advantages over the first, *viz.* : that the cones being turned *on* the spindle instead of *into* it, make the axle stronger in place of weaker, whereas with the first plan the axle is liable to snap off at the bearing with a sharp blow. Also the bearing being concave instead of convex, it can be kept well oiled with greater facility, in which respect it resembles the North of England bearing.

*The **Pickwick Bearing** belongs to the second class of cones, and is by far the best form of conical bearings yet introduced. Its great features are the simplicity and strength of its construction, and its beautifully exact adjustment. It is put together as follows:—The axle in the first place is not hardened, and is left parallel as for a plain bearing. In applying the bearing, the inner half of the box—which is divided up and down, instead of across—is first put on and fits well into the hub, which is recessed for its reception; a long and very hard cone is then slipped on, and is secured to the axle by a screw (which is turned through the oil hole). The outer half of the box is next screwed into the inner one, and thus the bearing is adjusted, and is kept from loosening by the use of a neat lock-nut. It is fairly dust proof, easily renewable, and very steady. A great improvement has lately been made in its mode of attachment to the fork, the ends of which are formed into arches or prongs ending in small sockets, into which small pins or rods work, these latter being at right angles to the exact centre of the axle, from which a considerable amount of strain is thus removed and friction consequently reduced.

The **Northampton Coned Bearing** has two conical collars turned upon the axle, about an inch apart. These are well hardened and the axle box is made in two halves, like that of a “Sheffield” plain bearing, having two corresponding coned grooves turned in it, into which the collars fit. This method gives much steadiness and admits of considerable adjustment. It is very similar to Warman’s double-circle thrust bearing.

Ordinary Conical Bearings are usually adjusted and secured by means of a nut and cotter, by an eccentric, or by a screw at the bottom. The “eccentric” consists of a small steel rod secured to the ends of the bearing-keeps by screws fixed out of its centre; this when turned by means of a pin set at right angles to it, gradually raises the lower bearing until sufficiently tight, when the whole is secured by tightening the nuts at the end. In the third method, the

*Very little used now.

ends of the bearing-keeps are united by a small bar, through the centre of which a screw passes ; this, when turned by a nut at the bottom, forces the lower half of the bearing into position, where it is secured by a lock-nut. This is a very good method, but little used ; and I may here mention that all the varieties of coned bearings are now but little employed in manufacture, although large numbers are still in use about the country, and I fancy in a season or two this variety of bearing will for front wheels be one of the past.

The last division of simple bearings now claims our attention.

Parallel Bearings consist of a hardened steel cylinder some $1\frac{1}{2}$ -in. or more in length, which fits the spindle exactly ; both axle and bearings are finished with a surface as smooth as glass, and as hard as it is possible to make them. To prevent the ingress of dirt and grit, which would of course wear them away, the boss of the crank is hollowed out, as is also the flange of the hub, and into these recesses the bearing runs, fitting accurately. This class of bearing is simplicity itself, and presents about the least amount of friction of any, as, being long, it presents more surface, in consequence of which the weight is further distributed. Also, a drop of good lubricating oil between the two surfaces really receives all the friction up to a certain point, and the metal has no contact anywhere except at the ends, consequently any friction that exists is caused by the presence of grit or dirt, or a failing in the supply of oil. The principle of this bearing is unique ; but there are several methods of fixing them to the fork ends.

All should, however, no matter in what way held, be fitted to the fork ends with a hinge working sideways ; as by this means the strain usually exerted upon them by pulling at the handles in hill work is removed.

The only plan of fixing to the forks, worth description is

The **Gimbal Joint** or application of the universal joint to the parallel bearing which is a good thing in this line. By fitting the bearing centrally with a half-round collar on the outside, and making the fork-end fit it loosely, on the principle of the ball and socket joint, the slightest twist either vertically or horizontally is prevented, for, with the other methods, the working of the arms on the handles and thrust of the pedals are prone to twist the bearing on the axle and cause it more or less to gag, jamb, or bite ; this is especially the case when going up stiff hills or working hard.

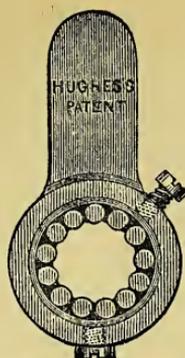
An objection to parallel bearings is that they cannot be adjusted for wear ; but if accurately fitted and attended to well, they will wear an immense time, and if made detachable, can be renewed at any time for a shilling or two.

Coming now to **COMPOUND BEARINGS**, we find them to be subdivided into two classes—Rollers and Balls, of both of which there are several varieties, the former however, like the cones, are rapidly falling out of popular estimation, and are but sparsely used by makers, the chief bearings in use being either balls or plain.

The **Ordinary Roller Bearing** consists of a circular steel box, somewhat resembling an overgrown parallel bearing, the diameter of which is some quarter of an inch larger than the axle. This box is "packed" with a number of small rollers of hardened steel; these completely fill it, just leaving enough room for the axle, which touches every roller, and, in revolving, turns them all. There is perhaps more friction with this bearing than there is with any previously described, as the motion of the axle amongst the rollers imparts to each one a motion in the opposite direction; now, as the rollers touch one another, each one imparts to its neighbour a motion opposed to its own, so that there are two forces at work in opposite directions, and consequently much friction, with its inseparable companions, loss of power and wear of material. This is theoretical. In practice they are found to run very easily, on account of the axle working on a moving surface, *i.e.*, when the weight comes on a roller it revolves, and will, as it were, have nothing to do with the axle. They are of more use to heavy riders than to light weights, as their good qualities are only seen when a great weight is placed upon them. They have an advantage in giving but little trouble except when worn, when they annoy one terribly; they are expensive, and although worth the price asked, if well made, on account of the time, care, and accuracy required in their manufacture, it is questionable whether they are proportionately worth it in use. To be good they must be well made and of good material, otherwise they are worse than useless, therefore cheap roller bearings should be avoided; this remark applies equally to their varieties as well as to Balls. In their ordinary form they have one great objection, *viz.*, they cannot be adjusted. To obviate this

Adjustable Rollers have been introduced. In these the roller box is made in two pieces, something like the Sheffield plain bearing, so that when worn the two halves can be tightened. An objection to them is that the case cannot at all times be so perfectly circular as with the ordinary method, in consequence of which some of the rollers get more pressure than others, and they do not revolve so freely. This is, however, more theoretical than practical.

Hughes' Adjustable Rollers are in principle the same as the ordinary ones, but between the rollers and the box is fitted a split steel inner case. A screw at the side presses upon this and so adjusts the bearing, whilst another screw at the bottom allows of the egress of the spirits used in cleaning it out when dirty.



HUGHES' ADJUSTABLE ROLLERS.

An objection to both these forms is the ease with which dust and grit are able to get in, by falling down between the roller box, crank, and hub of the machine. This is almost entirely obviated in

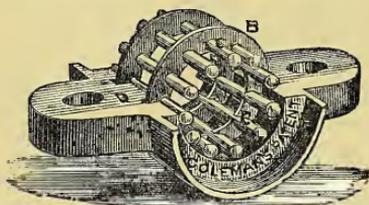
Plowright's Registered Dust-proof Bearing, in which the rollers are contained in a steel box, with collars at each end to secure the bearings, the whole being enclosed in an outer casing of steel; this runs into a recess in the flange of the hub, and so keeps the dust out in that direction. To prevent its ingress on the other side, a second steel casing is fitted over the outside of the first, which forms a cap and covers the boss of the crank. A lubricator is fitted, and at the bottom is a screw to allow of the bearings being washed out with paraffin now and then. It is a notable fact in their favour that one of the longest distances ever done on the road in one day was with them.

Another fault with the ordinary rollers is that when slightly worn they are apt to get twisted, when they hitch and drag, grinding away the surface of the roller box in double-quick time. To obviate this defect and to prevent the grinding produced by the opposing forces which each roller exerts on its fellow, is the object of most of the following varieties.

The "Cycle" Bearing. In this the rollers are not so numerous and do not touch each other, being kept apart by means of two brass guide rings or collars. These are flat and are kept well apart, their inner diameters being slightly larger than that of the axle, and their outer diameters somewhat beyond that of the bearing-box, which is provided with deep but narrow grooves into which they fit, and are thus prevented from coming in contact with the bearing box at all.

The inner edges of these collars are perforated with eleven circular holes for the reception of the rollers, and so cut that when the rollers are in them, they protrude a little on the inner side and fit closely to the axle, whilst they also are so fitted that they just come in contact

as well with the interior of the enclosing case or bearing-box. It will be seen that in this bearing the friction is greatly lessened, as, instead of having to contend with the friction of each other, they have—besides the very little friction of the axle itself—only to contend with that produced by their contact with the guide rings; the “cycles” or guide rings slowly revolve, thus bringing each roller in turn to the top, at which point the greatest amount of friction exists. They are, however, unadjustable, as the makers say they will run without oil, and make no provision for its application, which I think a mistake, as although the friction may be very small indeed, a little oil would lessen it still more, besides assisting in preventing wear. The accompanying sketch shows their construction:—



THE “CYCLE” BEARING.

The Hallamshire Rollers overcome both objections, as they keep the rollers separate, as well as prevent their twisting. They are constructed as follows:—Between the axle and roller box a broad loose collar is placed, which, like the upright collars of the previous bearing, touches neither of them. The rollers themselves are short, about half the length of the ordinary kind and the collar has alternate slots the width and length of the rollers, extending from the edge to the middle, in which the rollers work. By their being placed alternately in the collar, one is always at the top; they are also kept separate and the twisting obviated. The longitudinal friction of the rollers against the collar must, however, be very great.

The Paragon Roller Bearing is almost identical, but the guiding is in two halves, each set of rollers working independently of each other. This allows the rollers to suit themselves better to any little twist or inequality of motion, but creates at the same time a friction between the two deep guides.

Gribbin's Cone and Ring Bearing is one of the latest novelties in the way of bearings, and is the only successful attempt at an adjustable roller bearing I have yet seen. Coned rollers are used, and both axle and axle-box are plain, as for ordinary roller bearings, and an outer cap screws on laterally. Inside the case are placed two rings of round steel, one being on each side, and the coned rollers between. In adjusting the bearing, the outer cap is screwed up, and this pressing against the ring nearest it, pushes the rollers tighter both against the axle and the other ring. It will be seen from this,

that the rollers have not the varying velocities of double coned surfaces to contend against, but have only to bear the friction of the rings at one point of their coned ends, a friction considerably less than that exerted in ordinary rollers by contact with the axle-box, which these do not touch. By an interlocking flange between the axle-box and screw cap, dust is also excluded.

In **Sibert's Self-Lubricating Rollers** the axle-box is made in two halves, the upper one being a fixture to the fork, and the lower one screwing on underneath, it is made very deep and will thus hold a large quantity of oil, the construction of the "ball" or "dumb-bell" rollers favouring this end. The inventor warrants them to run 3,000 miles with one oiling, which is saying a good deal. The rollers are five in number, and are exact miniatures of an ordinary dumb-bell. A flat collar fits over the axle, and is just a shade larger in diameter, so as not to touch it; in length it varies from one-quarter to two-thirds the width of the axle-box, and at the ends of this two upright collars are placed, which almost touch the box; in each of these five slots are cut in pairs, exactly opposite and at equal distances from each other and radiating from the centre; into these the shafts of the rollers fit, and the whole revolves once to three revolutions of the axle. By narrowing the collar, and turning the roller ends flat, a longer bearing is obtained for those who prefer it. By the use of this bearing the rollers are kept apart, and twisting avoided, the friction against the collars is very small, the heating of the bearing is impossible, whilst the self-lubricating power is a great saver of trouble. They have, I believe, fully answered the expectations of the inventor.

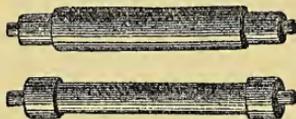
Gadsby's Northampton Rollers are very similar to the above. They consist of eight pairs of stout rollers connected by a narrow journal in the middle; the axle-box, like the last, is deep, but no collars are used. They run easier than ordinary rollers, on account of the increased size and diminished number of the rollers themselves, and are also less liable to twist on the bearing, whilst the deep axle-box renders frequent oiling unnecessary. They still however have the contact one against the other as a producer of friction.

The **Sandringham Bearing** is almost identical with the last, its chief feature, however, being the arrangement for the exclusion of dust, which is most effectively done by making use of overlapping flanges, bevelled to an edge, to cap both the boss of the crank and a projection turned on the centre of the hub flange. The rollers are of the same shape as those in the previous one, but smaller in diameter and more numerous.

Starley's Frictionless Rollers to my mind are a long way in advance of anything of the kind ever introduced before. The axle is provided with a wide steel collar turned upon it, and the case has

also the centre diameter much less than that at the sides. The rollers used are of two kinds and sixteen are employed for each bearing. The first are long and narrow and have the ends nearly twice the diameter of their central shaft, thus resembling Sibert's "dumb-bell" flat-sided rollers. These run (on the axle itself) on their ends and they touch the outer box, though not the collar on the axle, with their central shafts, and between them are placed shorter rollers of the ordinary shape, which touch the inner surfaces of both axle-collar and case. By this method the friction of the rollers against each other is not only done away with (the ends of the longer rollers being just kept from contact with each other by the insertion of the shorter ones), but the motion imparted to each roller by the axle is actually passed on to the next by the intermediate one, and, besides this, by using such a large diameter of roller to work upon the axle, the friction there is reduced to about one half.

The **Challenge Rolling Bearing** bears a slight resemblance to the above in the shape of the rollers, which are of two kinds, of the patterns shown in the annexed illustrations.



CHALLENGE ROLLERS.

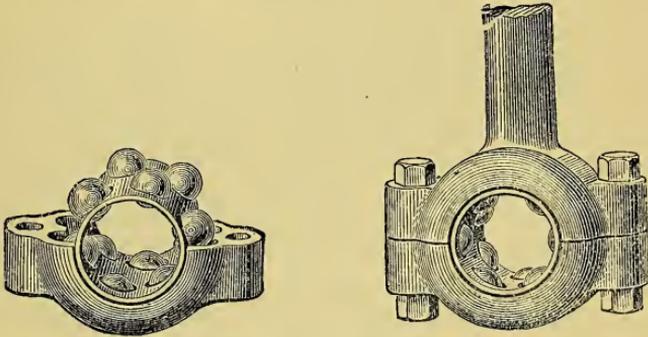
These rollers are placed alternately around an ordinary axle, the case also being the same as used with ordinary rollers.

This finishes the first division of compound bearings. We now come to the second and last, viz.,

BALL BEARINGS.—Of these there is a large number of slight varieties, but only two distinct types, viz.:—double and single. In principle they introduce between the surfaces of the axle and the bearing case movable points, and by this means substitute a rolling friction for a sliding one. Many of them differ much in theory and should be bad from that point of view, but in practice they have been found to be really advantageous, especially for heavy riders and for hill work and racing purposes. Not the least advantage gained by their use is the very little oiling they require, as if once well oiled and kept free from dirt and dust they will run as much as 100 to 200 miles without further attention, to say nothing of the absence of the oily mess that used to be such a certain concomitant, soiling the rider's clothes and getting about the machine as it exuded copiously from the bearings and crank ends.

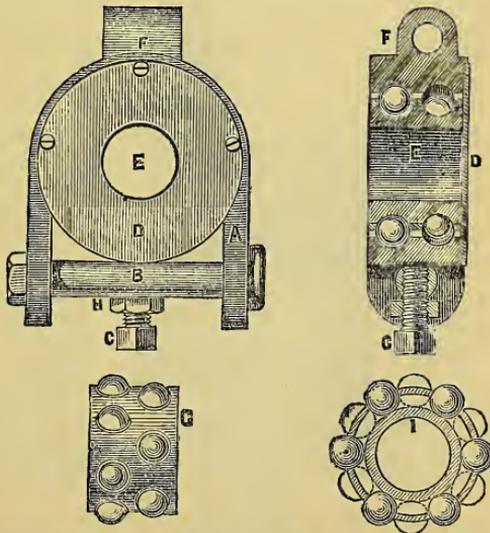
Humber's Bearing, or double balls, have won for themselves a good name during the past four seasons. They are constructed in two parts, the upper one being either solid with or hinged to the

fork, and the lower one secured to it by screws and nuts in the side flanges, as in the Sheffield plain bearing. Both these halves have two semi-circular grooves worked in them, which run completely round and are distant about $\frac{1}{8}$ -in. from each other, and the same distance from the outside of the case. The axle has two corresponding grooves turned in it, but rather shallower, and between the axle and bearing box is inserted a thin cylindrical collar, pierced alternately with ten circular holes, five being immediately between one pair of grooves, and the remaining five corresponding with the other. Into these holes small steel balls are inserted, which by this means are kept in their places and revolve in the grooves. The



DOUBLE BALL BEARINGS.

annexed illustrations show the arrangement as used by the Surrey Machinist Company, Humber, Settle and others. They prove excellent in practice, being very steady in running.



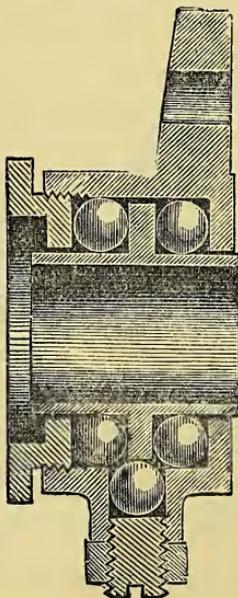
HILLMAN'S ADJUSTABLE DOUBLE BALL BEARINGS.

Hillman's Ball Bearings in principle are the same as Humber's, but are attached to the forks in a different manner. The fork ends are formed into a wide, deep Ω , or in other words are exactly similar to the old tuning-fork type of plain bearings; the bearing halves are fitted to this, and are easily adjustable from the bottom by a screw, as will be seen by the accompanying woodcuts.

The **Sandringham Dust-proof Ball Bearing** is almost identical with Humber's, but has no separating collar, so that the balls—eight in each groove—in revolving touch each other as do ordinary rollers. By a neat arrangement of overlapping caps and flanges, very similar to those used on the roller bearing by the same makers, the dust is very fairly excluded.

The **Club Ball Bearing** like the last is minus the cage; the axle has two raised grooves turned upon its surface, and the case is constructed with a deep vertical and central collar, which serves to keep the two sets of balls apart and separate in their respective grooves. The outer cap and the outer face of the hub-flange curve, so as to adjust the balls when necessary, the outer adjusting cap being provided with holes upon its face into which a pin passing through the crank boss fits, and holds secure when at its right pitch.

Palmer's Patent Adjustable Ball Bearing only resembles the ordinary pattern in having a double line of balls, in all other respects it is different. The case is divided vertically, an outer cap screwing on for lateral adjustment. Upon the axle is secured a steel hardened collar, upon the centre of which is a deep flange dividing the case of the bearing into two square compartments.



PALMER'S PATENT ADJUSTABLE BALL BEARING.

In these compartments a number of steel balls are placed, which thus bear against four points only, viz., at the sides, bottom and top. Adjustment can be made in two directions; the first laterally to take up side wear, by screwing the outer adjustment cap further in and securing by means of a spring cap fitting into notches cut in its outer circumference. The other is a vertical adjustment, the case having a cylindrical projection on its under side, perforated towards the axle to admit the introduction of a ball and screw, the latter pressing the former upward against the flange on the axle and taking up wear in that direction. It has now had a season's use and trial, and I believe has come out of the ordeal with flying colours.

Granger's and Singer's United Bearing combines double balls with rollers. Upon a cylindrical axle two flanges are turned, some half-an-inch apart, and between these a series of rollers of large diameter are placed; the interior of the case, like Palmer's, is parallel, and a row of balls is placed outside each flange, thus producing rollers between balls, adjustment being made by means of a lateral screw-cap. The balls do not touch the top of the bearing, and the rollers therefore take all the friction in that direction, whilst the balls do the same at the sides. In theory this seems one of the most perfect of compound bearings, as there is only the friction of the rollers and balls against each other and the axle to contend against, both these being at the same time reduced as much as possible by a scientific proportion in the relative sizes of the various parts.

Single Balls are, as the name denotes, placed in a single line; they are not separated by any collar, but are free to rotate against each other at pleasure. They are placed in grooved cases in either one or two parts, the latter—adjusted as with Humber's bearing—being the commonest of the unpatented varieties. Owing to the success and patronage accorded to the first two of the patented patterns, a number of imitations, differing in some slight degree from the originals, have sprung up. I shall, however, only treat of those possessing any points worthy of special notice.

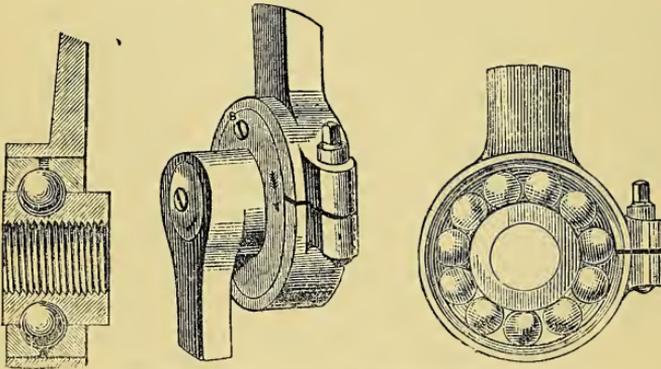
Bown's "Æolus" Adjustable Ball Bearing. The construc-



BOWN'S "ÆOLUS" ADJUSTABLE BALL BEARING.

tion of this will be clearly seen by reference to the accompanying

illustrations. A single row of balls is used, twelve in number, and the adjusting power of cones is made use of for adjustment, it being constructed as follows :—On the axle a steel collar is secured, having two wedge-like projections left upon its outer circumference, which thus form together a conical groove, in which the balls are placed. The case is separated vertically, and both halves are coned outwards ; the outer or adjustment half is provided with a milled edge, and by screwing up this with the fingers, the cones are tightened concentrically upon the balls with a great degree of nicety, and the adjustment plate is prevented from unscrewing by a bracket with a set of teeth, which fit into the indentations on the circumference of the adjusting case.

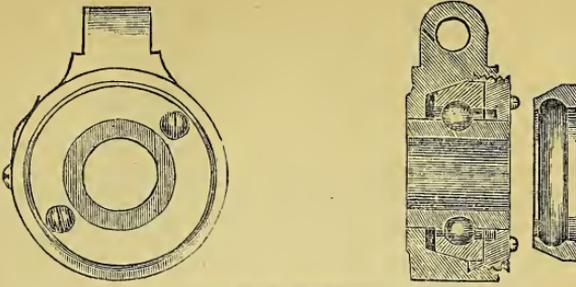


RUDGE'S UNEQUALLED BALL BEARING.

Rudge's Unequalled Ball Bearing is almost identical with Bown's. There are fewer balls of a larger diameter, only nine being used, thus lessening the friction a little ; the adjustment plate is of steel, and is not milled, but is provided with a small pin, by which it may be turned as required, whilst by splitting the outer case on one side and providing it with a screw and lock-nut working in projecting lugs, a certain amount of side adjustment is obtained in addition to that concentrically, thus making them capable of very great adjustability. In this bearing the cones have slightly concave surfaces, taking more the form of a groove than with Bown's.

Whitehouse's Ball Bearing may be termed a combination of Bown's and Rudge's, the interior being constructed on Rudge's pattern, the exterior on that of Bown, the case being, however, as it were, on its side, the securing bracket being at the side in place of on the top.

The **Stanley Ball Bearing** is provided with an adjustable sliding cone, which is separate from the outer screw-cap. This is forced on to the balls by screwing up the cap ; this method provides for the more effectual exclusion of dust from the interior of the bearing.



GREEN'S BEARING.

Green's Bearing has a case very similar to the previous ones, the balls being placed in grooves upon the axle. Inside the case a very strong flexible split steel ring is fixed. The inner surface of the case is coned slightly inwards, and the outer surface of the ring is coned to correspond, the inner surface being grooved to take the balls. A strong outer cap, with holes in its face is turned with a suitable tool and forces the split ring inwards, causing it to close until the proper adjustment is obtained.

The **Arab Ball Bearing**, like the last, is a novelty for the present season, and like the last too, its adjustability is obtained by means of a split steel ring. The case is parallel inwards, and provided with a ring likewise parallel. The axle is also parallel, and the whole thus forms a square section chamber, holding the balls. One side of the case is split and provided with lugs and screws which, when drawn together, close the ring around the balls, and so adjust them to the requisite degree.

The **A B C Bowl Bearing**. The construction of the "bowl" has been already described when noticing the pedals, those on the front wheel being exactly similar, though somewhat larger. The bowls, run upon spindles held by two circles placed opposite each other. The axle has a slight conical groove run round it centrally, and the fork end is simply a circle with right and left handed threads cut on its interior surface, two screw caps working into this, one on each side, to form the case proper. This double adjustment forms one of the chief features of the bearing, as the edges of both are milled and two small milled wheels or pinions, in connection with each other, work into these, the said wheels being pivoted upon the side of the bearing. By this plan both sides of the case are simultaneously and equally adjusted.

All classes of double balls are now much in vogue for racing machines. Double balls are much the steadier of the two, whilst the single type are slightly freer in running.

Double ball bearings of the ordinary pattern are adjusted in some makes by removing a paper washer and screwing up tight again,

and in others by procuring a new set of balls, a size larger than the first. Sibert's dumb-bell rollers may almost be classed as balls, as they really run on the balls at the ends.

This concludes our description of bearings for the driving-wheel. We now come to those for

The **Back Wheel**, which should run none the less easily than those of the front one; but the greatest desideratum in bearings for this wheel is, that they should be easily, safely, and quickly adjusted in compensation for wear; as the rear wheel (being so much smaller than its fellow) revolves between two and three times as fast, consequently the friction is inevitably greater, and the wheel works loose on its bearings sooner. Also, the bearings being so near the ground are more accessible to dust and grit, so that they ought to be protected in some way from this enemy. There are in back wheel bearings the same classes as in those for the front, but fewer varieties; these differ somewhat in construction from their more important brethren, on account of the different position and use of the wheel. The plain and parallel bearings form but one class, which we will consider first.

Plain Bearings. These, the simplest, oldest, and easiest running of any, consist of a straight steel pin passing through and fitting accurately the centre of the back wheel hub, and secured in various ways by lock-nuts to the ends of the back-fork. This is rarely used except on racing machines, as, although it presents less friction than any other kind, there is no means of adjustment for wear, and it soon gets shaky. This objection is however entirely remedied in

The **Taper Back-wheel Pin**, which I think ranks with the best bearings for the back-wheel yet introduced. By making the pin slightly taper in place of parallel as before, with a very slight increase in friction, far better adjustability is obtained. Cones are, however, still the most universal bearings for the back wheel—although balls are rapidly coming to the fore—and are of several kinds, as follows:—

Double or Moveable Cones consist, as in the first-mentioned bearing, of a steel pin passing through the centre of the hub; but instead of being straight, a truncated cone about 1-in. in length is placed at each end, that on the right-hand side being turned solid on the pin itself, the other being loose and working on the pin, with a worm cut inside it. By screwing up this cone all side-shake can be taken up; it is provided with two flats for this purpose, and when all is as it should be, the whole is secured with lock-nuts on the outside of the fork-ends. There is more friction with these than with plain bearings, and one bad defect is peculiar to them, they are liable to fasten in working, that is to screw up and become—wedge-like—so tight as to prevent the wheel revolving, when, if the rider is

not careful, or if he is going fast, a fall is almost certain, to say nothing of the wearing of the tyre by its scraping along the ground. This is however, happily not a frequent occurrence, and is mainly the result of inattention, bad fitting, or an insufficient quantity of oil.

Single or Fixed Cones differ from the double ones in that both are fixed, being made with square heads or bases, which fit into corresponding recesses in the fork-ends. The pin is an ordinary straight one, but rather smaller than usual, it passes through both cones, and is fastened on the outside with lock-nuts. To adjust the bearings the cones are drawn together by tightening the pin; they can never fasten, as being a fixture to the fork, it is impossible for them to twist.

In **Brazier's Cones**, the cones in place of being of the ordinary shape, are hemispherical, thus resembling half balls pierced centrally by the connecting pin.

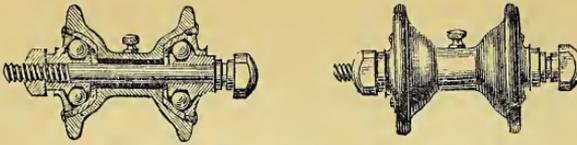
With the **Club Dust-proof Cones** the only difference as far as the cones are concerned, is that they are longer and more tapering. The chief feature of the bearing is the excellent arrangement adopted for the exclusion of dust. The hub is somewhat deeply recessed to receive washers, or more properly, collars, which fit on each end of the pin just behind the cones. These collars are provided with grooved edges, so that all dust before entering the bearing has to work up the sides of the collars, then into the grooves, and up again on the other sides. This plan in itself is almost sufficient to preserve the bearings effectually from dust, but in order to make more certain of it, felt washers an eighth of an inch in thickness, are placed on each side of the collars, completely filling up the recesses in the hubs.

As on the front-wheel, the compound division of bearings is represented, but not so largely in the roller class as there is only one variety, which is

Hughes' Rollers in which the rollers are contained in recesses turned just inside the hub, the bearing pin being straight, and running upon the rollers, which—like his front ones—are fitted with a flexible steel inner case, tightened by means of a screw.

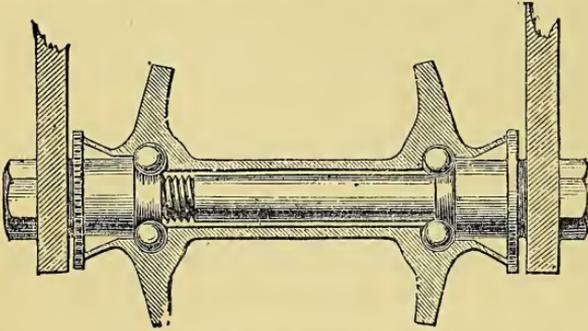
Ball bearings for the back wheel have a much larger number of varieties having become quite the fashion lately for all purposes.

Bown's Back-wheel Balls are contained in the hub of the wheel, the case or interior of the hub being flatly coned, and a cone also being provided upon the back-wheel pin by which they are adjusted as with ordinary double cones. The annexed illustrations fully illustrate their construction and mode of adjustment.



BOWN'S BACK-WHEEL BEARINGS.

Rudge's Unequalled Back-wheel Balls, are much the same in construction as his front bearings. The hub of the rear wheel is



RUDGE'S BACK WHEEL BALLS

recessed and hollowed out on each side, and in the grooves thus formed, two sets of balls are placed. The wheel pin goes through these and is provided with hardened steel, slightly hollowed, cones, by tightening up which the balls are adjusted. They run with great freedom and are much used upon racing machines.

The **Stanley Back-wheel Balls** are practically the same in principle, but the cones are made loose, sliding upon a flat sided centre pin, and are adjusted by outer caps screwing up outside on the pin, much in the same manner as with those for the front wheel by the same firm. The balls are placed in boxes at the fork ends thus getting them further apart, and securing greater steadiness.

Whitehouse's Back-wheel Balls are contained some distance within the body of the hub, and at first sight one is apt to wonder how they came there, as the groove in the case encircles fully three parts of their circumferences. The mystery is however explained by the fact that they are first inserted in the grooved hub, and outer caps afterwards neatly fitted and screwed on. They are adjusted by cones upon the centre-pin in the usual way.

In **Carver's Back-wheel Balls** a double row of very small balls is used, separated from each other by an alternately perforated collar as in Humber's front-wheel bearings.

In **Palmer's Rear Wheel Balls** the case within the wheel is nearly parallel with the straight pin but not quite, the cone being

but slight. The balls are placed within and adjusted by a closely fitting boss, which screws up to them and into the hub for adjustment, whilst dust is effectually kept out at the same time. They run very freely.

The **Atalanta Ball Bearing** has the cones, both upon the fork ends and in the hub, hollow or "female," the balls being placed in the recess thus formed and adjusted by screwing the outer cone up as required, a very effective dust cap being at the same time brought into a groove round the hub face, thus effectually keeping out the dust.

The **Club Back Wheel Balls** here illustrated, are also very neat and effective, the balls are placed in deep grooves or channels within the hubs, and the pin provided with very slight conical surfaces which push them up for adjustment. The ball channels are of steel, and project, thus leaving a chamber between the entrance to the ball grooves and the exterior of the hub, so that if any dirt gets in, it does not find its way to the bearings but lodges in the recess, although the dust caps or covers pretty safely prevent the chance of any getting in.

The wheels described, and the rather lengthy category of bearings gone through, we come to the second part of a machine, viz.,

THE FRAMEWORK.

This consists in the main of three parts, viz., forks, backbone, and steering-gear, with numerous accessories and varieties.

FORKS (front). These are the upright bars on each side of the wheel, which support the front end of the backbone and by which the wheel is turned. They used to consist—and still do on some of the cheap makes—of plain iron bars, some 2-in. wide, and $\frac{3}{8}$ -in. thick, being $\frac{1}{4}$ -in. wider at top than the bottom; but of late they have been much improved in strength, appearance, rigidity and lightness. It having been found that most strength is required at the top, just above the wheel, and very little at the axle, where they are attached to the bearings, they are now made thickest and widest at that part, gradually tapering downwards until they reach the bearings; the edges are also now made thin—almost sharp—all the thickness and strength being in the centre where it is most required. Those manufactured thus are known as

Bayonet Forks, they are light, strong, and handsome. Some few machines have forks somewhat between these and the old style. There have been several improvements and patents lately introduced, which are well deserving of mention. These are

The **Hollow Fork**; which was first introduced by Garrod of Fakenham, and has since become "the fork of the day," being almost

universally adopted by all makers of any pretensions throughout the country. They are constructed of steel tubes, first tapered and then flattened; in many makes the edges are rounded—and in my opinion these are the strongest—but most makers now bring them to almost as fine an edge as the bayonet solid fork, which of course makes them much neater in appearance. Their advantages over



GARROOD'S HOLLOW FORK.

solid forks are that they are lighter and far more rigid, *i.e.*, that they do not give and bend so much when any strain is put upon them, consequently the bearings are not so liable to be crossed upon the axle, and hill work is rendered easier; also being hollow, they are quite in accordance with the well-known mechanical fact, that hollow metal under certain conditions is stronger than the same area of solid. Their modifications have now become very numerous, the principle of which are as follows:—

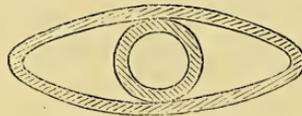
The **Eureka Forks** are almost circular in the centre, and have rounded edges; they differ but little from those in ordinary use. The thickened centre sets off the edges, making them appear sharper than they really are.

The **Cycle Company's** new fork is very similar, being of a diamond section, wide in the centre and gradually hollowing to the edges, which are very slightly rounded.



THE SUPPORTED FORK.

The **Supported Fork** is identical with that in general use, but a flat piece of sheet steel is first fitted, and driven in centrally across the tube, and afterwards brazed in to make all secure. By this means the sides are supported, and prevented in some measure from bulging or becoming indented by a forcible blow.



GRIBBIN'S DOUBLE TUBULAR FORK.

Gribbin's Double Tubular Fork is the same as the previous one, but the edges are more rounded, and a small circular tube takes the place of the flat steel, the same being firmly secured by rivetting in addition to brazing. This of course makes a very rigid, and at the same time neat fork.

The **Stanley Section** is that of a complete circle, the legs of the fork being formed of tapered tubes. This section is theoretically the most perfect on all points, and has been often tried, but so clumsy in appearance have the results proved, that they have not been adopted as a pattern until last season, when Messrs. Hydes and Wigfull succeeded in making a very neat attachment of them to a genuine "Stanley" head. In actual practice they fully agree with theory, being by far the stiffest forks I have yet come across.

The **D.H.F. or Double Hollow Fork** consists of two small round taper steel tubes united at the smaller ends by brazing, and gradually departing from each other until they reach the felloe of the wheel, where they are some inch or so apart, they then close slightly in again for another six inches, until they reach the handles, where they are finished off and fastened. Light, neat, and strong, it is difficult to imagine anything which could be possibly more rigid, especially in a back and forward motion. In consequence of this and their great success, many imitations have of course sprung up, some bidding fair to rival their copy. The chief of these being

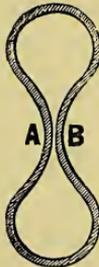
Fluted Forks, which consist of steel tubes, first slightly flattened,



FLUTED FORK.

and then indented centrally more or less on each side, thus presenting the appearance of two tubes united by a double web of steel. The illustration annexed shows us a section of the

Centaur Fork, which is so much indented that the sides (A B) touch in the middle. This is the nearest approach to the D.H.F.



CENTAUR FORK SECTION.

which can be made without infringing on Hillman's Patent, the likeness being still more heightened by the nature of the steering gear which allows of the forks being carried right up to the handles.

The **Acme Fork Section** is somewhat similar to the last mentioned, but is indented only on the outside, the inner surface being raised as much as the outer is depressed, thus giving a kind of triangular or true bayonet section and giving increased rigidity sideways.

The "**Arab**" **Sheet-steel Forks** are entirely different in construction from any other, and are at once light, rigid, and elegant. Each fork consists of a strip of sheet-steel, having the edges bent round so as to form two tubes.

Back Forks are similar in construction to those of the front wheel. Instead of being upright and straight they are more or less curved, and are set at an angle of from 15° to 45° with the perpendicular, according to the tastes of the manufacturer. Their office is of course to unite the back-wheel with the backbone. They are chiefly made solid, but many are made hollow, the ordinary elliptical, semi-circular and fluted sections being represented.

The **Semi-tubular Back Fork** is constructed out of flat sheet-steel. This is first cut out by a stamp to the proper shape, and then with suitable dies pressed into shape, the upper end fitting inside the backbone end, and the sides forming wide graceful semi-tubes, gradually tapering downwards, and ending in neat curls of flat steel. It is a neat, light, and withal strong pattern. Although there are comparatively few very especial patterns of the back fork in ordinary, the present season finds us with several very curious arrangements, and alterations of this portion of the machine, having as their object the lessening of vibration and jolting which, being transmitted to the spine of the rider, induces fatigue and lassitude. As I have not, however, given either an extended trial, I cannot speak from experience as to their merits, so will merely describe them and let my readers form their own opinions:—

The **Matchless Back-Wheel Rubber Cushion** is, as its name denotes, a rubber cushion; the back forks end in rather large boxes, having slots in an upward direction. The wheel pin passes through these, and is imbedded in the rubber, thus allowing of no "metallic connection." The slots keep it steady, and allow of a little more freedom than attainable by the simple use of rubber alone.

Porter's Wheel Cushions are somewhat similar in principle. Upon the ends of the fork a long vertical slot is made in metal attached for the purpose. The back-wheel pin slides in this, and is provided with a rubber buffer both above and below, the play being perfectly vertical.

Micklewright and Gladwin's Attachment consists of a 4-in. brass tube with slot down one side, a screw at the bottom, and an

external worm cut upon the top. Two of these are screwed on to the top of the back-fork ends ; the wheel pin placed within the slots,



MICKELWRIGHT AND GLADWYN'S PATENT ATTACHMENT.

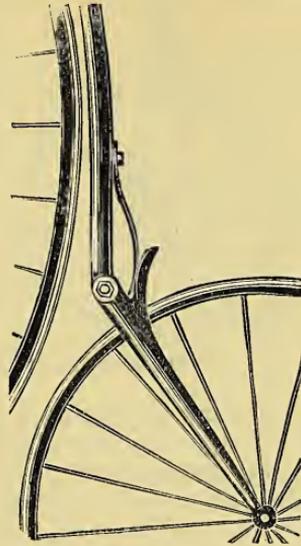
and strong spiral springs put inside the tubes above it. Brass caps then screw down upon the external worms, forcing the springs down, keeping them firm and compressing them. By screwing down more or less the power of the springs can be adjusted to a nicety, according to the weight of the rider. They can be fitted to an ordinary machine.

In **Denne's Non-Vibrating Back-fork**, the fork ends are not altered, but instead of being attached to the centre of the rear wheel, as usual, they are bolted to the ends of two rods which depend from the wheel-pin, and form an angle therewith, strong springs being so placed betwixt them, as shown in the illustration, as to take all the



DENNE'S NON-VIBRATING BACK-FORK.

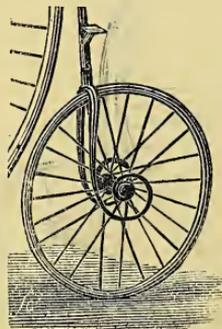
weight of the rider. The springs are kept against the back-fork by rubber bands, and should a breakage occur the machine is not incapacitated, as a stop prevents the joint collapsing, the machine then differing in no way in practice from an ordinary one.



PALMER'S NON-VIBARTING BACK-FORK.

Palmer's Non-Vibrating Back-fork has an alteration made at the junction of the backbone and fork, the two being hinged together, and the top of the latter provided with a thumb-like projection, against which a strong spring bolted to the backbone bears. This spring takes all the weight of the rider, and when an extra bump occurs the effect is simply a little more give in the spring.

Wood's Back-Wheel Springs may simply be described as a substitution for the ordinary back-fork sides of two flat helical springs, whereby the weight of the rider is suspended as it were from the back-wheel pin. This will be well understood by reference to the annexed illustration.



WOOD'S BACK-WHEEL SPRINGS

Through the front forks the power is transmitted from the handles to the axle of the driving wheel, for the purpose of guiding the machine, and therefore at the top of these is situated the

Steering Gear, which like many parts of the framework, differs more or less with nearly every maker. In this there are two classes, each working on an entirely different principle. The most ancient being that known as

*The **Socket Steering**, in which the forks unite just above the wheel, and from the centre of their junction arises a thick rounded pin, tapering gradually upwards, the top being square for the reception of the handle bar. Over this pin, and closely fitting it, is placed a deep cylindrical collar, or socket and neck, to which the backbone is secured. The handles being a fixture on the upper squared end of the central pin, turn the forks, and by their means the wheel (which by this method may be turned completely round, and run either backwards or forwards). Although this plan has numerous disadvantages, it is still used on a few of the cheaper makes, and even on some by larger and better class makers. The objections to this mode of steering are that, there being much friction, it the sooner wears loose and shaky, in which case there is no means of adjustment for wear. It is liable to fasten or stick from getting heated with the friction, or from being without sufficient oil, thus preventing the guidance of the machine, and almost invariably necessitating a dismount in a manner not usually selected by choice. It is very dirty, as the oil, working out from the edges of the socket, runs down the sides of the forks, and is from them transferred to the nether garments of the rider; it also allows the wheel to be turned completely round, which is awkward sometimes in the event of a fall, as the legs have then a nasty knack of getting a rough squeeze between the wheel and the backbone. The points in favour of it are, that it is neat in appearance, and, in general, strong.

The other class of steering gear, or head pieces, is on the principle of centres, and is divided into two distinct subdivisions, viz., the ordinary open centre or Ariel steering, and the Stanley or closed head, of both of which there are numerous varieties.

The **Ariel or Open Centre** plan derives its first name from the machine to which it was originally applied, and its second from the principle on which it works. In ordinary, the forks, instead of being united immediately above the wheel, are continued upwards in a straight line to the handles; at the place of their former union they are connected by a bar or bridge of iron, sometimes screwed to the sides of the fork, but more often now forged with them, as the nuts on the outside of the forks get loose, and wear away the trousers; above this bridge the forks are again connected by another

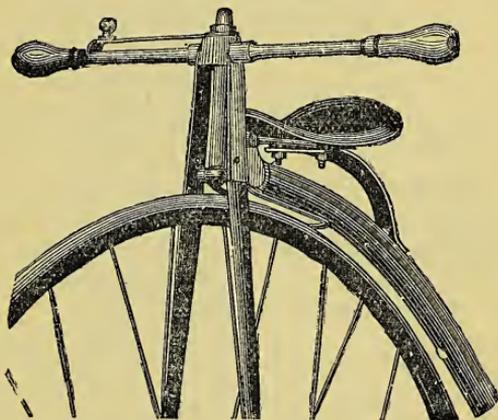
*Very rarely now used.

bridge in which there exists great diversity, scarcely two makers fitting it in the same manner; sometimes the handle bar itself forms the bridge, the forks being screwed to it, but more often it is flat and projects in front or behind, carrying suitable lugs for the reception of the handle bar. When hollow forks are used with this kind of head, these bridges are fitted to encircle the forks and so avoid making a hole in the hollow metal, which would tend to weaken it. On the lower bridge, at its central point, is either a concave cone or raised centre (or point), and in the centre of the upper one a worm is cut, through which a set-screw works, carrying either a centre or inverted cone at its end; between these the backbone is held, the "spindle" of which consists of a straight pin, having a raised or depressed centre at either end, as the case may be. By means of the set-screw the steering may be tightened or slackened at will, and the whole secured by the use of a lock-nut on the top of the upper bridge. Much diversity of opinion exists as to whether the lower centre should be on the bridge or on the spindle of the backbone; both have their good and bad points, the chief of which are that by having it on the bridge, *i.e.* raised, no grit or dust can get in; and so soak up the oil and wear the centre away; in opposition to this, by having it on the spindle—which I think the better plan—the centres are kept better oiled, as the oil is contained in the concavity, and a greater distance obtained between the centres, by which means greater strength and rigidity are gained, consequently less wear. Regarding the upper centre, by having it on the spindle itself, great rigidity is obtained, and the dust cannot get in; but the oil is retained better by having it on the set-screw pointing downwards. Still, as all the weight rests on the bottom centre, it is that one which most requires constant lubrication. The advantages possessed by this principle are that, working on centres, very little friction is caused, and what there is can easily be compensated for by simply adjusting the set-screw. The forks also, by being carried straight up to the handles, do not allow of the wheel turning round too much, yet at the same time allowing the machine to be turned round in as small a space as it is possible for any ordinary rider to do. It never fastens or sets, very little oil is required, and that does not work out and so soil the clothes of the rider, unless he sits very close to the handles and too much of the lubricant is added. There are a few modifications of the plan simple, some of which are improvements, others not, as follows:—

The **Special Steering Gear** has the forks brought together very much at the top, where they are united with a steel bridge, bearing handle-lugs in the front. Both centres are on the spindle of the backbone, the upper one being cut off slightly, as the corresponding cup centre, which is of course on the set-screw, has a hole drilled through it centrally, so that the set screw forms a lubricator when filled with oil; it is covered with a neat brass cap to prevent the oil getting out

and the dust getting in, and a steel shield is placed at the back to protect the clothes, as the oil necessarily runs continually down the back bone spindle from the top. The advantage claimed for it is that the spindle being so much longer (on account of having both centres upon it) there is not so much "play," and consequently the machine is more rigid. This is quite true, also it is very strong, and, for this class of steerage, neat.

Starley's Reciprocating Head very much resembles the former in general contour, but has two or three very material differences in construction. Both centres are replaced by half balls which work in accurately fitted sockets, and the upper one is adjusted by means of a set-screw, that instead of screwing down through a hole tapped in the solid top is screwed to the front side of a circular metal plug, which exactly fits into a socket provided for it at the top of the head, and is pivoted to it centrally, the pivot being in the place usually occupied by the set-screw. This plate is provided with an 8-in.



STARLEY'S RECIPROCATING HEAD

handle, which is in position when exactly over the right handle-bar of the machine, on which it rests, being turned down at the end for the purpose. By lifting this handle from off the handle-bar, and turning it completely round till it rests on the other, the upper socket is brought from the front of the head to the back, a distance of about 2-in., which operation makes a difference of some 5-in. or 6-in. in the rake of the machine, thereby adding considerably to the safety of the rider when descending hills.

The **Stanley, or Closed Centre Head**, in its various forms, is by far the neatest in use, and is now the general favourite. Like all other good things, it has its imitations, improvements, and alterations—good, bad, and indifferent; and not being, in its general form, patented, is now used by most makers of any pretensions. In reality it is a combination of the best points of the other two classes, having

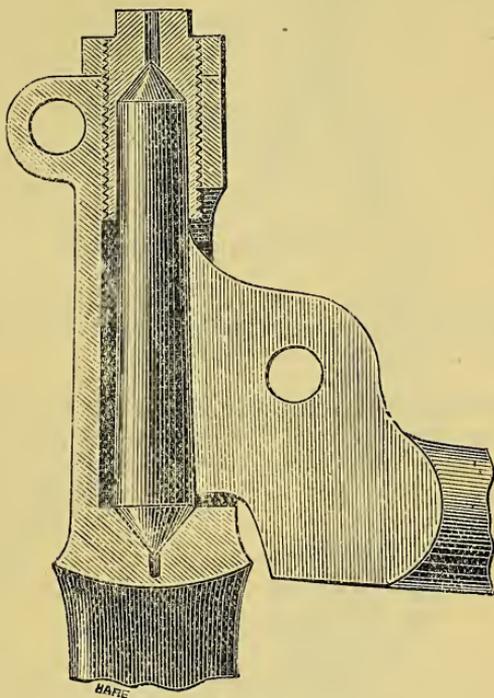
the neat appearance of the socket steering, and at the same time working on the centre principle, consequently possessing its advantages. In its original and simple form as it exists on the "Stanley"—the makers of which machine first introduced it—it is constructed as follows: The forks unite above the wheel as in the first described plan, and proceed upwards cylindrically for about 6-in., tapering slightly from about $1\frac{1}{2}$ -in. at its base to $1\frac{1}{4}$ -in. at the top, where the handles are fixed, in a line with the forks. It thus, in outward appearance, much resembles the socket. In the back part of the "barrel" a slot is cut, and the interior hollowed out; into this the spindle of the backbone is placed, and is adjusted by means of the set-screw and nut as before described. As in the ordinary centre-steering the neck of the backbone is nearly a square of 1-in. sides, it will be seen that some alteration is requisite here, or it would be impossible to turn the machine sufficiently. To effect this the neck is flattened out vertically to some $\frac{1}{4}$ -in. in thickness, and, to keep the requisite strength, is made some 2-in. to 3-in. deep; this enables the wheel to be turned with equal facility with the open-fronted or ordinary centre-steering gear, besides adding greatly to its appearance. This kind of steering is, perhaps, scarcely so strong as the open front, especially in some of the cheap makes. There are several modifications of this plan, the principal of which are

The **Humber Head**, which is extremely neat. The cylindrical portion is some 4-in. in length, and is surmounted by an oblong top with lugs projecting in front, through which the handles pass, which are thereby kept in an excellent position. It is now the favourite variety of close-centre steering.

The **Open Stanley Head** is almost exactly similar to the Humber, perhaps a little wider; the slot for the reception of the backbone spindle is cut through, leaving the front open and showing the spindle. A few ounces are gained in weight by this means, but it possesses no other advantage, and is neither so strong nor so neat as the preceding one.

The **Ball Bearing Stanley Head** is outwardly of the same pattern as the Humber, which it resembles in all respects with the exception that the lower centre is replaced by a flat surface fitting the barrel of the head and provided with a groove running all around it, whilst a corresponding groove is also cut in the bottom of the head and a set of steel balls placed between, the whole being protected from the entrance of dust by a leather flap. Whilst speaking on this latter subject, I may also mention that all the best machines now made are provided with neatly-fitting plates completely covering the opening of the Stanley head, and so effectively excluding dust and at the same time preventing the egress of the superfluous oil, which might soil the trousers.

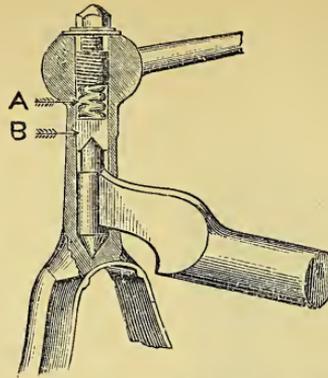
Hillman's Patent Head, invented and patented simultaneously also by W. Andrews, has but an alteration in the set-screw, which is hollowed out to nearly the top. The centres are both upon the



HILLMAN'S PATENT HEAD.

spindle, and placed $4\frac{1}{2}$ -in. apart, so that by this means with a low handle and head long centres can be used, thus giving, of course, increased steadiness and less liability to get loose and shaky.

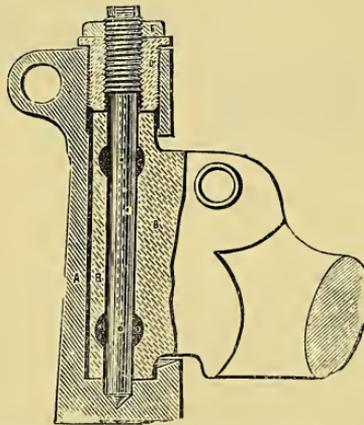
The **Self-adjusting Stanley Head** is constructed as follows :— The cylindrical portion ascends to the height of about $4\frac{1}{2}$ in., it then abruptly stops, and a worm is cut upon the outside ; on to this a gun-metal ball screws and is kept in position, when tight enough on, by a pin. No set-screw is used at all, but the top centre is turned upon the spindle and works in a small loose cup, above which is placed a stout coiled spring, these of course being fixed before the handles are screwed on. By this method the use of the set-screw and nuts on the top is dispensed with, and the spring, continually pressing the cup centre downwards, always keeps the steering adjusted, so that



THE SELF-ADJUSTING STANLEY HEAD.

there is no trouble in that respect. The annexed cut shows it in section, A representing the coiled spring which keeps the cup B on the top in position.

Swindley's Patent Central Pin Steering is externally one of the most approved Humber type, instead however of the neck ending in the usual centres, it is provided with a short shaft fitting the interior of the head. This shaft is flat, both upon the top and at the

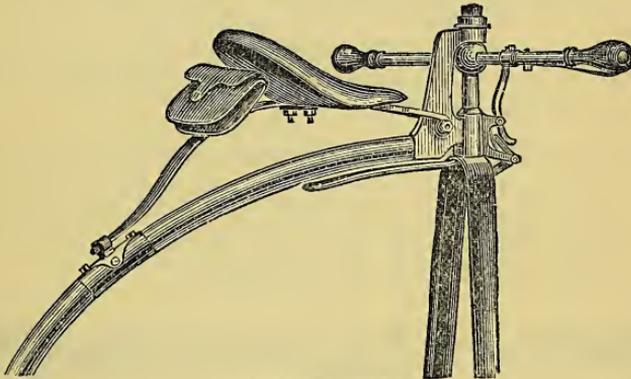


SWINDLEY'S PATENT CENTRAL PIN STEERING.

bottom, and through it is drilled a hole vertically; through this hole a pin passes, fitting in a centre at the bottom. The shaft takes a vertical bearing upon this pin, thus somewhat resembling the socket principle, and fitting flat upon the bottom of the head; a flat-faced screw is brought down upon the top to adjust for wear, and take out all horizontal shake. This head has only just been introduced, and together with

The **New Arab Steering** form the novelties of the season in this direction. In the Arab plan, which resembles Swindley's in a slight degree, insomuch as the centres are ignored, the usual centre pin of the neck instead of ending in centres is flat-topped, and provided with a number of rings turned upon its face, and parallel with each other. The set screw is so formed (in two halves) as to grip, and fit into these rings or grooves, thus securing steadiness and absence of shake at a very little expense.

In the **Defiance Head** the forks terminate in the usual way for a Stanley head, and proceed upwards some two inches, or thereabouts, when the head suddenly changes its mind and continues upwards in a (much smaller) solid bar, on the top of which a worm is cut. The neck is long, and the lower centre projects so as to fit into the short



DEFIANCE HEAD.

opening in the lower part of the head, whilst the flat neck continues upwards until it is a little higher than the staff of the head, when it bends forward and forms a ring around the top, having the inner part coned out. On the worm at the staff head, a cone—apex downwards—works, and so adjusts the steering, whilst a brass cap forms an attractive and useful finish to the whole. It is the most rigid head in the market, and for practical use on very rough roads cannot be surpassed.

These are the principal types, each of which has numerous modifications ; but, as the difference between them is very slight, it is not worth while describing them.

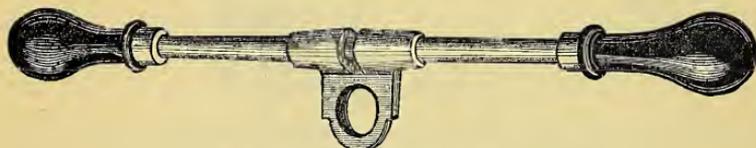
Proceeding upwards, we next come to

The **HANDLE-BAR**, in which very little difference exists. It consists of a bar of iron or steel, some 24-in. and upwards in length, secured to the head piece in the manner described with that part of the machine. Some, as will be seen from previous details, are necessarily fixed, whilst others revolve ; the former are fitted when

a front wheel brake, or none at all, is used, the latter when one on the back-wheel or ground is the favourite, as also when a front one is applied from the handles. A fixed handle-bar is best where possible, as in ascending hills or racing a firm hold on the handles is taken, and revolving ones turn and oblige a little inconvenient wrist play. Some makers fit their handles with cones at each end of the bracket, by which means a revolving handle may be kept adjusted, as with much use they soon work loose. In some heads the handles are made separate, in others they are rivetted to it, but although by this latter means they are superlatively firm, they are rather awkward to straighten when bent.

Most handles are solid ; but they are occasionally made of hollow weldless steel tubing, by which a few ounces in weight is saved and the handle rendered a little stiffer. I think, however, that they should always be made solid, as they are the parts most commonly bent in a fall, and a tube is rather a difficult matter to straighten, in most cases a new one being requisite. A few specialities in handle-bars and brackets deserve notice.

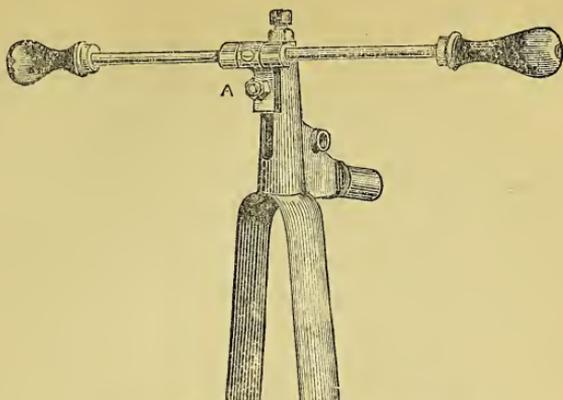
The **Centaur Detachable Bracket** is one of the simplest brackets made detachable, as it is simply and accurately fitted to the top of the upper bridge and secured by means of the lock-nut. It can be taken off in a minute, and the handle straightened if bent. It is very clearly shown in the annexed illustration.



THE CENTAUR DETACHABLE BRACKET

Cow-horn or Bent Handles are all the rage this season ; they are simply long handle-bars, bent down from 1-in. to 3-in., either close to the head or at their ends, most usually at the latter place, their object being to place the handle very low and allow of better purchase for the arms, without at the same time either shortening the steering head and centres, or placing the handle-bar in the way of the legs.

The **Royal Mail Adjustable Handle** is a wonderfully neat invention. As its name implies, it is a plan to allow the handle to be adjusted two or three inches upwards or downwards, and as will be seen by the illustration, is fitted to a Stanley head. The face of this latter is long and straight, with a slot cut from the top to about half-way down. The handle-bar is separate, and is affixed to a neat plate, fitting and sliding up and down the front of the head. This plate has a hole at its centre, through which a bolt passes, provided



ROYAL MAIL ADJUSTABLE HANDLE

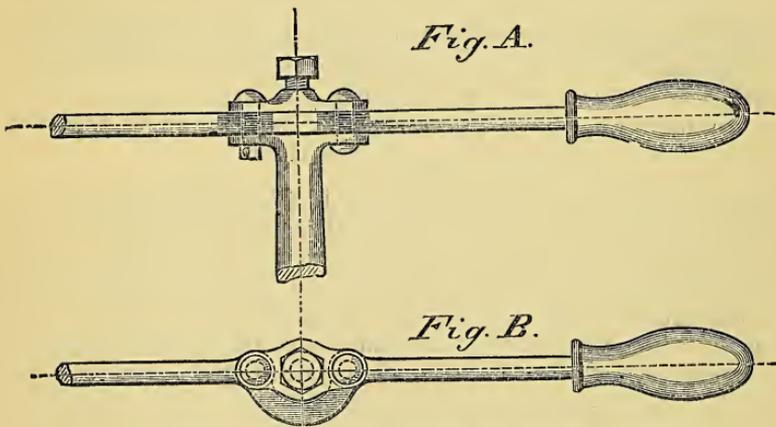
with a flat head placed inside the head of the machine ; its outer end is fitted with a nut, by slackening which the handle is loosened from the head, and may be adjusted to any height within length of the slot, and made all secure by tightening the nut once more.

Simpson's Adjustable Handle is used in connection with the "Defiance" head-piece previously described ; the handle-bar is in one piece, and forms a collar around the straight solid top of that peculiar steering, which has four or five horizontal grooves cut in its front. The central bulb of the handle-bar is pierced with a hole horizontally, and through this is driven a small cotter, which fits into one or another of the grooves on the head and holds the handle in position, being secured from working out by the use of a lock-nut on the smaller end. By this means the handle can be adjusted up or down to suit the arms and legs of the rider.

Starley's Patent Universally Adjustable Handles have, as their speciality, complete adjustment, although a fixture to the head. The first eight inches on each side of the head is tubular, the ends being adjustable to grip tightly smaller solid six-inch rods, which fit within the tubes. This allows of a complete adjustment in length from 20-in. upwards, whilst the solid ends are provided with screw clip sockets to hold the handles themselves, these being fitted on short rods bent at right angles to themselves. The handles may thus be raised or lowered three or four inches, as well as set at any angle, either forwards or backwards, or in any horizontal position to suit the natural fall of the hands upon them. They carry out most completely the idea of adjustability, and are of real practical utility.

The **Rucker Adjustable Handle** is somewhat similar, a straight bar being provided with a bent end carrying the handle, which can thus be placed at any point, either up or down, before or behind the head, as desired.

Mothersill's Swivelling Handles provide a means of easily and quickly putting the projecting handles of a bicycle out of the way, and are used in conjunction with his detachable pedals, before described. They admit of a bicycle being speedily stowed away in a small space, and are extremely useful to persons having limited space at their disposal. The desired end is attained in two ways, either by swivelling the handle round horizontally, or tilting it up vertically, and they can be used on any head. For use with the open front or "Ariel" steering, the handles are fitted on the top of a solid head, and are secured to it by means of bolts and nuts; these latter pass through slots in the handle-bar, and by loosening the nuts half a turn, and drawing back the bolts, the handles are free to revolve upon the centre-pin, and may then be turned in a line with the machine. Another plan is to secure two bolts, so as to project in front of the machine, and to fit the handles to these; one of them forms a pivot, and, as the handle only fits *on* the other, by a half-turn of an oblong nut, it is allowed to be raised on the other bolt to a perpendicular position, beside the head. When used with a Stanley head (as shown in the illustration) the top of the head is provided with double lugs, projecting on each side; the handle-bar then is so fitted that it passes round the front of the head, and is secured by a couple of bolts passing through the side flanges. One of these is nuted at the bottom, and forms a pivot upon which the handle turns horizontally when released from its hold of the other, by pressing a spring with



MOTHERSILL'S SWIVELLING HANDLES.

which the latter is provided and drawing the bolt out. This plan is the simplest and best of the three. Fig. A is a front view, and B represents the handle as seen from above.

The **Matchless Non-vibrating Handles** are designed to secure perfect isolation from metallic contact, and are constructed by fitting rather large boxes upon each end of the handle lugs.

These are packed with indiarubber rings, or washers, through which the handle-bar passes, the whole being screwed tight together with outer caps. The addition or subtraction from the number of washers increases, or otherwise, the rigidity as desired.

Palmer's Non-vibrating Handles. In these, the top of the head runs some 3in. forward, forming a deep slot. The handle-bar is placed in lugs at the top of a rod, hinged by its lower end to the bottom of the head. A strong spring is fitted on each side this rod, the normal position of the handle-bar being thus brought to the centre of the slot, which allows it some 2-in. to 3-in. play, or more properly, allows the head to vibrate as much as it will without the usual accompaniment of the handles thereto.

Garroods Extra Handles are simply additional handle-bars constructed to bolt on to the forks, from which they curve forwards and upwards. In using them the rider releases his hold upon the handles in ordinary, and leans down right over his wheel, thus working with a straight arm and bent back. Their use is only desirable when racing, facing a stiff wind, or climbing a stiff hill.

The **HANDLES** themselves are made commonly of ebony or rosewood; the former looks best, but soils the hands, and both—in fact all wood handles—more or less blister the hands on a long ride. Some are made of ivory, which is better and looks “grand” when new, but in time becomes discoloured and cracks, besides which it is very expensive. The best material is buffalo-horn, which when polished is beautifully soft and smooth, and consequently does not blister the hands, unless of an unsuitable shape or size. In shape the handles resemble those used on most machines, being round and bulbous at the extremities and some 4-in. long; they are in general, however, made much too small, and although the shape varies slightly with many makers, it is yet scarcely the thing.

Rubber Handles are, as their name implies, of solid rubber, the idea being to give a soft hold to the hands and at the same time mitigate the evil results of a fall to the handles. So far, so good, but as made at present they are an utter failure, for, being made in a mould, the ridge left in the middle chafes the hands worse than any wood, whilst the makers also seem desirous of further destroying their utility by putting their name and address on them in raised letters, and in failing to take off the original roughness before sending out to the British public.

Vulcanite and Soft Rubber Handles are constructed in a mould, and are formed with an inner core of soft rubber, the outer case or handle itself being vulcanite of the usual shape, and very much resembling horn. They have no nuts at the ends, and are very good in that respect, being made to screw on to the handle-bar, a worm being moulded in the soft rubber inside for that purpose. The chief objection to them is that falls are apt to split them.

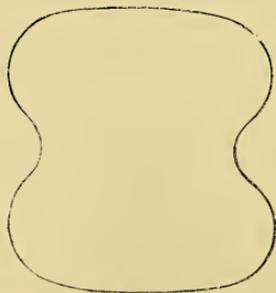
Spherical Handles are, as their name implies, spherical and resemble a cricket-ball; they are made of buffalo-horn and in size are as near 2-in. in diameter as it is possible to procure them in that material. They are most comfortable and give a much better grip than any others, as they allow the hands to be shifted into any position with equal comfort.

The **Detachable Handles** are made of horn, and are of the usual shape; their peculiarity consists in the ends being separate, screwing into the body of the handle, which is hollow and contains the nuts for fixing it to the handle-bar. By this means the handles can be quickly taken off if the rod requires straightening, whilst the nut are out of sight and do not rub the hands.

Ash's T Handles are made of hard wood. The handle-bar end is bent down, and the handle, long and elliptical in shape, fastened to it centrally, forming thus with the handle-bar a T. They are in a good position for power, and place the hands in a natural position.

The **BACKBONE** serves the same duty in a bicycle as it does in an animal, viz., it connects the various parts one with another. It used to consist of a solid circular or oval iron bar, bent to the requisite shape; but it is now constructed of hollow steel or iron, the reason being that, by mechanical laws, hollow metal, under certain conditions, is far stronger than solid, as well as considerably lighter. The best, strongest, and lightest are of steel, and should be largest—from $1\frac{1}{4}$ -in. in diameter—immediately beneath the spring, where most strength is requisite; they should then taper gracefully, but slightly downwards to the back fork, keeping at an equal distance from the wheel for about one-fifth of its circumference, and then proceed more or less perpendicularly to the back fork, according to the size of the rear-wheel. In section, backbones are usually made circular; but in some makes are elliptical, thus giving greater strength in the direction where it is most needed, without increasing the bulk of the material used.

Simpson's Fluted Backbone is altogether of a different shape, being flat-sided and fluted both top and bottom. The woodcut appended



SIMPSON'S FLUTED BACKBONE.

shows the section far better than would a mere verbal description. It possesses considerable strength, and is not unsightly in appearance.

The backbone is united to the neck and back-fork by either welding, or brazing and rivetting; the latter method is to be preferred, if well done, as welding weakens the metal by spreading it, and so making it thinner.

Hughes' Patent Neck is one of the flattened type, but is provided with a broad ledge, forming a rest for the spring, thus giving it increased steadiness or allowing a very close-cut flat spring to be used with this class of neck.

Keen's Extended Backbone is simply the backbone extended downwards to the level of the back-wheel centre, and fitted at its extremity with a stout pin, bolted on to it horizontally; on this the back-wheel works in a similar manner to a pedal. It does away with the weight of the back fork, but gives a machine a rather peculiar appearance, and some theoretical and possibly practical objections may be made to it on account of the extra strain the back pin must necessarily be subjected to. It is but little used.

Smith's Weldless Backbone and Back-fork Combined is formed out of one length of weldless steel tube, one end of which by careful manipulation is brought into the most approved shape for a back-fork, that being almost identical in appearance with the semi-tubular back-fork before described, the tube being first sawn up and then worked to the proper shape. This forms a very light, neat, and strong frame, without any brazing and rivetting.

The **SPRING**, as well as the backbone, is a very important part of a machine, for a bad spring renders riding extremely uncomfortable and unpleasant, sometimes even painful, a result too often set down as the fault of the machine itself, which consequently gets blamed for it. The *desiderata* in a spring are that it should be pliant, according to the weight of the rider—a spring pliant under 13st. would be terrifically stiff under 8st.—should be neat in appearance, simple in construction, and free from complication, as well as perfectly free from side-shake. There are many varieties of springs, their difference consisting either in the method of securing to the backbone in front, or in their mode of working and attachment behind. Taking first the after part of the springs in common use, we find that there are three methods, each with various modifications, the first being the

***Roller Spring**, which moves up and down the backbone (upon a thin steel plate attached for the purpose) by means of a small grooved roller fitted at the end; this is kept from jumping off the

*But little used.

backbone by a narrow ring or band going underneath. It works easily, but is apt to rattle and squeak occasionally if not oiled. It was at one time the favourite, but is now superseded by

The Sliding Spring. This class of spring has as many modifications in shape as any part of the machine. It obtains its name on account of its *sliding* up and down the backbone, the end being suitably constructed for the purpose. In some cases it simply rests on the "bone," being made nearly flat at the end and slightly curved to fit the backbone; it is obvious that this on a rough road is apt to jump and rattle; to obviate this, many makers make a short slot in the flat, and at its lower end screw a nut and bolt into the backbone with a leather washer beneath; this keeps this end of the spring free from side-shake and rattle, and allows of pretty free play; but for a heavy man the slot is sometimes found too short, and a sharp bump is felt when going over any sudden obstacle. It is vastly surpassed, both in appearance and ease, by

The Hinged Clip, in which the taper end of the spring is hinged to the centre of a steel clip passing about two-thirds round the backbone, fitting closely and sliding upon it; this holds everything very firm and makes it impossible to shake or jar in the slightest, as well as giving an extremely easy seat, on account of the end of the spring having two points of "play," viz., by sliding up and down the backbone and by the working of the hinge.

The Stanley Slide consists of a small block of gun-metal secured to the backbone, and pierced with a long rectangular eye; this is lined with leather and holds the tail of the spring, which passes through and slides up and down in it. It is simple, neat, and effective, and is greatly in vogue this season, being in some cases made with the upper part separate, and adjustable by means of a screw at each end.

The "**Stanley Improved**" Slide for the spring tail is very similar, but the spring, in place of sliding through a simple slot, slides in a slot cut through a roller which is fixed within a socket upon the backbone, and thus is enabled to turn a little and suit itself to any angle the spring tail is caused to take by the play of the spring, so that there is no jamming or cross locking.

In the **Dovetailed Slide** the spring is hinged to a small block dovetailed to fit into an oblong metal block secured to the backbone. In this it slides up and down, and is neat, free in working, and free from side-shake.

The Barrel Slide consists of a short rod affixed to the top of the backbone, the spring end being hinged to a cover forming three parts of a cylinder, which fits upon the rod and slides upon it.

Settle's Spring Slide in outward appearance is exactly similar, but upon further inspection it is found that the rod is replaced by a semi-circular chamber, in which an accurately fitted block hinged to the spring tail slides, the opening in the top being covered, and dust excluded by a cap similar to the slide used in the last pattern. The flat base gives steadiness, and the chamber will hold a considerable quantity of oil, so that frequent oiling is rendered unnecessary.

The **Imperial Spring Slide** is in reality a modification of the roller spring. On the backbone a long "up and down" loop of steel is secured; this holds the axle of a double roller, to which the spring tail is fastened. It works very easily, and does not rattle.

In the **A B C Spring Slide**, balls are made use of. These are very large, and have one side of them filed down and a hole drilled almost through them. The spring tail is fitted to a bolt and cross pin, the ends of which latter form two spindles, on which the hollowed balls are placed. A slide or case is attached to the backbone, forming two circular tubes or cylinders, and in these the balls work, fitting accurately.

Humber's Helical Spring consists of a helical coil of flat spring steel, taking two complete turns. It is bolted to the backbone at one end, the other supporting a cross-bolt, upon which the spring tail rests, being forked for the purpose.

Carver's Spring Tail is also upon the helical plan, but the coil is not so great, and is fitted at the top of a gracefully bent holder, which gives a much better finish to the whole affair. The spring tail, too, is not immediately attached to the coil, but is provided with a shackle or link as a connection.

In the **Alpha Spring** the spring itself ends in a small curl, and rests, not upon the backbone, but upon a second spring which is bolted to the backbone just behind the saddle, and curves up and backwards to form a support to the main spring. A small roller between the two surfaces enables them to work over each other with great ease and freedom.

The **Shackle Spring** consists of a double link or shackle, one end of which is hinged to the backbone, whilst the other is likewise hinged to the spring tail, which is thus enabled to play freely and give to any point included in the semicircle described by the shackle end to which it is fastened.

Patrick's Adjustable Shackle Spring is a very ingenious arrangement. The lower end of the shackle, instead of being hinged to the backbone itself, is secured in the same manner to the lower end of a short rod, which, working in grooves constructed for the purpose, may be pushed up or down by means of a screw with milled head, thus allowing of greater or less play to be given it according to the weight of the rider.

The **National Challenge Spring Tail** is hinged to the end of a double rod. Two short cylinders are bolted across the backbone, about an inch apart, and these are filled with rubber. Two bolts connect the double rod before mentioned, one passing through each cylinder, that piercing the rubber of the rearmost one doing so at a point very nearly at the top of the cylinder, whilst the forward one passes through at the bottom. By this a kind of lever spring is produced, with, as it were, two fulcra, both of which are not firm and solid, but supported upon rubber, which is subject to great compression, and whilst giving elasticity effects the severance at the spring end of metallic connection.

All these are differences only in the rearmost end of the spring. In order to gain as much elasticity as possible, in unison with neatness, compactness, and rigidity, the fitting of the front end of the spring has to be considered as well. They are therefore secured to the neck in two ways, with modifications.

The **Bow-fronted Spring** is constructed as follows:—In front of the spindle of the steering head a suitable projection is forged, to which the end of the spring is bolted or otherwise secured; from this point the spring makes a sharp curve upwards, doubling back upon itself and so passing round the steering gear (it being made wider with a slot in the centre for that purpose) and above the backbone, on which it works by one of the methods previously described. It is decidedly one of the most comfortable springs in ordinary use for rough roads, as the rider is seated almost in the centre, whereby he obtains the benefit of the maximum amount of play from either end, as well as from the elasticity of the spring itself. Its appearance is slightly against it, as it is scarcely so neat as the next class; but few would sacrifice comfort for appearance. It requires to be well and carefully tempered, otherwise it is apt to snap off at the bend. With Stanley heads it is rarely used; but in that case a slot is either cut in front of the head, or the spring divides a second time, and is bolted to the neck.

The **Bolted Spring** is the neatest in use, and is the favourite plan adopted on all light-class bicycles, and on most Stanley head machines. It has numerous modifications; but in general the front end of the spring, instead of passing over in front of the head, stops short behind it, and is there divided longitudinally for a short distance, fitting with a hinge-bolt on each side of the neck of the backbone, just behind the head. This gives it a fair amount of play, and allows of its being tightened should it work loose and get any side-shake. This plan for this style of spring is almost universally adopted.

The **Front Slide Spring** is a neat affair, being fitted with a joint behind, whilst it slides backwards and forwards, either through

or upon two short pins projecting from the sides of the neck. It allows play in front, but in general is rather stiff otherwise.

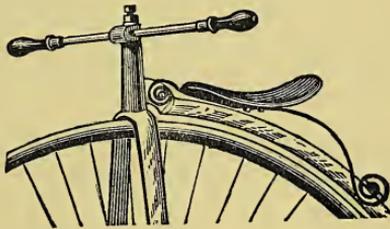
The **Pilot Spring** belongs to this variety, but is an improvement upon those in common use. A slotted cylinder holds the spring end, and is in its turn held in a rubber seating within a second cylinder affixed to the neck of the machine. This gives rubber insulation, and forward play at the same time.

The **Shackle Spring** is fixed to a joint behind, and in front is provided with a pair of arms or links, being jointed to these, and these in their turn bolted to the neck. By this means play is obtained almost immediately beneath the rider. Two kinds are used, in one of which the spring rests *on* the link, and in the other is *suspended* from it.

In **Sargent's Atalanta Spring** the spring rests on the shackle, but the latter is placed in such a position as to be almost in a line with the spring, which rests, a couple of inches from the front, upon a short pedestal of indiarubber, which in reality takes all the play, whilst the shackles keep the spring steady, and free from side shake.

The **Rubber Buffer Spring**, is secured to the backbone firmly in the place where the roller or slide usually fits; it then runs slanting upward, to within an inch of the fork, where it ends abruptly; in general appearance resembling a bow-fronted spring cut off just behind the fork. A rubber buffer or pad is placed between the backbone and the free end of the spring, which prevents the possibility of the rider coming down on the backbone.

Of compound springs differing both in their front and rear fastenings, there are several.

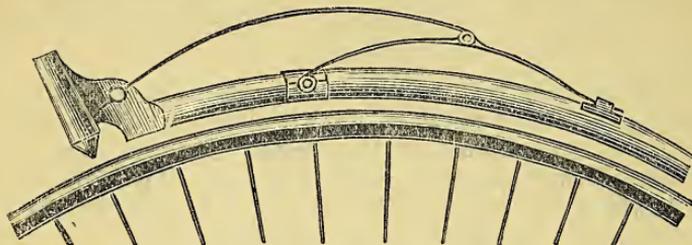


THE QUEEN SPRING.

The **Queen Spring** is so constructed that the rearmost end as well as the front ends in two helical coil springs, which are supported by bolts to the backbone and neck. It is very neat and effective.

The **Special Atalanta Spring** is identical in its front fastening with the Atalanta Spring just now described, but its rear end is supported upon a stout vertical coiled spring.

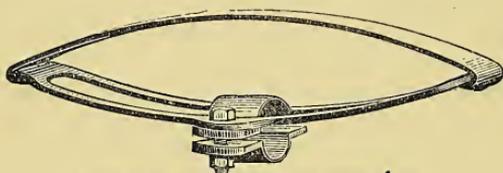
Palmer's Patent Combination Spring combines almost all the movements in common use. It consists of two short springs, one being bolted at its foremost extremity to the sides of the backbone, some 6-in. from the neck, and sliding in the rear in a neat Stanley slide. To the centre of this the tail end of the second spring is



PALMER'S COMBINATION SPRING.

hinged, whilst its front end forks and slides in slots cut in a rocking bolt in the neck. This plan gives extreme pliancy.

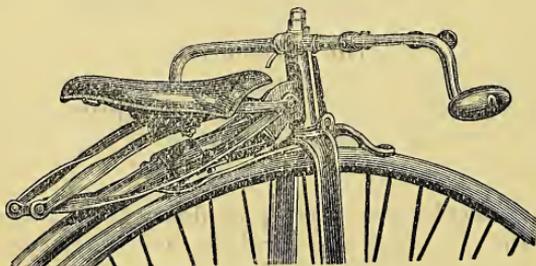
The **Premier Duplex Spring** is likewise a double one, but the two are arranged in a very different manner. One broad spring is fitted by means of clips and "saddle" to the backbone, both ends



HILLMAN HERBERT & COOPER'S
"PATENT DOUBLE ACTION SPRING."

curving upwards, the upturned ends supporting the second spring, which assumes the usual position, and is secured to the lower one by its ends being bent sharply over and inwards. The saddle is placed on the forepart of the upper spring. The peculiar method adopted in the fitting of this spring allows it to be fitted without the use of any pins or joints.

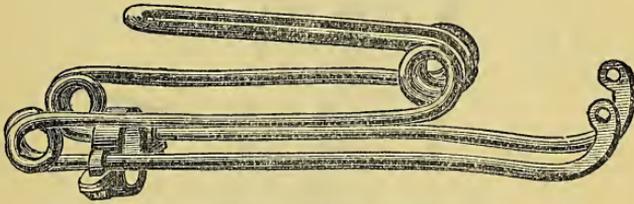
Ash's Leader Spring very much resembles this in outline, but, instead of being formed of two broad strips of spring steel, four



ASH'S LEADER SPRING.

narrow ones are used, which are placed two upon each side the backbone, and their ends bolted together with pins. This allows the ends to sink below the backbone, and the saddle to be attached to the centre of the arch, as the ellipse formed by the junction of the springs sits in a horizontal position. The maker fits springs also having only the front part arranged in this way, the rear end being bolted to the backbone.

The **Arab Cradle Spring** is most unlike any other. It is fastened by a bolt to the neck, and further secured in the middle by means of two hooks attached to a "saddle" fastened around the backbone, as shown in the illustration. The spring itself consists of a double length of wire or steel rod, which is held firm by the hooks, and then passes backwards a few inches, and, forming a loop or curl, proceeds forward to a couple of inches from the front ends, where it once more curls and turns, finishing up with a slight rise upwards at its rear end, as shown in the sketch. It is one of the

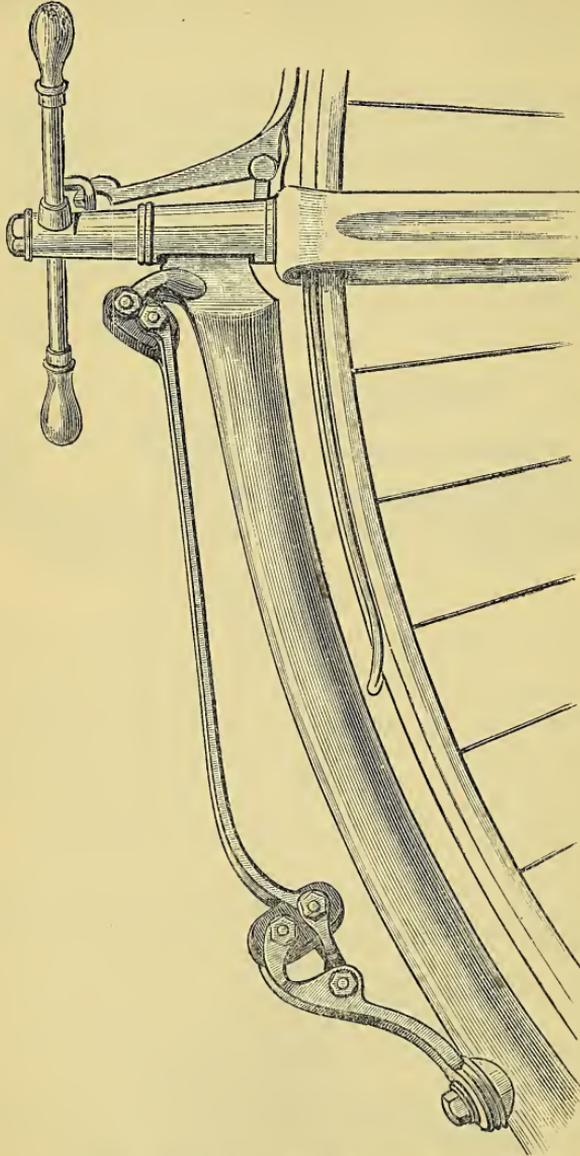


THE ARAB CRADLE SPRING.

most remarkable springs ever introduced, and, after an eight months trial of it, I can speak very highly of its practical qualities. To act in perfection, it must be properly selected for the weight of the rider, as, if constructed for a heavy man, it will almost pitch a light one over the handles, whilst if a heavy weight uses a light weight spring it "lets him down on the backbone," but when of the right strength it is extremely pleasant. It is for this reason the makers are so particular to ask the weight to be given when ordering.

