

No. 646,304.

Patented Mar. 27, 1900.

A. P. MORROW.
BACK PEDALING BRAKE.

(Application filed Sept. 19, 1899.)

(No Model.)

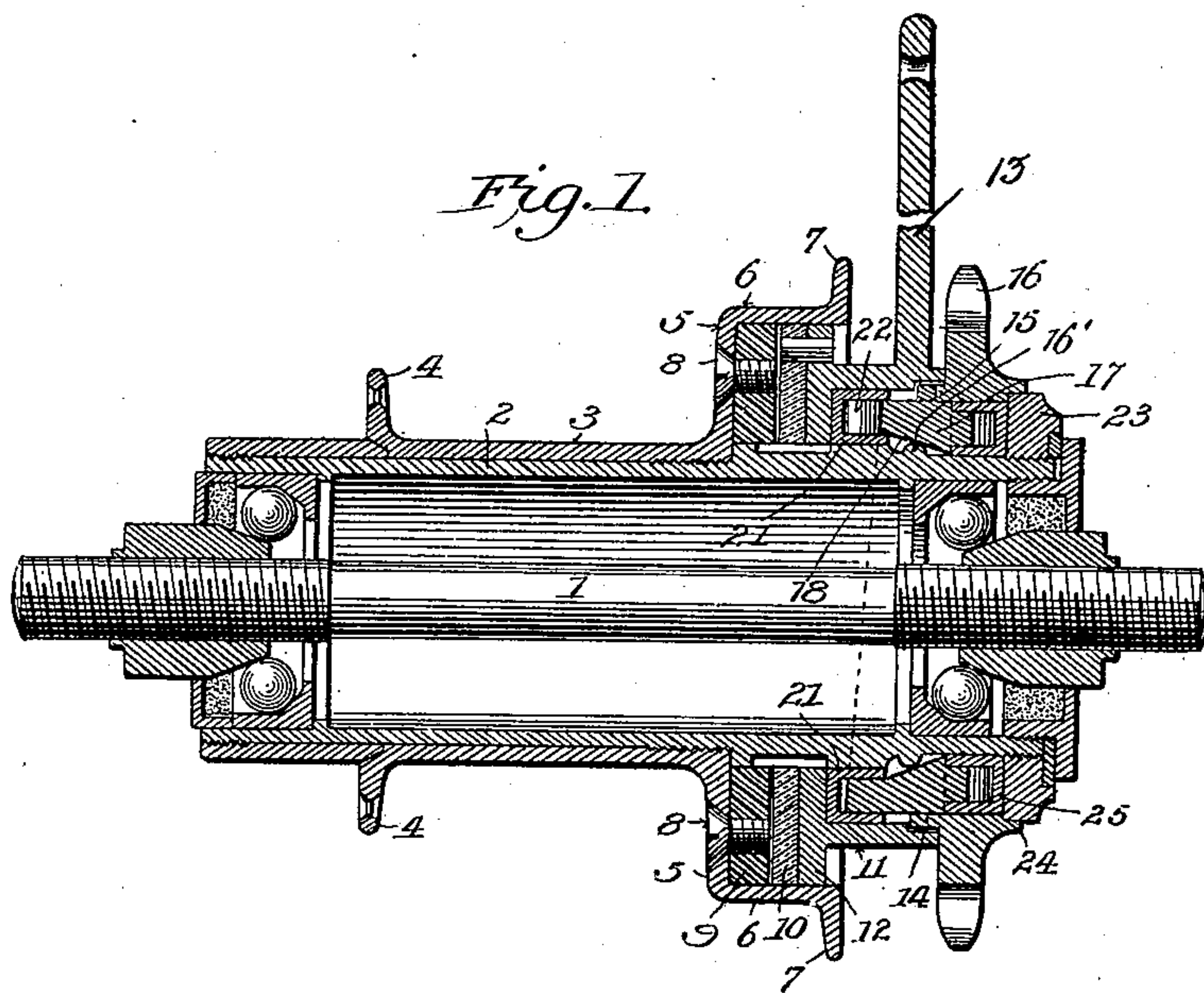
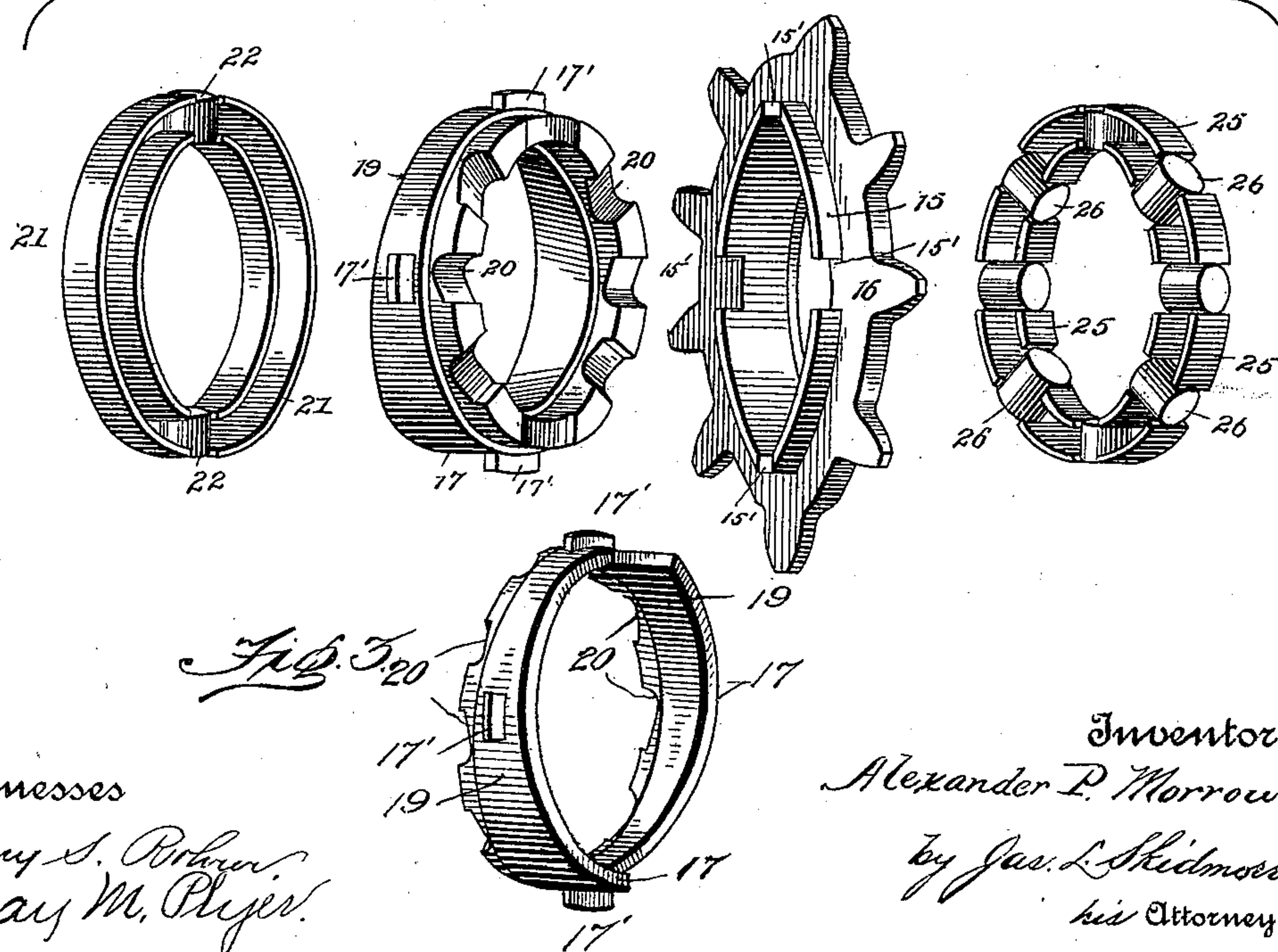


