N° 17,909 A.D. 1901

*Date of Application, 7th Sept., 1901*

*Complete Specification Left, 9th June, 1902—Accepted, 24th July, 1902*

PROVISIONAL SPECIFICATION.

# Improvements in Breaks for the Wheels of Bicycles and other Velocipedes Motor Cars and other Road Vehicles.

I, ROLAND NORTON, of No. 11, Roland Grove, Roland Road, Handsworth, in the County of Stafford, Engineer, do hereby declare the nature of this invention to be as follows:—

This invention consists of the herein described improvements in breaks for the wheels of bicycles and other velocipedes motor cars and other road vehicles. My invention is particularly applicable as a rim break for the pneumatic tyred front wheel or for the back wheel of a safety bicycle or other velocipedes or for any other road travelling wheel and can also be arranged to act upon the pneumatic or other tyre of such wheel.

I will first describe my invention as arranged for acting on the rim of the front wheel of a bicycle.

In the majority of rim breaks as at present made the indiarubber or other break blocks are arranged to move in an outward direction from the wheel centre so that the application of the break to the rim tends to distort the wheel and force the rim from the spokes. I arrange my break in a different manner so that the break blocks act against the sides of the rim gripping the rim between them thereby obtaining a very effective break and tending to true up the wheel and not to break the rim from the spokes. Moreover, the parts of my break are so arranged that a very effective grip is obtained by the break blocks on the wheel rim with a very slight pressure on the break lever. Also the break blocks can readily be adjusted to the rim so as to wear evenly or nearly evenly throughout.

In carrying out my invention I provide two short lever grips which turn on stationary fulcrum pins situated between the wheel rim and the front fork sides these fulcrum pins being carried by suitable clip brackets or the like or by other suitable means from the front fork sides. One arm of each of the lever grips projects outwardly from the fulcrum pin and to these two arms are jointed the ends of a stirrup piece which embraces the wheel rim and tyre and has connected to its upper end a pull rod which is connected to the hand lever by which the break is applied. The parts of the lever grips which carry the break blocks project upwardly above the fulcrum pins so that the two break blocks are situated at the sides of the rim. The act of applying the break raises the pull rod and the stirrup and the lever grips are turned slightly so that the break blocks which really form a pair of jaws grip the wheel rim between them and the friction set up forms the break. The attachments which carry the break blocks are fixed to the lever grips by screws or the like so that the angle of the faces of the break blocks relatively to the wheel rim can be adjusted to suit and properly fit against the wheel rim. It will be seen that when the break is applied the pressure of the break blocks on the rim tends to crush the sides of the rim together but has no tendency to force the rim outwardly from the spokes.

My invention is similarly applied as a rim break to the back wheel of a safety bicycle or to any other road travelling wheel of any other velocipede motor car or other road vehicle and can also be similarly arranged to act upon the tyre of the said wheel the two break blocks acting against the sides of the tyre and gripping the tyre between them instead of as in an ordinary tyre break rubbing on the periphery or tread of the tyre which runs along the ground.

[*Price* 8*d*.]

Instead of employing the stirrup to connect the ends of the two levers with the pull rod I may employ two links for the same purpose these links being jointed respectively to the ends of the levers and to ears on the end of the pull rod.

Dated this 6th day of September 1901,

CHARLES BOSWORTH KETLEY,
Agent for the Applicant.

## COMPLETE SPECIFICATION.

### Improvements in Brakes for the Wheels of Bicycles and other Velocipedes Motor Cars and other Road Vehicles.

I, ROLAND NORTON, of No. 11, Roland Grove, Roland Road, Handsworth, in the County of Stafford, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to brakes for cycles and the like purposes more especially of the kind usually known as "rim brakes," that is, brakes by which the retarding force is applied at the rim of the cycle or vehicle wheel. Now in brakes of this kind the force is usually applied to the rim in an approximately radial direction outwardly from the centre or hub of the wheel, resulting in a straining of the spoke connections and distortion of the rim.

The object of the present invention is to enable a considerable retarding force to be transmitted to the wheel rim on a comparatively light force being applied to the operating lever, and further, to apply such force to the rim in such a manner as to obviate straining of the spoke connections and distortion of the rim.

The invention consists in causing the retarding force to be applied approximately transversely to the wheel rim instead of radially and accomplishing this result by suitably pivoting small bell-crank levers on the cycle or other frame adjacent to the rim of the wheel to be braked, such levers being provided with brake pads on the arms nearest the wheel rim and connected at the ends of the outer arms by a forked or other usual connection to the brake rod or wire, a pull on which is adapted to cause the levers to oscillate about their pivots and apply the pads to the rim in an approximately transverse direction, thereby firmly nipping or squeezing the same transversely and causing an effective retardation without any tendency to distort the rim from its true circular form. The levers may be returned after application by spring power applied directly to the levers or to the brake rod or wire or otherwise as desired.