The **Matchless Spring** is constructed upon very similar lines. A bracket, or curved tail piece, is made fast to the backbone in the rear, and this is fitted with two sidelugs holding a link and a vertical rod depending from its upper extremity. This vertical rod holds a number of stout rubber buffers or rings, according to the weight of the rider, and upon these the spring tail rests, being held steady from side shake by means of the link before mentioned. Much the same principle is carried out in front, a semicircular bracket being attached to the neck, from the top of which a rod depends as before, supporting the forward end of the spring upon rubber rings. The chief difference in the principle of these two springs is that the last obtains its ease from the elasticity of rubber, whilst this one depends for the same commodity upon its compressibility.

The **Coventry Suspension Spring** is constructed as follows :— Both in front and behind tail and head pieces are securely bolted to the backbone ; these take the shape of the extremities of an ordinary spring, and are finished off with a species of hook underneath. To



THE COVENTRY SUSPENSION SPRING.

these hooks very stout rubber springs are attached, and the centre of the spring on which the saddle rests is suspended thereon. The front

end is provided with links as well, to procure immunity from side-shake. It is extremely pliant, and the rubber assists in rendering it a non-conductor of vibration.

A no less important item in conducing to the comfort or otherwise of the rider is

The **SADDLE**, of which likewise there are several varieties. In ordinary it consists of an iron pear-shaped plate, narrow to almost pointedness in front, and spreading out behind to form the seat for the rider; this has over all a covering of leather—pigskin. In some cases nothing intervenes betwixt the leather cover and the saddle-plate, but usually it is more or less padded with horse hair or other soft material. The whole is supported by an oblong block of wood the width of the spring, some 2-in. in thickness behind, and tapering to $\frac{1}{2}$ -in. in front, in order to give the rider a raised or level seat on account of the usual backward slope of the spring to which it is fastened, and firmly secured from slipping by means of a couple of iron pins fixed into the saddle-plate, one on each side of the wooden block. These have a worm cut on their lower ends, on which a thumb-screw works, by means of which a flat bar beneath the spring, forming a connection between the pins, is tightened, and the whole secured. In most makes now, plain nuts take the place of the thumb-screws; these are neater, do not bump on the backbone as the wings of the thumb-screw are apt to do, and may be made more secure by using the spanner.

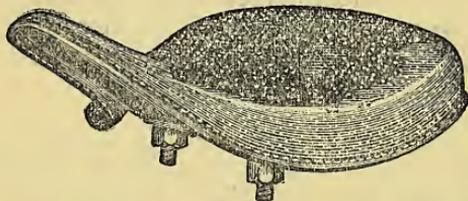
Mothersill's Patent Safety Saddle is designed to provide a safe seat when descending steep hills without the aid of springs or other shifting paraphernalia. It consists simply of an ordinary pigskin saddle, having a small secondary seat affixed in the rear, upon which the rider can sit when descending hills; the idea naturally strikes one as being necessarily very clumsy, but it has been carried out in a far neater manner than I could have deemed possible, the small secondary saddle looking very little different from a projecting valise.

For comfort a saddle should not be too small, it will also be found more comfortable if tilted up behind a little; some saddles are very nearly level, by which they are safer and easier to mount, as well as allowing the rider to slide well back in descending hills, but in general are not nearly so comfortable as those with a good tilt. This is the saddle in ordinary; now for the varieties.

The **Web-seated Saddle** differs from the ordinary in that the iron plate, instead of being solid, has two—sometimes only one—elliptical holes cut in its centre, over which is stretched a piece of webbing supporting the padding and cover. This usually gives a more comfortable seat than the ordinary, but is not infallible.

The **Air Saddle** is simply a canvas-covered indiarubber air cushion, conformable in shape to the ordinary "pigskin;" a screw mouth-piece is fitted behind, by means of which it is blown out when secured to the top of an ordinary saddle, with straps or otherwise, according to its construction. It gives a nice soft seat, entirely preventing *soreness*, but has a tendency to produce *stiffness* instead. In the best the air bag is placed between the plate and leather. Ordinary ones are fastened on to the top of the pigskin, and sometimes render it difficult to mount a high machine. They are also apt to stick, and so render a quick dismount awkward. Besides this, the air forcing the saddle so closely to the body, makes the seat uncomfortably warm, especially in summer. To remedy this last defect—which exists more or less with most saddles, but most with the air saddle, the one next to be described is ventilated by means of a number of eyelet holes. This is

Lamplugh and Brown's Suspension Saddle, which may be rightly called the "King of Saddles." It has quite monopolized the market—no less than 15,000 having been sold last season. It is constructed on an entirely novel principle; the wooden block is done away with, and a curved and corrugated metal plate takes its place; the usual iron saddle plate is entirely absent, the leather seat being



LAMPLUGH & BROWN'S SUSPENSION SADDLE.

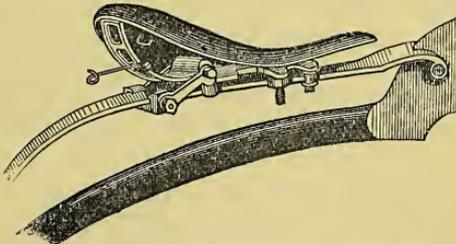
stretched or suspended from the frame, which it touches only behind and in front. It is thus enabled to yield at every point to the pressure of the thighs, and consequently does not chafe the rider in the slightest, whilst to obtain a cool seat it is made either with five eyelet holes down the centre, or with a lacing of "white leather" in the middle.

A larger form upon the same principle is made for tricycles, and I can highly recommend it for use on the bicycle to those who desire "something to sit upon," and I may mention I do not find it at all harder to mount and dismount, but rather the reverse.

The **Birmingham Small Arms Company's Saddle** is constructed upon a light circular steel frame, with a central stay or holder. The forward ends of the side pieces being detached from the centre-piece enable the sides of the peak to give a little under the pressure of the thigh. Besides these modifications in the form of the saddle itself,

The **Stanley Saddle Plate** provides a means of attaching the saddle to the spring without using the rather awkward nuts underneath. It consists of a long flat steel plate, forming quite a second spring; to this the saddle is attached, and the whole secured to the spring proper by a single nut, as the plate is provided with a slot at each end, working on buttons fixed on the top of the spring. It allows the saddle to be adjusted some 2-in. in an easy, neat, and efficacious manner, and also forms a second spring to assist, support, or even supplant the primary one in case of need. There is also a patent alteration in the mode of securing to the spring, which allows the saddle to be moved backwards and forwards on the spring at the will of the rider, without dismounting. The advantage of this is evident, for with the ordinary fixed saddle in descending hills, the weight of the rider is thrown further forward and taken in a measure off the back wheel, just the opposite of what should be the case; by the use of a sliding saddle the rider is enabled to shift his seat several inches further back when descending hills, thus throwing his weight more fully on the back wheel, which consequently "drags" or acts slightly as a brake, besides giving a back wheel or ground brake more power, and by shifting the weight further back from the centre of the front wheel, enabling one on that wheel to be used with greater safety and power. This apparatus is known as

The **Centaur Moveable Saddle**. In this the saddle is fixed upon a joint working upon two hinged arms, each $1\frac{1}{2}$ -in. long, the

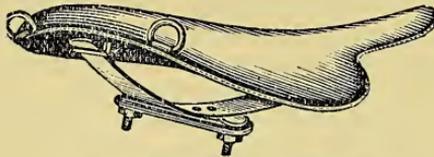


THE CENTAUR MOVEABLE SADDLE.

whole being fixed to an oblong frame with pins and nuts, as with ordinary saddles, for securing to the spring. These arms are kept forwards flat on the spring by a powerful concealed spring in their interior. By leaning forward slightly, the front of the saddle is depressed a little and a purchase gained on the arms; a backward pressure with the thighs then forces them back, causing their ends to describe semicircles of 3-in. diameter, of course shifting the saddle back that distance. By raising the body again, the saddle is once more brought forward by means of the springs.

In **Woolley's Spring Saddle**, the saddle itself, an ordinary plain one, is secured to the top of an inverted spring, the tail end

working in a "Stanley slide" at the back of the saddle. This makes, as it were, a double spring, and is very useful in a rough part of the country, especially with heavy weights, and is especially adapted for use with a spring too stiff for comfortable riding with the ordinary saddle.



WOOLEY'S SPRING SADDLE.

Jones' Rolling Saddle, like the previous one, consists of an alteration in the frame. The saddle, in place of being bolted direct to the spring, rests upon a cross-shaped iron plate, the longer arms of which are turned up at their ends, and bolted to a hinge running lengthways beneath the saddle. The shorter arms support rubber pads, the result of this arrangement being that the saddle tilts slightly forwards and to whichever side the rider leans, enabling him the better to reach his pedals and somewhat preventing soreness. It is a good thing and well carried out, but its price at present keeps it from being well in the market.

Carver's Non-slipping Saddle. Upon and across the spring a number of strips of steel wire are brazed, and the saddle-block grooved accordingly. These strips, fitting into the grooves, entirely prevent its slipping backwards, if it by any means becomes loose, thus allowing the rider to dismount in safety and tighten up again, although the wires occasionally come off, in which case they act as "roller bearings" instead of hold-fasts. On the whole, however, it is a good idea.

Fox's Metallic Saddle-block. In this, metal takes the place of wood, the saddle-block consisting of a strip of iron, which rests in front on the spring, goes horizontally backwards some 6-in., bends sharply down to the spring, and is then continued another 2-in. along it. The saddle is screwed on to the first portion, and, by means of two adjustment screws at the back, can be set at any angle, either flat for safety or tilted up behind for comfort.

The next part of the machine is—

The **STEP**, in which there is also some little variation. It is of course used for mounting and dismounting, and should be placed at just such a height that the rider can reach it easily from the ground, and also with equal facility from the saddle. Sometimes a double step is used, in which case the second is placed some 4-in. to 6-in. above the first, on the right-hand side of the machine. Ordinary steps are on the left, and are fixed to the backbone; they are of two kinds, the most ancient of which is

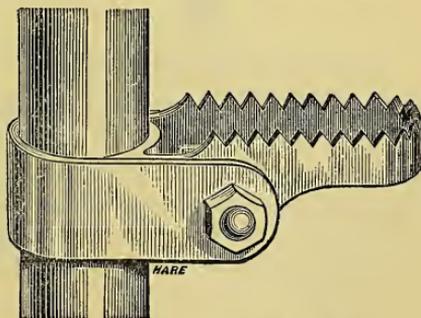
The **Circular Step** consisting of a circular plate of iron about the size of a florin, flat, and roughened at the top. Sometimes the circle is made hollow and bolted straight to the backbone; this is a neater plan than the other, but by far the neatest and most generally used is

The **Saw Step**, which consists of a flat iron pin having its upper surface filed into teeth, as in a rat-trap or saw. It is very good, being neater and lighter, as well as giving a much safer and quicker footing than the former; it has numerous varieties, some having two bars side by side, and so on through many slight alterations in shape, the most usual and best, resembling a gouge with serrated sides. In both these methods the step is fixed, so that should it happen to be placed at an unsuitable height, nothing is left but to have a second step, or put up with the inconvenience. This is obviated in the adjustable steps, of which there are several.

The **Acme Adjustable Step**, as its name implies, is adjustable to any height on the backbone. It consists of a ring of flexible steel, bearing the step on one side and divided on the other, the two ends being drawn together with a thumb-screw and nut. Its use is to form a readily-adjustable second step (which can, of course, as well as the first, be fixed at a suitable height on the backbone), the fixed one being placed very low down in order to decrease the number of hops to be taken in mounting. It answers its purpose well. Very similar is

Hughes' Adjustable Step, consisting of a strip of sheet steel, thin in the centre and bent round the backbone, around which it is tightened by a screw. The ends are saw-edged, and give a firm hold to the foot. The whole is neat, light, and readily adjustable.

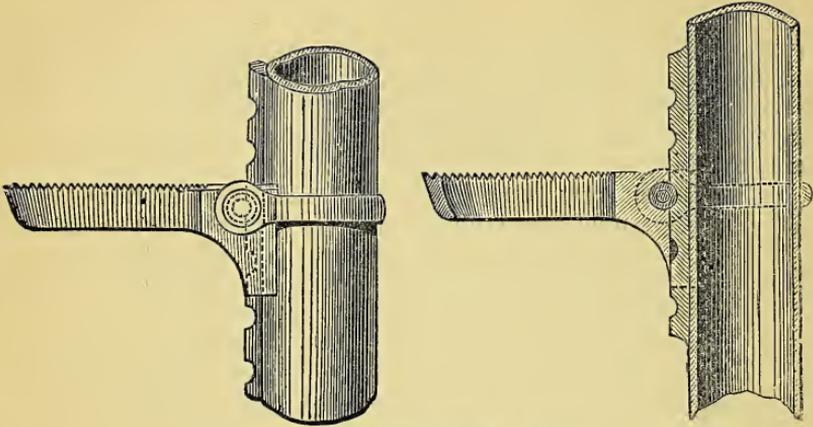
Hillman's Adjustable Step consists of a waist, or band of steel, passing round the backbone and ending in two slots. Between



HILLMAN'S ADJUSTABLE STEP.

the slotted ends a second portion fits, this taking the form of an oblong hollow serrated frame, curved on the interior so as to fit the backbone. A taper bolt and screw passing through the slots draws these two parts tight together, and holds it upon the backbone.

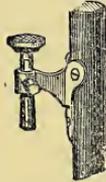
Rucker's Adjustable Step is somewhat similar in outward appearance to the last, but as will be seen from the illustrations a strip of metal with horizontal slots is fastened to the backbone. The inner face of the step is made with a groove in which the strip fits,



RUCKER'S ADJUSTABLE STEP.

and the bolt passing through one of the slots binds the whole together, and makes it a matter of absolute impossibility for it to slip. There are five points of adjustment.

The **Centaur Adjustable Step** is shown in the annexed illustration. It is circular, and is mounted upon a 3-in. straight pin,



CENTAUR ADJUSTABLE STEP.

which slides up and down in a projecting bracket provided for the purpose, and is secured when in position by a small side-screw.

The **Wolverhampton Step**, much used by makers in that town, consists of an oblong flat plate or wing affixed to the side of the backbone. This is provided with four holes, through which the end of a saw step passes, being secured by a nut on the other side. It is thus adjustable through four places.

The **Desideratum Step** is much neater, though somewhat on the same lines. It is in principle the same as the barrel spring slide, a plate screwing to the backbone bearing a long rod, on which a circular hollow step slides by means of a barrel at right angles to it,

Settle's Adjustable Step is the latest out. It consists of a piece of sheet steel or brass, stamped so as to form a semicircular slide, in which a corresponding block works bearing the step, which is kept firm in the desired position by means of a screw and nut.

BRAKES.

With the parts previously described a racing bicycle is complete, but to form a roadster, a brake of some sort is required if any touring is to be done or any hills descended of any steph. Many riders do without them, but all who have had any experience now find a brake indispensable. From time to time a large number of varieties of the brake, some of the most complicated kind, have been introduced, but with very few exceptions they have disappeared from daily use before the merits of that known as the "Double-lever spoon," which is now almost universally adopted as the brake *par excellence*. The points to be sought for in the selection of a brake are, 1st, facility and rapidity of application; 2nd, great power; 3rd, capability of gradual and continued application; 4th, safety in use, or non-liability to throw the rider; 5th, simplicity; 6th, reliability, having no weak points; 7th, neatness and lightness. The last, however, is quite a secondary object, and, provided the other points are gained, should be left out of calculation entirely. In the use of the brake, too much must not be expected of it, and it must be remembered that the object of a brake is not to pull the rider up sharply in the middle of a hill when going at 20 miles an hour or more—for such is impossible in combination with safety—but to check the impetus of the machine to such an extent that the control of it is not lost, and a dismount easily affected at any time. The first I shall describe is a natural one, and should be mastered by all riders, as a fall-back in case of the failure of, or for use in combination with, a mechanical brake. I refer to

Back Pedalling, which consists in applying the pressure on the ascending pedal, instead of the descending one, as in the act of propulsion. It requires a little practice to get into; but when learnt, a bicycle can be kept in hand down pretty stiff hills by its use. It has an advantage in being entirely independent of any mechanical contrivance, but in power is equal only to the strength and skill of the rider, and should his feet get jerked off the pedals he has nothing to fall back upon. Of mechanical brakes there is now but one class, viz.:

Front Wheel Brakes, those acting on the rear wheel and upon the ground having quite gone out of fashion, never now being fitted by any maker, although of course in use upon antiquated machines. Front wheel brakes are applied in several ways, the medium of contact with the wheel being either a metal roller or a

flat "spoon," the latter being the simplest and most powerful, whereas the former does not wear the rubber quite so much, which is about the only thing that can be said in its favour. These brakes *in inexperienced hands* are dangerous, as unless caution is exercised in their gradual application, a "cropper" is almost a certainty—*i.e.*, with most of them. In using them the rider should always sit well back in his saddle, or, better still, make use of a shifting one and apply the brake gently at first, gradually increasing the power in inverse proportion to the speed of the wheel, until the required slowness is obtained.

Of these the oldest in use is

*The **Thumb Brake**, consisting of a perpendicular bar, pivoted to the side or front of the steering gear just above the wheel. At the level of the handles it bends at right angles and runs along immediately in front of the handle-bar, until it reaches the handle itself, where it ends in a flat thumb-piece; below the pivot the bar again bends at right angles, running horizontally straight out over the wheel, some 3-in. or 4-in., and ending either in a roller or shovel—most commonly the latter. To apply it, the thumb is placed on the thumb-plate and the lever forced outwards; this depresses the other end, and applies the required check to the circumference of the driving-wheel. With this a machine may be kept fairly in hand down most ordinary hills, care being taken at no time to allow too much speed to be got up. Although front-wheel brakes are in general dangerous, on account of the sudden check given to the wheel by too quick and forcible an application, this one certainly is not, as the strain on the thumb is too great; on a long and steep hill, especially in cold weather, this strain on the thumb is so trying that on that account the brake becomes almost useless.

Rather better is

The **Double Thumb Brake**, which is essentially the same as the previous one. A bar runs vertically down in front of the head, bending at right angles over the wheel, its end being fitted, as before, with either a spoon or roller; this forms a lever, worked by a second bar fixed to the top of the first, at right angles to it and running horizontally along in front of the handle-bar, with thumb pieces fitted at each end, by which the pressure is given. It has an advantage in that it admits of both thumbs being used, whereby the strain is divided and the thumbs not tried so much, consequently there is more power. Superior to either of these, and in my opinion to the majority of the rest as well, is

The **Double Lever Brake**. This acts with a spoon on the wheel, which, as in the double thumb brake, is connected with a bent lever pivoted just above the wheel; at the top however, instead of con-

*Very little used.

tinuing in one solid piece along in front of the handles, it is in two parts, the second, or handle half, being pivoted again to the handle-bar close to the head. In action it is just the opposite to the thumb-brake, being pulled towards the rider with all the fingers of the right hand, whereby the shorter arm of the horizontal lever is moved forwards, imparting a similar movement to the top of the second vertical lever, which of course forces the spoon at its other end downwards on to the wheel. By this the strain and jar on the thumbs are obviated, and more power can be obtained, both on that account and also because of the different position and action of the hand, as well as the conjunction of levers. It is very powerful, and can be applied with great nicety if required.

As a rule the horizontal lever is very unscientifically fitted, and in consequence, although a sudden application will throw the rider over the handles, the strain upon the wrists and fingers is so great that the descent of a long hill will render the hand almost powerless before half way down. This can be remedied by scientific fitting, the fulcrum being close to the head, and the handle extending almost to the end of the steering-bar, and small horn handle at the end will also be found a considerable improvement. In one or two instances two horizontal levers are used, so that one hand can be relieved by the other when tired—an excellent arrangement. When accurately and scientifically fitted, the double lever brake is the best unpatented brake in use.

Simpson's Brake. In front of the handles an ordinary lever arm is placed; this is connected with a link working centrally on a projection about two-thirds down the front of the head, and the other end of this is hinged to the end of the brake lever itself, the two arms of which are about equal, the lower one bearing a spoon and being quite out of sight underneath the head. To apply it the lever is pulled as usual; this pushes out the upper end of the link, thus drawing in the lower link end and upper arm of the brake lever, and so bringing the spoon in contact with the wheel. At first sight it would appear decidedly dangerous, but experience proves the fallacy of this opinion. With some brakes the power is applied in various ways by turning the handle itself, which in such cases is made to revolve for the purpose. Of these

The **Stud Brake** is similar to the double lever brake, but the horizontal arm is absent and a stud is fixed to the handle-bar; upon turning the handles towards the rider, the stud rises, pushes the top of the vertical lever forward, and so applies the brake. It is scarcely so powerful as the double lever, yet more so than the thumb-brake, and the weight of the extra lever is avoided. The appearance is neat, and it is fairly safe.

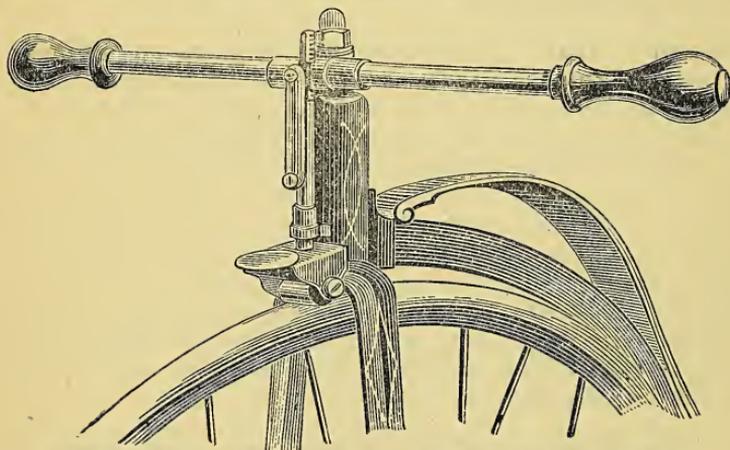
The **Cam or Eccentric Lever** is very similar, the stud being replaced by a gun-metal quadrant secured somewhat out of its centre

to the handle-bar, and having a slot cut just within its circumference, into which a small pin affixed to the top of the brake lever fits. By turning the handles upwards, the top of the lever is gradually and surely pushed forwards, and the brake applied. With a moderately tight handle-bar it can be applied to any degree and there left, thus relieving the hands of any strain.

The next are in their mode of action very similar. They are all extremely powerful, each is applied by the handles, and all act directly on the wheel in the best possible position for power—viz., immediately in front of the fork. They possess enormous power, and are well to the front in that respect.

Stassen's Eccentric Brake consists of a vertical rod placed in front of the steering-gear, with a roller at the bottom, worked up and down by means of an eccentric fixed on the handle.

Timberlake's Ratchet, or Rack-and-Pinion Brake, consists, as before, of a roller at the base of a vertical rod running through guides immediately in front of the steerage. The back of this is cogged, and the handle corresponds, so that by turning it either way the brake is elevated or depressed accordingly. It is a great favourite with many of our metropolitan riders. The accompanying illustration gives a very good idea of it, and shows the rubber band in front by which it is kept up from off the wheel when not required for use.



TIMBERLAKE'S RATCHET, OR RACK-AND-PINION BRAKE.

Ash's Leader Brake is likewise applied by means of an eccentric, the brake rod sliding up and down within a cylinder fitted in front of the head. By means of a neat little catch, however, the brake may be released immediately at will, whilst if desired the handle may be left go, the brake remaining full on, or when the brake is not in use the handle may be fixed, and so converted into a rigid handle. It is a most ingenious contrivance, being both powerful, safe, and useful.

Grout's Vertical Brake is, as with the others, a roller attached to the base of a vertical rod placed in front of the steerage. About $\frac{1}{2}$ -in. from either end, it is connected to the head by two short double-jointed connecting rods, the upper one being attached to the handle-bar in a similar manner to the stud of the stud-brake. The action of turning the handle of course applies the brake by depressing the vertical rod. It acts with the head in much the same way as do the two arms of a parallel ruler.

The **Birkbeck Front Brake** bears a great resemblance to Grout's, and is a very neatly constructed affair. Like the previous one it is connected to the handles by a finely curved stud or short lever, but its lower end is differently arranged, being provided with a vertical slot through which a pin passes, joining the two ends of a projecting holder which keeps it firm and in position. A further addition has also been made to it in the shape of a small spring lever which is fixed on the handle-bar; the shorter end of this is provided with a pin, which falls into a hole drilled in the lug holding the handle-bar, and passing through this enters the handle-bar itself, being kept in its place by a spring beneath the lever handle. Its purpose is to fix the handle when the brake is not in use, and by a pressure of the thumb or finger it can be instantly released and the brake set in action. These last four are each provided with a guard or shield over the roller, as that article has an unpleasant knack of throwing the mud or dust in a beautiful cascade over the rider's head, face and shoulders, and as they all require delicate application, should be used carefully by a beginner.

All the front-wheel brakes hitherto described act on the rubber tyre—the circumference of the circle—and therefore in the best possible position for power; one there is which does not do so, viz. :—

The **Arab Strap Brake**, acting on the hub, in which a little alteration is required, as follows :—A grooved flange or wheel, about 5-in. in diameter, is turned on the outsides of the hubs; to the inside of the front forks stout pins are attached, from which bands of steel proceed, passing round the flanges and connected by wires with the handles. A fixed handle is used, and on the handle-bars tubes are placed, provided with thumb-pieces and connected with the brake-cords. By pressing with the thumbs, the strap bites the brake-wheel nearly all round, thus stopping the wheel. It is pretty safe on the score of "croppers," as it is applied too near the axle to have sufficient power to stop the wheel "dead." It is powerful enough for most ordinary work.

The next items, and very useful ones too, although now but rarely fitted, are

FOOT-RESTS,

Of which there are several varieties. Many riders do without them in order to dispense with their weight; this is, however, with most kinds exceedingly trivial, and certainly does not counterbalance the amount of comfort obtained by their use. Some object to them as being in the way, but if neatly fitted they are not so; others again do not care for their appearance, and they certainly do not, in general, improve the neat looks of a bicycle. Their object, as their name implies, is to provide a resting-place for the feet, when not required for the propulsion of the machine, and although they are now almost out of fashion, still anyone who has done much touring will know their great use. If made detachable they can of course be taken off for ordinary "round about" riding. They may be divided into two classes, viz.—those on the fork or toe-rests, and projecting, or foot-rests proper; whilst there are again two kinds of each, *i.e.*, fixed and detachable.

Before describing any of them, I have first to mention, as with the brakes, a natural one, which is used by most riders who have no mechanical ones. This is, putting the **Legs over the Handles** and supporting them there. This, of course, can only be done on a machine with low handles, as now built. The advantages of this method are that, should the rider happen to meet with a spill, he most usually alights on his feet, clear of the machine; against it, it is urged that the weight of the legs, being placed over the front of the wheel, brings so much more weight on the wrong side of the axle, and also keeps the body close up to the head-piece, whereby that most undesirable event—a cropper—is more easily brought about. A sliding saddle, too, cannot be used, and a handle-alarum will scarcely allow of the plan. Some practice and a little confidence are required before the bicyclist can descend a hill in this manner, as the balance is so much harder to keep when the whole weight is right on the top of the machine, and no assistance is obtained from the legs.

Taking mechanical rests, and commencing with those "On the fork," we come to

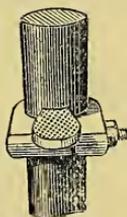
The Fixed Rest. This consists of a simple little toe-piece, projecting some $\frac{1}{2}$ -in. from the fork-sides, at just such a height as to clear the pedal when up. Some are flat; the best are rat-trapped saw-plates. They are the lightest and neatest in use, and are always "ready when wanted," which is the chief advantage possessed by fixed rests over folding ones. They do not give much surface for the foot to bear upon, and have consequently been rivalled by

The Folding Foot-rests, which are fixed on the fork sides, as before, but allow of nearly 2-in. of foothold. They are fitted with a

hinge close to the fork, against which they closely fold, being kept in their places by indiarubber bands passing round both them and the fork. To use them pressure is applied at the top, this forces them down to a horizontal position, and a foothold is obtained ; as soon as the feet are taken off, the rubber springs draw them up out of the way again. In order to ensure their proper working, the band should be supported behind the fork by a pin, which prevents its slipping off the rest when in use ; the inside also of the clip ought to be provided with a pin, to keep it pointing slightly outwards, so that the foot may find a ready hold to force it down.

Foot-rests on the fork, both fixed and folding, are in the best position for keeping the body well back on the saddle when descending hills ; they are also neat, and do not interfere with the appearance of a machine so much as projecting ones do. An objection to each of these rests is that, whilst riding with trousers—many do when taking short spins, riding in to business, &c.—they have an unpleasant and dangerous knack of catching the loose legs of the “unmentionables.” A remedy has been found in

The **Centaur Detachable Toe-rest**. This is illustrated below, and consists of a neat toe-plate provided with a fixed V shaped hook



CENTAUR DETACHABLE TOE-REST.

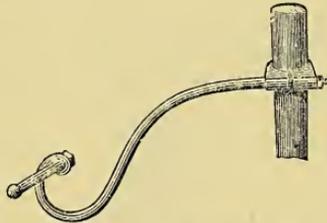
at one side behind, and with a straight pin having a worm cut on it at the other ; on this a second hook or jaw works, and is adjusted by means of a small nut behind. By this arrangement the rest can be fixed at any height on the fork and firmly secured by tightening the jaws against its edges, whilst it can be removed in half a-minute for ordinary riding, and kept for use on journeys only.

The next class of foot-rests we come to is that in which they project in front of the fork more or less ; they differ principally in shape, and are very comfortable when of the right length, but much the opposite when not so. Their chief point of vantage over the preceding class is that in ordinary use they are not in the way, and that they keep the heel out of the wheel, as that part of the foot rests against the side of the fork. Objection is taken to them on account of their weight and appearance, and also that they are in a bad position for safety from “croppers,” as the body cannot be so well kept back on the saddle, and the legs are kept so closely under the handles that it is very hard to get them out in time to alight on them in case of an accident.

Taking, as before, the ordinary fixed

Projecting Rests, we find that they are of numerous patterns; consisting of a straight rod, proceeding from the fork some 6-in. or 8-in. in a horizontal line, having a short foot-bar at right angles to its extremity. Some again have a supporting rod, either straight or curved, proceeding from the end to a point some 4-in. or 6-in. above or below the first one, whilst in others the support alone remains, the horizontal rod being done away with. In some makes they are rivetted to the inside of the fork; but in most cases they fit into lugs forged on the fork, and are secured with a nut.

The **Centaur Detachable Foot-rest**, illustrated below, is secured to the fork in a different way, the method adopted being that described as in use with their toe-rest. It is light and neat, and by being made detachable can be of course taken off, and the weight saved for ordinary riding.



THE CENTAUR DETACHABLE FOOT-REST.

ACCESSORIES.

Under this head come a large number of articles, both large and small, some of which, such as the wrench and oil-can—and, now that the bye-laws require them, lamps and bells—are necessities to every bicyclist, whilst others are of much use for special purposes, but can be done without by most riders, according to circumstances. Taking first the most important, we come to the

WRENCH, or SPANNER. In this we find great diversity. The use of the wrench is of course to keep the machine in order, by adjusting the various nuts and bolts with which it is kept together. The *desiderata* in a wrench are, that it should be light, neat, strong, both as regards power and construction, and that it should easily, quickly, and firmly bite all the nuts. There are two classes of wrench, viz., the adjustable and the unadjustable, each of which has numerous variations. Commencing with the latter, we come to

The **Flat Wrench**, which is made of a flat iron or steel plate, with holes cut either in the middle or on the sides and ends for the different sizes of nuts. They are usually made specially for the machine with which they are supplied, and will fit few nuts on any

other ; they are in general handy, neat, and strong, and do not slip from the nut if properly made to fit. If well made with holes for each size of nut, they are excellent ; but very often a bicyclist will have one unfortunate nut on his machine with no corresponding recess on the spanner for it ; or may be, one or two don't quite fit, in which case it is a continual worry and annoyance until a new wrench is procured.

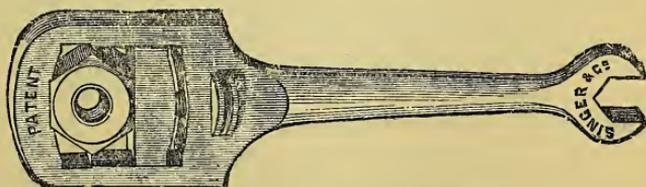
The **Handy Wrench** of the Coventry Machinists' Co. is an excellent one of this kind ; it is made to fit their machines only, and is of course of no use with any other make. It is flat, and has holes in the middle for the larger nuts, the smaller sizes being cut on separate pieces, as well as a screw-driver, which all fit into a square socket on one end, and by that means can be easily inserted into awkward places. It is, as its name implies, extremely handy, but care must be taken not to lose any of the separate portions.

The next class (adjustable wrenches) has rather more varieties, the commonest being the

Screw Wrench. This consists of a stout rod, with a worm cut on its upper end and surmounted by a flat hammer-head, with flat under surface. On this worm, which is flat, or square-sided, another block slides up and down, being pushed into position by means of a separate screw beneath it. By shifting the position of the under-piece the width of the spanner may be adjusted to fit any sized nut. The great objection is that it is wanting in firmness, and when the power is applied the jaws of the wrench are apt to open and slip off the nut, much to the detriment of the user's fingers and temper, besides spoiling the edges of the nut and taking a long time to adjust properly.

There are several patterns of this kind of wrench in use, but they all, more or less, have the same fault excepting

The **Challenge Wrench**, of which an illustration is given. As will be seen, it consists of an oblong frame at the end of a hollow rod, within which a screw is worked up and down by means of a milled roller, as shown in the sketch ; by working the screw up, a flat bar sliding in the frame is pressed against the side of the nut, the wrench having been first placed upon it. The whole article is neat, compact, well made, and strong ; it is 6-in. in length, and has a small jaw cut on the smaller end for the adjustment of the smaller nuts in awkward positions. When once adjusted to the nut it is



THE CHALLENGE WRENCH

impossible for it to slip off, on account of its having a bearing all round. It takes any sized nut from $1\frac{1}{4}$ -in., but cannot be used on nuts in corners and other awkward positions, unless the small jaws on the end will fit them. So far, it is by far the best wrench yet invented.

The **Yankee Wrench** is a very neat little affair made entirely by machinery. It is much on the same lines as the ordinary screw wrenches, having a slot cut down one side of the body, in which a



THE YANKEE WRENCH.

slide, holding the upper jaw, works. Its chief merit is that, being well and accurately made, and properly hardened, it does not slip, although it is not quite long enough to obtain great power.

Bown's Patent Wrench consists of a hollow shaft working for about two turns of the thread upon a short screw immediately below an upright "jaw." Upon this slides at right angles an angular second jaw, which is kept in its place by the shaft. In order to adjust it, the shaft is loosened as required, and the jaw-piece is enabled to work into position on a taper slide, being held in its place by once more re-tightening the shaft.

Brazier's Direct Spoke Tightener is a neat little instrument providing at once the handiest and most efficient means by which these bug-bears to beginners may be "laid hold of" and adjusted. It consists of a solid metal block, in shape resembling the half of a hollow square, with the outer edges rounded off, and a corrugated groove at the bottom angle of its inner surface. Through the back of the tool a slot is cut, by which a small wedge-shaped slide is secured, and the top is drilled and tapped; a thumbscrew working in the worm thus made forces the slide down upon the spoke—which is placed in the groove—and grips it fast, when it may be easily turned and adjusted.

The next all-important article to the bicyclist is the **Oil-can**. This little article has very few variations. That most useful and in general use is the "Goodenough," and imitations of the same. It is made of tin, and is about the size of a large watch, thus fitting easily into the pocket; it is fitted with a brass nozzle $1\frac{1}{2}$ -in. long, having a cap to screw on the end for the purpose of keeping the oil from coming out, and is also provided with a leather washer between it and the can itself for the same purpose. Both sides spring when pressed, by which means the oil is injected into the bearings. These are the best in use; some of superior quality are made entirely of brass, whilst the chief alteration in other kinds is that of having short thick spouts, and with some only one side is made to spring.

Bown's Pneumatic Oil-can is provided with valves in the interior, preventing the escape of the oil until pressed; this admits of the entire abolition of the usual screw-cap on the end of the nozzle, which is apt to get lost, to fall down in the dirt when using, or even occasionally to work loose and allow the oleaginous contents of the can to emerge from its recesses and spread themselves over the interior of the valise or pocket.

The **Salisbury Reservoir** is an invaluable companion on a long tour, on the Continent especially, as it holds as much as half a dozen ordinary oilers, and fits nicely in the saddle valise. It is in shape very similar to an ordinary phial, being about 4-in. long and 1-in. in diameter, and fitted with a brass screw cap and leather washer.

LUBRICATORS, being closely connected with the oilcan, come next. Their use is to keep a supply of oil in juxtaposition to the bearings, so that on a long journey they may not require frequent oiling. Most machines have holes drilled through to the bearings for the application of oil, and some makers insert a screw or plug therein to keep out the dust. It is into these holes the lubricators are screwed. They are of several kinds, the neatest being

Cup Lubricators, which are quite artistically designed, being a small brass cup with a screw-cap, the whole in shape after the pattern of a low vase.

Pillar Lubricators are not nearly so neat or handsome, being simply short cylinders of brass with screw-caps. These both have a simple hole drilled through them downwards at the bottom, but

Spring-top Lubricators have their covers hinged to them, and pressed down tightly by small and neatly fitted springs; they are A1, as with the ordinary ones it is rather a nuisance unscrewing and again putting on the tops, which operations, besides making the fingers generally dirty, occupy some little time, and the tops are liable to get lost.

Somewhat similar are

Bown's Spring-cap Lubricators, in which a hollow cap fits over the top of a pillar lubricator, being attached to the same by a coiled wire spring in the interior. In oiling up, the cap is lifted, the oil put in, and the cap allowed to resume its original position.

Even better still than these are

Valve Lubricators. They consist of ordinary lubricators with solid tops, which latter have small holes in their centres, large enough to admit the nozzle of the oil-can. Inside, short coiled springs force plugs upwards into the holes above, and so keep out the dust. To fill them, all that has to be done is to press down the plugs with the top of the oiler and inject the oil into them.

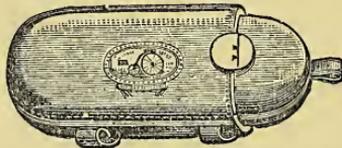
Another necessary is

The **Saddie Valise** or Pouch, in which the wrench, oil-can, and sundry odds and ends are carried. Of course these articles *can* be

stowed away in the pockets ; but a pouch is so convenient and cheap that few do without it, as pockets stuffed full are extremely in the way, besides being untidy ; it is also not over pleasant for the top of the oilcan to come off—as it does sometimes—and pour out its oleaginous contents into one's pocket. Valises are of several kinds ; the best are made of good leather, with 2-in. side and bottom pieces, so as to enable them to hold a decent amount ; they are fastened by a couple of straps and buckles to two staples fixed behind the saddle, so that they can be easily taken off if required. In some saddles—cheap ones usually—the saddle pouch is sewn on the saddle itself, and consists simply of two flat pieces of leather, sewn together at the edges and fitted with flap cover ; these are, however, far too small, as it is with much difficulty the oilcan and spanner can be stowed away, let alone other things.

The most useful of the common kinds has wide side pieces, a pocket inside for the oilcan, and a spring fastening in place of the usual button and strap ; but the best saddle valise of all is

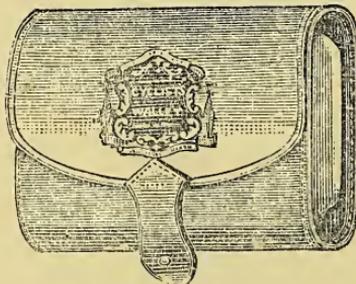
Lamplugh and Brown's Handy Bag, a very neat construction of stiff leather, much resembling an enlarged cigar case, and provided



LAMPLUGH AND BROWN'S HANDY BAG.

with separate receptacles for spanner and oilcan, strapped sideways behind the saddle. It opens at one end, one case fitting inside the other, and the whole made secure with a spring fastening.

The '**Cyclists' Wallet**, by the same makers, is a very neat and useful appendage. It is somewhat larger than the usual run of saddle bags, and is made with stout stamped ends, so that it does



THE 'CYCLIST'S' WALLET.

not collapse. A pocket inside holds the oilcan, and it is made of only good leather, which is an extra recommendation.

The **Barrel Valise** is another very useful variety. It consists of stout leather with two round ends, thus taking the shape of a barrel or cylinder, a flap being provided on the top for the purpose of packing ; this is secured by a spring cap, and the whole is fastened to the saddle by straps.

Bicyclists who do much touring frequently find it necessary to carry much more than can be stowed away in the small article above described, and in order to meet their wants several expedients have been adopted, and various styles of bag introduced. These are as follows :—

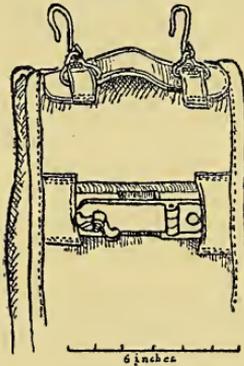
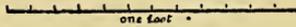
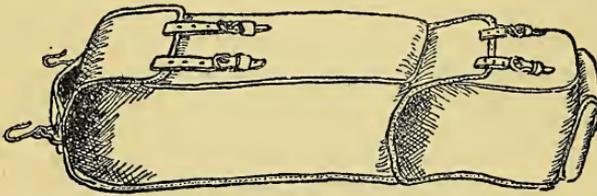
The **Multum-in-Parvo**. This useful bag, the invention of M. D. Rücker, Esq., of the London B.C., has now a great name and may fairly take place as one of the best in use. It is made in two sizes (No. 1, 12-in. × 7-in. × 4-in., and No. 2, 12-in, 6-in. × 4-in.), and is constructed of waterproof canvas with two straps below, by which it is fastened to the backbone and spring, and a pair of straps at the upper end, which buckle to the staples beneath the saddle. As, of course, a saddle pouch cannot be used as well, and it is scarcely advisable to pack the oiler, &c., inside with a change of clothes, both on account of the danger of spoiling those articles and because they are in constant requisition, a separate receptacle is therefore provided for them at the bottom. To “get inside,” a strap is provided, fitted with buckle. It will contain a surprising quantity of clothes when carefully packed in ; it fits on the backbone and spring-tail just behind the saddle. The points argued against it are, that it is in the way in mounting and dismounting, and places the weight behind the rider. Those for it, that it is neat, handy, and compact, and that it can be taken off bodily on stopping at an hotel. An accessory to this very useful appendage is

The **M.I.P. Holdfast**, a solid leather clip or clamp, which takes the place of the ordinary two upper straps, fitting on the backbone just below the spring. It is secured from loosening by a brass thumbscrew and bolt, and serves well to prevent the bag slipping about, keeping it firm to the machine and taking much of the weight off the top straps.

Lamplugh & Brown's Serviceable Multum is neither more nor less than a multum-in-parvo of the pattern described and fitted with the M.I.P. Holdfast. Its speciality lies, not in the pattern, but in the quality of manufacture, all the straps being hand-sewn and backed, thus almost absolutely preventing the danger and annoyance caused with the ordinary Multums by the straps coming off. The back, too, is protected by a piece of real “butt” leather from wear upon the backbone, and a handle is also provided at its upper end, wherewith to carry it as a bag when off the machine.

The **Saturday-to-Monday Bag** is simply a miniature of the M.I.P., and is intended for short tours, being especially suited to meet the wants of those who, being in business all the week, set off on Saturday from town, visiting friends at a distance, and returning to business on Monday morning.

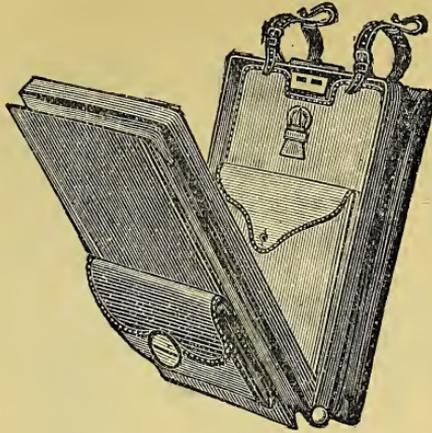
The **Cambridge Bag**, designed by A. P. Trotter, Esq., late Captain of the C.U.B.C., is in reality a combination of the M.I.P. and Saturday-to-Monday Bag, and may be described as a Saturday-to-Monday Bag sewn on to the lower end of a Multum, with the usual double pocket for tools attached below all. Instead of straps at the top it is provided with stout hooks, and one of the chief features is an attachment to the spring, the supporting wooden cross-bar at the back being cut away in the middle and a hinged brass bar fitted to fall across it and enclose the spring, the loose end being held fast by



THE CAMBRIDGE BAG.

means of a thumb-screw and bolt. This takes all^{the} the strain from the hooks, and keeps the bag beautifully steady and firm. The idea of the double bag is of course to provide more especially for long and Continental tours, for which it is admirably suited.

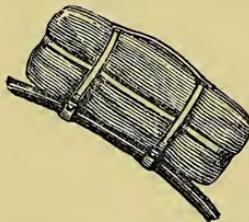
The **Clytie** is the latest introduction in the bag line, and bids fair to prove no small success. In outward shape and size it resembles the M.I.P., but instead of opening in the usual manner, it is constructed as will be seen by reference to the annexed



CLYTIE TOURIST'S BAG.

illustration, somewhat on the principle of a portmanteau, being hinged at the lower end and opening from top to bottom, and is well provided with pockets. It recommends itself for convenience of packing and getting at any article desired, as well as for its being provided with a lock and key, and made of black leather, which is easily washed and kept clean.

Spurrier's Bicycle and Hand Bag is likewise this season's novelty. The bag itself consists of a set of straps, and a large sheet of waterproof cloth, in which the things taken are wrapped and strapped together into almost any sized parcel desired, the straps being made with a handle coming at the top, by which the bundle may be carried. The chief novelty about the affair is the manner of

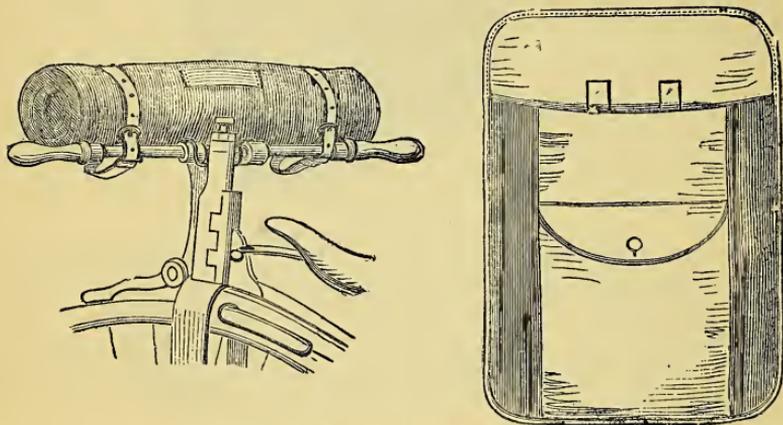


SPURRIER'S BICYCLE AND HAND BAG.

attaching to the machine, and for this purpose two clips are fastened a foot apart upon the backbone, these being provided with flat broad hooks. A cross of flat steel is secured to the bottom of the bundle by passing the straps through suitable slots therein, and this cross is provided with corresponding sockets into which the hooks fit. The luggage therefore may be attached to or detached from the bicycle in a second, by merely slipping it off the hooks, where I may mention it is kept firm by the curve of the backbone and the spring of the supporting cross.

For small quantities of luggage the

Handle Bag is very neat; it is circular, about 4-in. in diameter, and from 8-in. to 12-in. in length. It is made of solid leather, and straps to the handle-bar in front; it is opened by a flap on the circumference. It is neat and light, and well suited for small quantities of luggage, but it throws the weight a little on the wrong side, and is in the way of the rider's legs. This last is the most serious objection.



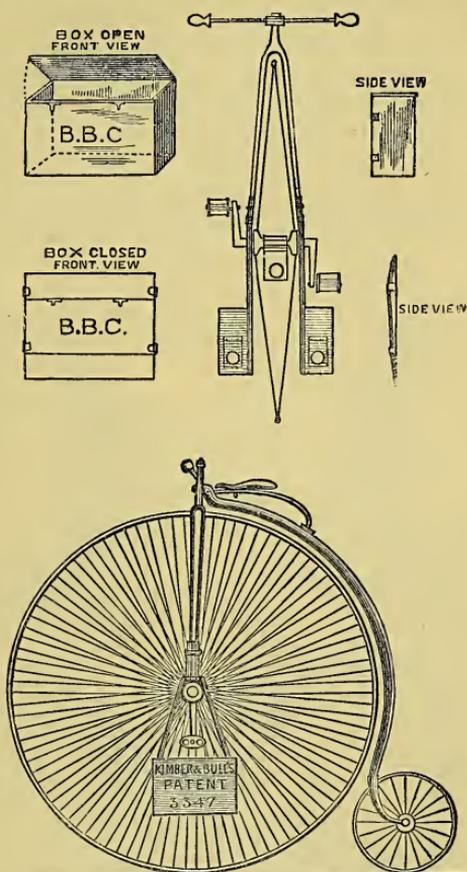
TOURIST BAG.

Clare's Tourist Bag is extremely simple in construction, consisting of a flat bag of a light waterproof material, somewhat resembling American cloth, 23-in. \times 18-in., one side of which is provided with a large calico pocket on the outside, with flap of the same material. When flatly packed, the bag with its contents is rolled up and placed upon a light wire frame, attached to the locknut of the steering gear, the whole being kept in place above the handle-bar and frame by a couple of straps. By this means it is kept up away from the legs of the rider, although it will not allow of "legs over handles." It is very light, weighing but a few ounces, and is extremely handy as well as cheap.

Goy's Luggage Carrier consists of an oblong skeleton plate fitting on the head of the machine immediately above the handles, being secured by a clamp placed beneath the set-screw of the steering-gear, which is screwed down well upon it. On the top of this the luggage is strapped. It places the weight neither in front nor behind, but over the centre of the wheel, and is very little in the way unless the baggage is bulky; besides which it is easily and quickly removed for the purpose of packing.

The **Cassie Luggage Boxes** are very curious affairs, and are carried in a totally different manner to any other luggage carrier made. They consist of two light block tin boxes, some 15-in. \times 12-in. \times

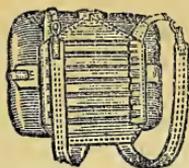
8-in., attached to light supporting rods which, with the boxes, form triangles. The apex of each of these triangles consists of a double clip with bolts and screws, by which means the boxes are attached to the lower extremities of the front forks, being slung one upon each side at such a distance as to be quite clear of the pedals. The boxes themselves are made to collapse when not in use, like luncheon



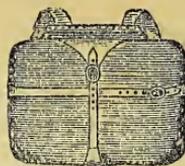
THE CASSIE LUGGAGE BOXES.

boxes. They cannot be in a better position as far as weight carrying goes, and are well out of the way. They will hold a good deal, and are provided with hooks in front, to which lamps may be attached for night riding.

Spurrier's Bicyclists' Takeabout, or Universal Knapsack can hold its own against most other contrivances for carrying luggage. It is very simple, consisting of a sheet of thin grey waterproof cloth, 2ft. square; in this the things must be folded, and the bundle made small or large, according to circumstances. When this is



SPURRIER'S TAKEABOUT.

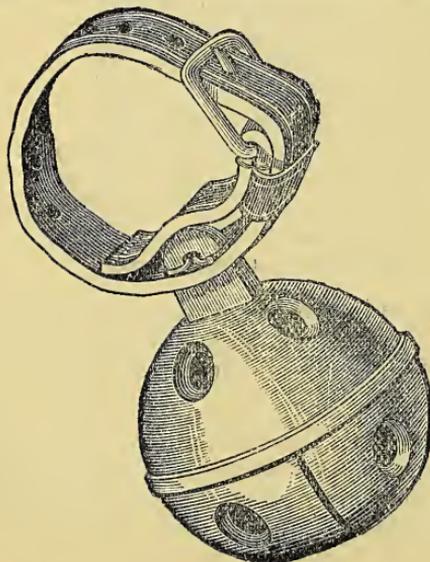


done, a light "back," provided with four straps, is affixed to the bundle, and the whole buckled into a neat knapsack, having web shoulder straps, whilst the "back" is provided with cross pieces of cane, which allow a passage for the air between the knapsack and the rider's back, and at the same time keep the whole shapely and stiff. It only weighs 10½ oz., whilst the price is moderate. I find in actual use one quite forgets its presence during the greater part of the ride, and there is none of that tiresome and dirty unstrapping needful to get the luggage detached from the machine before a rest can be taken.

In order to give pedestrians and others timely notice of the approach of the silent steed, and so prevent accidents, signals of various kinds are used. These consist of bells, whistles, and bugles, and, for night riding, lamps.

Taking **BELLS** first, we find a numerous variety in use, of variable merit. They may be divided into two great classes, viz., continuous and silenceable, and as the bye-laws of the Local Government Board now require it, one of these must be used by all bicyclists. Happily no especial pattern is specified, so one is enabled to take one's choice from the very large selection in the market.

The **Spherical Bell** in general use is a small sphere, having a number of slits across its lower half, and enclosing an iron ball which

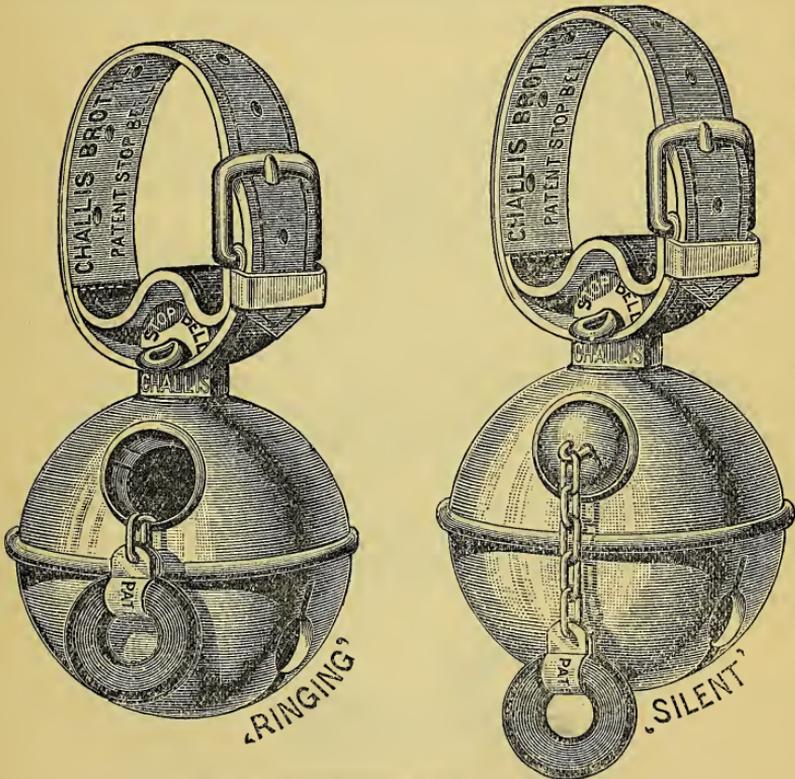


THE SPHERICAL BELL.

rattles on being shaken. It is the same pattern as those used on sleighs, dog collars, &c. The loudest are those with a single division, every cross-cut decreasing the strength of the sound, but rendering it less harsh. On a long journey, its continued tinkling is extremely disagreeable and trying to the nerves. Some affix it to the step, others to the centre of the wheel; but the best place is on the handle or in the hand, as it can then be quickly silenced or put in the pocket.

Challis Bros. Hard White Metal Bells are identical with the ordinary ones in construction, but are made of a hard white metal which looks like plated work, and emits a more mellow sound than the bronze. The makers also supply a very neat strap at 3d. for affixing the bell to the handle bar.

Challis Bros. White Metal Stop Bell is of the same shape, but one of the holes in the upper half of the sphere is fitted with a kind of socket, into which the weight tightly and accurately fits.



CHALLIS BROS. WHITE METAL STOP BELL.

The weight itself is provided with a cord and rubber spring, by which it is pulled into quietude and kept there as shown in Fig. 1. A touch of the finger then forces the ball again into the interior of

the sphere, where it sounds forth its melodious notes *ad libitum*. The latest introduction is a 2-in. bell which fully answers all the requirements of the bye-laws, and is a most useful instrument.

Gongs are used similar to those for shop doors, tables, electric bells, etc. These are screwed into the front of the head piece, or fastened on the handles, and fitted with a loose spring hammer, by pressing which, and again releasing it, the bell is rung—of course at the will of the rider only. They are neat, and give a good sound.



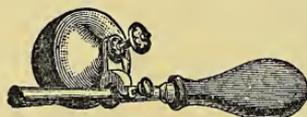
THE BUTTERFLY ALARM.

Matthews' Butterfly Alarm is of this class, very neat, effective and simple, as well as cheap; its speciality consists in the hammer being placed upon the top of a pyramidal coil of wire, which enables it to sound the alarm whenever pressed down, and released by the finger or thumb.

Harrison's Single Note Alarm is very much the same, the hammer being, however, a small heavy-headed lever, affixed to a stud at the side of the bell, and fitted with a small steel spring, which forces it into contact with the gong when pressed and released.

The **Imperial Lever Alarm** is likewise a single note gong. It has two especial features, one being that the hammer is internal and worked by means of a lever handle, which pushes it back to a certain distance, and then releasing it allows it to rebound against the bell. Its other and best feature is that of fitting the gong upon a square-headed staff instead of round, as is usually the case; this arrangement preventing the shaking to pieces, which is such a common, and indeed the only great fault with all gongs.

Stormonts' Alarm is a neat and effective contrivance of two gongs, placed opposite one another, on the same vertical staff. It is worked by pressing a button at the top, which in its descent works two catches and spring hammers, concealed in the interior in such a manner that one press on the button produces no less than six

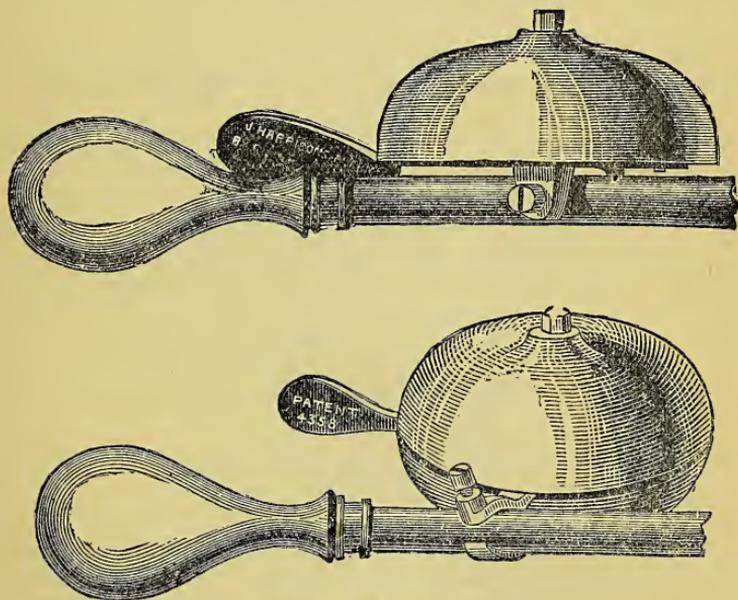


STORMONTS' ALARM.

different soundings. Whilst perfectly silent when not required, it can in a moment at will be caused to make a terrific din, even when almost standing still; in such case, for instance, as waiting behind

a cart in a narrow street for it to make room to pass. Its only objection is that it is continually coming to pieces, but a little careful attention now and then, and adjustment with the spanner, will put all to rights.

Harrison's Alarum is one of the best in use, and is somewhat akin to the last. It consists of a single or double gong, provided with a semi-circular rack inside, which works a hammer. It screws on the handle, and by pressing a small finger-plate the rack is caused to move its whole length, thus producing about a dozen sharp and rapid beats of the hammer upon the gong. It is also made to strike upon its return to position, where it is forced by means of a spring, thus the rider can produce some 20 or more distinct peals by a single pressure of the finger. The objection to this is, that the "whirr" made by the working of the ratchet dulls and confuses the sound of the gong. It is made in two forms, "Double" and "Single," two gongs arranged face to face, as in Stormonts', being used in the former.

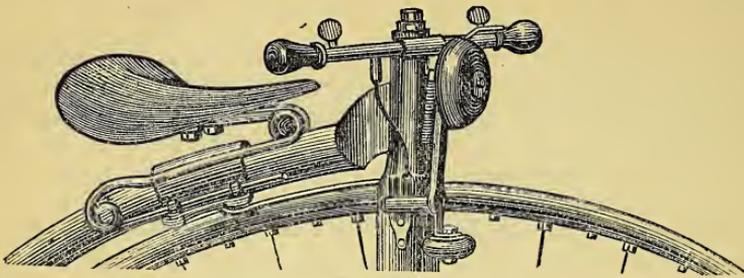


HARRISON'S ALARUMS.

The **Clock Alarum** is fixed upon a clockwork arrangement which, when wound up, will work the hammer at a furious rate for two or three minutes. It is put in action by pressing a button or lever, and continues ringing as long as the pressure is maintained.

The **Arab Alarum** is the most powerful yet out, and is made in three forms. It is of a gong shape, very large, and is struck by a hammer, which is actuated by pressing a button or key, thus forcing

a small connection against the spokes, each of which in passing produces a distinct sound. About 1,500 strokes per minute is the average, and the sound can be heard at a considerable distance.

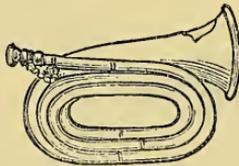


ARAB ALARUM.

Grouts' Alarum is likewise applied to the tyre of the front wheel. In front of the head a straight rod depends, on which slides a gong with revolving hammer; by lowering this upon the wheel a goodly sound is produced. It is neat and compact.

Whistles, Bugles, and Horns, need be scarcely more than mentioned, any good whistle with a clear, loud note, being suitable.

Bugles and Horns are of course of various sizes, patterns, tones, and prices, and are sold at most musical instrument depôts. During the past two seasons the matter of providing specially for the requirements of bicyclists in this respect has been gone into with a considerable amount of energy by Messrs. Keat and Sons, Kohler and Sons, and a few others. The former have given us the "Buglet" and the



THE BUGLET.

"Bicycle Bugle"—the first of which is illustrated above—in both of which the bell is made oval instead of round, in order to fit close to the side of the rider without inconvenience. The latter firm have also given the 'cycling world a very complete instrument in "The" Bugle at 25s., which is a miniature of the Army Regulation Bugle; it is complete with cord and tassel, and all the Bugle calls may be blown upon it. Amongst Horns, the best is a miniature of the ordinary post horn, and gives a good clear note. They are mostly used on Club runs, as signals for mounting and dismounting, slackening speed, &c. An objection to their universal use is that bicyclists using them are often too fond of "blowing their own trumpets," and as they require some amount of skill to blow well,

their sound in the hands of inexperienced performers is far from melodious, causing derision rather than respect. On a journey their weight is against them. In their favour it may be said that they prove more effective than any other kind of signal, as people, who would take no notice of a whistle or bell, will very quickly look about them at the sound of a bugle.

LAMPS are extremely useful to those who ride at night, besides which they are, as well as bells, now made compulsory in most districts. They are of numerous shapes and sizes, qualities and prices.

In order to insure a good light, they should be so constructed as not to be blown out by the wind, and also to be proof against sudden jerks caused by the unevenness of the road; they should also give a clear flame, without smoke, and ought to throw the light well forward and over as large a space as possible, besides being neat in appearance and compact in size. To describe all the slight differences in detail between most of them would be useless; the best only, therefore, I will mention. These are

The **Albion Lamp**. It is cheap and good, throws a good light, and is fitted with a spring handle to obviate its being put out by vibration. It is also constructed so as not to be blown out when going fast. The price is 5s. 6d.

The **Salsbury Noiseless Lamp** is very similar to the above in every respect, its chief point being in the fixing of the handle, which consists of a leather strap passing through flattened metallic tubes, by which means the liability of being shaken out of vibration is done away with, and all rattle avoided. It is made in two qualities, prices 9s. and 7s. 6d. respectively, the difference in price being due to the quality of the plate-glass front.

Dearlove's Head Lamp is in general principle much the same as the others, but it is fitted with a spring handle, composed of two bands of indiarubber, held together with tin bands, forming an antidote to vibration. He also makes another lamp, known as the No. 500, which is circular in shape, and is provided with a tin shade to cast light well on the ground. All are fastened to the machine by being hung on an iron hook, secured by the lock-nut of the steering gear, which is tightened down upon it. The advantage of this class of lamp is that it is very handy to light and clean, and quickly detached for either of these purposes. Also, being high up on the fore part of the machine, they are seen with clearness by pedestrians and others, and they throw the light well ahead. They have their objections in that in case of a fall they are almost sure to get smashed, that the vibration is such that in most patterns the act of riding over rough ground at a high rate of speed will either extin-

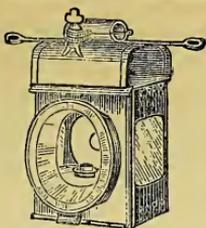
guish them or reduce the flame to a mere speck. They are also sometimes in the way, and besides send forth a not too pleasant odour if the rider leans much over the handles. To obviate these defects,

Hub Lamps have been introduced. In interior construction they are in general similar to those above, but, instead of being hung by the handle from the top of the steering gear, they are suspended in the interior of the wheel. The best way of doing this is by fixing them to a leather-lined split cylinder, the two halves of which are hinged together on one side, and fastened securely on the other when fixed to the axle of the driving-wheel. Some are suspended by padded hooks, but this method is one to be deprecated on account of their liability to swing off or wear through, when of course by dropping into the wheel they cause a sudden, unexpected, and often dangerous fall. Another plan is to fit the lamp to the axle by a hinged top, which is much better than hooks, but not so good as the cylinder, as the heat will sometimes cause the top to come unsoldered and thus cause a fall; and on that account all lamps should be very carefully made, with a view to the prevention of such an untoward occurrence. Objections to hub lamps in general are that they usually swing to and fro on rough roads, to such an extent as to try the eyes exceedingly in following the continually changing light, whilst it also prevents obstacles being easily seen. The shadow cast by the rim is another objection, though a slight one, and the difficulty of fitting and lighting may also be urged against them. In their favour it may be said that they are at the same time out of the way and safe from damage in the event of a fall; that they are not so unsightly as head lamps, and show a strong light immediately in front of the wheel. Hub lamps seem now to be those in most favour, and, as usual with everything else connected with the bicycle, have many varieties, the chief of which are :—

The **Albion Hub Lamp**, which is made with cylindrical hinged cap at the top, securely rivetted to the body of the lamp itself. Adjustable guide rods to keep the lamp in the centre of the wheel, powerful reflector, and red side lights. It is very well and neatly made, and throws a good light.

Dearlove's Hub Lamp has red and green side lights, and a red light at the back as well; it is fitted in a somewhat similar manner to the others, the top opening with a hinge and fastening round the axle, but it has an additional feature possessed by none of the others, in the shape of a spring placed beneath the axle, whereby much of the vibration is prevented.

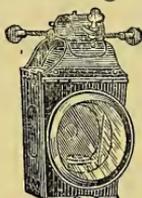
The "**Indestructible**" **Hub Lamp**, manufactured by Messrs. Platts and Co., and sold by a large number of dealers at 4s. 6d., is one of the best of the cheap lamps, being made, as far as the body



THE "INDESTRUCTIBLE."

goes, of one piece of tin, blocked into shape. It is fastened to the hub by a hinged flat cylinder, leather lined, has guide rods to keep it in the middle, red and green side lights, and a light at the back. The wick is small, and the oilchamber provided with a roughening whereon to strike the match.

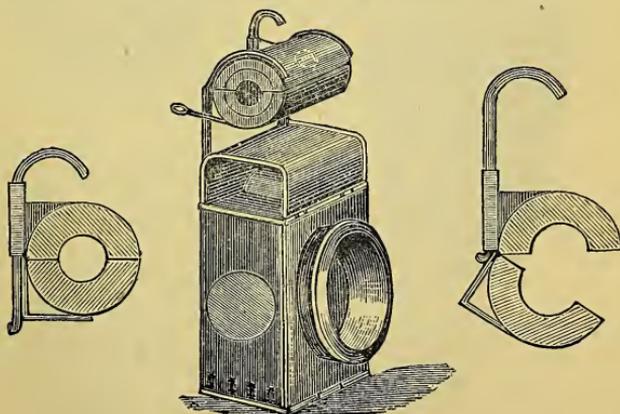
The "Fly-by-Night," by the same makers, has the same top fastening, but is a much superior lamp. It is long in body and tapering in shape downwards, and the top tapering as well, is especially adapted for narrow hubs, the guides on each side being adjustable. All parts are rivetted together, and it has coloured side



THE "FLY-BY-NIGHT."

and back lights. The wick is single, but broad, and gives a good light, and at its price (7s. 6d.) is one to be recommended. The front opens upwards, and is closed by a single spring catch.

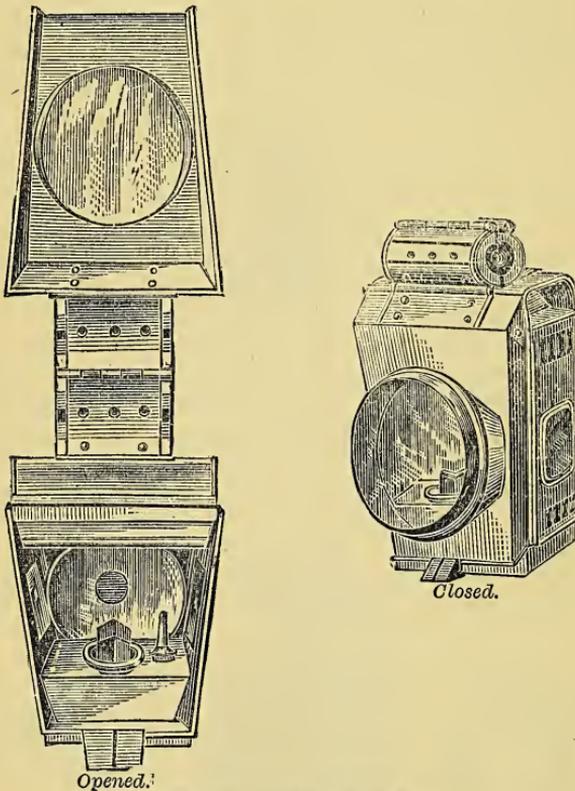
The **Salsbury Hub Lamp** is fastened to the axle with a hinged cylinder, the sides of which are secured in a very novel and ingenious manner; both halves of the cylinder are provided with a



SALSBURY HUB LAMP.

slide or socket at their backs, in which a stout brass flat wire works, being pulled up to open the cylinder and pushed down to close it, when it is impossible for it to open by any means. This lamp is also attached to the fastening in an excellent manner, for two stout rods run down behind, right to the bottom of the lamp, where they bend under for the support of the lamp, which is secured firmly to them throughout their whole length. I have not yet tried it, but report speaks very favourably of it.

The large "King-of-the-Road" is really a formidable-looking affair, being very long, though narrow, and tapering to the shape of the wheel from the top to the bottom. The oilchamber is large, holding sufficient oil for five or six hours' use, and the wick is double, the two wicks being set at an angle to each other. Red and green side lights are used, as well as a red one at the back. The reflector

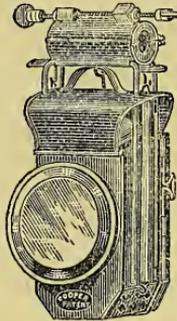


THE "KING-OF-THE-ROAD."

is very large and powerful, and made detachable for cleaning purposes. The peculiarity in construction of this lamp is that it hinges at the top of the cylindrical barrel fastening, being divided throughout its entire length; it is placed on the axle, and securely

held by a double spring catch at the bottom. Every part of this lamp has evidently been thought over and well studied by the makers, for as a piece of workmanship it is not to be excelled, and being entirely rivetted throughout, it is impossible for it to come to pieces, whilst its peculiar construction allows it, although so large, to be easily placed within a many-spoked wheel.

Cooper's Inextinguishable Hub Lamp is likewise suspended from the bottom, and, indeed, was the first one to be so made. As will be seen by the illustration, it is secured to the axle with a cylindrical fastening, this being kept from opening by two wire bolts, which turn down and cross and interlock each other. From this



COOPER'S "INEXTINGUISHABLE" HUB LAMP.

depend four straight rods, two on each side, running in slides on the sides of the lamp, and kept from slipping out by the catches at their ends. These serve as guides, keeping the lamp in a vertical position. It is suspended and fastened to the cylinder by two spiral springs held in cylinders on each side the lamp, to the bottom of which they are fastened. This method allows the lamp to be free from the vibration caused by an uneven road, the lamp remaining stationary whilst the wheel jumps up and down. I have used one of these, and find it—true to its name—"inextinguishable," being unaffected alike by road or wind. It is made in two patterns, one having a single, the other a double wick; the latter being a much larger lamp has the springs and guides placed within the body of the lamp.

The **Eclipse Lamp** of Messrs. Rea, Neale and Bourne, is constructed much upon the same principle, though with some improvements. The lamp in the first place may be described as being thoroughly well made throughout, all parts being copper rivetted and clamped, with a deep and large oil reservoir. The body of the lamp is suspended from the axle cylinder by two strong spiral springs, working in polished brass cylinders in the fore part of the sides of the lamp, these cylinders being lined with rubber and otherwise so constructed as to make the lamp perfectly silent in action.



THE ECLIPSE HUB LAMP.

The **Queen of Lamps**, like the King of the Road, has double wicks to ensure a good light. It is likewise constructed throughout with care. As will be seen from the illustrations, it is of neat shape, having circular base with four legs upon which to rest when out of the wheel, and oval glass to front, with plate glass side lights. The front opens downwards to pass between the spokes, and the suspending cylinder is secured by a spring catch, the two halves being forced together by a "mouse trap spring." The chief feature of the lamp, however, is the suspension of the body from the cylindrical top by means of four springs, which are best seen by reference to the accompanying illustrations.



THE QUEEN OF LAMPS.

The "Won't Go Out" Lamp is another by the same firm. Its chief especial feature is the mode of fastening to the hub. To effect this, the usual barrel fastening with side leathers is used, but attached in a different way, being hinged at the top and sprung together by powerful springs. To detach it, all that has to be done is to press the two wire loops at the top together. The body of the lamp is suspended from the barrel by two coiled wire springs, as shown in the illustration, and the door opens sideways at the back.



THE "WON'T GO OUT" LAMP.

In point of manufacture it is very well made, and gives a good light. A very useful attachment to all lamps, only just introduced, is

Salsbury's Patent Wick Holder, consisting of a long staple of pin wire with pointed ends. This passes through the wick and also through holes in the wick channel, and its purpose is to prevent the vibration causing the wick to slip down and disappear in the oilchamber.

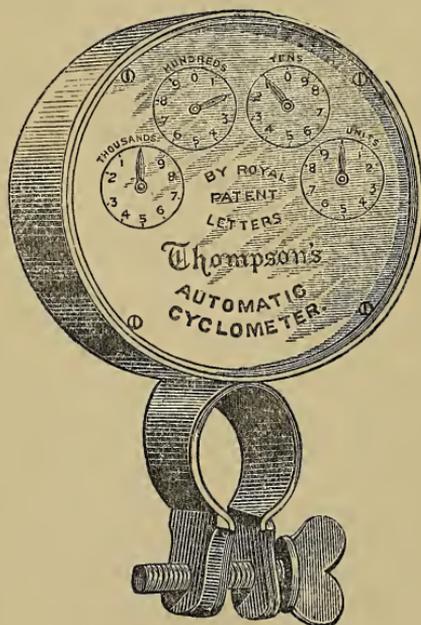
I will now describe the varieties of another class of instrument, which may be reckoned as luxuries rather than necessities. I refer to

DISTANCE REGISTERS, of which there are several in the market. They are, of course, in connection with the driving wheel, and are very useful to those who desire to know the exact distances travelled by them. Some give the distance in number of revolutions, in which case they are suitable for any sized wheel, requiring only a little calculation to find the exact distance run. Others again record the distance in miles and furlongs, when, of course, the length of the journey can be seen at once; these require to be specially made to size of wheel.

Wilkinson's New Distanceometer is a neat circular instrument fixed on the top of the front fork, down the side of which a slight rod is carried to about 2-in. above the bearings, where it works in sockets on a metal clip secured to the fork. This lower end is fitted with five vertical pins in a cage, whilst the upper end forms

the centre of a cog-wheel fitting into the instrument. To one of the spokes a stout pin is secured horizontally, so that at every revolution of the wheel this turns one of the before-mentioned pins, by which means motion is conveyed, through the medium of the rod, to the cog-wheel above, which sets in motion a train of wheels connected with dial plates, by which the distance is indicated. It gives distance in miles and furlongs, and has the advantage of being always in sight, so that the rider has not to dismount to see the distance he has traversed. It also has an advantage in the rider being able to take off the glass top and "set the hands" without injury to the instrument, and is besides the cheapest yet produced, and can be used with a hublamp.

Thompson's Cyclometer, of which an illustration is given, shows either revolutions, or miles and yards, as preferred, and is so constructed that a train of wheels, contained in a case, is set in motion by a weight, which remains stationary whilst the case and mechanism revolve, being attached to the axle of the driving-wheel inside, by means of a flexible steel band and thumb-screw. It is a neat and strong instrument, impervious to dust or wet, well out of the way, and tells the distance accurately.

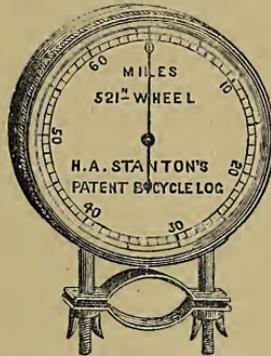


THOMPSON'S CYCLOMETER.

Johnson's Road Measure is another neat little instrument. It consists, as before, of a train of wheels, with dial plates showing either distance or revolutions; these are set in motion by a ball, which runs in a groove round the instrument; this ball remains

stationary whilst the body of the instrument is carried round by the wheel. At one point in the groove, four cross arms are so arranged that one of them is always across the channel, so that the ball coming in contact with it moves it forward, drawing the next one after it to undergo the same operation; by this means motion is imparted to the leading wheel, and the whole set in action. It is secured to the interior of the driving-wheel by means of two straps, one of which, passing round the instrument itself, also encircles the axle, whilst the other is strapped round two of the spokes. It is extremely neat, out of the way, well protected, and a good indicator.

Stanton's Bicycle Log outwardly much resembles Thompson's, with the exception of having but one hand in place of four. It is fixed to the axle in the interior of the driving-wheel, and the clips for that purpose are so constructed as to fit any diameter of axle. The single face shows the distance in miles, the motive power being obtained by means of a falling plate and arms, so constructed that it is impossible for it to repeat or fail to act, by any jerk of the



STANTON'S BICYCLE LOG.

machine. The hand can be turned to zero at starting, so that, at the end of a journey, the distance run can be told at a glance; this is an advantage, as all other registers, with the exception of Wilkinson's, require a reading to be taken before starting and another on stopping, and the difference of the two found for the distance run.

The **Miles Distance Recorder** is another instrument for the same purpose; it is secured to the axle of the driving wheel in such a manner that the case revolves round a fixed projection, or catch, and so sets the works in motion. It is neat, handy, and accurate.

Very similar to this is

Carey's Cyclometer, which is long and neat, and suspended upon the axle by a hinged top. A five-cogged wheel is turned once at every revolution of the wheel, and thus imparts the required motion to the internal machinery.

Walker's Trocheameter is fixed to the hub by a thumb-screw and clamp, and has two dials, one showing miles and quarters, and the other marking at every 24 miles, the whole range of the instrument running up to 240 miles.

Another useful accessory to the bicycle is the

Stand, or Support, of which there are several varieties, all with the same object in view, viz.: The keeping of the machine in an upright position when not in use. The simplest way of all is, of course, to allow it to rest against a wall as nearly upright as possible. This plan is objected to on account of the liability of the handles to get scratched if the wall is rough, and should the latter be papered or smoothly plastered, more or less damage to it is inevitable unless a pad is made to fit the end of the handle, and care is exercised in using it in all cases.

A very simple way, and an excellent one into the bargain, is—where practicable—to suspend the machine by the handles, either to a beam or other suitable article. This may be done in two ways; either by passing a stout cord over the beam, and joining the ends at such a height that, when the loop so formed is passed over the handles, the front wheel hangs about an inch from the ground; or by means of a single cord secured to the ceiling, and having an oblong piece of wood or iron attached to the lower end: this has a slot cut half-way across its other extremity; and when passed round the handles, and the slot hitched to the cord above, will elevate the machine to any required height at a moment's notice. By suspending the machine, it is kept upright, and is also much more easily cleaned and attended to, the wheels revolving freely when required.

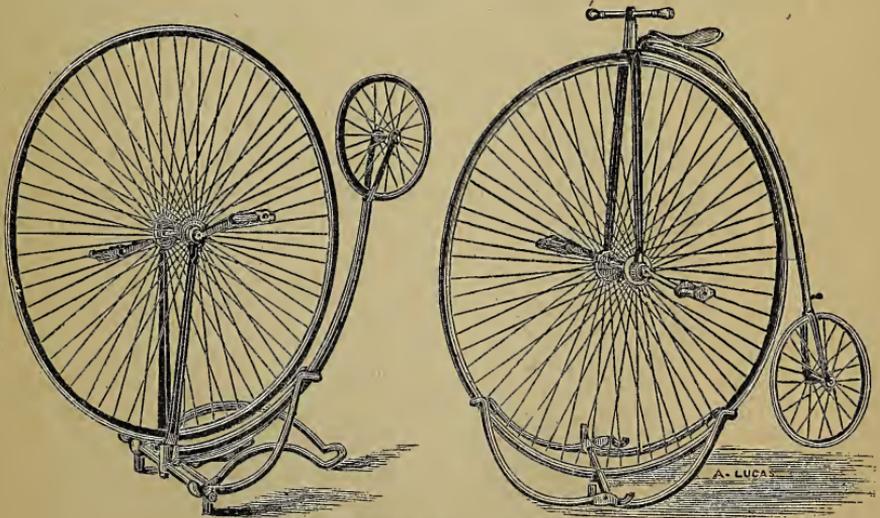
Where this is not practicable, another good way is to procure a couple of stout screw-eyes from the nearest ironmonger, and screw them into the floor some eighteen inches apart, and to each of these attach a stout cord, having a wood or metal clip as described above, at its other end. By passing these over the handles of the machine, and straining each cord tight by means of the clip, a bicycle can be kept most securely in an upright position. The whole apparatus does not cost a shilling, but it has this drawback, in some cases, that the bicycle "stall" cannot be shifted from one place to another without unscrewing the eyes, and making fresh holes in the floor. Very similar in principle to this is

Harrison's Bicycle Stand, consisting of an iron triangular frame, two corners of which are perforated with a hole, through which two stout cords are attached, each one fitted with the metal clip described above; the other corner is furnished with a raised semi-circular groove, the outer edges of which are about an inch apart, and a similar groove is affixed in the centre of the opposite

side. Into these grooves the front wheel fits, and the cords being passed over the handles on each side, and tightened, keep the machine safely upright.

