

No. 882,159.

PATENTED MAR. 17, 1908.

A. P. MORROW.
BACK PEDALING COASTER BRAKE.

APPLICATION FILED JULY 6, 1905.

2 SHEETS—SHEET 1.

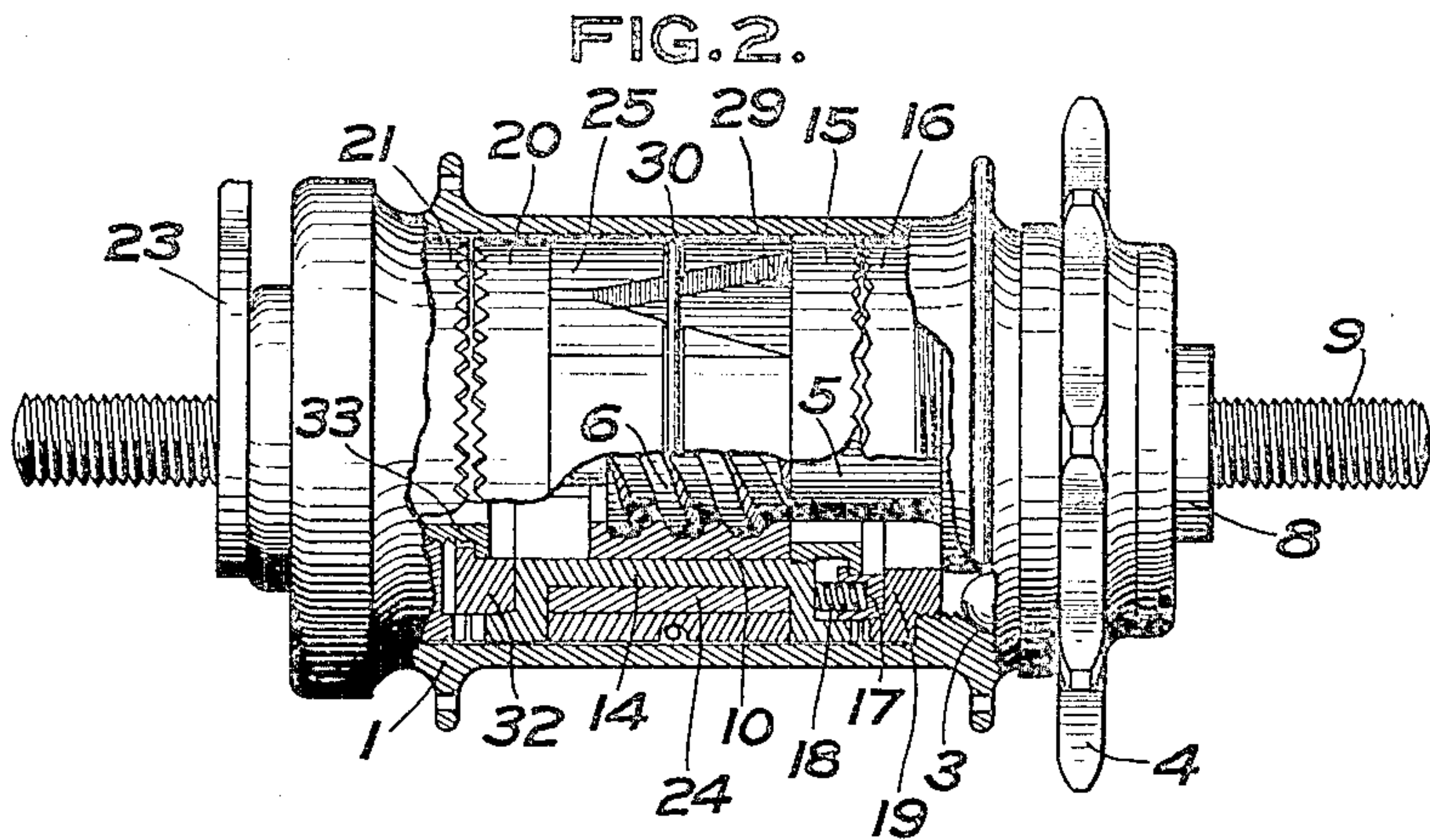
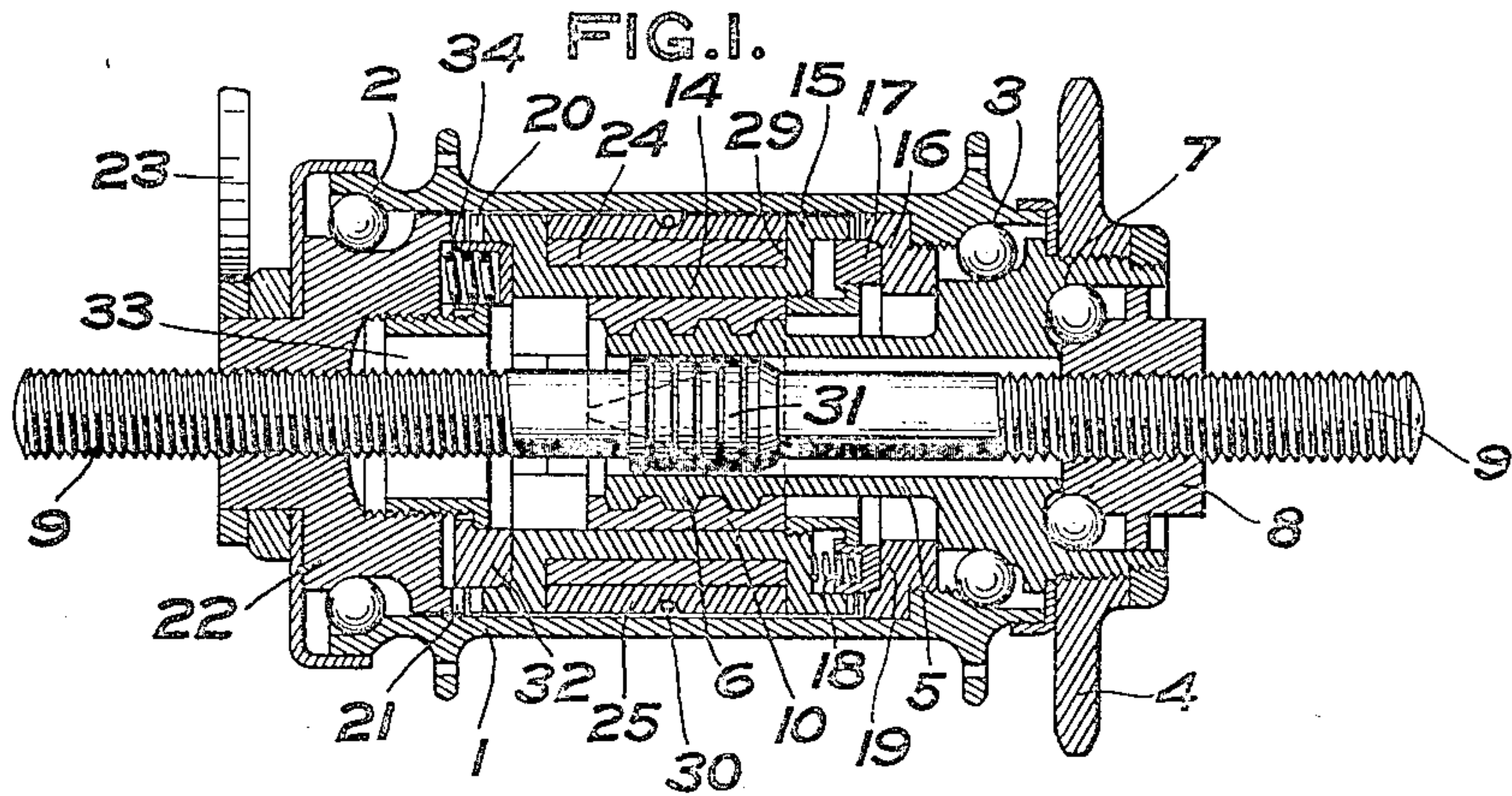