In the acompanying drawing.

Figures 1 and 2 illustrate the application of one form of the invention to the front wheel of a cycle, the views being front elevations with the brake off and on respectively.

Figure 2ª is a detail view hereinafter referred to.

Figure 3 is a detail view showing a convenient form of operating lever.

Figures 4 and 5 illustrate the application of one form of the invention to the back wheel of a bicycle, the views being a side elevation and reverse plan respectively.

In carrying out the invention in one convenient manner as applied to the front wheel of a cycle and as illustrated in Figures 1 to 3, a pair of bell-crank levers *a*, *a* are pivoted to suitable clamps *b*, *b*, adapted to be secured to the front fork of the cycle adjacent to and one on each side of the wheel rim. The inner

arms of the levers are provided with brake pads *c*, *c* of usual form whilst the outer arms are connected by a fork *d*, *d* of any ordinary kind to the brake rod or wire *e* which is secured to the hand operating lever *f*. The pads are preferably carried by attachments which are secured to the levers *a* by screws as shewn so that the angle of the faces of the pads to the rim can be adjusted to suit and properly fit against the same. It is preferable that the lever *f* should be pivoted in such a manner as shown in Figure 3 that a downward motion of the lever results in an upward pull of the brake rod *e*. On such an upward pull being applied to the rod *e* the levers *a*, *a* are oscillated about their pivots $a^1$ $a^1$ their pads moving in arcs about said pivots and being applied to the rim in approximately transverse and opposing directions thereby nipping or squeezing the rim and effectively retarding the same without any tendency to outward radial distortion. By suitably arranging the positions of the pivots $a^1$ and the lengths and disposition of the lever arms, the pads need only require a small movement to be applied and the direction of application can be approximated as near as possible transversely to the rim.

By applying the force through the medium of the outer arms of the bell crank levers suitably disposed and proportioned, only a comparatively light pull on the rod *e* is required to effectively retard the wheel. The pads and levers may be withdrawn from the rim by springs *g g* (see Figure 2[a]) or a single spring may be coiled about the rod *e* or applied at the hand lever *f* as desired. In place of return springs the elasticity of the fork *d* may be relied on to effect a return of the levers *a*.

In applying the brake to the back wheel of a bicycle the levers *a a* are arranged in a similar manner to that just described, the clamps *b*, *b*, being secured to the lower fork members of the machine frame as shown in Figures 4 and 5. The brake rod or wire *e* in this case is preferably made in segments *e*, $e^1$, $e^2$, linked to small bell-crank levers $e^3$ $e^4$ disposed at convenient portions of the frame.

In place of the forked connection between the levers and the brake rod or wire, two separate links may be employed, the links being jointed respectively to the ends of the levers and to ears on the end of the rod.

The improved brake may be applied to the wheel or wheels of a motor car or other vehicle wheel and can also be arranged to act upon the tyre of the wheel, the two brake pads acting against the sides of the tyre and gripping the tyre between them instead of as in an ordinary tyre brake rubbing on the periphery or tread of the tyre.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is

1.—A brake for cycle wheels and the like in which the brake pads or blocks are carried upon the inner ends of bell-crank levers which are pivoted adjacent to the wheel rim and operated to cause the pads to grip or squeeze the rim or tyre approximately transversely substantially in the manner and for the purposes hereinbefore described.

2.—An improved brake for cycles and like purposes constructed and operated substantially as hereinbefore described and illustrated in the accompanying drawings.

Dated this 7th day of June 1902.

MARKS & CLERK
18, Southampton Buildings, London, W.C.
13, Temple Street, Birmingham, and 30, Cross Street, Manchester,
Agents.

