No. 860,234. PATENTED JULY 16, 1907.

P. P. O'HORO.

COASTER BRAKE.

APPLICATION FILED JULY 9, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

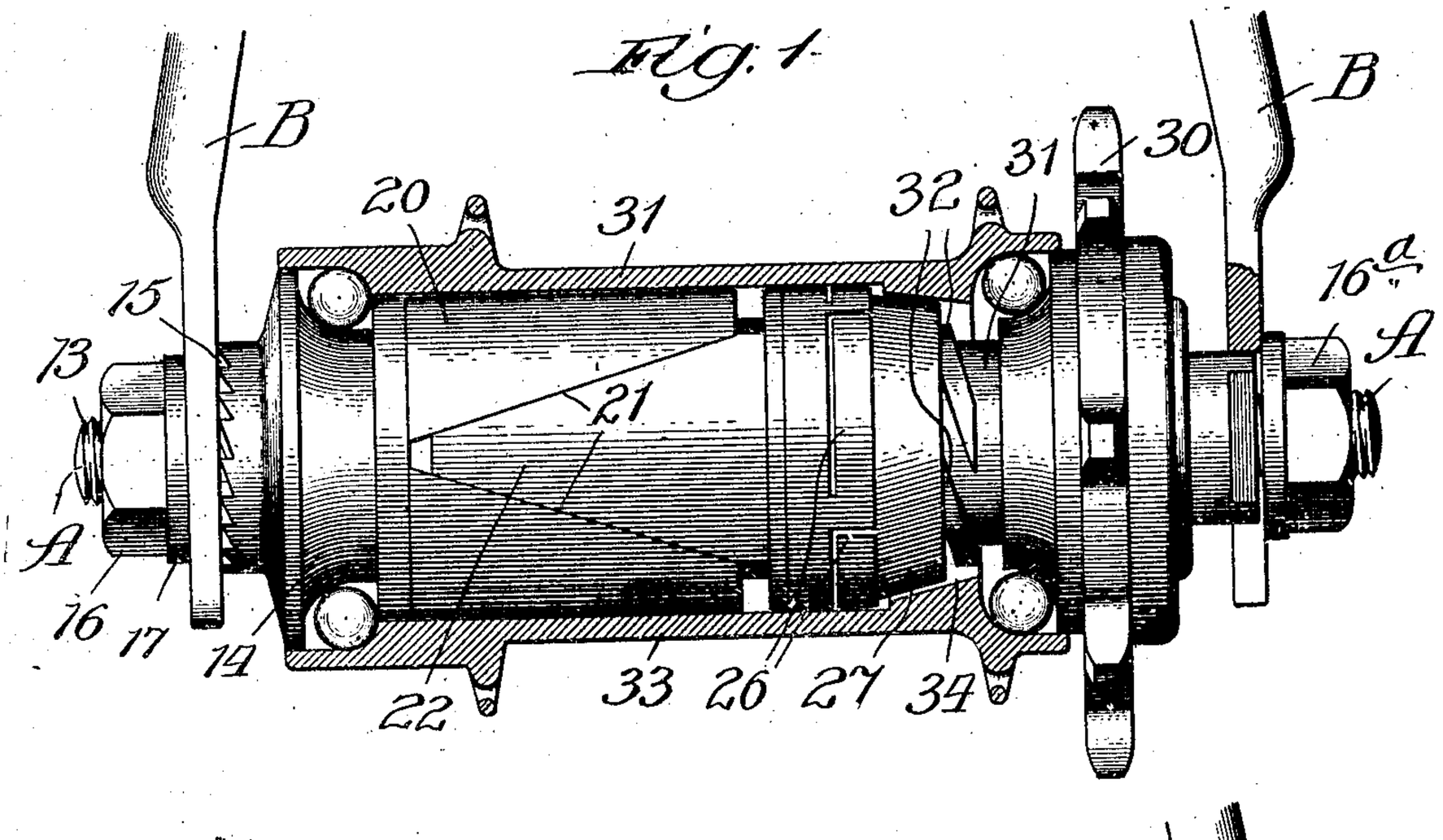
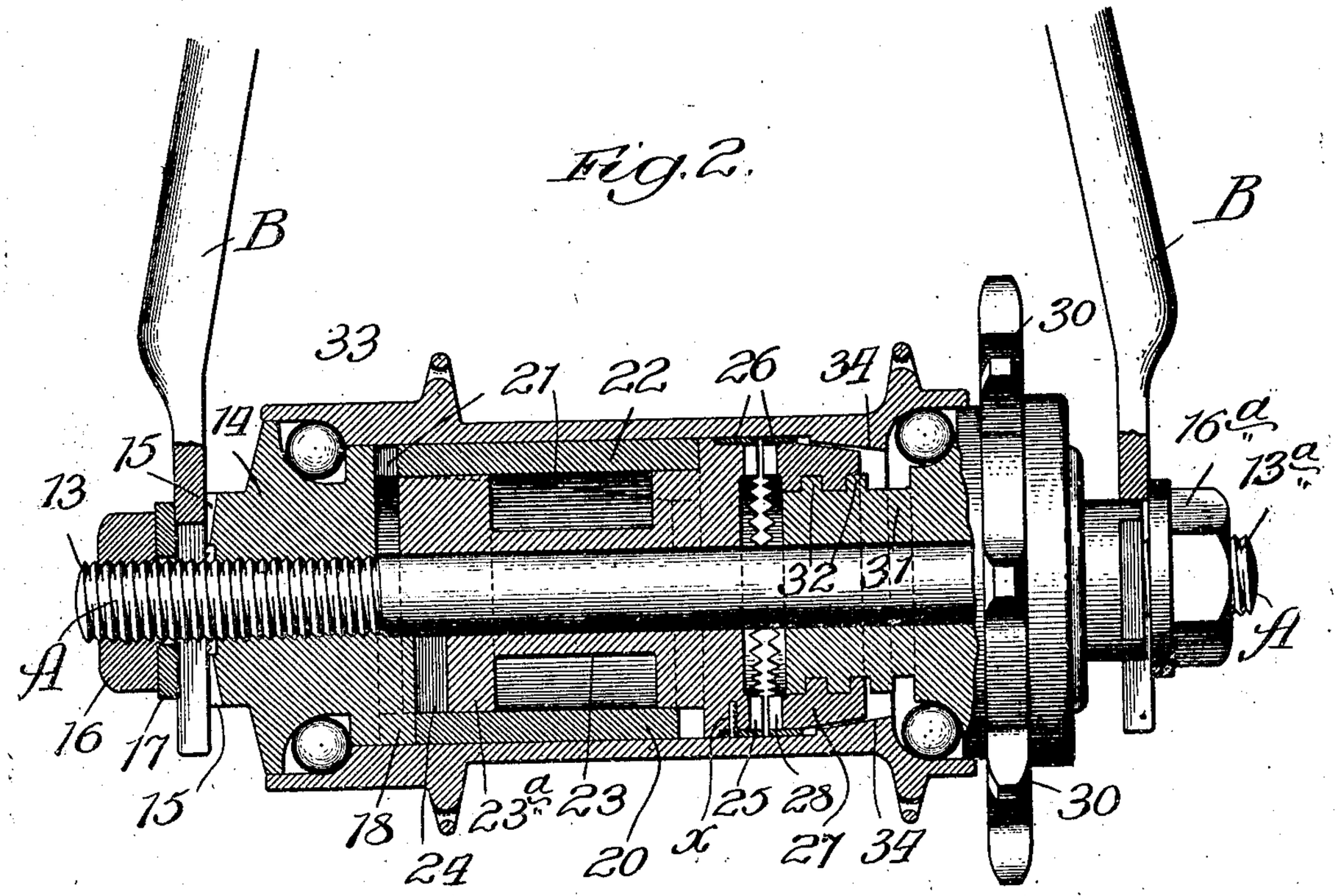