FIG. 3.

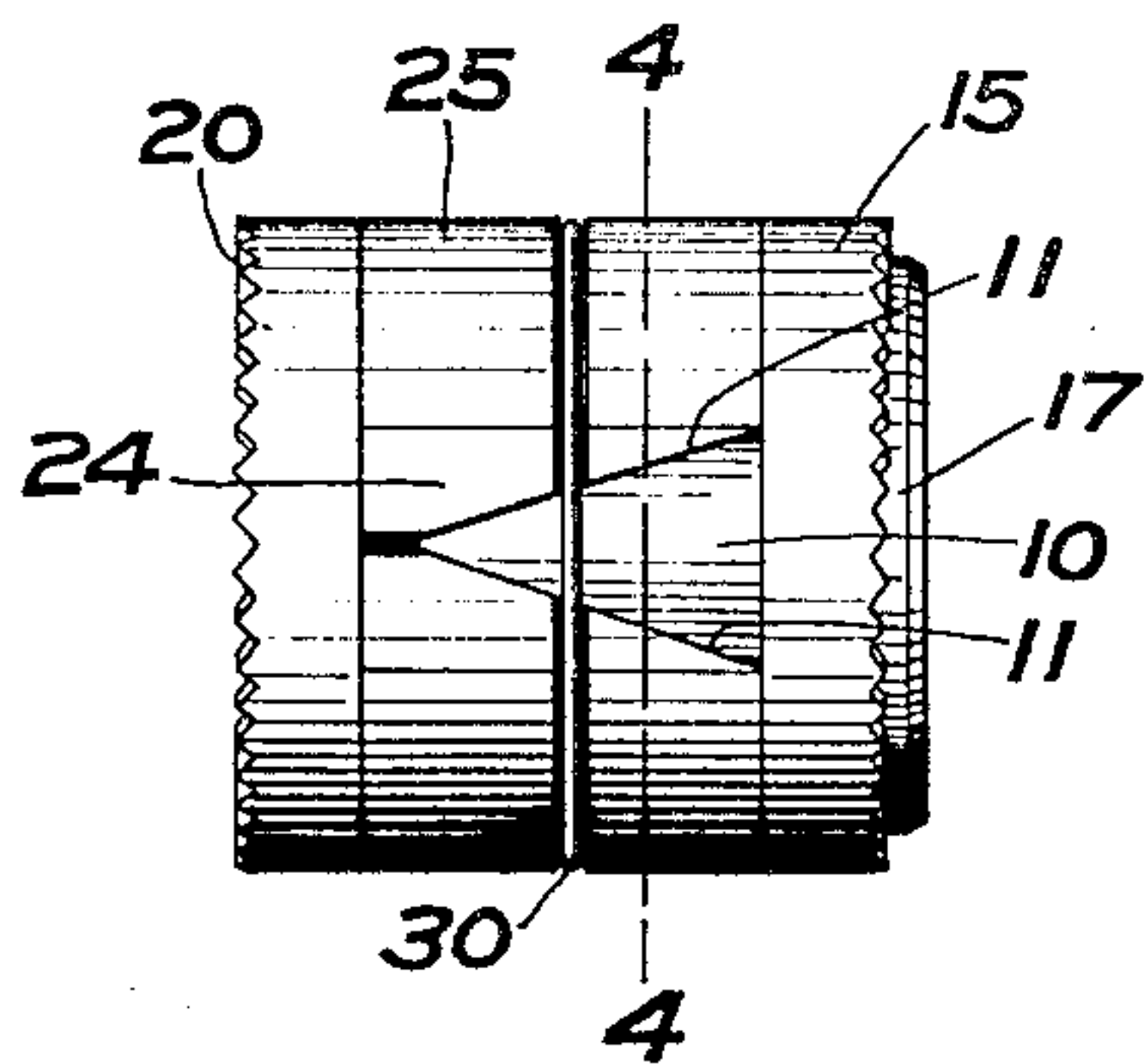
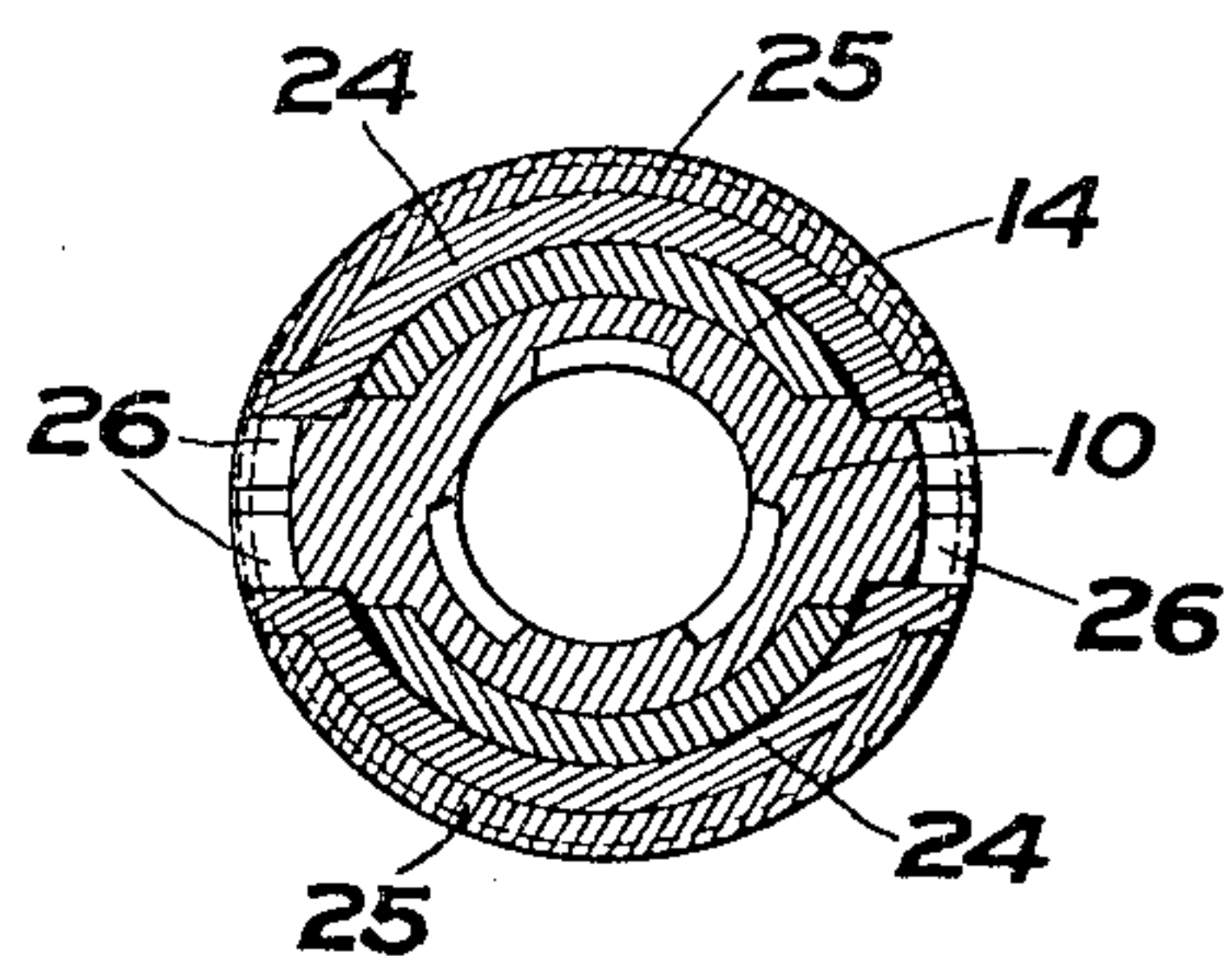