This stand is also now provided with a couple of hook-like projections, so that, by turning the bicycle upside down, placing the handle-bar against these, and arranging the cords tightly around the ends of the back-wheel pin, the machine may be kept in an upright position on its back, thus allowing much greater facilities for cleaning the wheels and bearings. It is a neat apparatus, and is very useful where the machine cannot safely or conveniently be suspended, and also for supporting it in the open air, as at race meetings, &c.

Lee's Patent Folding Double-purpose Bicycle Stand consists of an iron frame, some 2ft. in length by 1ft. and 6in. at its ends respectively. This frame is provided with a pair of small crooked arms, one on each side, at about 3in. from its wider end, and to each of the end pieces is hinged a small light frame, one of which serves to raise the smaller end of the stand some 6in. from the ground, whilst the other slopes backwards in the opposite direction from the larger end, and is provided centrally at its extremity with a U shaped cavity; this, in conjunction with the main frame itself, supports the driving wheel of the bicycle in an upright position, and, of course, by that means, the whole machine. In order to clean the wheels and adjust the bearings, all that has to be done is to turn the machine upside down and place the handles against the hooked arms, when the saddle will rest against the top of the stand and the machine will be kept upright. When not in use, both the smaller frames fold up flat with the larger one out of the way.



WICKSTEED'S BICYCLE STAND.

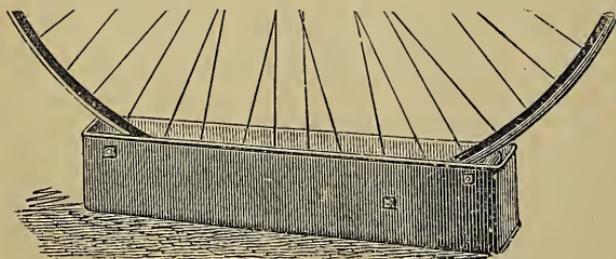
Wicksteed's Bicycle Stand is at the same time the latest and best out in this line, its charm consisting in its neatness, simplicity, and effectiveness combined. It consists of two light triangular frames of iron rod bent into arcs of a circle, and hinged together by their bases, the sides projecting slightly beyond their junction, forming hooks or loops, whilst the apex of each triangle is depressed into a U shape. When placed on the ground in ordinary position the two frames take the shape of an unstrung bow, and by wheeling the machine on to it, the wheel falls naturally into the two U shaped depressions, causing the frame to rise on each side and support the wheel, and with it, of course, the machine. By doubling the frames back upon each other the handles may be placed in the central hooks, whilst the backbone, just below the spring, rests in one of the U's, and the machine may be thus held very firmly for the better cleansing of spokes and bearings.

Porter's Simplex Stand consists of a metal base secured to the floor by two screws. This forms a pedestal, upon which a stout rod departs vertically, ending in a hook. In this latter the fork is held, and the machine thus kept upright.

Beach's Stand consists of an oblong frame with four uprights, two at each end. These uprights are placed in pairs opposite each other, two being long, and two short, whilst all are adjustable. They are provided with sockets or cups, which hold the machine up by the bearings, thus allowing either wheel to be "spun" for adjustment and cleaning purposes at will.

The **Coventry Machinists' Stand** consists of a brass pedestal screwed to the floor, and fitted with two screw-clips sliding up and down it. These clips hold the rim of the front wheel in two places, and keep the machine very firm, but it is a fixture to one place and cannot be moved without damage to the floor, whilst a forcible blow to the machine, when supported thus, would be very likely to cause serious injury to the wheel. It is, however, essentially a stand for exhibition purposes rather than for private use.

Besides these articles already described, there are several other specialities for bicycle riders' use, of which I may mention the following:—



STARLEY'S WHEEL WASHER.

Starley's Wheel Washer, consisting of an oblong box, provided with rollers running from side to side a few inches from each end, and also with two pairs of circular brushes fixed, face outwards, upon the inner sides of the box. To use it the wheel is placed in the box, resting upon the rollers, and the box filled with water. On turning the wheel the brushes rub against the sides of the rim, and so clean it in double quick time. It must be remembered that the rims get dirty quickest, and take as long as any portion to thoroughly clean, so that the saving in time is something considerable.

Phillips's Tyre Binders consist of a coil of steel wire, which, when placed around a loose tyre and the rim, hold the two together and keep the tyre from coming off. These little things are but 1d. each, and are very useful, in fact no bicyclist should be without them on a lengthy trip.

The **Toledo Powder** is a very fine white powder for cleaning the spokes and other bright parts of a bicycle. It very quickly removes rust, and assists somewhat in preventing its re-appearance.

Harrington's Enamel is the latest introduction in the non-corrosive way. It is a species of japan, being in much the same manner baked into the metal. Unlike japan, however, the enamel does not chip or crack, and should any portion be removed the surroundings do not peel as with japan, paint, and plating. It is done in any dark colours or combination of colours, and has a most effective appearance, whilst it is not only perfectly impervious to wet and rust, but is also acid proof even. I have had it in use some six or eight months, and have never before been "happy" about my machine after a rainy run, but now I can leave it for a month without attention, and it will be none the worse. I confidently anticipate that it will next season almost entirely supersede both paint and japan in the finish of bicycles.

Halliwell's 'Cyclist's Shoe is but just introduced ; it is made of very pliant leather, and can be bent about in any direction. In pattern it resembles the running shoe, being low and laced to the toe, where is found the peculiarity adapting it so well for bicyclists' use, for the toe is not only ventilated, but very slightly "puffed" so as to allow the toes plenty of room and to spare. They are most comfortable in use, and admirably fulfil the purpose for which they are intended. This brings us to the conclusion of the examination of parts, pieces, and etceteras, but improvements and alterations are being made almost daily, some of which will be found in the addenda at the end of the present volume, whilst those to come will receive full attention in my next.

HICKLING & Co.,

PATENTEES OF THE CELEBRATED
RACK-AND-PINION BRAKE, UNDETACHABLE TYRES, &c.,

MANUFACTURERS OF

THE "LONDON."

"One of the 'Gems of the Metropolis.'"—*The Indispensable*, 1880.

"The whole machine is finely finished, and a splendid Roadster, reliable, strong and easy running."—*The Bazaar*, December, 1880.

THE "TIMBERLAKE"

"Sound, safe, reliable and handsome."—*The Indispensable*, 1880.

"A thoroughly strong and trustworthy machine."—*Bicycles and Tricycles of the year 1879-80*.

THE "BERKSHIRE."

"A sound, strong, all-round machine."—*The Indispensable*, 1880.

"The cheap, yet trustworthy steed, is the 'Berkshire.'"—*Wheel World*, June, 1880.

'TELESCOPIC TRICYCLE'

"Really a capital machine."—*Cycling*, March, 1880.

SPECIALITY FOR THE SEASON 1881.

THE "PILOT" BICYCLE,

A high-class and highly finished machine, of a different pattern from the "London and Timberlake," Ball Bearings to both wheels, broad hollow front and back forks, bent handles, *new spring with forward play and rubber bearings*, &c., &c.

Descriptive Catalogues (containing testimonials) free on application.
More good Agents wanted in the Country and Abroad.

HICKLING & Co.,
MAIDENHEAD, BERKSHIRE.

30, QUEEN VICTORIA STREET,
1, MOOR LANE, FORE STREET,
SUN COURT, MILTON STREET,

} LONDON, E.C.

SECTION II.

FULL DESCRIPTION OF UPWARDS OF 400 MACHINES.

IN the following descriptions of the various makes, I have endeavoured to give a fair field and no favour. I have therefore, so that order of precedence should count as nothing, described those manufactured in each town separately, taking the towns in alphabetical order, and the machines in their turn, in a similar manner. On account of the large number of machines now in use, I have been obliged to economise space as much as possible, and have therefore entered into no elaborate descriptions of each machine, but have simply mentioned concisely the styles of its different component parts, with separate mention of specialities (*i.e.* those patented parts and other peculiarities which will be, with a few exceptions, found only on the machine in question), these having been minutely described and commented upon in the previous "Analysis of the Bicycle." The remarks I have made at the conclusion of each description are intended as a slight guide to the quality, &c., of the machines, and are made either in accordance with my own actual experience in riding, or from a careful inspection. Some few I have either not seen or would rather say nothing at all about, beyond the simple description, so have made no remarks whatever upon them. Unless otherwise mentioned, it will be understood that the cranks are keyed on, and that the rubbers are cemented to the rims; it must also be understood that the prices given are for machines with backbone, forks and rims painted, unless otherwise stated. When no mention is made of the bearings of the back wheel, they are of the same kind as those for the front wheel; a 50-in. wheel is taken as the standard size, and dimensions of parts given accordingly. The thickness of the spokes is given according to the Birmingham Wire Gauge, and uninitiated readers may be informed that the higher the number the smaller is the wire. I also give the width of the hub flanges apart, or "dish," as well as their diameter, and in the descriptions the first number refers to the width and the second to the diameter. The length of handle-bar is also given, as well as the height of same above the wheel, the first number referring to the length, the second to the height. The size of the backbone is taken just beneath the saddle. "G.M." stands for "Gunmetal." "D.L.S." signifies "Double-lever spoon," in reference to the brake. When two numbers are quoted for number of spokes and size of wire, the first of each refers to the front wheel, the latter to the back, the size of which wheel when fitted to a 50-in. machine I have also this year given. Another novel feature in the details this season is the length of steering centres, which I place next the height of the head. When nothing is said of the back forks they are solid, and in like manner the pedal pins, when not mentioned, must be taken to be plain. The gauge of the backbone is a guide to the thickness of the metal used, high numbers signifying thin, low numbers thick material.

BEDFORD. One maker, one machine.

BEDFORD.

G. WOOTTON, 4, Gwyn Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12, direct steel spokes. 16-in. back wheel. 6-in. x 4-in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ in. to 5-in. throw. Coned rubber pedals. Æolus ball bearings. Elliptical hollow forks. Open Stanley head, $3\frac{1}{2}$ -in. centres. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{1}{4}$ -in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Bell. Valise. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	10	0	0	52-in.	11	0	0
48-in.	10	5	0	54-in.	11	10	0
50-in.	10	10	0	56-in.	12	0	0

Extras. All bright, 30/-

Remarks. A strong average roadster. No specialities.

BIRMINGHAM. Bicycle making in Birmingham is still rapidly on the increase, several new firms having gone into the trade, including the Birmingham Small Arms Company. As a rule the brands of manufacture in Birmingham have been vastly improved during the past season, makers there now striving to produce good articles, instead of, as heretofore, mainly endeavouring to cut out their Wolverhampton neighbours in price, with a consequent depreciation in quality. There are now in all fifteen makers, turning out thirty patterns of machine, of all qualities from the highest to the lowest, the majority being well-finished neat machines, at a fair and moderate price.

ÆOLUS.

J. R. WHITEHOUSE AND Co., Macdonald Street, Summer Lane.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. No. 11, direct steel spokes (inch scale). G.M. hubs. Slotted cranks. Rubber pedals, plain. Æolus bearings. Hollow forks. Low Humber head. 24-in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted sliding spring. Hogskin saddle. Saw step. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	10	0	52-in.	13	0	0
48-in.	12	0	0	54-in.	13	10	0
50-in.	12	10	0	56-in.	14	0	0

Extras. Front brake, 10/- Wrench, 2/6. Bright, 10/-

Remarks. All wearing parts well hardened. A serviceable roadster.

ALPHA No. 1.

BIRMINGHAM SMALL ARMS Co., Small Heath.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 50 and 20, No. 11, direct steel spokes. 16-in. back wheel. $5\frac{3}{4}$ -in. x $5\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 5-in. throw. Non-slipping rubber pedals. Double ball bearings. Æolus balls to back wheel. Weldless steel elliptical hollow forks.

BIRMINGHAM.—CONTINUED.

Humber head, 3½-in. centres. 24-in. x 5-in. horn handles. 1½-in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Eclipse wrench. Oilcan. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	16	0	0
48-in.	15	0	0	54-in.	16	10	0
50-in.	15	10	0	56-in.	17	0	0

Extras. All bright except felloes, 38/- Bright rims, 12/- Gold lines, 10/- Hancock's non-slipping tyres, 5/- Plated all over, 70/-

Remarks. All parts are made interchangeable, and of best material. Excellent in workmanship, it forms a good roadster (*see advertisement*).

ALPHA No. 2.

BIRMINGHAM SMALL ARMS Co., Small Heath.

Description. 7/8-in. and 3/4-in. red rubbers. Crescent steel rims. 50 and 20, No. 11, direct steel spokes. 16-in. back wheel. 5½-in x 4½-in. G.M. hubs. Detachable cranks, 5-in. throw. Fluted rubber pedals. Double ball bearings. Cones to back wheel. Elliptical hollow forks. Humber head. 3½-in. centres. 24-in. x 5-in. horn handles. 1½-in. 15 W.G. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. Leg-guard. Eclipse wrench. Oilcan. Valise.

PRICES.

	£	s.	d.
46-in. to 51-in.	13	0	0
56-in.	13	10	0

Extras. Same as No. 1.

Remarks. Machine made and interchangeable throughout. A good machine (*see advertisement*).

ALPHA RACER.

BIRMINGHAM SMALL ARMS Co., Small Heath.

Description. 5/8-in. and 1/2-in. red rubbers. D.S.H. steel rims. 70 and 26, No. 12, butt ended direct steel spokes. 16-in back wheel. 5½-in. x 5½-in. G.M. Hubs. Detachable cranks, 5-in. throw. Any kind of pedals. Æolus ball bearings. Weldless steel fluted hollow front forks. Hollow back do. Humber head, 3½-in. centres. 26-in. x 5-in. horn handles. 1½-in oval steel backbone, 15 W.G. Bolted sliding spring. Pigskin racing saddle. Saw step. Eclipse wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	19	0	0	52-in.	20	10	0
48-in.	19	10	0	54-in.	21	0	0
50-in.	20	0	0	56-in.	22	0	0

Differences. All bright, £2 less.

Remarks. This is without doubt a very fine machine, and is sent out at the prices given, plated all over (*see advertisement*).

ANTIVIBRATION.

PALMER AND Co., Victoria Works, Aston, Birmingham.

Description. 7/8-in. and 5/8-in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct steel spokes. 18-in. back wheel. G.M. hubs. Detachable cranks, 5½-in. throw. Rubber pedals. Palmer's adjustable double ball bearings.

BIRMINGHAM—CONTINUED.

Elliptical hollow front forks. Semi-elliptical antivibration back ditto. Humber head, 5-in. centres. 24-in. x 4½-in. antivibration horn handles. 1½-in. steel backbone. Palmer's antivibration double spring. Pigskin saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan.

Specialities. Antivibration handles (page 53). Double spring (page 60). Antivibration back fork joint (page 42).

PRICES.

				£	s.	d.					£	s.	d.
46-in.	}	..	..	12	0	0	52-in.	..	..	12	10	0
48-in.		..	..	12	5	0	54-in.	..	..	12	15	0
50-in.		..	..	12	5	0	56-in.	..	..	13	0	0

Extras. All bright, 15/-

Remarks. This machine is designed to overcome the vibration of rough roads. It is well made, and as far as I know answers its purpose well (see advertisement).

BARWELL.

J. BARWELL AND Co., 151, Brearley Street, West.

Description. 7/8-in. and 11/16-in. red rubbers. Crescent steel rims. No. 14 direct steel spokes. 15-in. back wheel. 5½-in. x 5-in. G.M. clamped hubs. Fixed cranks, 4-in. to 5-in. throw. Rubber pedals. Double ball bearings. Balls to back wheel. Elliptical hollow forks. Humber head. 4½-in. centres. 26in. x 5-in. horn handles. 1½-in. 16 W.G. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Oval saw step. D.L.S. brake. Leg-guard. Flat Wrench. Oilcan.

Specialities. Clamp wheel (page 11).

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	13	10	0	52-in.	..	..	14	5	0
48-in.	..	..	..	13	15	0	54-in.	..	..	14	10	0
50-in.	..	..	..	14	0	0	56-in.	..	..	14	15	0

Remarks. Bright or painted. A very well made machine. Light and strong, as a roadster or racer.

BIRMINGHAM No. 1.

HARDEY & STOTT, 22, Whittall Street.

Description. 7/8-in. and 5/8-in. red rubbers. U rims. Direct spokes. G.M. hubs. Detachable cranks. Rat-trap pedals. Ball bearings. Humber head. Horn handles. Steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. Wrench and oiler.

PRICE.

				£	s.	d.
All sizes	..	..	..	10	0	0

Remarks. Fair. Machines chiefly made to order.

BIRMINGHAM No. 2.

HARDEY & STOTT, 22, Whittall Street.

Description. 7/8-in. and 5/8-in. grey rubbers. V rims. 50, No. 10, nipple spokes. Solid hubs. Slotted cranks. Rubber pedals. Coned bearings throughout. Stanley head. Ebony handles. 1½-in. iron backbone. Bolted sliding spring. Saddle. Wrench. Leg-guard. Oiler.

PRICE.

				£	s.	d.
All sizes	..	..	..	6	0	0

Remarks. Roughly put together.

BIRMINGHAM—CONTINUED.

ELECTRIC.

C. TRUMAN & Co., 85, Loveday Street.

Description. $\frac{3}{4}$ -in. red rubbers. Potential felloes. 64, No. 12, direct steel spokes. G.M. hubs, 6-in. x $4\frac{1}{2}$ -in. Detachable cranks. Rubber pedals, plain. Double ball bearings. Balls to back wheel. Hollow steel forks. Humber head. 24-in. horn handles. $1\frac{1}{2}$ -in. weldless steel backbone. Bolted sliding spring. Suspension saddle. Saw step. Double-lever spon brake. Screw wrench. Leg-guard. Valise. Bell and oilcan.

PRICE.

All sizes £ s. d.
 16 0 0

Extras. All bright, polished, 15/-

Remarks. No specialities, but well made and finished throughout.

ELITE.

J. R. WHITEHOUSE, Morgan's Mills, Macdonald Street, Summer Lane.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. grey rubbers. Crescent rims. No. 11 direct steel spokes (inch scale). G.M. hubs. Rat-trap pedals. Whitehouse's self-lubricating bearings throughout. Hollow forks. Humber head. 22-in. horn handles. $1\frac{1}{2}$ -in. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	9	10	0	52-in.	11	0	0
48-in.	10	0	0	54-in.	11	10	0
50-in.	10	10	0	56-in.	12	0	0

Extras. All bright, 10/- D.L.S. brake, 10/- Wrench, 1/6.

Remarks. Well hardened bearings. A strong, reliable and serviceable machine.

ENDURANCE.

R. & T. GREEN, 102, Buckingham Street.

Description. Red rubbers. U rims. Clamp wheels. G.M. flanges. Slotted cranks. Rubber pedals. Coned bearings throughout. Stanley head. Ebony handles. Steel backbone. Bolted sliding spring. Pigskin saddle. Circular step. Trowser-guard. Wrench. Oiler.

Speciality. Registered Clamp wheel (page 11).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	10	0	0	52-in.	11	0	0
48-in.	10	10	0	54-in.	11	5	0
50-in.	10	15	0	56-in.	11	10	0

Extras. All bright, £1. Brake, 15/-

ENDURANCE RACER.

R. & T. GREEN, 102, Buckingham Street.

Description. Red rubbers. Crescent rims. Clamp wheels. G.M. flanges. Slotted cranks. Rubber pedals. Coned bearings throughout. Stanley head. Low set ebony handles. Steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. Wrench. Oilcan.

Speciality. Registered Clamp wheel (page 11).

BIRMINGHAM—CONTINUED.

PRICES.

	£.	s.	d.		£.	s.	d.
46-in.	12	10	0	52-in.	14	0	0
48-in.	13	0	0	54-in.	14	10	0
50-in.	13	10	0	56-in.	15	0	0

Remarks. Finished all bright. A good machine.

EXACT.

EVANS & DODD, Steelhouse Lane.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. 60, No. 11, homo iron direct spokes. G.M. hubs, 5-in. dish. Detachable cranks. Rubber pedals, plain. Double ball bearings. Cones to back wheel. Hollow forks. Stanley head. 24-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Screw wrench. Leg-guard. Valise. Bell. Oiler.

PRICES.

	£.	s.	d.		£.	s.	d.
46-in.	6	15	0	52-in.	7	10	0
48-in.	7	0	0	54-in.	7	15	0
50-in.	7	5	0	56-in.	8	0	0

Extras. Polishing, 10/- Plating, 30/-

Remarks. Largely made for export and the trade. Finished bright, but not polished.

HANDSWORTH No. 1.

GEORGE RILEY, 205 & 207, Soho Road, Handsworth.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, direct spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, Æolus balls to back wheel. Elliptical hollow front forks. Semi-tubular back. Humber head, 4-in. centres. 24-in. x 5-in. horn handles. $1\frac{3}{4}$ -in. oval steel backbone. Helical fronted Stanley slide spring. Suspension saddle. Saw step. Long D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

Specialities. Pattern of detachable cranks.

PRICES.

	£.	s.	d.		£.	s.	d.
46-in.	13	13	0	52-in.	13	13	0
48-in.				54-in.	14	14	0
50-in.				56-in.	14	14	0

Extras. Plated all over, 70/- Ball pedals, 20/-

Remarks. Half plated, and picked out with gold. A genuine, thoroughly well-made machine throughout. Can be relied upon as a roadster (see advertisement).

HANDSWORTH No. 2.

GEORGE RILEY, 205 & 207, Soho Road, Handsworth.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, charcoal iron direct plated spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ in. throw. Rubber pedals. Double ball bearings. Æolus balls to back wheel. Elliptical hollow forks. Humber head,

BIRMINGHAM—CONTINUED.

4-in. centres. 24-in. x 5-in. horn handles. 1½-in. 14g. steel backbone. Helical fronted Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

			£ s. d.				£ s. d.
46-in. .. .. .	..	..	} 11 11 0	52-in. .. .. .	..	..	11 11 0
48-in. .. .. .	..	..		54-in. ... .. .	..	..	} 12 12 0
50-in. .. .. .	..	..		56-in. .. .. .	..	..

Extras. All bright, 15/- Plated, 50/-

Remarks. A sound, strong roadster (see advertisement).

HANDSWORTH No. 3.

G. RILEY, 295 & 207, Soho Road, Handsworth.

Description. 7/8-in. and 5/8-in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, iron direct plated spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, 4½-in. throw. Rubber pedals. Double ball bearings. Cones to back wheel. Elliptical hollow forks. Humber head. 4-in. centres. 24-in. x 5-in. horn handles. 1½-in. 14 W.G. steel backbone. Helical fronted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. 5-hole flat wrench. Oilcan. Gong. Valise.

PRICES.

			£ s. d.				£ s. d.
46-in. .. .. .	..	..	} 8 8 0	52-in. .. .. .	..	..	8 8 0
48-in. .. .. .	..	..		54-in. .. .. .	..	..	} 9 9 0
50-in. .. .. .	..	..		56-in. .. .. .	..	..

Extras. All bright, 15/-

Remarks. Sound material, and cheap at the price (see advertisement).

HANDSWORTH No. 4.

G. RILEY, 295 & 207, Soho Road, Handsworth.

Description. ¾-in. and 5/8-in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct iron spokes. 16-in. back wheel. G.M. hubs. Detachable cranks, 4½-in. throw. Rat-trap pedals. Parallel bearings. Cones to back wheel. Elliptical hollow forks. Humber head, 4-in. centres. 24-in. x 5-in. ebony handles. 1½-in. 14 W.G. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

			£ s. d.				£ s. d.
46-in... .. .	..	..	} 7 0 0	52-in. .. .. .	..	..	7 0 0
48-in... .. .	..	..		54-in. .. .. .	..	..	} 7 10 0
50-in... .. .	..	..		56-in. .. .. .	..	..

Extras. All bright, 15/- Horn handles, 2/6 Double ball bearings, 10/-

Remarks. (See advertisement.)

HAWK No. 1.

HAWKINS & Co., 15, Steelhouse Lane.

Description. ¾-in. and 5/8-in. red rubbers. Potential steel rims, 60 and 20, No. 11, direct steel spokes. 16-in. back wheel. 5½-in. x 5½-in, G.M. hubs.

BIRMINGHAM—CONTINUED.

Detachable cranks, 5-in. to 5½-in. throw. Rat-trap pedals. Double ball bearings. Cones to back wheel. Elliptical hollow forks. Humber head. 4½-in. centres. 24-in. x 6-in. horn handles. 1½-in. steel backbone. Bolted shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	8	0	0	52-in.	8	15	0
48-in.	8	5	0	54-in.	9	0	0
50-in.	8	10	0	56-in.	9	5	0

Extras. All bright, 10/- Plated, 30/-

Remarks. Warranted by the maker for 12 months. A very fair article.

HAWK No. 2.

HAWKINS & Co., 15, Steelhouse Lane.

Description. 7⁄8-in. and 5⁄8-in. red rubbers. Potential steel rims. 80 and 20, Nos. 11 and 12, butt-ended direct steel spokes. 16-in back wheel. 5½-in. x 5½-in. G.M. hubs. Detachable cranks, 5-in. to 5½-in. throw. Coned rubber pedals. Double ball bearings. Balls to back wheel. Elliptical hollow forks to both wheels. Humber head, 4½-in. centres. 26-in. x 6-in. horn handles. 1½-in. 16 W.G. steel backbone. Bolted shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	9	0	0	52-in.	10	5	0
48-in.	9	5	0	54-in.	10	10	0
50-in.	10	0	0	56-in.	11	0	0

Extras. All bright, 10/- Plated, 30/- Ball pedals, 10/-

Remarks. Soundly made and strong, with a neat exterior.

HAWK SPECIAL.

HAWKINS & Co., 15, Steelhouse Lane.

Description. 7⁄8-in. and 5⁄8-in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct spokes. 16-in. back wheel. 5½-in. x 5-in. G.M. hubs. Detachable cranks, 5½-in. throw. Rubber pedals. Double ball bearings. Cones to back wheel and pedals. Solid forks. Stanley head, 4½-in. centres. 24-in. x 6-in. horn handles. 1½-in. 14 W.G. backbone. Bolted shackle spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

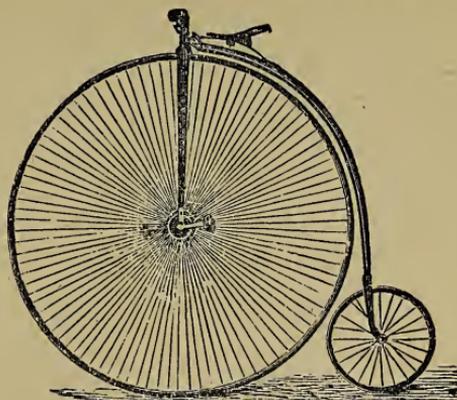
PRICES.

	£	s.	d.		£	s.	d.
46-in.	6	0	0	52-in.	6	10	
48-in.				54-in.			
50-in.				56-in.			

Extras. All bright, 10/- Plated, 30/-

BIRMINGHAM—CONTINUED.**INTERCHANGEABLE RACER.**

PALMER & Co., Victoria Works, Sixways, Aston.



INTERCHANGEABLE RACER.

Description. $\frac{3}{4}$ -in. and $\frac{1}{2}$ -in. red rubbers. Crescent steel rims. 80 and 20 No. 13 direct steel spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Palmer's adjustable double ball bearings. Elliptical hollow front forks, semi-tubular back. Humber head, 4-in. centres. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{1}{4}$ -in. weldless steel backbone. Bolted Stanley slide spring. Pigskin racing saddle. Flat wrench. Oilcan. Valise.

Specialities. Palmer's patent adjustable double ball bearings (*pages 30 and 36*).

PRICE.

All sizes £12 12 0

Extras. All bright and burnished, 15/- Half plated, 20/- All plated, 40/-

Remarks. Built on the interchangeable principle. A first-rate racer, largely used for that purpose in the Midlands. A thoroughly good machine, at a very reasonable price (*see advertisement*).

INTERCHANGEABLE ROADSTER.

PALMER & Co., Sixways, Aston.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubber. Crescent steel rims. 60 and 20 No. 11 $\frac{1}{2}$ direct steel spokes. 18-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Palmer's adjustable double ball bearings. Elliptical hollow forks. Humber head, 5-in. centres. 24-in. x $5\frac{1}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. weldless steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

Specialities. Palmer's adjustable double ball bearings, (*pages 30 and 36*). Combination antivibration spring (*page 60*). Antivibration handles (*page 53*). Joint to back fork (*page 42*).

BIRMINGHAM—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	10	0	0	52-in.	10	10	0
48-in.				54-in.	10	15	0
50-in.				56-in.	11	0	0

Extras. All bright, 15/- Half plated, 15/- All plated, 20/- Suspension saddle, 5/- Anti vibration spring, handle-bar, and back fork, 15/- each.

Remarks. Built on the interchangeable system, in good style, at a very reasonable figure. A neat light roadster. I am now using one, and, as far as I have yet tried it, am perfectly satisfied (*see advertisement*).

RALEIGH.

S. ARMSTRONG, 16, Great Hampton Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20 No. 11 direct spokes. 16-in back wheel. 6-in. x 5 $\frac{1}{2}$ -in. G.M. hubs. Fixed cranks. Rat-trap pedals. Coned bearings throughout. Elliptical forks. Humber head, 3 $\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. 1 $\frac{1}{2}$ -in. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. Leg-guard. Flat wrench. Oilcan. Valise. Bell.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	6	5	0	52-in.	7	5	0
48-in.				54-in.	7	10	0
50-in.				56-in.	7	15	0

Extras. All bright, 10/-

Remarks. Very fair.

ROVER.

J. R. WHITEHOUSE, Macdonald Street, Summer Lane.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. V rims. 44, No. 11, lock-nutted spokes. Solid hubs. Rubber pedals, plain. Plain bearings. Coned back wheel. Solid gun iron forks. Open Stanley head. 22-in. walnut handles. Lap-welded iron backbone. Bolted sliding spring. Pigskin saddle. Saw step. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	8	0	0	52-in.	8	15	0
48-in.				54-in.	9	0	0
50-in.				56-in.	9	5	0

Extras. Brake, 10/- Bright, 10/- Wrench, 2/6.

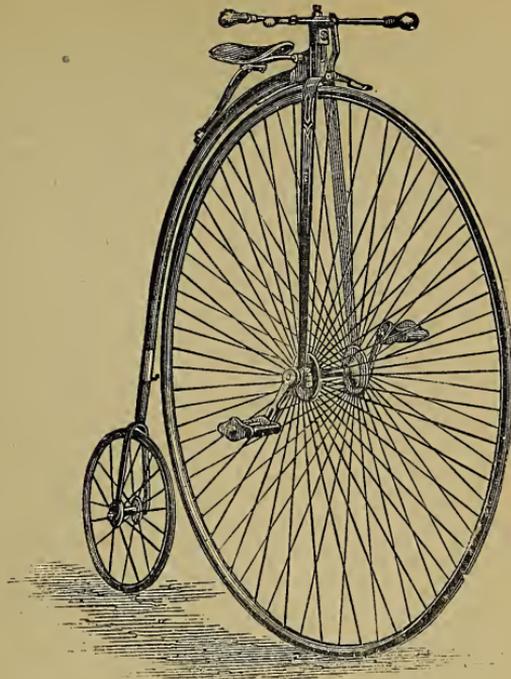
Remarks. Roughly made, but strong and serviceable for beginners.

ROYAL MAIL.

ROYAL SEWING MACHINE Co., Herbert Road, Small Heath.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12 $\frac{1}{2}$, direct steel spokes, 17-in. back wheel. G.M. hubs. Slotted cranks, 4 $\frac{1}{2}$ -in. to 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Ball bearings to front, cones to back wheel. Elliptical hollow forks. Royal Mail patent head, 3 $\frac{3}{4}$ -in. centres. 24-in. adjustable horn handles. 1 $\frac{3}{8}$ -in. steel backbone. Bolted roller slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

BIRMINGHAM—CONTINUED.



ROYAL MAIL.

Specialities. Royal Mail adjustable handle (page 50).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	0	0	52-in.	15	5	0
48-in.	14	10	0	54-in.	15	10	0
50-in.	15	0	0	56-in.	15	15	0

Extras. All bright, 15/- Balls to back wheel, 10/-

Remarks. Built of best material on the interchangeable principle; sent out japanned and ornamented. A very good machine, and can be relied on.

SANSPAREIL No. 1.

W. ANDREWS, 3, Steelhouse Lane.

Description. $\frac{7}{8}$ -in. x $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 64 and 20, No. 11, direct steel spokes. 16-in. back wheel. 6-in x 5-in. G.M. hubs. Detachable cranks, 5-in. to 6-in. throw. Rubber pedals. Double ball bearings. Balls to back wheel. Elliptical hollow front forks, semi-tubular back. Andrews' patent head, 5-in. centres. 24-in. x 5-in. horn handles. 1 $\frac{3}{8}$ -in. steel backbone. Bolted shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Andrew's patent head (page 47). Andrew's pedals (page 17).

BIRMINGHAM—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	10	0	52-in.	} 16	0	0
48-in.	14	10	0	54-in.			
50-in.	15	0	0	56-in.			

Extras.—All bright, 10/- All plated, £3. Bright parts plated, £1.

Remarks. A first-class, highly finished machine. Can be thoroughly relied on, as the maker possesses a conscience. Is coming well to the fore as a racer (see advertisement).

SANSPAREIL No. 2.

W. ANDREWS, 3, Steelhouse Lane.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 64 and 20, No 11, direct steel spokes. 16-in. back wheel. $5\frac{1}{2}$ -in. 5-in. G.M. hubs. x Detachable cranks, $5\frac{1}{2}$ -in. to 6-in. throw. Rubber pedals. Double ball bearings. Balls to back wheel. Lowmoor iron elliptical solid forks. Andrews' patent head, 5-in. centres. 24-in x 5-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Andrews' patent head (page 47).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	} 13	0	0	52-in.	} 13	10	0
48-in.				54-in.			
50-in.				56-in.			

Extras. All bright, 10/- Plated, £3. Half do., £1.

Remarks. A sound, strong roadster. Thoroughly well made, and fit for work (see advertisement).

SPECIAL.

WILLIAM GRANGER, 38, Vyse Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct steel spokes. $16\frac{1}{2}$ -in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{3}{4}$ -in. G.M. hubs. Fixed cranks, 5-in. throw. Rubber pedals. Parallel bearings. Cones to back wheel. Solid iron elliptical forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x $4\frac{3}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step, Leg-guard. Flat wrench. Oilcan.

Specialities. The new cheap ball bearing extra (addenda).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	} 8	0	0	52-in.	} 8	5	0
48-in.				54-in.			
50-in.				56-in.			

Extras. All bright, 10/- Hollow forks, 20/- Ball bearings, 15/-

Remarks. Sound and strong.

BIRMINGHAM—CONTINUED.

STANDARD.

WILLIAM GRANGER, 38, Vyse Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12, nipped spokes. 16-in. back wheel. $5\frac{3}{4}$ -in. x $4\frac{3}{4}$ -in. G.M. hubs. Fixed cranks, 5-in. throw. Rubber pedals. Rudge's ball bearings. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x $4\frac{3}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted shackle spring. Suspension saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	0	0	52-in.	14	10	0
48-in.	14	0	0	54-in.	14	15	0
50-in.	14	5	0	56-in.	15	0	0

Extras. All bright, 10/-

Remarks. A sound and reliable machine, containing good work and good material.

UNIQUE.

S. ARMSTRONG, 16, Great Hampton Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 28, No. 11, direct steel spokes. 18-in. back wheel. $5\frac{3}{4}$ -in. x 5-in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings. Cones to back wheel. Elliptical forks. Humber head, $3\frac{1}{2}$ -in. centres. x 24-in. 5-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	7	15	0	52-in.	9	0	0
48-in.	8	10	0	54-in.	9	10	0
50-in.	8	15	0	56-in.	9	15	0

Extras. All bright, 10/- Ball bearings, £2.

Remarks. A fair roadster.

BRIGHTON. This town is not noted much for actual manufacture, comparatively little being carried on there; but the agency business seems flourishing, if we may judge by the flourishing state of Messrs. Maynard, Harris, & Co., the Brighton Bicycle Co., and Harrison & Co., who are extensive agents, and have depôts for repairs, hire of machines, and sale of all best makes. I describe three machines by as many makers. These are:—

BRIGHTON SUPERB.

BRIGHTON BICYCLE Co., Viaduct Works, London Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 18, No. 10, non-corrosive direct spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, 5-in. to 7-in. throw. Oval rubber pedals, coned. Ball bearings to front, taper pin to back wheel. Solid bayonet forks. Humber head, 3-in. centres. 25-in. x 4-in. horn handles. $1\frac{1}{2}$ -in. oval steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise. Stormont's alarum.

BRIGHTON—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	10	0	0	52-in.	10	10	0
48-in.				54-in.			
50-in.				56-in.			

Remarks. Usual bright parts plated, rest painted black and gold. A strong, cheap machine.

TOURIST.

G. O. GODDARD, 33 and 34, Portland Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. U rims. 50 and 20, No. 12, direct spokes. G.M. hubs. Rubber pedals, plain. Ball bearings. Coned back wheel. Hollow forks. Centre steering. 22-in. x $5\frac{3}{4}$ -in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted sliding spring. Suspension saddle. Circular hollow step. D.L.S. brake. Flat wrench. Leg-guard and bell.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	9	0	0	52-in.	10	10	0
48-in.	9	10	0	54-in.	11	0	0
50-in.	10	0	0	56-in.	11	10	0

Extras. All bright, £5.

Remarks. Chiefly built to order, so pattern is hardly a decided one.

UNIVERSAL.

H. GORRINGE, 1, Richmond Buildings.

Description. Red rubbers. Crescent rims. Lock-nutted or direct spokes. G.M. hubs. Detachable slotted cranks. Oval rat-trap pedals. Coned bearings throughout. Stanley head. Ebony handles. Steel backbone. Bolted hinged-clip sliding spring. Pigskin saddle. D.L.S. brake. Leg-guard. Wrench. Oilcan.

PRICE.

All sizes (all bright) £ s. d.
.. .. . 13 0 0

Remarks. A strong, well-made machine. No specialities.



BRISTOL. Although unknown to the majority of riders, this Western city stands well to the fore in the quality, though a little behind-hand in the quantity of its productions in our especial line. There are three makers resident there, who turn out three machines at various prices, but all showing much good work, especially the "Clifton."

CARLTON.

H. E. KEAR, Red Cross Iron Works, 1 & 2, Redcross Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 68 and 24, No. 12, direct steel spokes. G.M. hubs. Detachable cranks, $4\frac{1}{4}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow forks. Humber head, 4-in. centres. 24-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Improved double-action spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Cyclist's wallet.

Specialities. Improved neck, and double-action spring.

BRISTOL—CONTINUED.

PRICE.

All sizes £14 0 0

Extras. Half bright, 10/- All bright, 30/-

Remarks. A sound, strong, well-built machine, fit for all sorts of road work (see advertisement).

BRISTOL.

MORGAN, Victoria Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. grey rubbers. Crescent rims. Direct spokes. Wide gun-metal hubs. Slotted cranks. Rubber pedals. Sheffield plain bearings. Coned back. Bayonet forks. Stanley head. Horn handles. Steel backbone. Bolted clip-tail spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Valise. Wrench. Oiler.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	10	10	0	52-in.	12	0	0
48-in.	11	0	0	54-in.	12	10	0
50-in.	11	10	0	56-in.	13	0	0

Extras. All bright, £1. Æolus bearings, 30/-

Remarks. A fair machine for the money, and may be depended upon.

CLIFTON.

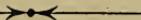
THOMAS PITCHER, Clifton Bicycle Works, Lewin's Mead.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. Numerous direction spokes. Gun metal hubs. Slotted cranks. Rubber pedals. Plain hardened "Sheffield" or roller bearings. Single coned back-wheel pin. Bayonet forks. Humber head. Horn handles. Steel backbone. Bolted hinged clip-sliding spring. Stanley saddle plate. Pigskin saddle. D.L.S. brake. Saw step. Leg-guard. Flat wrench, fitting all nuts. Oiler.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	10	0	52-in.	15	0	0
48-in.	14	0	0	54-in.	15	10	0
50-in.	14	10	0	56-in.	16	0	0

Remarks. All working parts properly hardened. Ought to be a wider favourite. Few are superior at the price.



CALNE (WILTS.) This little town, situated in close proximity to the famous Bath road, boasts of a single manufacturer, whose works are handy for repairs in case of accident whilst touring over this well-known highway. He turns out two sterling machines, which are as follows:—

PROGRESS.

E. W. MAUNDRELL, Progress Iron Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 50 and 20. No. 12, lock-nutted steel spokes. 16-in. back wheel. 6-in. x 4-in. solid hubs. Detachable cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Adjustable parallel bearings. Cones to back wheel. Bayonet forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. 15 W.G. steel backbone. Bolted clip-tailed sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

CALNE (WILTS)—CONTINUED.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	7	0	0	52-in.	..	..	..	8	10	0
48-in.	..	..	..	7	10	0	54-in.	..	..	..	9	0	0
50-in.	..	..	..	8	0	0	56-in.	..	..	..	9	10	0

Extras. All bright, 10/- Non-slipping tyres, 10/-

Remarks. Strong, sound, and cheap.

SPECIAL PROGRESS.

E. W. MAUNDRELL, Progress Iron Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Potential steel rims. 70 and 20, No. 14, lock-nutted steel spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 4-in. to 5-in. throw. Rubber pedals. Double ball bearings. Cones to back wheel. Elliptical hollow forks. Stanley head, $3\frac{1}{2}$ -in. centres. 26-in. x 5 in. horn handles. $1\frac{3}{8}$ -in. 18 W.G. steel backbone. Double rubber blocked spring. Suspension saddle. Double saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	12	10	0	52-in.	..	..	..	14	0	0
48-in.	..	..	..	13	0	0	54-in.	..	..	..	14	10	0
50-in.	..	..	..	13	10	0	56-in.	..	..	..	15	0	0

Extras. All bright, 10/- Non-slipping tyres, 10/-

Remarks. A strong, neatly finished, and reliable machine. Makes a fine light roadster.

CARDIFF, representing Welsh manufacture, boasts of a single firm, who have this season considerably added both to the quality and quantity of their manufactures, turning out no less than six machines. These are:—

No. 1. CAMBRIAN.

MORRIS BROS., 16, Angel Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. U rims. No. 11 charcoal iron direct spokes. 17-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Sheffield T bearings. Cones to back wheel and pedals. Solid iron forks. Stanley head, $4\frac{1}{2}$ -in. centres. 24-in. x 5-in. rosewood handles. $1\frac{1}{2}$ -in. iron backbone. Bolted shackle spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	6	15	0	52-in.	6	15	0	
48-in.				54-in.				
50-in.				56-in.				7	5	0

Extras. All bright, 20/- Balls to front wheel, 25/- Ditto back, 20/-

Remarks. Strongly made, and all wearing parts case hardened.

CARDIFF—CONTINUED.

No. 2. CAMBRIAN.

MORRIS, BROS., 16, Angel Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. Nos. 11 and 12 direct steel spokes. 17-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, 4-in. to $5\frac{3}{4}$ -in. throw. Rubber pedals, plain. Parallel bearings. Cones to back wheel. Solid Lowmoor iron forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x 5-in. ebony handles. $1\frac{1}{4}$ -in. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Improved leg-guard, and back wheel pin.

PRICES.

				£ s. d.					£ s. d.
46-in.	..	..	..	} 9 10 0	52-in.	..	..	..	} 9 10 0
48-in.	..	..	..		54-in.	..	..	..
50-in.		56-in.	

Extras. All bright, 20/- Balls to front, 25/-; to back, 20/-

Remarks. Strong and reliable.

No. 3. CAMBRIAN.

MORRIS BROS., 16, Angel Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims, Nos. 11 and 12 direct steel spokes. 17-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, 4-in. to $5\frac{3}{4}$ -in. throw. Rubber pedals, plain. Double ball bearings, cones to back wheel. Elliptical hollow forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted barrel slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Improved leg-guard, and back wheel pin.

PRICES.

				£ s. d.					£ s. d.
46-in.	..	..	..	} 11 15 0	52-in.	..	..	..	} 11 15 0
48-in.	..	..	..		54-in.	..	..	..
50-in.		56-in.	

Extras. All bright, 20/- Balls to back wheel, 20/-

Remarks. A good machine.

SPECIAL CAMBRIAN.

MORRIS BROS., 16, Angel Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Potential steel rims. No. 12 direct steel spokes. $17\frac{1}{2}$ -in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, $3\frac{7}{8}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Knuckle-jointed parallel bearings. Reversed cones to rear wheel. Elliptical hollow forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x 5-in. bent horn handles. $1\frac{1}{4}$ -in. steel backbone. Adjustable pitch spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

Specialities. Adjustable pitch spring, &c.

CARDIFF—CONTINUED.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	}	14	14	0	|	52-in.	}	14	14	0	
48-in.						54-in.					
50-in.						56-in.					

Extras. All bright, 20/- Balls to front, 17/6. Ditto back wheel, 12/6.
Remarks. Highly finished. A strong and handsome roadster.

SPECIAL CAMBRIAN RACER.

MORRIS BROS., 16, Angel Street.

Description. $\frac{3}{4}$ -in. and $\frac{1}{2}$ -in. red rubbers. Potential steel rims. No. 12 direct steel spokes. 17 $\frac{1}{2}$ -in. back wheel. 6in. x 5-in. G.M. hubs. Detachable cranks, 3 $\frac{7}{8}$ -in. to 5 $\frac{1}{2}$ -in. throw. Rat-trap pedals. Ball bearings. Elliptical hollow forks. Humber head, 4 $\frac{1}{2}$ -in. centres. 24-in. x 5-in. bent horn handles. 1 $\frac{1}{2}$ -in. steel backbone. Adjustable spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan.

PRICE.

All sizes £15 15 0

Remarks. Bright or painted. On the lines of the Special Roadster, but built lighter throughout. Is largely used on the Welsh tracks.

BOY'S CAMBRIAN.

MORRIS BROS., 16, Angel Street.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. V iron rims. Nos. 11 and 12 charcoal iron direct spokes. G.M. hubs. Fixed cranks. Rat-trap pedals. Plain bearings. Cones to back wheel. Solid forks. Open centre head, 5-in. centres. Rose-wood handles. 1-in. iron backbone. Bolted sliding spring. Pigskin saddle. Saw step. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

			£	s.	d.				£	s.	d.
24-in.	}	3	10	0	|	32-in.	}	4	0	0	
26-in.						34-in.					
28-in.						36-in.					
30-in.	}	3	15	0	|	38-in.	}	4	15	0	
40-in. .. .. .						.. .. .					£5 0 0

Extras. All bright, 10/-

Remarks. A strong toy.

YOUTH'S CAMBRIAN.

MORRIS BROS., 16, Angel Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. U rims. No. 11 charcoal iron nipped spokes. 17-in. back wheel. 5-in. x 4 $\frac{1}{2}$ -in. iron hubs. Fixed cranks, 4in. to 5 $\frac{1}{2}$ -in. throw. Rat-trap pedals. T plain bearings. Cones to back wheel and pedals. Solid iron forks. Stanley head, 4 $\frac{1}{2}$ -in. centres. 20-in. x 5-in. horn handles. 1 $\frac{1}{2}$ -in. iron backbone. Bolted shackle spring. Pigskin saddle. Saw step. Leg-guard. Flat wrench. Oilcan.

PRICES.

42, 44, and 46-in. £6.

Extras. All bright, 20/-

CHELTHENHAM. One maker, one machine.

VICTORIA.

T. DAVIS & Co., Victoria Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 24, No. 11, direct steel spokes. 16-in. back wheel. 6-in. G.M. hubs. Detachable cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings. Cones to back wheel and pedals. Elliptical hollow forks. Humber head, 4-in. centres. 22-in. x 8-in. horn handles. $1\frac{1}{4}$ -in. 10 W.G. steel backbone. Bolted Stanley slide spring. Suspension saddle. Fluted saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	9	9	0	52-in.	12	12	0
48-in.	10	10	0	54-in.	13	13	0
50-in.	11	11	0	56-in.	14	14	0

Extras. All bright, 10/- Lamp, 12/-

Remarks. Sound and strong.



COLCHESTER. Likewise one firm of manufacturers, but this time two machines.

GREAT EASTERN No. 1.

THE BRITANNIA MANUFACTURING Co.

Description. $\frac{7}{8}$ -in. and $\frac{1}{2}$ -in red rubbers. U rims. 50 and 20, No. 12, nipple spokes. Solid hubs, $6\frac{1}{4}$ -in. x 4-in. Fixed cranks. Rubber pedals. Plain bearings. Bayonet forks. Stanley head. Horn handles, 22-in x $5\frac{1}{2}$ -in. $1\frac{1}{4}$ -in. steel backbone. Bolted sliding spring. Pigskin saddle. Spoon brake. Screw wrench. Leg-guard. Valise. Oilcan.

PRICES.

	£	s.	d.
46-in. to 48-in.	9	0	0
50-in. to 56-in.	10	0	0

Extras. All bright, £1.

Remarks. Made entirely on the premises. Strong and useful.

GREAT EASTERN No. 2.

THE BRITANNIA MANUFACTURING Co.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. U rims. Direct spokes. Detachable cranks. Rubber pedals. Coned throughout. Hollow forks. Stanley head. Horn handles, 22-in. x 5-in. $1\frac{1}{4}$ -in. steel backbone. Bolted sliding spring. Pigskin saddle. Spoon brake. Screw wrench. Leg-guard. Valise. Oilcan.

PRICES.

	£	s.	d.
46-in. to 48-in.	11	10	0
50-in. to 56-in.	12	10	0

Extras. All bright, £1.

Remarks. Of good workmanship and materials. Built to order.

COVENTRY, the chief seat of the trade, contains twelve firms, most of whom are upon a considerable and extensive scale, and whose works it is a pleasure to inspect. These, between them, turn out 48 machines, the majority of which can be relied on for containing genuine good work and the best of material. At one time the productions of Coventry were generally heavy and cumbersome, although excelling in strength, but at present there are quite as many light-class machines built there as those of the opposite type, whilst a general increase of elegance, together with better finish and a neater outline, are the especial features for 1881. Since my last issue of "The Indispensable" several business changes have taken place, but these have been neither so numerous nor sweeping as in former years, which speaks well for the general stability of the trade. Messrs. Starley & Sutton are the only firm who have left the ranks of bicycle makers, they having their hands more than full with the tricyclic branch of the wheel trade. The firm of Rudge & Co. (late of Wolverhampton), has been incorporated with that of the Tangent and Coventry Tricycle Co., who now trade under the former name in their new Coventry Works. A new firm this season is the "Zephyr" Bicycle and Tricycle Co., who have started to make only first-class goods, and carry out their intention in the fullest manner. Bayliss, Timms & Co. are now known as Timms & Co., the senior partner having left the firm. Kirby & Co. is a new firm, being manufacturing agents of a speciality in the safety line. Settle & Co., although entering the lists last season, were not able to supply until the present one, are now in full swing; whilst extensive additions have been made to the premises of Bayliss, Thomas & Co.; Hillman, Herbert & Cooper; Singer & Co.; and Warman, Laxon & Co.; the latter firm having also taken in a new partner, now trade as Warman, Laxon & Aslatt. Besides the firms mentioned in this book there are none.

ARTIZAN'S.

WARMAN, LAXON & ASLATT, Albion Mills, West Orchard.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubers. V iron rims. No. 12 lock-nutted spokes (inch scale). 18-in. back wheel. $5\frac{1}{2}$ -in. x 3-in. iron hubs. Fixed cranks $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings to front, cones to back wheel. Solid Lowmoor iron forks. Stanley head, 3-in. centres. 22-in. x 4-in. ebony handles. $1\frac{1}{4}$ -in. iron backbone. Bolted clip-tail spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.
46-in. to 54-in.	8	10	0
56-in.	9	0	0

Extras. All bright, 30/-

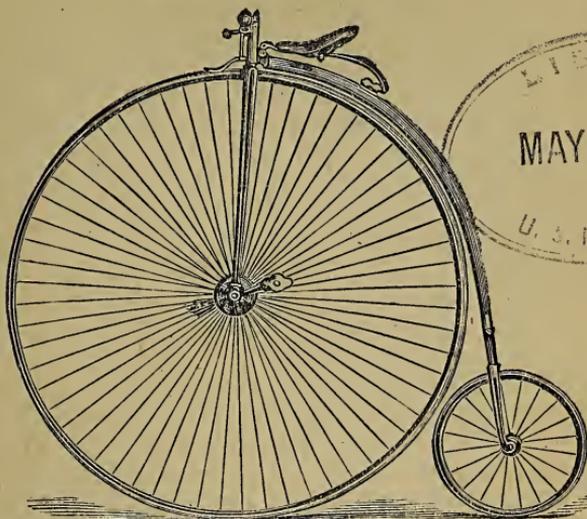
Remarks. A new introduction this season. Sound and strong for beginners and those who cannot go to any great expense (see advertisement).

45832

COVENTRY—CONTINUED.

BRITISH CHALLENGE.

SINGER & Co., Alma Street.



BRITISH CHALLENGE.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. non-slipping red rubbers. Crescent steel rims. 60 and 20, No. 12, butt-ended direct spokes. 17 $\frac{1}{2}$ -in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, 4-in. to 5 $\frac{1}{2}$ -in. throw. Non-slipping rubber pedals. Double ball bearings to front, adjustable balls to back wheel. Fluted hollow forks to both wheels. Dust-proof Humber head, 4-in. centres. 22-in. to 26-in. horn handles. 1 $\frac{3}{8}$ -in. oval steel backbone. British Challenge rubber spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. 2 flat wrenches. Oilcan.

Specialities. British Challenge spring (page 53). Front ball bearings, and fluted back forks.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	16	10	0	52-in.	18	0	0
48-in.	17	0	0	54-in.	18	10	0
50-in.	17	10	0	56-in.	19	0	0

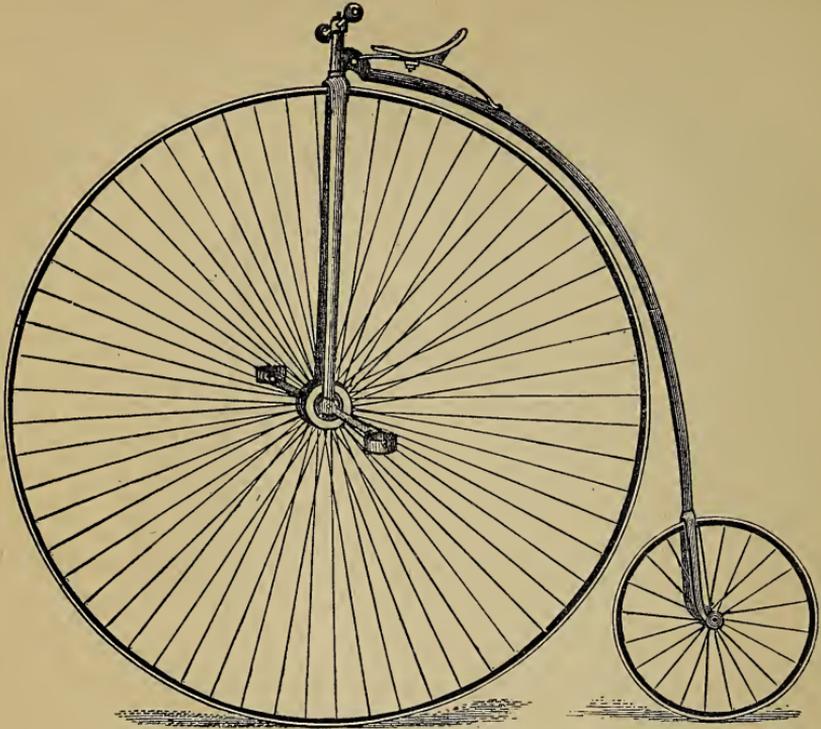
Extras. All bright, 35/- Plated entire, 85/- Balls to pedals, 25/- 1-in. tyres, 10/-

Remarks. Messrs. Singer's speciality for the present season. A very fine machine, eminently adapted for touring and road work. Workmanship and finish are first-class, and all usual bright parts are plated (see advertisement).

CENTAUR No. 3.

THE CENTAUR BICYCLE Co., West Orchard.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 64 and 24, No. 11, lock-nutted steel spokes. 16-in. back wheel. 6-in. x 4 $\frac{1}{2}$ -in. steel hubs. Fixed cranks, 4-in. to 6-in. throw. Rubber pedals. Coned bearings through-out. Elliptical solid iron forks. Humber head, 3 $\frac{1}{2}$ -in. centres, 24-in. x 4 $\frac{1}{2}$ -in. horn handles. 1 $\frac{3}{8}$ -in. 14 W.G. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. Leg-guard. Flat wrench. Oilcan.

COVENTRY—CONTINUED.

CENTAUR No. 3.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	10	0	0	52-in.	11	5	0
48-in.	10	5	0	54-in.	11	10	0
50-in.	10	10	0	56-in.	11	15	0

Extras. All bright, 20/- D.L.S. brake, 10/-

Remarks. A strong, reliable machine, at a moderate price (*see advertisement*).

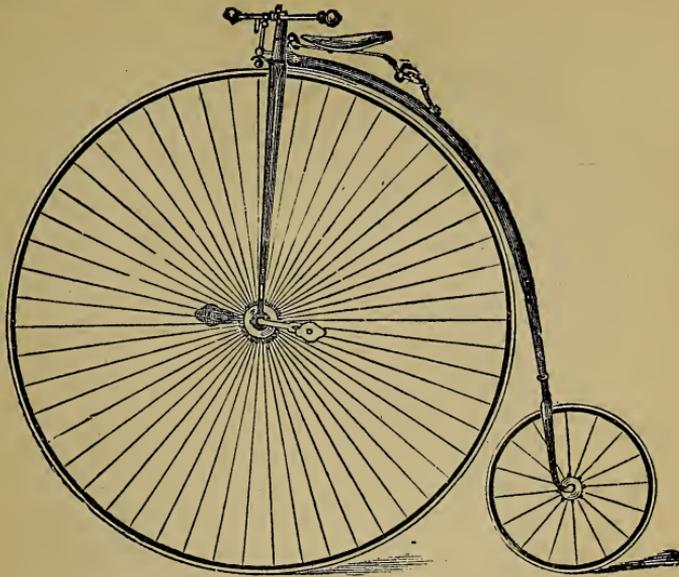
CLUB.

COVENTRY MACHINISTS' Co., LIMITED, Cheylesmore.

Description. $1\frac{5}{8}$ -in. and $\frac{3}{4}$ -in. non-slipping red rubbers. Club hollow rims. 56 and 16, No. 13, lock-nutted direct spokes. 17-in. back wheel. $5\frac{1}{4}$ -in x $4\frac{1}{2}$ -in B.B. iron hubs. Fixed cranks, 4-in. to 5-in. throw. Rubber pedals. Club double ball bearings to front, Club dust-proof cones to back wheel. Fluted hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. horn handles. $1\frac{3}{8}$ -in. 14 W.G. oval steel backbone. Club rubber suspension spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Handy wrench. Oilcan.

Specialities. Club hollow felloes (*page 6*). Club spokes (*page 9*). Club ball bearings (*page 30*). Club rubber suspension spring (*page 62*). Handy wrench (*page 77*).

COVENTRY—CONTINUED.



CLUB.

PRICES.

£ s. d.			£ s. d.				
46-in.	16	0	0	52-in.	17	0	0
48-in.	16	10	0	54-in.	17	10	0
50-in.	16	10	0	56-in.	18	0	0

Extras. All bright, 40/- Plated, 70/- Ball pedals, 10/- Detachable cranks, 5/-
Remarks. A fine machine, much improved under the new management
 (see advertisement).

CLUB RACER.

COVENTRY MACHINISTS' Co., LIMITED, Cheylesmore.

Description. $\frac{5}{8}$ -in. and $\frac{1}{2}$ -in. red rubbers. Club hollow rims. 72 and 20, No. 13, direct steel spokes. 16-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 5-in. throw. Rat-trap pedals. Single ball bearings. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. horn handles. 1 $\frac{3}{8}$ -in. 14 W.G. oval steel backbone. Neat bolted sliding spring. Suspension racing saddle. Saw step. Leg-guard. Handy wrench. Oilcan.

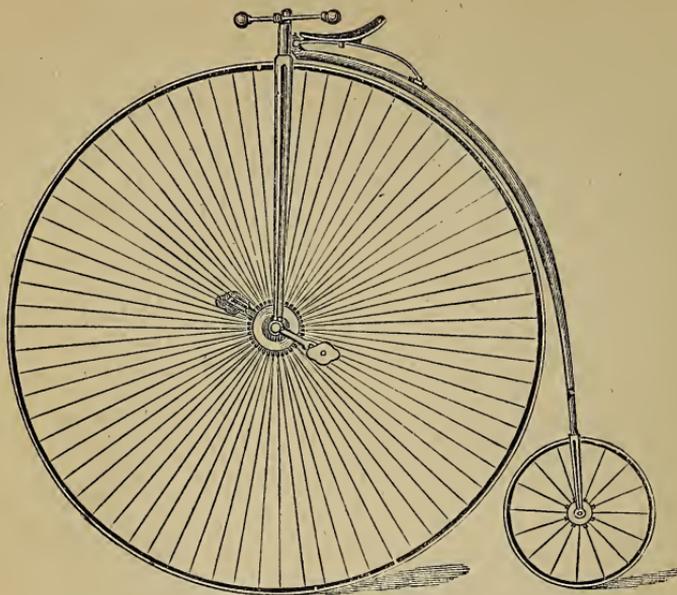
Specialities. Club hollow felloes (page 6). Single ball bearings (*addenda*). Handy wrench (page 77).

PRICES.

£ s. d.			£ s. d.				
46-in.	17	0	0	52-in.	18	0	0
48-in.	17	10	0	54-in.	18	10	0
50-in.	17	10	0	56-in.	19	0	0

Extras. All bright, 40/- Entirely plated, 90/- Balls pedals, 10/-

Remarks. Cut out on good lines for a racer or light roadster. Very nicely finished (see advertisement).

COVENTRY—CONTINUED.

CLUB RACER.

COVENTRY PERFECTION, No. 3.

TIMMS & Co., East Street Works.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. U rims. 60 and 20, No. 11, direct spokes. 16-in. back wheel. $6\frac{1}{2}$ -in. x $4\frac{3}{8}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{4}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings. Cones to back wheel. Low-moor iron solid forks. Stanley head, $3\frac{1}{2}$ -in. centres. 22-in. x $5\frac{1}{2}$ -in. ebony handles. $1\frac{1}{4}$ -in. 14 W.G. steel backbone. Bolted sliding spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	8	10	0	52-in.	10	0	0
48-in.	9	0	0	54-in.	10	10	0
50-in.	9	10	0	56-in.	11	0	0

Extras. All bright, 15/-

Remarks. Of sound material and fair build, well suited for beginners (*see advertisement*).

COVENTRY PERFECTION HOLLOW FORK.

TIMMS & Co., East Street Works.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12, direct spokes. 16-in. back wheel. $6\frac{1}{2}$ -in. x $4\frac{3}{8}$ -in. G.M. hubs. Detachable cranks, $4\frac{1}{4}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Paragon roller bearings. Cones to back and pedals. Elliptical hollow front forks, solid back. Humber head, $3\frac{1}{2}$ -in. centres. 22-in. x $5\frac{1}{4}$ -in. horn handles. $1\frac{1}{8}$ -in. 12 W.G. steel backbone. Bolted

COVENTRY—CONTINUED.

sliding spring. Woolley's patent saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	0	0	52-in.	12	10	0
48-in.	11	10	0	54-in.	13	0	0
50-in.	12	0	0	56-in.	13	10	0

Extras. All bright, 15/- Plated, 25⁰/₀

Remarks. Well put together for all-round work (see advertisement).

COVENTRY STAR.

W. HOSIER & Co., Smithford Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11, and 12, direct spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, 5-in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow forks. Humber head, 3 $\frac{1}{2}$ -in. centres. 24in. x 5-in. horn handles. 1 $\frac{3}{8}$ -in. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

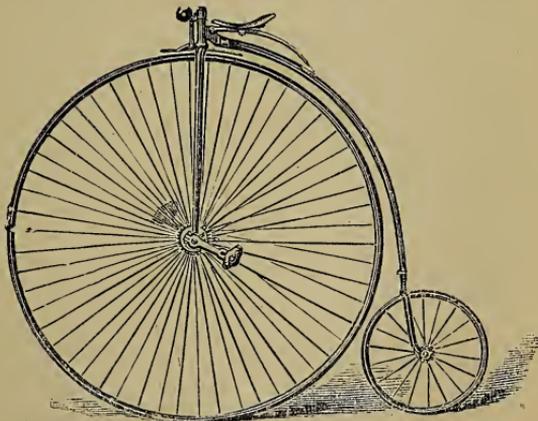
	£	s.	d.		£	s.	d.
46-in.	12	10	0	52-in.	13	5	0
48-in.	12	15	0	54-in.	13	10	0
50-in.	13	0	0	56-in.	14	0	0

Extras. All bright, 30/- Ball pedals, 40/- Plated all over, 40/-

Remarks. Sent out with head, neck, handles, and spring plated. A good machine for the money.

COVENTRY TRIUMPH No. 1.

WARMAN, LAXON & ASLATT, Victoria Works and Albion Mills, West Orchard.



COVENTRY TRIUMPH No. 1.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. No. 10, inch scale, direct spokes. 18-in. back wheel. 5-in. x 4-in. iron hubs. Detachable cranks, 4 $\frac{1}{2}$ -in. to 6-in. throw. Rubber pedals. Parallel bearings to front,

COVENTRY—CONTINUED.

cones to back wheel. Solid iron forks. Humber head, 3-in. centres. 22-in. x 4½-in. horn handles. 1½-in. steel backbone. Shackle slide spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

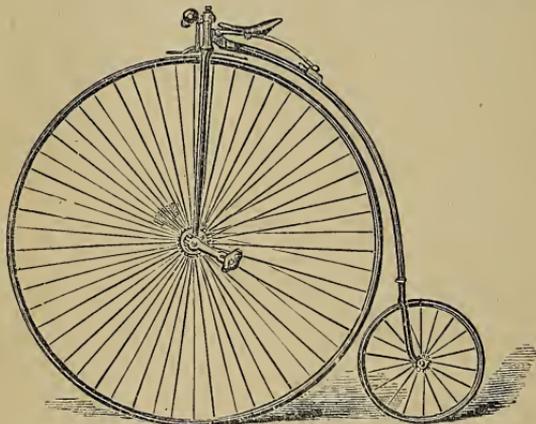
	£	s.	d.		£	s.	d.
46-in.	12	0	0	52-in.	13	10	0
48-in.	12	10	0	54-in.	14	0	0
50-in.	13	0	0	56-in.	14	10	0

Extras. All bright, 30/-

Remarks. Sound material, and reliable as a roadster (*see advertisement*).

COVENTRY TRIUMPH No. 2.

WARMAN, LAXON & ASLATT, Albion Mills, West Orchard.



COVENTRY TRIUMPH No. 2.

Description. 7⁄8-in. and ¾-in. red rubbers. Crescent steel rims. 44 and 18, No. 12, lock-nutted spokes. 18-in. back wheel. 5½-in. x 3½-in. iron hubs. Fixed cranks, 4-in. to 5½-in. throw. Rubber pedals. Parallel bearings to front, cones to back wheel. Lowmoor iron solid forks. Stanley head, 3-in. centres. 22-in. x 4-in. ebony handles. 1¼-in. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.
46-in. to 48-in.	10	0	0
50-in. to 56-in.	10	10	0

Extras. All bright, 30/-

Remarks. A cheap and strong machine (*see advertisement*).

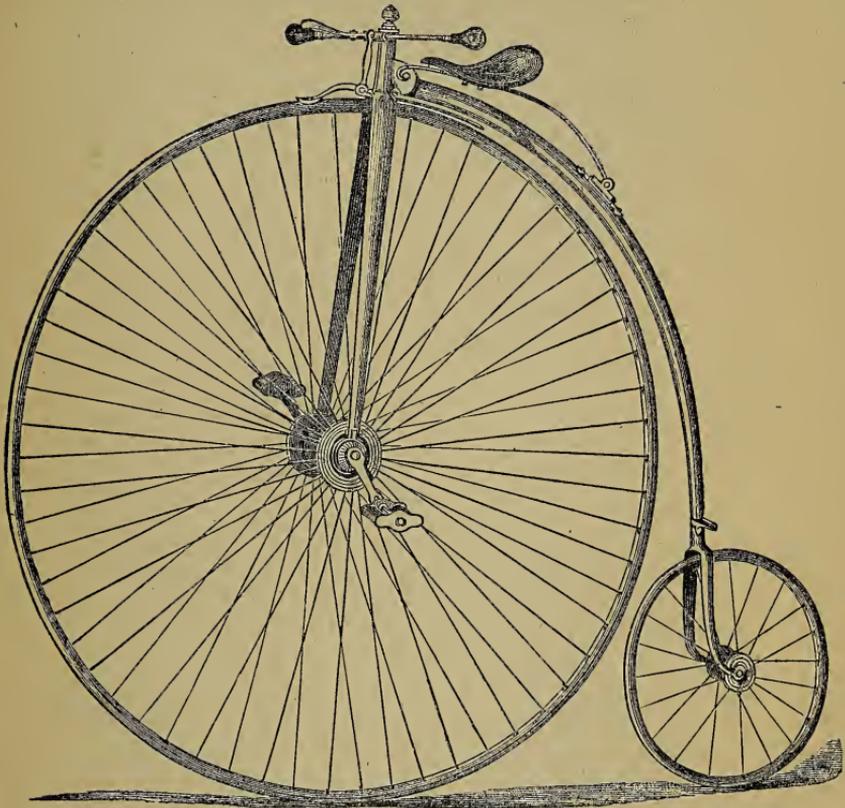
COVENTRY ZEPHYR.

ZEPHYR BICYCLE & TRICYCLE Co., Lower Ford Street.

Description. 7⁄8-in. and ¾-in. red rubbers. Crescent steel rims. 60 and 20, No. 11, charcoal iron direct spokes. 16-in. back wheel. 6-in. x 4½-in. G.M. hubs. Detachable cranks, 4-in. to 5½-in. throw. Rubber pedals. Parallel

COVENTRY—CONTINUED.

bearings to front, dust-proof cones to back wheel. Elliptical hollow forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. Long D.L.S. brake. Leg-guard. Flat wrench. Oilcan.



COVENTRY ZEPHYR.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	13	10	0	52-in.	..	..	..	14	10	0
48-in.	..	..	..				54-in.	..	..	..	15	0	0
50-in.	..	..	..				56-in.	..	..	..	15	10	0

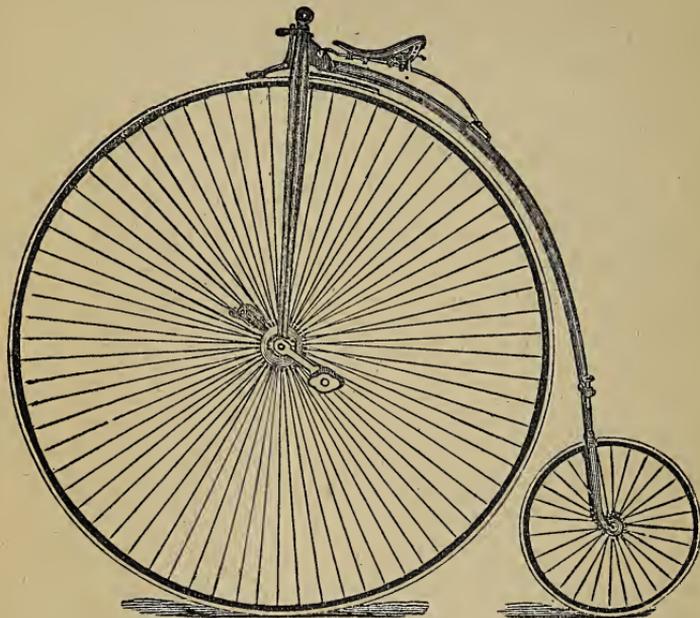
Extras. All bright, 30/- Plated, 90/- Balls to front wheel, 25/- Ditto back, 20/-

Remarks. Workmanship and material of best quality. A highly-finished and really cheap machine, made with considerable care. Makes a good roadster (*see advertisement*).

COVENTRY—CONTINUED.

DOUBLE FLUTED HOLLOW FORK CENTAUR.

CENTAUR BICYCLE Co., West Orchard Works.



DOUBLE FLUTED HOLLOW FORK CENTAUR.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 64 and 24, No. 11, butt-ended direct spokes. 16-in. back wheel. 6-in. x $4\frac{3}{4}$ -in. G.M. hubs. Detachable cranks, 5-in. to 6-in. throw. Rubber pedals. Double ball bearings to front, adjustable taper pin to back wheel. Fluted hollow (Centaur section) forks. Open centre head, $4\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. 14 W.G. steel backbone. Bolted Centaur slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Centaur section forks (page 39). Centaur adjustable step, extra (page 63). Centaur moveable saddle, extra (page 65).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	16	0	0
48-in.	15	0	0	54-in.	16	10	0
50-in.	15	10	0	56-in.	17	0	0

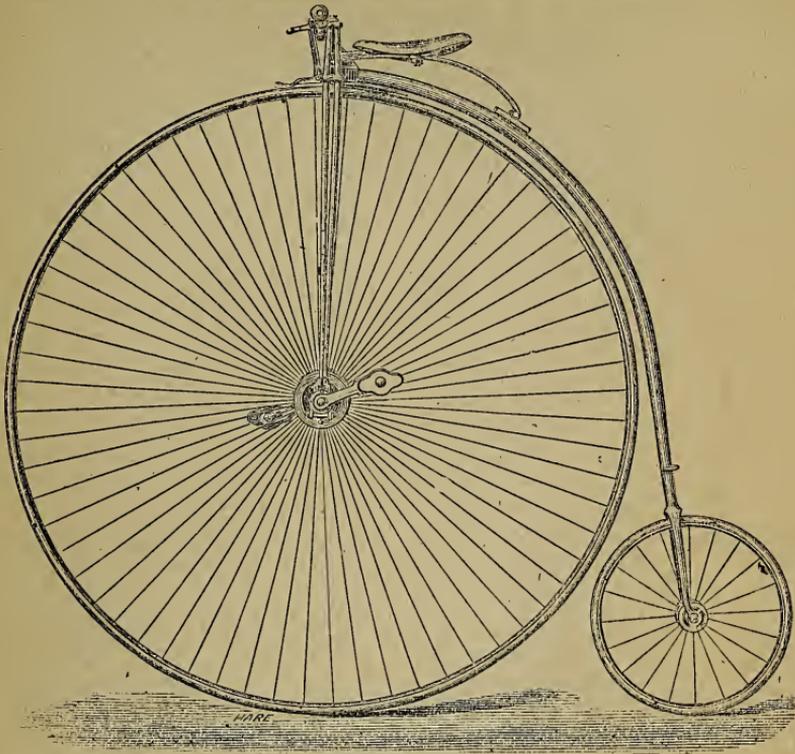
Extras. All bright, 20/- Balls to back wheel, 12/- Adjustable step, 2/6. Moveable saddle, 10/- Plated, £5. Ball pedals, 20/-

Remarks. Still the company's speciality. Strong, rigid, and elegant; it makes a fine roadster (see advertisement).

COVENTRY—CONTINUED.

D.H.F. PREMIER.

HILLMAN, HERBERT & COOPER, Premier Works.



D.H.F. PREMIER.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers, Crescent steel rims. 60 and 20-No. 12, butt-ended direct spokes. 16-in. back wheel. $5\frac{3}{4}$ -in. G.M. hubs. Hillman's detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings. Cones to back wheel. Double hollow forks. Open centre head. $5\frac{1}{2}$ -in. centres. 24-in. x $5\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Double hollow forks (page 39). Hillman's adjustable ball bearings, extra (page 30). Patent ball pedals, extra (page 19). Duplex spring, extra (page 60). Hillman's adjustable step, extra (page 67).

PRICES.

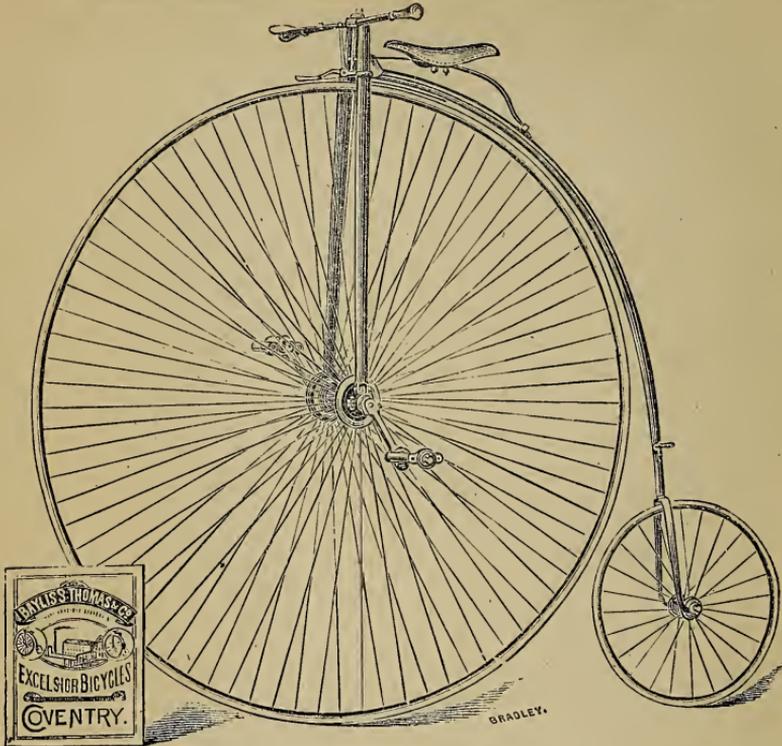
	£	s.	d.		£	s.	d.
46-in.	14	0	0	52-in.	15	10	0
48-in.	14	10		54-in.	16	0	0
50-in.	15	0	0	56-in.	16	10	0

Extras. All bright, 30/- Ball bearings, 20/- Balls to back wheel, 15/ Duplex spring, 10/- Ball pedals, 30/- Adjustable step, 3/-

Remarks. A very highly finished and genuine machine. Thoroughly well made throughout, and reliable, both as a roadster or racer (see advertisement).

COVENTRY—CONTINUED.**DUPLEX EXCELSIOR.**

BAYLISS, THOMAS & Co., Excelsior Works, Lower Ford Street.



DUPLEX EXCELSIOR

Description. 1-in. and $\frac{3}{4}$ -in. red rubbers. U V rims. 60 and 24, No. 11, nipped spokes. 18-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. steel hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Coned bearings throughout. Lowmoor iron solid forks. Open centre head, 5-in. centres. 24-in. x $5\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	10	0	52-in.	15	0	0
48-in.	14	0	0	54-in.	15	10	0
50-in.	14	10	0	56-in.	16	0	0

Remarks. A sound, strong, roadster for rough work. An old favourite, but now somewhat eclipsed by the hollow fork machines (see advertisement).

DUPLEX EXCELSIOR HOLLOW FORK RACER.

BAYLISS, THOMAS & Co., Excelsior Works, Lower Ford Street.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 80 and 24, No. 13, butt-ended direct spokes. 18-in. back wheel. 5-in. x 5-in. bell-metal hubs.

COVENTRY—CONTINUED.

Detachable cranks, 4-in. to 4½-in. throw. Rat-trap pedals. Double ball bearings. Balls to back wheel. Elliptical hollow forks. Open centre head, 5-in. centres. 24-in. x 5¼-in. horn handles. 1½-in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. Leg-guard. Flat wrench. Oilcan.

Specialities. Hollow forks running right to the handle-bar.

PRICES.

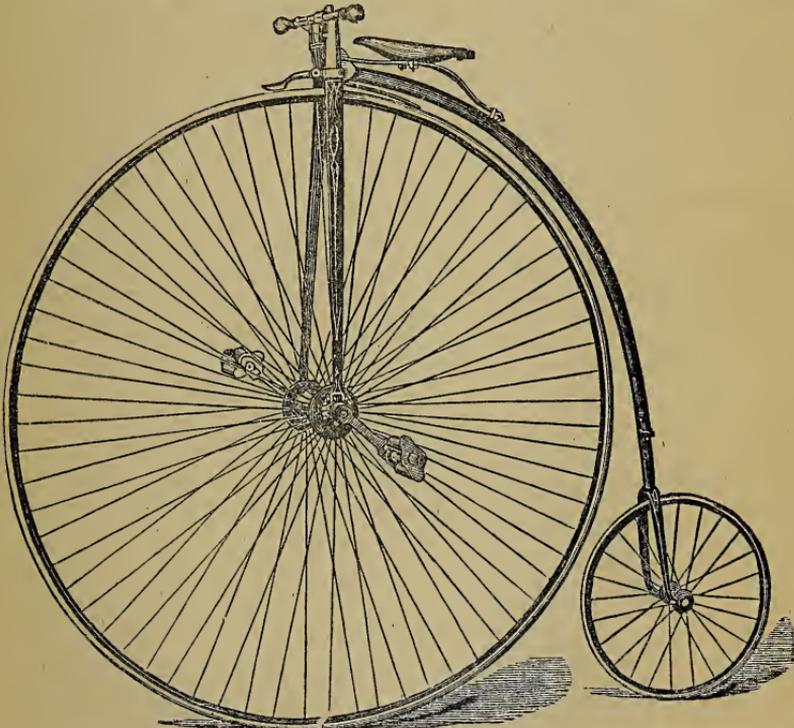
			£	s.	d.				£	s.	d.
46-in.	..	..	14	10	0	52-in.	..	..	16	0	0
48-in.	..	..	15	0	0	54-in.	..	..	16	10	0
50-in.	..	..	15	10	0	56-in.	..	..	17	0	0

Extras. All bright, 30/- Bright parts plated, 40/- All plated except rims, 90/-

Remarks. Thoroughly well made throughout, and nicely finished. Has done some good work on the path, and is especially successful on grass courses (*see advertisement*).

DUPLEX EXCELSIOR HOLLOW FORK ROADSTER.

BAYLISS, THOMAS & Co., Excelsior Works, Lower Ford Street.



D.E.H.F. ROADSTER.

Description. 1-in. and ¾-in. red rubbers. U V rims. 60 and 24, No. 11, butt-ended direct spokes. 18-in. back wheel. 5½-in. x 4½-in. bell-metal hubs. Detachable cranks, 4½-in. to 5½-in. throw. Rubber pedals. Double ball bearings. Balls to back wheel. Elliptical hollow forks. Open centre head, 5-in. centres.

COVENTRY—CONTINUED.

24-in. x 5½-in. horn handles. 1½-in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Forks and head in one.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	16	0	0
48-in.	15	0	0	54-in.	16	10	0
50-in.	15	10	0	56-in.	17	0	0

Extras. All bright, 30/- Part plated, 40/-

Remarks. Sound material and good fitting and finish combine to make a reliable machine, eminently adapted for all-round road work and touring purposes (see advertisement).