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

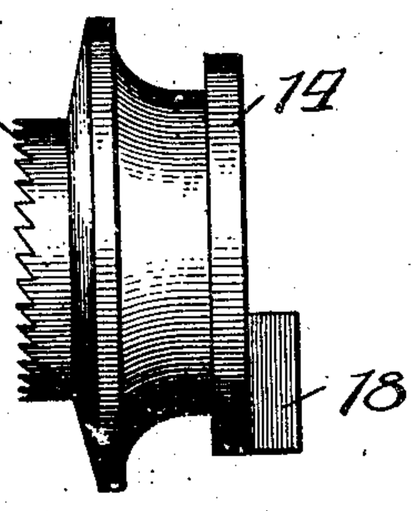


Fig. 4.

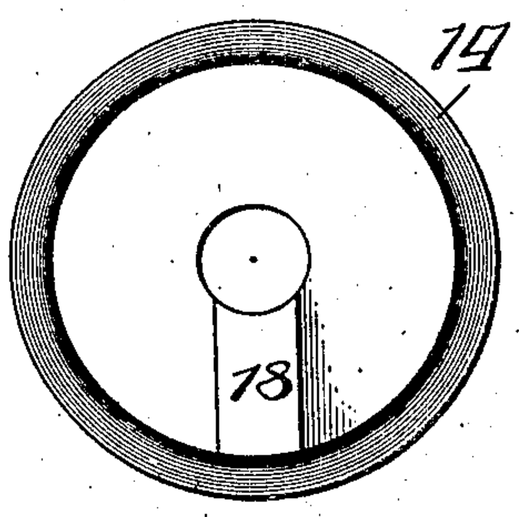


Fig. 5.

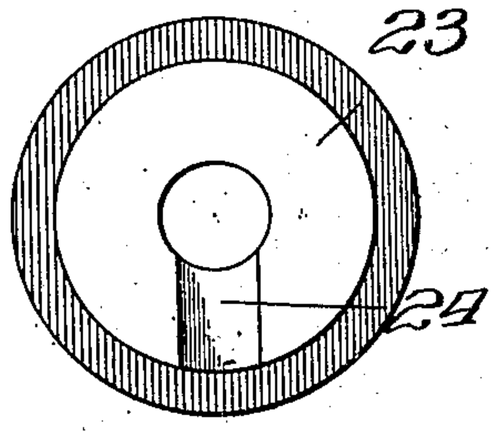


Fig. 6.

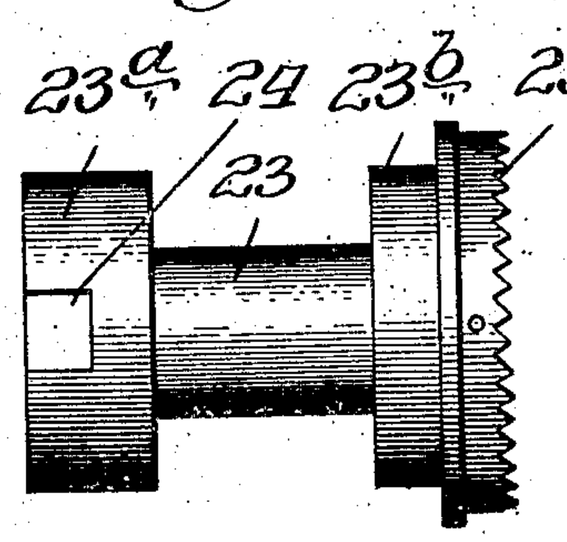


Fig. 7.

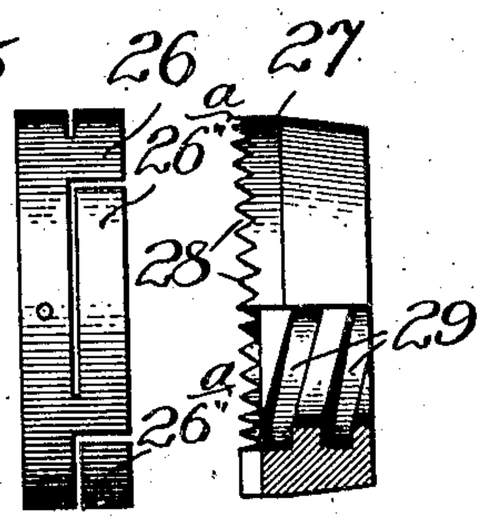


Fig. 8.

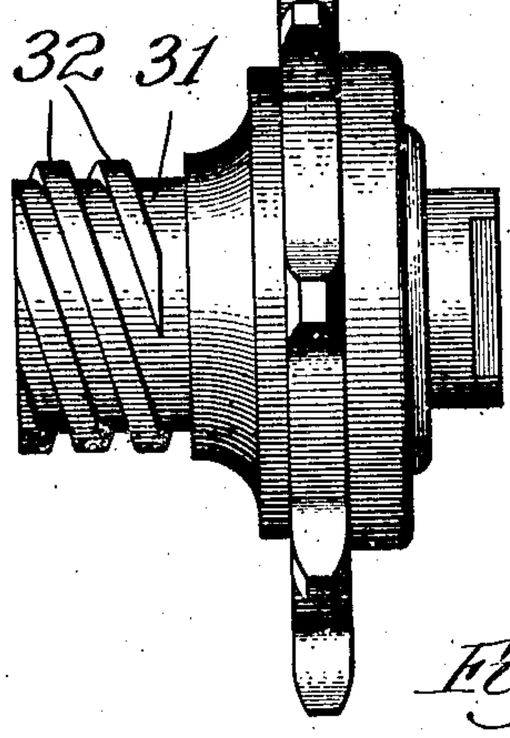


Fig. 9.