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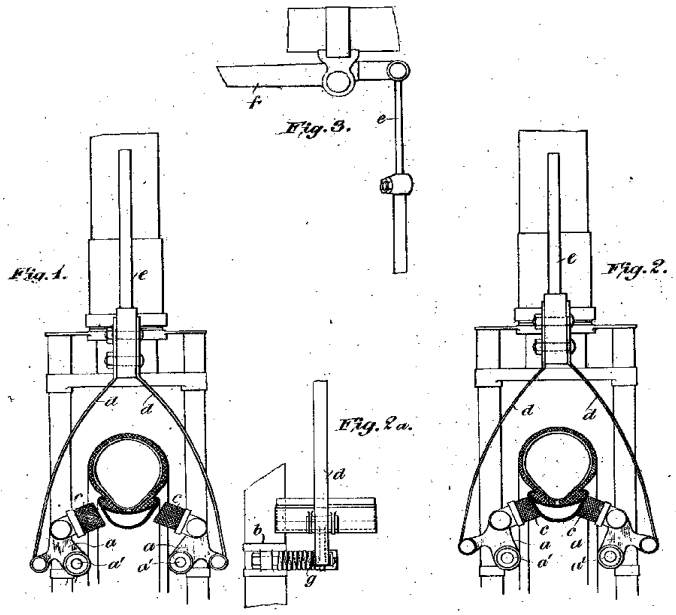
NORTON'S Complete Specification.

SHEET 1.

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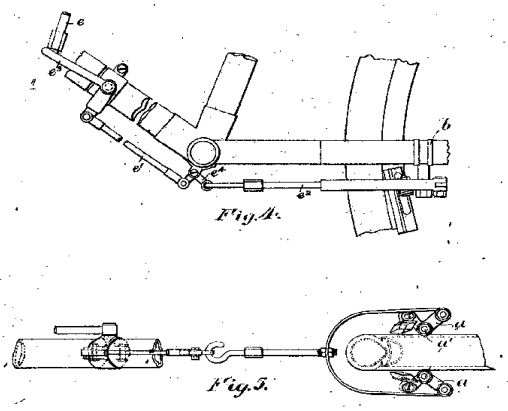





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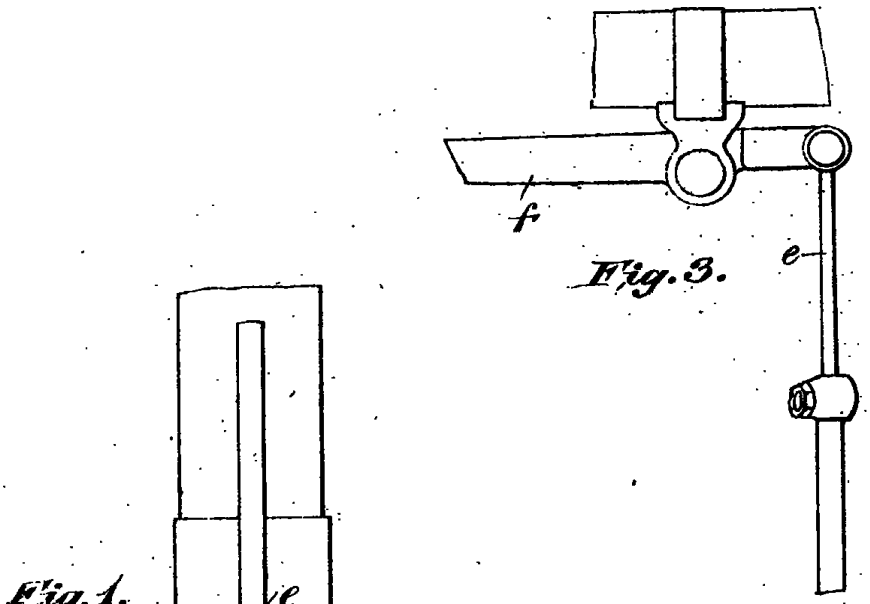
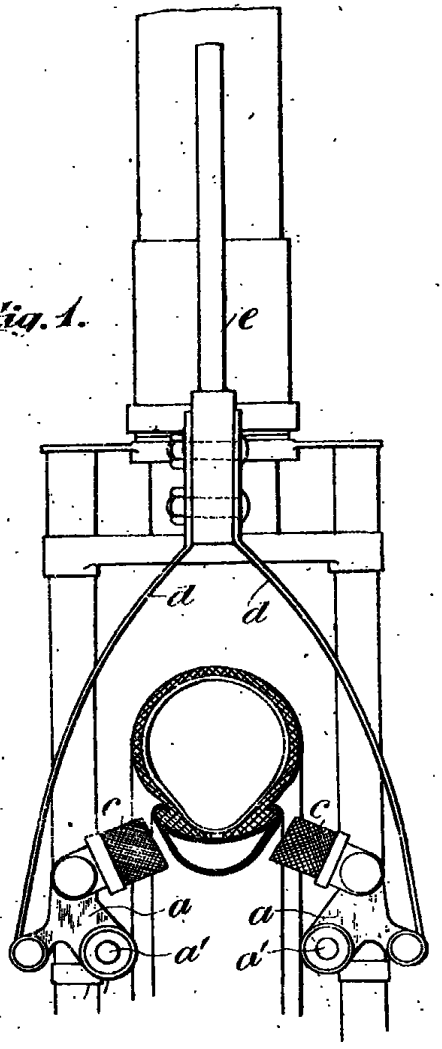



Fig. 3.