DUPLEX EXCELSIOR HOLLOW FORK SEMI-RACER.

BAYLISS, THOMAS & Co., Excelsior Works, Lower Ford Street.

Description. ⅞-in. and ¾-in. non-slipping grey and red rubbers. Crescent steel rims. 80 and 26. No. 13, butt-ended direct spokes. 18-in. back wheel. 5½-in. x 4½-in. bell-metal hubs. Detachable cranks. 4½-in. to 5½-in. throw. Rubber pedals. Double ball bearings. Elliptical hollow forks. Open centre head, 5-in. centres. 24-in. horn handles. 1½-in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Front forks.

PRICES.

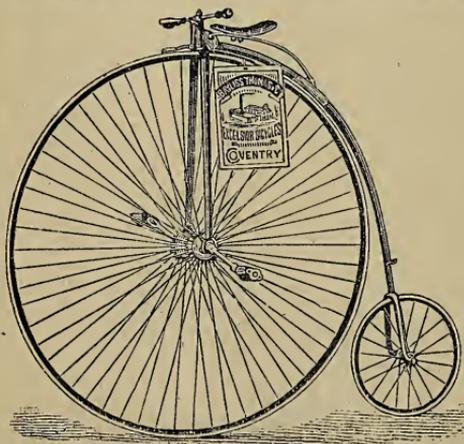
	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	16	0	0
48-in.	15	0	0	54-in.	16	10	0
50-in.	15	10	0	56-in.	17	0	0

Extras. All bright, 30/-

Remarks. An excellent light roadster (see advertisement).

EXCELSIOR No. 1.

BAYLISS, THOMAS & Co, Excelsior Works, Lower Ford Street.



EXCELSIOR No. 1.

COVENTRY—CONTINUED.

Description. 1-in. and $\frac{3}{4}$ -in. red rubbers. U V rims. 60 and 20, No. 11, direct steel spokes. 18-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. steel hubs. Detachable, cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Coned bearings throughout. Lowmoor iron elliptical solid forks. Stanley head, $4\frac{1}{2}$ -in. centres. 24-in. x $5\frac{1}{2}$ -in. horn handles. $1\frac{1}{4}$ -in. 14 W.G. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	10	0	52-in.	13	0	0
48-in.	12	0	0	54-in.	13	10	0
50-in.	12	10	0	56-in.	14	0	0

Extras. All bright, 30/-

Remarks. A sound machine at a moderate price.

EXCELSIOR No. 2.

BAYLISS, THOMAS & Co., Excelsior Works, Lower Ford Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. grey rubbers. U V rims. 60 and 20, No. 11, direct spokes. 18-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. iron hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Coned bearings throughout. Solid iron forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. 14 W.G. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	9	10	0	52-in.	11	0	0
48-in.	10	0	0	54-in.	11	10	0
50-in.	10	10	0	56-in.	12	0	0

Extras. All bright, 30/-

Remarks. A good machine for common work.

EXCELSIOR No. 3.

BAYLISS, THOMAS & Co., Excelsior Works, Lower Ford Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. grey rubbers. U V rims. 50 and 20, No. 11, direct spokes. 18-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. iron hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Coned bearings throughout. Solid iron forks. Stanley head, $4\frac{1}{2}$ -in. centres. 24-in. ebony handles. Steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in... ..	8	10	0	52-in.	9	0	0
48-in... ..				54-in.			
50-in... ..				56-in.			

Extras. All bright, 30/-

Remarks. Strong and cheap.

COVENTRY—CONTINUED.**FLEET.**

SETTLE & Co., Fleet Works, Fleet Street.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12, butt-ended direct steel spokes. 16-in. back wheel. 6-in. x 5-in. phosphor-bronze hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Double ball bearings. Balls to back wheel and pedals. Elliptical hollow forks. Dust-proof Humber head, $3\frac{3}{4}$ -in. centres. 26-in. x 4-in. horn handles. $1\frac{3}{8}$ -in. weldless steel backbone. Bolted patent slide spring. Suspension saddle. Saw step. Flat wrench. Oilcan.

Specialities. Design of back wheel and pedal bearings. Spring slide (page 57).

PRICES.

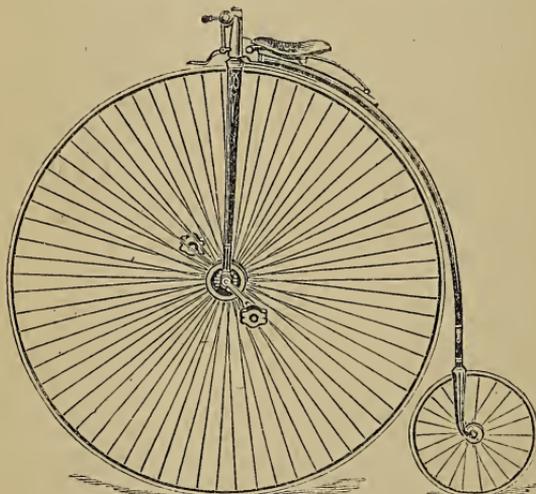
	£	s.	d.		£	s.	d.
46-in.	16	0	0	52-in.	16	15	0
48-in.	16	5	0	54-in.	17	0	0
50-in.	16	10	0	56-in.	17	5	0

Extras. All bright, 40/- Plated, £3. Rims plated, 10/-

Remarks. Material, fitting and finish all of the best, every part thoroughly hard. Can be relied on as a light roadster and semi-racer (see advertisement).

GRAND.

SETTLE & Co., Fleet Works, Fleet Street.

**GRAND.**

Description. $\frac{5}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12, butt-ended direct steel spokes. 16-in. back wheel. 6-in. x 5-in. phosphor-bronze hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Settle's patent pedals. Double ball bearings, balls to front, balls to back wheel and pedals. Elliptical hollow forks, Dust-proof Humber head, $4\frac{1}{4}$ -in. centres. 24-in. x $4\frac{3}{8}$ -in. horn handles. $1\frac{3}{8}$ -in. weldless steel backbone. Bolted patent slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

COVENTRY—CONTINUED.

Specialities. Patent pedals (page 16). Spring slide (page 57). Adjustable step, to order (page 69). Pedal and back wheel bearings.

PRICES.

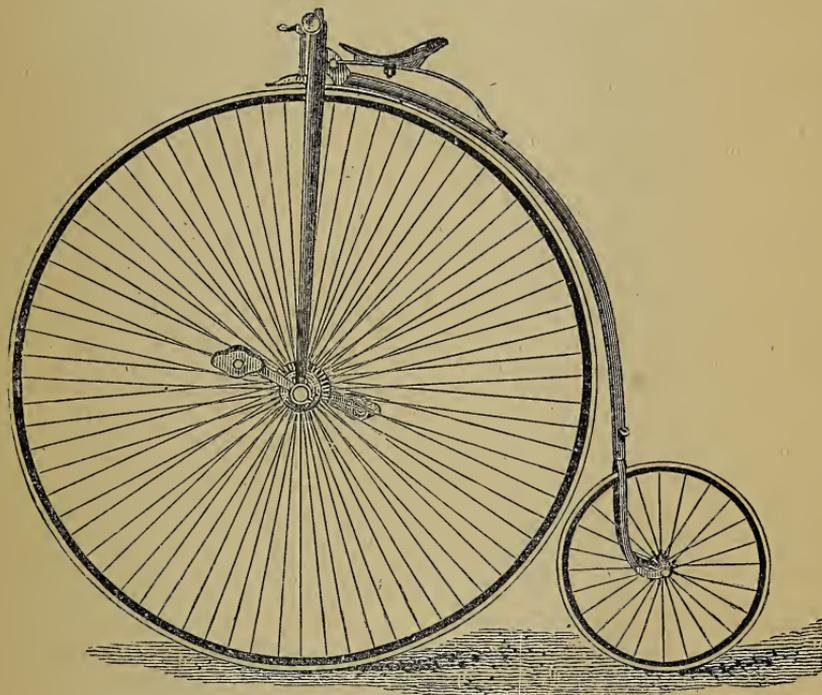
£ s. d.				£ s. d.			
46-in.	17	0	0	52-in.	17	15	0
48-in.	17	5	0	54-in.	18	0	0
50-in.	17	10	0	56-in.	18	5	0

Extras. All bright, 40/- Plated, £3.

Remarks. All usual bright parts are plated, and the machine can be relied on for quality of material and workmanship, every part being excellently fitted. It runs very nicely, and is a handsome roadster (see advertisement).

HOLLOW FORK SPECIAL TRIUMPH.

WARMAN, LAXON & ASLATT, Albion Mills, West Orchard.



HOLLOW FORK SPECIAL TRIUMPH.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 72 and 24, No. 13, direct steel spokes. 18-in. back wheel. $6\frac{1}{2}$ -in. by $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $6\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings. Elliptical hollow forks. Open centre head, 4-in. centres. 22-in. x $5\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone Bolted shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Detachable cranks.

COVENTRY—CONTINUED.

PRICES.

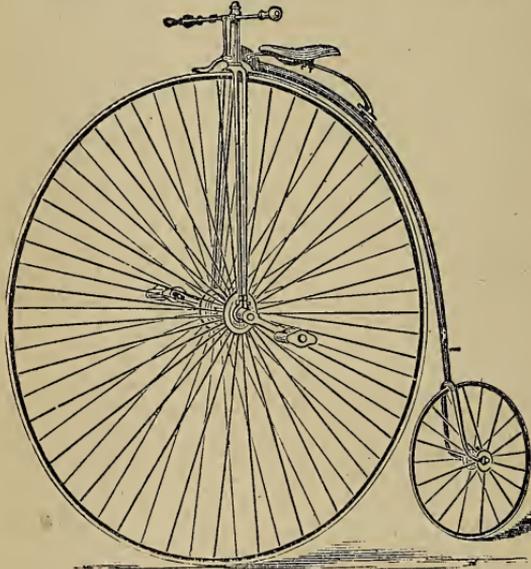
	£	s.	d.		£	s.	d.
46-in.	14	0	0	52-in.	15	10	0
48-in.	14	10	0	54-in.	16	0	0
50-in.	15	0	0	56-in.	16	10	0

Extras. All bright, 30/- Plated, £3.

Remarks. This is a sound and well-made roadster, fit for all-round work (see advertisement).

IMPERIAL CHALLENGE.

SINGER & Co., Challenge Works, Alma Street.



IMPERIAL CHALLENGE.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, butt-ended direct spokes. 18-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, 4-in. to 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Green's ball bearings. Cones to back wheel and pedals. Double hollow forks. Humber head, 4-in. centres. 24-in. x 5-in. horn handles. 1 $\frac{3}{8}$ -in. steel backbone. Bolted barrel slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. 2 flat wrenches. Oilcan.

Specialities. Green's ball bearings (page 33). Double hollow forks to Stanley head (page 39). Challenge wrench, extra (page 77).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	15	0	0	52-in.	16	10	0
48-in.	15	10	0	54-in.	17	0	0
50-in.	16	0	0	56-in.	17	10	0

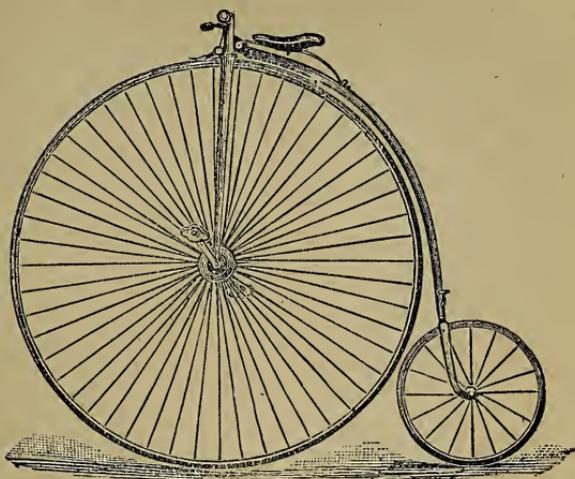
Extras. All bright, 40/- Plated, bright parts, 35/- All plated, 90/- Balls to back wheel, 20/- ; to pedals, 25/- 1-in. tyres, 10/-

Remarks. A neat, strong roadster, containing good work and sound material. Messrs. Singer's chief pattern last season (see advertisement).

COVENTRY—CONTINUED.

NEW GENTLEMAN'S.

COVENTRY MACHINISTS' Co., LIMITED, Cheylesmore.



NEW GENTLEMAN'S.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 56 and 16, No. 13, direct spokes. 17-in. back wheel. $5\frac{1}{4}$ -in. x 4-in. B.B. iron hubs. Fixed cranks, 4-in. to 5-in. throw. Rubber pedals. Single ball bearings to front, dust-proof cones to back wheel. Humber head, 3-in. centres. 24-in. horn handles. $1\frac{1}{4}$ in. backbone. Bolted sliding spring. Pigskin saddle. Round step. D.L.S. brake. Leg-guard. Handy wrench. Oilcan.

Specialities. Dust-proof cones (page 35). Club single balls (*addenda*).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	0	0	52-in.	12	10	0
48-in.	11	10	0	54-in.	13	0	0
50-in.	12	0	0	56-in.	13	10	0

Remarks. This is a strong, sound machine. No deviations are made from standard patterns for anyone (*see advertisement*).

PEOPLE'S CHALLENGE.

SINGER & Co., Challenge Works, Alma Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, butt-ended direct spokes. 18-in. back wheel. G.M. hubs. Detachable cranks. Rubber pedals. Ball bearings to front, cones to back wheel. Solid iron forks. Humber head, 4-in. centres. 24-in. ebony handles. $1\frac{3}{8}$ -in. steel backbone. Bolted Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Two flat wrenches. Oilcan.

Specialities. "Not sold by weight." This is a speciality with all Messrs. Singer's machines,

COVENTRY—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	10	0	52-in.	14	0	0
48-in.	13	0	0	54-in.	14	10	0
50-in.	13	10	0	56-in.	15	0	0

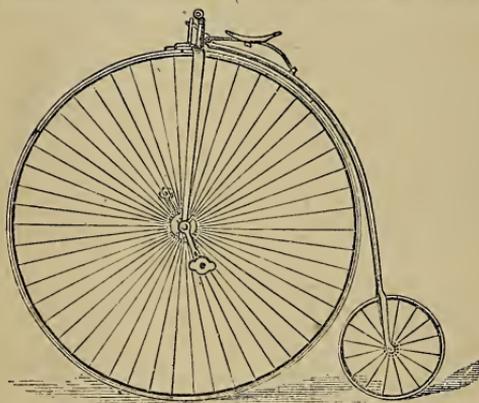
Extras. All bright, 40/- Part plated, 35/- All plated, 90/- Ball bearings, 20/-
Remarks. A sound, strong roadster, at a moderate price (*see advertisement*).

PONY.

(See "Peculiar Bicycles.")

PREMIER No. o.

HILLMAN, HERBERT & COOPER, Premier Works.



PREMIER No. 0.

Description. $\frac{3}{4}$ -in. and $\frac{3}{8}$ -in. grey rubbers. Crescent steel rims. 64 and 20, No. 12, direct spokes. 17-in. back wheel. $5\frac{3}{8}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings. Cones to back wheel. Elliptical solid forks. Hillman's patent head, 5-in. centres. 24-in. x $5\frac{1}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Hillman's patent head (*page 47*).

PRICES.

	£	s.	d.
46-in. to 54-in.	10	0	0
56-in.	10	10	0

Extras. All bright, 10/- Plated, 50/- Ball bearings, 25/- Holdfast cranks, 7/6.

Remarks. A remarkably cheap machine (*see advertisement*).

QUEEN.

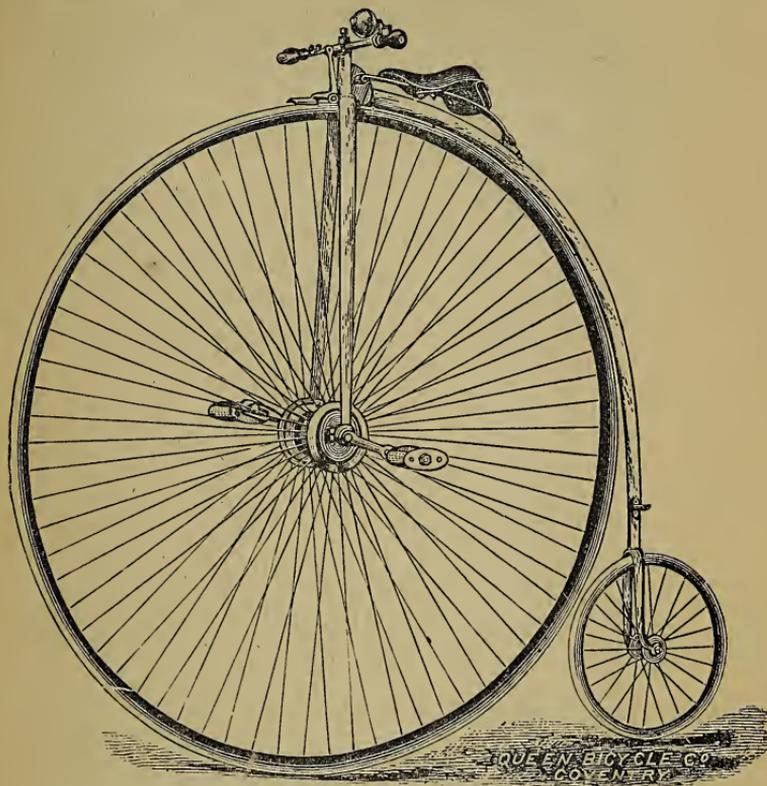
QUEEN BICYCLE Co., Railway Approach.

Description. $\frac{1}{8}$ -in. and $\frac{9}{16}$ -in. non-slipping red rubbers. D.S.H. steel rims. 80 and 20 tapered direct steel spokes. 16-in. back wheel. 6-in. x 6-in. G.M. hubs. Detachable cranks, 4-in. to $5\frac{1}{4}$ -in. throw. Rubber pedals. Rudge's ball bearings throughout. Elliptical hollow forks, Humber head, $5\frac{1}{2}$ -in. centres. 26-in.

COVENTRY—CONTINUED.

horn handles. Large oval steel backbone. "Queen" coil and slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Champion wrench. Oilcan. Bell. Valise.

Specialities. Queen spring (page 59).



QUEEN.

PRICE.

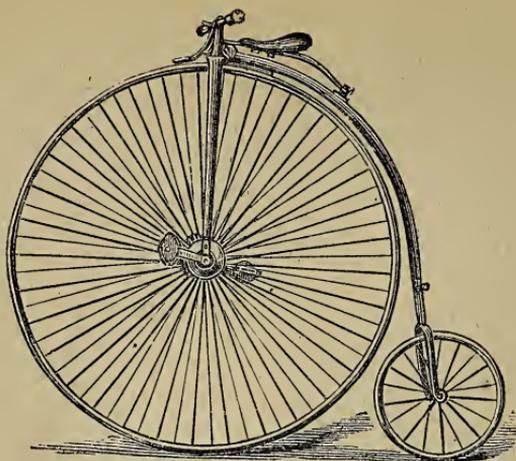
All sizes £21 0 0

Remarks. This is a very fine and light machine, sent out nickel-plated all over, except rims, without extra charge (see advertisement).

RIVAL TRIUMPH.

WARMAN, LAXON & ASLATT, Albion Mills, West Orchard.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 72 and 20, No. 13, direct steel spokes. 16-in. back wheel. $6\frac{1}{4}$ -in x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Bown's Æolus ball bearings. Elliptical hollow front forks, semi-tubular back. Humber head, $4\frac{3}{4}$ -in. centres. 22-in. x 5-in. horn handles. $1\frac{3}{4}$ -in. steel backbone. Bolted shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

COVENTRY—CONTINUED.

RIVAL TRIUMPH.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	16	0	0
48-in.	15	0	0	54-in.	16	10	0
50-in.	15	10	0	56-in.	17	0	0

Extras. All bright, 30/- Plated, £3.

Remarks. This is built on the lines of the "Rudge," and is well put together and neatly finished, forming a nice light roadster, and being the firm's specialité for 1881 (see advertisement).

ROYAL CHALLENGE.

SINGER & Co., Challenge Works, Alma Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, butt-ended direct spokes. 18-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Green's ball bearings. Cones to back wheel and pedals. Elliptical hollow front forks, solid back. Humber head, 4-in. centres. 24-in. horn handles. 1 $\frac{3}{8}$ -in. steel backbone. Bolted barrel slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. 2 flat wrenches. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	16	0	0
48-in.	15	0	0	54-in.	16	10	0
50-in.	15	10	0	56-in.	17	0	0

Extras. All bright, 40/- Balls to back wheel, 20/- 1-in. tyres, 10/- Plated, 90/-

Remarks. A neat, strong roadster, of good material and finish. Has been well tried (see advertisement).

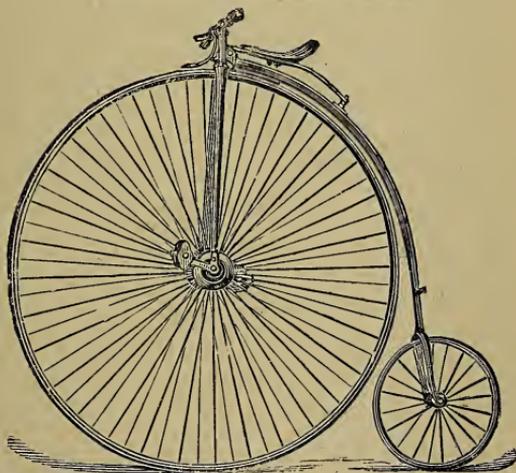
COVENTRY—CONTINUED.



ROYAL CHALLENGE;

RUDGE.

RUDGE & Co., Rudge Works.



RUDGE.

Description. $\frac{1}{2}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 80 and 24, No. 13, direct steel spokes. 17-in. back wheel. Phosphor-bronze hubs. Fixed cranks. Rubber pedals. Rudge's ball bearings throughout. Elliptical hollow forks. Rudge head, 4-in. centres. 26-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Rudge's ball bearings (page 32).

COVENTRY—CONTINUED.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	15	0	0	52-in.	..	..	15	15	0
48-in.	..	..	15	5	0	54-in.	..	..	16	0	0
50-in.	..	..	15	10	0	56-in.	..	..	16	5	0

Extras. All bright, 20/-

Remarks. A finely finished, handsome machine. Eminent as a racer. Both the one mile professional championships of England and the World for 1881 were won upon one.

SETTLE.

SETTLE & Co., Fleet Works, Fleet Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 11, butt-ended direct steel spokes. 18-in. back wheel. 6-in. x 5-in. phosphor-bronze hubs. Detachable cranks, $4\frac{1}{4}$ -in. to $5\frac{1}{2}$ -in. throw. Double rubber pedals. Double ball bearings to front, cones to rear wheel and pedals. Elliptical hollow forks. Dust-proof Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x $4\frac{3}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted patent slide spring. Suspension saddle. Saw step. D.L.S. Brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Double rubber pedals (page 16). Patent spring slide (page 57).

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	15	0	0	52-in.	..	..	15	15	0
48-in.	..	..	15	5	0	54-in.	..	..	16	0	0
50-in.	..	..	15	10	0	56-in.	..	..	16	5	0

Extras. All bright, 40/-

Remarks. A machine for rough general road work. It is thoroughly reliable being put together with very great care, of only best material. All bright parts are plated (see advertisement).

STANLEY EXCELSIOR HOLLOW FORK SEMI-RACER.

BAYLISS, THOMAS & Co., Excelsior Works, Lower Ford Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. non-slipping grey and red rubbers. Crescent steel rims. 80 and 26, No. 13, butt-ended direct spokes. 18-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Ball bearings. Elliptical hollow forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

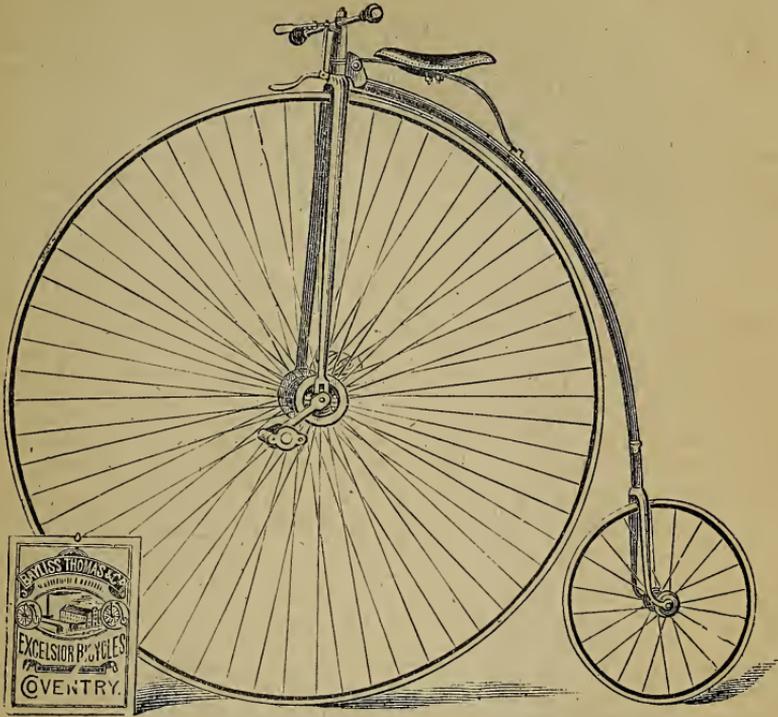
PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	14	10	0	52-in.	..	..	16	0	0
48-in.	..	..	15	0	0	54-in.	..	..	16	10	0
50-in.	..	..	15	10	0	56-in.	..	..	17	0	0

Extras. All bright, 30/- All plated, except rims, 90/-

Remarks. Usual bright parts plated. A fine machine for general road work and occasional racing. Thoroughly well built.

COVENTRY—CONTINUED.



STANLEY EXCELSIOR HOLLOW FORK SEMI-RACER.

STANLEY EXCELSIOR HOLLOW FORK ROADSTER.

BAYLISS, THOMAS & Co., Excelsior Works, Lower Ford Street.

Description. 1-in. and $\frac{3}{4}$ -in. red rubbers. U V rims. 60 and 20, No. 11, butt-ended direct spokes. 18-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. bell-metal hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings. Balls to back wheel. Elliptical hollow forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x $5\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

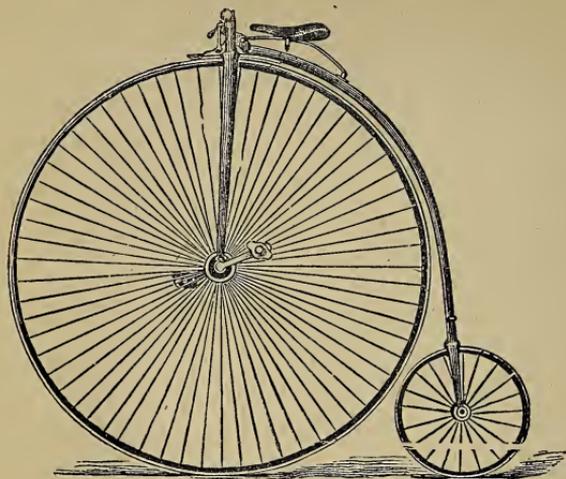
			£	s.	d.				£	s.	d.
46-in.	..	..	14	10	0	52-in.	..	..	16	0	0
48-in.	..	..	15	0	0	54-in.	..	..	16	10	0
50-in.	..	..	15	10	0	56-in.	..	..	17	0	0

Extras. All bright, 30/- Part plated, 40/-

Remarks. A sound, reliable, and handsome roadster, thoroughly well put together, and fit for rough work.

COVENTRY—CONTINUED.**S.H.F. PREMIER.**

HILLMAN, HERBERT & COOPER, Premier Works.



S.H.F. PREMIER.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 64 and 24, No. 12, direct spokes. 16-in. back wheel. $5\frac{3}{4}$ -in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings. Cones to back wheel. Elliptical hollow forks. Hillman's patent head, 5-in. centres. 24-in. x $5\frac{1}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Hillman's patent head (page 48). Hillman's ball pedals, extra (page 19). Hillman's ball bearings, extra (page 28). Duplex spring, extra (page 60). Adjustable step, extra (page 67).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	0	0	52-in.	14	10	0
48-in.	13	10	0	54-in.	15	0	0
50-in.	14	0	0	56-in.	15	10	0

Extras. All bright, 30/- Other extras same as for D.H.F.

Remarks. A fine, handsome, well-made machine, only differing from the D.H.F. in the head and forks (see advertisement).

SPECIAL.

HOSIER & Co., Smithford Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, butt-ended direct spokes. 18-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. solid hubs. Fixed cranks, 5-in. throw. Rubber pedals. Parallel bearings. Cones to back wheel. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x $4\frac{1}{2}$ -in. ebony handles. $1\frac{3}{8}$ -in. steel backbone. Bolted sliding spring. Pigskinsaddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

COVENTRY—CONTINUED.

PRICE.

All sizes £10 10 0

Extras. All bright, 30/- ; plating, 40/-

Remarks. Strong and serviceable, all wearing parts well hardened.

SPECIAL CENTAUR No. 1.

CENTAUR BICYCLE Co., West Orchard Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 64 and 24, No. 11, butt-ended direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. steel hubs. Detachable cranks, 5-in. to 6-in. throw. Rubber pedals. Double ball bearings to front, taper pin to back wheel. Lowmoor iron elliptical solid forks. Open centre head, 5-in. centres. 24-in. x $5\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. 14 W.G. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Centaur detachable cranks.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	0	0	52-in.	14	10	0
48-in.	13	10	0	54-in.	15	0	0
50-in.	14	0	0	56-in.	15	10	0

Extras. All bright, 20/- Other extras same as Double Fluted Hollow Fork.

Remarks. A sound, strong machine for general road wear (see advertisement).

SPECIAL CHALLENGE.

SINGER & Co., Challenge Works, Alma Street.



SPECIAL CHALLENGE.

COVENTRY—CONTINUED.

Description. 1-in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20. Nos. 11 and 12, butt-ended direct spokes. 18-in. back wheel. 6-in. x 5-in. iron hubs. Detachable cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Challenge rolling bearings to front, cones to back wheel. Solid forks. Special centre head, $5\frac{1}{2}$ -in. centres. 24-in. ebony handles. $1\frac{3}{8}$ -in. steel backbone. Bow fronted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Two flat wrenches. Oilcan.

Specialities. Challenge rolling bearings (*page 28*). Special steering (*page 44*).

PRICES.

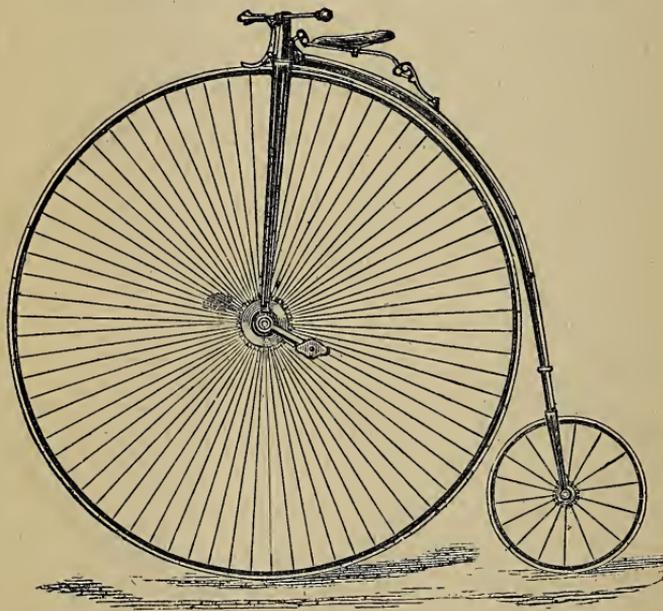
			£	s.	d.				£	s.	d.
46-in.	..	..	13	10	0	52-in.	..	..	15	0	0
48-in.	..	..	14	0	0	54-in.	..	..	15	10	0
50-in.	..	..	14	10	0	56-in.	..	..	16	0	0

Extras. All bright, 40/- Balls to front wheel, 25/-; to back, 20/-; to pedals, 25/-.

Remarks. A great favourite once, and still a strong, useful machine for rough parts of the country (*see advertisement*).

SPECIAL CLUB.

COVENTRY MACHINISTS' Co. (Limited), Cheylesmore.



SPECIAL CLUB.

Description. $\frac{3}{4}$ -in. and $1\frac{1}{16}$ -in. red rubbers. Club hollow rims. 64 and 16, No. 13, lock-nutted direct spokes. 17-in. back wheel. $5\frac{1}{4}$ -in. x $4\frac{1}{2}$ -in. B.B. iron hubs. Detachable cranks, 4-in. to 5-in. throw. Rubber pedals. Club double ball bearings to front wheel. Club back wheel balls. Fluted hollow forks. Dust

COVENTRY—CONTINUED.

proof Humber head, 3½-in. centres. 24-in. horn handles. 1½-in. 14 W.G. steel backbone. Patent rubber suspension spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Handy wrench. Oilcan.

Specialities. Club hollow felloes (*page 6*). Club spokes (*page 9*). Club ball bearings (*pages 30 and 37*). Suspension spring (*page 62*). Handy spanner (*page 77*).

PRICES.

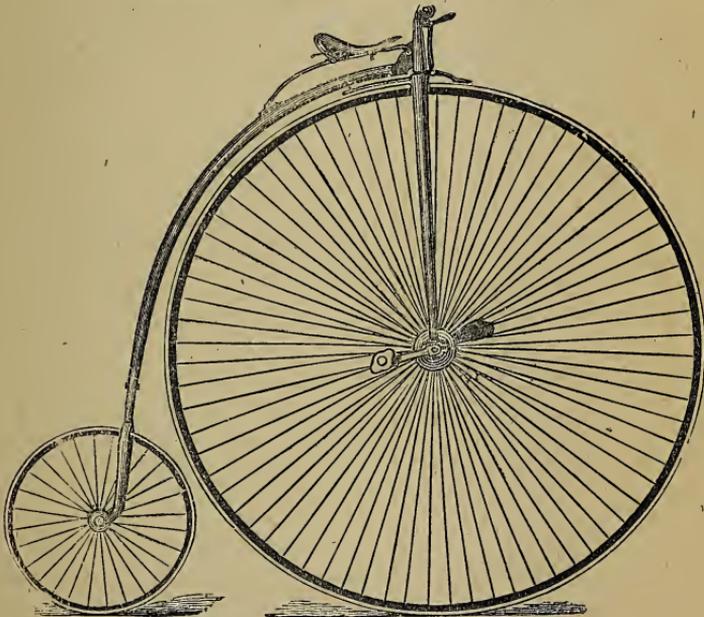
				£	s.	d.					£	s.	d.	
46-in.	}	17	0	0	52-in.	..	..	..	18	0	0
48-in.					54-in.	..	..	..	18	10	0
50-in.					56-in.	..	..	..	19	0	0

Extras. All bright, 40/- Plated entirely, 90/- Ball pedals, 10/- Non-slipping tyres, 5/-

Remarks. A very highly-finished machine. Well constructed and reliable, with several specialities (*see advertisement*). Specially designed as a light roadster.

SPECIAL HOLLOW FORK CENTAUR No. 2.

CENTAUR BICYCLE Co., West Orchard Works.



SPECIAL HOLLOW FORK CENTAUR No. 2.

Description. 7/8-in. and 3/4-in. red rubbers. Crescent steel rims. 64 and 24, No. 11, butt-ended direct spokes. 16-in. back wheel. 6-in. x 4½-in. G.M. hubs. Detachable cranks, 5-in. to 6in. throw. Rubber pedals. Double ball bearings. Taper pin to back wheel. Supported elliptical hollow forks.

COVENTRY—CONTINUED.

Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. 14 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	10	0	52-in.	15	0	0
48-in.	14	0	0	54-in.	15	10	0
50-in.	14	10	0	56-in.	16	0	0

Extras. All bright, 20/-

Remarks. A good and neatly-finished light roadster.

SPECIAL HOLLOW FORK COVENTRY PERFECTION.

TIMMS & Co., East Street Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12, butt-ended direct spokes. 16-in. back wheel. $6\frac{1}{2}$ -in. x $4\frac{3}{8}$ -in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow forks. Open centre head, $4\frac{1}{2}$ -in. centres. 22-in. x $5\frac{1}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. 12 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	10	0	52-in.	15	0	0
48-in.	14	0	0	54-in.	15	10	0
50-in.	14	10	0	56-in.	16	0	0

Remarks. Sent out all bright or painted. Strong, well-made, and fit for work (*see advertisement*).

SUN AND PLANET.

(*See "Peculiar Bicycles."*)

'XTRAORDINARY CHALLENGE.

(*See "Peculiar Bicycles."*)

BOY'S OWN.

COVENTRY MACHINISTS' Co., Limited, Cheylesmore.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 40 and 13 direct spokes. 14-in. back wheel. 4-in. x $3\frac{1}{2}$ -in. B.B. iron hubs. Fixed cranks, $4\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings. Cones to back wheel and pedals. Lowmoor iron solid forks. Humber head, 3-in. centres. 18-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. Leg-guard. Handy wrench. Oilcan.

Specialities. Handy wrench (*page 77*).

COVENTRY—CONTINUED.

PRICES.

				£	s.	d.					£	s.	d.
38-in.	..	..	..	7	10	0	42-in	..	..	..	8	10	0
40-in.	..	..	..	8	0	0	44-in	..	..	..	9	0	0

Remarks. No alterations from standard pattern allowed. A strong, useful little machine. Thoroughly well-made (see advertisement).

BOY'S PREMIER.

HILLMAN, HERBERT & COOPER, Premier Works.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. grey rubbers. Crescent steel rims. 50 and 18, No. 12, direct spokes. 14-in. back wheel. 5-in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings. Cones to back wheel and pedals. Solid forks. Humber head, $4\frac{1}{2}$ -in. centres. 20-in. x $5\frac{1}{4}$ -in. ebony handles. $1\frac{1}{2}$ -in. backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

				£	s.	d.					£	s.	d.
36-in.	..	..	..	6	10	0	42-in.	...	..	..	8	0	0
38-in.	..	..	..	7	0	0	44-in.	..	..	..	8	10	0
40-in.	..	..	..	7	10	0							

Extras. All bright, 10/-

Remarks. A useful, reliable article; will stand a lot of knocking about.

OUR BOY'S EXCELSIOR.

BAYLISS, THOMAS & Co., Excelsior Works.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. grey rubbers. U V rims. 40, No. 11, lock-nutted steel spokes. Solid hubs. Fixed cranks. Rubber pedals. C.ned throughout. Lowmoor iron forks. Stanley head. 20-in. horn handles. 1-in. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Flat wrench. Leg-guard. Oilcan.

PRICES.

				£	s.	d.
Up to 36-in.	..	..	..	6	10	0
„ 40-in.	..	..	..	7	0	0
„ 44-in.	..	..	..	7	10	0

Remarks. Really well and strongly made, and will bear any amount of rough and tumble work.

YOUTH'S TRIUMPH.

WARMAN, LAXON & ASLATT, Albion Mills, West Orchard.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. grey rubbers. V iron rims. No. 10, inch scale, direct spokes. 15-in. back wheel. Iron hubs. Fixed cranks. Iron three-sided pedals. Parallel bearings to front, cones to back wheel. Iron solid forks. Socket head. 18-in. ebony handles. $1\frac{1}{2}$ -in. backbone. Clip-tail spring. Pigskin saddle. Saw step. Leg-guard. Flat wrench. Oilcan.

PRICES.

				£	s.	d.
20-in. to 24-in.	..	..	..	2	5	0
26-in. to 30-in.	..	..	..	2	10	0
32-in. to 34-in.	..	..	..	4	4	0
36-in. to 40-in.	..	..	..	5	5	0

Remarks. Strongly built and cheap (see advertisement).

CROYDON, long so well-known in connection with the bicycle trade, has now almost ceased its connection therewith, there now only remaining two makers on a very small scale, who turn out five machines between them.

CROWN.

CROYDON BICYCLE Co., 108, North End.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. Lock-nutted spokes. Iron hubs. Slotted cranks. Rat-trap pedals. Coned throughout. Stanley head. Rosewood handles. Iron backbone. Bolted clip-tail spring. Pigskin saddle. Circular step. D.L.S. brake. Folding foot-rests. Lubricators. Valise. Wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	7	2	0	52-in.	7	14	0
48-in.	7	6	0	54-in.	7	18	0
50-in.	7	10	0	56-in.	8	2	0

Remarks. Nothing wonderful.

CROWN No. 2.

CROYDON BICYCLE Co., 108, North End.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. rubbers. Crescent rims. Lock-nutted spokes. Iron hubs. Slotted cranks. Rubber pedals. Roller bearings. Coned back wheel and pedals. Stanley head. Ebony handles. Iron tubular backbone. Bolted sliding spring. Pigskin saddle. Circular step. Valise. D.L.S. brake. Folding foot-rests. Lubricators. Wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	7	4	0	52-in.	7	16	0
48-in.	7	8	0	54-in.	8	0	0
50-in.	7	12	0	56-in.	8	4	0

Remarks. Much the same as No. 1, but has rollers.

CROWN No. 3.

CROYDON BICYCLE Co., 108, North End.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 68 direct action spokes. G.M. hubs. Slotted cranks. Rat-trap pedals. Roller bearings. Coned back and pedals. Humber head. Iron backbone. Bolted sliding spring. Pigskin saddle and valise. Circular step. D.L.S. brake. Folding foot-rests. Wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	7	14	0	52-in.	8	6	0
48-in.	7	18	0	54-in.	8	10	0
50-in.	8	2	0	56-in.	8	14	0

Remarks. Finished all bright.

PARADIGM.

ROBERT WICKS, Pitlake Bridge.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. grey rubbers. rims. Spokes nutted at both ends, somewhat similar to Grout's. G.M. hubs. Slotted cranks. Rubber

CROYDON—CONTINUED.

pedals. Coned bearings throughout. Stanley steering. Boxwood handles. Iron backbone. Bolted sliding spring. Pigskin saddle. D.L.S. brake. Circular step. Leg-guard. Wrench. Oilcan.

Specialities. Doubly-nutted spokes.

PRICES.

				£	s.	d.					£	s.	d.	
46-in.	10	15	0	|	52-in.	..	..	..	12	10	0
48-in.	11	10	0	|	54-in.	..	..	..	12	15	0
50-in.	12	0	0	|	56-in.	..	..	..	13	5	0

Extras. All bright, 20/-

Remarks. A very fair article.

SPECIAL CROWN.

CROYDON BICYCLE Co., 108, North End.

Description. 1-in. and $\frac{7}{8}$ -in. red rubbers. Crescent rims. Direct spokes. G.M. hubs. Detachable cranks. Rubber pedals. Roller bearings. Hollow forks. Stanley head. Horn handles. Steel backbone. Bolted spring. Pigskin saddle. Saw step. Wrench. Leg-guard. Oiler.

Specialities. Peculiar roller bearings and Crown spring.

PRICES.

				£	s.	d.					£	s.	d.	
46-in.	13	0	0	|	52-in.	..	..	..	14	10	0
48-in.	13	10	0	|	54-in.	..	..	..	15	0	0
50-in.	14	0	0	|	56-in.	..	..	..	15	10	0

Extras. Plated, £3 10/- Spokes only, £1.



DERBY has now two makers, who turn out three very neat light-class machines.

RAWSON RACER.

RAWSON & GREAVES, Midland Bicycle Works, Burton Road.

Description. $\frac{5}{8}$ -in. and $\frac{1}{2}$ -in. red rubbers. D.S.H. steel rims. 80 and 22, No. 13, direct steel spokes. 15-in. back wheel. $4\frac{1}{2}$ -in. x 4-in. G.M. hubs. Fixed cranks, $4\frac{3}{4}$ -in. throw. Rat-trap ball pedals. Plain steel bearings. Elliptical hollow front forks, semi-tubular back. Humber head, $3\frac{7}{8}$ -in. centres. 23-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. 16 W.G. steel backbone. Bolted shackle spring. Pigskin saddle. Saw step. Leg-guard. Two flat wrenches. Oilcan.

PRICES.

				£	s.	d.					£	s.	d.	
46-in.	12	10	0	|	52-in.	..	..	..	13	5	0
48-in.	12	15	0	|	54-in.	..	..	..	13	10	0
50-in.	13	0	0	|	56-in.	..	..	..	13	15	0

Extras. All bright, 10/- Balls to front wheel, 25/-; ditto, back, 10/-

Remarks. An excellent machine, and the one which S. Rawson used in his long-distance races against time.

DERBY—CONTINUED.**RAWSON ROADSTER.**

RAWSON & GREEAVES, Midland Counties' Bicycle Works, Burton Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Potential steel rims. 70 and 22, Nos. 12 and 13, direct steel spokes. 15-in. back wheel. 5-in. x 4-in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{4}$ -in. throw. Rubber ball pedals. Plain bearings. Cones to back wheel. Elliptical hollow front forks. Semi-tubular back. Humber head, $3\frac{3}{4}$ -in. centres. 23-in. x $4\frac{1}{4}$ -in. horn handles. $1\frac{1}{4}$ -in. 14 W.G. steel backbone. Bolted shackle spring. Pigskin saddle. Saw step. Leg-guard. Two flat wrenches. Oilcan.

Specialities. Saddle and spring cut very close,

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	10	0	52-in.	13	5	0
48-in.	12	15	0	54-in.	13	10	0
50-in.	13	0	0	56-in.	13	15	0

Extras. All bright, 10/- Balls to front wheel, 25/- Ditto back, 10/-
D.L.S. brake, 15/- Suspension saddle, 4/-

Remarks. Really a well-made, neat, and handsome machine.

RELIANCE.

THOMAS WALKER, 20, St. Luke Street, Derby.

Description $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Potential steel rims. 72 and 20, No. 12, direct steel spokes. 16-in. back wheel. 6-in. x $4\frac{3}{4}$ -in. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. throw. Rubber ball pedals. Double ball bearings to front, balls to back wheel. Elliptical hollow front forks. Semi-tubular back. Humber head. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{1}{4}$ -in. 16 W.G. steel backbone. Bolted shackle spring. Web-seated saddle. Saw step. D.L.S. Brake. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	0	0	52-in.	13	10	0
48-in.	12	10	0	54-in.	14	0	0
50-in.	13	0	0	56-in.	14	10	0

Extras. All bright, 10/-

Remarks. A very neat machine, built on the lines of the "Humber."

DUBLIN is no longer represented in the manufacturing line, but Carey Bros., of St. Andrew Street, still do a considerable trade as Agents for all the best makes.

FAKENHAM. The home of the hollow fork. One maker. Two machines.

SPECIAL HOLLOW FORK.

JOHN C. GARROOD, Lancaster Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. Nos. 12 & 13 non-corrosive direct steel spokes. 17-in. back wheel. $5\frac{1}{2}$ -in. x $5\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Patent grip ball pedals. Double ball

FAKENHAM—CONTINUED.

bearings. Balls to back wheel. Elliptical hollow forks. Humber head, 5-in. centres. 26-in. x 5-in. horn handles. 1 $\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted sliding spring. Garrood's improved saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. "Grip" pedals (page 17).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	16	0	0
48-in.	15	0	0	54-in.	16	10	0
50-in.	15	10	0	56-in.	17	0	0

Extras. All bright, 30/- Plated, £2 15/-

Remarks. The first machine on which the hollow fork was regularly applied. Very well made.

SPECIAL LANCASTER.

J. C. GARROOD, Lancaster Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. Nos. 11 and 12, direct iron spokes. 17-in. back wheel. 5 $\frac{1}{2}$ -in. x 5-in. iron hubs. Fixed cranks, 4-in. to 6-in. throw. Patent "Grip" pedals. Plain bearings to front, cones to back wheel. Solid bayonet forks. Humber head, 4 $\frac{3}{8}$ -in centres. 24-in. x 5 $\frac{1}{2}$ -in. horn handles. 1 $\frac{3}{8}$ -in. backbone. Bolted sliding spring. Pigskin saddle. Saw step. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

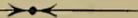
Specialities. "Grip" pedals (page 17).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	10	10	0	52-in.	11	15	0
48-in.	11	0	0	54-in.	12	5	0
50-in.	11	10	0	56-in.	12	15	0

Extras. All bright, 30/-; Plated, 55/-

Remarks. Strong and sound (see advertisement).



GREAT BRIDGE (Staffordshire) still has a maker, who now, however, confines himself to one machine. This is the

FAVOURITE.

C. M. LEES, 109 and 110, New Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 24, Nos. 12 and 13, direct steel spokes. 16-in. back wheel. 6-in. x 4 $\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 4-in. to 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow forks. Humber head, 4-in. centres. 22-in. x 4 $\frac{1}{2}$ -in. horn handles. 1 $\frac{3}{8}$ -in. 16 W.G. steel backbone. Bolted Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Screw wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	12	0	52-in.	13	0	0
48-in.				54-in.			
50-in.				56-in.			

Extras. Plating, £3. Ball pedals, 25/-

Remarks. Highly-finished all bright. A very serviceable machine. Machines built to purchasers' orders.

HORSHAM. One maker. Three machines.

GRANVILLE.

FRANK ALBERY, 56, West Street.

Description. 1-in. and $\frac{7}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 6-in. throw. Rubber pedals. Single ball bearings to front, cones to back wheel. B. iron solid forks. Humber head, 4-in. centres. 24-in. horn handles. $1\frac{1}{4}$ -in. iron backbone. Bolted Stanley slide spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Lion wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	7	5	0	52-in.	8	0	0
48-in.	7	10	0	54-in.	8	5	0
50-in.	7	15	0	56-in.	8	10	0

Extras. All bright, 10/-; hollow forks, 10/-; balls to back wheel, 10/-

Remarks. Used by local riders.

SPECIAL GRANVILLE.

FRANK ALBERY, 56, West Street.

Description. 1-in. and $\frac{3}{4}$ -in. red rubbers. Potential steel rims. 80 and 20 direct spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, 6-in. throw. Rat-trap pedals. Æolus ball bearings. Elliptical hollow forks. Humber head, 4-in. centres. 27-in. x $5\frac{1}{2}$ -in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Rowlinson's patent spring. Suspension ventilated saddle. Saw step. D.L.S. brake. Leg-guard. Lion wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	15	5	0
48-in.	14	15	0	54-in.	15	10	0
50-in.	15	0	0	56-in.	15	15	0

Extras. Ball pedals, 20/-

Remarks. Six months' warranty given. Nickel-plated all over.

YOUTH'S GRANVILLE.

FRANK ALBERY, 56, West Street.

Description. $\frac{5}{8}$ -in. and $\frac{1}{2}$ -in. red rubbers. Crescent steel rims. 40 and 16 direct spokes. 12-in. back wheel. G.M. hubs. Fixed cranks, 4-in. throw. Rat-trap pedals. Plain bearings to front, cones to back wheel. Solid forks. Humber head. 20-in. x $4\frac{1}{2}$ -in. horn handles. Bolted sliding clip-tail spring. Pigskin saddle. Saw step. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
36-in.	3	15	0	42-in.	4	10	0
38-in.	4	0	0	44-in.	4	15	0
40-in.	4	5	0				

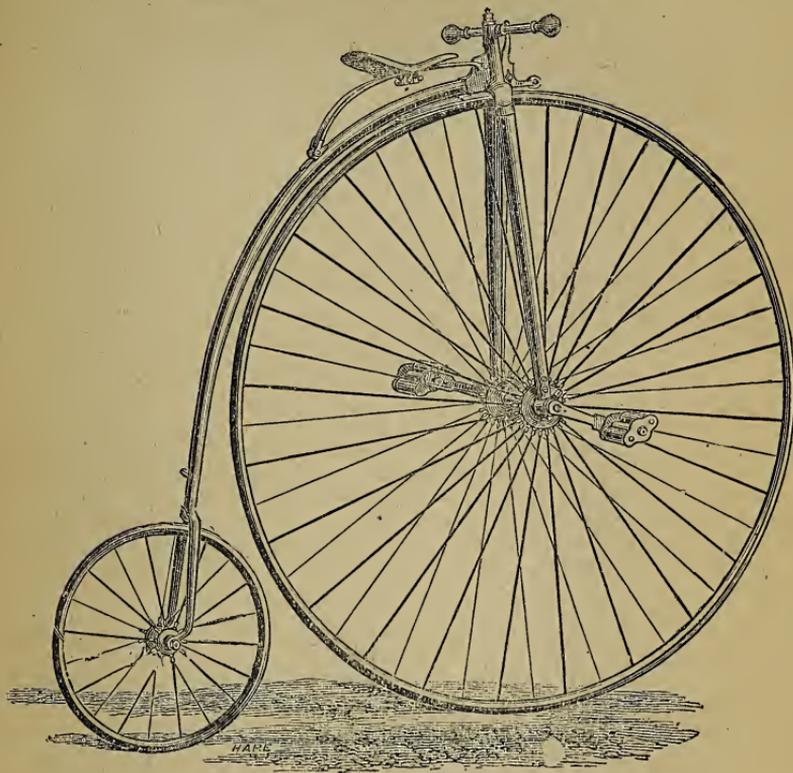
Extras. All bright, 7/6. Brake, 5/-

Remarks. Strong and cheap for boys' use.

KING'S LYNN boasts of two makers, who turn out three machines, all of which bear an excellent reputation.

LYNN EXPRESS.

JAMES PLOWRIGHT, 27, Railway Road.



LYNN EXPRESS.

Descrip'tion. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, butt-ended direct steel spokes. 17-in. back wheel. 6-in. x $5\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ in. throw. Rubber pedals. Plowright's roller bearings or balls. Balls to back wheel. Elliptical hollow forks. Dust-proof Humber head, $4\frac{1}{2}$ -in. centres. 25-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. 14 W.G. steel backbone. Bolted barrel slide spring. Suspension saddle. Pigskin saddle. Saw step. Leg-guard. Flat wrench. Oilcan.

Specialities. Plowright's registered dust-proof roller bearings (page 25).

PRICE.

	£	s.	d.		£	s.	d.
46-in.	13	15	0	52-in.	15	5	0
48-in.	14	5	0	54-in.	15	15	0
50-in.	14	15	0	56-in.	16	5	0

Extras. All bright, 30/-

Remarks. This is a very well made and reliable machine, and was used by Messrs. Coston and Smythe in their ride of 205 miles in the day, on the road.

KING'S LYNN—CONTINUED.**LYNN EXPRESS No. 2.**

JAMES FLOWRIGHT, 27, Railway Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. U rims. 48 and 18, Nos. 11 and 12, lock-nutted spokes. 17-in. back wheel. 6-in. x 5-in. iron hubs. Fixed cranks, $4\frac{1}{2}$ -in. to 6-in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Open centre head, $4\frac{1}{2}$ -in. centres. 24-in. x 6-in. ebony handles. 15 W.G. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	9	10	0	52-in.	10	5	0
48-in.	9	15	0	54-in.	10	10	0
50-in.	10	0	0	56-in.	10	15	0

Extras. All bright, 20/- Brake, 10/-*Remarks.* Strong and cheap (see advertisement).**SANDRINGHAM.**

J. Cox & Sons, 18, Railway Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 24, Nos. 11 & 12, direct steel spokes. 17-in. back wheel. $5\frac{5}{8}$ -in. x 5-in. G.M. hubs. Fixed cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Dust-proof ball bearings. Elliptical hollow forks. Dust-proof Humber head, 4-in. centres. 23-in. x $5\frac{1}{4}$ -in. horn handles. $1\frac{1}{4}$ -in. 16 W.G. steel backbone. Bolted barrel slide spring. Web-seated saddle. Saw step. Leg-guard. Flat wrench. Oilcan. Valise.

Specialities. Sandringham dust-proof double ball bearings (page 30).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	15	0	52-in.	13	5	0
48-in.	12	5	0	54-in.	13	15	0
50-in.	12	15	0	56-in.	14	5	0

Extras. All bright, 17/6. Brake, 12/6. Suspension saddle, 5/-*Remarks.* Strongly made; well fitted and finished.

LEICESTER. This town has long been known in connection with the wheel trade, and still holds its own. It possesses two of the finest racing paths in the Kingdom, and boasts of four makers, who, between them, turn out a dozen machines, which, as a rule, are strongly made and fit for work. A large amount of racing takes place in the town, and the local makes are much in vogue on the path there.

EMPEROR No. 1.

ROBERT EDLIN, Frog Island.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 70, No. 12, direct spokes. G.M. hubs. Fixed cranks. Rubber pedals. Double ball bearings, cones to back. Solid forks. Stanley head. Horn handles. Steel backbone. Sliding bolted spring (special pattern). Pigskin saddle. Saw step. Wrench. Oilcan.

LEICESTER—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	0	0	52-in.	12	10	0
48-in.	11	10	0	54-in.	13	0	0
50-in.	12	0	0	56-in.	13	10	0

Extras. Brake, 10/-

Remarks. Good and reliable. Either bright or painted.

EMPEROR No. 2.

ROBERT EDLIN, Frog Island.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 70, No. 12, direct spokes. G.M. hubs, $5\frac{1}{2}$ -in. x $4\frac{3}{4}$ -in. Fixed cranks. Rubber pedals. Ball bearings. Hollow forks. Stanley head. Horn handles. Steel backbone. Edlin's special pattern spring. Pigskin saddle. Saw step. Wrench. Oilcan.

Specialities. Spring.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	10	0	52-in.	14	0	0
48-in.	13	0	0	54-in.	14	10	0
50-in.	13	10	0	56-in.	15	0	0

Remarks. A very fine roadster, well-made, handsome, and strong.

EMPEROR RACER.

ROBERT EDLIN, Frog Island.

Description. $\frac{5}{8}$ -in. and $\frac{1}{2}$ -in. red rubbers. V U rims. 80, No. 13, direct spokes. G.M. hubs, $5\frac{1}{2}$ -in. x $4\frac{1}{4}$ -in. Fixed cranks. Rat-trap pedals. Ball bearings to both wheels. Hollow steel forks. Humber head. Horn handles. Steel backbone. Special spring. Pigskin racing saddle. Wrench. Oiler.

Specialities. Edlin's spring.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	0	0	52-in.	15	10	0
48-in.	14	10	0	54-in.	16	0	0
50-in.	15	0	0	56-in.	16	10	0

Extras. Balls to pedals, 30/-

Remarks. One of the lightest racers made. Finished all bright, and well put together.

FOX.

THOMAS FOX, JUNR., Kent Street Works, New Bridge Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 72, No. 12, direct spokes. G.M. hubs. Fixed cranks. Rat-trap pedals, plain. Double ball bearings. Æolus balls to back wheel. Hollow steel forks. Low Humber head. 21-in. horn handles. Steel backbone. Jointed hinged-block sliding spring. Saw step. Suspension saddle. Wrench. Oilcan.

Specialities. Metallic saddle block (page 66).

LEICESTER—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	16	0	0
48-in.	15	0	0	54-in.	16	10	0
50-in.	15	10	0	56-in.	17	0	0

Extras. Front brake, 10/-

Remarks. Finished all bright. A very high-class, and reliable, handsome machine. Still further improved for this season.

LEICESTER.

T. FOX, JUNR., Kent Street Works, New Bridge Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. 60 direct spokes. G.M. hubs. Fixed cranks. Rubber pedals. Plain Sheffield bearings. Coned back wheel. Bayonet forks. Stanley head. Horn handles. Steel backbone. Bolted hinged-clip spring. Saw step. Pigskin saddle. Wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	10	0	0	52-in.	11	10	0
48-in.	10	10	0	54-in.	12	0	0
50-in.	11	0	0	56-in.	12	10	0

Remarks. Strong, well made, and neat.

LEICESTER DEFIANCE No. 1.

W. SPIERS, 5, St. James Street.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. D.S.H. steel rims. 72 and 24, No. 12, butt-ended direct steel spokes. 16-in. back wheel. 6-in. x 4 $\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 4-in. to 5 $\frac{1}{4}$ -in. throw. Rubber pedals. Rudge's ball bearings throughout. Elliptical hollow front forks, semi-tubular back. Dust-proof Humber head, 3 $\frac{1}{2}$ in. centres. 24-in. x 4 $\frac{1}{2}$ -in. horn handles. 1 $\frac{3}{8}$ -in. steel backbone. Bolted shackle spring. Suspension saddle. Saw step. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	15	0	0	52-in.	16	10	0
48-in.	15	10	0	54-in.	17	0	0
50-in.	16	0	0	56-in.	17	10	0

Remarks. All bright or painted. A very good article. Lightly built for racing.

LEICESTER DEFIANCE No. 2.

W. SPIERS, 5, St. James Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 72 and 24, No. 11, direct spokes. 16-in. back wheel. 6-in. x 4 $\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 4-in. to 5 $\frac{1}{4}$ -in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow front forks, semi-tubular back. Dust-proof Humber head, 3 $\frac{1}{2}$ -in. centres. 24-in. x 4 $\frac{1}{2}$ -in. horn handles. 1 $\frac{3}{8}$ -in. steel backbone. Bolted shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

LEICESTER—CONTINUED.

PRICES.

				£	s.	d.					£	s.	d.	
46-in.	11	5	0	|	52-in.	..	..	..	12	7	6
48-in.	11	12	6	|	54-in.	..	..	..	12	15	0
50-in.	12	0	0	|	56-in.	..	..	..	13	2	6

Extras. Rudge's ball bearings, 22/-

Remarks. A fair, strong machine.

LEICESTER DEFIANCE No. 3.

W. SPIERS, 5, St. James Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 4-in. to $5\frac{1}{4}$ -in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{1}{2}$ -in. steel backbone. Bolted shackle spring. Pigskin saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan. Bell. Valise.

PRICES.

				£	s.	d.					£	s.	d.	
46-in.	7	10	0	|	52-in.	..	..	..	8	5	0
48-in.	7	15	0	|	54-in.	..	..	..	8	10	0
50-in.	8	0	0	|	56-in.	..	..	..	8	15	0

Extras. All bright, 10/- Æolus bearings, 30/-

Remarks. Strong and cheap.

STAR.

J. PARR, 62, Navigation Street,

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 70 and 20, No. 13, direct steel spokes. 16-in. back wheel. 5-in. x $4\frac{7}{8}$ -in. G.M. hubs. Fixed cranks, 5-in. throw. Rubber pedals. Double ball bearings to front, balls to back wheel. Elliptical hollow front forks, semi-tubular back. Humber head, 4-in. centres. 25-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

PRICES.

				£	s.	d.					£	s.	d.	
46-in.	14	5	0	|	52-in.	..	..	..	15	15	0
48-in.	14	15	0	|	54-in.	..	..	..	16	5	0
50-in.	15	5	0	|	56-in.	..	..	..	16	15	0

Extras. Ball pedals, 10/-

Remarks. Built with very narrow tread. Strong, light, and well put together. Largely in use in the district.

STAR No 2.

J. PARR, 62, Navigation Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 70, No. 11, direct steel spokes. $5\frac{3}{4}$ -in. x $4\frac{3}{4}$ -in. G.M. hubs. Fixed cranks. Rubber pedals. Plain bearings. Humber head. 24-in. x $4\frac{1}{4}$ -in. horn handles. Steel backbone. Bolted hinged-clip sliding spring. Pigskin saddle. D.L.S. brake. Saw step. Wrench. Leg-guard. Oilcan.

LEICESTER—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	0	0	52-in.	13	10	0
48-in.	12	10	0	54-in.	14	0	0
50-in.	13	0	0	56-in.	14	10	0

Remarks. Thoroughly well made. All bright.

STAR No. 3.

J. PARR, 62, Navigation Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. grey rubbers. U rims. 60, No. 11, direct spokes. G.M. hubs. Fixed cranks. Rubber pedals. Plain bearings. Humber head. Ebony handles. Iron backbone. Bolted sliding spring. Pigskin saddle. Leg-guard. Saw step. Wrench. Oilcan.

PRICE.

All sizes £10 0 0

Remarks. Strong and well made throughout.

YOUTH'S STAR.

J. PARR, 62, Navigation Street.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. grey rubbers. V rims. Lock-nutted spokes, G.M. hubs. One-hole cranks. Rubber pedals. Plain bearings. Centre steering. Hard wood handles. Iron backbone. Bolted sliding spring. Saw step. Saddle. Oilcan. Spanner.

PRICE.

30-in. to 40-in... .. £6 10 0

Remarks. A useful toy.



LIVERPOOL. Here one maker has it all his own way in the manufacturing line, turning out three machines.

PEERLESS.

W. SLADE, 98 & 99, Prescott Street, and 1, Harper Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers, Crescent steel rims. 60 and 20, Nos. 11 & 12, lock-nutted spokes. 17-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings to front, cones to back wheel. Solid forks. Humber head. 24-in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted clip-tail spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Monkey wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	10	10	0	52-in.	12	0	0
48-in.	11	0	0	54-in.	12	10	0
50-in.	11	10	0	56-in.	13	0	0

Extras. All bright, 30/- Ball bearings, 30/-

Remarks. Handsome and strong as a roadster.

LIVERPOOL—CONTINUED.**RACING PEERLESS.**

W. SLADE, 98 & 99, Prescott Street.

Description. $\frac{3}{4}$ -in. and $\frac{1}{2}$ -in. red rubbers. Crescent steel rims. 70 and 20. No. 12, direct steel spokes. 15-in. back wheel. 6-in. x 5-in. bell-metal hubs. Detachable cranks, 4-in. to 5-in. throw. Rat-trap pedals. Ball bearings throughout. Elliptical hollow forks. Humber head. 25-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted hinged slide spring. Suspension racing saddle. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	15	10	0	52-in.	17	0	0
48-in.	16	0	0	54-in.	17	10	0
50-in.	16	10	0	56-in.	18	0	0

Remarks. Finished all bright. Light and strong, makes an excellent racing machine.

SPECIAL PEERLESS.

W. SLADE, 99, Prescott Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, direct steel spokes. 16-in. back wheel. 6-in. x 5-in. bell-metal hubs. Detachable cranks, 5-in. to 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings. Balls to back wheel. Elliptical hollow forks. Humber head. 25-in. x 4 $\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Monkey wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	15	0	0	52-in.	16	10	0
48-in.	15	10	0	54-in.	17	0	0
50-in.	16	0	0	56-in.	17	10	0

Extras. All bright, 30/-

Remarks. Highly finished, and a first-class machine, making a really reliable roadster.



LONDON & NEIGHBOURHOOD. As in most other places, several changes have taken place in this district amongst the trade. These, however, are by no means so sweeping as in former years, the most noticeable being the addition to the ranks of the makers of the firm of Rücker & Co.; Mr. M. D. Rücker, Jun., long so well-known in metropolitan riding circles, having gone in entirely for the manufacture of high-class machines. Messrs. Harrington & Co. have taken extensive additional premises, and have introduced their new Enamel for coating machines, which is becoming quite the thing. Messrs. Sargent have made several changes in their business, very much to the improvement thereof, and S. Miller has left the ranks. The Toledo Steel Co. is now under new management, and in entirely new hands, whilst Howard & Co. are, this year, absentees. The business of W. Keen has been purchased by a well-

LONDON & NEIGHBOURHOOD—CONTINUED.

known amateur, and is carried on under the old name. Hutchinson & Co., Ernest Walker, and Gibbins & Simon are missing, as also is W. Clarke; and last, but not least, the Bicycle and Tricycle Supply Association has been formed, and adds another one to the ranks of the trade. In all there are 63 machines, of every variety of quality, from the highest to the lowest.

A B C No. 1.

NEWTON WILSON & Co., 144, High Holborn.

Description. 1-in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 52 direct blued spokes. Plated steel hubs. Detachable cranks. Rubber pedals. A B C bearings throughout. Open Stanley head. Ebony handles. Steel backbone. Bolted A B C slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Special wrench. Oilcan.

Specialities. Spokes blued to prevent rust. A B C bearings (*page 33*). A B C spring slide (*page 57*). A B C balanced pedals, extra (*page 16*).

PRICE.

All sizes £15 15 0

Extras. Balanced pedals, 21/-

Remarks. Replaces the Acme.

A B C No. 2.

NEWTON WILSON & Co., 144, High Holborn.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 52 direct blued steel spokes. Plated hubs. Detachable cranks. A B C bearings throughout. Hollow oval forks. Humber head (plated). Horn handles. Steel backbone. Bolted, A B C slide, blued spring. Suspension saddle. Adjustable step. D.L.S. brake. Leg-guard. Special wrench. Oilcan.

Specialities. A B C bearings (*page 33*). A B C balanced pedals, extra (*page 16*).

PRICE.

All sizes £17 17 0

Extras. Balanced pedals, 21/-

Remarks. Similar to No. 1, but with hollow forks, plated head, and blued spring.

A B C No. 3.

NEWTON WILSON & Co., 144, High Holborn.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. Acme detachable spokes. Steel hubs. Detachable cranks. A B C bearings throughout. Hollow bayonet or triangular forks. Ball Stanley head, with set-screw counter-sunk in the top. Horn handles. Steel backbone, with space for spare spokes. Bolted A B C slide spring. Suspension saddle. Adjustable step. D.L.S. brake. Leg-guard. Wrench. Oiler.

Specialities. A B C bearings (*page 33*). Acme spokes (*page 10*). A B C spring slide (*page 57*). Spare spokes in backbone. Special head. Balanced pedals, extra (*page 16*).

LONDON & NEIGHBOURHOOD—CONTINUED.

PRICE.

All sizes £25 4 0

Extras. Balanced pedals, 21/-

Remarks. All bright parts plated. Very elaborately got up in every way, as it ought to be for the price.

ANTELOPE.

G. SNELLING, 90, Kentish Town Road, N.W.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. Nos. 11 and 12 direct spokes. 16-in. back wheel. $5\frac{1}{2}$ -in. x $5\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, reversed cones to back wheel. Elliptical hollow forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x $4\frac{3}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. 16 W.G. steel backbone. Bolted Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	0	0	52-in.	12	10	0
48-in.	11	10	0	54-in.	13	0	0
50-in.	12	0	0	56-in.	13	10	0

Extras. All bright, 20/- Balls to back wheel, 10/- Plating, £3. Cradle spring, 10/-

Remarks. A sound machine, well suited for general work. Warranted by the maker.

ARAB.

JOHN HARRINGTON & Co., 18 and 20, Norman's Buildings, St. Luke's.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 70 and 20, No. 14, special direct steel spokes. 17-in. back wheel. 6-in. x 6-in. steel hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Dust-proof rubber ball pedals. Arab ball bearings to front, cones to back wheel. Elliptical hollow forks. Arab head. 26-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{1}{2}$ -in. 15 W.G. steel backbone. Arab cradle spring. Suspension saddle. Circular step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

Specialities. Arab ball pedals (*page 19*). Arab ball bearings (*page 33*). Arab sheet steel forks, to order (*page 40*). Arab head (*page 49*). Cradle spring (*page 61*). Arab brake, extra (*page 73*). Harrington's enamel (*page 153*).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	0	0	52-in.	14	10	0
48-in.	13	10	0	54-in.	15	0	0
50-in.	14	0	0	56-in.	15	10	0

Extras. All bright, burnished, 40/- Plated, 70/- Arab brake, 30/- Balls to back wheel, 21/- Arab alarum, 15/-

Remarks. The whole machine is light and elegant, and is coated all over with Harrington's enamel. It is well finished and fitted, and of best material. Built with great care (*see advertisement*).

LONDON & NEIGHBOURHOOD—CONTINUED.**ASHTON.**

ASHTON BROS., 13, London Road, Clapton, E.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 64 and 24, Nos. 11 and 12, direct spokes. 16-in. back wheel. $5\frac{1}{4}$ -in. x 6-in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. throw. Rat-trap pedals. Ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x $5\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. 16 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

Specialities. Detachable leg-guard. Leather dust-covers to back wheel.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	16	0	0
48-in.	15	0	0	54-in.	16	10	0
50-in.	15	10	0	56-in.	17	0	0

Extras. All bright, 25/- Balls to back wheel, 12/6.

Remarks. Well put together, of sound material. Fit for touring and all-round work.

ATALANTA No. 1.

SARGENT & PETTS, 2A, Prince of Wales' Road.

Description. $\frac{7}{8}$ -in. and $1\frac{1}{16}$ -in. red non-slipping rubbers. Crescent steel rims. 60 and 20, No. 11, direct spokes. 17-in. back wheel. 6-in. x $5\frac{1}{4}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Leather and rat-trap pedals. Double ball bearings to front, Atalanta cones to back wheel. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x $5\frac{1}{2}$ -in. horn handles. $1\frac{1}{2}$ -in. 15 W.G. steel backbone. Special Atalanta spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Two flat wrenches. Oilcan. Bell. Valise.

Specialities. Combined leather and rat-trap pedals. Atalanta back wheel balls, extra (page 27). Atalanta spring (page 59).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	5	0	52-in.	14	15	0
48-in.	13	15	0	54-in.	15	5	0
50-in.	14	5	0	56-in.	15	15	0

Extras. All bright, 30/- Ball pedals, 12/6. Balls to back wheel, 10/-

Remarks. A carefully made and reliable roadster, of pleasing exterior.

ATALANTA No. 2.

SARGENT & PETTS, 2A, Prince of Wales' Road.

Description. $\frac{7}{8}$ -in. and $1\frac{1}{16}$ -in. grey rubbers. Crescent steel rims: 52 and 18, No. 11, direct spokes. 17-in. back wheel. $5\frac{3}{4}$ -in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid iron forks. Humber head, $3\frac{1}{2}$ -in. centres. 23-in. x $5\frac{1}{2}$ -in. ebony handles. $1\frac{1}{2}$ -in. 16 W.G. steel backbone. Bolted sliding clip spring. Pigskin saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan. Valise.

LONDON & NEIGHBOURHOOD—CONTINUED.

PRICES.

£ s. d.				£ s. d.			
46-in.	..	..	9 10 0	52-in.	..	..	11 0 0
48-in.	..	..	10 0 0	54-in.	..	..	11 10 0
50-in.	..	..	10 10 0	56-in.	..	..	12 0 0

Extras. All bright, 20/-

Remarks. Good for common work.

BELGRAVIA.

J. E. BRAMLEY & Co., 170, Eaton Square, S.W.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 72 and 20, No. 11, coated direct spokes. 20-in. back wheel. 6 $\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 4 $\frac{1}{2}$ -in. to 5 $\frac{1}{2}$ -in. throw. Rat-trap pedals. Æolus ball bearings. Elliptical hollow forks. Humber head. 24-in. horn handles. Oval 14 W.G. steel backbone. Double plate, bolted rocking shackle spring. Suspension saddle. Adjustable step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Double plate spring.

PRICES.

£ s. d.				£ s. d.			
46-in.	..	..	11 0 0	52-in.	..	..	12 10 0
48-in.	..	..	11 10 0	54-in.	..	..	13 0 0
50-in.	..	..	12 0 0	56-in.	..	..	13 10 0

Remarks. Finished all bright in good style.

BERKSHIRE.

HICKLING & Co., 30, Queen Victoria Street, E.C.

(See "Maidenhead.")

BIRKBECK No 1.

C. SNOW, Birkbeck Road, Kingsland, E.

Description. $\frac{7}{8}$ -in. and $\frac{11}{16}$ -in. red rubbers. Crescent steel rims. 52 and 18, Nos. 12 and 14, nudded diamond wire spokes. 16-in. back wheel. 5 $\frac{1}{2}$ in. x 4 $\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 4 $\frac{1}{2}$ -in. to 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings to front, cones to back wheel. Elliptical solid forks. Humber head, 3 $\frac{1}{2}$ -in. centres. 24-in. x 5 $\frac{1}{2}$ -in. horn handles. 1 $\frac{1}{2}$ -in. 14 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. Birkbeck brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

Specialities. Birkbeck front brake (page 73).

PRICES.

£ s. d.				£ s. d.			
46-in.	..	..	10 10 0	52-in.	..	..	12 0 0
48-in.	..	..	11 0 0	54-in.	..	..	12 10 0
50-in.	..	..	11 10 0	56-in.	..	..	13 0 0

Extras. All bright, 30/- Hollow forks, 10/- Plated, 60/- Ball bearings and detachable cranks, 12/6.

Remarks. Sound and reliable. Well up to touring and general road work (see advertisement).

LONDON & NEIGHBOURHOOD—CONTINUED.**BIRKBECK No. 2.**

C. SNOW, Birkbeck Road, Kingsland, E.



BIRKBECK No. 2.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 12 and 14, direct spokes. 16-in. back wheel. $5\frac{1}{4}$ -in. x $4\frac{3}{4}$ -in. G.M. hubs. Detachable cranks, 4-in. to 5-in. throw. Rubber pedals. Æolus ball bearings to front, cones to back wheel. Elliptical S.C. iron front forks, fluted back. Dust-proof Humber head, $3\frac{1}{2}$ -in. centres. 26-in. x $4\frac{3}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. 16 W.G. steel backbone. Bolted Stanley slide spring. Ventilated suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

Specialities. Birkbeck front brake (page 73).

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	12	10	0	52-in.	..	..	..	14	0	0
48-in.	..	..	..	13	0	0	54-in.	..	..	..	14	10	0
50-in.	..	..	..	13	10	0	56-in.	..	..	..	15	0	0

Extras. All bright, 30/- Plated, 60/- Balls to back wheel, 10/- Hollow forks, 10/-

Remarks. A good semi-racer and light roadster (see advertisement).

LONDON & NEIGHBOURHOOD—CONTINUED.

CHAMPION.

A. MARKHAM, 345, Edgware Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 65 and 22, No. 10, direct spokes. $16\frac{1}{2}$ -in. back wheel, $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $6\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, balls to back wheel. Elliptical hollow forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. $1\frac{1}{2}$ -in. backbone. Bolted Stanley slide spring. Suspension saddle. Adjustable step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	6	15	0	52-in.	..	..	7	0	0
48-in.	..	..				54-in.	..	..	
50-in.	..	..				56-in.	..	..	

Remarks. All bright or painted.

CELERRIMA No. 1.

M. TRIGG, 31, Allen Road, Stoke Newington.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. Direct charcoal iron spokes. G.M. hubs. Detachable cranks. Rubber pedals. Roller bearings. Cones to back wheel and pedals. Hollow forks. Stanley head. 22-in. horn handles. Steel backbone. Bolted Stanley slide spring. Suspension saddle. Saw step. Valise. D.L.S. brake. Wrench. Leg-guard. Oilcan.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	12	0	0	52-in.	..	..	12	15	0
48-in.	..	..	12	5	0	54-in.	..	..	13	0	0
50-in.	..	..	12	10	0	56-in.	..	..	13	5	0

Extras. All bright, 25/- Plated, £3.

Remarks. A well made machine, highly suited for touring purposes.

CELERRIMA No. 2.

M. TRIGG, 31, Allen Road, Stoke Newington.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. U rims. Direct spokes. G.M. hubs. Fixed cranks. Rubber pedals, plain. Roller bearings to front, cones to back wheel. Hollow forks. Stanley head. 24-in. ebony handles. Steel backbone. Bolted sliding spring. Suspension saddle. Valise. Wrench. Saw step. Leg-guard. Oiler.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	10	0	0	52-in.	..	..	10	15	0
48-in.	..	..	10	5	0	54-in.	..	..	11	0	0
50-in.	..	..	10	10	0	56-in.	..	..	11	5	0

Extras. All bright, 25/- Plated, £3.

CELERRIMA No. 3.

M. TRIGG, 31, Allen Road, Stoke Newington.

Description. $\frac{1}{2}$ -in. and $\frac{3}{8}$ -in. grey rubbers. V rims. Direct spokes. Solid hubs. Fixed cranks. Rubber pedals, plain. Roller bearings to front, cones to

LONDON & NEIGHBOURHOOD—CONTINUED.

back wheel. Solid forks. Stanley head. Ebony handles. Iron backbone. Bolted sliding spring. Pigskin saddle. Saw step. Wrench. Oiler.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	8	0	0	52-in.	..	..	..	8	15	0
48-in.	..	..	..	8	5	0	54-in.	..	..	..	9	0	0
50-in.	..	..	..	8	10	0	56-in.	..	..	..	9	5	0

Extras. All bright, 25/- Plated, £3.

CITY.

W. O. Aves, City Bicycle Works, 46, Barbican.

Description. $\frac{7}{8}$ -in. and $1\frac{1}{16}$ -in. non-slipping red rubbers. Crescent steel rims. 70 and 20, No. 12, direct steel spokes. 16-in. back wheel. $5\frac{1}{2}$ -in. x $5\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to 5-in. throw. Rubber pedals. Double ball bearings to front, "Æolus" to back wheel. Elliptical hollow forks to both wheels. Humber head, 4-in. centres. 23-in. x 4-in. bent horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.I.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	17	0	0	52-in.	..	..	..	17	15	0
48-in.	..	..	..	17	5	0	54-in.	..	..	..	18	0	0
50-in.	..	..	..	17	10	0	56-in.	..	..	..	18	5	0

Extras. All bright, 10/- Plating, 60/-

Remarks. Finished half bright and japanned in superior style. An excellent machine.

CITY No. 2.

W. O. Aves, 46, Barbican, City.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 70 and 20, No. 12, direct spokes. 16-in. back wheel. $5\frac{1}{2}$ -in. x $5\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to 5-in. throw. Rubber pedals. Double ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, 4-in. centres. 24-in. x 4-in. horn handles, $1\frac{3}{8}$ -in. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	15	0	0	52-in.	..	..	..	15	15	0
48-in.	..	..	..	15	5	0	54-in.	..	..	..	16	0	0
50-in.	..	..	..	15	10	0	56-in.	..	..	..	16	5	0

Extras. All bright, 10/-

Remarks. A sound, strong machine.

CLAPHAM.

J. PORTER & Co., 8, Crescent Place, Clapham Common.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Potential steel rims. Nos. 11 and 12 direct spokes. 15-in. back wheel. 6-in. x $5\frac{3}{8}$ -in. G.M. hubs. Fixed cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Ball bearings. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. horn handles. $1\frac{1}{2}$ -in. steel backbone. Bolted barrel slide spring. Woolley's saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

LONDON & NEIGHBOURHOOD—CONTINUED.

PRICES.

			£ s. d.				£ s. d.
46-in. .. ..	..	..	} 13 13 0	52-in. .. ..	..	..	} 14 14 0
48-in. .. ..	..	..		54-in. .. ..	..	..
50-in. .. ..	..	..		56-in. .. ..	..	..

Extras. All bright, 30/- Detachable cranks, 4/- Plated, 84/- Painted spokes, 5/-
Remarks. Sound and strong. A genuine article.

CLIMAX.

W. G. LEWIS & Co., Speedwell Works, Romford, E.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. D.S.H. steel rims. 72 and 20, Nos. 11 and 12, butt-ended direct steel spokes. 16-in. back wheel. $5\frac{7}{8}$ -in. x $5\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 6-in. throw. Rubber pedals. Rudge's ball bearings throughout. Elliptical hollow forks. Dust-proof Humber head, 4-in. centres. 24-in. x 5-in. ivory handles. $1\frac{1}{2}$ -in. oval steel backbone and back-fork in one. Bolted sliding spring. Suspension ventilated saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Handy bag.

PRICE.

All sizes £18 18 0

Extras. Burnished and plated, 63/-

Remarks. Finely got up, a light and elegant machine.

CRITERION (Barker's).

J. BARKER, London Street, Kingston-on-Thames.

Description. Red rubbers. U rims. Lock-nutted spokes. G.M. hubs. Slotted cranks. Rubber pedals. Coned bearings throughout. Stanley head. Horn handles. Steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. Trouser-guard. Wrench. Oilcan.