Fig. 10.

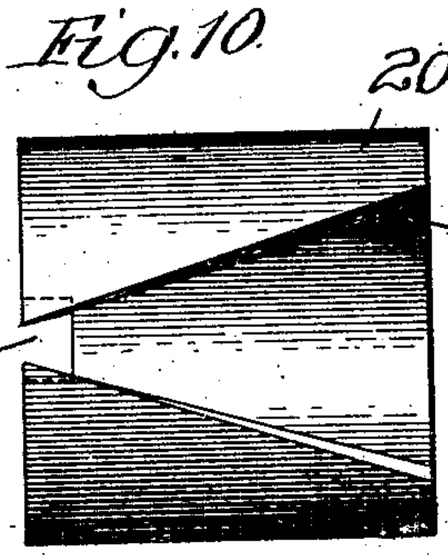


Fig. 11.

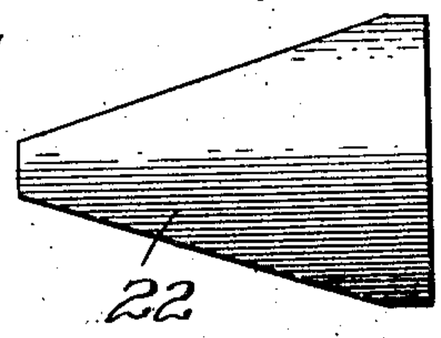
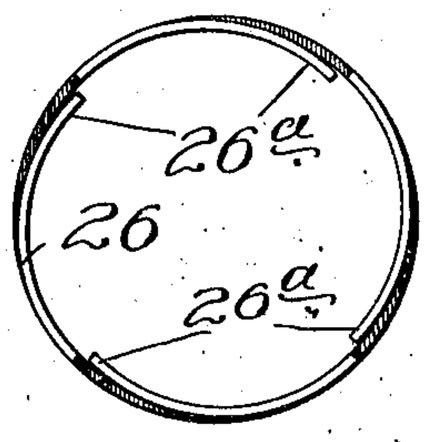


Fig. 12.



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UNITED STATES PATENT OFFICE.

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COASTER-BRAKE.

No. 860,234. Specification of Letters Patent. Patented July 16, 1907.

Application filed July 9, 1906. Serial No. 325,279.

REISSUED

To all whom it may concern:

Be it known that I, PETER P. O'HORO, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Coaster-Brakes, of which the following is a specification.

My invention relates to an improvement in the class of coaster-brakes in which the braking effect, induced by back-pedaling, produces a wedging action against an expansible spring-sleeve on the axle inside the hub of the rear wheel, to expand said sleeve against the inner surface of the hub and thus bind it to the stationary axle.

The primary object of my invention is to incorporate the braking principle thus outlined in a greatly simplified construction of coaster-brake, involving comparatively few parts and materially reduced weight and dimensions of the device, with further important advantages of reduction in cost of manufacture and durability in the matters of keeping in working order and wear.

Referring to the accompanying drawings—Figure 1 shows my improved coaster-brake, mounted in its bearings, by a plan sectional view, with the braking mechanism inside the cylindrical hub in elevation. Fig. 2 is a similar view showing the hub and the braking mechanism coöperating with it, as well as other parts, in section, the parts in this figure, as well as those in the preceding figure, being shown in the relative positions they occupy for coasting. Fig. 3 is a view in side elevation of a ball-race ratcheted interlocking collar; Fig. 4, an inner face view of the same. Fig. 5 is an end view of a ratcheted spool adapted to loosely surround the stationary rear shaft and to be held against rotation by engagement with the aforesaid collar, while having a limited longitudinal movement; Fig. 6, a view of the same in side elevation. Fig. 7 is a view in elevation of a spring band to surround the ratcheted end of the spool upon which it is fastened. Fig. 8 is a view in broken sectional elevation of the externally tapering and internally threaded ratchet-faced collar for binding the hub to the sprocket for the driving purpose of the device. Fig. 9 is a view in side elevation of the driving sprocket for the rear wheel, provided with an externally threaded hub to enter and coöperate with the collar shown in Fig. 8. Fig. 10 is a view in elevation of the expansible split spring sleeve adapted to fit inside the hub and to be expanded against the inner surfaces of the latter for producing the braking action; Fig. 11, a similar view of the wedge for spreading the sleeve of Fig. 10. Fig. 12 is an end view of the spring-band shown in Fig. 7.