FIG. 4.



WITNESSES:

Clarence W. Carroll.
L. Thon.

INVENTOR:

Alexander P. Morrow
by *Chas. A. Davis*
his atty

A. P. MORROW.
BACK PEDALING COASTER BRAKE.

APPLICATION FILED JULY 6, 1905.

2 SHEETS—SHEET 2.

FIG. 5.

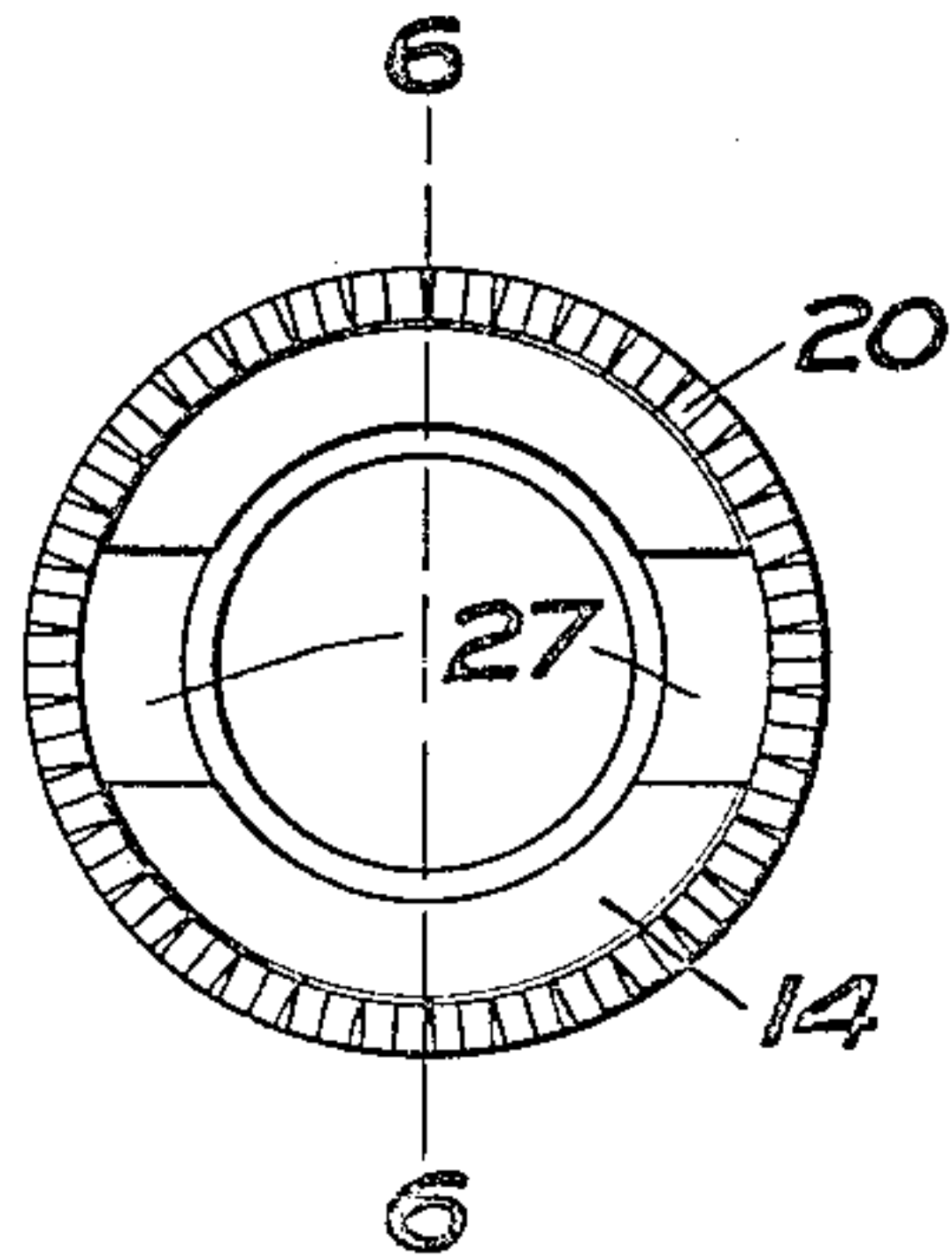


FIG. 6.