PRICES.

			£ s. d.				£ s. d.		
46-in. .. ..	..	..	} 9 0 0	52-in. .. ..	..	..	} 10 10 0		
48-in.		9 10 0	54-in. .. ..	..		..	11 0 0
50-in.		10 0 0	56-in. .. ..	..		..	11 10 0

Remarks. Finished all bright.

CRITERION (Leach's).

LEACH, 2, Wellington Street, Southampton Street, Camberwell, S.E.

Description. Red rubbers. V rims. Lock-nutted spokes. G.M. hubs. Slotted cranks. Rubber pedals. Double coned bearings throughout. Humber head. Horn handles. Bolted sliding spring. D.L.S. brake. Pigskin saddle. Circular step. Leg-guard. Wrench. Oilcan.

PRICES.

			£ s. d.				£ s. d.		
46-in. .. ..	..	..	} 9 0 0	52-in. .. ..	..	..	} 9 15 0		
48-in.		9 5 0	54-in. .. ..	..		..	10 0 0
50-in.		9 10 0	56-in. .. ..	..		..	10 5 0

Extras. All bright, 50/-.

LONDON & NEIGHBOURHOOD—CONTINUED.

DESIDERATUM.

A. E. STRANGE & Co., 29, Waterloo Road, S.E.

Description. 1-in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 72 direct spokes. G.M. hubs. Slotted cranks. Rat-trap pedals. Coned bearings throughout. Bayonet forks. Stanley head. Horn handles. Steel backbone. Bolted hinged-clip sliding spring. Suspension saddle. Circular step. Wrench. Spring-top lubricators. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	9	10	0	52-in.	12	10	0
48-in.	10	10	0	54-in.	13	10	0
50-in.	11	10	0	56-in.	14	10	0

Extras. All bright, 10/-*Remarks.* Light, strong, and very well made.

FACILE.

(See "Peculiar Bicycles.")

HOLLOW FORKED BRITANNIA.

W. G. LEWIS and Co., Speedwell Works, Romford, E.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 72 and 20, Nos. 11 and 12, homo iron direct spokes. 16-in. back wheel. $5\frac{7}{8}$ -in. x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 6-in. throw. Rubber coned pedals. Æolus ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head. 24-in. x 5-in. horn handles. $1\frac{1}{2}$ -in. oval steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	10	0	52-in.	13	10	0
48-in.	12	15	0	54-in.	14	0	0
50-in.	13	0	0	56-in.	14	10	0

Extras. All bright, 40/- Balls to back wheel, 20/-*Remarks.* Strongly made, and serviceable.

HOLLOW FORK TOURIST.

T. A. SMILY, Dalston Junction, E.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. Direct spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Ball bearings. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	16	0	0	52-in.	16	15	0
48-in.	16	5	0	54-in.	17	0	0
50-in.	16	10	0	56-in.	17	5	0

Extras. All bright, 30/-*Remarks.* No fixed rules, but made to order and in proportion.

LONDON & NEIGHBOURHOOD—CONTINUED.

HOLLOW FORKED TRAVELLER.

T. A. SMILY, Dalston Junction.

Description. $\frac{3}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. Direct spokes. 18-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 6-in. throw. Rubber pedals. Ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	15	0	0	52-in.	15	15	0
48-in.	15	5	0	54-in.	16	0	0
50-in.	15	10	0	56-in.	16	5	0

Extras. All bright, 30/-

Remarks. No fixed rule.

INVINCIBLE RACER.

SURREY MACHINISTS' Co., 85, Blackman Street.

Description. $\frac{5}{8}$ -in. and $\frac{1}{2}$ -in. red rubbers. D.S.H. steel rims. 80 and 30, No. 15, Invincible rigid steel spokes. 15-in. back wheel. $5\frac{1}{2}$ -in. x 4-in. G.M. hubs. Fixed cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Ball bearings. Elliptical hollow forks. Humber head, 4-in. centres. 26-in. bent horn handles. $1\frac{3}{8}$ -in. 16 W.G. oval steel backbone and back fork combined. Bolted sliding spring. Pigskin racing saddle. Open saw step. Screw wrench. Oilcan. Valise.

Specialities. D.S.H. rims (page 6). Invincible spokes (page 12).

PRICE.

All sizes £16 10 0

Extras. All bright, 20/- Plated, 60/- Ball pedals, 21/-

Remarks. A very light and rigid machine. It was upon one of these Cortis did all his wonderful times (see advertisement).

INVINCIBLE ROADSTER.

SURREY MACHINISTS' Co., 85, Blackman Street, S.E.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. D.S.H. steel rims. 60 and 30, Nos. 13 and 14, Invincible steel spokes. 16-in. back wheel. $5\frac{1}{2}$ -in. x 4-in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, 4-in. centres. 26-in. bent horn handles. $1\frac{3}{8}$ -in., 16 W.G., oval steel backbone and back fork in one. Bolted sliding spring. Suspension saddle. Open saw step. D.L.S. brake. Leg-guard. Bown's wrench. Oilcan. Valise.

Specialities. D.S.H. rims (page 6). Invincible spokes (page 12). Introducers of D.L.S. brake, and backbone and back fork in one.

PRICE.

All sizes £16 10 0

Extras. All bright, 20/-

Remarks. One of the most rigid machines the market. Good material, well manipulated (see advertisement).

LONDON & NEIGHBOURHOOD—CONTINUED.**LONDON.**

HICKLING & Co., 30, Queen Victoria Street.

(See "Maidenhead.")

NANCY LEE.

SOUTH LONDON MACHINISTS' Co., Suffolk Grove, Southwark, S.E.

Description. 1-in. and $\frac{7}{8}$ -in. red rubbers. Crescent steel rims. 70 and 24, No. 13, direct spokes. 15-in. back wheel. 6-in. x 5 $\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 6 $\frac{1}{4}$ -in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow front forks, semi-tubular back. Humber head, 4-in. centres. 24-in. x 5-in. horn handles. Steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	10	0	0	52-in.	..	..	10	15	0
48-in.	..	..	10	5	0	54-in.	..	..	11	0	0
50-in.	..	..	10	10	0	56-in.	..	..	11	5	0

Extras. All bright, 20/-**NONPAREIL.**

J. STASSEN & SON, Euston Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. Screwless spokes. Solid hubs. Fixed cranks. Rubber pedals. Ball bearings. Hollow forks. Humber head. Horn handles. Bolted sliding spring. Suspension saddle. Saw step. Wrench. Oiler.

Specialities. Screwless spokes (page 10). Eccentric front brake, extra (page 72).

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	13	5	0	52-in.	..	..	14	5	0
48-in.	..	..	13	10	0	54-in.	..	..	14	10	0
50-in.	..	..	14	0	0	56-in.	..	..	14	15	0

Extras. Eccentric brake, 20/- All bright, 20/- Balls to back wheel, 10/-

Remarks. An extremely strong machine, well-made and reliable. All for heavy weights and long-distance men. Has been wonderfully improved this season.

NONSUCH.

SOUTH LONDON MACHINISTS' Co., Suffolk Grove, Southwark, S.E.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. 40 and 16 nudded spokes. 16-in. back wheel. 5 $\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 6-in. throw. Rat-trap pedals. Roller bearings to front, cones to back wheel. Solid forks. Humber head. 22-in. ebony handles. Iron backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	6	5	0	52-in.	..	..	7	0	0
48-in.	..	..	6	10	0	54-in.	..	..	7	5	0
50-in.	..	..	6	15	0	56-in.	..	..	7	10	0

Extras All bright, 10/-

LONDON & NEIGHBOURHOOD—CONTINUED.

NORWOOD.

W. KEEN & Co., Empress Works, Norwood Junction.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. Nos. 11 and 12 direct steel spokes. 17-in. back wheel. $5\frac{3}{8}$ -in. G.M. hubs. Fixed cranks, 4-in. to 6-in. throw. Rubber pedals. Double ball bearings to front, balls to back wheel. Hollow forks. Humber head, $4\frac{1}{2}$ -in. centres. 26-in. x $5\frac{1}{2}$ -in. horn handles. Steel backbone. Sliding jointed spring. Suspension saddle. Sawstep. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

Specialities. Special section of hollow fork, and adjustment of spring.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	16	0	0	52-in.	16	15	0
48-in.	16	5	0	54-in.	17	0	0
50-in.	16	10	0	56-in.	17	5	0

Extras. All bright, 20/-

Remarks. A very fine roadster. Well and strongly made, of good materials.

NORWOOD No. 2.

W. KEEN & Co., Empress Works, Norwood Junction.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. grey rubbers. U steel rims. Nos. 11 and 12 direct spokes. 17-in. back wheel. $5\frac{1}{2}$ -in. x 3-in. G.M. hubs. Fixed cranks, 4-in. to 5-in. throw. Rat-trap pedals. Roller bearings to front, cones to back wheel. Solid forks. Stanley head, 4-in. centres. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted sliding spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICE.

All sizes £12 0 0

Extras. All bright, 20/-

Remarks. A serviceable article.

NORWOOD RACER.

W. KEEN & Co., Empress Works, Norwood Junction.

Description. $\frac{3}{4}$ -in. and $\frac{1}{2}$ -in. red rubbers. Crescent steel rims. No. 12 direct steel spokes. 16-in. back wheel. $5\frac{1}{2}$ -in. x 4-in. G.M. hubs. Fixed cranks, 4-in. to $4\frac{1}{2}$ -in. throw. Rat-trap pedals. Ball bearings throughout. Special section hollow forks to both wheels. Humber head, 4-in. centres. 24-in. x $4\frac{1}{4}$ -in. horn handles. Steel backbone. Front slide spring. Suspension racing saddle. Saw step. Flat wrench. Oilcan.

Specialities. Special section of hollow forks.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	16	10	0	52-in.	16	10	0
48-in.				54-in.			
50-in.				56-in.			

Extras. All bright, 20/-

Remarks. Thoroughly well and neatly made.

LONDON & NEIGHBOURHOOD—CONTINUED.**PERIOD No. 1.**

S. DAVIS & Co., 15, Blackman Street, Boro', S.E.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. Direct spokes. 17-in. back wheel. $5\frac{1}{2}$ -in. x 4-in. G.M. hubs. Fixed cranks, 4-in. throw. Rubber pedals. Double ball bearings to front, balls to back wheel. Elliptical hollow front forks to both wheels. Humber head, 4-in. centres. 24-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Combination wrench. Oilcan. Alarum. Valise.

PRICE.

All sizes £15 15 0

PERIOD No. 2.

S. DAVIS & Co., 15, Blackman Street, Boro', S.E.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. 60 and 20, Nos. 9 and 10, direct spokes. 17-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. throw. Rubber pedals. Ball bearings to front, cones to back wheel. Elliptical hollow forks. Stanley head, $3\frac{1}{4}$ -in. centres. 22-in. x $4\frac{3}{4}$ -in. horn handles. $1\frac{1}{4}$ -in. hollow backbone. Bolted shackle spring. Web saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICE.

All sizes £10 10 0

PIONEER.

H. J. PAUSEY, Bedford Road, Clapham, S.W.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. D.S.H. steel rims. 66 and 22, No. 13, butt-ended direct steel spokes. 15-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, balls to back wheel. Elliptical hollow forks to both wheels. Humber head, 4-in. centres. 26-in. bent horn handles. $1\frac{3}{8}$ -in. steel backbone. Improved spring. Suspension saddle. Saw step. D.L.S. brake. Screw wrench. Oilcan.

Specialities. Improved spring.

PRICE.

All sizes £17 0 0

Extras. All bright, 20/-

Remarks. Suitable for both road and path work. Light, strong, and nicely put together. A new introduction.

PORTABLE.

(See "Peculiar Bicycles.")

ROYAL.

S. PEAKE & Co., 5, Lisle Street, Leicester Square.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 64 and 24, No. 12, direct spokes. 16-in. back wheel. $5\frac{3}{4}$ -in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings. Cones to back wheel. Elliptical hollow forks. Humber head, 5-in. centres. 24-in. x $5\frac{1}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

LONDON & NEIGHBOURHOOD—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	0	0	52-in.	14	10	0
48-in.	13	10	0	54-in.	15	0	0
50-in.	14	0	0	56-in.	15	10	0

Remarks. Patronised by H.R.H. Prince Albert Victor of Wales, and hence the name. A sound, genuine machine (see advertisement).

RUCKER.

M. D. RUCKER, JUN., & Co., Letchford's Buildings, Bethnal Green.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Potential steel rims. 60 and 20, Nos. 12 and 13, direct spokes. 16-in. back wheel. 5 $\frac{1}{2}$ -in. x 5-in. G.M. hubs. Fixed cranks, 5 $\frac{1}{4}$ -in. throw. Rubber pedals. Ball bearings throughout. Elliptical hollow forks. Swindley's patent central-pin steering, 5-in. centres. 24-in. x 5-in. horn handles. 1 $\frac{3}{8}$ -in. 16 W.G. steel backbone. Shackle-fronted spring. Suspension saddle. Rucker's adjustable step. D.L.S. brake. Leg-guard. Bell. Wrench. Oilcan. Valise.

Specialities. Swindley's patent central-pin steering (page 48). Rucker's adjustable step (page 68).

PRICE.

All sizes £17 0 0

Remarks. A very fine machine, newly introduced for this season. Highly finished, well put together, and of sound material, it forms an admirable roadster.

SPECIAL ATALANTA.

SARGENT & PETTS, 2A, Prince of Wales' Road.

Description. $\frac{3}{4}$ -in. and $\frac{1}{8}$ -in. non-slipping rubbers. Crescent steel rims. 66 and 22, No. 12, direct spokes. 16-in. back wheel. 6-in. x 5 $\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 4 $\frac{1}{2}$ -in. to 5 $\frac{1}{2}$ -in. throw. Combination pedals. Double ball bearings to front, reversed cones to back wheel. Elliptical hollow forks. Humber head, 3 $\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. 1 $\frac{1}{4}$ -in. 16 W.G. steel backbone. Special Atalanta spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Two flat wrenches. Oilcan. Valise.

Specialities. Special Atalanta spring (page 59).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	5	0	52-in.	14	15	0
48-in.	13	15	0	54-in.	15	5	0
50-in.	14	5	0	56-in.	15	15	0

Extras. All bright, 30/- Balls to back wheel, 10/- Ball pedals, 12/6.

Remarks. Soundly made, and strong. Well suited for a rough roadster.

SPECIAL CELERRIMA.

M. TRIGG, 31, Allen Road, Stoke Newington.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Potential rims. Direct spokes. G.M. hubs. Detachable cranks. Rat-trap pedals. Æolus bearings. Coned back wheel. Hollow forks. Stanley head. Horn handles. Steel backbone. Bolted Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Wrench. Leg-guard. Oilcan.

LONDON & NEIGHBOURHOOD—CONTINUED.

PRICE.

All sizes £13 13 0

Extras. All bright, £1 5/- Plated, £3.*Remarks.* A very fair article.**SPECIAL CHAMPION.**

A. MARKHAM, 345, Edgware Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 80 and 20, No. 12, mild steel direct spokes. $16\frac{1}{2}$ -in. back wheel. 5-in. x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 6-in. throw. Rubber pedals. Ball bearings throughout. Elliptical hollow front and back forks, Humber head, 4-in. centres. 24-in. x $5\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted Stanley slide spring. Suspension saddle. Adjustable step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICE.

All sizes £12 0 0

Remarks. Finished bright or painted, at same figure.**SPECIAL HOLLOW FORK UNECLIPSED.**

T. HANCOCK, 108, Bishopgate Street without, E.C.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. U steel rims. 60 direct spokes. G.M. hubs. Detachable fluted cranks. Hancock's pedals, plain. Double ball bearings. Double cones to back wheel. Hollow forks. Stanley head. 22-in. x 5-in. horn handles. Steel backbone. Bolted sliding spring. Suspension saddle. Leg-guard. Saw step. D.L.S. brake. Flat wrench. Oilcan.

Specialities. Hancock's pedals (page 17).

PRICES.

	£	s.	d.
Up to 50-in.	12	12	0
above 50-in.	13	2	0

Extras. All bright, 20/- Polishing, 12/- Plating, 42/-*Remarks.* Strongly and neatly made. A really good and reliable handsome machine.**SPECIAL NONSUCH.**

SOUTH LONDON MACHINISTS' Co., Suffolk Grove, Southwark.

Description. 1-in. and $\frac{7}{8}$ -in. red rubbers. U rims. 50 and 20, No. 13, direct spokes. 16-in. back wheel. 6-in. G.M. hubs. Fixed cranks, $6\frac{1}{2}$ -in. throw. Rat-trap pedals. Ball bearings to front, cones to back wheel. Solid forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. horn handles. Tubular backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	8	10	0	52-in.	9	5	0
48-in.	8	15	0	54-in.	9	10	0
50-in.	9	0	0	56-in.	9	15	0

Extras. All bright, 10/- Æolus balls, 20/- Plated, £4.

LONDON & NEIGHBOURHOOD—CONTINUED.

SPECIAL SWAN.

R. MOTHERSILL, 97, Cheapside.

Description. 1-in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 72 lock-nutted spokes. Phosphor-bronze hubs. Detachable patent cranks and removable pedals, coned. Parallel bearings. Cones to back wheel. Hollow forks. Stanley head. Patent swivelling handles. Horn handles. Steel backbone. Bolted hinged-clip spring. Suspension or Mothersill's patent saddle. Special D.L.S. brake. Leg-guard. Saw step. Lubricators. Wrench. Oilcan.

Specialities. Mothersill's swivelling handles (page 52). Mothersill's patent pedals (page 20). Mothersill's patent safety saddle.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	15	0	52-in.	16	5	0
48-in.	15	5	0	54-in.	16	15	0
50-in.	15	15	0	56-in.	17	5	0

Remarks. This is a very fine machine, and fitted with Mothersill's patent improvements. It is really built by a well-known Coventry firm. All bright.

SPECIAL TENSION.

TENSION BICYCLE Co., Watson Street, Stoke Newington Green, N.

Description. $\frac{3}{4}$ -in. and $\frac{3}{8}$ -in. non-slipping rubbers. Potential steel rims. 64 and 24, No. 11, direct steel spokes. 16-in. back wheel. 6-in. x 6-in. phosphor-bronze hubs. Detachable cranks, $3\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, Æolus to back wheel. Elliptical hollow forks. Stanley head, $4\frac{1}{2}$ -in. centres. 26-in. x 2-in. bent down non-vibrating vulcanite handles. $1\frac{1}{2}$ -in. steel backbone. Shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	15	0	0	52-in.	16	10	0
48-in.	15	10	0	54-in.	17	0	0
50-in.	16	0	0	56-in.	17	10	0

Extras. All bright, £2. Plated, £3.

Remarks. A good and well-built steed. Can be built lighter for racing purposes.

STANDARD.

C. WHEATON, 35, Long Acre.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. grey rubbers. Crescent steel rims. 60 and 22, No. 11, direct spokes. 16-in. back wheel. 5-in. x 4-in. G.M. hubs. Detachable cranks, $4\frac{1}{4}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Parallel hinged bearings to front, cones to back wheel. Elliptical hollow forks. Open centre head, 5-in. centres. 22-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted hinged-slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	9	4	0	52-in.	10	8	0
48-in.	9	12	0	54-in.	10	16	0
50-in.	10	0	0	56-in.	11	4	0

Remarks. Finished bright or painted. A sound, well-constructed machine. Mr. Wheaton is one of the oldest in the trade.

LONDON & NEIGHBOURHOOD—CONTINUED.**STANHOPE.**

W. J. BODEN, 163, Waterloo Road, S.E.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. 60, No. 11, direct spokes. G.M. hubs. Fixed cranks. Rubber pedals. Coned bearings. Stanley head. Horn handles. Steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Wrench. Leg-guard. Oiler.

PRICE.

All sizes £6 10 0

Extras. All bright, 40/-*Remarks.* Workmanship, fair. Appearance, good.**TENSION.**

TENSION BICYCLE Co., Watson Street, Stoke Newington Green.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct steel spokes. 16-in. back wheel. 6-in. x 4-in. G.M. hubs. Detachable cranks, 5-in. throw. Rat-trap pedals. Roller bearings to front, cones to back wheel. Solid elliptical forks. Stanley head, 5-in. centres. 24-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted slotted spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	10	10	0	52-in.	12	0	0
48-in.	11	0	0	54-in.	12	10	0
50-in.	11	10	0	56-in.	13	0	0

Extras. All bright, 30/- Plated, £3.*Remarks.* Sound and strong for common use.**TIMBERLAKE.**

HICKLING & Co., 30, Queen Victoria Street.

*(See "Maidenhead.")***TOURIST.**

T. A. SMILY, 17, Dalston Lane, Dalston Junction.

Description. Red rubbers. Crescent rims. Lock-nutted spokes. Solid hubs. Slotted cranks. Rubber pedals. Roller bearings. Coned bearings to back wheel. Stanley head. Horn handles. Steel backbone. Bolted roller spring. Suspension saddle. D.L.S. brake. Saw step. Flat wrench. Leg-guard. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	15	5	0
48-in.	14	15	0	54-in.	15	10	0
50-in.	15	0	0	56-in.	15	15	0

Extras. All bright, 30/-*Remarks.* Well suited for road work. Made to order chiefly.**TRAVELLER No. 1.**

T. A. SMILY, 17, Dalston Lane, Dalston Junction.

Description. 1-in. and $\frac{5}{8}$ -in. red rubbers. U rims. Direct spokes. G.M. hubs. Slotted cranks. Rubber pedals. Roller bearings. Cones to back wheel.

LONDON & NEIGHBOURHOOD—CONTINUED.

Stanley head. Ebony handles. Steel backbone. Bolted roller spring. D.L.S. brake. Saw step. Valise. Wrench. Saddle. Oilcan.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	13	15	0	52-in.	..	..	14	10	0
48-in.	..	..	14	0	0	54-in.	..	..	14	15	0
50-in.	..	..	14	5	0	56-in.	..	..	15	0	0

Extras. All bright, 30/-

Remarks. Plain, strong roadster.

TRAVELLER No. 2.

T. A. SMILY, 17, Dalston Lane, Dalston Junction.

Description. Red rubbers. U rims. Direct-action spokes. G.M. hubs. Slotted cranks. Rat-trap pedals. Plain bearings. Coned back. Centre steering. Ebony handles. Bolted sliding spring. Pigskin saddle. Circular step. Thumb brake. Wrench. Leg-guard. Oilcan.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	10	0	0	52-in.	..	..	10	15	0
48-in.	..	..	10	5	0	54-in.	..	..	11	0	0
50-in.	..	..	10	10	0	56-in.	..	..	11	5	0

Extras. All bright, 30/-

Remarks. Strong, cheap.

UNECLIPSED.

T. HANCOCK, 108, Bishopsgate Street Without.

Description. Red rubbers. U rims. 60 direct spokes. G.M. hubs. Detachable cranks. Rubber pedals. Roller bearings. Coned back wheel. Hollow forks. Humber head. Horn handles. Steel backbone. Bolted hinged-clip spring. Pigskin saddle. Adjustable step. Leg-guard. Valise. D.L.S. brake. Wrench. Oilcan. Alarum.

PRICES.

			£	s.	d.
Up to 50-in.	..	..	11	10	0
Above 50-in.	..	..	12	0	0

Extras. All bright, 20/- Burnished, 12/- Ball bearings, 20/-

Remarks. Soundly made, and serviceable.

UNIVERSITY.

H. J. PAUSEY, Bedford Road, Clapham, S.W.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Potential steel rims. 66 and 22, No. 12, direct spokes. 15-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. G.M. interlocking hubs. Detachable cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Double ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, $3\frac{3}{4}$ -in. centres. 26-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Arab cradle spring. Suspension saddle. Saw step. D.L.S. brake. Screw wrench. Oilcan. Bell. Valise.

Specialities. Interlocking hub (page 12).

PRICE.

All sizes £15 0 0

Extras. All bright, 20/- Plated, 60/- Balls to back wheel, 12/6

Remarks. A reliable roadster. Well put together, and very creditably finished.

LONDON & NEIGHBOURHOOD—CONTINUED.

VICTORIA.

J. PORTER & Co., 8, Crescent Place, Clapham Common, S.W.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. Nos. 11 and 12 direct spokes. 15-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, $5\frac{1}{4}$ -in. throw. Rat-trap pedals. Plain bearings to front, cones to back wheel. Solid forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted barrel-slide spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	10	10	0	52-in.	..	..	11	11	0
48-in.	..	..				54-in.	..	..	
50-in.	..	..				56-in.	..	..	

Extras. All bright, 30/- Balls to front wheel, 20/- Ditto back, 15/-
Remarks. Sound and strong. A fair machine for the money.

VOLANTE.

TOLEDO STEEL Co., 6, Stanhope Street, Euston Road, N.W.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 64 and 20 direct spokes. 16-in. back wheel. G.M. hubs. Detachable cranks. Rat-trap pedals. Double ball bearings to front, balls to back wheel. Solid steel forks. Humber head, 4-in. centres. 20-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted hinged-slide spring. Web-seated saddle. Saw step. D.L.S. brake. Universal wrench. Oilcan. Bell. Valise.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	13	0	0	52-in.	..	..	13	10	0
48-in.	..	..				54-in.	..	..	
50-in.	..	..				56-in.	..	..	

Extras. All bright, 20/- Ball pedals, 30/- Plating, 60/-
Remarks. A well-made article. $7\frac{1}{2}\%$ discount for cash.

VOLANTE No. 2.

TOLEDO STEEL Co., 6, Stanhope Street, Euston Road, N.W.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Potential steel rims. 60 and 24 butt-ended direct steel spokes. 16-in. back wheel. G.M. hubs. Detachable cranks. Rat-trap pedals. Double ball bearings to front, Æolus to back wheel. Elliptical hollow front forks, semi-tubular back. Humber head, 4-in. centres. 26-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Universal Wrench. Oilcan. Bell. Valise and lamp.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	13	10	0	52-in.	..	..	15	0	0
48-in.	..	..				54-in.	..	..	
50-in.	..	..				56-in.	..	..	

Extras. All bright, 20/- Ball pedals, 30/- Plated, 60/-
Remarks. A very fine and well-made machine. $7\frac{1}{2}\%$ discount for cash.

LONDON & NEIGHBOURHOOD—CONTINUED.

WANDERER.

H. J. PAUSEY, Bedford Road, Clapham, S.W.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 66 and 22, No. 11, direct spokes. 15-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Ball bearings to front, cones to back wheel. Solid elliptical forks. Humber head, $3\frac{3}{4}$ -in. centres. 24-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted sliding spring. Web-seated saddle. Saw step. D.L.S. brake. Screw wrench. Oilcan. Bell. Valise.

PRICE.

All sizes £10 10 0

Extras. All bright, 20/- Balls to back wheel, 14/-

Remarks. A sound, reliable article (see advertisement).

WILL-O'-THE-WISP No. 1.

F. HUCKLEBRIDGE, 78, Lower Sloane Street, Chelsea.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 84 and 20, No. 11, direct steel spokes. 15-in. back wheel. $5\frac{1}{4}$ -in. x 5-in. steel hubs. Detachable cranks, 4-in. to 5-in. throw. Rubber pedals. Rudge's ball bearings to front, cones to back wheel. Elliptical hollow forks. Dust-proof Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x $4\frac{3}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. 14 W.G. steel backbone. Bolted sliding spring. Ventilated suspension saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan. Bell. Valise.

Specialities. Only two sizes of nut used on the machine, and spanner sent to fit these.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	15	0	0	52-in.	15	15	0
48-in.	15	5	0	54-in.	16	0	0
50-in.	15	10	0	56-in.	16	5	0

Extras. All bright, 30/-

Remarks. Made of good material, is a sound and reliable roadster.

WILL-O'-THE-WISP No. 2.

F. HUCKLEBRIDGE, 78, Lower Sloane Street, Chelsea.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 70 and 20, No. 11, direct spokes. 15-in. back wheel. 6-in. x $3\frac{1}{2}$ -in. solid hubs. Detachable cranks, $4\frac{1}{2}$ -in. to 5-in. throw. Rat-trap pedals. Single ball bearings to front, cones to back wheel. Solid Lowmoor iron forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x $4\frac{3}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted slotted spring. Pig-skin saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan. Bell. Valise.

PRICE.

All sizes £10 10 0

Extras. All bright, 40/-

Remarks. Very fair.

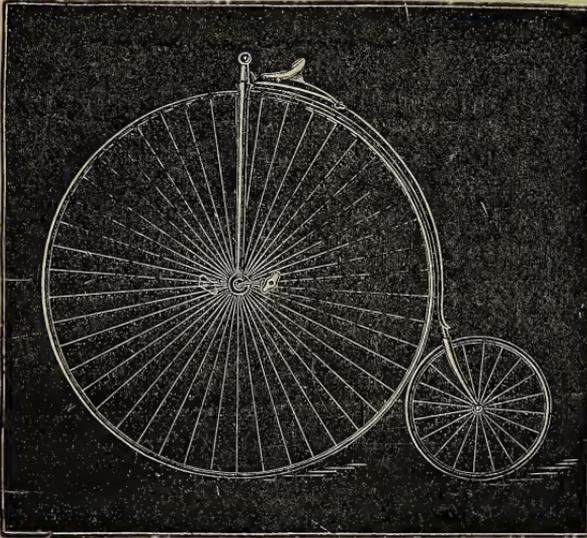
XX.

NEWTON WILSON & Co., 144, High Holborn.

Description. 1-in. and $\frac{3}{4}$ -in. red rubbers. U rims. No. 10 direct spokes. Plated G.M. hubs. Fixed cranks. Rubber pedals. Roller bearings. Single

LONDON & NEIGHBOURHOOD—CONTINUED.

coned back wheel. Ball Stanley head. Bone handles. Bolted roller spring
Pigskin saddle. Saw step. Wrench. Oilcan.



xx.

PRICE.

All sizes £10 10 0

Extras. All bright, 25/- Trailing brake, 21/-*Remarks.* Suitable for first season riders.

ZEPHYR.

T. HARRIS, 4, John's Court, Wigmore Street, W.

Description. Red rubbers. U rims. Direct spokes. G.M. hubs. Slotted cranks. Rubber pedals. Plain bearings. Coned back wheel. Centre steering. Horn handles. Steel backbone. Bolted hinged-clip sliding spring. Pigskin saddle. Circular step. Stud spoon brake. Leg-guard. Wrench. Oilcan.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	8	0	0	52-in.	..	..	..	9	10	0
48-in.	..	..	..	8	10	0	54-in.	..	..	..	9	15	0
50-in.	..	..	..	9	0	0	56-in.	..	..	..	10	5	0

Extras. All bright, 20/- Adjustable rollers, 20/-*Remarks.* A strong, cheap bicycle.

MAIDENHEAD. Here Messrs. Hickling & Co. luxuriate all to themselves in the manufacturing line. They turn out only sound work, and have this season largely extended their premises.

MAIDENHEAD—CONTINUED.

BERKSHIRE.

HICKLING & Co., Queen Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. V iron rims. 48 and 18, No. 11, charcoal iron direct spokes. 16-in. back wheel. $5\frac{3}{4}$ -in. x 4-in. G.M. hubs, Fixed cranks, 5-in. throw. Rubber pedals. Special parallel bearings to front, cones to back wheel. Solid forks. Humber head, $3\frac{1}{4}$ -in. centres. 22-in. x 5-in. ebony handles. Steel backbone. Bolted sliding spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Two flat wrenches. Oilcan.

PRICES.

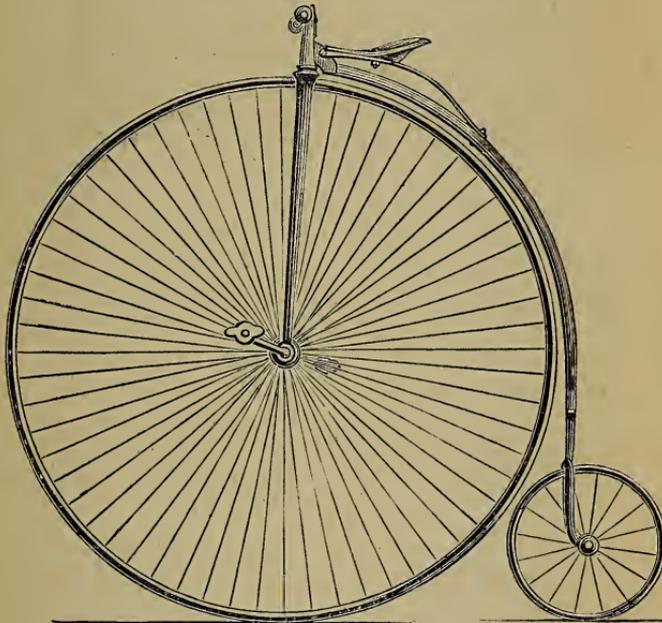
	£	s.	d.		£	s.	d.
46-in.	10	10	0	52-in.	10	10	0
48-in.				54-in.	11	0	0
50-in.				56-in.	11	10	0

Extras. All bright, 40/- Plated, £5. Hollow forks, 10/- Ball bearings, 10/-

Remarks. Sound, durable and strong, at a reasonable figure (*see advertisement*).

LONDON.

HICKLING & Co., Queen Street.



LONDON.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. wired red rubbers. Crescent steel rims. 60 and 24, No. 11, charcoal iron direct spokes. 16-in. back wheel. $5\frac{3}{4}$ -in. x 5-in. G.M. hubs. Fixed cranks, 5-in. throw. Rubber pedals. Double ball bearings to front, cones to back wheel. Elliptical hollow forks. Dust-proof Humber head, $3\frac{1}{4}$ -in. centres. 24-in x $5\frac{1}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake Leg-guard. Two flat wrenches. Oilcan.

Specialities. Wired tyres.

MAIDENHEAD—CONTINUED.

PRICES.

			£	s.	d.				£	s.	d.	
46-in.	14	0	0	|	52-in.	..	..	15	10	0
48-in.	14	10	0	|	54-in.	..	..	16	0	0
50-in.	15	0	0	|	56-in.	..	..	16	10	0
<i>Extras.</i> All bright, 40/-			Plated, £5.			Æolus bearings, 20/-			Balls to back wheel, 20/-			

Remarks. Graceful and durable, forms a sterling roadster (see advertisement).

PILOT.

HICKLING & Co., Queen Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. wired red rubbers. Crescent steel rims. 72 and 24, No. 11, charcoal iron direct spokes. 16-in. back wheel. $5\frac{3}{4}$ -in. x 5-in. G.M. hubs. Fixed cranks, 5-in. throw. Rubber pedals. Double ball bearings to front, Æolus balls to back wheel. Elliptical hollow forks to both wheels. Dust-proof Humber head, $3\frac{1}{4}$ -in. centres. 26-in. bent down horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Special Pilot spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Two flat wrenches. Oilcan.

Specialities. Wired tyres. Pilot spring (page 59).

PRICES.

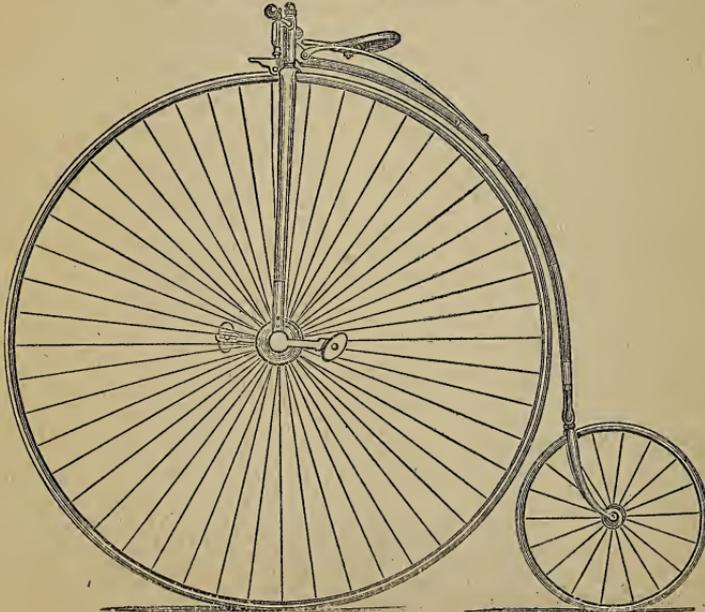
			£	s.	d.				£	s.	d.	
46-in.	15	0	0	|	52-in.	..	..	16	10	0
48-in.	15	10	0	|	54-in.	..	..	17	0	0
50-in.	16	0	0	|	56-in.	..	..	17	10	0

Extras. All bright, 40/- Plated, £5. Detachable cranks, 10/-

Remarks. Messrs. Hickling's latest introduction and speciality for 1881. Quite up to the best standard. Well-built and strong (see advertisement).

TIMBERLAKE.

HICKLING & Co., Queen Street,



TIMBERLAKE.

MAIDENHEAD—CONTINUED.

Description. $\frac{7}{8}$ -in and $\frac{5}{8}$ -in. wired red rubbers. Crescent steel rims. 60 and 24, No. 11, charcoal iron direct spokes. 16-in. back wheel. $5\frac{3}{4}$ -in. x 5-in. G.M. hubs. Fixed cranks, 5-in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Timberlake head. $3\frac{3}{4}$ -in. centres. 24-in. x $5\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. Rack and pinion brake. Leg-guard. Two flat wrenches. Oilcan.

Specialities. Wired tyres. Timberlake head. Rack and pinion brake. (page 72).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	0	0	52-in.	14	10	0
48-in.	13	10	0	54-in.	15	0	0
50-in.	14	0	0	56-in.	15	10	0

Extras. All bright, 40/- Plated £5. Hollow Forks, 10/- Ball bearings, 10/-

Remarks. One of the oldest roadsters in the market. It keeps up with the times, and upholds its reputation well (see advertisement).



MALDON. Here one maker again, who this year confines himself to the production of a single pattern of machine. This is the

UNIQUE.

T. S. BATE, Spital Road.

Description. $1\frac{3}{8}$ -in. and $1\frac{1}{8}$ -in. red rubbers. Potential steel rims. 72 and 24, No. 12, direct spokes. 17-in. back wheel. $5\frac{1}{2}$ -in. x 5-in. Phosphor-bronze hubs. Detachable cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Æolus ball bearings. Double tubular front forks, semi-tubular back. Humber head, $4\frac{1}{4}$ -in. centres. 24-in. x 4-in. bent down horn handles. $1\frac{1}{2}$ -in. 14 W.G. steel backbone. Bolted Stanley slide spring. Suspension ventilated saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	16	0	0	52-in.	16	10	0
48-in.				54-in.			
50-in.				56-in.			

Extras. Plated, 60/- Dust-guard to head, 6/- Butt-ended spokes, 15/-

Remarks. Finished burnished, or japanned at option. A fine machine, well suited for road work (see advertisement).



MANCHESTER. In this town there are five makers, who between them turn out fifteen machines, ranging in quality and style from the highest to the lowest. Few, if any, changes have taken place this year in the trade.

CLARKE No. 1.

R. CLARKE, Junr., New Moston, Failsworth.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, direct spokes. 18-in. back wheel. $5\frac{3}{4}$ -in. x 5-in. G.M. hubs. Detachable cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Rudge's ball bearings to

MANCHESTER—CONTINUED.

front, Bown's Æolus to back wheel. Elliptical hollow forks. Humber head, 4-in. centres. 23-in. x 5-in. horn handles. 1 $\frac{3}{8}$ -in. steel backbone. Bolted slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	10	0	52-in.	13	5	0
48-in.	12	15	0	54-in.	13	10	0
50-in.	13	0	0	56-in.	13	15	0

Extras. All bright, 20/-

Remarks. This is a sound, first-class machine, containing good work and good material. The terms are nett cash and no agents, hence the low figure.

CLARKE No. 2.

R. CLARKE, Junr., New Moston, Failsworth.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. No 11, inch scale, direct spokes. 18-in. back wheel. 5 $\frac{3}{4}$ -in. x 5-in. G.M. hubs. Fixed cranks, 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Plain Sheffield bearings to front, cones to back wheel. Lowmoor iron solid forks. Stanley head, 4-in. centres. 22-in. x 5 $\frac{1}{2}$ -in. ebony handles. 1 $\frac{1}{2}$ -in. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	7	4	0	52-in.	7	12	0
48-in.	7	6	0	54-in.	7	14	0
50-in.	7	10	0	56-in.	7	16	0

Extras. All bright, 20/- Minus brake, 10/- less.

Remarks. All wearing parts properly hardened.

EUROPEAN.

WM. HARRISON, 128, Portland Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 64 and 24, No 11, direct spokes. 16-in. back wheel. 6 $\frac{1}{2}$ -in. x 5 $\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 4 $\frac{3}{4}$ -in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow forks. Humber head, 3-in. centres. 24-in. horn handles. 1 $\frac{3}{8}$ -in. steel backbone. Coiled barrel-slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICE.

All sizes £11 11 0

Extras. All bright, 25/- Plated, 50/-

Remarks. Very fair (see advertisement).

FLYING PRINCE.

WILLIAM HARRISON, 128, Portland Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Potential steel rims. 60 and 24, No. 11, butt-ended direct steel spokes. 16-in. back wheel. 6 $\frac{1}{4}$ -in. x 4 $\frac{1}{4}$ -in. phosphor-bronze hubs. Fixed cranks, 4 $\frac{3}{4}$ -in. throw. Rubber pedals. Double ball bearings to front, balls to back wheel. Elliptical hollow forks to both wheels. Ball bearing

MANCHESTER—CONTINUED.

Humber head, 3½-in. centres. 23½-in. x 4½-in. horn handles. 1½-in. 14 W.G oval steel backbone. Special rubber-clothed spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan.

Specialities. Universal joint to front bearings. Adjustable handle. Balls to steering gear.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	16	10	0	52-in.	17	5	0
48-in.	16	15	0	54-in.	17	10	0
50-in.	17	0	0	56-in.	17	15	0

Extras. All bright, 25/-

Remarks. Warranted for two years. Very highly got up, and thoroughly well-built. An excellent machine with several novelties (*see advertisement*).

HANOVER No. 1.

GRIBBIN BROS., Miles Platting.

Description. 7/8-in. and ¾-in. red rubbers. Crescent steel rims. Nos. 12 & 14 charcoal iron, inch scale direct spokes. 16-in. back wheel. 5½-in. x 4½-in. G.M. hubs. Detachable cranks, 5½-in. throw. Rubber pedals. Cone and ring bearings. Double tubular elliptical front forks, semi-tubular back. Humber head. 24-in. horn handles. 1½-in. steel backbone. Bolted Stanley slide spring. Ventilated suspension saddle. Saw step. D.L.S. brake. Leg-guard. Bown's wrench. Oilcan. Bell. Valise.

Specialities. Cone and ring bearings (*page 26*). Double tubular fork (*page 38*).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	15	10	0	52-in.	17	0	0
48-in.	16	0	0	54-in.	17	10	0
50-in.	16	10	0	56-in.	18	0	0

Extras. All bright, 20/-

Remarks. Awarded three silver medals at Exhibitions. A fine and well-built substantial roadster.

HANOVER No. 2.

GRIBBIN BROS., Miles Platting.

Description. 7/8-in. and ¾-in. red rubbers. Crescent steel rims. Inch scale, Nos. 11 and 12, charcoal iron direct spokes. 16-in. back wheel. 5½-in. x 4½-in. G.M. hubs. Fixed cranks, 5½-in. throw. Rubber pedals. Adjustable roller bearings to front, cones to back wheel. Double tubular forks. Humber head, 3-in. centres. 24-in. x 4½-in. horn handles. 1½-in. steel backbone. Bolted Stanley slide spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Cone and ring bearings, extra (*page 26*). Double tubular fork (*page 38*).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	0	0	52-in.	14	10	0
48-in.	13	10	0	54-in.	15	0	0
50-in.	14	0	0	56-in.	15	10	0

Extras. All bright, 20/- Ball, or cone and ring bearings, 20/- Detachable cranks, 5/- Suspension saddle, 5/-

Remarks. Thoroughly well-built and sound. Up to all-round road work and touring.

MANCHESTER—CONTINUED.**HANOVER No. 3.**

GRIBBIN BROS., Miles Platting.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 40 and 14, Nos. 10 and 11, nipped spokes. 16-in. back wheel. 6-in. x $3\frac{1}{2}$ -in. iron hubs. Fixed cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Plain bearings to front, cones to back wheel, Elliptical hollow forks. Humber head, 3-in. centres. 24-in. x $4\frac{1}{2}$ -in. ebony handles. $1\frac{1}{2}$ -in. iron backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

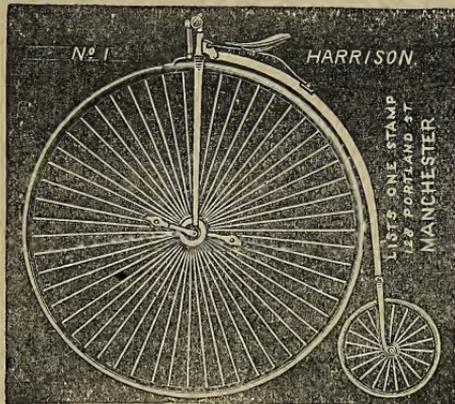
	£	s.	d.		£	s.	d.
46-in.	10	10	0	52-in.	12	0	0
48-in.	11	0	0	54-in.	12	10	0
50-in.	11	10	0	56-in.	13	0	0

Extras. All bright, 20/- Roller bearings, 10/- Brake, 10/-

Remarks. Sound and strong.

HARRISON.

WILLIAM HARRISON, 128, Portland Street.



HARRISON.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. grey rubbers. Crescent steel rims. 60 and 20, No. 11, direct steel spokes. 16-in. back wheel. $6\frac{1}{2}$ -in. x 5-in. G.M. hubs. Fixed cranks, $4\frac{3}{4}$ -in. throw. Rubber pedals. Double ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, 3-in. centres. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. 14 W.G. steel backbone. Bolted clip-tailed spring. Suspension saddle. Oval step. D.L.S. brake. Leg-guard. Special wrench. Oilcan. Bell. Valise.

Specialities. Harrison's special wrench.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	0	0	52-in.	14	5	0
48-in.				54-in.	14	10	0
50-in.				56-in.	14	15	0

Extras. All bright, 25/- Balls to back wheel, 20/-

Remarks. A sound, well-constructed roadster. Can be relied upon (see advertisement).

MANCHESTER—CONTINUED.

MANCHESTER EXPRESS No. 1.

T. CLARKE, 21, Leigh Place, Stockport Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 84 and 20 direct spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, $4\frac{3}{4}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, balls to back wheel. Elliptical hollow forks. Ball bearing Stanley head. 23-in. horn handles. $1\frac{1}{4}$ in. steel backbone. Bolted Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

Specialities. Ball bearing Stanley head (page 46).

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	} 11	0	0	52-in.	..	..	..	11	0	0
48-in.	..	..	..				54-in.	..	..	..	11	5	0
50-in.	..	..	..				56-in.	..	..	..	11	15	0

Extras. All bright, 25/- Plating, 60/-

Remarks. A well-finished and complete machine.

MANCHESTER EXPRESS No. 2.

T. CLARKE, 21, Leigh Place, Stockport Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 72 and 20, No. 12, direct spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, $4\frac{3}{4}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 23-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted Stanley slide spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	} 8	15	0	52-in.	..	..	..	9	0	0
48-in.	..	..	..				54-in.	..	..	..	9	5	0
50-in.	..	..	..				56-in.	..	..	..	9	10	0

Extras. All bright, 25/- Plated 60/-

Remarks. Very good value for money.

MANCHESTER EXPRESS No. 3.

T. CLARKE, 21, Leigh Place, Stockport Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12, direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $4\frac{3}{4}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Humber head, 3-in. centres. 23-in. x $4\frac{1}{2}$ -in. ebony handles. $1\frac{1}{4}$ -in. steel backbone. Front slide spring. Pigskin saddle. Circular step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	} 6	15	0	52-in.	..	..	..	7	0	0
48-in.	..	..	..				54-in.	..	..	..	7	5	0
50-in.	..	..	..				56-in.	..	..	..	7	10	0

Extras. All bright, 25/- Plated, 60/-

Remarks. Fair.

MANCHESTER—CONTINUED.**MANCHESTER EXPRESS No. 4.**

T. CLARKE, 21, Leigh Place, Stockport Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. V iron rims. No. 11, direct spokes. 15-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $4\frac{5}{8}$ -in. to $5\frac{5}{8}$ -in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Humber head, 3-in. centres. 23-in. x $4\frac{1}{2}$ -in. Lignum-vitæ handles. 1 $\frac{1}{4}$ -in. steel backbone. Bolted sliding spring. Pigskin saddle. Circular step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

			£ s. d.				£ s. d.
46-in. ..	..	..	} 5 10 0	52-in. ..	..	..	} 6 0 0
48-in. ..	..	..		54-in. ..	..	..
50-in. ..	..	..		56-in. ..	..	..

Extras. All bright, 20/- Plated, 60/-**MANCHESTER EXPRESS No. 5.**

T. CLARKE, 21, Leigh Place, Stockport Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. grey rubbers. V iron rims. No. 11 direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{4}$ -in. iron hubs. Fixed cranks, $4\frac{5}{8}$ -in. to $5\frac{5}{8}$ -in. throw. Rat-trap pedals. Parallel bearings to front, cones to back wheel. Solid forks. Humber head, 3-in. centres. 23-in. x $4\frac{1}{2}$ -in. wood handles. 1 $\frac{1}{4}$ -in. iron backbone. Bolted sliding spring. Pigskin saddle. Circular step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

			£ s. d.				£ s. d.
46-in. ..	..	..	} 4 10 0	52-in. ..	..	..	} 5 0 0
48-in. ..	..	..		54-in. ..	..	..
50-in. ..	..	..		56-in. ..	..	..

Extras. All bright, 25/- Plated, 60/-**MANCHESTER SPECIAL EXPRESS.**

T. CLARKE, 21, Leigh Place, Stockport Road.

Description. 1-in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 84 and 20, No 13, direct spokes. 16-in. back wheel. 6-in. x $4\frac{3}{4}$ -in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{5}{8}$ -in. throw. Rubber pedals. Ball bearings throughout. Elliptical hollow forks. Ball bearing Humber head. 23-in. horn handles. 1 $\frac{1}{4}$ -in. steel backbone. Bolted shackle spring. Suspension ventilated saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

Specialties. Ball bearing head (*page 46*).

PRICES.

			£ s. d.				£ s. d.
46-in. ..	..	..	} 14 0 0	52-in. ..	..	..	14 5 0
48-in. ..	..	..		54-in. ..	..	..	14 10 0
50-in. ..	..	..		56-in. ..	..	..	14 15 0

Extras. All bright, 25/- Plated, 60/-*Remarks.* A sound, reliable, and very complete machine.**SKINNER.**

H. & A. SKINNER, Park Works, 63, Alexandra Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. D.S.H. steel rims. 72 and 26, No. 11 direct steel spokes. 17-in. back wheel. 6-in. x 5-in. G.M. hubs. Detach-

MANCHESTER—CONTINUED.

able cranks, 4-in. to 6-in. throw. Rubber pedals. Rudge's ball bearings. Elliptical hollow front and back forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted clip-tail spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	0	0	52-in.	13	15	0
48-in.	13	5	0	54-in.	14	0	0
50-in.	13	10	0	56-in.	14	5	0

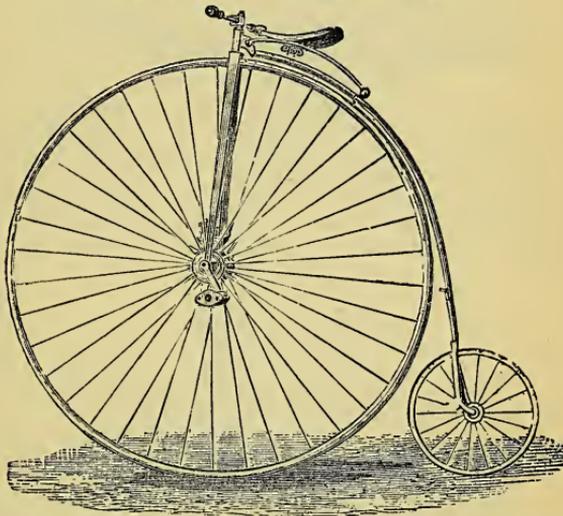
Extras. All bright, 20/-

Remarks. A very well sent out article. Strong, carefully made, and reliable.

MANSFIELD has now but one firm of manufacturers, who turn out three machines of a light order, and of sterling quality.

ALBERT.

SIMPSON & SON, Albert Works.



ALBERT.

Description. $7\frac{1}{8}$ -in. and $1\frac{1}{8}$ -in. red rubbers. Crescent steel rims. 60 and 24, No. 12 $\frac{1}{2}$, direct steel spokes. 17-in. back wheel. $5\frac{1}{2}$ -in. x $5\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to 6-in. throw. Rubber pedals. Double ball bearings to front, dust-proof cones to back wheel. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 22-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

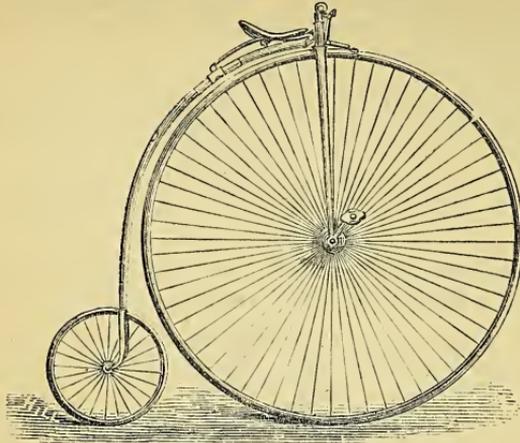
	£	s.	d.		£	s.	d.
46-in.	11	0	0	52-in.	12	0	0
48-in.				54-in.			
50-in.				56-in.			

Extras. None allowed.

Remarks. A good, strong, durable roadster, at a moderate cost.

MANSFIELD—CONTINUED.**DEFIANCE HOLLOW FORK.**

SIMPSON & SON, Albert Works.



DEFIANCE HOLLOW FORK.

Description. $\frac{3}{4}$ -in and $1\frac{1}{8}$ -in. red rubbers. Crescent steel rims. 80 and 30, No. 12 $\frac{1}{2}$, direct steel spokes. 17-in. back wheel. $5\frac{1}{2}$ in. x $5\frac{1}{4}$ -in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to 6-in. throw. Rubber pedals. Double ball bearings to front, Æolus balls to back wheel. Elliptical hollow front forks, semi-tubular back. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x $5\frac{1}{4}$ -in. horn handles. $1\frac{1}{2}$ -in. steel backbone. Shackle-fronted spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	15	0	0	52-in.	16	10	0
48-in.	15	10	0	54-in.	17	0	0
50-in.	16	0	0	56-in.	17	10	0

Extras. All bright, 20/- All plated, 80/-

Remarks. A very fine light roadster, and semi-racer.

SPECIAL TUBULAR DEFIANCE (S.T.D.)

S. SIMPSON & SON, Albert Works.

Description. $\frac{7}{8}$ -in. and $1\frac{1}{8}$ -in. red rubbers. Crescent steel rims. 80 and 30, No. 12 $\frac{1}{2}$, direct steel spokes. 17-in. back wheel. $5\frac{1}{2}$ -in. x $5\frac{1}{4}$ -in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to 6-in. throw. Patent combined pedals. Double ball bearings to front, Æolus balls to back wheel. Fluted hollow front forks, semi-tubular back. S.T.D. head, $6\frac{1}{2}$ -in. centres. 24-in. horn handles, adjustable $3\frac{1}{2}$ -in. to 5-in. $1\frac{1}{2}$ -in. fluted steel backbone. Bolted shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. S.T.D. head (*page 49*). Fluted backbone (*page 54*). Simpson's adjustable handles (*page 51*). Combined pedals (*page 16*).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	16	0	0	52-in.	17	10	0
48-in.	16	10	0	54-in.	18	0	0
50-in.	17	0	0	56-in.	18	10	0

Extras. All bright, 30/- Plated, 80/-

Remarks. The most rigid machine in the market. Admirably adapted for rough and bumpy roads.

NEWCASTLE-ON-TYNE brings us to a single firm of manufacturers, who turn out two first-class varieties in good style.

NORTHERN.

NORTH OF ENGLAND BICYCLE Co., High Bridge & Pilgrim Street.

Description. 7-in. and 3-in. red rubbers. Crescent hollow steel rims. 68 and 24, Nos. 11 and 12, direct spokes. 17-in. back wheel. 5 $\frac{3}{4}$ -in. x 5-in. G.M. hubs. Fixed cranks, 5-in. to 5 $\frac{1}{2}$ -in. throw. Rubber ball pedals. Double ball bearings to front, cones or balls to back wheel. Elliptical hollow front and back forks. Humber head, 4-in. centres. 24-in. x 5 $\frac{1}{4}$ -in. horn handles. 13-in. steel backbone. Shackle spring. Suspension saddle. Oval step. D.L.S. brake. Leg-guard. Special wrench. Oilcan. Bell. Valise.

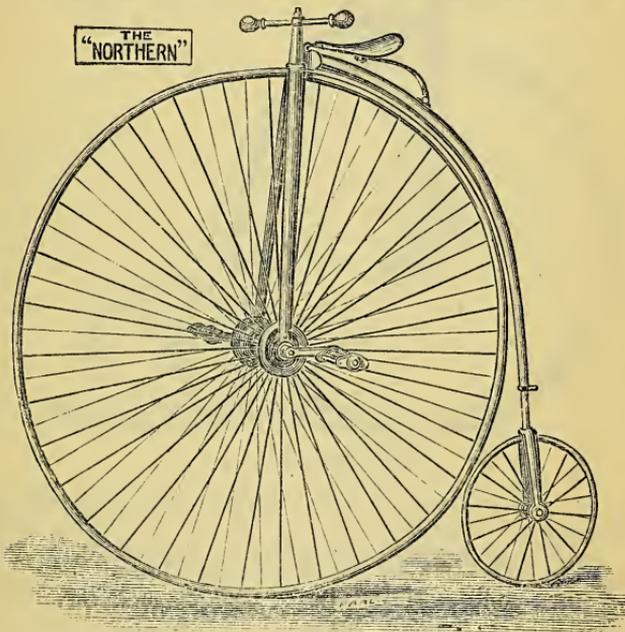
PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	16	0	0
48-in.	15	0	0	54-in.	16	10	0
50-in.	15	10	0	56-in.	17	0	0

Remarks. Sent out in a very complete and perfect manner. Good material and workmanship make it reliable (see advertisement).

NORTHERN RACER.

NORTH OF ENGLAND BICYCLE Co., High Bridge & Pilgrim Street.



NORTHERN RACER.

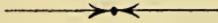
Description. 5-in. and 1-in. red rubbers. Crescent steel rims. 68 and 24, Nos. 12 and 13, direct spokes. 17-in. back wheel. 5 $\frac{1}{2}$ -in. x 5 $\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 4 $\frac{1}{2}$ -in. to 5-in. throw. Rat-trap pedals. Ball bearings through out. Elliptical hollow front and back forks. Humber head, 4-in. centres. 26-in. x 5 $\frac{1}{4}$ -in. horn handles. 13-in. steel backbone. Shackle spring. Special racing saddle. Flat wrench. Oilcan.

NEWCASTLE-ON-TYNE—CONTINUED.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	16	10	0	52-in.	..	..	17	10	0
48-in.	..	..	17	0	0	54-in.	..	..	18	0	0
50-in.	..	..	17	0	0	56-in.	..	..	18	10	0

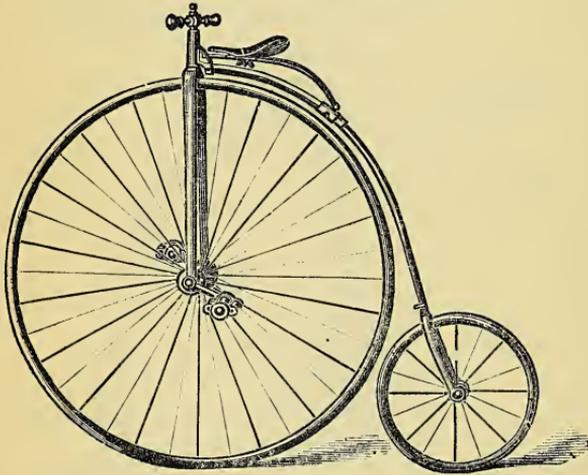
Remarks. A most complete machine. Largely used for racing purposes upon Northern tracks. 202 miles have been accomplished on it in 14 hours (*see advertisement*).



NORTHAMPTON. One maker, four machines, all containing sound material and reliable work.

NORTHAMPTON A.

E. GADSBY, Bearward Street.



NORTHAMPTON A.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 40 and 16, No. 11, lock-nutted spokes. 18-in. back wheel. 5-in. x $3\frac{3}{4}$ -in. iron hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Coned bearings. Solid forks. Stanley head, $3\frac{3}{8}$ -in. centres. 18-in. x $5\frac{3}{4}$ -in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted hinged clip spring. Pigskin saddle. Circular step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

			£	s.	d.				£	s.	d.
46-in.	..	..	9	0	0	52-in.	..	..	10	10	0
48-in.	..	..	9	10	0	54-in.	..	..	11	0	0
50-in.	..	..	10	0	0	56-in.	..	..	11	10	0

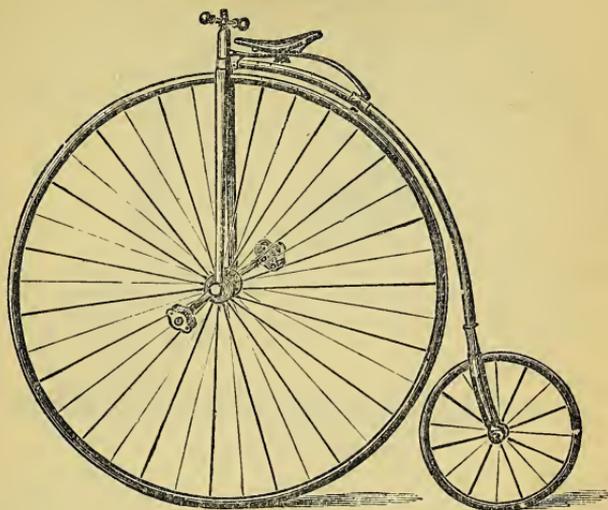
Extras. All bright, 20/-

Remarks. Sound and cheap for common work.

NORTHAMPTON—CONTINUED.

NORTHAMPTON No. 2.

E. GADSBY, Bearward Street.



NORTHAMPTON No. 2.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. No. 11, inch scale, lock-nutted spokes. 18-in. back wheel. $5\frac{1}{2}$ -in. x 4-in. iron hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Adjustable roller bearings to front, cones to back wheel. Elliptical hollow forks. Northampton open head, 4-in. centres. 22-in. x $5\frac{1}{2}$ -in. horr. handles. 1 $\frac{1}{2}$ -in. steel backbone. Bolted hinged-slide spring. Pigskin saddle. Circular step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Head.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	0	0	52-in.	12	10	0
48-in.	11	10	0	54-in.	13	0	0
50-in.	12	0	0	56-in.	13	10	0

Extras. All bright, 20/-

Remarks. Strong and reliable. A good machine.

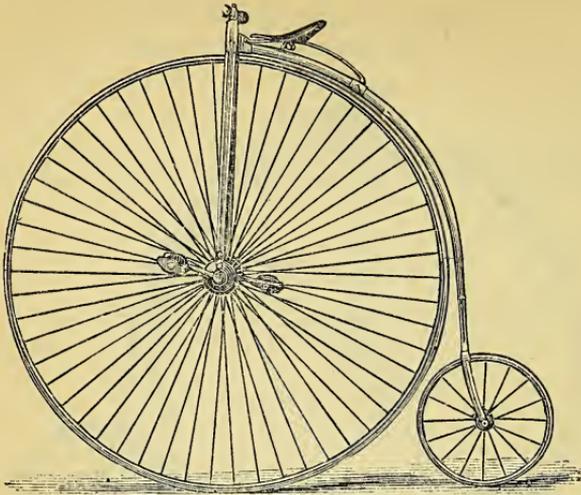
NORTHAMPTON SPECIAL.

E. GADSBY, Bearward Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. No. 11, inch scale, direct spokes. 16-in. back wheel. 6-in. x 4-in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, Æolus balls to back wheel and pedals. Elliptical hollow forks. Northampton open head, 4-in. centres. 22-in. x $5\frac{1}{2}$ -in. horn handles. 1 $\frac{1}{4}$ -in. steel backbone. Bolted hinged-slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Head.

NORTHAMPTON—CONTINUED.



NORTHAMPTON SPECIAL.

PRICES.

£ s. d.				£ s. d.			
46-in.	14	0	0	52-in.	15	10	0
48-in.	14	10	0	54-in.	16	0	0
50-in.	15	0	0	56-in.	16	10	0

Extras. All burnished, 20/-

Remarks. A well-finished, strong, and reliable roadster.

BOY'S OWN.

G. GADSBY, Bearward Street.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. U V iron rims. Inch scale, No. 12, lock-nutted spokes. 15-in. back wheel. 4-in. x 3-in. iron hubs. Fixed cranks. Rat-trap pedals. Plain Sheffield bearings to front, cones to back wheel. Solid elliptical forks. Northampton open centre head. 18-in x $4\frac{1}{2}$ -in. horn handles. $1\frac{1}{2}$ -in. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. Flat wrench. Oilcan.

PRICE.

40-in. to 44-in. £6 0 0

Remarks. A sound, useful article.



NOTTINGHAM still keeps select, boasting of five makers of only first-class machines, ten in number. During the past season Messrs. Humber, Marriott & Cooper have removed their actual works to Beeston, a suburb of Nottingham, where they have built a fine new factory.

CARVER (Class 4).

JAMES CARVER, Alfred Street Mills.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 60 and 24, Nos. 12 & 13, direct solid spokes. 16-in. back wheel. $6\frac{1}{2}$ -in. x 5-in. G.M. hubs.

NOTTINGHAM—CONTINUED.

Fixed cranks, 4-in. to 5½-in. throw. Rubber pedals. Double ball bearings to front, dust-proof taper pin to back wheel. Solid Lowmoor iron forks. Humber head, 3½-in. centres. 26-in. x 4½-in. horn handles. 1¼-in. 16 W.G. steel backbone. Carver's spiral shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Two flat wrenches. Oilcan. Bell. Valise.

Specialities. Special spiral shackle spring (*page 57*). Non-slipping saddle and pedals (*pages 20 and 66*).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	15	0	52-in.	14	5	0
48-in.				54-in.	14	10	0
50-in.				56-in.	14	15	0

Extras. Hollow forks, 20/- Balls to back wheel, 20/- Andrews' patent head, 5/- Dust-guard to head, 5/- Detachable cranks, 5/-

Remarks. A sound, strong, and well-made roadster. Finished all bright in a superior manner.

HOLLOW SPOKE RACER (Class 3).

JAMES CARVER, Alfred Street Mills.

Description. 5/8-in. and ½-in. red rubbers. Crescent steel rims. 80 and 24, No. 13, butt-ended direct hollow spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, 4-in. to 5½-in. throw. Rat-trap pedals. Double ball bearings to front, balls to back wheel. Solid Lowmoor iron forks. Andrews' patent head, 4¾-in. centres. 24-in. x 4½-in. horn handles. 1¼-in. 16 W.G. steel backbone. Carver spiral shackle spring. Pigskin racing saddle. Two flat wrenches. Oilcan.

Specialities. Hollow spokes (*page 9*). Carver spring (*page 57*). Non-slipping saddle and pedals (*pages 20 and 66*).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	0	0	52-in.	14	10	0
48-in.				54-in.	14	15	0
50-in.				56-in.	15	0	0

Extras. Hollow forks, 20/- Detachable cranks, 5/-

Remarks. A very fine machine, sent out burnished all over. Made with solid spokes if desired.

HOLLOW SPOKE ROADSTER (Class 1).

JAMES CARVER, Alfred Street Mills.

Description. ¾-in. and 5/8-in. red rubbers. Crescent steel rims. 80 and 24, No. 13, butt-ended direct hollow spokes. 16-in. back wheel. 6½-in. x 5-in. G.M. hubs. Fixed cranks, 4-in. to 5½-in. throw. Rubber pedals. Double ball bearings to front, dust-proof taper pin to back wheel. Lowmoor iron solid forks. Humber head, 3¾-in. centres. 26-in. x 5-in. horn handles. 1¼-in., 16 W.G., steel backbone. Carver's spiral shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Two flat wrenches. Oilcan. Bell. Valise.

Specialities. Hollow spokes (*page 9*). Carver's spring (*page 57*). Non-slipping saddle and pedals (*pages 20 and 66*).

NOTTINGHAM—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	0	0	52-in.	14	15	0
48-in.	14	5	0	54-in.	15	0	0
50-in.	14	10	0	56-in.	15	5	0

Extras. Hollow forks, 20/- Balls to back wheel, 20/- Dust-guard to head, 4/-
Detachable cranks, 5/- Andrews' patent head, 5/-

Remarks. A very fine light roadster. Well finished and sound.

HUMBER RACER.

HUMBER, MARRIOTT & COOPER, Queen's Road.

Description. $\frac{5}{8}$ -in. and $\frac{1}{2}$ -in. grey rubbers. Humber hollow steel rims. No. 13 direct steel spokes. 16-in. back wheel. 5-in. x 5-in. G.M. hubs. Fixed cranks, $3\frac{3}{4}$ -in. to $4\frac{3}{4}$ -in. throw. Rat-trap pedals. Ball bearings throughout. Elliptical hollow front forks, semi-tubular back. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. horn handles. $1\frac{3}{8}$ -in. 16 W.G. steel backbone. Slide-fronted spring. Pigskin racing saddle. Saw step. Flat wrench. Oilcan.

Specialities. Humber hollow felloes (page 6).

PRICE.

All sizes £18 0 0

Extras. All bright, 20/-

Remarks. One of the finest racers made. The amateur championships of 1881 were won on it, and it is ridden by a large number of crack racing men.

HUMBER ROADSTER.

HUMBER, MARRIOTT & COOPER, Queen's Road.

Description. $1\frac{3}{16}$ -in. and $\frac{5}{8}$ -in. grey rubbers. Crescent steel rims Nos. 12 and 13 direct spokes. 16-in. back wheel. $5\frac{1}{4}$ -in. x 5-in. brass hubs. Fixed cranks, $5\frac{3}{4}$ -in. throw. Rubber pedals. Double ball bearings to front, balls to back wheel. Elliptical hollow front forks, semi-tubular back. Humber head, 4-in. centres. 24-in. horn handles. $1\frac{1}{4}$ -in. 15 W.G. steel backbone. Curl-tailed spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	17	0	0	52-in.	17	15	0
48-in.	17	5	0	54-in.	18	0	0
50-in.	17	10	0	56-in.	18	5	0

Extras. All bright, 20/- Plated, £4.

Remarks. Excellent fitting, finish, and material combine to make a first-class machine.

IMPERIAL.

W. SMITH, Crocus Street, Meadows.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 60, No. 11, direct spokes. $6\frac{1}{2}$ -in. x $4\frac{3}{4}$ -in. G.M. hubs. Fixed cranks. Rubber pedals. Double ball bearings. Coned back wheel. Bayonet hollow forks. Stanley head of a peculiarly neat pattern. 24-in. horn handles. Steel backbone. Bolted shackle spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Spanner. Oilcan.

NOTTINGHAM—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	5	0	52-in.	13	0	0
48-in.	12	10	0	54-in.	13	5	0
50-in.	12	15	0	56-in.	13	10	0

Extras. All bright, 20/-

Remarks. Light, strong, well-finished, and rapidly gaining favour.

IMPERIAL RACER.

W. SMITH, Crocus Street, Meadows.

Description. $\frac{3}{8}$ -in. and $\frac{1}{2}$ -in. red rubbers. Crescent steel rims. 70, No. 12, direct steel spokes. G.M. hubs. Fixed cranks. Rat-trap pedals. Ball bearings. Bayonet hollow forks. Stanley head. Horn handles. Steel backbone. Bolted shackle spring. Pigskin saddle. Saw step. Wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	15	0	0	52-in.	15	15	0
48-in.	15	5	0	54-in.	16	0	0
50-in.	15	10	0	56-in.	16	5	0

Extras. All bright, 20/-

Remarks. Light, neat, strong, well finished.

ROBIN HOOD.

JOHN SIBERT & Co., Hockley Mill Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 70, No. 12, direct-action spokes. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks. Rubber pedals. Sibert's self-lubricating axle box and dumb-bell roller bearings. Coned back pin and pedals. Hollow forks. Stanley head. 24-in. horn handles. Steel backbone. Shackle spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Wrench. Oilcan. Lubricators.

Specialities. Sibert's self-lubricating axle box and dumb-bell roller bearings (page 27).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	0	0	52-in.	12	10	0
48-in.	11	10	0	54-in.	13	0	0
50-in.	12	0	0	56-in.	13	10	0

Extras. Plating, 30/- Ball bearings, 20/-

Remarks. Finished all bright. Very light. A good machine.

SWIFT.

R. J. BALL, 54, Alfreton Road.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 56 and 20, No. 11, direct steel spokes. 16-in. back wheel. $5\frac{3}{4}$ -in. x $4\frac{1}{4}$ -in. G.M. interlocking hubs. Fixed cranks, 4-in. to $5\frac{1}{4}$ -in. throw. Rubber pedals. Double ball bearings to front, balls to back wheel. Elliptical hollow front and back forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. 16 W.G. steel backbone. Curl spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Interlocking hub (page 11.)

NOTTINGHAM—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	0	0	52-in.	12	10	0
48-in.	11	10	0	54-in.	13	0	0
50-in.	12	0	0	56-in.	14	0	0

Extras. All bright, 10/- Ball pedals, 20/-

Remarks. A well made, strong, and reliable light roadster.

TOURISTS' HOLLOW SPOKE.

JAMES CARVER, Alfred Street Mills.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 13, butt-ended direct hollow spokes. 16-in. back wheel. $6\frac{1}{4}$ -in. x 5-in. G.M. hubs. Fixed cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, dust-proof taper pin to back wheel. Lowmoor iron solid forks. Humber head, $3\frac{1}{2}$ -in. centres. 26-in. x 5-in. horn handles. $1\frac{1}{2}$ -in. 16 W.G. steel backbone. Carver spiral shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Hollow spokes (page 9). Carver spring (page 57). Non-slipping saddle and pedals (pages 20 and 66).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	15	0	52-in.	15	5	0
48-in.	15	0	0	54-in.	15	10	0
50-in.	15	0	0	56-in.	15	15	0

Extras. Hollow forks, 20/- Balls to back wheel, 20/- Dust guard to head, 4/- Detachable cranks, 5/- Andrews' patent head, 5/-

Remarks. A first-class roadster, of good material and fine finish. Sent out burnished all over.



PORTSMOUTH boasts of a manufacturer, who ought to do—and I believe does—a good Southern trade, as he is very careful w^h all his work, and turns out three varieties, of excellent quality.

LEADER.

G. WALLACE ASH, 13, Russell Street, Southsea.

Description. $\frac{5}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 86 and 24, No. 12, direct steel spokes. 15-in. back wheel. $5\frac{1}{2}$ -in. x $5\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 5-in. throw. Rubber pedals. Double ball bearings to front, cones to back wheel. Solid forks. Humber head, $3\frac{1}{2}$ -in. centres. 26-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Patent Leader spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan.

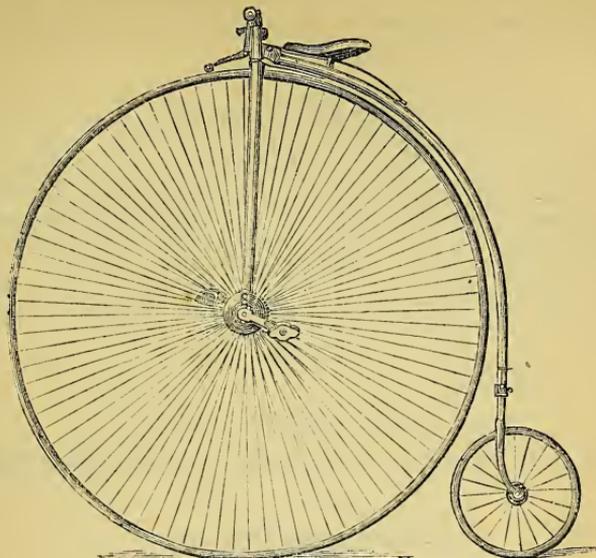
Specialities. Leader spring (page 60).

PRICE.

All sizes £11 11 0

Extras. All bright, 30/- Ball pedals, 20/-

PORTSMOUTH—CONTINUED.



LEADER.

Remarks. Both workmanship and material sound throughout. A good machine at a reasonable figure (*see advertisement*).

SOUTHSEA LEADER.

G. WALLACE ASH, 13, Russell Street, Southsea.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 18, No. 11, direct steel spokes. 15-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Roller bearings to front, cones to back wheel. Solid iron forks. Stanley head, 3-in. centres. 24-in. x $5\frac{1}{2}$ -in. ebony handles. $1\frac{1}{4}$ -in. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICE.

All sizes £8 10 0

Extras. All bright, 30/-

Remarks. Sound and strong (*see advertisement*).

SPECIAL LEADER.

G. WALLACE ASH, 13, Russell Street, Southsea.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Potential steel rims. 100 and 30, No. 13, direct steel spokes. 15-in. back wheel. $6\frac{1}{4}$ -in. x $5\frac{1}{4}$ -in. G.M. hubs. Detachable cranks, 5-in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow front and back forks. Humber head, 4-in. centres. 26-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Patent Leader spring. Suspension saddle. Adjustable step. D.L.S. or Leader brake. Leg-guard. Screw wrench. Oilcan.

Specialities. Leader spring (*page 60*). Leader automatic brake (*page 72*).

PRICE.

All sizes £14 5 0

Extras. All bright, 30/- Ball pedals, 20/- Plated, 60/-

Remarks. This is a really first-class machine, made with considerable care. It can be relied on as a roadster for comfort and durability (*see advertisement*).

RAINHILL (Lancashire). One firm here holds out, and, besides doing a considerable trade as agents for other makers, supply four very creditable machines as their own manufacture.

LANCASHIRE A.

J. & W. M. HAYES.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Potential steel rims. 60 and 20, Nos. 12 and 13, butt-ended direct spokes. 17-in. back wheel. $4\frac{1}{2}$ -in. x 6-in. G.M. hubs. Detachable cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Æolus ball bearings. Gribbin's double tubular forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x $5\frac{1}{2}$ -in. horn handles. Oval steel backbone. Bolted barrel-slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Valise.

PRICE.

All sizes £15 0 0

Extras. D.S.H. rims, 15/- Plated, 50/-

Remarks. Built for rough Lancashire roads. A sound, strong roadster.

LANCASHIRE B.

J. & W. M. HAYES.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 10 and 11, direct spokes. 17-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings to front, cones to back wheel. Solid Lowmoor iron forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. Steel backbone. Bolted barrel slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICE.

All sizes £10 10 0

Extras. Balls to front wheel, 15/-; ditto, back, 15/-

Remarks. An all-round reliable roadster.

LANCASHIRE C.

J. & W. M. HAYES.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, direct spokes. 17-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x 5-in. ebony handles. Steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICE.

	£	s.	d.
All sizes	8	10	0

Remarks. Not so well finished as class B, but a sound machine.

RAINHILL—CONTINUED.

LANCASHIRE HOLLOW FORK ROADSTER.

J. & W. M. HAYES.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, butt-ended direct spokes. 17-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. Steel backbone. Bolted barrel-slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICE.

All sizes £12 10 0

Extras. D.S.H. rims, 15/- Plated, 50/-

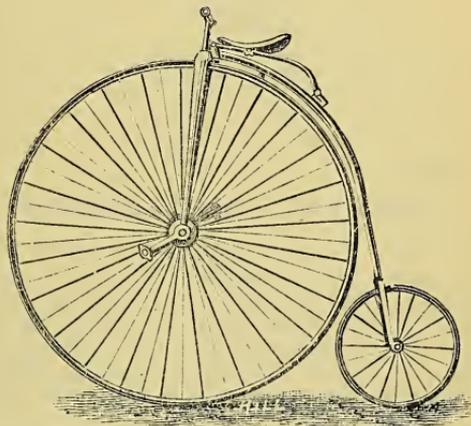
Remarks. A strong, all-round roadster, fit for general give-and-take roads.



RUNCORN. One maker, one machine.

RELIANCE.

R. LEA AND SON.



RELIANCE.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60, No. 10, direct spokes. G.M. hubs. Fixed cranks. Rubber pedals, plain. Ball bearings. Coned back wheel. Hollow forks. Stanley head. 24-in. x 5-in. detachable horn handles. $1\frac{1}{2}$ -in. steel backbone. Bolted shackle spring. Suspension saddle. Saw step. Valise. Wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	0	0	52-in.	14	15	0
48-in.	14	5	0	54-in.	15	0	0
50-in.	14	10	0	56-in.	15	5	0

Extras. All bright, 20/- Balls to back, 15/-; to pedals, 25/- Brake, 15/-

Remarks. A very good machine.

SHEFFIELD still retains its reputation for light-class, neat machines.

During the past season several new patterns have been introduced, and most of the old ones thoroughly remodelled. The only actual change which has taken place in the trade is in the business of the "Hallamshire," which has changed hands, and is now conducted in a thoroughly sound manner by Messrs. Ellis and Buchan. Messrs. Coupe, Addy & Hall, wire drawers, &c., of the Tinsley Steel Works, have introduced a good little safety, and I have unearthed another maker in the form of C. Anderton, who has been long in the trade, although in the background hitherto. There are now eight manufacturers, sending out between them nineteen machines of all qualities and prices.

AXIOM.

C. ANDERTON, Copper Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 52 and 16, Nos. 10 and 11, direct steel spokes. 17-in. back wheel. 6-in. x $3\frac{3}{4}$ -in. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Adjustable parallel bearings to front, cones to back wheel. Solid iron forks. Humber head, $3\frac{3}{4}$ -in. centres. 22-in. x $5\frac{1}{2}$ -in. lignum-vitæ handles. $1\frac{1}{2}$ -in. lap-welded backbone. Bolted sliding spring. Pigskin saddle. Circular step. D.L.S. brake. Flat wrench. Oilcan.

PRICES.

				£	s.	d.						
46-in.	6	0	0	52-in.	..	..	6	10	0
48-in.				54-in.	..	..	7	0	0
50-in.				56-in.	..	..	7	10	0

Extras. All bright, 20/-

Remarks. Very cheap.

CHESTER REGISTERED.

HYDES & WIGFULL, Limited, Stanley Street, Wicker.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12, direct steel spokes. 18-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, 6-in. throw. Rubber pedals. Double ball bearings to front, plain pin to back wheel. Elliptical hollow forks. Registered Stanley head. 24-in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Pattern of head.

PRICES.

				£	s.	d.						
46-in.	15	0	0	52-in.	..	..	15	10	0
48-in.				54-in.	..	..	16	0	0
50-in.				56-in.	..	..	16	10	0

Extras. Plated, 40/-

Remarks. A sound, fairly-built roadster.

DART No. 1.