A is the rear axle of a bicycle or motor cycle, having its bearings, as usual, in the members of the rear fork B, in which it is non-rotatably supported. Upon one threaded end 13 of the axle is screwed a ball-race collar 14 provided on its outer face with a ratchet 15, between which, and a nut 16 screwed on the end of the axle against a washer 17, is clamped the adjacent member of the fork B. By thus clamping this fork member engagement of its inner surface with the teeth of the ratchet 15 is produced, thereby providing a simple and effective means for securing the braking mechanism against rotation. The collar 14 is provided on its inner face with a lug 18, to enter a corresponding recess 19 in the adjacent end of a split spring-sleeve 20 surrounding the axle about the spool thereon, hereinafter described, and abutting against the collar. The split 21 in the spring-sleeve is wedge-shaped to receive a wedge 22 for expanding the sleeve, as and for the purpose hereinafter described. The spool 23, which fits loosely about the axle inside the sleeve 20, is provided in its head 23^a with a recess 24 to receive the lug 18, which also enters the sleeve-recess 19, to hold the spool against rotation while permitting to it a limited longitudinal movement. The opposite head 23^b of the spool is faced with a ratchet 25 of greater diameter than the head on which it is provided; and this ratchet is surrounded by a spring-band 26 pinned to the spool, as indicated at x (Fig. 2), and protruding, as an annular spring, beyond the face on this ratchet.

The preferred construction of the ring 26 is that illustrated, of an endless band having a series of arc-shaped spring-tongues 26^a extending about its outer section, and formed by cutting the band at intervals transversely and extending each transverse cut from its inner end part way about the circumference of the band. This spring band part way overlaps and yieldingly bears against the outer surface of a collar 27 surrounding the axle and provided about its inner face with a ratchet 28 opposing the ratchet 25 to engage therewith, the interior of the collar 27 being provided with coarse threads 29 of great pitch and the exterior surface of this collar tapering outwardly. At 30 is shown the driving-sprocket containing in its outer end a ball-bearing (not shown, but of ordinary or any suitable construction). From the inner face of the sprocket extends a hub 31 carrying coarse screw-threads 32, this hub screwing into the collar 27 about the axle, adjacent to the threaded end 13^a thereof at which it is fastened by a nut 16^a to the other member of the fork B. A ball-race is provided, as shown, about the inner face of the sprocket 30, like that formed about the collar 14, to afford ball-bearings for the ends of the wheel-hub 33, which houses the ball-bearings at its ends and envelops the intermediate mechanism described. Where the wheel-hub, near its end adjacent to the sprocket, surrounds the tapering collar 27,

it is provided about its internal surface with an outwardly tapering section 34, in which the collar 27 works, as and for the purpose hereinafter described.

The operation of the device is as follows: As the parts of the mechanism are represented in Figs. 1 and 2, they occupy, as hereinbefore stated, their relative positions for coasting. That is to say, the hub 33 is free to rotate on its ball-bearings without turning any of the mechanism inside it, since the collar 27 is out of contact with the tapering surface 34 in the wheel-hub, and the ratchets 28 and 25 are out of engagement with each other. The act of "pedaling," by turning the sprocket 30 and thus rotating the wheel in the forward direction, screws the thread 32 on the hub 31, by the initial slight portion of a turn of the sprocket, into the collar 27, without, however, exerting sufficient force by the screwing action to overcome the retaining pressure of the spring 26 and thus rotate the collar 27; so that the screwing of the hub 31 into the adjacent collar 27 draws the latter toward the sprocket, with the effect of engaging the outer tapering surface of the collar with the tapering surface 34 within the wheel-hub 33, which results, by the ensuing clutch-action, in binding the wheel-hub to the collar 27, and thus to the hub of the sprocket, whereby the pedaling, in turning the sprocket, also turns the wheel-hub and with it the rear wheel. The braking operation is performed by "back-pedaling", which involves reversal of the sprocket 30 and resultant turning of the threads of the sprocket-hub 31 in the direction to force the collar 27 toward the left and engage its ratchet 28 with the ratchet 25 on the spool 23; upon which engagement the stress of back-pedaling by pressing the collar 27, by longitudinal movement thereof, against the ratcheted-end of the spool, forces the latter against the wedge 22; which is thus driven into the split 21 of the sleeve 20 sufficiently far to expand the sleeve with great force against the surface surrounding it of the wheel-hub, thus locking the latter to the stationary axle A, since the split sleeve and spool are locked, against rotary movement about the axle, to the ball-race collar 14 by the lug 18, and the ball-race collar is itself screwed, and thus rigid, upon the axle. As will be understood, when, in pedaling, the rider stops turning the pedals and therefore stops the sprocket, the momentum of the rear wheel in carrying the hub 33 and the collar 27 engaging with it, through a very small portion of a complete rotation of the wheel-hub causes the collar 27 to turn on the threaded hub of the sprocket in the direction to withdraw the collar from engagement with the beveled surface 34 in the wheel-hub; and, obviously, the moment that disengagement is effected between the beveled binding-surfaces, the wheel-hub is free to rotate independently for coasting.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a coaster-brake, the combination with a stationary axle and sprocket, of a wheel-hub rotatably surrounding the axle, an expansible braking-sleeve surrounding the axle inside said hub, a wedge for expanding said sleeve, a spool on the axle within said sleeve engaging said wedge and provided with a ratchet on one end, an internally threaded collar surrounding the axle having a ratchet on its face, means for producing a clutch-action between said collar and hub, and a threaded hub on the sprocket working in said collar, for the purpose set forth.