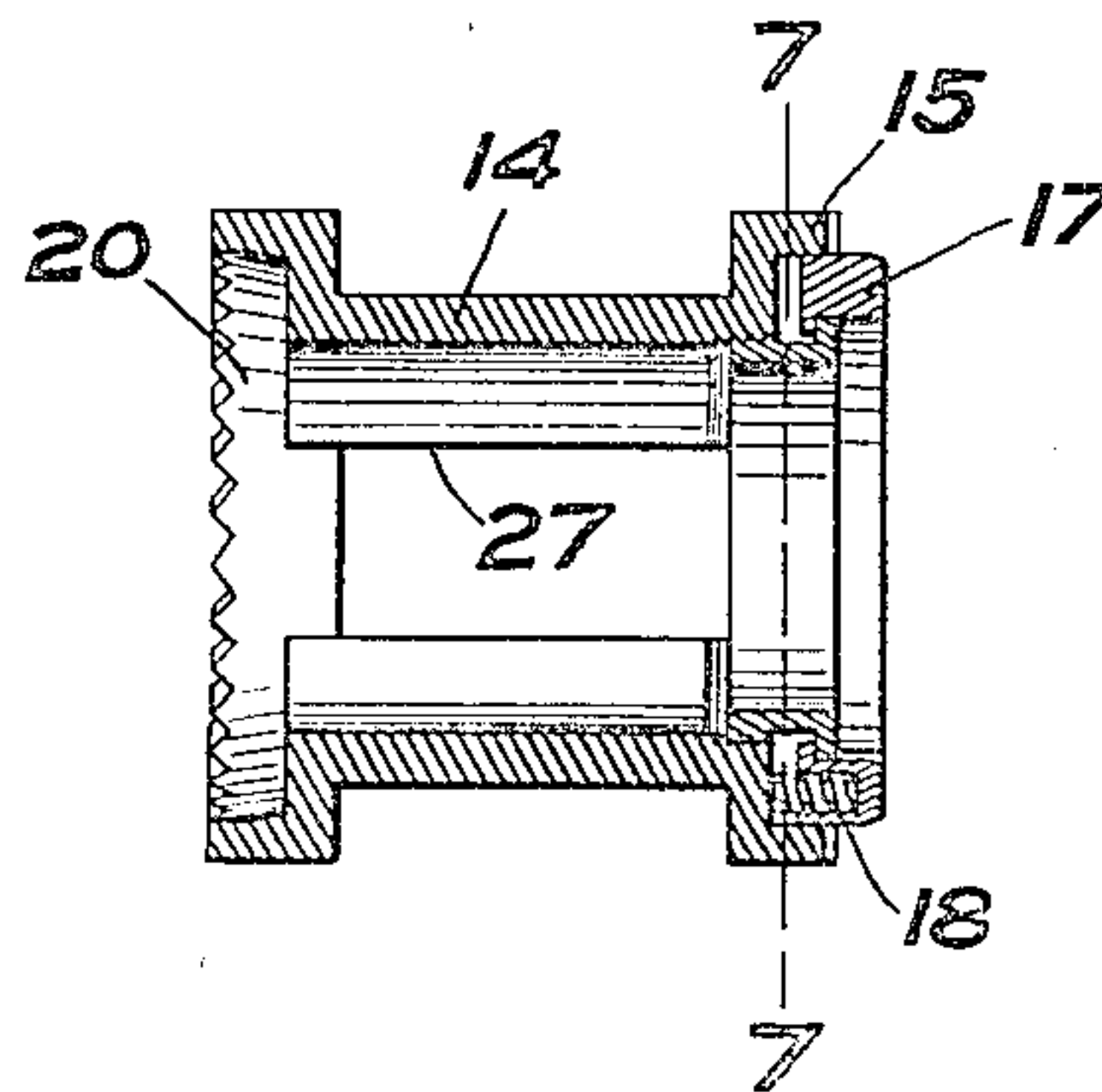


FIG. 8.