SMITH, SONS & Co., Bow Works, West Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20 direct steel spokes. 17-in. back wheel. $5\frac{1}{2}$ -in. x 5-in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, balls to back

SHEFFIELD—CONTINUED.

wheel. Elliptical hollow forks. Humber head, 4-in. centres. 24-in. x 5-in. horn handles. 1 $\frac{3}{8}$ -in. 14 W.G. steel backbone. Bolted coiled spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	15	0	52-in.	14	15	0
48-in.				54-in.	15	5	0
50-in.				14	5	0	56-in. .. .. .	15	15	0

Remarks. All bright or painted. A fine machine.

DART No. 3.

SMITH, SONS & Co., Bow Works, West Street.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 52 and 20 direct spokes. 17-in. back wheel. 5 $\frac{1}{2}$ -in. x 5-in. G.M. hubs. Fixed cranks, 4 $\frac{1}{2}$ -in. to 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Plain Sheffield bearings to front, cones to back wheel. Solid forks. Humber head, 4-in. centres. 24-in. x 5-in. ebony handles. 1 $\frac{1}{4}$ -in. 15 W.G. steel-backbone. Bolted Stanley slide spring. Pig-skin saddle. Circular step. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	8	0	0	52-in.	9	10	0
48-in.	8	10	0	54-in.	10	0	0
50-in.	9	0	0	56-in.	10	10	0

Extras. Brake, 10/-

Remarks. Sound and strong.

ELECTRIC.

F. W. BAGSHAW & SONS, Sheffield Bicycle Works, Hillfoot.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct steel spokes. 17-in. back wheel. 6-in. x 4-in. G.M. hubs. Fixed cranks, 4 $\frac{1}{2}$ -in. to 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Plain Sheffield bearings to front, cones to back wheel. Solid Lowmoor iron forks. Humber head, 3 $\frac{1}{2}$ -in. centres. 22-in. x 5-in. horn handles. 1 $\frac{3}{4}$ -in. steel backbone. Bolted sliding spring. Pig-skin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Registered hub, extra (page 11).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	10	0	52-in.	13	0	0
48-in.	12	0	0	54-in.	13	10	0
50-in.	12	10	0	56-in.	14	0	0

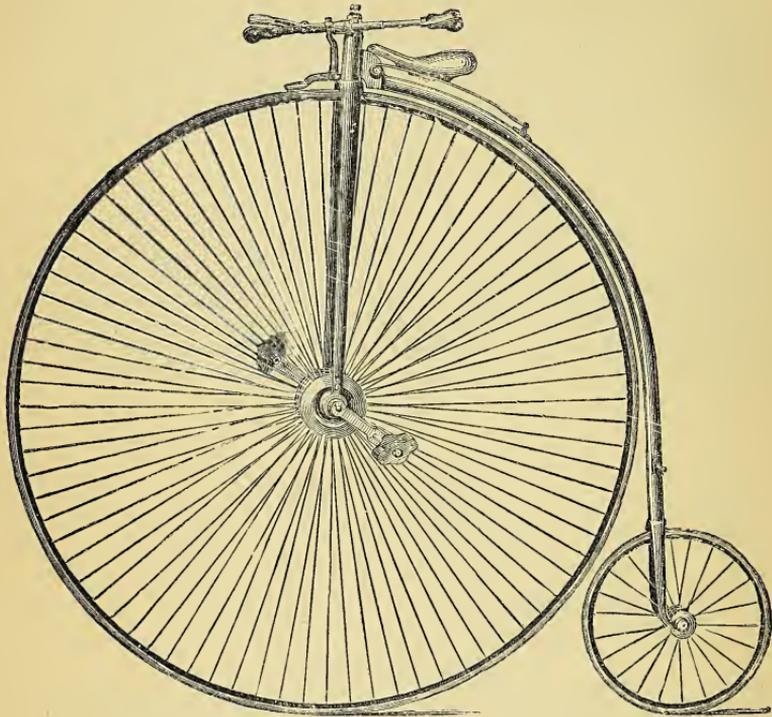
Extras. All bright, 10/- Ball bearings, 20/- Ditto back wheel, 12/- Patent hub, 7/6. Hollow forks, 10/-

Remarks. This is a sound, well-built roadster, nicely finished and reliable.

SHEFFIELD—CONTINUED.

HALLAMSHIRE No. 1.

ELLIS & BUCHAN, Sylvester Gardens.



HALLAMSHIRE NO. 1.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 70 and 24, No. 12, direct steel spokes. 16-in. back wheel. 6-in. x $5\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 5-in. to 6-in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow front forks, semi-tubular back. Humber head, 4-in. centres. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted shackle spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

PRICES.

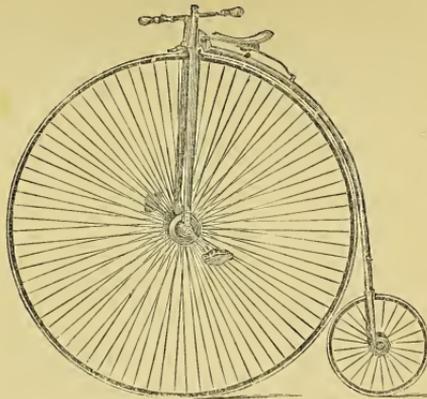
	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	15	0	0
48-in.				54-in.			
50-in.				56-in.			

Extras. Plating, 40/-

Remarks. Sent out bright or painted. A very fine machine. Well up to road or racing work. Good material, well put together (*see advertisement*).

SHEFFIELD—CONTINUED.

HALLAMSHIRE No. 2.
 ELLIS & BUCHAN, Sylvester Gardens.



HALLAMSHIRE No. 2.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No 11, direct steel spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, 5-in. throw. Rubber pedals. Double ball bearings to front, cones to back wheel. Solid steel forks. Humber head, 4-in. centres. 24-in. x 5-in. horn handles. $1\frac{1}{2}$ -in. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

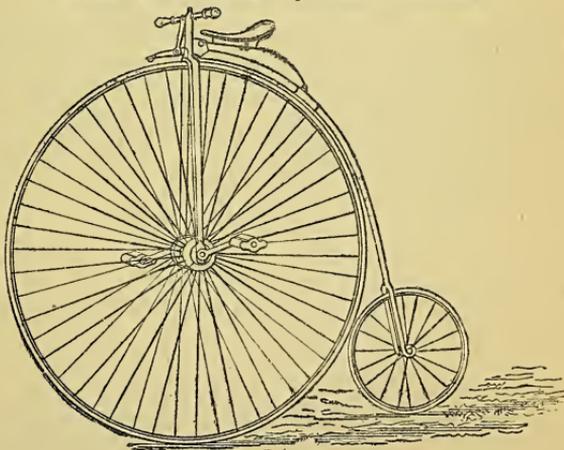
PRICES.

			£	s.	d.				£	s.	d.			
46-in.	..	..	11	10	0	52-in.	..	..	12	0	0
48-in.				54-in.				12	10	0
50-in.	..	..				56-in.	..	..				

Extras. All bright, 10/- Plated, 40/-

Remarks. A soundly built, reliable machine (see advertisement).

HALLAMSHIRE No. 3.
 ELLIS & BUCHAN, Sylvester Gardens.



HALLAMSHIRE No. 3.

SHEFFIELD—CONTINUED.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 50 and 18 direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 5-in. throw. Rubber pedals. Plain Sheffield bearings to front, cones to back wheel. Solid Lowmoor iron forks. Stanley head, 3-in. centres. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{1}{2}$ -in. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	6	10	0	52-in.	7	10	0
48-in.	7	0	0	54-in.	8	0	0
50-in.				56-in.			

Extras. All bright, 10/-

Remarks. Very fair (see advertisement).

MARMION.

HYDES & WIGFULL, Limited, Stanley Street, Wicker.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12, direct steel spokes. 18-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 6-in. throw. Rubber pedals. Double ball bearings to front, cones to back wheel. Elliptical hollow front and back forks. Stanley head, 4-in. centres. 24-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted Stanley improved slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Introdurers of Stanley head.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	0	0	52-in.	12	10	0
48-in.				54-in.	13	0	0
50-in.				56-in.	13	10	0

Remarks. Painted in any two colours, and no alteration allowed. A thoroughly sound machine.

ORIGINAL CHESTER.

HYDES & WIGFULL, Limited, Stanley Street, Wicker.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 50 and 18, No. 11, direct steel spokes. 18-in. back wheel. $5\frac{1}{2}$ -in. x 4-in. G.M. hubs. Detachable cranks, 6-in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Stanley head. 22-in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	10	10	0	52-in.	11	0	0
48-in.				54-in.	11	10	0
50-in.				56-in.	12	0	0

Remarks. Painted in two colours only. Very fair.

ORIGINAL STANLEY.

HYDES & WIGFULL, Limited, Stanley Street, Wicker.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12, direct steel spokes. 18-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs.

SHEFFIELD—CONTINUED.

6-in. cranks. Rubber pedals. Roller bearings to front, cones to back wheel. Lowmoor iron solid forks. Stanley head. 24-in. horn handles. 1 $\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

				£	s.	d.					£	s.	d.	
46-in.	12	10	0	|	52-in.	..	..	..	13	0	0
48-in.					54-in.	..	..	..	13	10	0
50-in.					56-in.	..	..	..	14	0	0

Remarks. Finished bright or painted. A fine and well-trying steel.

SHEFFIELD No. 1.

C. ANDERTON, Copper Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 80 and 30 direct steel spokes. 17-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings without cages to front, balls to back wheel. Lowmoor iron solid forks. Humber head, 4-in. centres. 24-in. x 5-in. horn handles. 1 $\frac{3}{8}$ -in. steel backbone. Bolted shackle spring. Web-seated saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan.

PRICES.

				£	s.	d.					£	s.	d.	
46-in.	13	10	0	|	52-in.	..	..	..	14	10	0
48-in.					54-in.	..	..	..	15	0	0
50-in.					56-in.	..	..	..	15	10	0

Extras. Hollow forks, 12/6. Ball pedals, 25/- Plating, 50/-

Remarks. Soundly made and strong. Good material and fitting.

SHEFFIELD No. 2.

C. ANDERTON, Copper Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 11 and 12, direct steel spokes. 17-in. back wheel. 6-in. x 4-in. G.M. hubs. Fixed cranks, 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, cones to back wheel. Solid elliptical forks. Stanley head, 3 $\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. 1 $\frac{1}{2}$ -in. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan.

PRICES.

				£	s.	d.					£	s.	d.	
46-in.	10	10	0	|	52-in.	..	..	..	11	10	0
48-in.					54-in.	..	..	..	12	0	0
50-in.					56-in.	..	..	..	12	10	0

Extras. All bright, 10/-

Remarks. A cheap and sound machine.

SHEFFIELD No. 3.

C. ANDERTON, Copper Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 56 and 20, No. 11, direct spokes. 18-in. back wheel. 6-in. x 4-in. G.M. hubs. Fixed cranks, 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Sheffield T bearings to front, cones to back wheel.

SHEFFIELD—CONTINUED.

Solid forks. Stanley head, $3\frac{1}{2}$ -in. centres. 22-in. x 5-in. ebony handles. $1\frac{1}{2}$ -in. steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	} 9	0	0	52-in.	..	..	..	9	10	0
48-in.	..	..	..				54-in.	..	..	..	10	0	0
50-in.	..	..	..				56-in.	..	..	..	10	10	0

Remarks. Bright or painted.

STANLEY REGISTERED.

HYDES & WIGFALL, Limited, Stanley Street, Wicker.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. non-slipping red rubbers. Crescent steel rims. 60 and 20, No. 12, Stanley nipped steel spokes. 18-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, 6-in. throw. Rubber pedals. Double ball bearings to front, Stanley balls to back wheel. Round hollow front forks, oval back. Dust-proof Registered Stanley head. 24-in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Stanley nipples (page 10). Stanley back wheel balls (page 36). Registered head and neck. Round forks (page 39).

PRICES.

				£	s.	d.					£	s.	d.
46-in...	..	..	..	} 18	0	0	52-in.	..	..	..	18	10	0
48-in..	..	..	..				54-in.	..	..	..	19	0	0
50-in..	..	..	..				56-in.	..	..	..	19	10	0

Remarks. Polished and plated all over, or japanned to order. A very finely built, fast, light and reliable machine.



SITTINGBOURNE. Here two makers turn out between them seven machines, embracing several novelties, and being in general sound, genuine articles.

EMPEROR No. 1.

DENNE & Co., East Kent Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 24, Nos. 11 and 12, charcoal iron direct spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{3}{4}$ -in. throw. Rubber pedals. Double ball bearings to front, dust-proof cones to back wheel. Lowmoor iron solid forks. Humber head, $3\frac{3}{4}$ -in. centres. 26-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted barrel-slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Eclipse wrench. Oilcan.

PRICE.

All sizes £12 0 0

Extras. All bright, 40/-

Remarks. A sound, well constructed roadster.

SITTINGBOURNE—CONTINUED.

EMPEROR No. 2.

DENNE & Co., East Kent Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. V rims. 52 and 16, Nos. 11 and 12, lock-nutted spokes. 16-in. back wheel. 6-in. x $3\frac{1}{2}$ -in. iron hubs. Detachable cranks, $4\frac{1}{2}$ -in. to $5\frac{3}{4}$ -in. throw. Rat-trap pedals. Parallel bearings to front, cones to back wheel. Solid forks. Stanley head, $3\frac{3}{4}$ -in. centres. 22-in. x 5-in. ebony handles. $1\frac{1}{4}$ -in. iron backbone. Bolted clip-tailed spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICE.

All sizes £9 10 0

Remarks. Only supplied painted. Sound and strong.

IMPERIAL KENT DEFIANCE.

F. CLEAVER & Co., Kent Bicycle Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Potential steel rims. 60 and 20, Nos. 11 and 12, direct spokes. 17-in. back wheel. 6-in. x $5\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. to $5\frac{3}{4}$ -in. throw. Rubber pedals. Æolus ball bearings to front, dust-proof cones to back wheel. Elliptical hollow front forks, fluted back. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. horn handles. $1\frac{3}{8}$ -in. 16 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Fluted back fork.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	0	0	52-in.	} 14	15	0
48-in.	14	5	0	54-in.			
50-in.	14	10	0	56-in.			

Extras. All bright, 30/-

Remarks. Highly finished, and well put together.

KING OF THE ROAD.

DENNE & Co., East Kent Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. best red rubbers. Potential steel rims. 60 and 24, Nos. 11 and 12, charcoal iron direct spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{3}{4}$ -in. throw. Rubber pedals. Double ball bearings to front, dust-proof cones to back wheel. Elliptical hollow front and back forks. Humber head, $3\frac{3}{4}$ -in. centres. 26-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted barrel-slide spring. Suspension ventilated saddle. Saw step. D.L.S. brake. Leg-guard. Eclipse Wrench. Oilcan. Valise.

Specialities. Non-vibrating back fork (page 41).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	} 16	16	0	52-in.	} 17	10	0
48-in.				54-in.			
50-in.				56-in.			

Extras. All bright, 45/- Folding pedals, 21/-

Remarks. All wearing parts are thoroughly hard. A reliable and genuine roadster.

SITTINGBOURNE—CONTINUED.**SPECIAL HOLLOW FORK INVICTA.**

F. CLEAVER & Co., Kent Bicycle Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct spokes. 17-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. horn handles. $1\frac{1}{4}$ -in. 16 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	9	10	0	52-in.	10	0	0
48-in.				54-in.	10	5	0
50-in.				56-in.			

Extras. All bright, 30/- Ball bearings, 20/-*Remarks.* Sound and strong.**SPECIAL INVICTA No. o.**

F. CLEAVER & Co., Kent Bicycle Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 24, Nos. 10 and 11, direct spokes. 17-in. back wheel. $5\frac{1}{4}$ -in. x $4\frac{1}{4}$ -in. G.M. hubs. Fixed cranks. Rat-trap pedals. Parallel bearings to front, cones to back wheel. Solid forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. rosewood handles. $1\frac{1}{4}$ -in. 16 W.G. steel backbone. Bolted sliding spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	8	10	0	52-in.	9	0	0
48-in.				54-in.			
50-in.				56-in.			

Extras. All bright, 20/-*Remarks.* All working parts hard.**SPECIAL KENT DEFIANCE.**

F. CLEAVER & Co., Kent Bicycle Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 72 and 20, No. 12, direct spokes. 17-in. back wheel. 5-in. x 5-in. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. to $5\frac{3}{4}$ -in. throw. Rubber pedals. Æolus ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. horn handles. $1\frac{1}{4}$ -in. 16 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	15	0	52-in.	13	5	0
48-in.				54-in.			
50-in.				56-in.			

Extras. All bright, 30/-*Remarks.* A fine, well finished roadster.

SMETHWICK. Still one maker, who, however, now confines himself to the manufacture of a single pattern, to which he gives all his attention.

HOLLOW FORK ÆOLUS.

A. H. WARD, Cross Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 80 and 20, No. 11, tinned homo iron direct spokes. 17-in. back wheel. $5\frac{1}{2}$ -in. x 5-in. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. throw. Ward's dust-proof pedals. Æolus ball bearings. Elliptical hollow forks. Humber head, $3\frac{5}{8}$ -in. centres. 24-in. horn handles. $1\frac{3}{8}$ -in. 16 W.G. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. Flat wrench. Oilcan. Bell. Valise.

Specialities. Ward's improved pedals.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	} 12	0	0	52-in.	} 12	10	0
48-in.				54-in.			
50-in.				56-in.			
	12	10	0		13	0	0

Extras. All bright, 20/- Plated, 50/-

Remarks. Especially built for general road work. A good machine in every way.



SURBITON. Still two makers and two machines. I believe Keen has a novelty in bicycle construction now in the market, but I have not yet been able to glean particulars of it.

ECLIPSE.

JOHN KEEN.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12, direct spokes. 16-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{4}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{4}$ -in. to $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Ball bearings. Elliptical hollow front and back forks. Humber head, $3\frac{3}{4}$ -in. centres. 24-in. x $4\frac{1}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICE.

All sizes £16 0 0

Extras. All bright, 10/- Hollow felloes, 20/- Plating, 20/-

Remarks. A fast machine for light road work and racing purposes; Keen, of course, always uses one himself.

PRECURSOR.

E. DICKMAN, Brighton Road.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 70 and 24, No. 12, direct spokes. 16-in. back wheel. 6-in. x 5-in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Double ball bearings to front, balls to back wheel. Elliptical hollow forks. Humber head, 4-in. centres. 24-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

SURBITON—CONTINUED.

PRICES.

				£	s.	d.					£	s.	d.		
46-in.	8	0	0	}	52-in.	..	..	..	}	12	0	0
48-in.	10	0	0		54-in.	..	..	..		12	0	0
50-in.	12	0	0		56-in.	..	..	..		12	12	0

Extras. All bright, 20/- Rudge's or Bown's bearings to front wheel, 20/-

Remarks. A substantial, genuine machine.



TROWBRIDGE (Wilts). Here one maker is located, turning out five varieties of all classes.

KING OF THE ROAD.

E. A. TRANTER, Yerbury Factory.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Potential steel rims. 70 and 22, No. 12, butt-ended direct spokes. 16-in. back wheel. 7-in. x 5-in. phosphor-bronze hubs. Detachable fluted cranks, 6-in. throw. Rubber pedals. Double ball bearings to front, Æolus balls to back wheel. Elliptical hollow forks. Humber head. 24-in. x 5-in. horn handles. 1 $\frac{1}{4}$ -in. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan.

Specialities. 7-in. hub, bell-shaped.

PRICE.

All sizes £15 15 0

Extras. All bright, 40/-

Remarks. Two years' warranty given. A strong roadster of good quality.

M.P.

E. A. TRANTER, Yerbury Factory.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. Lock-nutted spokes, inch scale. 16-in. back wheel. Iron hubs. Fixed cranks, 6 $\frac{1}{2}$ -in. throw. Rubber pedals. Parallel bearings to front, cones to back wheel. Solid forks. Stanley head. 22-in. x 5-in. ebony handles. 1 $\frac{1}{2}$ -in. iron backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

				£	s.	d.					£	s.	d.		
46-in.	}	7	7	0	52-in.	}	7	7	0
48-in.					54-in.				
50-in.					56-in.				

Extras. All bright, 40/-

Remarks. Warranted for 12 months.

TROWBRIDGE—CONTINUED.

ROYAL LEOPOLD.

E. A. TRANTER, Yerbury Factory.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. non-slipping red rubbers. D.S.H. steel rims. 80 and 36, No. 12, butt-ended direct spokes. 16-in. back wheel. 7-in. x $5\frac{1}{2}$ -in. G.M. hubs. Detachable fluted cranks, 6-in. throw. Rubber pedals. Æolus ball bearings throughout. Elliptical hollow front and back forks. Humber head. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{5}{8}$ -in. oval steel backbone. Ball bearing spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Valise.

Specialities. Ball bearing spring.

PRICE.

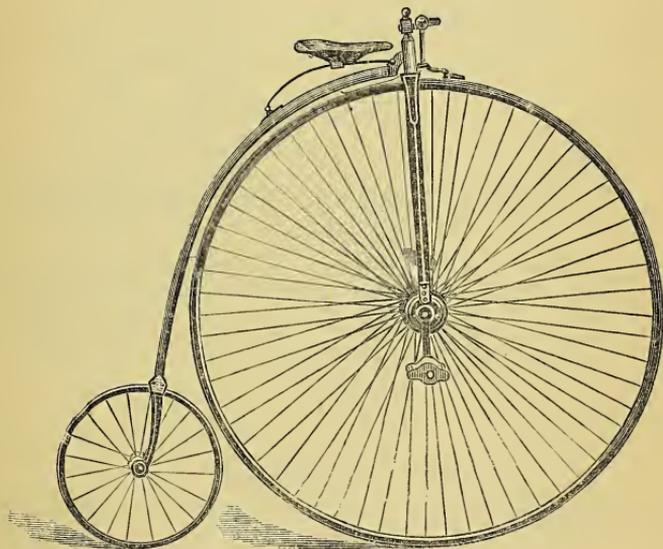
All sizes £20 0 0

Extras. All bright, 40/-

Remarks. Warranted for two years. A high-class machine, and the leading one of the firm.

SINGLE HOLLOW FORK.

E. A. TRANTER, Yerbury Factory.



SINGLE HOLLOW FORK.

Description. $\frac{1}{2}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 70 and 22, No. 11 $\frac{1}{2}$, butt-ended direct spokes. 16-in. back wheel. 7-in. x 5-in. G.M. hubs. Detachable cranks, 6-in. throw. Rubber pedals. Æolus ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head. 24-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Screw wrench. Oilcan. Valise.

TROWBRIDGE—CONTINUED.

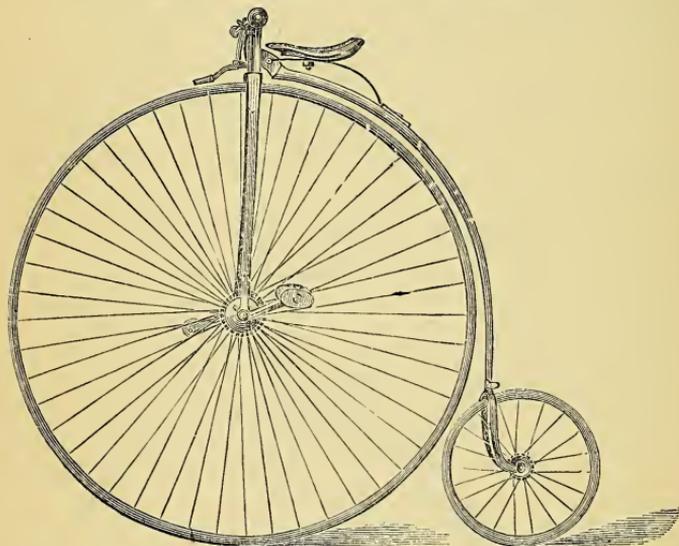
PRICE.

All sizes £13 13 0

Extras. All bright, 40/-*Remarks.* Well finished, and warranted for two years.

TEN GUINEA.

E. A. TRANTER, Yerbury Factory.



TEN GUINEA.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct spokes. 16-in. back wheel. $6\frac{1}{2}$ -in. x 4-in. G.M. hubs. Detachable cranks, $6\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, cones to back wheel. Solid forks. Stanley head. 22-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. iron backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan.

PRICE.

All sizes £10 10 0

Extras. All bright, 40/-*Remarks.* Warranted for 12 months.

WEST BROMWICH. Mr. Smith has much improved his brands for this year and now makes three in place of one.

CAPTAIN'S

J. MILBROWE SMITH, 49, Carter's Green.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. moulded red rubbers. D.S.H. steel rims. 72 and 24, No. 14, butt-ended direct spokes. 16-in. back wheel. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. phosphor-bronze hubs. Detachable cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Ball bearings

WEST BROMWICH—CONTINUED.

throughout. Elliptical hollow front and back forks. Humber head (special pattern) 4½-in. centres. 25-in. x 5-in. horn handles. 1⅜-in. 16 W.G. steel backbone. Bolted ball bearing spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Ball bearing spring.

PRICE.

All sizes £16 0 0

Remarks. Sent out plated all over. A sound, well-constructed, natty machine.

CLUBMAN'S.

J. MILBROWE SMITH, 49, Carter's Green, High Street.

Description. ¾-in. and ⅝-in. red rubbers. Potential steel rims. 64 and 20, No. 12, direct spokes. 16-in. back wheel. 5½-in. x 4½-in. phosphor-bronze hubs. Detachable fluted cranks, 5½-in. throw. Rubber pedals. Double ball bearings to front, balls to back wheel and pedals. Elliptical hollow front and back forks. Humber head (special pattern), 4½-in. centres. 25-in. x 5-in. horn handles. 1⅜-in. 16 W.G. steel backbone. Bolted ball bearing spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Ball bearing spring.

PRICE.

All sizes £12 0 0

Extras. All bright, 10/- Plating, 40/-

Remarks. Fit for touring purposes. Kept in repair for 12 months.

SERVICEABLE.

J. MILBROWE SMITH, 49, Carter's Green, High Street.

Description. ¾-in. and ⅝-in. red rubbers. Crescent steel rims. 64 and 20, No. 12, direct spokes. 16-in. back wheel. 5½-in. x 4½-in. G.M. hubs. Detachable cranks, 5½-in. throw. Rubber pedals. Ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, 4½-in. centres. 25-in. x 6-in. horn handles. 1⅝-in. 15 W.G. steel backbone. Bolted clip-tail spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

£ s. d.				£ s. d.			
46-in.	} 9	0	0	52-in.	} 9	10	0
48-in.				54-in.			
50-in.				56-in.			

Extras. All bright, 10/- Plating, 40/-

Remarks. All parts thoroughly hardened. A reliable machine for all-round road work.

WOKINGHAM (Berks). Here Mr. Butler, famed for the "Omnicycle," makes a single pattern of the two-wheeler.

TOURING.

THOMAS BUTLER, Cycle Works.

Description. ⅞-in. and ⅝-in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct spokes. 17-in. back wheel. 6-in. x 5-in. G.M. hubs. Detach-

WOKINGHAM—CONTINUED.

able cranks, 4-in. to 5½-in. throw. Rubber pedals. Æolus ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, 3-in. centres. 22-in. x 4½-in. horn handles. 1½-in. 15 W.G. steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	14	0	0	52-in.	..	..	..	15	10	0
48-in.	..	..	..	14	10	0	54-in.	..	..	..	16	0	0
50-in.	..	..	..	15	0	0	56-in.	..	..	..	16	10	0

Remarks. Sent out bright or plated. A sound, reliable, and well-constructed machine, suitable for all-round work and touring generally (*see advertisement*).



WOLVERHAMPTON, still almost as much a mystery as ever, has picked up a little lately in the general quality of goods supplied, although the best firm—that of Rudge & Co.—has left the town and come to Coventry. During the past season several changes have as usual taken place, some names disappearing from the list whilst others fill their places. Several of these latter I have been unable to unearth, although I am aware of their existence. So, as far as I can give any reliable data, the town contains now some twenty-three makers, vending amongst them seventy-one machines. Messrs. Littlewood & Co., Nokes, and H. M. Lord are this year absentees, and their places are filled by George Harris, Patrick and Co., and T. Hough. The firm of Harrington & Co. has changed hands, and is now known as the Desideratum Bicycle Co., whilst the name of Gwinnett now replaces that of A. Button & Co. In general the machines are of the inferior cheap class, but several makers are already making sound and even good class stuff, the chief of whom are Devay & Co., Brazier, George Hughes, T. Hough, H. Clarke, Beech, Muir & Co., W. Lewis, Griffiths Bros., and a few—very few—others.

ADVANCE No. 2.

JAMES BEECH, Gladstone Works.

Description. 7/8-in. and 3/4-in. red rubbers. Crescent steel rims. 70 and 20, No. 11, direct spokes. 16-in. back wheel. 6-in. x 4½-in. G.M. hubs. Fixed cranks, 4½-in. to 5½-in. throw. Rubber pedals. Adjustable roller bearings to front, cones to back wheel. Solid iron forks. Humber head, 3¾-in. centres. 22-in. x 5½-in. horn handles. Steel backbone. Bolted Stanley slide spring. Pigskin saddle. Adjustable step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Alarum. Valise.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	7	0	0	52-in.	..	..	..	7	10	0
48-in.	..	..	..				54-in.	..	..	..	7	15	0
50-in.	..	..	..				56-in.	..	..	..	8	0	0

Remarks. Finished bright or painted, in good style.

WOLVERHAMPTON—CONTINUED.

ADVANCE No. 3.

JAMES BEECH, Gladstone Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 60 and 20, No. 11, direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Roller bearings to front, cones to back wheel. Solid iron forks. Humber head, $3\frac{1}{4}$ -in. centres. 22-in. x $5\frac{1}{2}$ -in. horn handles. Iron backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.	
46-in.	5	15	0	52-in.	}	6	5	0
48-in.	6	0	0	54-in.				
50-in.				56-in.				

Remarks. All bright or painted. Materials guaranteed by the maker.

ADVANCE No. 4.

JAMES BEECH, Gladstone Works.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. 60 and 20, No. 11, direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Roller bearings to front, cones to back wheel. Solid forks. Humber head, $3\frac{1}{4}$ -in. centres. 22-in. x $5\frac{1}{2}$ -in. horn handles. Iron backbone. Bolted sliding spring. Pigskin saddle. Saw step.

PRICE.

All sizes £4 10 0

Extras. All bright, 5/-

Remarks. A very low figure.

ALERT.

JAMES BEECH, Gladstone Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 70 and 20, No. 11, coated direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{2}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Double ball bearings to front, cones to back wheel. Elliptical hollow front and back forks. Humber head, $3\frac{1}{4}$ -in. centres. 22-in. x $5\frac{1}{2}$ -in. horn handles. Steel backbone. Bolted Stanley slide spring. Pigskin saddle. Adjustable step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Alarum. Valise.

PRICES.

	£	s.	d.		£	s.	d.	
46-in.	7	10	0	52-in.	}	8	5	0
48-in.	7	15	0	54-in.				
50-in.				56-in.				

Extras. Balls to back wheel, 15/-

Remarks. Sent out burnished bright all over. Brake and step of gun-metal.

AUTO.

GEORGE HUGHES, Temple Works, Temple Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. D.S.H. steel rims. 72 and 24, No. 11, plated direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 5-in. to 6-in. throw. Rubber pedals. Æolus ball bearings.

WOLVERHAMPTON—CONTINUED.

Elliptical hollow front forks, semi-tubular back. Humber head, 4-in. centres. 24-in. x 5-in. horn handles. 1 $\frac{1}{4}$ -in. steel backbone. Bolted barrel-slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Bown's wrench. Oilcan. Bell. Valise and patent lamp.

Specialities. Mode of detaching cranks.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	10	2	6	52-in.	10	10	0
48-in.	10	10	0	54-in.	11	5	0
50-in.				56-in.			

Remarks. Bright or painted in good style. A sound, strong machine (*see advertisement*).

BEST-OF-ALL.

JOHN SANKEY & Co., Blakenhall.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. U rims. 60 and 20 direct spokes. G.M. hubs. Fixed cranks. Rubber pedals. Double ball bearings to front, cones to back wheel and pedals. Humber head. 22-in. horn handles. Steel backbone. Bolted sliding spring. Pigskin saddle with valise. Leg-guard. D.L.S. Brake. Screw wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	6	17	0	52-in.	7	12	0
48-in.	7	2	0	54-in.	7	17	0
50-in.	7	7	0	56-in.	8	2	0

BEST-OF-ALL.

W. FORD & Co., 81, Dudley Road.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. U rims. 60, No. 11, direct spokes. 6-in. x 5-in. G.M. hubs. Detachable cranks. Rat-trap pedals, coned. Æolus ball bearings to front, cones to back wheel. Elliptical hollow forks. Stanley head. Ivory handles, 22 $\frac{1}{2}$ -in. x 4 $\frac{3}{4}$ -in. Steel backbone. Bolted Stanley slide spring. Suspension saddle. Adjustable step. D.L.S. brake. Screw wrench. Leg-guard. Valise. Bell. Oilcan.

PRICES.

	£	s.	d.
Up to 50-in.	8	10	0
Above 50-in.	9	0	0

Remarks. Bright or painted. Well got up.

CLARENCE.

JOHN SANKEY & Co., Blakenhall.

Description. Grey rubbers. V rims. Nuted non-corrosive spokes. Solid hubs. Fixed cranks. Rubber pedals. Plain bearings to front, cones to back wheel. Stanley head. Ebony handles. Bolted sliding spring. Pigskin saddle. D.L.S. brake. Saw step. Wrench and oilcan.

PRICES.

	£	s.	d.
46-in.	6	0	0
48-in. to 52-in.	6	5	0
54-in. to 56-in.	6	10	0

Remarks. Bright or japanned. Strong.

WOLVERHAMPTON—CONTINUED.

CLIMAX.

H. CLARKE, Darlington Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 50, No. 11, direct spokes. 6-in. x $4\frac{1}{4}$ -in. G.M. hubs. Fixed cranks. Rubber pedals, plain. Roller bearings to front, cones to back wheel. Solid forks. Humber head. 24-in. ebony handles. $1\frac{1}{2}$ -in. iron backbone. Pigskin saddle and valise. Circular step. D.L.S. brake. Screw wrench. Leg-guard. Bell. Oilcan.

PRICES.

Up to 50-in.	..	..	..	6	10	0
Above that size	..	..	..	7	0	0

Extras. All bright, 10/-

Remarks. Sound, strong, and worth the money.

COGENT.

H. CLARKE, Cogent Works, Darlington Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 12 and 13, direct spokes. 6-in. x 5-in. G.M. hubs. Detachable cranks. Rubber pedals, coned. Ball bearings. Elliptical hollow forks. Humber head. 24-in. horn handles. $1\frac{1}{4}$ -in. steel backbone. Bolted Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Flat wrench. Bell. Valise. Oilcan.

PRICES.

				£	s.	d.
Up to 50-in.	..	..	..	10	0	0
above 50-in.	..	..	..	10	10	0

Extras. All bright, 10/-

Remarks. A good sound roadster, made for work and not for show.

COGENT No. 2.

H. CLARKE, Cogent Works, Darlington Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, Nos. 12 and 13, nipple spokes. 6-in. x 5-in. G.M. hubs. Detachable cranks. Rubber pedals, coned. Ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head. 24-in. horn handles. $1\frac{1}{2}$ -in. steel backbone. Bolted Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Flat wrench. Bell. Valise. Oilcan.

PRICES.

				£	s.	d.
Up to 50-in.	..	..	..	8	10	0
Above that size	..	..	..	9	0	0

Extras. All bright, 10/-

Remarks. Strong, well-made, and cheap. Clarke does a large trade in parts and sundries.

COMMERCIAL No. 1.

A. ROBINSON & Co., Albert Place.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 80 and 20, No. 11, coated direct spokes. 16-in. back wheel. 6-in. x $5\frac{1}{2}$ -in. G.M. hubs.

WOLVERHAMPTON—CONTINUED.

Detachable cranks, 5½-in throw. Rubber pedals. Adjustable roller bearings to front, cones to back wheel. Solid forks. Humber head, 3-in. centres. 23-in. x 5½-in. horn handles. 1½-in. steel backbone. Shackle spring. Web-seated saddle. Adjustable step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Alarum. Valise.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	6	10	0	52-in.	..	..	..	7	5	0
48-in.	..	..	..	6	15	0	54-in.	..	..	..	7	10	0
50-in.	..	..	..	7	0	0	56-in.	..	..	..	7	15	0

Extras. Balls to front wheel, 10/-

Remarks. Bright or painted at same figure.

COMMERCIAL No. 2.

A. ROBINSON & Co., Albert Place.

Description. ⅞-in. and ¾-in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct spokes. 16-in. back wheel. 6-in. x 5½-in. G.M. hubs. Fixed cranks, 5½-in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Stanley head, 3-in. centres. 23-in. x 5½-in. horn handles. 1½-in. backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Alarum. Valise.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	6	5	0	52-in.	..	..	..	7	0	0
48-in.	..	..	..	6	10	0	54-in.	..	..	..	7	5	0
50-in.	..	..	..	6	15	0	56-in.	..	..	..	7	10	0

CONNAUGHT.

BOWERS & COOK, 25, Bilston Road.

Description. ⅞-in. and ¾-in. red rubbers. Crescent rims. 60 and 20, No. 10, direct spokes. G.M. hubs. Fixed cranks. Rat-trap pedals. Roller bearings to front, cones to back wheel and pedals. Solid forks. Ball Stanley head. 18-in. x 5½-in. ebony handles. Iron backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oiler. Valise.

PRICE.

All sizes £5 10 0

Extras. All bright, 10/- Plated, 50/-

Remarks. Cheap.

COTSWOLD.

WOLVERHAMPTON MACHINISTS' Co., 18, Peel Street.

Description. ⅞-in. and ¾-in. red rubbers. Crescent rims. 50, No. 11, direct spokes. 6½-in. x 4½-in. G.M. hubs. Detachable cranks. Rubber pedals. Roller bearings to front, cones to back wheel and pedals. Hollow forks. Humber head. 24-in. x 4½-in. horn handles. Hollow backbone. Bolted sliding spring. Pigskin saddle. D.L.S. brake. Valise. Wrench. Oilcan. Harrison's alarum.

WOLVERHAMPTON—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	8	15	0	52-in.	9	10	0
48-in.	9	0	0	54-in.	9	15	0
50-in.	9	5	0	56-in.	10	0	0

Extras. All bright, 7/6. Ball bearings, 25/-

Remarks. Strong and serviceable.

COTSWOLD No. 2.

THE WOLVERHAMPTON MACHINISTS' Co., 18, Peel Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. U rims. 50, No. 11, lock-nutted spokes. $6\frac{1}{2}$ -in. x 4-in. G.M. hubs. Detachable cranks. Rubber pedals, plain. Roller bearings to front, cones to back wheel. Solid forks. Humber head. 22-in. x $4\frac{1}{2}$ -in. horn handles. Hollow backbone. Bolted Stanley slide spring. Suspension saddle. Adjustable step. D.L.S. brake. Leg-guard. Screw wrench. Valise. Bell. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	6	12	0	52-in.	7	4	0
48-in.	6	16	0	54-in.	7	8	0
50-in.	7	0	0	56-in.	7	12	0

DART.

BOWERS & COOK, 25, Bilston Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 60, No. 10, direct spokes. G.M. hubs. Fixed cranks. Rubber pedals. Roller bearings to front, cones to back wheel and pedals. Stanley head. 22-in. x $5\frac{1}{2}$ -in. horn handles. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Valise. Screw wrench. Oilcan.

PRICES.

	£	s.	d.
46-in. to 52-in.	8	10	0
54-in. to 56-in.	8	15	0

Remarks. All bright or painted at same prices.

DEMO.

GEORGE HUGHES, Temple Works, Temple Street.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. 72 and 20, No. 11, direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 5-in. to 6-in throw. Rubber pedals. Parallel bearings to front, cones to back wheel. Solid forks. Humber head, 4-in. centres. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{1}{2}$ -in. steel backbone. Bolted barrel-slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Adjustable wrench. Oilcan. Bell. Valise and lamp.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	3	15	0	52-in.	4	10	0
48-in.	4	10	0	54-in.	5	5	0
50-in.				56-in.			

Remarks. A most complete machine for the money (*see advertisement*).

WOLVERHAMPTON—CONTINUED.

DESIDERATUM.

DESIDERATUM BICYCLE Co., Stewart Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 72 and 20, Nos. 11 and 12, non-corrosive direct steel spokes. 18-in. back wheel. 6-in. x $5\frac{1}{4}$ -in. G.M. hubs. Detachable cranks, $5\frac{1}{4}$ -in. throw. Rubber pedals. Ball bearings to front, cones to back wheel. Solid forks. Self-adjusting Stanley head, $4\frac{1}{4}$ -in. centres. 24-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. 15 W.G. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Self-adjusting Stanley head (page 47).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	9	10	0	52-in.	10	5	0
48-in.	9	15	0	54-in.	10	10	0
50-in.	10	0	0	56-in.	10	15	0

Extras. All bright, 15/- Hollow forks, 15/- Balls to back wheel, 15/-
Plating, 40/-

Remarks. A very fair all-round machine.

DON.

DONALD BRAZIER, 22, Temple Street.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. 60, No. 11, direct spokes. 6-in. x 5-in. G.M. hubs. Fixed cranks. Rat-trap pedals. Rudge's ball bearings. Hollow forks. Humber head. 24-in. x $4\frac{3}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Saw step. Bolted sliding spring. Suspension saddle. Leg-guard. Wrench. Oilcan.

PRICE.

	£	s.	d.
All sizes	14	10	0

Remarks. All bright. Well fitted and finished. Light, strong and neat. A first-class machine.

DON No. 2.

DONALD BRAZIER, 22, Temple Street.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. 60, No. 11, direct spokes. 6-in. x 5-in. G.M. hubs. Fixed cranks. Rat-trap pedals, coned. Roller bearings to front, Brazier's cones to back wheel. Hollow forks. Humber head. 24-in. x $4\frac{3}{4}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Saw step. Bolted sliding spring. Pigskin saddle. Leg-guard. Wrench. Oilcan.

Specialities. Brazier's cones (page 35).

PRICES.

	£	s.	d.
46-in. to 48-in.	7	10	0
50-in. to 52-in.	8	0	0
54-in. to 56-in.	8	10	0

Extras. Brake, 10/-

Remarks. Strong, cheap and reliable.

WOLVERHAMPTON—CONTINUED.

EAGLE.

BOWERS & COOK, 25, Bilston Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. 64, No. 11, direct spokes. G.M. hubs. Detachable cranks. Rubber pedals, coned. Æolus ball bearings. Hollow forks. Stanley head. Horn handles. Steel backbone. Bolted sliding spring. Pigskin saddle. D.L.S. brake. Saw step. Valise. Wrench. Oilcan. Bell.

PRICES.

		£	s.	d.
46-in. to 48-in.		12	0	0
50-in. to 52-in.		12	10	0
54-in. to 56-in.		13	0	0

Remarks. Finished very creditably. All bright.

ESSENTIAL No. 1.

WILLIAM GWINNETT, 6, Alma Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 70 and 20 direct steel spokes. 18-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, 6-in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. $1\frac{1}{2}$ -in. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise and hub lamp.

PRICES.

		£	s.	d.				£	s.	d.
46-in.	}	11	11	0	52-in.	}	11	11	0	
48-in.					54-in.					
50-in.					56-in.					

Extras. Plated, 35/- Ball pedals, 18/-

Remarks. All bright or painted.

ESSENTIAL No. 2.

WILLIAM GWINNETT, 6, Alma Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct iron spokes. 18-in. back wheel. 6-in. x 4-in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. to 6-in. throw. Rat-trap pedals. Roller bearings to front, cones to back wheel. Solid iron forks. Stanley head, $3\frac{1}{2}$ -in. centres. 22-in. horn handles. $1\frac{1}{2}$ -in. iron backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan. Bell. Valise.

PRICES.

		£	s.	d.				£	s.	d.
46-in.	}	4	10	0	52-in.	}	4	10	0	
48-in.					54-in.					
50-in.					56-in.					

Remarks. Plenty for the money.

WOLVERHAMPTON—CONTINUED.**EXCELSIOR.**

W. FORD & Co., 81, Dudley Road.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. U rims. 60, No. 11, direct spokes. 5-in. x $3\frac{3}{4}$ -in. G.M. hubs. Fixed cranks. Rat-trap pedals. Roller bearings to front, cones to back wheel and pedals. Solid forks. Stanley head. $22\frac{1}{2}$ -in. x 6-in. horn handles, $1\frac{1}{4}$ -in. iron backbone. Bolted sliding spring. Pigskin saddle. Circular step. D.L.S. brake. Flat wrench. Leg-guard. Bell. Valise. Oilcan.

PRICES.

	£	s.	d.
Up to 50-in.	4	10	0
Above that size	5	0	0

Remarks. Most complete at the price.

EXPRESS No. 1.

J. DEVEY & Co., Tower Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. No. 10 lock-nutted spokes (inch scale). 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks. Rubber pedals. Plain bearings. Humber head. 24-in. horn handles. Bolted sliding spring. Web saddle. Saw step. D.L.S. brake. Leg-guard, Valise. Spanner. Oilcan.

PRICES.

	£	s.	d.
46-in.	6	0	0
48-in. to 50-in.	6	10	0
52-in. to 54-in.	6	15	0
56-in.	7	0	0

Remarks. Finished all bright. Very good value for money (*see advertisement*).

EXPRESS No. 2.

J. DEVEY & Co., Tower Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. V rims. 48, No. 9, direct spokes. G.M. hubs. Fixed cranks. Rat-trap pedals. Plain bearings to front, cones to back wheel. Humber head. Horn handles. Iron backbone. Bolted sliding spring. Pigskin saddle. Saw step. Wrench. Oilcan.

PRICE.

All sizes	£4	10	0
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Extras. D.L.S. brake, 3/-

Remarks. Very cheap and strong (*see advertisement*).

EXPRESS RACER.

J. DEVEY & Co., Tower Works.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Potential rims. 60, No. 11, direct spokes. 6-in. x 5-in. G.M. hubs. Fixed cranks. Rat-trap pedals. Æolus ball bearings. Hollow forks. Humber head. 26-in. horn handles. Steel backbone. Bolted sliding spring. Suspension racing saddle. Saw step. Wrench. Oilcan.

PRICE.

All sizes	£10	0	0
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Remarks. Light, and good value for money. Well finished (*see advertisement*).

WOLVERHAMPTON—CONTINUED.

EXTRA SPECIAL EXPRESS.

Jos. DEVEY & Co., Tower Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 80 and 24, No. 12, direct steel spokes. 16-in. back wheel. 6-in. x 5 $\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 4 $\frac{1}{2}$ -in. to 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow forks. Humber head, 4-in. centres. 24-in. x 5-in horn handles. 1 $\frac{3}{8}$ -in. steel backbone. Bolted Stanley slide spring. Suspension saddle. Sawstep. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise. Hub lamp.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	0	0	52-in.	12	15	0
48-in.	12	5	0	54-in.	13	0	0
50-in.	12	10	0	56-in.	13	5	0

Remarks. Sent out plated, bright, or painted at option. A really fine, reliable, and well finished machine (*see advertisement*).

FIVE GUINEA.

HENRY SWITZER & Co., Church Lane.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 40 and 18, No. 11, nipped spokes. 17-in. back wheel. 6 $\frac{1}{2}$ -in. x 4-in. G.M. hubs. Fixed cranks, 6-in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Ball Stanley head, 4-in. centres. 22-in. x 4 $\frac{1}{2}$ -in. horn handles. 1 $\frac{3}{8}$ -in. iron backbone. Bolted clip-tail spring. Leather saddle. Saw step. Thumb brake. Leg-guard. Flat wrench. Oilcan. Valise.

PRICE.

All sizes £5 5 0

Remarks. Fairly cheap.

FLORENTINE.

THOMAS HOUGH, Florence Works, Mander Street, Penn Road.

Description. $\frac{3}{4}$ -in. and $\frac{3}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 11, coated direct spokes. 16-in. back wheel. 6-in. x 4-in. G.M. hubs. Fixed cranks, 6-in. throw. Rubber pedals. Special ball bearings to front, cones to back wheel. Solid forks. Humber head. 24-in. x 6 $\frac{1}{2}$ -in. horn handles. Iron backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Patent wrench. Oilcan. Bell. Valise.

Specialities. Hough's cheap ball bearing (*addenda*).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	7	5	0	52-in.	7	15	0
48-in.				54-in.	8	0	0
50-in.				56-in.	8	5	0

Extras. All bright, 10/-

Remarks. A sound, genuine machine (*see advertisement*).

WOLVERHAMPTON—CONTINUED.

FORESTER.

W. FORD & Co., 81, Ludley Road.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. U rims. 60, No. 11, direct spokes. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks. Rat-trap pedals. Double ball bearings to front, cones to back wheel and pedals. Solid forks. Stanley head. 24-in x $5\frac{1}{2}$ -in. horn handles. $1\frac{1}{2}$ -in. backbone. Bolted Stanley slide spring. Pigskin saddle. Adjustable step. D.L.S. brake. Screw wrench. Bell. Valise. Oilcan.

PRICES.

	£	s.	d.
Up to 50-in.	5	10	0
Above that size	6	0	0

Extras. All bright, 20/-*Remarks.* Low priced.

HIBERNIA.

HENRY SWITZER & Co., Church Lane.

Description. $\frac{3}{4}$ -in. and $\frac{3}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 12, direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $5\frac{1}{4}$ -in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Humber head, 4-in. centres. 24-in. x $4\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Adjustable step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	7	10	0	52-in.	8	5	0
48-in.	8	0	0	54-in.	8	10	0
50-in.	8	0	0	56-in.	8	15	0

Extras. Plating, 30/- Æolus bearings, 40/- Hollow forks, 10/-*Remarks.* Very fair. Maker does a good trade in sundries.

MERCURY.

MUIR & Co., Frederick Street, Heath Town.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 60, No. 12, direct spokes. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Roller bearings to front, cones to back wheel. Ball Stanley head. Horn handles. Tubular backbone. Bolted sliding spring. Saw step. Pigskin saddle. Leg-guard. D.L.S. brake. Wrench. Oilcan. Lubricators.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	7	0	0	52-in.	7	15	0
48-in.	7	5	0	54-in.	8	0	0
50-in.	7	10	0	56-in.	8	5	0

Remarks. Worth the money, a strong machine.

PERFECTION.

C. GORTON, Talbot Works, Stewart Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 60, No. 11, direct spokes. $5\frac{1}{2}$ -in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks. Rubber pedals. Roller

WOLVERHAMPTON—CONTINUED.

bearings to front wheel. Coned back pin. Humber head. Horn handles.
Bolted barrel-slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-
guard. Valise. Wrench. Oilcan. Bell.

PRICE.

All sizes £6 10 0

Remarks. All bright or painted.

PERFECTION No. 3.

C. GORTON, Talbot Works, Stewart Street.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. 52 nipple spokes.
Solid hubs. Fixed cranks. Rubber pedals. Coned bearings throughout.
Humber head. Ebony handles. Iron backbone. Bolted sliding spring. Pig-
skin saddle. Saw step. Wrench. Oilcan.

PRICES.

	£	s.	d.
Up to 50-in.	4	10	0
Above that size	5	0	0

PERFECTION RACER.

C. GORTON, Talbot Works, Stewart Street.

Description. $\frac{5}{8}$ -in. and $\frac{1}{2}$ -in. red rubbers. Potential rims. 70, No. 12, direct
spokes. 6-in. and 5 $\frac{1}{2}$ -in. G.M. hubs. Fixed cranks. Rat-trapped pedals. Rudge's
ball bearings. Hollow forks. Humber head. 24-in. horn handles. Steel
backbone. Bolted sliding spring. Pigskin saddle. Saw step. Wrench.
Oilcan.

PRICE.

All sizes £10 10 0

Remarks. Either painted or all bright. Light, and nicely got up.

REGO.

GEORGE HUGHES, Temple Works, Temple Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Potential steel rims. 72 and 24,
No. 11, plated direct spokes. 16-in. back wheel. 6-in. x 4 $\frac{1}{2}$ -in. G.M. hubs.
Detachable cranks, 5-in. throw. Rubber pedals. Roller bearings to front, cones
to back wheel. Solid forks. Humber head, 4-in. centres. 24-in. x 5-in. horn
handles. 1 $\frac{1}{4}$ -in. backbone. Bolted barrel-slide spring. Pigskin saddle. Saw
step. D.L.S. brake. Leg-guard. Patent wrench. Oilcan. Valise.

Specialities. Hughes's detachable hubs and cranks (pages 9 & 14).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	5	12	0	52-in.	6	0	0
48-in.	6	0	0	54-in.	6	15	0
50-in.				56-in.			

Extras. Æolus ball bearings, 15/-

Remarks. Worth the money (see advertisement).

WOLVERHAMPTON—CONTINUED.**SANKEY'S SPECIAL No. o.**

JOHN SANKEY & Co., Blakenhall.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 60 direct spokes. G.M. hubs. Fixed cranks. Rat-trap pedals. Æolus ball bearings. Humber head. 24-in. horn handles. Steel backbone. Bolted hinged-slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oiler. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	9	10	0	52-in.	10	5	0
48-in.	9	15	0	54-in.	10	10	0
50-in.	10	0	0	56-in.	10	15	0

Remarks. All bright or painted. A genuine machine.

SPECIAL CHAMPION RACER.

T. LANE & SONS, Temple Street.

Description. $\frac{5}{8}$ -in. and $\frac{1}{2}$ -in. red rubbers. Crescent rims. Direct spokes. G.M. hubs. Detachable cranks. Rat-trap pedals (plain). Æolus ball bearings. Humber head. Hollow forks. Horn handles. Bolted sliding spring. Pigskin saddle. Saw step. Wrench. Oilcan.

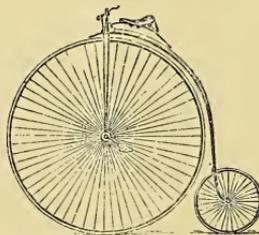
PRICES.

	£	s.	d.
46-in. to 50-in.	10	0	0
52-in. to 54 in	10	5	0
56-in.	10	10	0

Remarks. Light and neat.

SPECIAL COMMERCIAL.

A. ROBINSON & Co., Albert Place.



SPECIAL COMMERCIAL.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 80 and 20, No. 11, coated direct spokes. 16-in. back wheel. 6-in. x $5\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow forks. Humber head, 3-in. centres. 23-in. x $5\frac{1}{2}$ -in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench and oilcan combined. Spoke tightener. Double alarm. Hub lamp.

WOLVERHAMPTON—CONTINUED.

PRICES.

			£	s.	d.				£	s.	d.	
46-in.	10	5	0	|	52-in.	..	..	11	0	0
48-in.	10	10	0	|	54-in.	..	..	11	5	0
50-in.	10	15	0	|	56-in.	..	..	11	10	0

Extras. Plated, 25/-

Remarks. Very completely got up, and fairly constructed throughout (see advertisement).

SPECIAL EXPRESS.

J. DEVEY & SON, Tower Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 10, direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks, 6-in. throw. Rubber pedals. Ball bearings. Elliptical hollow forks. Humber head, $3\frac{1}{2}$ -in. centres. 24-in. x 5-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted shackle spring. Web-seated saddle. Adjustable step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

			£	s.	d.				£	s.	d.	
46-in.	8	15	0	|	52-in.	..	..	9	10	0
48-in.	9	0	0	|	54-in.	..	..	9	15	0
50-in.	9	5	0	|	56-in.	..	..	10	0	0

Remarks. Finished bright or painted. Messrs. Devey's principal pattern, and real good value for the money (see advertisement).

SPECIAL FLORENTINE.

THOMAS HOUGH, Florence Works, Mander Street.

Description. $\frac{3}{4}$ -in. and $\frac{3}{8}$ -in. red rubbers. Crescent steel rims. 72 and 24 direct coated spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, 6-in. throw. Rubber pedals. Special ball bearings to front, cones to back wheel. Solid forks. Humber head, 4-in. centres. 24-in. horn handles. Steel backbone. Bolted Stanleyslide spring. Pigskin saddle. Oval step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

Specialities. Hough's cheap ball bearing (*addendi*).

PRICES.

			£	s.	d.				£	s.	d.	
46-in.	8	10	0	|	52-in.	9	0	0
48-in.	..	..				54-in.	..	..	9	5	0
50-in.	..	..				56-in.	..	..	9	10	0

Remarks. More good value for money. Sound and reliable (see advertisement).

SPECIAL HOLLOW FORK ADVANCE.

JAMES BEECH, Gladstone Works.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 70 and 20, No. 11, coated direct steel spokes. 16-in. back wheel. 6-in. x $4\frac{3}{4}$ -in. G.M. hubs. Detachable cranks, 5-in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow forks. Humber head, 3-in. centres. 22-in. x 5-in. horn handles.

WOLVERHAMPTON—CONTINUED.

1 $\frac{3}{8}$ -in. steel backbone. Bolted Stanley slide spring. Suspension saddle. Adjustable step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise. Hub lamp.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	0	0	52-in.	12	15	0
48-in.	12	5	0	54-in.	13	0	0
50-in.	12	10	0	56-in.	13	5	0

Remarks. Sound, well finished. No extras. A good machine.

SPECIAL HOLLOW FORK UNIVERSITY.

W. PATRICK & Co., Pearson Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 70 and 24 direct spokes. 17-in. back wheel. G.M. hubs. Detachable cranks, 4 $\frac{1}{2}$ -in. to 5 $\frac{1}{2}$ -in. throw. Rubber pedals. Æolus ball bearings. Elliptical hollow forks. Humber head. 24-in. horn handles. 1 $\frac{3}{8}$ -in. steel backbone. Bolted adjustable shackle spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Bell. Valise.

Specialities. Adjustable shackle spring (page 57).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	12	0	52-in.	12	12	0
48-in.				54-in.	13	0	0
50-in.				56-in.			

Extras. Plated, 30/-

Remarks. Bright or painted. A very fair machine.

SPECIAL PERFECTION.

C. GORTON, Talbot Works, Stewart Street.

Description. 1-in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 80 direct spokes. 6-in. x 5 $\frac{1}{2}$ -in. G.M. hubs. Fixed cranks. Rubber pedals. Single ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head. 24-in. horn handles. Bolted barrel-slide spring. Suspension saddle. Saw step. D.L.S. brake. Valise. Wrench. Oilcan. Harrison's alarum. Lamp.

PRICE.

All sizes £8 0 0

Extras. Æolus ball bearings to both wheels, 30/- All plated, 30/-

Remarks. Finished all bright. Quite up to its price, and nicely got up.

SPECIAL TEMPEST.

WILLIAM LEWIS, Cleveland Road.

Description. $\frac{3}{4}$ -in. and $\frac{1}{2}$ -in. red rubbers. Crescent steel rims. 72 and 24, No. 13, direct spokes. 16-in. back wheel. 6-in. x 5 $\frac{1}{2}$ -in. G.M. hubs. Detachable cranks. Rat-trap pedals. Æolus ball bearings. Elliptical hollow forks. Humber head, 4-in. centres. 22-in. x 5-in. horn handles. 1 $\frac{3}{8}$ -in. 16 W.G. steel backbone. Bolted adjustable roller-slide spring. Suspension saddle. Adjustable step. Fla wrench. Oilcan.

WOLVERHAMPTON—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	16	0	0	52-in.	16	5	0
48-in.	16	5	0	54-in.	16	10	0
50-in.				56-in.			

Remarks. A very fine machine, suitable for light road and racing work. Has only 13-in. tread, and is very nicely and completely got up.

SPECIAL WHITMORE No. 1.

LLOYD & Co., Church Lane.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. grey rubbers. Crescent rims. Lock-nutted spokes (inch scale). G.M. hubs. Detachable slotted cranks. Rubber pedals. Roller bearings to front, cones to back wheel. Ball Stanley head. Horn handles. Steel backbone. Bolted barrel-slide spring. Pigskin saddle. Leg-guard. Valise. D.L.S. brake. Circular step. Wrench. Oilcan.

PRICE.

All sizes £9 10 0

Remarks. Fair.

TEMPEST No. 1.

LEWIS, Tempest Works, Cleveland Road.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 60 and 20, No. 11, direct spokes. 6-in. x 5 $\frac{1}{2}$ -in. G.M. hubs. Fixed cranks. Rubber pedals. Ball bearings to front, cones to back wheel. Humber head. 22-in. x 5-in. horn handles. Circular step. Bolted sliding spring. Suspension saddle. D.L.S. brake. Leg-guard. Wrench. Oilcan.

PRICES.

	£	s.	d.
46-in. to 48-in.	12	0	0
49-in. to 52-in.	12	2	6
53-in. to 56-in.	12	5	0

Extras. Plated, 35/- Æolus bearings, 27/6.

Remarks. All bright. Well worth the money. Sold largely to dealers.

TEMPEST No. 2.

LEWIS, Tempest Works, Cleveland Road.

Description. Red rubbers. Crescent rims. Nutted spokes. Solid hubs. Fixed cranks. Rubber pedals. Roller bearings. Coned back wheel. Ball Stanley head. Bone handles. Steel backbone. Bolted sliding spring. Pigskin saddle. Circular step. D.L.S. brake. Screw wrench. Leg-guard. Bell. Valise. Oilcan.

PRICES.

	£	s.	d.
46-in. to 48-in.	7	10	0
49-in. to 52-in.	7	12	6
53-in. to 56-in.	7	15	0

Remarks. Strong, fair.

WOLVERHAMPTON—CONTINUED.**TEMPEST No. 3.**

WILLIAM LEWIS, Tempest Works, Cleveland Road.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. Direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks, $4\frac{1}{4}$ -in. to $5\frac{1}{2}$ -in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Ball Stanley head. 22-in. x 5-in. horn handles. Iron backbone. Bolted sliding spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	6	0	0	52-in.	6	2	6
48-in.				54-in.			
50-in.				56-in.			

Extras. Detachable bearings, 10/-

Remarks. Not so well finished as the No. 2, but much resembling it, and equally reliable.

STANDARD No. 1.

GEORGE G. HARRIS, Skidmore's Buildings, Stewart Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 72 and 20, No. 11, direct spokes. 16-in. back wheel. G.M. hubs. Fixed cranks. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Stanley head. 24-in. horn handles. Steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Alarum. Valise.

PRICES.

	£	s.	d.
46-in. to 50-in.	6	0	0
52-in. to 56-in.	6	10	0

STANDARD No. 2.

GEORGE G. HARRIS, Skidmore's Buildings, Stewart Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 60 and 20, No. 11, direct spokes. 16-in. back wheel. G.M. hubs. Fixed cranks, 6-in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Stanley head. 22-in. horn handles. Iron backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Flat wrench. Oilcan. Valise.

PRICES.

	£	s.	d.
46-in. to 50-in.	4	15	0
52-in. to 56-in.	5	5	0

Extras. All bright, 10/-**TOURIST.**

Muir & Co., Frederick Street, Heath Town.

Description. $\frac{3}{4}$ -in. and $\frac{3}{8}$ -in. red rubbers. Crescent rims. 72, No. 11, direct spokes. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks. Rat-trap pedals. Ball bearings. Hollow forks. Stanley head. 24-in. horn handles. Steel backbone. Bolted shackle spring. Adjustable step. Web-seated saddle. D.L.S. brake. Leather mud-guard. Wrench. Oilcan.

WOLVERHAMPTON—CONTINUED.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	12	0	0	52-in.	12	15	0
48-in.	12	5	0	54-in.	13	0	0
50-in.	12	10	0	56-in.	13	5	0

Remarks. Awarded a medal at the Wolverhampton Industrial Exhibition. A sound, genuine machine, well and carefully built. Has many improvements for the present season.

UNIVERSAL No. 1.

GRIFFITHS BROS., Clyde Works, Heath Town.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 80, No. 12, direct spokes. G.M. hubs. Detachable cranks. Rat-trap pedals. Æolus ball bearings. Hollow forks. Humber head. Horn handles. Steel backbone. Bolted barrel-slide spring. Suspension saddle. Adjustable saw step. D.L.S. brake. Leg-guard. Wrench. Valise. Oilcan. Stormont's alarum. Spoke tightener.

PRICE.

All sizes £16 0 0

Remarks. A good machine. Finished all bright with considerable care. Hubs and cranks plated.

UNIVERSAL No. 2.

GRIFFITHS BROS., Clyde Works, Heath Town.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 80 and 20, No. 12, direct spokes. G.M. hubs. Detachable cranks. Rat-trap pedals. Æolus ball bearings to front, cones to back wheel. Stanley head. Horn handles. Steel backbone. Bolted roller spring. Pigskin saddle. Adjustable step. D.L.S. brake. Leg-guard. Valise. Wrench. Oilcan.

PRICE.

All sizes £11 0 0

Remarks. Worth the money. Much improved since last season.

UNIVERSAL No. 3.

GRIFFITHS BROS., Clyde Works, Heath Town.

Description. Grey rubbers. U rims. 50 and 18 lock-nutted spokes. G.M. hubs. Fixed cranks. Rat-trap pedals. Roller bearings to front, cones to back wheel. Stanley head. Boxwood handles. Bolted sliding spring. Saddle. Circular step. D.L.S. brake. Leg-guard. Wrench. Oilcan. Bell.

PRICE.

All sizes £7 0 0

Remarks. Stong and neat. All bright or painted.

UNIVERSAL No. 4.

GRIFFITHS BROS., Clyde Works, Heath Town.

Description. Red rubbers. U rims. 44 lock-nutted spokes. Solid hubs. Fixed cranks. Rubber pedals. Roller bearings to front, cones to back wheel and pedals. Solid forks. Stanley head. Ebony handles. Iron backbone. Bolted sliding spring. Pigskin saddle. Circular step. D.L.S. brake. Wrench. Oilcan. Valise. Leg-guard.

WOLVERHAMPTON—CONTINUED.

PRICE.

All sizes £6 0 0

Remarks. Very fair.

UNIVERSITY No. 1.

W. PATRICK & Co., Pearson Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 24 direct spokes. 16-in. back wheel. G.M. hubs. Detachable cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Humber head. 24-in. horn handles. Steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Alarum. Valise.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	9	0	0	52-in.	..	..	..	9	0	0
48-in.	..	..	..				54-in.	..	..	..	9	10	0
50-in.	..	..	..				56-in.	..	..	..

Extras. Burnished, 10/-*Remarks.* A very fair machine.

UNIVERSITY No. 2.

W. PATRICK & Co., Pearson Street.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. grey rubbers. Crescent rims. Direct spokes. 16-in. back wheel. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Stanley head. 22-in. horn handles. Iron backbone. Bolted sliding spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

PRICES.

				£	s.	d.					£	s.	d.
46-in.	..	..	..	7	5	0	52-in.	..	..	..	7	5	0
48-in.	..	..	..				54-in.	..	..	..	7	10	0
50-in.	..	..	..				56-in.	..	..	..

Extras. All bright, 10/-

VICTOR.

NEVE & SON, 10, Queen Square.

Description. Red rubbers. U rims. Direct spokes. Solid hubs. Fixed cranks. Rubber pedals. Roller bearings to front, cones to back wheel. Stanley head. Horn handles. Tubular backbone. Bolted sliding spring. Saw step. Leg-guard. Pigskin saddle. Valise. Wrench. Oilcan.

PRICES.

				£	s.	d.
46-in. to 48-in.	..	..	..	6	5	0
49-in. to 52-in.	..	..	..	6	10	0
53-in. to 56-in.	..	..	..	6	15	0

Remarks. Bright or painted. Fair.

WOLVERHAMPTON—CONTINUED.

WHITMORE RACER.

LLOYD & Co., Church Lane.

Description. $\frac{5}{8}$ -in. and $\frac{1}{2}$ -in. red rubbers. Crescent rims. 80 direct spokes. G.M. hubs. Detachable cranks. Rubber pedals. Rudge's ball bearings. Hollow forks. Stanley head. Horn handles. Steel backbone. Bolted sliding spring. Pigskin saddle. Circular step. Wrench. Oilcan.

PRICE.

All sizes £14 0 0

Remarks. Very fair.

WHITMORE No. 2.

LLOYD & Co., Church Lane.

Description. Red rubbers. V rims. Lock-nutted spokes. G.M. hubs. Fixed cranks. Rubber pedals. Roller bearings to front, cones to back wheel and pedals. Ball Stanley head. Ebony handles. Hollow backbone. Bolted hinged-clip sliding spring. Pigskin saddle. Circular step. D.L.S. brake. Leg-guard. Bell. Wrench. Oilcan.

CE.

46-in. to 56-in. £3 5 0

Remarks. Bright or painted.

WHITMORE No. 3.

LLOYD & Co., Church Lane.

Description. Red rubbers. U rims. Lock-nutted spokes. G.M. hubs. Fixed cranks. Rubber pedals. Coned bearings throughout. Stanley head. Ebony handles. Hollow beam. Bolted sliding spring. Pigskin saddle. Leg-guard. D.L.S. brake. Circular step. Valise. Wrench. Oilcan.

PRICES.

			£	s.	d.
46-in. to 50-in.	..	..	..	7	0 0
52-in. to 56-in.	..	..	..	7	10 0

Remarks. Sold largely to several dealers in London.

WOLVERHAMPTON CHAMPION.

T. LANE & SON, 75, Temple Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 60, No. 11, direct spokes. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Fixed cranks. Rubber pedals. Adjustable roller bearings, coned back wheel and pedals. Humber head. 22-in. horn handles. Bolted barrel-slide spring. Pigskin saddle. Adjustable step. D.L.S. brake. Leg-guard. Valise. Wrench. Oilcan. Harrison's alarum.

PRICES.

			£	s.	d.
46-in.	..	..	..	7	10 0
48-in. to 50-in.	..	..	..	8	0 0
52-in. to 56-in.	..	..	..	8	10 0

Extras. Double ball bearings, 12/- Bown's or Rudge's ditto to both wheels, £1 10/-

Remarks. Worth the money. Bright.

WOLVERHAMPTON—CONTINUED.**WOLVERHAMPTON CHAMPION No. 2.**

T. LANE & SON, 75, Temple Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. V rims. 50, No. 11, nipple spokes 5-in. x 4-in. solid hubs. Fixed cranks. Rubber pedals. Coned bearings. Ball Stanley head. 22-in. ebony handles. Bolted sliding spring. Pigskin saddle. Leg-guard. Lubricators. Wrench. Valise. Oilcan. Bell.

PRICES.

	£	s.	d.
46-in. to 50-in.	6	5	0
52-in. to 56-in.	6	10	0

Remarks. All bright.**WONDER.**

H. CLARKE, Cogent Works, Darlington Street.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. V rims. Nipple spokes. Solid hubs. Slotted cranks. Rubber pedals. Roller bearings to front, cones to back wheel. Ball Stanley head. Rosewood handles. Iron backbone. Bolted clip-tail spring. Pigskin saddle. D.L.S. brake. Circular step. Bell. Spanner. Oilcan.

PRICE.

All sizes	£5	10	0
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Extras. All bright, 10/-*Remarks.* Cheap at the money.**BOY'S ADVANCE.**

JAMES BEECH, Gladstone Works.

Description. Red rubbers. Crescent rims. Direct spokes. G.M. hubs. Fixed cranks. Rat-trap pedals. Plain bearings to front, cones to back wheel and pedals. Solid forks. Stanley head. Ebony handles. Bolted sliding spring. Pigskin saddle. Saw step. Flat wrench. Leg-guard. Bell. Oilcan.

PRICES.

	£	s.	d.
Up to 36-in.	3	5	0
, 40-in.	3	15	0

JUVENILE TEMPEST.

WILLIAM LEWIS, Cleveland Road.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. Direct spokes, 15-in. back wheel. G.M. hubs. Fixed cranks. Rubber pedals. Parallel bearings to front, cones to back wheel. Solid forks. Stanley head. 18-in. horn handles. Iron backbone. Bolted sliding spring. Pigskin saddle. Saw step. Flat wrench. Oilcan.

PRICES.

	£	s.	d.
30-in. to 36-in.	3	15	0
37-in. to 40-in.	4	5	0

Extras. All bright, 10/-*Remarks.* A strong, reliable machine for a youngster.

WOLVERHAMPTON—CONTINUED.

YOUTH'S COGENT AND JUVENILE COGENT.

HENRY CLARKE, Darlington Street.

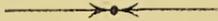
Description. Grey rubbers. U rims. Direct spokes. Solid hubs. Fixed cranks. Rat-trap pedals. Parallel bearings throughout. Crescent rim-steel forks. Malleable open head. Ebony handles. Bolted sliding spring. Pigskin saddle. Bell. Oilcan. Wrench.

PRICES.

JUVENILE.				YOUTH'S.			
			£ s. d.				£ s. d.
24-in.	..	..	2 10 0	34-in.	..	..	3 10 0
26-in.	..	..	2 14 0	36-in.	..	..	3 14 0
28-in.	..	..	2 18 0	38-in.	..	..	3 19 0
30-in.	..	..	3 2 0	40-in.	..	..	4 4 0
32-in.	..	..	3 6 0				

Extras. Crate, 2/-

Remarks. A cheap toy, certainly.



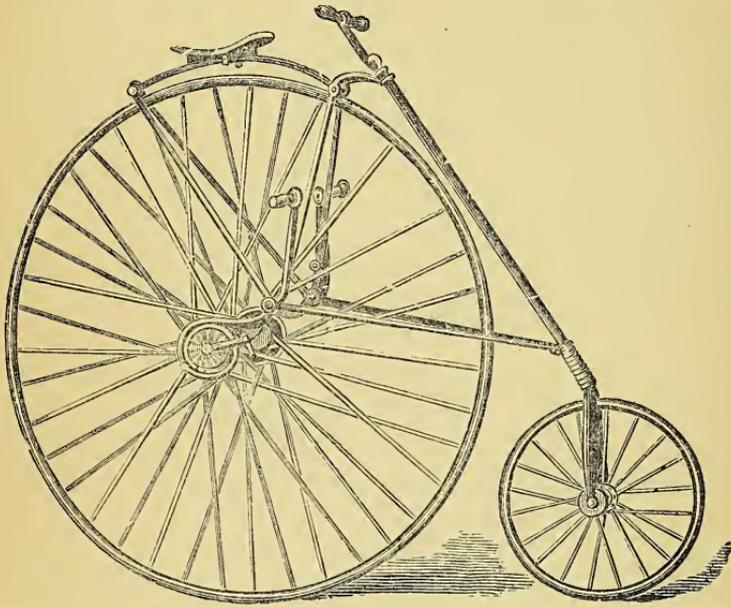
PECULIAR BICYCLES.

There are several machines which differ so much from those in ordinary use, that they require a separate description, and may well be termed "peculiar" bicycles. The main objects sought for in their altered construction are either increased safety or greater speed, although those aiming only at the latter have now quite collapsed and gone out, whilst of the other class we have several new introductions. The "Bicyclette," "Club Safety," "Fletcher's Patent," "Flying Dutchman," "Safety," "Shadow," "Sultan," and "Wagtail Champion," are now no longer made, so I omit a description of them. The new introductions are the "Hall," "Sun and Planet," "Little Shiely," the "Devon Safety," and the "American Star." Taking those now manufactured in alphabetical order, we come first to

THE AMERICAN STAR.

This machine has its small wheel in front. *Harper's Weekly* says of it, "The propelling power is given to the driving wheel by two levers, one on each side of the wheel, operated by the feet, and by an ingenious system of clutches, exercising a continuous force upon the hub to turn the wheel steadily. These levers may be worked alternately or together; or one lever alone can be worked, while the leg operating the other may be kept at rest. . . . If there is sufficient headway made so that the machine can run by its own momentum the levers can be kept still, and the legs at rest."

It is further claimed that, as the rider is supported between the wheels, and so much farther back than on the ordinary bicycle, he is safe from headers. We are told that "as the small wheel leads, it is quite possible to ride safely over a six-inch log." My slight acquaintance with the machine leads me to think that it has merit, but the inventor's ideas of details are, as yet, somewhat crude, and he ought to be able to improve the machine in many points.



AMERICAN STAR.

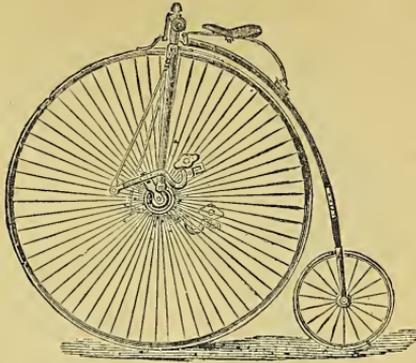
I am sorry I cannot personally pass upon the merits of the American "Star," but a friend has examined it for me, and writes me, in substance, as follows:—It is safe from headers, but there are chances of going over backwards. This, however, to an active person, is not necessarily dangerous, as he can, with agility, alight upon his feet. It is more difficult to learn than the ordinary bicycle, principally on account of the necessity of mounting by the hub. It lacks power. The rider can apply but little more than his weight, because any considerable pull on the handles raises the front wheel clear from the ground. An objection to the machine is the fact that, with the clutch motion which moves the wheel, there is no possibility of back-peddalling, and consequently the brake must be in almost constant use. Power is applied to the clutch through a leather strap which winds around the hub.

A further description is to be found in *Harper's Weekly*.

(From *The Cyclist*, March 16th.)

THE DEVON SAFETY.

THE EXETER BICYCLE & TRICYCLE CO., Sidwell Street, Exeter.



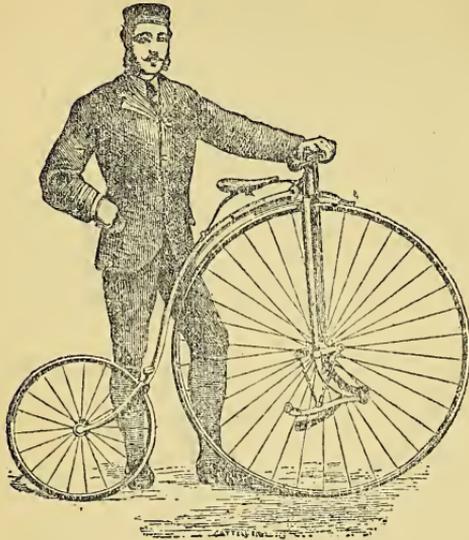
THE DEVON SAFETY.

In general construction this machine is somewhat as follows:— $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 60 and 20 butted direct spokes. G.M. hubs. Detachable cranks, with short throw. Ball bearings. Hollow forks. Stanley head. Horn handles. Steel backbone. Bolted barrel-slide spring. Suspension saddle. D.L.S. brake. Rubber pedals. Wrench and oiler. The spring is very long, so as to allow the saddle to be fixed some inches away from the head. Its speciality consists in its method of driving, which is as follows:—To the side of each fork a straight rod is attached, working at its top end upon a joint. In length, each rod about reaches the bearings, and at its lower extremity a second rod is jointed. This second rod has attached to it, at about one-third of its length from the first, a socket and pin, the latter of which is provided with a nut, wherewith it is fastened to the crank end in the same way as an ordinary pedal; passing this point, the rod curves, dropping so as to form a U, the rearmost end of which carries a pedal. The side rods swing to and fro, and upon pressure being applied to the pedals they act somewhat on the lines of a piston and crank, and so work the machine. The advantage of this method of driving is, that the rider can sit very much farther from the head and so obtain safety in riding, and at the same time have his pedals well beneath him with a nearly vertical tread. I have not given it a trial, so cannot say how it actually goes, but in point of manufacture it is a very well constructed machine, and is certainly considerably safer than the ordinary. The manufacturers also apply to this machine, if desired, a very neat and ingenious contrivance, by which the steering is effected by both wheels simultaneously, by which means the rider can take much sharper turns, and need only lean inwards in turning one-half as much as with the ordinary machine (*see advertisement*).

Price, £16 16s. od.

THE FACILE.

ELLIS & Co., 165, Fleet Street, London.



THE FACILE.

This little machine has been a long time now before the public, and, although for some time in the back ground, it has by reason of its utility gradually worked its way to the fore, until there is at the present time a considerable demand for it. The "Facile" is simply a small strongly-built machine with Stanley head, direct spokes, &c., and a 40-in. driving wheel; the rear wheel is about 18-in. in diameter, and trails a long way in the rear of the leader, in order to decrease the liability of going over the handles. The front forks are prolonged some 12-in. below the bearings, and project slightly forwards; to their ends are jointed 18-in. pedal levers, to which secondary cranks are jointed. Its appearance is not so taking as that of the taller bicycle, but safety is assured; its object being to allow a tall man to drive a small wheel with a straight leg, and with the feet but a few inches from the ground. Greater safety is also obtained by trailing the rear wheel so far behind. The leg action is nearly vertical, and it runs very easily, being especially good at hill climbing on account of the small size of the driving wheel, though of course a very high speed cannot be got out of it; but in this respect ten miles an hour will satisfy most people, and this it is easily capable of. The steering action differs considerably from that of the ordinary, as the feet give no assistance, so that it has all to be done with the arms.

Price, £12 12s. od.

THE "HALL" BICYCLE.

COUPE, ADDY & HALL, Tinsley Steel Works, Sheffield.

In general outline, build and proportion the "Hall" Bicycle differs little from the machines at present in use, with the exception of its having smaller wheels, and a patented gearing to be presently described; in short, it has a driving wheel ranging from 36-in. to 44-in., with a trailing wheel, ranging from 12-in. to 18-in. in diameter. These are constructed with plenty of "dish," G.M. hubs, strong steel direct spokes, crescent steel felloes, red rubbers, head of the "Humber" type, forks of hollow steel, backbone proportionately large, and also of best steel tubing; bolted Stanley-slide spring suspension saddle, &c., &c. The peculiarity of the machine is the patent gearing, for the construction of which the forks—a few inches above the bearings—run into prongs resembling a very long tuning-fork, the opening between the prongs being "fore and aft." Between these prongs, upon each side of the wheel, three toothed wheels are fitted upon bearings affixed to the aforesaid prongs: these wheels are of different sizes, the upper one being a fixture upon the axle of the driving wheel, and the lower one attached to a crank and pedal; the centre wheel being much smaller than either of the others serves to transmit the power and motion from the cranks to the wheel. The sizes of the upper and lower wheels differ according to circumstances, but in general they are so arranged that a 40-in. wheel drives as a 54-in., that is to say that, although using only a 40-in. wheel, each revolution of the pedals causes it to proceed as far as one revolution of a 54-in. wheel. The prongs bearing the gearing are bent backwards at an angle to the main forks, thus bringing the pedals more directly beneath the rider as well as providing for his safety, as the leverage obtained by resting the weight upon the pedals makes it a matter of almost absolute impossibility to go over the handles—although were one to do so, the consequences would lose much of their terror, the feet being but six inches from the ground. I found it to run easily upon the level and down hill, and ran it with comparative ease up the rise of the railway arch adjoining the works. Taking it all in all I consider it answers well, and although the extra friction of the geared wheels naturally adds to the work uphill, and it is hardly so well suited to a very loose road as the ordinary, it forms an admirable safety machine, securing effectually its object.

In steering it is slightly more work for the hands than with the ordinary, but is far easier than upon many other safety machines. The gearing is enclosed in a cover of tin, which keeps the wheels free from dirt, and prevents the clothes being soiled or caught in the teeth.

LITTLE SHIELTY.

WILLIAM MORTON, 5, Lothian Street, Edinburgh.