Fig. 2.



Witnesses

Harry S. Rohrer.
May M. Plyer.

Inventor

Alexander P. Morrow

by Jas. L. Skidmore
his Attorney.

UNITED STATES PATENT OFFICE.

ALEXANDER PATTERSON MORROW, OF ELMIRA, NEW YORK.

BACK-PEDALING BRAKE.

SPECIFICATION forming part of Letters Patent No. 646,304, dated March 27, 1900.

Application filed September 19, 1899. Serial No. 730,986. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER PATTERSON MORROW, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Braking and Coasting Mechanism for Bicycles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to bicycles, and more particularly to coasting and braking mechanism controlled by the feet of the rider.

The object of the invention is to provide improved mechanism whereby the sprocket-wheel on the rear hub is firmly locked to the hub during the forward revolution of the sprocket to drive the wheel, automatically released or unlocked from the hub when the motion of the sprocket is stopped, thus permitting the pedals and sprocket-wheel to remain stationary and the hub to revolve as in coasting, and caused to apply a brake when moved backward, as by back-pedaling.

The construction and novel features of the invention will be fully described hereinafter, and defined in the appended claims, in connection with the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a central longitudinal section of a bicycle-hub with my improvements applied thereto. Fig. 2 is a detail view showing parts of the mechanism in perspective and arranged to their relative positions when assembled. Fig. 3 is a view in perspective of the brake-ring, showing the cam-surfaces on the rear face thereof.

The reference-numeral 1 designates the rear axle of a bicycle, and 2 the hub thereof, provided with the usual or any suitable ball-bearings. Upon the hub 2 is firmly secured, by screw-threads or other means, a sleeve 3, formed at one end with a spoke-flange 4 and at its opposite end with a brake-flange comprising the vertical wall 5, the horizontal rim

6, and an annular vertical spoke-flange 7. If preferred, the brake-flange may be formed integral with the hub instead of employing the sleeve 3. To the inner surface of the wall 5 is secured, by screws 8 or other means, a fiber ring 9, which constitutes an annular brake-surface, against which a brake-shoe, carrying a friction-ring 10, is adapted to bear. This brake-shoe consists of an annular band 11, having an annular vertical flange 12, to which the ring 10 is secured, and an integral arm 13, adapted to be secured to the frame of the machine to hold the brake-shoe against rotation, but permitting a limited lateral movement thereof. The inner surface of the outer end of the band 11 is annularly recessed, as at 14, to adapt it to overlap an annular flange 15, projecting from the sprocket-wheel 16.

The hub 2 is formed with an integral annular rib or boss 16', adapted to cooperate frictionally with a brake-ring 17, which surrounds the hub and is beveled on its inner surface 18. The inner edge of the brake-ring 17 is formed with two cam-surfaces 19, while its outer edge is formed with a series of beveled surfaces or teeth 20, and the periphery of said brake-ring 17 is provided with projection 17', adapted to fit in the cut-out portions or apertures 15', formed in the annular flange 15 of the sprocket-wheel. Between the inner edge of the ring 17 and the outer surface of the flange 12 of the brake-flange are interposed two or more segmental boxes or guides 21, of rectangular form in cross-section and open at their outer sides. Between the ends of these boxes are interposed loose rollers 22 for a purpose hereinafter explained.

23 designates a retaining-ring internally threaded to fit upon the thread end of the hub to retain the sprocket-wheel in position, said sprocket-wheel having an outer annular flange 24, overlapping the peripheral edge of the ring 23.

Between the toothed outside of the brake-ring 17 and the retaining-ring 23 are interposed the mechanism for clutching the sprocket-wheel to the hub, comprising a series of short segmental boxes 25, open at their outer sides, and a series of rollers 26, interposed between the ends of the boxes.

The operation of the mechanism as thus described is as follows: While the machine is being driven forward the teeth 20 on the outer side of the brake-ring ride up over the rollers 26, which forces the brake-ring 17 slightly to the left, causing it to bind tightly upon the boss 16 of the hub, thus locking the brake-ring and sprocket to the hub, so that they revolve together. When it is desired to coast, the motion of the pedals is stopped, thus stopping the revolution of the sprocket and brake-ring and causing the teeth 20 of the latter to recede from their contact with the rollers and drop behind said rollers into the grooves or spaces within the guides or boxes 25. This movement releases the brake-ring from its frictional engagement with the boss 16 and permits the hub and axle to revolve freely within the sprocket and brake-ring, while the pedals and sprocket are held stationary. To brake the machine, it is only necessary for the rider to back-pedal, which causes the cam-faces or cones 19 on the inner surface to ride up slightly out of the boxes, within which they normally extend, over the rollers 22, thus exerting lateral pressure against the flange 12 of the brake-shoe and forcing its friction-ring 10 into frictional contact with the fiber ring 9 on the brake-flange of the hub to effect the braking action. It will be apparent that as soon as the back pressure is relieved the cam-surfaces 19 will drop back into the boxes behind the rollers 22, thus freeing the brake, and that as soon as forward pedaling is resumed the brake-ring will again bind upon the boss 16 through the clutch devices on the outer side of the brake-ring.