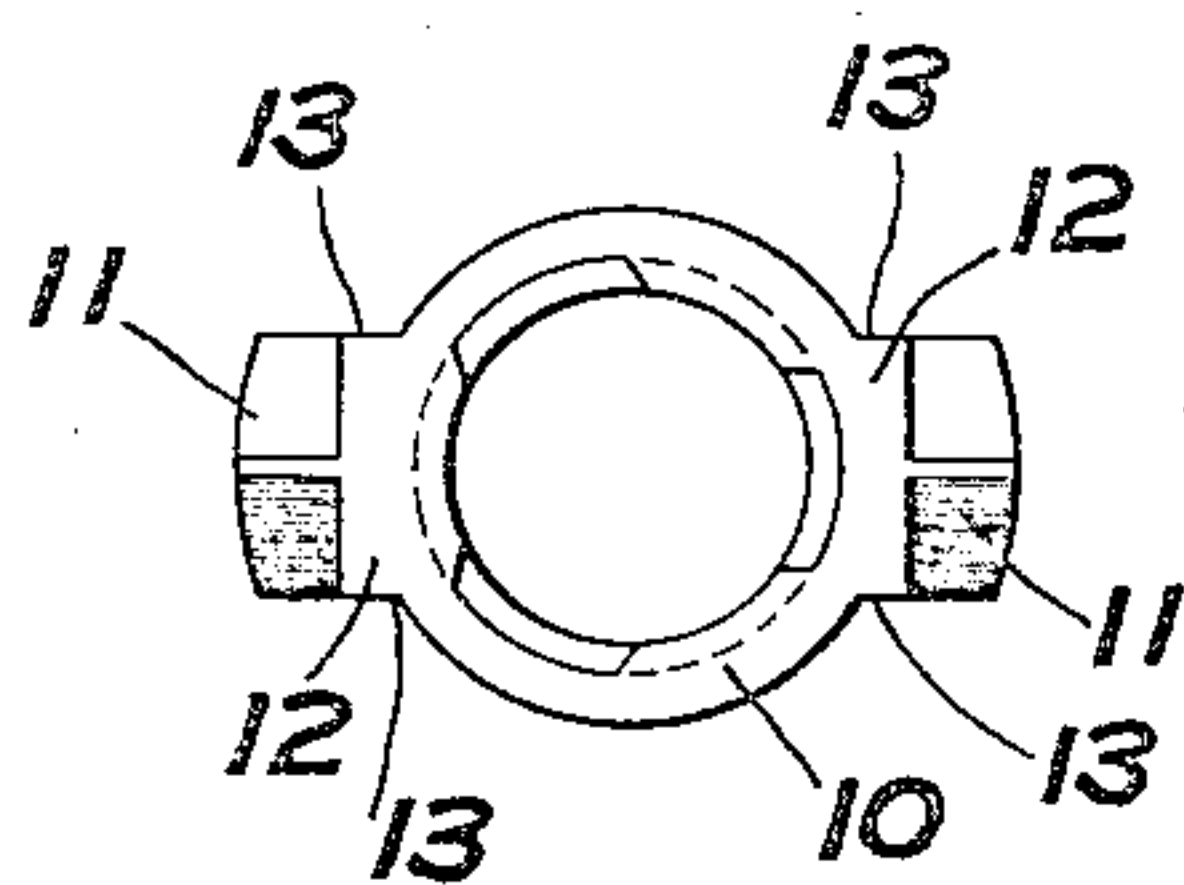


FIG. 9.

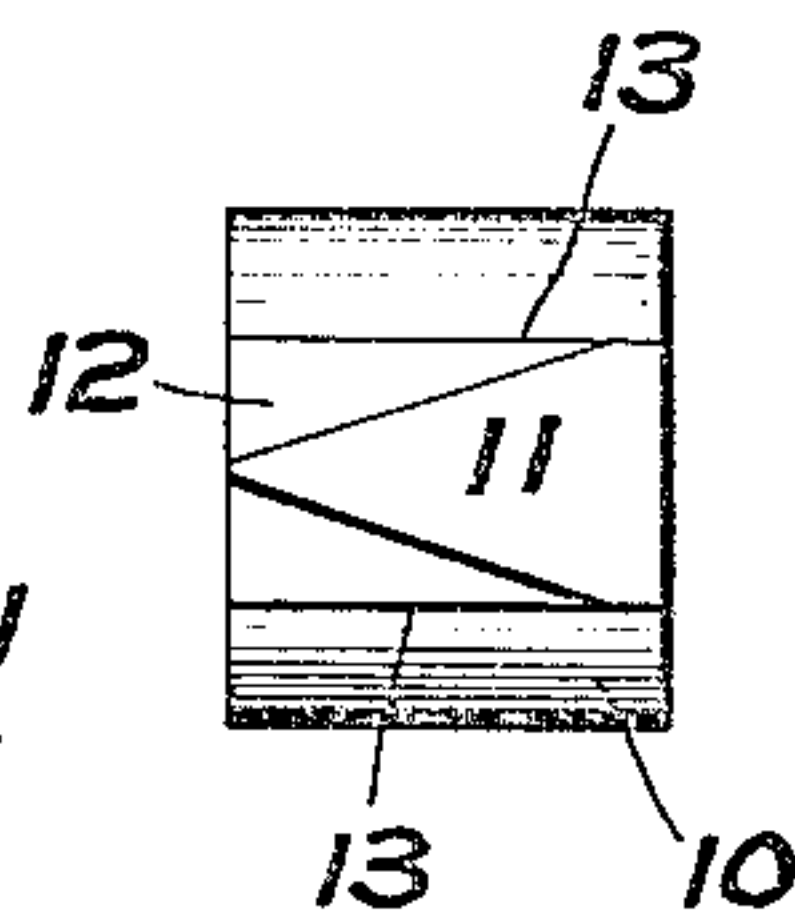


FIG. 7.