2. In a coaster-brake, the combination with the stationary axle and sprocket, of a wheel-hub rotatably surrounding the axle and provided with a tapering section on its inner surface, an expansible braking-sleeve surrounding the axle inside said hub, a wedge for expanding said sleeve, a spool on the axle within said sleeve engaging said wedge and provided with a ratchet on one end, an internally threaded collar surrounding the axle, having a ratchet on its face and a tapering outer surface to cooperate with the tapering section in said hub, and a threaded hub on the sprocket working in said collar, for the purposes set forth.

3. In a coaster-brake, the combination with the stationary axle and sprocket, of a wheel-hub rotatably surrounding the axle and provided with a tapering section on its inner surface, an expansible braking-sleeve surrounding the axle inside said hub, a wedge for expanding said sleeve, a spool on the axle within said sleeve, engaging said wedge and provided with a ratchet on one end, a spring on the ratchet end of said spool, an internally-threaded collar surrounding the axle and engaged by said spring, said collar having a ratchet on its face and a tapering outer surface to coöperate with the tapering surface within said hub, and a threaded hub on the sprocket working in said collar, for the purposes set forth.

4. A coaster-brake comprising, in combination, a stationary axle having a ball-race collar rigidly secure on one end and a sprocket rotatably mounted on its opposite end and provided with an externally-threaded hub and a ball-race, a spool loosely surrounding said axle, interlocking with said collar and provided with a ratchet on one end, a sleeve surrounding and interlocking with said spool and split to form a wedge-shaped opening in its wall, a wedge confined in said opening and engaged by the ratcheted-end of said spool, a spring-band on and projecting beyond said spool-end, an internally-threaded collar, in which said threaded sprocket-hub works, overlapped by said spring-band and provided with a ratchet-face and a tapering circumferential surface, and a wheel-hub rotatably supported at its ends on ball-bearings in said races and provided with an internal tapering section to coöperate with said tapering collar, for the purposes set forth.

5. In combination, a coaster-brake having a stationary threaded axle and a sprocket, a wheel-hub rotatably surrounding the axle, an expansible braking-sleeve about said axle within the hub, a wedge for expanding said sleeve, means for driving the wedge, a collar screwed on the axle and interlocking with said sleeve, a ratchet on the outer face of said collar, bearings for the axle-ends, and a nut on an end of the axle, between which and said ratchet the adjacent bearing is clamped.

6. In combination, a coaster-brake having a stationary threaded axle and a sprocket, a wheel-hub rotatably surrounding the axle, an expansible braking-sleeve about said axle within the hub, a wedge for expanding said sleeve, a spool on the axle within said sleeve engaging the wedge, means for driving the spool against the wedge, a collar screwed on the axle and interlocking with said sleeve, a ratchet on the outer face of said collar, bearings for the axle-ends, and a nut on an end of the axle, between which and said ratchet the adjacent bearing is clamped.

7. A coaster brake having a stationary threaded axle, bearing cones threaded on the axle, a sprocket, a wheel hub surrounding the axle, a braking surface surrounding the axle and held from rotation by one of the cones and means on the cone holding the braking surface adapted to engage the inner face of the rear fork of the vehicle to lock the cone to the fork at the point of contact between the cone and the fork.

PETER P. O'HORO.

In presence of—
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A. U. THORIEN.