This is certainly a very peculiar bicycle. It has 30-in. and 20-in. wheels, the ordinary Stanley head, and cow horn handles, with about 3-in. rake, and a very nearly straight backbone with rather high spring. From the front bearings two stout rods fall away rearwards, one on each side the wheel, making an angle of about 30° with the ground, and terminating an inch beyond the circumference of the wheel; where they serve to support a short horizontal rod, stays also running from the junction to the top of the forks. Much the same arrangement is carried out in front, rods running upwards from the bearings at an angle of 45° and having their ends supported by stays from the fork tops. Between the extremities of the two frames, projecting in front, a spur wheel is fitted provided with ordinary cranks one on each side, whilst to the horizontal rod supported in the rear two levers are attached ending in broad hollow jaws, between which pedals are fitted; these pedals are in position a few inches in front of the bearings, and some 5 or 6 inches from the ground, and are connected by means of steel rods and joints with the cranks upon the before mentioned spur wheel. Around this spur wheel a chain is fitted, gearing with a second spur wheel upon the hub of the driving wheel. Thus by working the levers the cranks turn the spur wheel, and the chain transmits motion to the driver and so propels the machine. The machine is made in two patterns; in one the wheel is geared to run 50 per cent. faster than the pedals, a 30-in. running as a 45-in., whilst in the other two spur wheels of different sizes are used, as well upon the hub as attached to the cranks, and by an ingenious arrangement either may be utilized at pleasure, the one multiplying the power 100 per cent, a 30-in. wheel running as a 60-in., the other running level for work against steep hills and high winds.

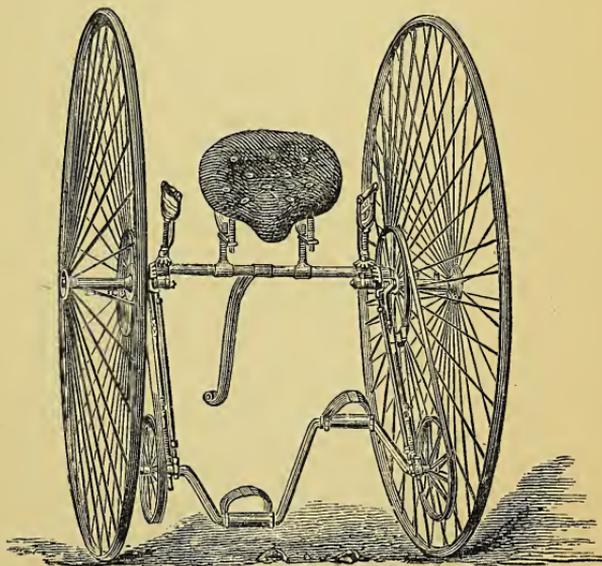
OTTO.

THE OTTO BICYCLE Co., 118, Newgate Street, London.

Since the issue of my last edition, the manufacture of this queer machine has been handed over to the Birmingham Small Arms Company, and the "Otto" Company have taken offices and show rooms in Newgate Street. I have therefore been able to inspect the machine and try it for myself. In general appearance the "Otto" somewhat resembles a large-wheeled "Meteor" tricycle without its back wheel, or, better still, a "Salvo" with the front wheel and framework absent; the seat being placed above the axle connecting two 50-in. wheels.

In point of construction the wheels are usually 50-in. or 54-in. in diameter, and built with very large G.M. hubs, direct spokes, crescent rims, and red rubbers. Upon the inner side of each wheel

a smooth band wheel, about a foot in diameter, is securely attached and connected with a second band wheel, by an endless flat steel band of great strength and pliancy. The second pair of band wheels are of the same size as the first, and are attached to the ends of a double-cranked pedal shaft, such as is used with the majority of tricycles. The connection of this shaft and wheels with the main frame is one of the most ingenious parts in the construction of the whole machine, and shows to good advantage the admirable and really exquisite fitting and workmanship. Stout rods project downwards and forwards from the axle to the pedal shaft, passing through cylindrical sockets, and thus supporting it. At the upper ends of the rods "spade" handles are attached, and by turning either of these the end of the pedal-shaft in connection with it is raised, which action consequently causes the band upon that side to become slack, when, of course, the other wheel remaining in gear drives round its companion, and thus the machine may be turned in either direction as required. This action is facilitated much by the simultaneous application of the brake to whichever wheel is thrown out of gear, this operation being performed automatically. The seat is a neat padded one of especial pattern, and placed upon two C shaped springs, supported on adjustable rods in the centre of the main axle, at its junction with a tubular "tail" or support, which falls away rearwards, and ends in a small roller, serving to support the rider should he lose his balance backwards.



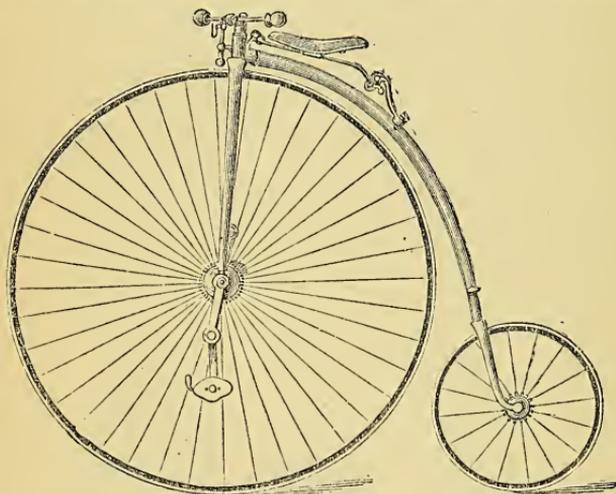
OTTO.

It is said to run very well, and to be good at the ascent of hills, but as I have not yet been able to master it, I cannot speak from experience on that score. It takes a considerable amount of practise to learn to ride, for I found myself little better than at first going off, after about a couple of hours' trial. When mastered, it seems to run very steadily, and that it is safe at obstacles I may say that I saw a rider drive one over a 3-in. baulk of timber without its forcing him out of his balance in the slightest. It is heavier than the ordinary bicycle, and takes up as much room as a tricycle, or nearly so (*see advertisement*).

Price, £21 os. od.

PONY.

COVENTRY MACHINISTS' Co., Cheylesmore, Coventry.



PONY.

This little curiosity, the invention of Mr. Blood, senr., of the Irish Champion B.C., consists of an ordinary bicycle, similar in construction to the Club bicycle, by the same manufacturers. Instead, however, of a large driving wheel being used, 40-in. is rarely exceeded, and a man six feet in height is enabled to drive this with a straight leg, by means of a second crank which connects the pedal with the crank proper; this second crank revolves on a short pin, secured to the end of the first, and the pedal is placed at the other extremity. It will be seen from this that when the pedal is at its lowest point it only clears the ground by about six inches, and hangs suspended at its highest point, at the same elevation as the centre of the wheel. The advantage of this is that, a low machine being ridden, a fall is not fraught with so much danger as is the case when driving a high wheel, besides which, being closer to the ground, the

difficulty of mounting and dismounting is vastly decreased. A little power is lost on account of the non-rigidity or swaying motion of the pedal and second crank. Its chief objection for some time was the swinging of the secondary crank when the feet were taken off; this has, however, now been remedied by the adoption of a neat catch to the pedal, by which that appendage is fixed, for the time being, by a side pressure of the foot, to the butt of the main crank, thus acting for the nonce as a footrest. It has proved a boon to elderly and timid persons, and has already been rather extensively patronised (*see advertisement*).

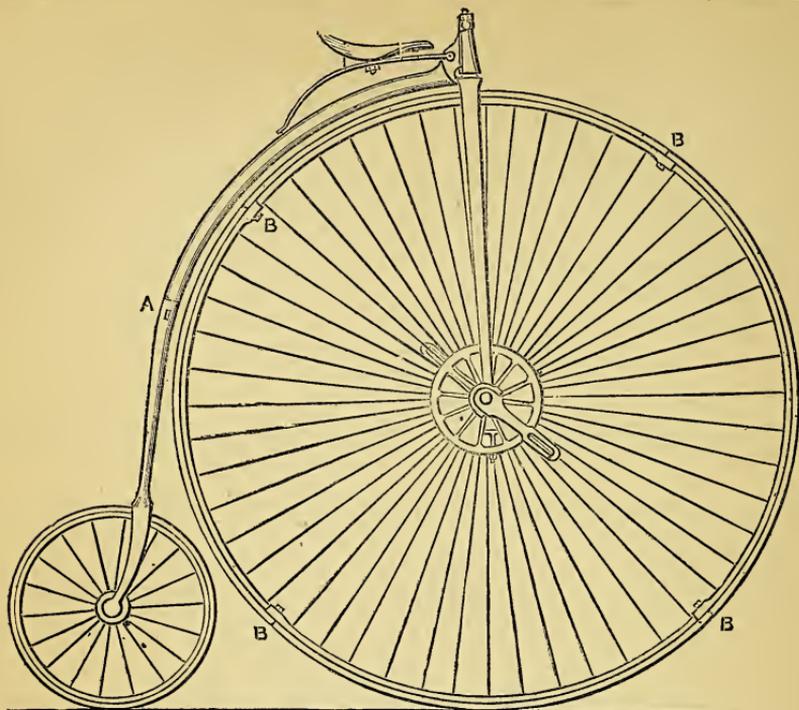
The price is £17 10s., from 40-in. to 44-in. driving wheel.

Extras. Same as the "Club."

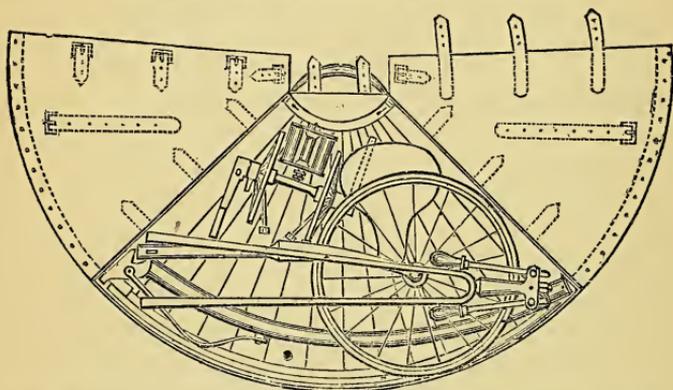
PORTABLE.

THE TENSION BICYCLE Co., Watson Street, Stoke Newington Green, London.

The idea of putting a bicycle into a bag is, indeed, a queer one, but of considerable value for all that, in these days of high railway charges. Now this wonderful "Portable" is simply an ordinary bicycle of the best quality, constructed so as to be easily taken to pieces, and packed in a specially made bag. When "set up" the details of the machine are as follows:—Grout's patent metallic fixed tyres. Crescent rims. Direct spokes. Steel skeleton hubs. Detachable slotted cranks. Rubber pedals. Double ball bearings to front wheel, and fixed cones to back. Hollow steel forks. Stanley head. Horn handles. Steel backbone. Bolted sliding spring. Suspension saddle and saw step. With the metallic fixed tyre (*page 4*) as a speciality, and finished bright all over, with a very high burnish. So much for it when complete; now come its peculiarities, viz., how to take it to pieces. This is done in a very simple manner, thus:—The backbone is provided with a joint (A) about two-thirds the way down, and can be taken in two by the removal of a bolt. This is the only joint about the frame-work, the chief difficulty being of course the wheel, and this is constructed in four parts, the rim-pieces being connected by simple, neat bolts (B), and the spokes screwing into the four parts of a light ring, which are secured to the periphery of the hub itself by neat catch-bolts. The "Wonderful Bag" is quadrant shaped, and by taking the hub out, and the forks, handles, and pedals off, the wheel sections fold flat upon each other, and fit snugly therein, whilst the other parts can also easily find room in the interior, as shown in the accompanying illustration. It takes about ten minutes to fit together, and is a valuable acquisition to commercial and other travellers who wish to take their bicycle with them, but cannot stand the enormous drain upon the pocket which taking the ordinary machines much about by rail entails. It is also very convenient for stowage, if the owner is not blessed with commodious premises, as it takes up no more room than an ordinary portmanteau when packed.



THE "PORTABLE" BICYCLE READY FOR USE



THE "PORTABLE" BICYCLE PACKED IN THE "WONDERFUL" BAG.

The price, owing to the necessary excessive care required in its construction, is rather high, and is as follows:—

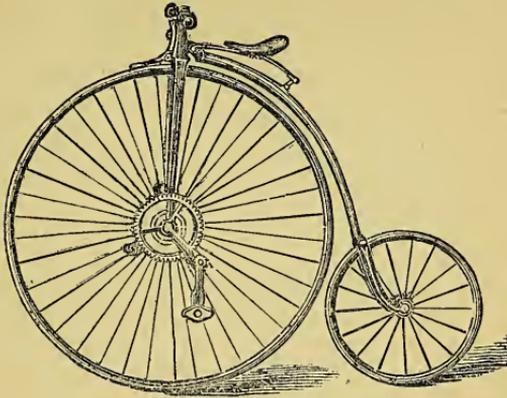
PRICES.

			£	s.	d.
46-in. to 50-in.	...	...	20	0	0
52-in.	...	...	21	0	0
54-in.	...	...	22	0	0
56-in.	...	...	23	0	0

Or if painted, instead of bright, £1 less.

SUN & PLANET.

KIRBY & Co., West Orchard, Coventry.



SUN & PLANET

In construction this machine is as follows:— $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. Direct spokes, inch scale. 18-in. back wheel. 4-in. x 4-in. G.M. hubs. Special crank and pedal motion. Ball bearings throughout. Solid forks. Humber head. 20-in. horn handles. $1\frac{1}{8}$ -in. steel backbone. Bolted shackle spring. Suspension saddle. Saw step. D.L.S. brake. Flat wrench. Bell. Valise. Oilcan. It belongs to the small-wheeled variety, and the speciality consists in the adoption of the "Sun & Planet" motion as a means of transmitting driving power. To the uninitiated the arrangement may be described thus:—Upon each side the hub a large 10-in. or 12-in. spur wheel is fastened just outside the forks; taken thus, the wheel and its attachments with a hollow axle run loose in the bearings; through this hollow axle a rod passes, carrying at each end a crank, which is provided at its end with a small spur wheel, so placed as to gear with the larger one; and the same pin that serves to secure the small spur wheel to the end of the crank serves to attach a second crank, which hangs loose and carries a specially constructed pedal at its lowest extremity. If either of the cranks be turned by itself upon its own centre the small spur wheel will revolve and travel round the larger one, but if the feet are pressed so as always to keep the crank in a vertical position, the small wheel draws the large one round with it, at the same time causing it to travel about $1\frac{1}{3}$ revolutions to one of the pedals; thus, a 36-in. wheel travels as a 48-in., and so on. I have given it a practical trial over the

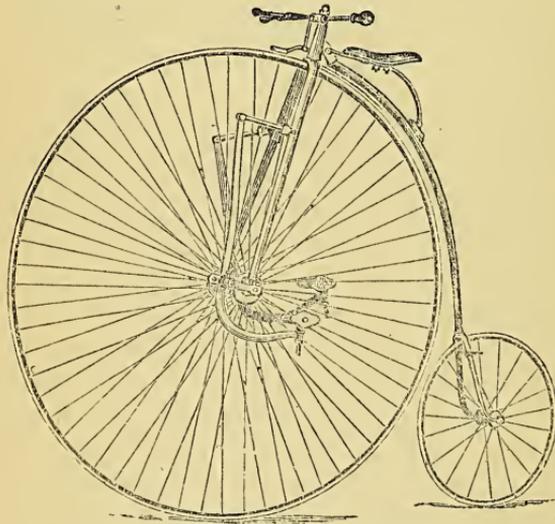
roads, and find it is but little harder to drive up hills than the ordinary, and a ten to twelve mile pace on a fair road easily obtainable. Its steering action, foot motion, and position of rider are identical with those of the ordinary machine, whilst one has the advantage of being close to the ground, in a place of comparative safety (*see advertisement*).

PRICES.

			£	s.	d.
36-in. to 40-in.	...	...	14	10	0
42-in. to 44-in.	...	...	15	0	0

'XTRAORDINARY CHALLENGE.

SINGER & Co., Alma Street, Coventry.



XTRAORDINARY CHALLENGE.

This is constructed as follows:— $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent rims. 60 and 20, Nos. 11 and 12, butt-ended direct spokes. 22-in. back wheel. 6-in. \times 5-in. iron hubs. Detachable cranks, 4-in. to $5\frac{1}{2}$ -in. throw. Adjustable rubber pedals. Ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, 4-in. centres. 24-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Bolted barrel-slide spring. Suspension saddle. Saw step. D.L.S. brake. Two flat wrenches. Leg-guard and oilcan. Its peculiarities are two; first, the use of a very great rake, and secondly, a different

pedal action. The first varies from 7-in. to 12-in., or even more if ordered, the generality being 9-in., and the forks bend slightly just above the wheel, bringing the two centres of the Stanley head in a direct line with the point of contact of the wheel with the ground. This gets over the difficulty of steering with so great a rake; but of course as the rider sits so much further back than on the ordinary bicycle, something must be done to enable him to work the pedals properly, and this is effected by the use of a pair of bent levers, having pedals at their lower ends; these being connected, after a manner of the "togle-joint," with a pair of short arms working on universal joints at the sides of the forks. These levers are connected with the cranks of the driving wheel, as shown in the accompanying illustration.

Now for its merits. These, theoretically considered, are as follows: 1. Perfect safety is provided from "croppers," or falling over the handles. 2. Increased facility is afforded for mounting and dismounting, the saddle being placed so low. 3. Greater comfort is obtained by the lessening of the intensity of jolts, the body not having to be raised so high in order to pass over obstacles in the road. 4. An increase of power for the same reason, and also by reason of the more direct and continuous downward pressure exerted on the pedals, as well as by the application of the togle-joint movement to the levers. 5. Any size of wheel may be driven, either large or small, without reference to the length of the rider's leg, although the smaller sizes are found the best in practice. Against these, theory urges the following objections:—1. The queer appearance of the machine. 2. That more weight being upon the back wheel, speed will be materially lessened and the mounting of hills of any altitude rendered either extremely fatiguing or utterly impossible. 3. That speed will soon be retarded and more power required, on account of the greater number of frictional points existing in the bearings and joints of the levers, 4. That the weight is increased by the addition of the levers. So much for theory. Now for practice, and on this point I can speak confidently from experience, as I have ridden several specimens of the "Xtraordinary" over some miles of road, hilly and level, good, bad, and indifferent. Now the real question to be considered is, not whether it is so superior to the ordinary bicycle that it will cut it out of the market, but if it is a true success, and, whilst providing for the safety of the rider, is still capable of being propelled with sufficient ease not to fatigue him more than the ordinary machine, and at the same time not to be behind-hand in pace. Taking it in this light I can certainly speak of it as a decided success, for I find that I can mount hills quite as easily as with the ordinary bicycle, and can get a good ten to twelve miles an hour out of it very comfortably. Over rough ground it has a decided advantage, for it can be driven over such at a pace at which the ordinary machine would capsize unless the rider were very

careful. Large stones, brick ends, etc., can be ridden over with impunity, the only penalty for so doing being a sharp jar, though nothing like what would be felt on an ordinary bicycle. On a smooth level road, or on a path, I should say the neater machine has the advantage in pace, but not so much as would be imagined by some—a quarter of a mile in an hour's ride, perhaps, if so much. At first the steering is peculiar and the course irregular, but a little practice soon overcomes that, and the chief objection that can be successfully brought against it is its peculiar appearance, which certainly will not contrast favourably with the neat appearance of the older machine, whilst riders of light machines might also raise an objection to its weight, which after all is but a very few pounds more than an ordinary machine, although Messrs. Singer would build them lighter if specially ordered. It is a capital thing for night-riding. The prices are given below, but I should not advise anyone to go in for a higher wheel than 56-in., although a 70-in. or 80-in. could be ridden by a tall man.

For the present season the machine has been improved in manufacture by a careful hardening of the steering centres, which was insufficiently done in the first machines.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	17	0	0	52-in.	18	10	0
48-in.	17	10	0	54-in.	19	0	0
50-in.	18	0	0	56-in.	19	10	0

Extras. All bright, 40/- Bright levers, 10/- Bright parts plated, 35/- Plated levers, 20/- Arab cradle spring, 5/- 1-in. tyres, 10/- Balls to back wheel, 20/-



COMPARATIVE VIEW OF PRICES AND WEIGHTS.

The following prices are of 50-in. machines, fitted as described in this work. As some bicycles are provided with brake and other adjuncts at the prices, whilst others are simply the plain machine, the full descriptions had better be consulted therefore, in order to make a fair comparison, as it will be seen from them how much is given for the money. The graduation of prices may, however, be reckoned a pretty fair criterion as to the finish, fitting, and general excellence of material used in their construction. The weights are as given me by the manufacturers themselves, and may be taken as a tolerably safe guide (in connection with the general description and prices) to the cut and style of the machine; they are about an average, but very few makers build their machines to the weights given by them, mostly running them a pound or two heavier. I find the weights of machines have, during the past season, somewhat settled down to a "happy medium," somewhere about 10lbs. under "lbs. for inches." I have been told I should weigh them all, but as it is manifestly impossible for me to actually weigh the same size machine of every one of the patterns herein described, it would be unfair to the manufacturers were I to weigh some and not others.

In making a comparison also, it must be remembered that "all bright" of many of the "cheap" machines simply means "unpainted," quite different to the beautiful polish which is charged extra for, or put upon higher class machines.

NAME OF MACHINE.	Where described. Page.	Weight. lbs.	PRICES.					
			Painted.			All-bright.		
			£	s.	d.	£	s.	d.
A B C No. 3	166	38	25	0	0	25	0	0
Rapid No. 3	Add.	36	24	0	0	24	0	0
Queen	142	35	21	0	0	21	0	0
Royal Leopold	219	38	20	0	0	22	0	0
Otto	248		21	0	0	21	0	0
Portable	251	40	19	0	0	20	0	0
Climax	173	33	18	18	0	22	0	0
Stanley Registered	214	42	18	10	0	18	10	0
Xtraordinary Challenge	454		18	0	0	20	0	0
Humber Racer	202	34	18	0	0	19	0	0
Alpha Racer	107	34	18	0	0	18	0	0
A B C No. 2	166	39	17	17	0	17	17	0
Club Racer... ..	127	30	17	10	0	19	10	0
Grand	138	40	17	10	0	19	10	0
Matchless	Add.	46	17	10	0	19	10	0
Special Club	150	38	17	10	0	19	10	0
Rapid No. 2	Add.	40	17	10	0	18	0	0

NAME OF MACHINE.	Where described. Page.	Weight. lbs.	PRICES.					
			Painted.			All-bright.		
			£	s.	d.	£	s.	d.
British Challenge	125	46	17	10	0	19	5	0
Humber Roadster	202	39	17	10	0	18	10	0
City	172	38	17	10	0	18	0	0
Northern Racer	197	32	17	0	0	18	10	0
S.T.D.	196	40	17	0	0	18	10	0
Flying Prince	190	37	17	0	0	18	5	0
Pioneer	178	32	17	0	0	18	0	0
Rucker	179	38	17	0	0	17	0	0
King of the Road (Denne) Club	215 126	38 40	16	16	0	19	0	0
Fleet	138	38	16	10	0	18	10	0
Hollow Fork Tourist	174	33	16	10	0	18	0	0
Hanover No. 1	191	36	16	10	0	17	10	0
Invincible Racer	175	27	16	10	0	17	10	0
Invincible Roadster	175	34	16	10	0	17	10	0
Norwood Racer	177	28	16	10	0	17	10	0
Norwood No. 1	177	38	16	10	0	17	10	0
Invincible Racer	175	28	16	10	0	16	10	0
Racing Peerless	165	30	16	10	0	16	10	0
Special Tempest	236	36	16	5	0	16	5	0
Imperial Challenge	140	43	16	0	0	18	0	0
Pilot	188	42	16	0	0	18	0	0
Special Tension	181	38	16	0	0	18	0	0
Special Peerless	165	35	16	0	0	17	10	0
Defiance Hollow Fork	196	40	16	0	0	17	0	0
Electric (Truman)... ..	109	40	16	0	0	16	15	0
Eclipse	217	35	16	0	0	16	10	0
Captain's	220	34	16	0	0	16	0	0
Leicester Defiance No. 1... ..	162	32	16	0	0	16	0	0
National No. 1	Add.	36	16	0	0	16	0	0
Unique	189	42	16	0	0	16	0	0
Universal No. 1	239	42	16	0	0	16	0	0
King of the Road (Tranter)	218	40	15	15	0	17	15	0
A B C No. 1	166	42	15	15	0	15	15	0
Period No. 1	178	36	15	15	0	15	15	0
Special Cambrian Racer	122	32	15	15	0	15	15	0
Special Swan	181	36	15	15	0	15	15	0
Royal Challenge	144	42	15	10	0	17	10	0
Settle	146	42	15	10	0	17	10	0
Alpha No. 1	106	39	15	10	0	17	8	0
D.E.H.F. Racer	134	34	15	10	0	17	0	0
D.E.H.F. Roadster	135	42	15	10	0	17	0	0
D.E.H.F. Semi-Racer	136	38	15	10	0	17	0	0
Golightly No. 1	Add.	40	15	10	0	17	0	0
Hollow Fork Traveller	175	36	15	10	0	17	0	0
Rival Triumph	144	37	15	10	0	17	0	0

NAME OF MACHINE.	Where described. Page.	Weight. lbs.	PRICES.					
			Painted.			All-bright.		
			£	s.	d.	£	s.	d.
Special Hollow Fork ...	156	35	15	10	0	17	0	0
S.E.H.F. Roadster ...	147	44	15	10	0	17	0	0
S.E.H.F. Semi-Racer ...	146	40	15	10	0	17	0	0
Will-o'-the-Wisp No. 1 ...	185	38	15	10	0	17	0	0
Ashton	168	40	15	10	0	16	15	0
D.F.H.F. Centaur ...	132	40	15	10	0	16	10	0
Imperial Racer	203	27	15	10	0	16	10	0
Rudge	145	35	15	10	0	16	10	0
City No. 2	172	40	15	10	0	16	0	0
Special Cambrian Racer ...	122	32	15	10	0	15	15	0
Chester Registered ...	208	42	15	10	0	15	10	0
Fox	161	36	15	10	0	15	10	0
Mount Edgcombe... ..	Add.	40	15	10	0	15	10	0
Northern	197	38	15	10	0	15	10	0
Star (Parr)	163	39	15	5	0	15	5	0
London	187	43	15	0	0	17	0	0
D.H.F. Premier	133	38	15	0	0	16	10	0
Hollow Fork Special Triumph	139	35	15	0	0	16	10	0
Tourist (Smily)	182	35	15	0	0	16	10	0
Northampton Special ...	199	33	15	0	0	16	0	0
University (Pausey) ...	183	38	15	0	0	16	0	0
Royal Mail	114	40	15	0	0	15	15	0
Sanspareil No. 1	115	40	15	0	0	15	10	0
Emperor Racer (Edlin) ...	161	32	15	0	0	15	0	0
Lancashire A	206	38	15	0	0	15	0	0
Special Granville	153	38	15	0	0	15	0	0
Touring	221	46	15	0	0	15	0	0
Tourist's Hollow Spoke ...	204	35	15	0	0	15	0	0
Lynn Express No. 1 ...	159	42	14	15	0	16	5	0
Special Cambrian	121	39	14	14	0	15	14	0
Special Challenge	149	44	14	10	0	16	10	0
Duplex Excelsior	134	44	14	10	0	16	0	0
Imperial Kent Defiance ...	215	38	14	10	0	16	0	0
Reliance (Lea)	207	40	14	10	0	15	10	0
Special Hollow Fork Cen- taur No. 2	151	39	14	10	0	15	10	0
Volante No. 2	184	40	14	10	0	15	10	0
Archbishop No. 1	Add.	37	14	10	0	15	0	0
Hollow Spoke Roadster ...	201	34	14	10	0	14	10	0
Clifton	119	38	14	10	0	14	10	0
Don No. 1	228	36	14	10	0	14	10	0
Hallamshire No. 1	210	34	14	10	0	14	10	0
Special Hollow Fork Covent- ry Perfection	152	36	14	10	0	14	10	0
Special Atalanta	179	36	14	5	0	16	15	0

NAME OF MACHINE.	Where described. Page.	Weight. lbs.	PRICES.					
			Painted.			All-brilliant.		
			£	s.	d.	£	s.	d.
Atalanta No. 1	168	40	14	5	0	15	15	0
Special Leader	205	37	14	5	0	15	15	0
Traveller No. 1	182	38	14	5	0	15	15	0
Standard (Granger)	117	34	14	5	0	14	15	0
Dart No. 1	208	37	14	5	0	14	5	0
Hollow Spoke Racer	201	30	14	5	0	14	5	0
Royal	178	38	14	0	0	16	10	0
A 1 Eclipse... ..	Add.	40	14	0	0	16	0	0
Arab	167	38	14	0	0	16	0	0
Timberlake	188	44	14	0	0	16	0	0
Carlton	118	38	14	0	0	15	10	0
S.H.F. Premier	148	38	14	0	0	15	10	0
Zephyr (Coventry)	130	42	14	0	0	15	10	0
Harrison	192	40	14	0	0	15	5	0
Manchester Special Express	194	34	14	0	0	15	5	0
Hanover No. 2	191	36	14	0	0	15	0	0
Nonpareil	176	36	14	0	0	15	0	0
Special Centaur No. 1.	149	41	14	0	0	15	0	0
Barwell	108	35	14	0	0	14	0	0
Carver	200	40	14	0	0	14	0	0
Sheffield No. 1	213	40	14	0	0	14	0	0
Special Crown	156	38	14	0	0	14	0	0
Whitmore Racer	242	36	14	0	0	14	0	0
S.H.F. (Tranter)	219	40	13	13	0	15	13	0
Clapham	172	38	13	13	0	15	3	0
Special Celerrima... ..	179	38	13	13	0	14	18	0
Handsworth No. 1	110	38	13	13	0	13	13	0
People's Challenge	141	42	13	10	0	15	10	0
Birkbeck No. 2	170	42	13	10	0	15	0	0
Skinner	194	44	13	10	0	14	10	0
Volante	184	36	13	10	0	14	10	0
Sanspareil No. 2	116	42	13	10	0	14	0	0
Special Progress	120	38	13	10	0	14	0	0
Emperor No. 2 (Edlin)	161	37	13	10	0	13	10	0
Endurance Racer	109	33	13	10	0	13	10	0
Special Kent Defiance	216	38	13	5	0	14	15	0
Hollow Fork Britannia	174	38	13	0	0	15	0	0
Alpha No. 2	107	41	13	0	0	14	18	0
Coventry Star	129	36	13	0	0	14	10	0
Coventry Triumph No. 1	129	38	13	0	0	14	10	0
Clarke No. 1	190	39	13	0	0	14	0	0
Rawson Racer	155	33 $\frac{1}{2}$	13	0	0	13	10	0
Rawson Roadster	156	37	13	0	0	13	10	0
Original Stanley	212	40	13	0	0	13	0	0
Reliance (Walker)... ..	156	36	13	0	0	13	0	0
Star No. 2 (Parr)	163	40	13	0	0	13	0	0

NAME OF MACHINE.	Where described. Page.	Weight. lbs.	PRICES.					
			Painted.			All-bright.		
			£	s.	d.	£	s.	d.
Universal (Gorringe) ...	118	42	13	0	0			
Imperial Roadster ..	202	36	12	15	0	13	0	0
Sandringham ...	160	40	12	15	0	13	15	0
Special Hollow Fork Un- eclipsed	180	37	12	12	0	13	12	6
Interchangeable Racer ...	113	28	12	12	0	13	7	0
Favourite (Lees)	157	39	12	12	0	12	12	0
National No. 2	Add.	40	12	12	0	12	12	0
S.H.F. University (Patrick)	236	39	12	12	0	12	12	0
Eclipse No. 2	Add.	44	12	10	0	14	10	0
Marmion	212	42	12	10	0	14	10	0
Excelsior No. 1	136	41	12	10	0	14	0	0
Celerrima No. 1	171	40	12	10	0	13	15	0
Great Eastern No. 2 ...	123	40	12	10	0	13	10	0
Hollow Fork Æolus ...	217	34	12	10	0	13	10	0
Æolus	106	38	12	10	0	13	0	0
Electric (Bagshaw) ...	209	38	12	10	0	13	0	0
Eagle	229	40	12	10	0	12	10	0
Extra Special Express ...	231	36	12	10	0	12	10	0
Lancashire Hollow Fork ...	207	35	12	10	0	12	10	0
Special Hollow Fork Advance	235	36	12	10	0	12	10	0
Tourist (Muir)	238	40	12	10	0	12	10	0
Antivibration	107	39	12	5	0	13	0	0
Tempest No. 1	237	38	12	2	6	12	2	6
Emperor No. 1 (Denne) ...	214	36	12	0	0	14	0	0
Albert	195	40	12	0	0	13	10	0
Gblightly No. 2	Add.	40	12	0	0	13	10	0
New Gentleman's	141	40	12	0	0	13	10	0
Antelope (Snelling) ...	167	38	12	0	0	13	0	0
Durable	Add.	40	12	0	0	13	0	0
Northampton No. 2 ...	199	38	12	0	0	13	0	0
Norwood No. 2 ..	177	40	12	0	0	13	0	0
Paradigm	154	42	12	0	0	13	0	0
Precursor	217	36	12	0	0	13	0	0
Coventry Perfection Hollow Fork	128	36	12	0	0	12	15	0
Clubman's	221	36	12	0	0	12	10	0
Swift	203	38	12	0	0	12	10	0
Belgravia	169	36	12	0	0	12	0	0
Emperor No. 1 (Edlin) ...	160	40	12	0	0	12	0	0
Leicester Defiance No. 2...	162	38	12	0	0	12	0	0
Robin Hood	203	33	12	0	0	12	0	0
Special Champion	180	33	12	0	0	12	0	0
Cambrian No. 3	121	39	11	15	0	12	15	0
Leader	204	39	11	11	0	13	0	0
European	190	40	11	11	0	12	16	0

NAME OF MACHINE.	Where described. Page.	Weight. lbs.	PRICES.					
			Painted.			All-bright.		
			£	s.	d.	£	s.	d.
Handsworth No. 2 ...	110	39	11	11	0	12	6	0
Victoria (Davis) ...	123	40	11	11	0	12	1	0
Essential No. 1 ...	229	35	11	11	0	11	11	0
Birkbeck No. 1 ...	169	36	11	10	0	13	0	0
Peerless ...	164	39	11	10	0	13	0	0
Special Lancaster... ..	157	39	11	10	0	13	0	0
Tension	182	40	11	10	0	13	0	0
Bristol	119	40	11	10	0	12	10	0
Hanover No. 3	192	38	11	10	0	12	10	0
Uneclipsed	183	40	11	10	0	12	10	0
Archbishop No. 2 ...	Add.	38	11	10	0	12	0	0
Desideratum (Strange) ...	174	38	11	10	0	12	0	0
Hallamshire No. 2 ...	211	38	11	10	0	12	0	0
Original Chester	212	42	11	0	0	13	0	0
Manchester Express No. 1	193	38	11	0	0	12	5	0
Victoria (Davis)	123	45	11	0	0	12	1	0
Sheffield No. 2	213	40	11	0	0	11	10	0
Leicester	102	40	11	0	0	11	0	0
Universal No. 2	239	40	11	0	0	11	0	0
Endurance Racer	109	34	10	15	0	11	15	0
Special Commercial ...	234	36	10	15	0	10	15	0
Berkshire	187	44	10	10	0	12	10	0
Ten-guinea	220	43	10	10	0	12	10	0
Will-o'-the-Wisp No. 2 ...	185	42	10	10	0	12	10	0
Bedford	106	44	10	10	0	12	0	0
Coventry Triumph No. 2 ...	130	41	10	10	0	12	0	0
Excelsior No. 2	137	44	10	10	0	12	0	0
Special (Hosier)	148	38	10	10	0	12	0	0
Traveller No. 2	183	42	10	10	0	12	0	0
Victoria (Porter)	184	40	10	10	0	12	0	0
Celerrima No. 2	171	42	10	10	0	11	15	0
X X	185	40	10	10	0	11	15	0
Atalanta No. 2	168	42	10	10	0	11	10	0
Centaur No. 3	125	42	10	10	0	11	10	0
Wanderer	185	42	10	10	0	11	10	0
Elite	109	42	10	10	0	11	0	0
Nancy Lee	176	38	10	10	0	11	0	0
Auto	223	30	10	10	0	10	10	0
Lancashire B	206	40	10	10	0	10	10	0
Perfection Racer	233	35	10	10	0	10	10	0
Period No. 2	178	40	10	10	0	10	10	0
Interchangeable Roadster	113	38	10	5	0	11	0	0
Brighton Superb	117	43	10	5	0	10	5	0
Tourist (Goddard)	118	42	10	0	0	15	0	0
Great Eastern No. 1 ...	123	43	10	0	0	11	0	0
Lynn Express No. 2 ...	159	40	10	0	0	11	0	0

NAME OF MACHINE.	Where described. Page.	Weight. lbs.	PRICES.					
			Painted.			*All bright.		
			£	s.	d.	£	s.	d.
Hawk No. 2	112	38	10	0	0	10	10	0
Premier No. 0	142	40	10	0	0	10	10	0
Standard (Wheaton)	181	36	10	0	0	10	10	0
Birmingham No. 1	108	42	10	0	0	10	0	0
Criterion (Barker)	173	40	10	0	0	10	0	0
Express Racer	230	34	10	0	0	10	0	0
Sankey's Special No. 0	234	40	10	0	0	10	0	0
Northampton A	198	42	10	0	0	11	0	0
Desideratum	228	38	10	0	0	10	15	0
Cogent	225	36	10	0	0	10	10	0
Dispatch	Add.	42	10	0	0	10	0	0
Special Champion Racer... ..	234	35	10	0	0	10	0	0
Star No. 3 (Parr)	164	44	10	0	0	10	0	0
Special H.F. Invicta	216	38	9	15	0	11	5	0
Criterion (Leach)	173	42	9	10	0	12	0	0
Emperor No. 2 (Denne)	215	39	9	10	0	11	10	0
Cambrian No. 2	121	41	9	10	0	10	10	0
Coventry Perfection No. 3	233	40	9	10	0	10	5	0
Special Whitmore... ..	237	40	9	10	0	9	10	0
Cotswold No. 1	226	41	9	5	0	9	12	6
Special Express	235	40	9	5	0	9	5	0
Zephyr (Harris)	186	40	9	0	0	10	0	0
Leeds	Add.	40	9	0	0	9	10	0
National No. 3	Add.	40	9	0	0	9	10	0
Serviceable	221	38	9	0	0	9	10	0
Special Nonsuch	180	40	9	0	0	9	10	0
University No. 1 (Patrick)	240	40	9	0	0	9	10	0
Dart No. 3	209	42	9	0	0	9	0	0
Sheffield No. 3	213	40	9	0	0	9	0	0
Manchester Express No. 2	193	40	8	15	0	10	0	0
Special Invicta No. 0	216	42	8	15	0	9	15	0
Unique (Armstrong)	117	33	8	15	0	9	5	0
Special Florentine... ..	235	40	8	15	0	8	15	0
Artizan's	124	43	8	10	0	10	0	0
Excelsior No. 3	137	42	8	10	0	10	0	0
Southsea Leader	205	39	8	10	0	10	0	0
Celerrima No. 3	171	44	8	10	0	9	15	0
Cogent No. 2	225	40	8	10	0	9	0	0
Hawk No. 1	111	38	8	10	0	9	0	0
Rover	114	40	8	10	0	9	0	0
Workman's No. 1... ..	Add.	42	8	10	0	9	0	0
Best of All (Ford)... ..	224	42	8	10	0	8	10	0
Dart (Bowers & Cook)	227	42	8	10	0	8	10	0
Lancashire C.	206	44	8	10	0	8	10	0
Handsworth No. 3	111	40	8	8	0	9	3	0
Whitmore No. 2	241	40	8	5	0	8	5	0

NAME OF MACHINE.	Where described. Page.	Weight. lbs.	PRICES.					
			Painted.			All-bright.		
			£	s.	d.	£	s.	d.
Crown No. 3	154	44	8	2	0	8	2	0
Leicester Defiance No. 3 ...	163	40	8	0	0	8	10	0
National No. 4	Add.	44	8	0	0	8	10	0
Progress	119	44	8	0	0	8	10	0
Special	116	36	8	0	0	8	10	0
Alert	223	38	8	0	0	8	0	0
Don No. 2	228	38	8	0	0	8	0	0
Hibernia	232	42	8	0	0	8	0	0
Special Perfection	236	40	8	0	0	8	0	0
Wolverhampton Champion No. 1	241	42	8	0	0	8	0	0
Granville	158	44	7	15	0	8	5	0
Tempest No. 2	237	42	7	12	6	7	12	6
Crown No. 2	154	44	7	12	0	7	12	0
Clarke No. 2	190	40	7	10	0	8	10	0
Florentine	231	40	7	10	0	8	0	0
Crown No. 1	154	44	7	10	0	7	10	0
Mercury	232	40	7	10	0	7	10	0
M.P.	218	45	7	7	0	9	7	0
Best of All (Sankey)	224	44	7	7	0	7	7	0
Exact	110	44	7	5	0	7	15	0
University No. 1	240	42	7	5	0	7	15	0
Advance No. 2	222	40	7	5	0	7	5	0
Handsworth No. 4	111	42	7	0	0	7	15	0
Hallamshire No. 3	211	38	7	0	0	7	10	0
Raleigh	114	42	7	0	0	7	10	0
Workman's No. 2	Add.	42	7	0	0	7	10	0
Cotswold No. 2	227	42	7	0	0	7	7	6
Commercial No. 1	225	38	7	0	0	7	0	0
Universal No. 3	239	40	7	0	0	7	0	0
Whitmore No. 3	241	42	7	0	0	7	0	0
Manchester Express No. 3	193	42	6	15	0	8	0	0
Cambrian No. 1	120	40	6	15	0	7	15	0
Nonsuch	176	44	6	15	0	7	5	0
Champion	171	40	6	15	0	6	15	0
Commercial No. 2	226	40	6	15	0	6	15	0
Stanhope	182	44	6	10	0	8	10	0
Climax	173	42	6	10	0	7	0	0
Express No. 1	230	40	6	10	0	6	10	0
Perfection	232	40	6	10	0	6	10	0
Victor	240	40	6	10	0	6	10	0
Clarence	224	42	6	5	0	6	5	0
Wolverhampton Champion No. 2	242	42	6	5	0	6	5	0
Tempest No. 3	238	44	6	2	6	6	2	6
Axiom	208	38	6	0	0	7	0	0

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NAME OF MACHINE.	Where described. Page.	Weight. lbs.	PRICES.					
			Painted.			All-bright.		
			£	s.	d.	£	s.	d.
Advance No. 4	223	38	4	10	0	4	15	0
Demo	227	40	4	10	0	4	10	0
Essential No. 2	229	40	4	10	0	4	10	0
Excelsior (Ford)	230	40	4	10	0	4	10	0
Perfection No. 3	233	44				4	10	0
Hawk Special	112	40	6	0	0	6	10	0
Advance No. 3	223	42	6	0	0	6	0	0
Birmingham No. 2	108	44	6	0	0	6	0	0
Rego	233	40	6	0	0	6	0	0
Standard No. 1 (Harris)	238	42	6	0	0	6	0	0
Universal No. 4	239	44	6	0	0	6	0	0
Manchester Express No. 4	194	44	5	10	0	6	15	0
Forester	232	42	5	10	0	6	10	0
Connaught	226	40	5	10	0	6	0	0
Wonder	242	40	5	10	0	6	0	0
Five Guinea	231	44	5	5	0	5	5	0
Standard No. 2	238	43	4	15	0	5	5	0
Manchester Express No. 5	194	46	4	10	0	5	15	0
Express No. 2	230	42	4	10	0	5	0	0

40 INCHES.

Pony	250	40	17	10	0	19	10	0
Sun and Planet	253	42	14	10	0	16	0	0
Facile	246	42	12	10	0	14	0	0
Boy's Own (C. M. Co.)	152	25	8	10	0	9	10	0
Boy's Premier	153	26	7	10	0	8	0	0
Boy's Own Excelsior	153	26	7	0	0	8	0	0
Youth's Star	164	27	6	10	0	6	10	0
Boy's Own (Gadsby)	200	34	6	0	0	6	0	0
Youth's Triumph	153	26	5	5	0	6	5	0
Boy's Cambrian	122	30	5	0	0	5	10	0
Youth's Interchangeable	Add.	28	5	0	0	5	10	0
Youth's Granville	158	28	4	5	0	4	12	6
Juvenile Tempest	242	28	4	5	0	4	5	0
Youth's Cogent	243	24	4	4	0	4	14	0
Boy's Advance	242	30	3	15	0	4	5	0
National Junior	Add.	30	3	15	0	4	5	0
Juvenile Cogent (30-in.)	243	18	3	2	0	3	12	0

SELECTION AND PURCHASE OF BICYCLES.



THE object of the present work is to guide the intending purchaser in his choice, by giving him a full bill of fare to select from. If, however, after perusing the "Indispensable" he still feels undecided, I refer him to my "Complete Guide to Bicycling"—a new edition of which will be issued shortly—in which I have given rather lengthy notes on the points to be looked to in the selection of machines, as well as a few hints as to how and where to purchase. If he still feels puzzled I would recommend him to purchase from one of the large agents or manufacturers, whose notices will be found in these columns, and who will also be able to assist him somewhat in his selection; or if he desires more impartial advice, I shall be happy to give him the best assistance in my power through the columns of *The Cyclist*, if he will send all particulars as to height, weight, use for which required, experience, kind of roads in neighbourhood, and price which would be given, at the same time naming (and numbering) any machines which may have struck his fancy, addressing to The Editor, *The Cyclist* Office, 12, Smithford Street, Coventry; or I will, if he prefers, advise him by post if he will address me at my private address (The Collegiate School, Coventry), in which case he must enclose a stamped directed envelope.

DIRECTORY OF MANUFACTURERS.

NAME.	ADDRESS.	CHIEF MACHINE.
Albery, F.	56, West Street, Horsham	<i>Granville</i>
Anderton, C.	Copper Street, Sheffield	<i>Sheffield</i>
Andrews, W.	3, Steelhouse Lane, Birmingham	<i>Sanspareil</i>
Armstrong, S.	16, Great Hampton Street, Birmingham	<i>Raleigh</i>
Ash, G. W.	13, Russell Street, Southsea	<i>Leader</i>
Ashton, Bros.	13, London Road, Clapton, E.	<i>Imperial</i>
Aves, W. O.	46, Barbican, London, E.C.	<i>City</i>
Bagshaw, F. W. & Sons	Hillfoot, Sheffield	<i>Electric</i>
Ball, R. J.	54, Alfreton Road, Nottingham	<i>Swift</i>
Barker	London Street, Kingston-on-Thames	<i>Criterion</i>
Barkwell, J. & Co.	151, Brearley Street, West, Birmingham	<i>Barwell</i>
Bate, T. S.	Maldon, Essex	<i>Unique</i>
Bayliss, Thomas & Co.	80, Lower Ford Street, Coventry	<i>Duplex Excel-sior</i>
Beech, James	Gladstone Works, Wolverhampton	<i>Advance</i>
Beech, James	39, Union Street, Plymouth	<i>Mount Edg-cumbe</i>
Bicycle Supply Association	27 to 30, Holborn Viaduct, London, E.C.	<i>Matchless</i>
Birmingham Small Arms Co.	Small Heath, Birmingham	<i>Alpha</i>
Boden, W.	163, Waterloo Road, London, S.E.	<i>Stanhope</i>
Bowers & Cook	25, Bilston Road, Wolverhampton	<i>Connaught</i>
Bramley & Co.	170, Eaton Square, London	<i>Belgravia</i>
Brazier, Donald	22, Temple Street, Wolverhampton	<i>Don</i>
Brighton Bicycle Co.	Viaduct Works, Brighton	<i>Brighton Su-perb</i>
Britannia Manufacturing Co.	Colchester	<i>Great Eastern</i>
Butler, Thomas	Cycle Works, Wokingham	<i>Touring</i>
Carver, J.	Alfred Street, Nottingham	<i>Carver</i>
Centaur Bicycle Co.	West Orchard, Coventry	<i>Centaur</i>
Clarke, H.	Darlington Street, Wolverhampton	<i>Cogent</i>
Clarke, R.	New Moston, Failsworth, Manchester	<i>Clarke</i>
Clarke, T.	21, Leigh Place, Stockport Rd., Manchester	<i>Manchester Express</i>
Cleaver, F. & Co.	Kent Bicycle Works, Sittingbourne	<i>Invicta</i>
Coventry Machinists' Co.	Cheylesmore, Coventry	<i>Club</i>
Cox & Sons	18, Railway Road, King's Lynn	<i>Sandringham</i>
Croydon Bicycle Co.	108, North End, Croydon	<i>Crown</i>
Davis & Co.	Victoria Works, Cheltenham	<i>Victoria</i>
Davis, S., & Co.	15, Blackman Street, London	<i>Period</i>
Denne & Co.	East Kent Works, Sittingbourne	<i>King of the Road</i>
Desideratum Bicycle Co.	Stewart Street, Wolverhampton	<i>Desideratum</i>
Devey, Joseph	Tower Works, Wolverhampton	<i>Express</i>
Dickman, E.	Brighton Road, Surbiton	<i>Precursor</i>
Edlin	Frog Island, Leicester	<i>Emperor</i>
Ellis & Buchan	Sylvester Gardens, Arundel St., Sheffield	<i>Hallamshire</i>
Ellis & Co.	165, Fleet Street, London	<i>Facile</i>

NAME.	ADDRESS.	CHIEF MACHINE.
Evans & Dodd	Steelhouse Lane, Birmingham.	<i>Exact</i>
Ford & Co.	81, Dudley Road, Wolverhampton.	<i>Excelsior</i>
Fox, T.	Kent Works, New Bridge Street, Leicester.	<i>Fox</i>
Gadsby, E.	Bearward Street, Northampton.	<i>Northampton</i>
Garrood, John C.	Lancaster Works, Fakenham, Norfolk	<i>Lancaster</i>
Goddard	33, Portland Street, Brighton	<i>Tourist</i>
Gorringe	1, Richmond Buildings, Brighton	<i>Universal</i>
Gorton, C.	Stewart Street, Wolverhampton	<i>Perfection</i>
Granger, W.	38, Vyse Street, Birmingham	<i>Standard</i>
Green, R. & T.	102, Buckingham Street, Birmingham	<i>Endurance</i>
Gribbin Bros.	Collyhurst Street, Miles Platting, Manchester	<i>Hanover</i>
Griffiths Bros.	Clyde Works, Heathtown, Wolverhampton	<i>Universal</i>
Gwinnett, W.	6, Alma Street, Wolverhampton	<i>Essential</i>
Hancock, T.	108, Bishopsgate Street Without, London	<i>Uneclipsed</i>
Hardey & Stott	22, Whittall Street, Birmingham	<i>Birmingham</i>
Harrington, J., & Co.	18 and 20, Norman's Buildings, St. Luke's, London, E.C.	<i>Arab</i>
Harris, G.	Skidmore's Buildings, Stewart Street, Wolverhampton	<i>Standard</i>
Harris, T.	4, John's Court, Wigmore Street, London	<i>Zephyr</i>
Harrison, William	128, Portland Street, Manchester	<i>Harrison</i>
Hawkins & Co.	15, Steelhouse Lane, Birmingham	<i>Hawk</i>
Hayes, J. & W. M.	Rainhill, Lancashire	<i>Lancashire</i>
Hickling & Co.	Queen Street, Maidenhead	<i>Pilot</i>
Hillman, Herbert & Cooper	Premier Works, Coventry	<i>D.H.F.</i>
Hosier, W.	Smithford Street, Coventry	<i>Coventry Star</i>
Hough, Thomas	Florence Works, Mander Street, Penn Road, Wolverhampton	<i>Florentine</i>
Hucklebridge, F.	77, Lower Sloane Street, Chelsea	<i>Will-o'-the-Wisp</i>
Hughes, George	Temple Street, Wolverhampton	<i>Auto</i>
Humber, Marriott & Cooper	Queen's Road, Nottingham	<i>Humber</i>
Hydes & Wigfull	Stanley Street, Sheffield	<i>Stanley</i>
Kear, H. E.	Red Cross Iron Works, Bristol	<i>Carlton</i>
Keen, J.	Surbiton	<i>Eclipse</i>
Keen, W., & Co.	Express Works, Albert Rd., South Norwood	<i>Norwood</i>
Lane, T., & Sons.	75, Temple Street, Wolverhampton	<i>Champion</i>
Lea, R.	Runcorn	<i>Reliance</i>
Leach	2, Wellington Street, Southampton Street, Camberwell, S.E.	<i>Criterion</i>
Lees, C. M.	110, New Rd., Great Bridge, Staffordshire	<i>Favourite</i>
Lewis, W. G.	Speedwell Works, Romford, London, E.	<i>Speedwell</i>
Lewis, W.	Tempest Works, Wolverhampton	<i>Tempest</i>
Lloyd & Co.	Church Lane, Wolverhampton	<i>Whitmore</i>
Markham, A.	345, Edgware Road, London	<i>Champion</i>
Maundrell, E. W.	Progress Iron Works, Quemerford, Calne, Wilts.	<i>Progress</i>
Morgan	Victoria Road, Bristol	<i>Bristol</i>
Morris Bros.	16, Angel Street, Cardiff	<i>Cambrian</i>
Mothersill, R.	97, Cheapside, London	<i>Swan</i>
Muir & Co.	Heath Town, Wolverhampton	<i>Tourist</i>
Mortimer, H. T.	Cycle Works, Canterbury	<i>Archbishop</i>
National Bicycle Co.	National Works, Spon Street, Coventry	<i>National</i>
Newton Wilson & Co.	144, High Holborn, London	<i>ABC</i>
Neve & Son	10, Queen Square, Wolverhampton	<i>Victor</i>

NAME.	ADDRESS.	CHIEF MACHINE.
North of England Bicycle Co. Otto Bicycle Co. Palmer & Co	44, High Bridge, Newcastle-on-Tyne 118, Newgate Street, London Victoria Works, Six Ways, Aston, Birm.	<i>Northern</i> <i>Otto</i> <i>Interchangeable</i>
Parr, J. Patrick, W., & Co. Pausey, H. J. Peake & Co. Phillips, Albert	62, Navigation Street, Leicester Pearson Street, Wolverhampton Bedford Road, Clapham, S.W. 5, Lisle Street, Leicester Square, London Excelsior Works, Rea Street, South, Birmingham	<i>Star</i> <i>University</i> <i>Pioneer</i> <i>Royal</i> <i>Golightly</i>
Pitcher, T. Plowright, J. Porter, J., & Co.	Clifton Works, Lewin's Mead, Bristol 27, Railway Road, King's Lynn 8, Crescent Place, Clapham Common, London	<i>Clifton</i> <i>Lynn Express</i> <i>Clapham</i>
Queen Bicycle Co. Rawson & Greaves Riley, George	Railway Approach, Coventry Burton Road, Derby 205 & 207, Soho Road, Handsworth, Birmingham	<i>Queen</i> <i>Rawson</i> <i>Handsworth</i>
Robinson, A., & Co., Royal Sewing Machine Co.	Albert Place, Wolverhampton Herbert Road, Small Heath, Birmingham	<i>Commercial</i> <i>Royal Mail</i>
Rücker, M. D., & Co.	Letchford's Buildings, Bethnal Green, London	<i>Rücker</i>
Rudge, D., & Co. Russom, T., & Co. Sankey & Co.	Rudge Works, Coventry 34, Hunslet Lane, Leeds Blakenhall, Wolverhampton	<i>Rudge</i> <i>Leeds</i> <i>Best of All</i>
Sargent & Petts Settle & Co. Sibert, J.	2A, Prince of Wales' Road, London Fleet Works, Fleet Street, Coventry Hockley Mill Works, Nottingham	<i>Atalanta</i> <i>Grand</i> <i>Robin Hood</i>
Simpson & Son Singer & Co. Skinner & Co. Slade, W.	Albert Works, Bridge Street, Mansfield Challenge Works, Alma Street, Coventry 63, Alexandra Road, Manchester 99, Prescott Street, Liverpool	<i>Defiance</i> <i>Challenge</i> <i>Alexandra</i> <i>Peerless</i>
Smily Smith, Sons, & Co. Smith, J. Milbrowe Smith, W. Snelling, G.	17, Dalston Lane, Dalston Junction, London Bow Works, West Street, Sheffield 49, Carter's Green, West Bromwich Crocus Street, Meadows, Nottingham 90, Kentish Town Road, London	<i>Traveller</i> <i>Dart</i> <i>Captain's</i> <i>Imperial</i> <i>Antelope</i>
Snow, C. South London Machinist Co. Spiers, W., & Co.	Birkbeck Road, Kingsland, London, N. Suffolk Grove, Great Suffolk Street, Southwark, London 5, St. James' Street, Leicester	<i>Birkbeck</i> <i>Nonsuch</i> <i>Leicester Defiance</i>
Stassen Strange, A. E. St. George's Foundry Co.	Euston Road, London 29, Waterloo Road, London, S.E. Pope Street, Birmingham	<i>Noupareil</i> <i>Desideratum</i> <i>Rapid</i>
Surrey Machinists' Co. Switzer & Co. Tension Bicycle Co.	85, Blackman Street, London Church Lane, Wolverhampton Watson Street, Stoke Newington Green, London	<i>Invincible</i> <i>Hibernia</i> <i>Tension</i>
Timms & Co.	East Street Works, Coventry	<i>Coventry Perfection</i>
Toledo Steel Co. Tranter, E. A. Trigg, M. Truman, C.	6, Stanhope St., Euston Road, London Yerbury Factory, Trowbridge, Wilts. 31, Allen Road, Stoke Newington, London 85, Loveday Street, Birmingham	<i>Volante</i> <i>Leopold</i> <i>Celerrima</i> <i>Electric</i>

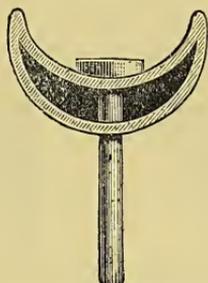
NAME.	ADDRESS.	CHIEF MACHINE.
Walker, E.	Silver Street, Enfield, Middlesex	<i>Imperial</i>
Walker, T.	20, St. Luke Street, Derby	<i>Reliance</i>
Ward, A. H.	Cross Street, Smethwick	<i>H.F. Æolus</i>
Warman, Laxon and Aslatt	Albion Mills, West Orchard, Coventry	<i>Triumph</i>
Wheaton, C.	35, Long Acre, London	<i>Standard</i>
Whitehouse, J. R.	Morgan's Mills, Macdonald Street, Birmingham	<i>Æolus</i>
Wicks, R.	Pitlake Bridge, Croydon	<i>Paradigm</i>
Wootton, G.	4, Gwyn Street, Bedford	<i>Bedford</i>
Wolverhampton Machinists' Co.	18, Peel Street, Wolverhampton	<i>Cotswold</i>
Zephyr Bicycle Co.	Lower Ford Street, Coventry	<i>Coventry</i> <i>Zephyr</i>



ADDENDA.

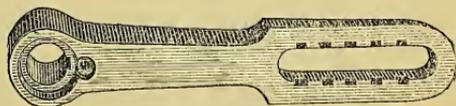


THE articles and machines described here are, for the most part, such as have only just been introduced, or such as I have received intimation of after the printing of that portion of the work in which they should have appeared. One or two also are noticed here which were omitted from their proper positions by oversight, and I also give one or two illustrations of articles, the descriptions of which appeared in the earlier parts of the work.



CLUB HOLLOW FELLOE,

The **Club Hollow Felloe**, illustrated above, is fully described on page 6.

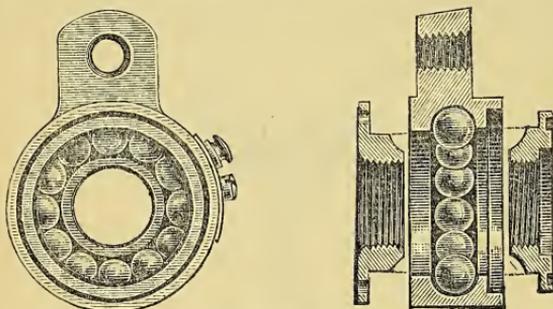


C.M. Co's. SAFETY PEDAL-CRANK.

The **Coventry Machinists' Co's. Safety Pedal-Crank** is described and commented upon on page 20.

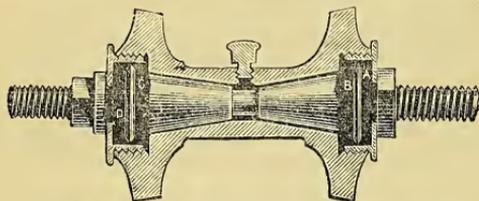
Hough's cheap Ball Bearing is constructed mainly for cheapness, and therefore is remarkable for an excessive absence of complication. As will be seen by reference to the accompanying cuts, it is of the single variety, and unadjustable. The case is made in one solid piece, with a groove to receive the balls turned out inside; the bush, which takes the wear upon the axle, is in two parts, being divided centrally. To affix the bearing, the inner half of the bush is screwed into its place on the axle; the bearing case is then put over it, and the balls inserted in their places, after which the other half of the bush is screwed on, and the whole is complete and ready for use. There is no means of adjustment, but they are cheaply made, and being thoroughly hard will wear a very long time before adjustment becomes requisite.

Granger's cheap Adjustable Ball Bearing, likewise constructed for cheapness, is somewhat different. The grooved bush on the axle is solid, and so is the wrought-iron case, this latter being split on one side and provided with lugs and a nut and bolt, whilst on the other side a tubular projection lets daylight into the centre. To fit the bearing, the bush is secured to the axle and then the case put on; the balls are next dropped into the centre through the cylinder, and, when all are in, a suitable screwed plug fills the cavity and makes all secure. A certain amount of adjustment is obtained by tightening the bolt and drawing the lugs together, and the bearing is cheaply constructed as well as serviceable.



CLUB SINGLE BALL BEARINGS.

The **Club Single Ball Bearings**, illustrated above, are adjusted by screwing on the crank, and are identical in construction with their double pattern described on page 30, with the only difference of having a single line of balls in place of a double one.



CLUB BACK WHEEL DUST-PROOF CONES.

The **Club Dust-proof Cones**, shown in the accompanying engraving, are described upon page 35.

The **Norwood Fork Section** is the same as the ordinary elliptical pattern on the outer side, but the inner side has a deep flute or indentation down its entire length.

The **Stanley Registered Head and Neck** has the handles placed in front of the head, whilst the neck runs sharply down into a flat-ended backbone which is hollow from end to end, and resembles much in appearance the neck of a child's small wooden horse.

The **Double Leg-guard** is constructed for the especial purpose of allowing a machine to be closer built. It consists of two short rods placed one on each side the wheel, of the same length as the usual one, and ending in balls or knobs, so that there is but little chance of catching the trousers or knickers.

Challis' Registered Oilcan Case is a very neat and handy little construction. It is made of good leather, of a shape suitable for the purpose for which it is intended, and is provided with a flap cover and spring clasp, or button. It is extremely useful if the oilcan is carried in the pocket, as many prefer to do, and also keeps it better out of harm's way when in the pouch.

Challis' Stop Bell, described and illustrated on page 87, has been improved of late, as shown in the sketches, by the substitution of a neat chain for the cord, a longer staple to the strap, and an improved form of spring for holding the ball, making it far more practically useful than formerly, so that it may now be said to be about perfect.

Clares' Perfected "Guiding Star" Hub Lamp is but just introduced, and is certainly a vast improvement upon the previous



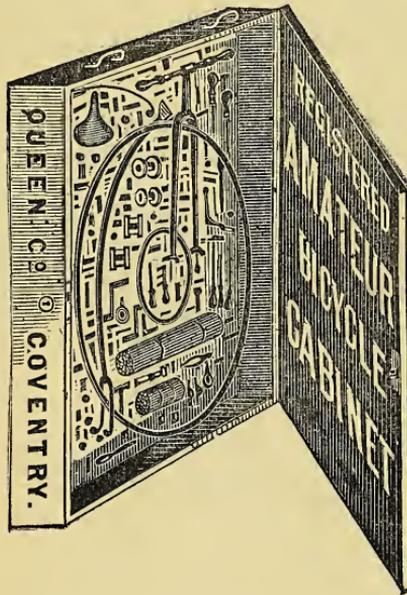
CLARES' PERFECTED "GUIDING STAR."

pattern, and may now fairly take rank with the very best lamps in use. As will be seen by reference to the illustrations, it has several peculiarities; it is, in the first place, hung from the bottom by stout wires passing right over the axle, somewhat in the manner of Salisbury's, and forming the top cylindrical attachment, which encases a powerful spring, allowing admittance of the axle by simply pressing it firmly against the two curved wires. It is then perfectly safe, and cannot fall or shake off, as the bottom jaw only opens, and the top jaw forms a hook of itself. The next improvement is the back light, which opens easily, and shuts with a spiral spring, neatly fastened immediately below. Just inside the door is a small rough piece of metal on which to strike the match, which can then be inserted through the hole in the reflector, and thus the wick can be lighted

in the roughest weather. The reflector is removeable, and the reservoir is stated to hold sufficient oil to supply a $\frac{3}{4}$ -in. wick for seven hours.

Underwood's Odometer is likewise but just out, and is both cheaply and simply constructed. It is circular, and screws on to the axle, between the hub flanges. It marks the miles up to ten on one dial, and in hundreds up to three hundred on a smaller dial. A falling plate actuates a toothed wheel, which gears with another, showing at once the miles, and on the axle of this an eccentric works, which marks the hundreds on the dial plate. It is sold at a very cheap figure, but whether it registers accurately, or will stand much work, I cannot say, as I have not tried it.

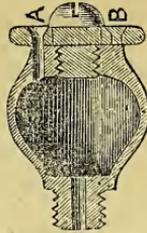
The **Bicycle Cabinet** is a very useful case of parts and fittings, in a partly finished state, sufficient material being provided for any



BICYCLE CABINET.

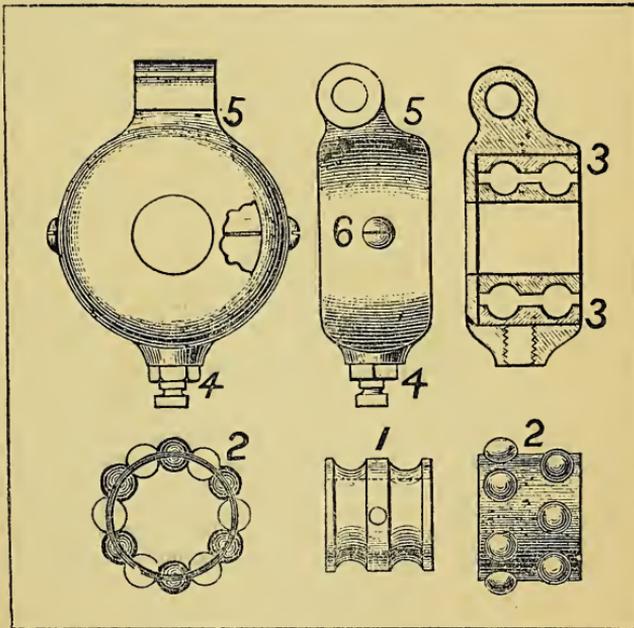
ordinary amateur mechanic, with his head screwed on right, to put together a sound, strong machine. All the material is sound, and all the heavy work is done—such as welding the forks (solid) to the head, &c. Several modifications can be had in pattern, if desired, and ball bearings and other luxuries at a slight extra cost. As a pattern to go by, the machine may be briefly described as having direct spokes, G.M. flanges, plain bearings and fixed cranks, Humber head, solid forks, horn handles, steel backbone, Stanley slide spring, pigskin saddle, &c., &c.

The "Rapid" Lubricators will be fully understood by reference to the accompanying illustration, which clearly shows their construction. They are large and roomy, and hold an ample supply of oil.



RAPID LUBRICATOR.

The "Rapid" Double Ball Bearings. As in the ordinary double ball bearing, a doubly grooved collar fits on the axle, and takes the wear, whilst the balls are placed alternately and kept apart by a steel collar. The outer case is made solid and uniform with a hollow lug at the base, and obtains the upper and lower halves of the bearing, which are adjusted sideways by two screws one on each side, and pushed upwards for adjustment by a nut and screw in the bottom lug.



RAPID DOUBLE BALL BEARINGS.

The American Rubber Handles are solid $2\frac{1}{4}$ -in. balls of white rubber. I have been favoured with a trial of these through the kindness of Mr. Howard, of the Detroit B.C. I find them to give a firm

grip to the hands, and quite obviate the slipping which is the case when horn is held in a hand wet with perspiration or rain; and, being perfectly spherical and large, are of a very comfortable shape.

A 1 ECLIPSE.

JAMES BEECH, 39, Union Street, Plymouth.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. Direct spokes. 16-in. back wheel. 6-in. x $4\frac{1}{2}$ -in. G.M. hubs. Detachable cranks. Rubber pedals. Roller bearings to front, cones to back wheel. Solid forks. Stanley head. Horn handles. Steel backbone. Bolted sliding spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	13	0	0	52-in.	14	10	0
48-in.	13	10	0	54-in.	15	0	0
50-in.	14	0	0	56-in.	15	10	0

Extras. All bright, 40/- Plated, 45/0

Remarks. Sound and strong. Well known in the district.

ARCHBISHOP No. 1.

H. T. MORTIMER, Canterbury Cycle Works, Canterbury.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. non-slipping red rubbers. Crescent steel rims. Butt-ended direct spokes. 16 $\frac{1}{2}$ -in. back wheel. 6-in. x $5\frac{3}{4}$ -in. G.M. hubs. Detachable cranks, 6-in. throw. Rubber pedals. Rudge's ball bearings throughout. Elliptical hollow forks. Humber head. $4\frac{1}{4}$ -in. centres. Horn handles. 1 $\frac{3}{8}$ -in. 16 W.G. steel backbone. New special spring. Suspension ventilated saddle. Adjustable circular step. D.L.S. brake. Leg-guard. Wrench. Oilcan. Bell. Valise. Inextinguishable lamp.

Specialities. New and improved spring.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	15	0	0
48-in.				54-in.			
50-in.				56-in.			

Extras. All bright, 10/-

Remarks. One of the latest introductions. A good sterling machine.

ARCHBISHOP No. 2.

H. T. MORTIMER, Cycle Works, Canterbury.

Description. $\frac{3}{4}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 48 direct steel spokes. 16 $\frac{1}{2}$ -in. back wheel. 5-in. G.M. hubs. Detachable cranks. Rubber pedals. Roller bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, $4\frac{1}{4}$ -in. centres. 22-in. x $4\frac{3}{4}$ -in. horn handles. 1 $\frac{3}{8}$ -in. 16 W.G. steel backbone. Bolted Stanley slide spring. Web-seated saddle. Adjustable round step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Bell. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	10	0	52-in.	12	0	0
48-in.				54-in.			
50-in.				56-in.			

Extras. All bright, 10/-

Remarks. Sound, and worth the money.

DISPATCH.

St. GEORGE'S FOUNDRY Co., Pope Street, Birmingham.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. grey rubbers. Crescent steel rims. Direct spokes. G.M. plated hubs. 16-in. back wheel. Fixed cranks. Rubber pedals. Ball bearings to front, cones to back wheel. Solid forks. Stanley, special pattern, head. 24-in. ebony handles. Steel backbone. Bolted sliding plated spring. Pigskin saddle. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

	£	s.	d.
46-in.	9	10	0
48-in. to 54-in.	10	0	0
56-in.	10	10	0

Remarks. Bright parts plated, others japanned. A durable roadster, at a moderate figure (see advertisements).

DURABLE.

BICYCLE SUPPLY ASSOCIATION, 27, 28, 29, and 30, Holborn Viaduct, London.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 64 direct spokes. 16-in. back wheel. G.M. hubs. Detachable cranks. Rat-trap pedals. Double ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head. 24-in. horn handles. Steel backbone. Bolted Stanley slide spring, Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench, Oilcan.

PRICES.

£	s.	d.	£	s.	d.		
46-in.	11	0	0	52-in.	12	10	0
48-in.	11	10	0	54-in.	13	0	0
50-in.	12	0	0	56-in.	13	10	0

Extras. All bright, 10/-

Remarks. Guaranteed free from flaws or bad material for 12 months from date of purchase. A sound machine (see advertisement).

ECLIPSE No. 2.

JAMES BEECH, 39, Union Street, Plymouth.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. grey rubbers. Crescent steel rims. Lock-nutted spokes. 17-in. back wheel. Solid hubs. Fixed cranks. Rubber pedals. Coned bearings throughout. Solid forks. Socket head. Horn handles. Steel backbone. Bolted sliding spring. Pigskin saddle. Saw step. Roller brake. Leg-guard. Flat wrench. Oilcan.

PRICES.

£	s.	d.	£	s.	d.		
46-in.	11	10	0	52-in.	13	0	0
48-in.	12	0	0	54-in.	13	10	0
50-in.	12	10	0	56-in.	14	0	0

Extras. All bright, 40/-

Remarks. Sound and strong. Fit for beginners.

GOLIGHTLY No. I.

ALBERT PHILLIPS, Excelsior Works, Rea Street South, Birmingham.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 64 and 20, No. 12, direct steel spokes. 16-in. back wheel. $5\frac{3}{4}$ -in. x 5-in. G.M. hubs. Fixed cranks, 5-in. throw. Non-slipping rubber pedals. Ball bearings. Elliptical

hollow forks. Humber head, 3½-in. centres. 24-in. x 4½-in. horn handles. 1½-in. steel backbone. Bolted shackle spring. Suspension saddle. Saw step D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	15	0	0	52-in.	15	15	0
48-in.	15	5	0	54-in.	16	5	0
50-in.	15	10	0	56-in.	16	10	0

Extras. All bright, 30/- Plated, 90/-

Remarks. A really well made, high quality article. A new introduction. A good roadster (see advertisement).

GOLIGHTLY No. 2.

ALBERT PHILLIPS, Excelsior Works, Rea Street South, Birmingham.

Description. ⅞-in. and ⅝-in. red rubbers. Crescent steel rims. 64 and 20, No. 12, direct steel spokes. 16-in. back wheel. 5½-in. x 5-in. G.M. hubs. Detachable cranks, 5-in. throw. Rubber pedals. Ball bearings to front, cones to back wheel. Elliptical hollow forks. Stanley head, 3½-in. centres. 24-in. x 4½-in. horn handles. 1½-in. steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	11	10	0	52-in.	12	10	0
48-in.	12	0	0	54-in.	13	0	0
50-in.	12	0	0	56-in.	13	10	0

Extras. All bright, 30/-

Remarks. Soundly-built and strong (see advertisement).

LEEDS.

T. RUSSELL & Co., 34, Hunslet Lane, Leeds.

Description. ⅞-in. and ¾-in. red rubbers. Crescent steel rims. 70 direct spokes. 16-in. back wheel. G.M. hubs. Detachable cranks. Rubber pedals. Parallel bearings to front, cones to back wheel. Solid forks. Humber head. Horn handles. Steel backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	8	10	0	52-in.	9	5	0
48-in.	8	15	0	54-in.	9	10	0
50-in.	9	0	0	56-in.	9	15	0

Extras. All bright, 10/-

MATCHLESS.

BICYCLE AND TRICYCLE SUPPLY ASSOCIATION, 27 to 20, Holborn Viaduct, London, E.C.

Description. ⅞-in. and ¾-in. non-slipping red rubbers. Crescent steel rims. 64 and 20, butt-ended, charcoal iron direct spokes. 17-in. back wheel. 6-in. x 5-in. G.M. hubs. Detachable cranks, 4½-in. to 5½-in. throw. Non-slipping rubber pedals. Special double ball bearings to front, balls to back wheel. Fluted hollow front and back forks. Dust-proof Humber head, 4-in. centres.

24-in. insulated ebonite rubber handles. 13-in. oval steel backbone. Special rubber cushion spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Special wrench. Oilcan.

Specialities. Ball bearings resembling the "Club." Rubber insulation to bearings (page 40). Insulated handle bar (page 52). Rubber cushion spring (page 61).

PRICES.

	£	s.	d.		£	s.	d.
46-in.	16	10	0	52-in.	18	0	0
48-in.	17	0	0	54-in.	18	10	0
50-in.	17	10	0	56-in.	19	0	0

Extras. All bright and plated, 50/-

Remarks. All usual bright parts are plated. The novelty of the season. In point of manufacture, fitting and finish, it is A 1, being manufactured for the Association by Messrs. Singer & Co., of Coventry, in their very best style. Report so far speaks very favourably of the improvement of rubber insulation. I have not tried it myself. It is essentially a roadster (see advertisement).

MOUNT EDGCUMBE.

JAMES BEECH, 39, Union Street, Plymouth.

Description. 7-in. and 3-in. red rubbers. D.S.H. steel rims. Direct spokes. 16-in. back wheel. G.M. hubs. Detachable cranks, 4½-in. to 5½-in. throw. Rubber pedals. Ball bearings to front, cones to back wheel. Elliptical hollow forks. Humber head, 4-in. centres. 24-in. horn handles. Steel backbone. Bolted Stanley slide spring. Web-seated saddle. Saw step. D.L.S. brake. Leg-guard. Screw wrench. Oilcan. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	14	10	0	52-in.	16	0	0
48-in.	15	0	0	54-in.	16	10	0
50-in.	15	10	0	56-in.	17	0	0

Extras. All bright, 40/-

Remarks. Thoroughly made and strong.

NATIONAL No. 1.

NATIONAL BICYCLE Co., National Works, Spon Street, Coventry.

Description. 7-in. and 5-in. red rubbers. Potential steel rims. 80 and 20, butt-ended, non-corrosive direct steel spokes. 16-in. back wheel. 6-in. x 6-in. G.M. hubs. Detachable cranks, 5½-in. throw. Rubber pedals. Ball bearings. Elliptical hollow forks. Humber head, 4½-in. centres. 26-in. cow-horn handles. 13-in. oval steel backbone. Coil front, Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Leg-guard. Champion wrench. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	15	10	0	52-in.	16	0	0
48-in.				54-in.			
50-in.				56-in.			

Remarks. Usual bright parts plated. A new introduction, forming a sound, well-constructed roadster. This is the new firm's leading machine; they have only just entered the trade, but are under the able guidance of Mr. H. J. Lawson, who is quite an old hand in it.

NATIONAL No. 2.

NATIONAL BICYCLE Co., National Works, Spon Street, Coventry.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 72 and 20 direct spokes. 16-in. back wheel. G.M. hubs. Detachable cranks, $5\frac{1}{2}$ -in. to 6-in. throw. Elliptical rubber pedals. Ball bearings. Elliptical hollow forks. Humber head, 4-in. centres. 26-in. horn handles. $1\frac{3}{8}$ -in. oval steel backbone. Coil front, Stanley slide spring. Pigskin saddle. Saw step. D.L.S. Brake. Leg-guard. Wrench. Oilcan.

PRICE.

All sizes £12 12 0

Remarks. Just introduced. A very fair article. Well made. Extra strong. Bright parts plated.

NATIONAL No. 3.

NATIONAL BICYCLE Co., National Works, Spon Street, Coventry.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 72 and 20 direct spokes. 16-in. back wheel. G.M. hubs. Detachable cranks, $5\frac{1}{2}$ -in. to 6-in. throw. Rubber pedals. Ball bearings. Elliptical forks. Humber head, 4-in. centres. 26-in. horn handles. $1\frac{3}{8}$ -in. steel backbone. Coil, Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Oilcan. Valise.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	8	10	0	52-in.	9	10	0
48-in.				54-in.			
50-in.				56-in.			

Remarks. Well worth the money.

NATIONAL No. 4.

NATIONAL BICYCLE Co., National Works, Spon Street, Coventry.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent rims. 72 and 20 direct spokes. 16-in. back wheel. G.M. hubs. Fixed cranks, $5\frac{1}{2}$ -in. to 6-in. throw. Rubber pedals. Roller bearings to front, cones to back wheel. Stanley head. 26-in. horn handles. $1\frac{3}{8}$ -in. backbone. Bolted Stanley slide spring. Pigskin saddle. Saw step. D.L.S. brake. Leg-guard. Flat wrench. Bell. Valise. Oilcan.

PRICES.

	£	s.	d.		£	s.	d.
46-in.	7	10	0	52-in.	8	10	0
48-in.				54-in.			
50-in.				56-in.			

NATIONAL SPECIAL.

NATIONAL BICYCLE Co., National Works, Spon Street, Coventry.

Description. $1\frac{3}{8}$ -in. and $\frac{9}{16}$ -in. non-slipping red rubbers. D.S.H. steel rims. 80 and 26, butt-ended, non-corrosive steel spokes. 16-in. back wheel. $\frac{5}{8}$ -in. x 6-in. G.M. hubs. Detachable cranks, $5\frac{1}{2}$ -in. throw. Rat-trap pedals. Rudge's adjustable ball bearings throughout. Elliptical hollow forks to front and back wheels. Humber head, $4\frac{1}{2}$ -in. centres. 26-in. cow-horn handles. $1\frac{3}{8}$ -in. oval steel backbone. Coil fronted, Stanley slide spring. Suspension saddle. Saw step. D.L.S. brake. Champion wrench. Leg-guard. Bell. Valise. Oilcan.

PRICE.

All sizes £21 0 0

Remarks. Plated all over. Every extra is included at the price, and, taken all in all, is a very fine machine.

NATIONAL JUNIOR.

NATIONAL BICYCLE Co., National Works, Spon Street, Coventry.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. 40 and 20 direct spokes. 14-in. back wheel. Iron hubs. Fixed cranks, 5-in. throw. Plain bearings. Solid forks. Stanley head. 22-in. horn handles. Oval backbone. Bolted sliding spring. Leather saddle. Saw step. D.L.S. brake. Wrench. Oilcan.

PRICES.

	£	s.	d.
30-in. to 34-in.	3	3	0
36-in. to 40-in.	3	15	0

Remarks. One of the cheapest boys' machines in the market.

RAPID No. 1.

ST. GEORGE'S FOUNDRY Co., Pope Street, Birmingham.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. Direct spokes. G.M. hubs. 16-in. back wheel. Detachable cranks. Rubber pedals. Rapid adjustable ball bearings to front, cones to back wheel. Elliptical hollow forks. Stanley head, special pattern. 24-in. ebony handles. Steel backbone. Bolted sliding spring. Suspension saddle. D.L.S. brake. Leg-guard. Flat wrench. Oilcan.

Specialities. Rapid ball bearings (*page 275*).

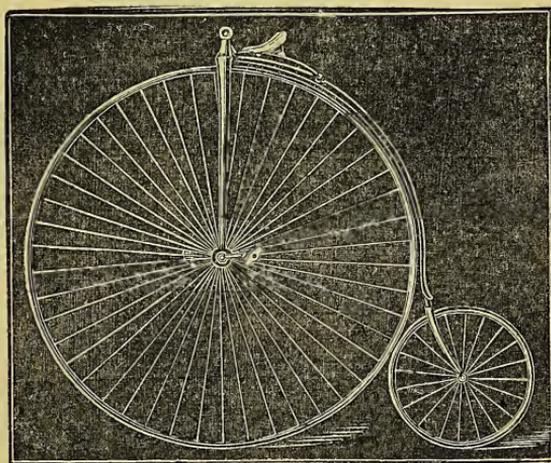
PRICES.

	£	s.	d.
46-in.	14	10	0
48-in. to 54-in.	15	0	0
56-in.	15	10	0

Remarks. Japanned to order in good style. A very favourable machine (*see advertisements*).

RAPID No. 2.

ST. GEORGE'S FOUNDRY Co., Pope Street, Birmingham.



RAPID No. 2.