Fig. 1.



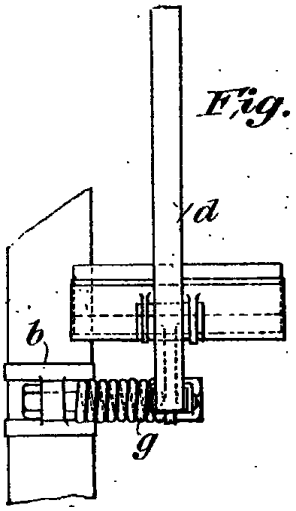
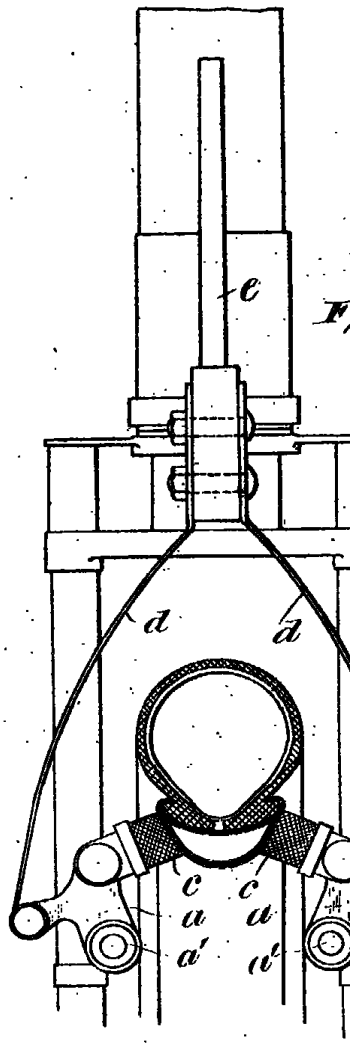




Fig. 2a.



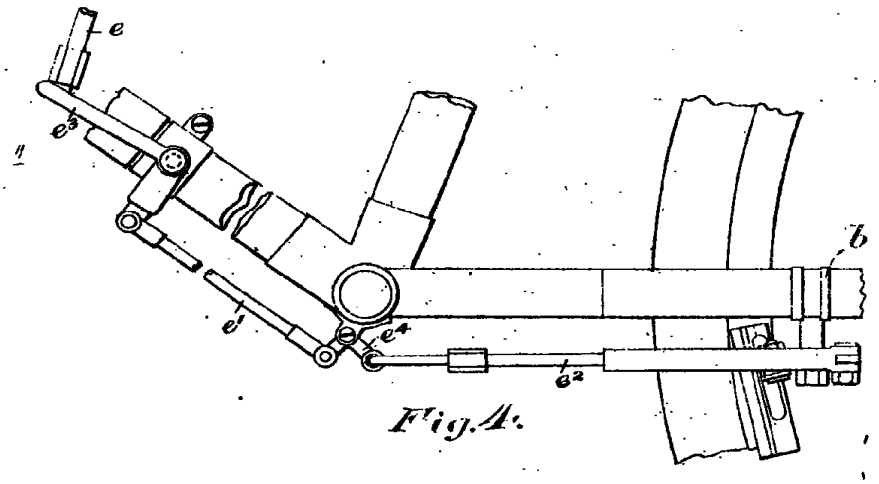



Fig. 4.

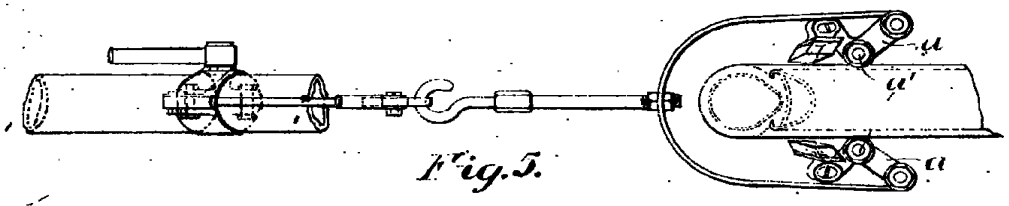



Fig. 5.

Fig. 2.

[This Drawing is a reproduction of the Original on a reduced scale.]

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