I make no broad claim in this application to the hub having an annular overhanging brake-flange and a sleeve securely fastened to the body portion of the hub and projecting beyond the flange for the reason that said hub forms the subject-matter of another application for patent now pending, filed by me under date of December 26, 1899, Serial No. 741,633.

I claim—

1. The combination with the rear hub of a bicycle provided with an annular projection, of a combined coasting and braking mechanism, comprising a brake-ring cooperating with said annular projection on the hub; a brake-flange on the hub; a non-rotatable but laterally-movable brake-shoe encircling the hub; a sprocket-wheel loosely mounted on the hub; segmental boxes or guides and rollers located on opposite sides of the brake-ring; cam-surfaces on either side of the brake-ring for engaging said roller, means for causing the brake-ring and sprocket to move in unison, and means for taking the right-hand thrust.

2. The combination with the rear hub of a bicycle, formed with a brake-flange and an annular rib or boss, of a combined coasting

and braking mechanism comprising an internally-beveled brake-ring formed with teeth on either side thereof; a non-rotatable but laterally-movable brake-shoe; a sprocket-wheel loosely mounted on the hub, a retaining-ring, and clutch mechanism between the brake-ring and brake-shoe, and between the brake-ring and retaining-ring consisting of segmental boxes or guides and rollers interposed between the ends of the boxes or guides.

3. The combination with the rear hub of a bicycle, provided with a brake-flange, and an annular rib or projection, of a combined coasting and braking mechanism, comprising an internally-beveled brake-ring formed on both its inner and outer faces with inclined teeth or cam-surfaces, the cams on the inner and outer surfaces being of unequal length; a non-rotatable brake-shoe encircling the hub and adapted to move laterally; a sprocket-wheel; means for connecting said sprocket and brake-ring; clutch mechanism on opposite sides of the brake-ring consisting of segmental boxes or guides and rollers interposed between the ends of the boxes, and means for retaining the parts in their relative operative position.

4. The combination with the rear hub of a bicycle provided with an annular brake-flange, and an annular friction rib or boss, of a combined coasting and braking mechanism comprising a brake-ring beveled to cooperate with said boss, and formed on its inner side with a plurality of cams, and on its outer side with a series of teeth; a non-rotatable brake-shoe having a vertical annular flange loosely mounted on the hub, adapted to move laterally; a sprocket-wheel and a retaining-ring therefor; means for connecting the sprocket and brake-ring so as to cause them to move in unison; clutch mechanism between the brake-ring and brake-shoe flange and between the brake-ring and retaining-ring, consisting of segmental guides into which the cams and teeth of the brake-ring extend, and rollers between the guides.

5. A bicycle-hub comprising a horizontal hollow body portion, an annular flange projecting vertically and laterally from one end of the body portion, and a sleeve securely fastened to said body portion, one end of said sleeve extending beyond the said annular flange, and provided with an annular bead or projection, in combination with braking mechanism adapted to frictionally engage said flange, driving mechanism cooperating with said annular bead or projection, and means for retaining the parts in proper relative position on the hub.

6. A bicycle-hub comprising a horizontal hollow body portion, an annular flange projecting vertically and laterally from one end of the body portion, and a sleeve securely fastened to said body portion, said sleeve extending beyond the said annular flange.

7. A bicycle-hub comprising a horizontal

hollow body portion, an annular flange projecting vertically and laterally from one end of the body portion, a sleeve securely fastened to said body portion, one end of the sleeve
5 extending beyond the said annular flange, said sleeve being provided with a projecting surface.

In testimony whereof I affix my signature in presence of two witnesses.

ALEXANDER PATTERSON MORROW.

Witnesses:

O. P. HIPPLE,
A. D. LONG.