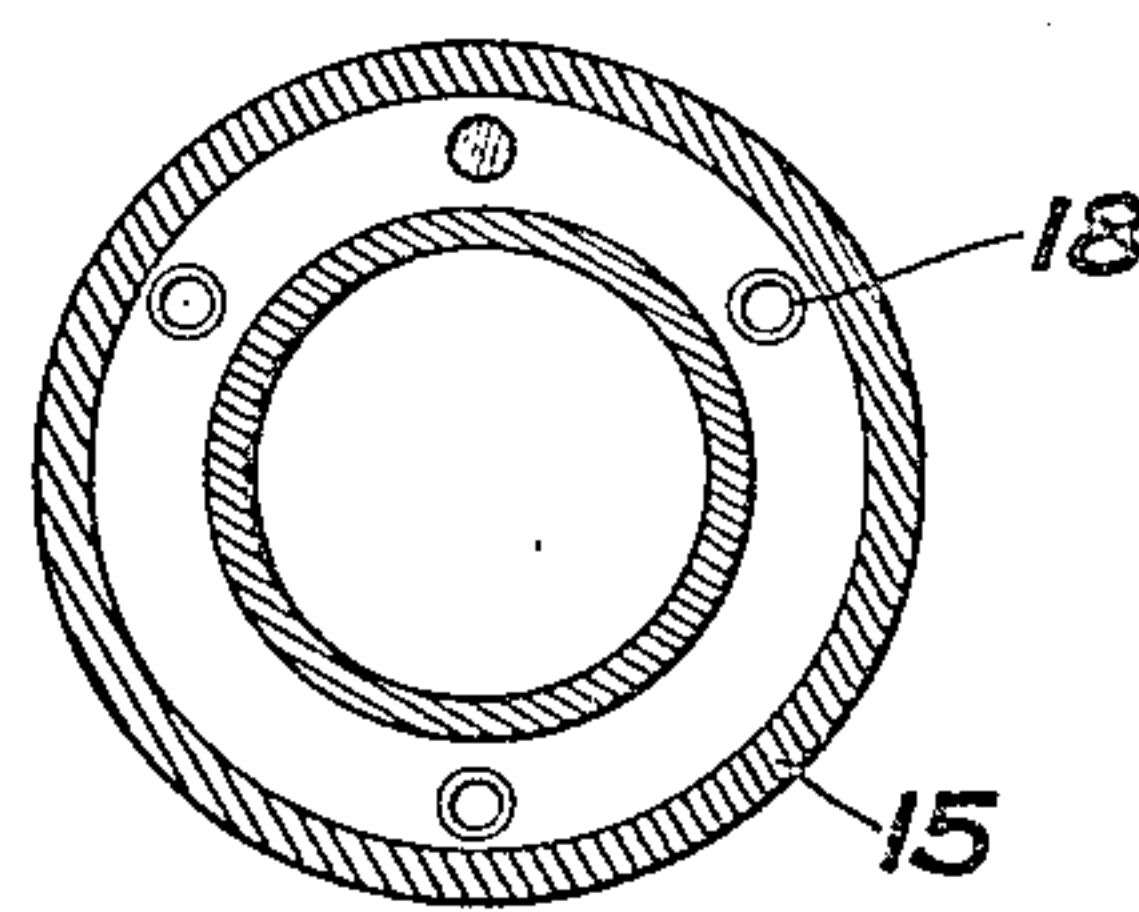


FIG. 10.