Description. $\frac{7}{8}$ -in. and $\frac{5}{8}$ -in. red rubbers. Crescent steel rims. Direct Bessemer steel spokes, No. 10 inch scale. 14-in. back wheel. $5\frac{1}{2}$ -in. x 5-in. G.M. hubs. Detachable cranks, 5-in. throw. Rubber pedals. Patent "Rapid" ball bearings. Elliptical hollow front and back forks. Special pattern Humber head, $4\frac{1}{2}$ -in. centres. 24-in. x 5-in. ebony handles. $1\frac{1}{4}$ -in. 16 W.G. steel backbone. Bolted ball-slide spring. Suspension saddle. Crescent step. D.L.S. brake. Flat wrench. Leg-guard. Oilcan.

Specialities. "Rapid" double ball bearings (*addenda*). Spring slide, and head

PRICES.

				£	s.	d.
40-in.	..	..	..	17	0	0
48-in. to 54-in.	..	..	..	17	10	0
56-in.	..	..	..	18	0	0

Extras. All bright and plated, £4.

Remarks. Constructed on the latest approved patterns. A new introduction this season, but the makers have long been in the trade as part makers (*see advertisement*).

RAPID No. 3.

St. GEORGE'S FOUNDRY Co., Pope Street, Birmingham.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. D.S.H. steel rims. Direct Bessemer steel spokes. G.M. hubs. 16-in. back wheel. Detachable cranks. Rubber pedals. "Rapid" adjustable double ball bearings to front, balls to back wheel and pedals. Elliptical hollow steel forks. Special pattern Stanley head. 24-in. horn handles. Hollow handle bar. Steel backbone. Bolted sliding spring. Suspension saddle. Adjustable step. D.L.S. brake. Leg-guard. Valise. Flat wrench. Bell. Oilcan.

Specialities. "Rapid" double ball bearings (page 275).

PRICES.

				£	s.	d.
46-in.	..	..	..	23	10	0
48-in. to 54-in.	..	..	..	24	0	0
56-in.	..	..	..	24	10	0

Remarks. A very high-class machine. Fitted and finished in first-class style, and nickel-plated all over except rims (*see advertisements*).

WORKMAN'S No. 1.

H. T. MORTIMER, Cycle Works, Canterbury.

Description. $\frac{3}{4}$ -in. red rubbers. Crescent rims. 48 and 20, No. 11, direct spokes. $16\frac{1}{2}$ -in. back wheel. 6-in. x 4-in. solid iron hubs. Fixed cranks, 6-in. throw. Rat-trap pedals. Parallel bearings. Solid forks. Stanley head, $4\frac{1}{2}$ -in. centres. 22-in. x 5-in. horn handles. $1\frac{1}{4}$ -in. 12 W.G. iron backbone. Bolted clip-tail spring. Pigskin saddle. Saw step. D.L.S. brake. Flat wrench. Leg-guard. Bell. Valise. Oilcan.

PRICE.

All sizes £7 10 0

Extras. All bright, 10/-

WORKMAN'S No. 2.

H. T. MORTIMER, Cycle Works, Canterbury.

Description. $\frac{7}{8}$ -in. and $\frac{3}{4}$ -in. red rubbers. Crescent steel rims. 48 and 20, No. 11, direct spokes. $16\frac{1}{2}$ -in. back wheel. 6-in. x 4-in. wrought iron hubs. Fixed

cranks, 6-in. throw. Rat-trap pedals. Roller bearings to front, cones to back wheel. Solid forks. Stanley head, $4\frac{1}{4}$ -in. centres. 22-in. x 5-in. horn handles. $1\frac{1}{2}$ -in., 13 W.G., lap-welded backbone. Bolted sliding spring. Web-seated saddle. Saw step. D.L.S. brake. Screw wrench. Leg-guard. Bell. Valise. Oilcan. Hub lamp.

PRICES.

			£	s.	d.
46-in. to 50-in.	..	..	8	10	0
52-in. to 56-in.	..	..	9	0	0

Extras. All bright, 10/-

Remarks. Cheap and strong (see advertisement).

YOUTH'S INTERCHANGEABLE.

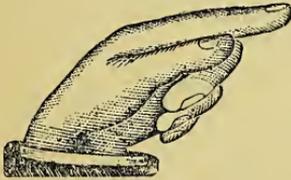
PALMER & Co., Victoria Works, Sixways, Birmingham.

Description. $\frac{3}{4}$ -in. and $\frac{5}{8}$ -in. best red rubbers. Crescent steel rims. 40 and 16, No. 13, Bessemer steel spokes. 12-in. back wheel. 4-in. x 4-in. G.M. hubs. Detachable cranks, $4\frac{1}{2}$ -in. throw. Coned base parallel bearings. Rubber pedals. Solid forks. Steel backbone. Palmer's new head. 20-in. horn handles. Bolted sliding spring. D.L.S. brake. Screw wrench for all nuts. Valise. Oilcan.

PRICE.

All sizes	£5	0	0
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Remarks. An excellent little article (see advertisement).



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Catalogue of Novelties and Machines described for the first time in the present volume.

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OUT OF DATE.



LARGE number of peculiarities in construction are introduced every year into the manufacture of bicycles, and an equally large number fall yearly into disuse. Hitherto I have retained descriptions of these obsolete parts for the benefit of inventors and others, but, as they have now become very numerous, I have deleted them from the present volume. Full descriptions, however, of all these are to be found in

THE INDISPENSABLE FOR 1880,

a few copies of which are still on hand, and may be had for 1s. 4d., by post, from the publishers of the present volume. The following is a list of the out of date parts and peculiar machines which appear in that volume, but not in the present :—

TYRES.—Moseley's unstretchable. Morrell's safety.

RIMS.—U V. Corrugated. Flat.

HUBS.—Miller's detachable.

SPOKES.—Grout's self-adjusting. Tupper's. Harrington's.

WHEELS.—Block Tension. Ariel No. 2.

RIGID WHEELS.—Twisted spoke. Garrood's. Sandringham. Lawson's Stella. Superb. Perfect. Hutchinson's. Clifton. Lever-arm Tension No. 1. Lever-arm Tension No. 2. Ariel.

CRANKS.—Desideratum detachable. Europa detachable. All England. Eccentric.

PEDALS.—Jackson's patent. Skeleton. Dedicoat's grip. Starley's oscillating.

BEARINGS.—Coventry hinged box. Superb detachable parallel. Timberlake's parallel. Starley's detachable parallel. Tangent do. Essential adjustable parallel. Miller's. Button's roller. Whitehouse's twin roller. Harrington's roller. Acme roller. Trio roller. Quadruple roller. Agnew's roller. Smith's, Nancy Lee, and Pitcher's coned roller. Garrard's Universal ball.

BACK WHEEL BEARINGS.—Miller's cone. Harrington's roller. Agnew's roller. Invincible, Centaur, and Excelsior ball.

FORKS.—Invincible semi-circular. T.H.F. Premier rigid.

STEERING HEADS.—Spring, coned and ball bearing socket. Acme fork top. Duplex. Europa. Suspension. Champagne top. Ball Stanley. Invincible. Nutless Stanley. Hutchinson. Royal. Keen's. Premier.

HANDLES.—Jackson's lifting-nut for. Special Tangent. C. M. Co's. adjustable. Electric vibrating. Harrington's.

SPRINGS.—Warman's roller slide for. Warman and Laxon's slide for. Backed. Stanley. Acme. Simpson's. Premier Universal. Wheaton's free-ended. New Invincible. Maher's front-action. Invincible. Dediccoat's Invisible.

SADDLES.—Weymouth. Cornish. Cane-seated. Hunt's sliding.

STEPS.—Alliance, Desideratum, and Harrington's adjustable. Self-adjusting hinged. Dediccoat's spring.

BRAKES.—Back wheel. Starley's grip. Dediccoat's Invisible. C. M. Co's. safety skid. Starley's safety. Vesey's application of. Reverse-action. Thumb-screw. Starley's thumb-lever. Irresistible. Clarke's guard. Bate's safety spring. Carter's trailing. Jackson's stilt. Simpson's safety slipper. Safeguard. Cords for.

ADJUSTABLE RAKE.—Carter's. Club.

TOE AND FOOT RESTS.—Safety. Coventry. Challenge. Automaton.

WRENCHES.—Dediccoat's folding. Starley's adjustable. Hallamshire. Snail. Bury St. Edmund's.

LUBRICATORS.—Needle. Skylight.

VALISE.—Stassen's circular wheel.

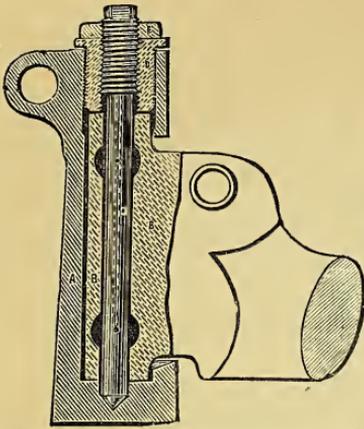
BELLS.—American chimes. Dediccoat's stop. Leonardt's alarum. Faire Fuir. Immaculate alarum.

LAMPS.—Comet combined. Lee's paraffin.

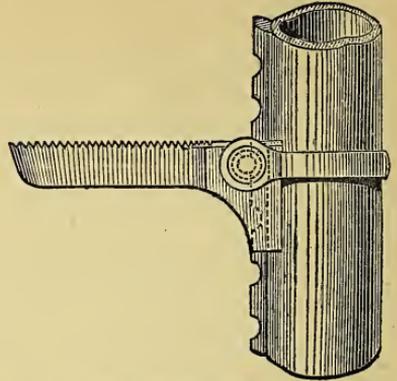
METERS.—Stassen's. Darton's. The Telemeter. Marvel mile meter.

PECULIARBICYCLES.—Bicyclette. Club Safety. Fletcher's patent. Flying Dutchman. Safety. Shadow. Sultan. Wagtail Champion.





CENTRAL PIN STEERING, SWINDLEY'S PATENT.



PATENT ADJUSTABLE STEP.

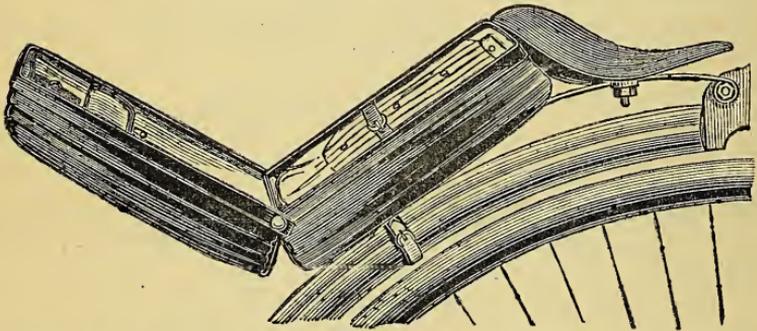
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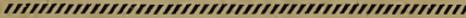
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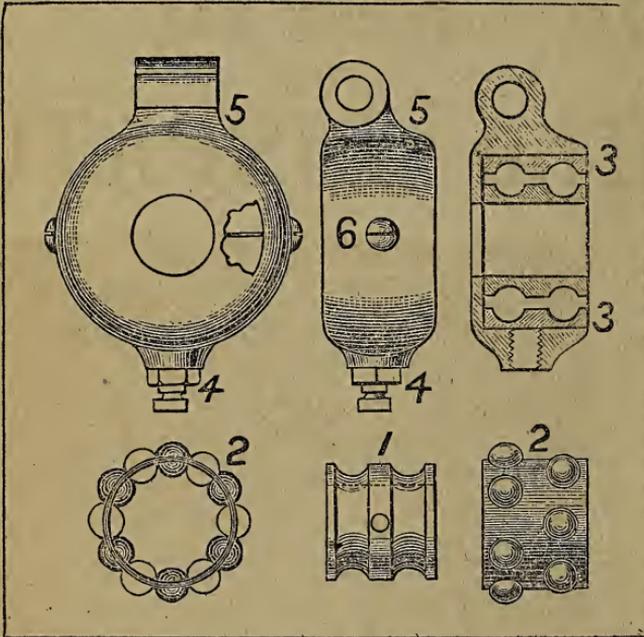
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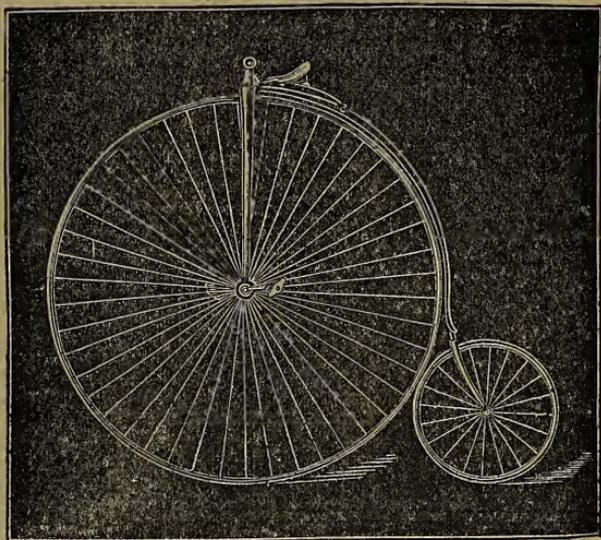
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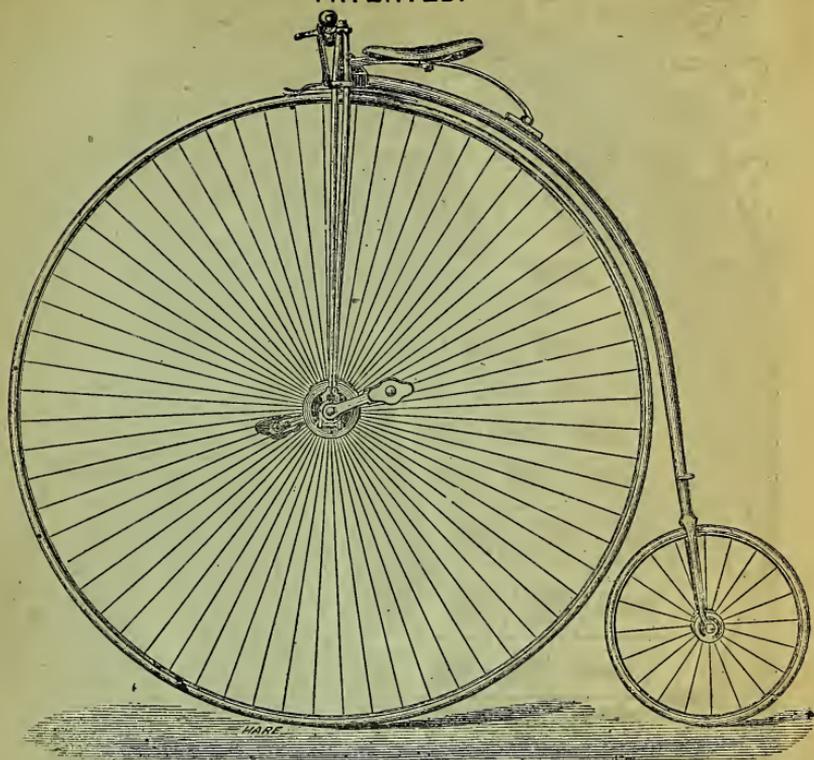
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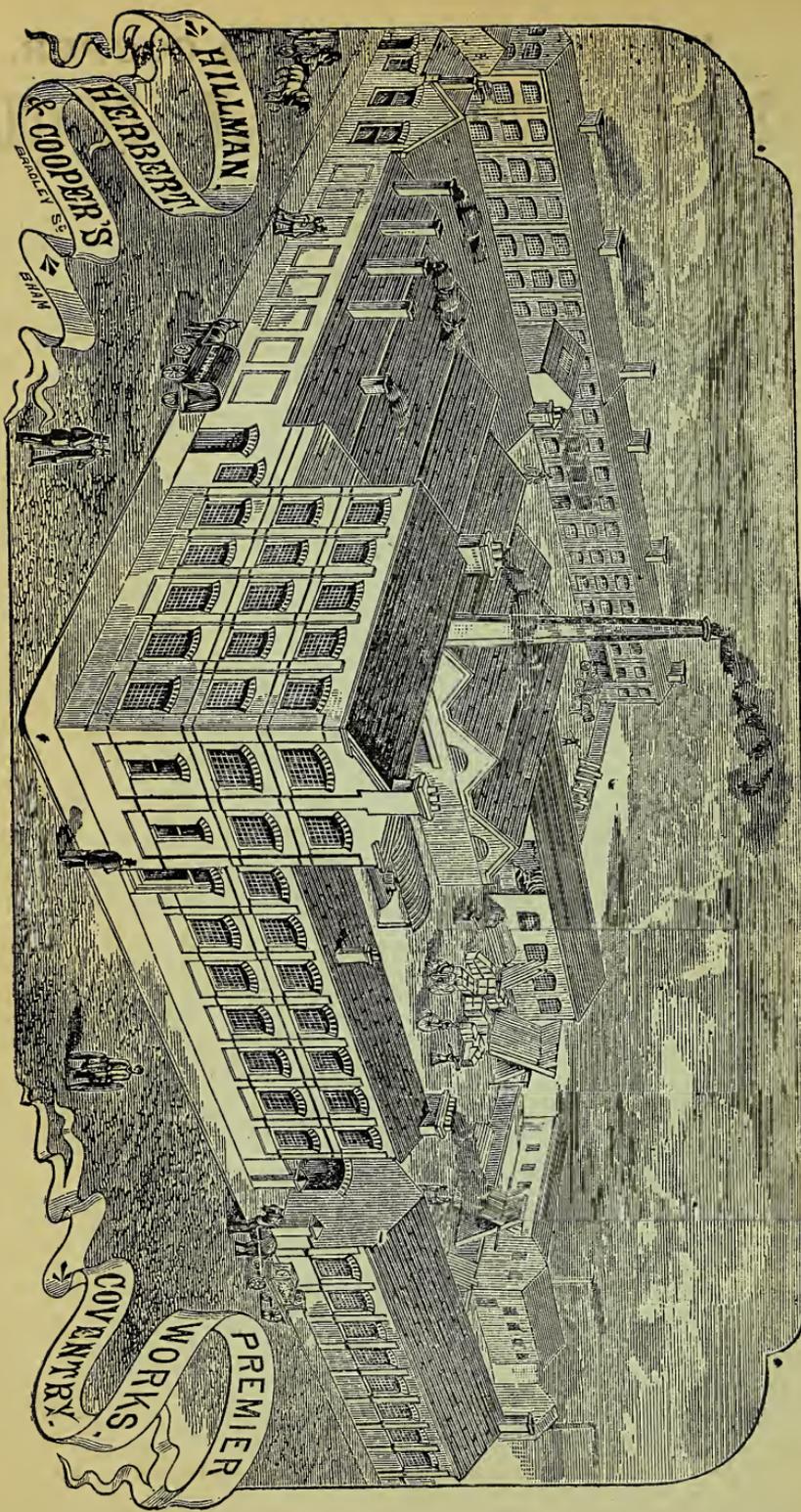
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46 inches and under	..	14	10	0	54 inches	16	0	0
48 " " " "	..	14	10	0	56 " " " "	..	16	10	0
50 " " " "	..	15	0	0	58 " " " "	..	17	0	0
52 " " " "	..	15	10	0	60 " " " "	..	17	10	0

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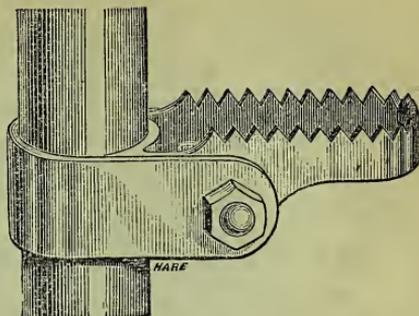
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Patent Adjustable and Detachable Step.



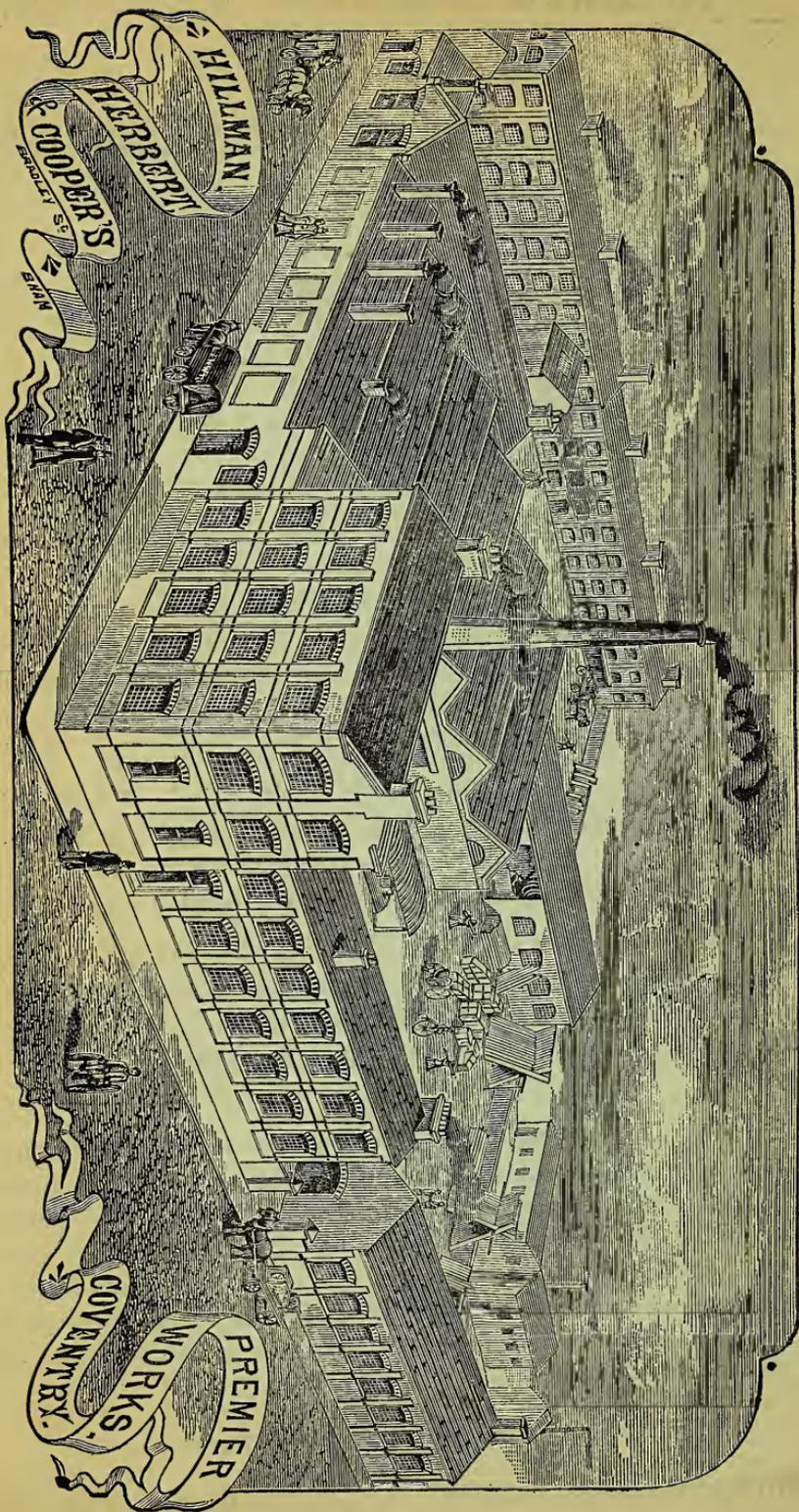
Since the application of the fixed Step to the Bicycle as a means of mounting and dismounting, numerous attempts have been made to introduce one that might be placed in any position on the backbone of a bicycle to suit the requirements of the rider; none, however, have been satisfactory until the invention of that represented above, owing probably, to their excessive weight and limited range of adjustment.

The step we illustrate is made entirely of steel, it is no heavier than an ordinary one of the lightest kind. It can be attached or removed by any one in a few seconds, placed on either side of the backbone, & at any angle raised or lowered from 4 to 6 inches.

But perhaps its greatest advantage is that it requires no holes piercing for its attachment to the backbone, a matter of importance, as at this part the latter is somewhat weakened by the operation of tapering, and is seldom more than $\frac{1}{8}$ in. thick at any part.

After glancing at the engraving, very little explanation will be necessary as to its construction. It consists of two U shaped pieces of steel, one forming a strap round the backbone, the other (the step) which is well serrated at the top to prevent the foot slipping. The straight sides of the latter slide into the corresponding ears of the strap, a cross pin passes through both with set screw therein, the screwing up of which jams the whole immovably in position.

PRICE, Polished 5s., Nickel-plated, 6s.



SEASON 1881.



THE

'TOURING' BICYCLE

PERFECTLY CONSTRUCTED,

WITH ALL

RECENT IMPROVEMENTS.

APPLY DIRECT_{LY} TO

THOMAS BUTLER,

PATENTEE OF

THE "OMNICYCLE,"

WOKINGHAM, BUCKS.

SPECIAL TERMS TO CLUBS.

The 'Special' Tension Bicycle for the Season

Has the SEVEN BEST PATENT IMPROVEMENTS employed in its construction, and a selection of all the best fittings in the trade, for which

NO EXTRA CHARGE IS MADE.

PRICE LISTS FREE, ONE STAMP.

The Tension Bicycle
And Arrow Tricycle Co.,
Watson St., Stoke Newington Green, London, N.

PATENTEES OF THE
HILL-CLIMBING TRICYCLE ACTION.

Of all Agents.

CHALLIS'S

PATENT

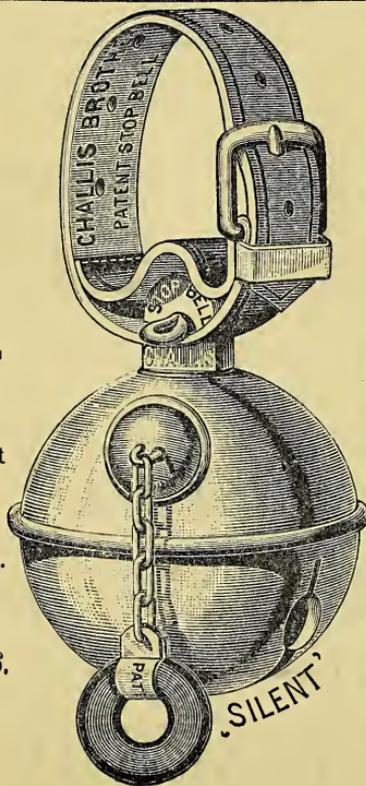
STOP BELL.

The loudest, best
finished, and
most durable Bell.

PRICES,

No. A1, '2-in., 2/6.

No. 1, 1 $\frac{3}{4}$ -in., 2/-



Of all Agents.

CHALLIS'S

REGISTERED

TOOL POUCH, 5s.,

Made in 3 sizes.

CHALLIS'S

REGISTERED

Oil Can Case, 1s.,

With patent fastening.

CHALLIS'S

Pure Sperm Oil,

In Tins, $\frac{1}{4}$ pint, $\frac{1}{2}$
pint, and pint.

9d., 1s. 3d., 2s.

CHALLIS BROS.,

HOMERTON, E.

H. T. MORTIMER,
CANTERBURY
'CYCLE & WORKS.

ENQUIRE ABOUT THE
 PATENT

“Canterbury”
TRICYCLE,

ALSO ABOUT THE

PATENT
BICYCLE SPRING.

“THE FAVORITE,”

Manufactured in 3 Patterns,

Viz:—

Roadster, Semi-Roadster,
 and Racer.

SPECIALITIES—

Best Workmanship; Extra long Neck and Improved Centre-Pin, making the Bicycle as rigid as possible and which seldom requires tightening. All the latest improvements, and built to purchaser's requirements.

WRITE FOR LISTS TO

C. M. LEES,
NEW ROAD,
GREAT BRIDGE.

W. SPIERS,

MAKER OF

Bicycles, Tricycles,

AND

Perambulator Wheels,

AND

Boys' Bicycles,

TO ORDER.

5, ST. JAMES' STREET,
LEICESTER.

JAMES PLOWRIGHT,

27, RAILWAY ROAD, LYNN,

Sole Maker of the

LYNN “EXPRESS”

Bicycles & Tricycles.

PRIZE MEDAL,

Awarded for

Excellence of

Design and

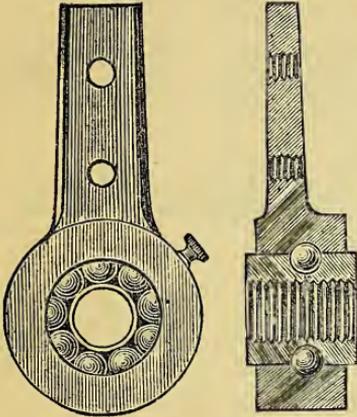
Workmanship.



218 Miles on the Road, in one day, is the greatest Bicycle Feat on Record. This was accomplished upon the Lynn “Express.”

CATALOGUES FREE.

THE
 "FLORENTINE" BICYCLE.



These solid Steel Ball Bearings have been fully tested, and are declared to be the most durable and easy running bearing now in use. Each machine is fitted with the greatest care by hand, or only the most approved machinery, and the excellence of their finish is universally admitted.

"Special Florentine," 50in., £8 15s.;
 the "Florentine No. 1," 50in., £7 10s.

SOLE MANUFACTURER,

THOMAS HOUGH,
 FLORENCE WORKS," WOLVERHAMPTON.

Descriptive Lists, post free.

THE "BIRKBECK" BICYCLES!

Reputed for excellent finish and sound workmanship.

STRONG, HANDSOME, LIGHT AND DURABLE,

Well known to the bicycling world as first-class reliable machines, and sold at a very reasonable price.

Every Machine Warranted to be of the best Material & Workmanship.

PRICE LIST FREE.

C. SNOW, Manufacturer,

The Birkbeck Bicycle & Tricycle Works,

BIRKBECK RD., KINGSLAND, LONDON, E.

THE COMMERCIAL BICYCLES, TRICYCLES,

And all kinds of Fittings, Season 1881.

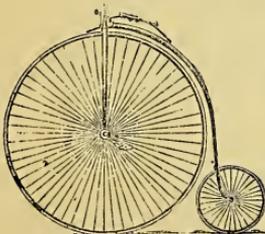
Manufactured by

A. ROBINSON & Co.,

Albert Place, Wolverhampton.

Seventh Annual Illustrated Catalogue and Price List,
 with 70 Illustrations, 1 stamp; Photos., 3 stamps.

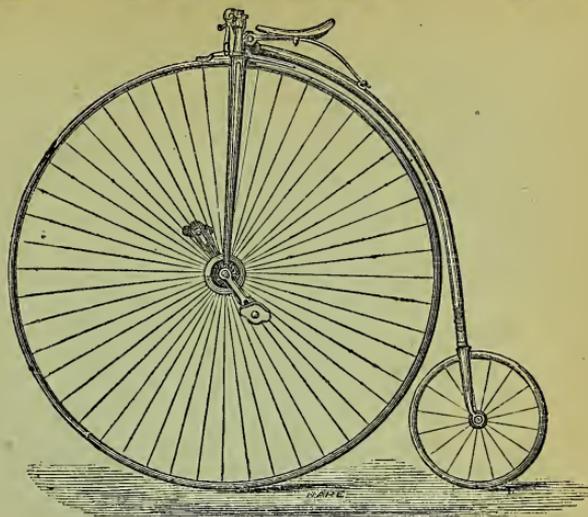
Intending purchasers should send for this little book
 before purchasing.



Agents Wanted on good Commission.

Say where you saw this Advertisement.

HILLMAN, HERBERT & COOPER, THE "PREMIER" No. 0.



The above is a thoroughly strong and reliable Machine at an extremely moderate price, destined to supersede some of the so-called cheap machines, sold positively in some cases for less money than the material costs in a really good honest machine. The head is of the close centre steering pattern, known as the "Stanley." Front spoon brake and bow spring. The wheels have strong steel felloes, and moulded tyres, and are fitted either with butt-ended spokes, screwed direct into the hub, or with nipples and lock-nuts. The Bearings are **flint hard**, parallel to the front, and adjustable cones to the back.

PRICES painted in either two or three colors.

46, 48, 50, 52, 54-in.

£10. 0s. 0d.

56, 58, 60-in.

£10 10s. 0d.

EXTRAS—All Bright, 10s.; Nickel Plated, 50s.; Ball Bearings to front wheel, 25s. ditto to back, 20s.; "Holdfast" (detachable) Cranks, 7s, 6d.

BOYS' BICYCLES.

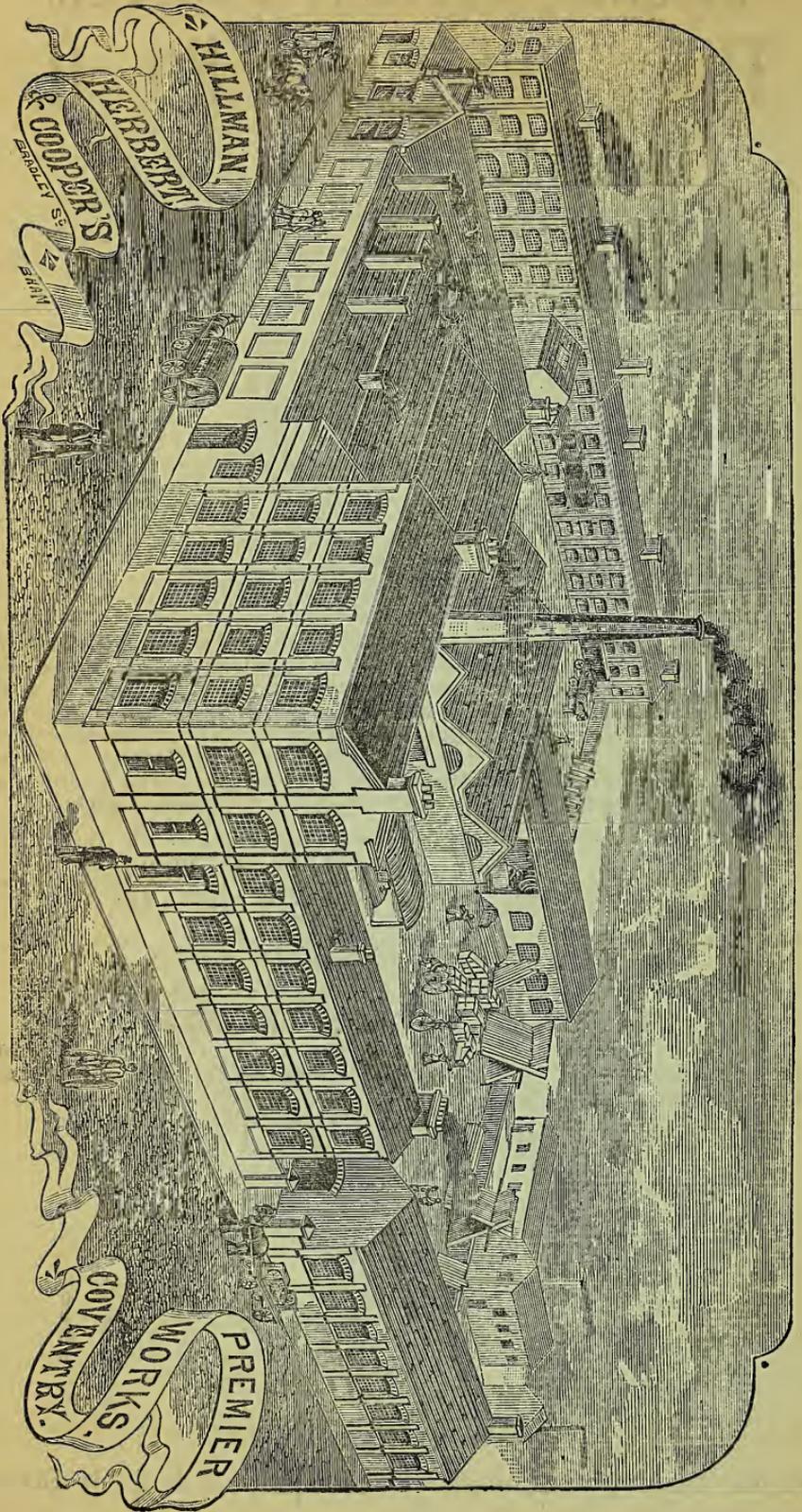
Boys' Bicycles are identical with the No. 0. They are of great strength, and we have no hesitation in warranting them for any length of time for fair wear and tear.

PRICES PAINTED IN 2 OR 3 COLORS.

<i>Length of leg.</i>	<i>Size.</i>	<i>Price.</i>		
<i>Inches.</i>	<i>In.</i>	£	s.	d.
22	30	5	15	0
23	32	6	0	0
24	34	6	5	0
25	36	6	10	0
26	38	7	0	0
27	40	7	10	0
28	42	8	0	0
29	44	8	10	0

Extras the same as No. 0.

Works: Coventry; London: 97, Cheapside & 5, Lisle Street.



HILLMAN
HERBERT

COOPER'S

SHAW

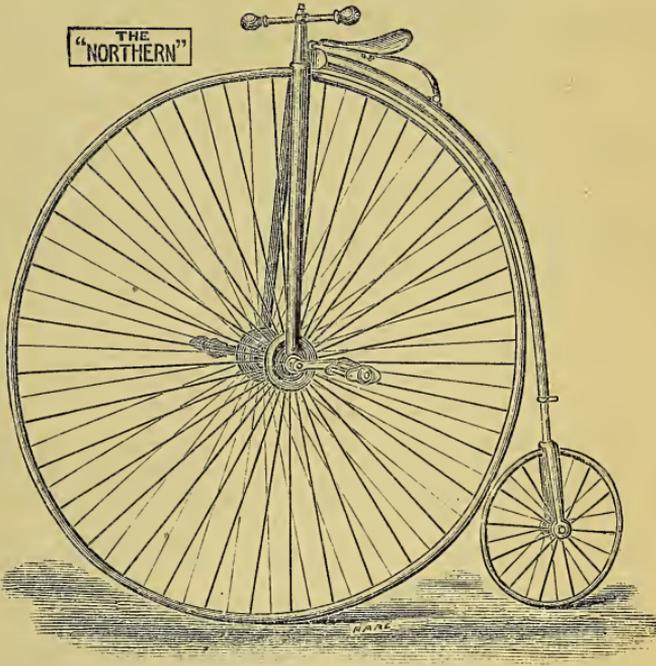
PREMIER
WORKS.
GOVERNMENT.

THE "NORTHERN"

PRICE LIST FREE.

PHOTOS. 3 STAMPS.

The "Northern" for Road Work.



The "Northern" for Racing.

IMPORTANT FACTS!

Well worth noting by those who contemplate Purchasing
New Machines.

Mr. W. GELLENDER won the Amateur Long Distance Championship of the World, at Newcastle, on June 21st, 1880, covering 202 miles. Longest distance on record. Mr. ROBSON, second (196); and Mr. MILLS, third. All rode "Northern."

MANUFACTURED BY THE

North of England Bicycle Co.,

44 & 46, HIGH BRIDGE,
AND PILGRIM STREET, NEWCASTLE.

ESTABLISHED, 1859.

GEORGE HUGHES,
Temple Works, Temple Street,
WOLVERHAMPTON.

Patentee and Manufacturer of the well-known

DEMO. REGO. AUTO.

(REGISTERED TRADE MARK.)

BICYCLES AND TRICYCLES.

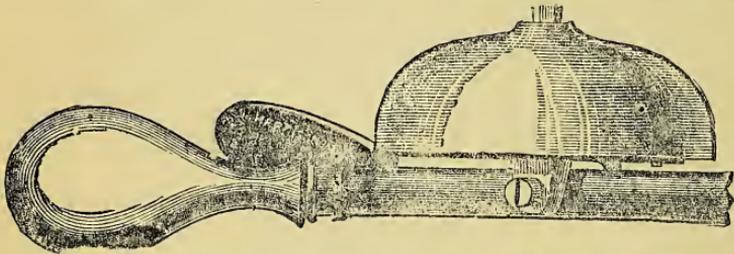
Stampings and Fittings, all kinds.

Crescent Steel Rims, 3/6 pair; Hubs, 6/- pair; Wire, 3d. per lb.
Bearings: Parallel, 3/-; Roller, 9/-; Æolus Ball, 21/- pair.

Illustrated List, 1 stamp. Photo., 3 stamps.

BICYCLE BELLS.

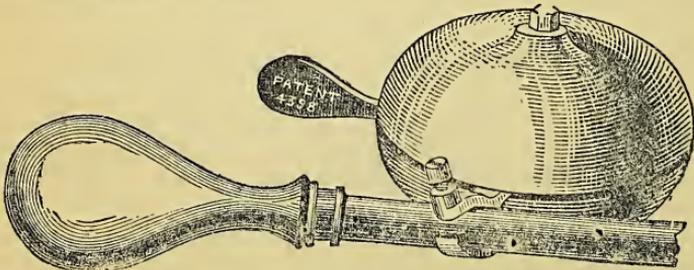
HARRISON'S PATENT ALARM BELL



Meets all the requirements of the Act.

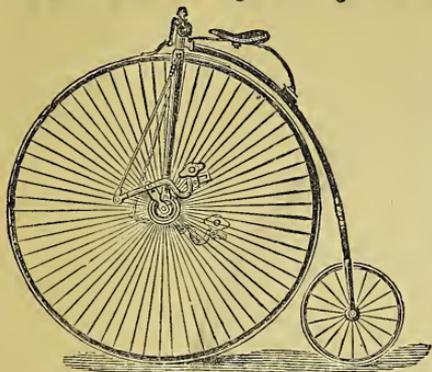
The Cycling Times (Nov. 27th, 1879) says, "This Bell, as now constructed, is certainly the best Bicycle Bell in the Market, &c., &c."

The Cricket and Football Times (Dec. 4th, 1879) says, "We consider this Bell an improvement on any in use."



Spanners, Warranted forged of best Iron; Steel Balls, Spoke Tighteners,
&c., &c.

THE
Devon Safety Bicycle.



PATENT.

This splendid Machine permits of the rider's "weight" being utilised. Will run over all obstacles without throwing over the handles. Is more powerful than the ordinary, and requires an upright position, avoiding round shoulders in boys.

PRICE, £16 16S.

Full particulars (stamp) from

The EXETER BICYCLE & TRICYCLE Co., Exeter.

London Agents—Messrs. Maynard, Harris & Co., 127, Leadenhall St.; & M. D. Rucker & Co., Bethnal Green.

WM. PLATTS & Co.,

Bicycle Lamp Manufacturers,
19 & 20, NEWHALL HILL,
BIRMINGHAM,

Sole Makers of the celebrated

"Fly-by-Night" Hub Lamp,

Registered No. 3356. Strongly rivetted and well finished. The best and cheapest lamp in the market.

Price 7/6, of all Dealers.

Purchasers are warned against spurious imitations, which are sold by unscrupulous dealers for extra profit.

Also Makers of the

'Indestructible' & 'Sunbeam'
BICYCLE LAMPS, AND
"THE NEWHALL"
TRICYCLE LAMP.

"Special Unique!"

"Special Unique!"

"Special Unique!"

This favourite Machine is intended to compare favourably with the best now before the Public.

Read the Testimonials and Press Notices.

PRICE LISTS FREE. PHOTOS. 4d. EACH.

T. S. BATE,
MALDON.

Repairs and Sundries at most moderate charges, consistent with best work.

TRICYCLE REPAIRS A SPECIALITÉ.

H. E. KEAR,

RED CROSS IRON WORKS,

BRISTOL,

Bicycle Manufacturer,

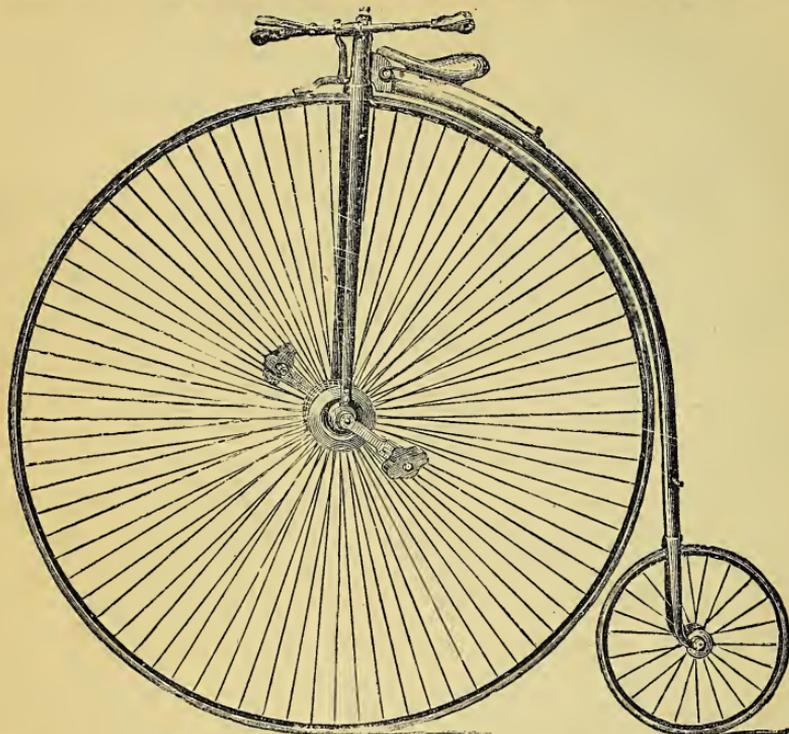
AND

Agent for Hillman, Herbert and Cooper's celebrated D.H.F. Bicycles.



READ THE CYCLIST!

THE "HALLAMSHIRE" NO. 1.



Fitted in a most superb style, with **broad knife-edged oval hollow forks** to both wheels; **Bown's "Æolus" ball bearings** to both wheels; new and improved **shackle** to spring; 24in. handle bar; 70 to 90 spokes, 12 W.G.; **adjustable cranks**; new, handsome and **improved bell-shaped gun-metal hubs**; strong and light best buffalo colored horn handles, &c., &c. Its **appearance, lightness, rigidity and durability**, and the ease and comfort with which it is ridden, justly entitles it to be placed in the **foremost rank of Bicycles** for the 1881 Season.

Weight of 52in., 33lbs., **PRICE £15**, bright or painted.

THE "HALLAMSHIRE" NO. 2.

This Machine is got up in exactly the same style as the No. 1, the same material being used in its manufacture, excepting that, for hollow forks, solid but **light elegant forks** are substituted. In the place of "Æolus" ball bearings, the "**Hallamshire**" **double-row roller bearings**, adjustable and dust-proof, or ordinary ball bearings are fitted.

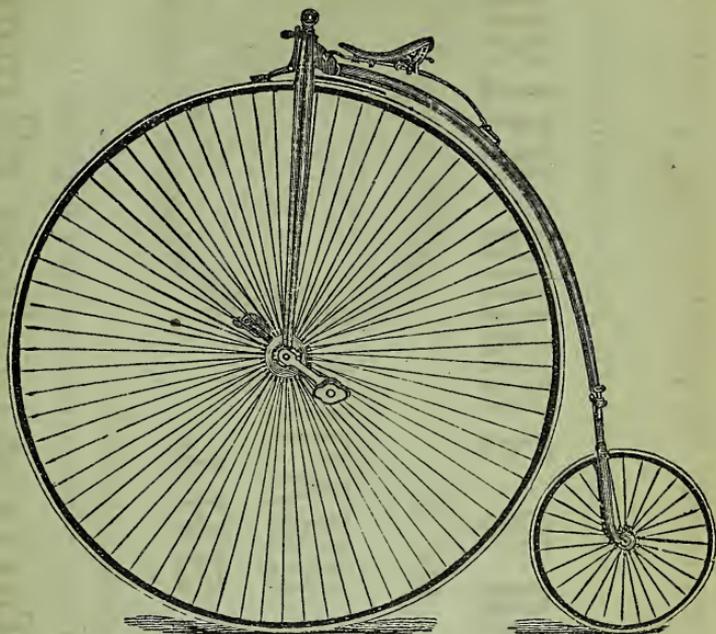
Price of 52in., **£12**, painted; 10/ extra if bright.

MANUFACTURED BY

ELLIS & BUCHAN,

"Hallamshire" Bicycle Works, SYLVESTER GARDENS, **SHEFFIELD.**

THE D.F.H.F. CENTAUR PRIZE MEDAL ROADSTER.



"It is admitted on every hand that the introduction of a hollow, in lieu of a solid fork for a bicycle, is a gain as regards rigidity, strength, and the saving of weight. Messrs. Hillman and Herbert, however, having in view, no doubt, the great additional strength given to bulb iron by the bulb or bead at its edge, introduced the double hollow fork, which to a certain extent carries out this theory of strength. The "CENTAUR" COMPANY, of Coventry, have now introduced what we may perhaps call a "connected double hollow fork;" that is, while the bead for strengthening is obtained, as will be seen by the section here given, the fork is practically in one piece.



SECTION OF FORK.

"This section, which the Company call the hollow fluted or girder section fork, is so rolled that the pressure on any part is counteracted. Thus the thrust upon the crown of the arch A is resisted by the crown of the arch B, and *vice-versa*. This, it will be seen, obviates the springing of the forks and cross-winding of the bearings, when great pressure is applied to the handles and pedals."—*Bicycling Times*, April 3rd, 1879.

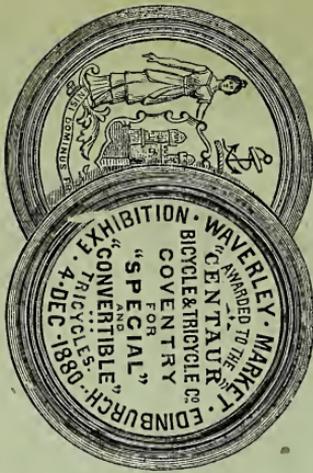
"This is without doubt the finest machine yet introduced for all purposes being very fast and light enough for racing, and at the same time possessing unequalled rigidity and strength, thus eminently fitting it for road work and touring purposes; it is elegant in the extreme."—*The Indispensable*, 1879.

Price, 50-in. £15 15s.,

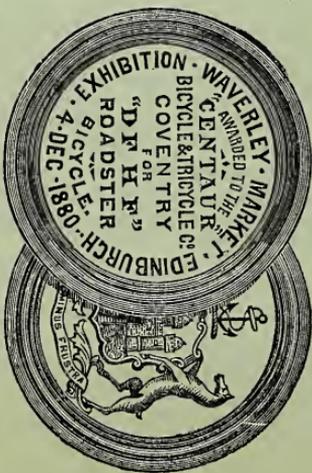
Including Ball Bearings, Patent Detachable Cranks,
AND OTHER IMPROVEMENTS.

Edinburgh Bicycle & Tricycle Exhibition, Dec., 1880,

Where the latest and most improved machines for the present season were Exhibited,



THE ONLY
SILVER MEDALS
FOR BEST



ROADSTER BICYCLE & BEST ROADSTER TRICYCLE

Were awarded to the "CENTAUR" COMPANY, COVENTRY,

THE TEST BEING

Excellence of Workmanship, Ingenious Construction and Ease of Propulsion.

Full descriptive Catalogues of the "Centaur" Bicycles or Tricycles, with Testimonials,
Post Free on application.

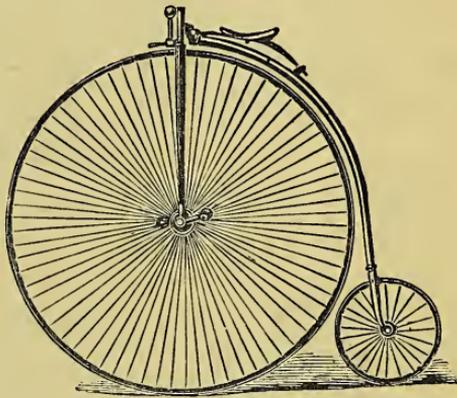
PALMER & CO.,

MAKERS OF THE

INTERCHANGEABLE

Bicycles *and* Tricycles.

SOLE
MAKERS
OF
PALMER'S
PATENT
DOUBLE
BALL
BEARINGS.



SOLE
MAKERS
OF
THE NEW
ANTI-
VIBRATION
BICYCLE.

These Machines being the only ones built absolutely on the **INTERCHANGEABLE** System, will especially recommend themselves to riders as being the safest machines for touring, as any parts broken from the almost inevitable spills can be replaced immediately on receipt of telegram, guaranteed to fit.

Write for price list and description of the INTERCHANGEABLE system of manufacture to

**VICTORIA WORKS,
SIX † WAYS, † ASTON, † BIRMINGHAM.**

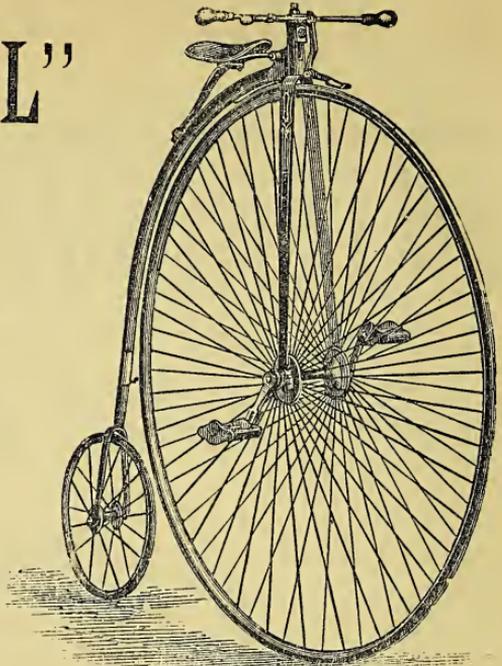
THE
"ROYAL MAIL"
ROADSTER.

For Construction, Finish, and Excellence of Manufacture it is unsurpassed.

The Company desire to call particular attention to their Patent Adjustable Handle. By simply slackening the nut, the handle can be raised or lowered to suit the height of the rider, and, when required, can be removed altogether.

—:0:—

Racers and Semi-Racers
MADE TO ORDER.



PATENTEES AND MANUFACTURERS—

THE ROYAL SEWING MACHINE COMPANY, LIMITED,
SMALL HEATH, BIRMINGHAM.

MAYNARD HARRIS & Co.,
PATENTEES OF THE CELEBRATED
'DEVON' TRICYCLE,
THE "DEVON SAFETY" BICYCLE,
THE "EVERCLEAN" COLLAR, CUFFS, &c.

A large assortment of BICYCLES & TRICYCLES on view.
Also a large and varied assortment of Sundries.

CLUBS SUPPLIED WITH UNIFORMS.
Price Lists and Estimates Free on Application.

MAYNARD HARRIS & Co.,
126 & 127, Leadenhall St., London ; 31, West St., Brighton.

THE
BICYCLING WORLD

Is the official organ of the League of American Wheelmen, and is the only paper in America which aims to be a special exponent to Bicycling.

Every Wheelman who wishes to have a reliable record and herald of events and progress of this art in America, or to keep up with the best Literature relating to it, will subscribe for this paper. Every Manufacturer who wishes to sell machines for American use should advertise in it.

→*EDITED + BY + LOUIS + HARRISON.*←

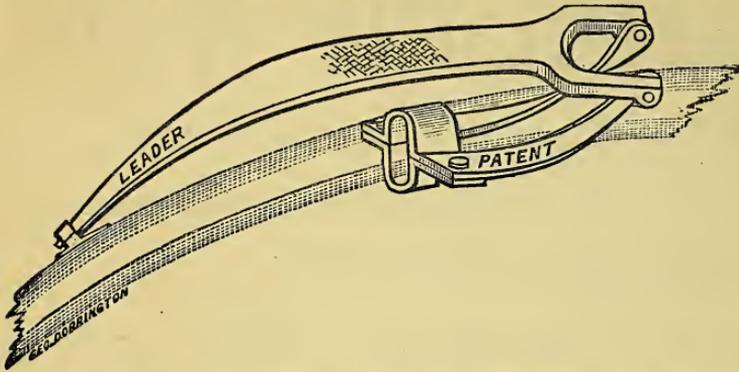
PUBLISHED BY

E. C. HODGES & Co.,
WATER STREET, BOSTON, MASS., U.S.A.

SUBSCRIPTION 8/4 per year, post paid.

The Cyclist and Bicycling World together 13/- at the office of
The Cyclist, 12, Smithford Street, Coventry.

PATENT 'LEADER' SPRING,



Acknowledged by all who have ridden it to be the easiest riding and easiest mounting Spring yet produced.

THE "LEADER,"

THE "LEADER,"

THE "LEADER,"

THE "LEADER,"

THE "LEADER,"

A perfect specimen of a perfect
BICYCLE

At a reasonable price.

With the patent Automatic Brake and Spring is the easiest and safest machine manufactured.

Price Lists free on application.

On easy terms of purchase.

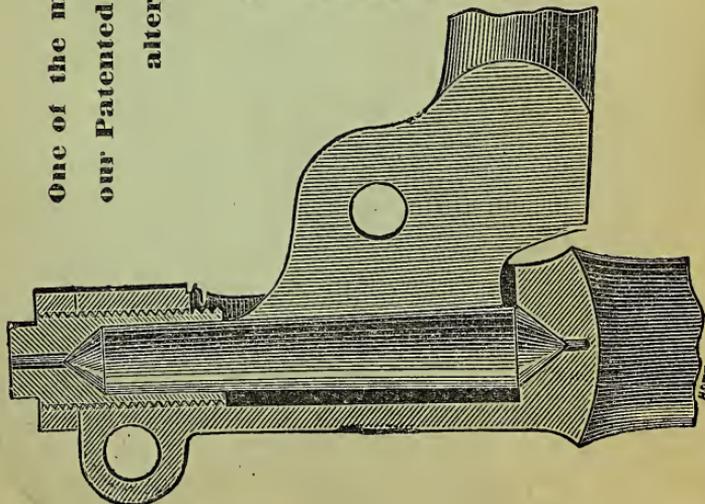
Agents wanted where none appointed.

G. WALLACE ASH & Co.,
"LEADER" BICYCLE & TRICYCLE WORKS,
OFFICE:-13, RUSSELL ST., SOUTHSEA, PORTSMOUTH.

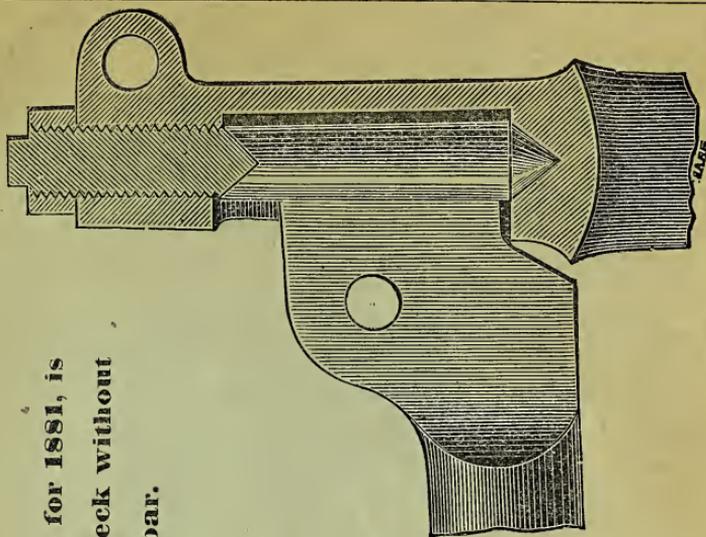
IMPROVED HEAD AND NECK AS USED TO S.H.F. "PREMIER."



One of the most important improvements for 1881, is our Patented method of lengthening the neck without altering the height of the handle bar.



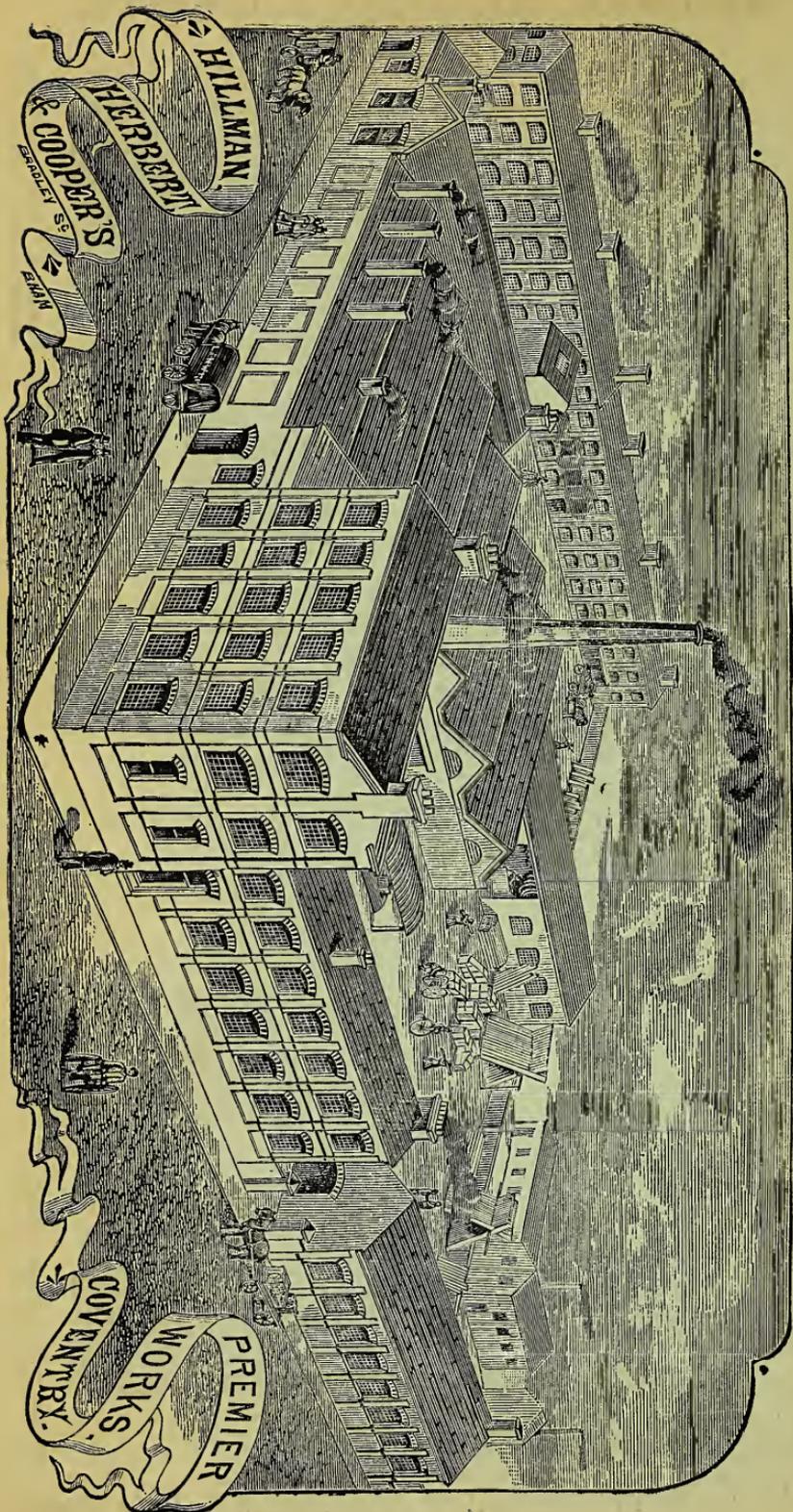
IMPROVED PATENT HEAD AND LENGTHENED NECK AS USED BY HILLMAN, HERBERT AND COOPER



OLD AND DEFECTIVE PLAN OF STANLEY HEAD AS USED BY OTHER MAKERS.

The illustrations herewith of the old and new method fully convey the defect of one and the value of the other. The shortness of the necks hitherto has been a continual source of annoyance to Bicycle riders, as the great strain must inevitably cause the centres to wear an oval shape, when proper adjustment becomes impossible, but in the new method this strain is entirely removed by the lengthened neck, which is allowed for by counterboring the top or adjusting centre for its reception. Rickety machines and broken set screws are therefore no longer connected with the use of the Stanley Head when fitted with this patent.

HILLMAN, HERBERT & COOPER,



HILLMAN
HERBERT

COOPER'S

PREMIER
WORKS.
COVENTRY, ENGLAND.

THE LATEST NOVELTIES!

The Sun & Planet Bicycle,

A full-speeded safety machine, with no perceptible increase of friction; on entirely new principles.

THE RAMBLER TRICYCLE,

The only chainless automatic double-driver. It can be taken through an ordinary doorway.

THE NOVELTY LAMP,

Which can be lighted in a high wind.

KIRBY & Co.,
 PATENTEES,
 WEST ORCHARD, COVENTRY.

THE 'OTTO.'

The "Otto" Bicycle

*Is safe, fast & comfortable.
 The only one suitable for Ladies.*

RIDING

Is easily and safely learnt in from one to three hours.

"The iron horse of the future."—*Society.*

"It is much safer than the ordinary bicycle, and unites the convenience of bicycle and tricycle without their inconvenience.—*A. W.*

"There is an absence of vibration, making riding a luxury."—*Col. S.*

"Of the ladies' machines the 'Otto' is fast gaining favour."—*Bell's Life.*

"A certain, and rapidly growing success."—*J. H.*

"We anticipate a prosperous career for this novel and practical cycle."—*Griffin's Bicycles for the Year 1881.*

Photographs, Prospectuses, and Testimonials may be had at the Offices & Riding Room,

118, Newgate St., LONDON.

THE

Handsworth Bicycles.

These Machines are among the best and cheapest in the market.

The No. 2, fitted with Bown's bearings to both wheels, weldless steel hollow forks & backbone, powerful lever brake, and other improvements, equipped ready for the road, price £11 11s., not surpassed by any machine at the price.

PRICES.

No. 1, £13 13s.; No. 2, £11 11s.;

No. 3, £8 8s.

THE

Handsworth Tricycle,

One of the lightest and easiest running Machines made,

Price, £12 0s. 0d.

GEORGE RILEY,
 Handsworth, Birmingham.

THE
GOLDEN RULES OF TRAINING,
By TRAINER,

Fourth Edition, Fifth Thousand. Post free, 4 Stamps.

See Reviews in "The Cyclist," "Cycling," "Athletic and
Bicycling World," &c.

THE
Complete Guide to Bicycling,
By HENRY STURMEY.

A FEW LEFT ONLY. PRICE, 14 STAMPS.

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TRICYCLISTS' INDISPENSABLE ANNUAL,
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A FEW LEFT. FREE, 16 STAMPS.

THE
I.M.P. DRESSING CASES.

Price List, Post Free.

H. A. JUDD, 101, QUEEN STREET, EXETER.

By Her Majesty's  Royal Letters Patent.

THE

CAROUCHE TRICYCLE

OR

CARRIAGE OF PLEASURE,

FOR LADIES, GENTLEMEN & JUVENILES;

PATENTEES AND MANUFACTURERS,

The 'Carouche' Tricycle Co.,

MUCH PARK STREET AND JORDAN WELL,

COVENTRY.

These Machines are unsurpassed for their
Elegance of Style, Workmanship, Finish, Ease & Comfort,
Requiring, as they do, but little exertion on the part of the rider
in their propulsion.

ILLUSTRATED CATALOGUES AND PRICE LISTS

Can be obtained gratis on application.

TO BICYCLISTS AND TRICYCLISTS.

Paint, Japan, & Nickel Plating Superseded.

THE MOST STARTLING NOVELTY OF THE AGE

IS

HARRINGTON'S ENAMEL!

Which far surpasses all hitherto-used processes for the preservation and beautifying of Metal Work, and is calculated to entirely supersede Nickel Plating, Japanning, Painting, and all kinds of Varnishes and Colourings in the coating and ornamentation of Bicycles and Tricycles.

It is far more durable and effective than anything yet invented, and
HAS A MOST EFFECTIVE APPEARANCE,
IS INTENSELY HARD.

WILL NOT CHIP, WEAR, OR SCRATCH OFF,
ENTIRELY PREVENTS RUST,

HAS A SMOOTH AND LUSTROUS SURFACE,

CAN BE DONE IN ANY COLOUR

OR COMBINATION OF COLOURS, IS

CHEAPER & MORE DURABLE THAN PLATING

IS MORE EFFECTIVE THAN PLATING,

CAN BE DONE IN A DAY,

AND WILL LAST FOR YEARS.

This wondrous invention can be applied to any Bicycle or Tricycle, and that too without taking to pieces, and will add pounds to the value of a machine in appearance alone, an entire Bicycle being covered for

25s.

*HAVE YOUR NEW MACHINE FOR THIS SEASON ENAMELLED!
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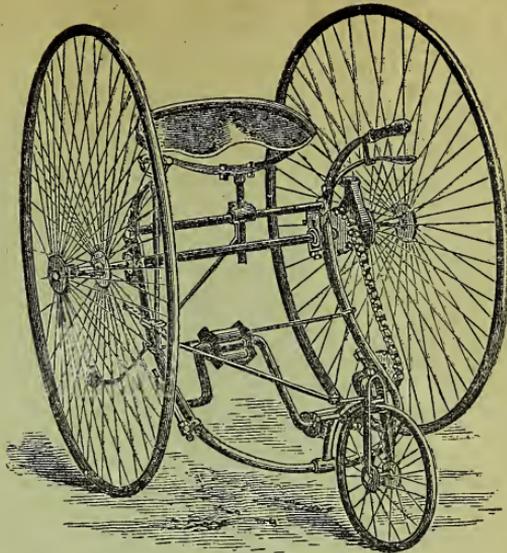
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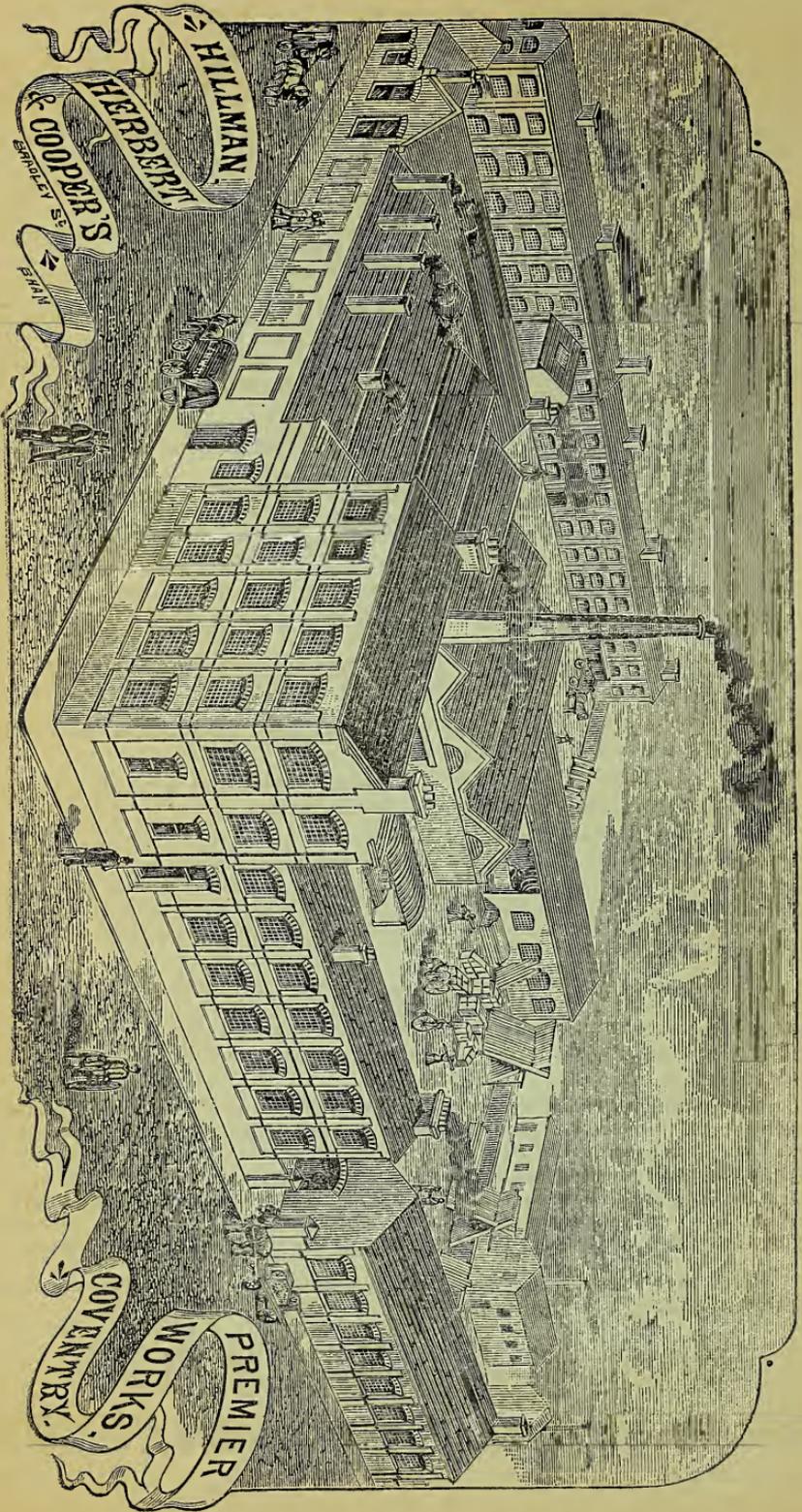
In the machine above represented, the exact proportion of power required (which varies with every movement of the guiding wheel) is imparted to each of the driving wheels. For example, when turning to the left, the right hand or outer wheel receives the larger proportion of power, and in turning to the right *vice versa*.

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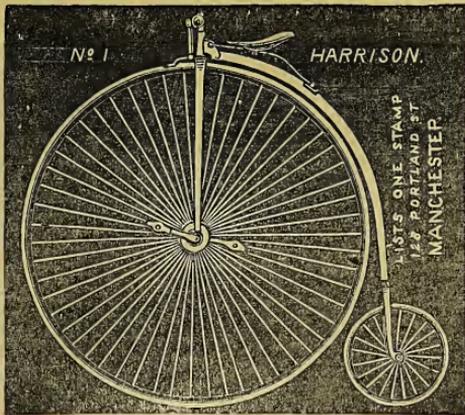
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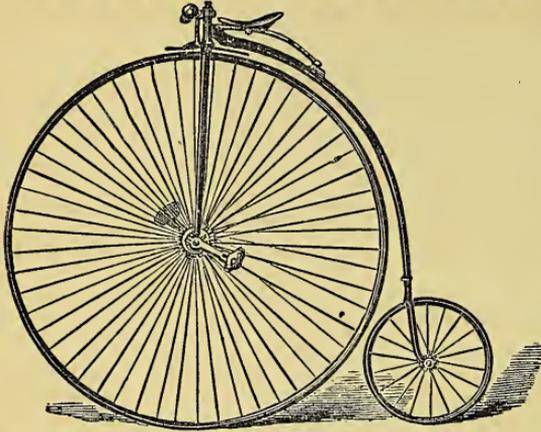
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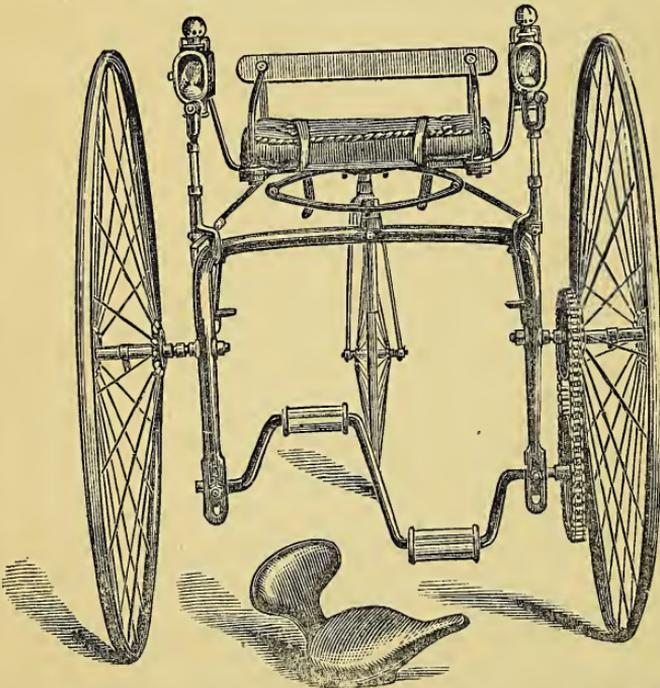
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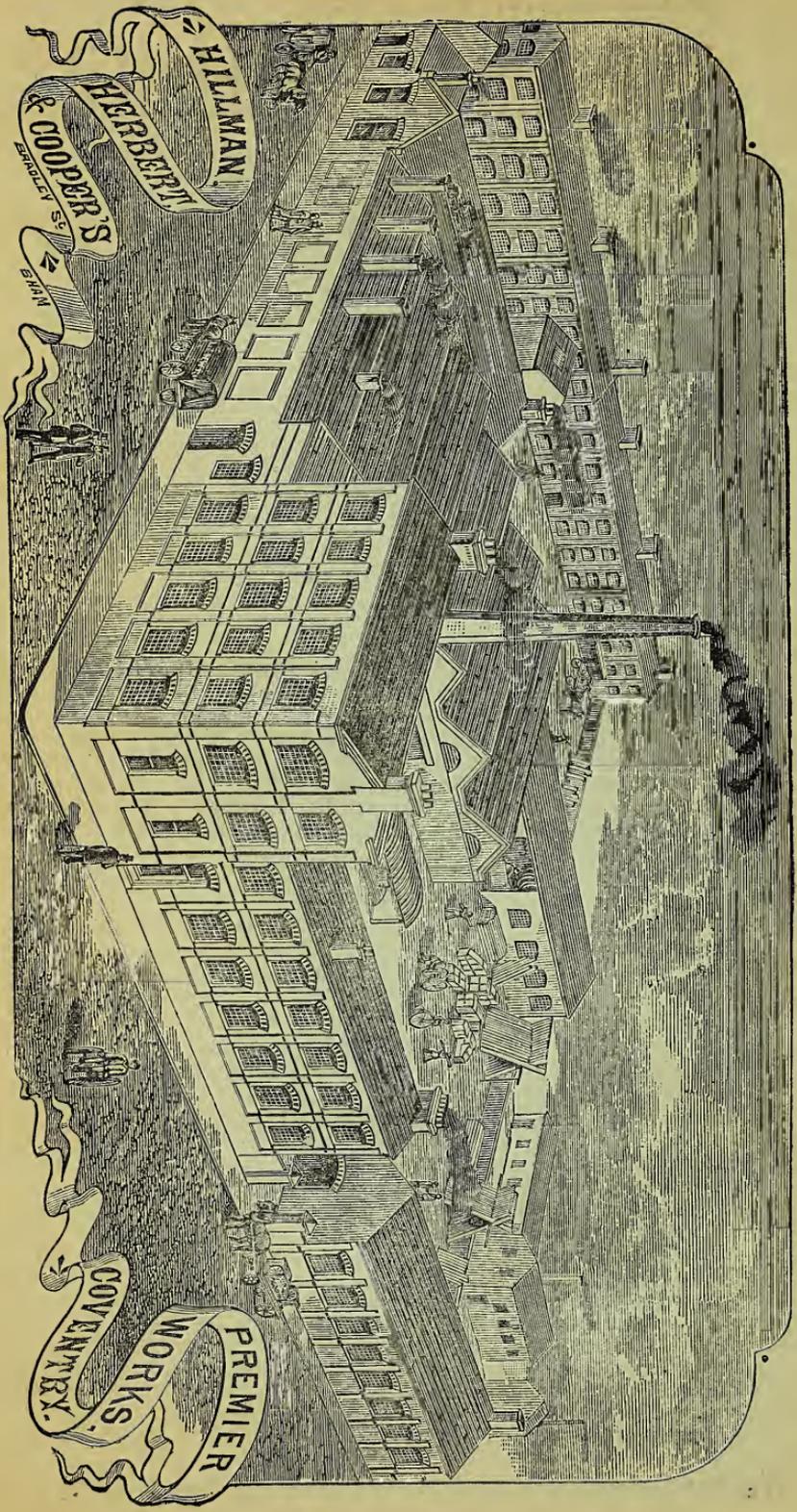
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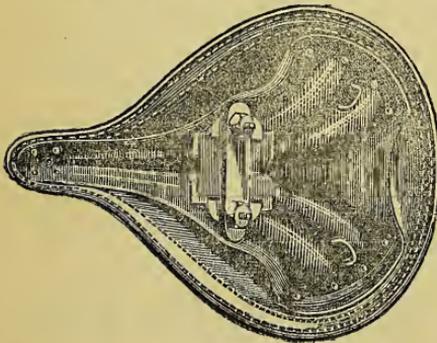
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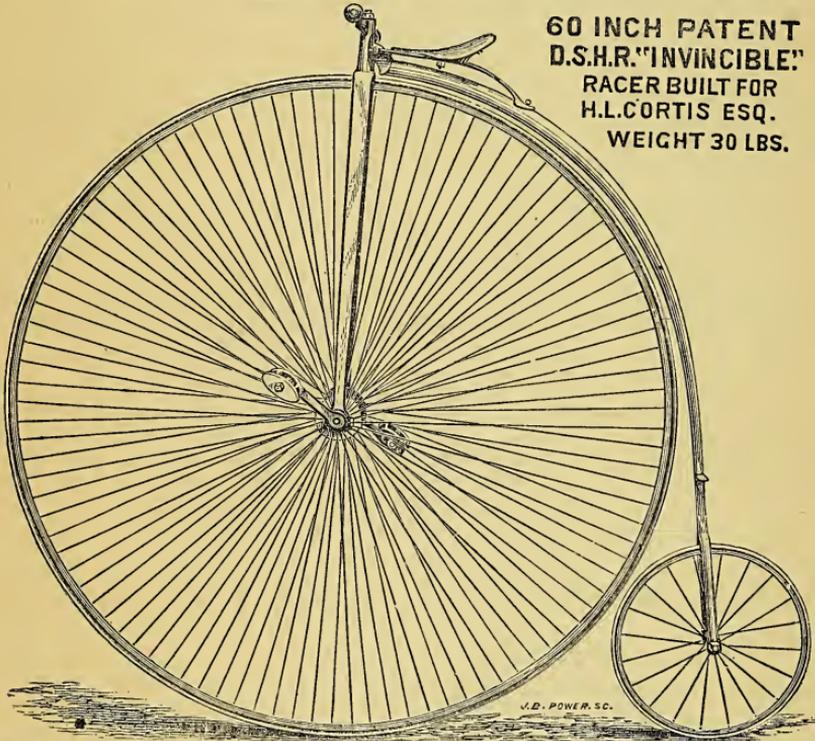


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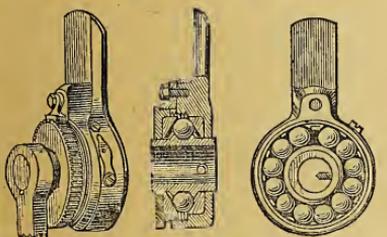
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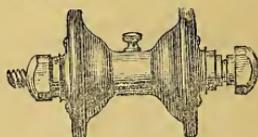
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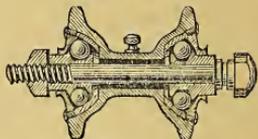
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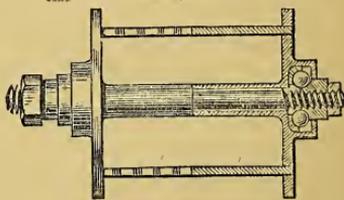
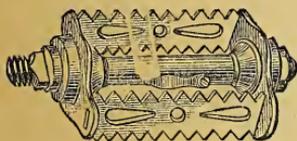


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