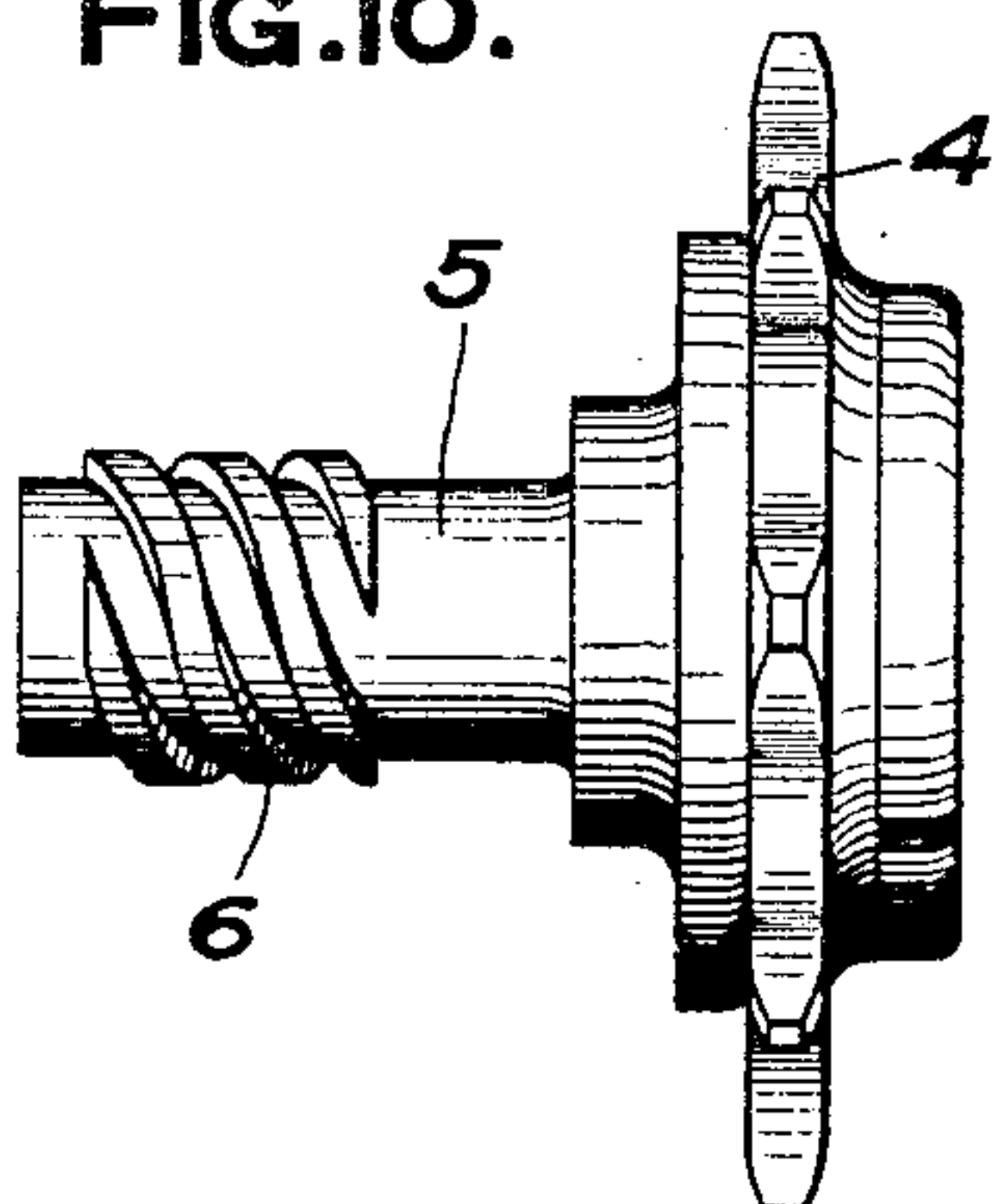


FIG. 11.

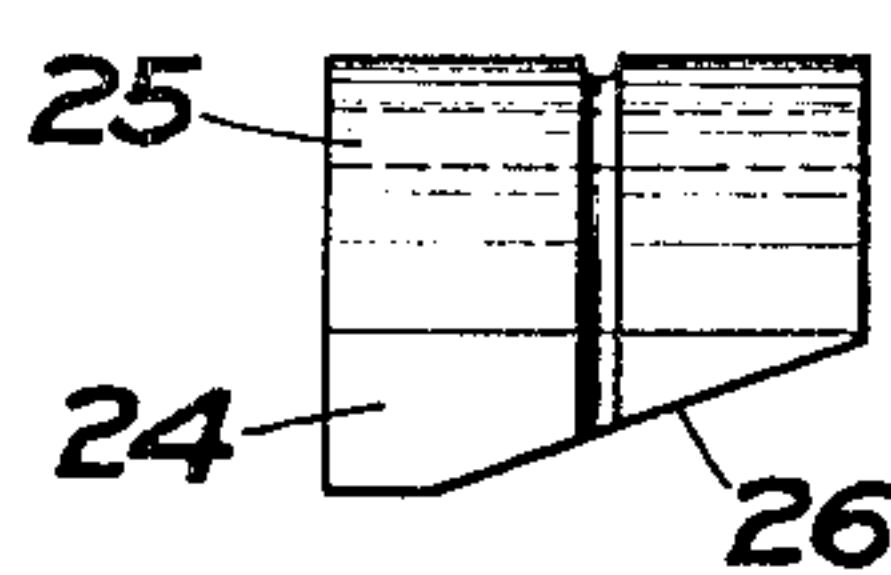
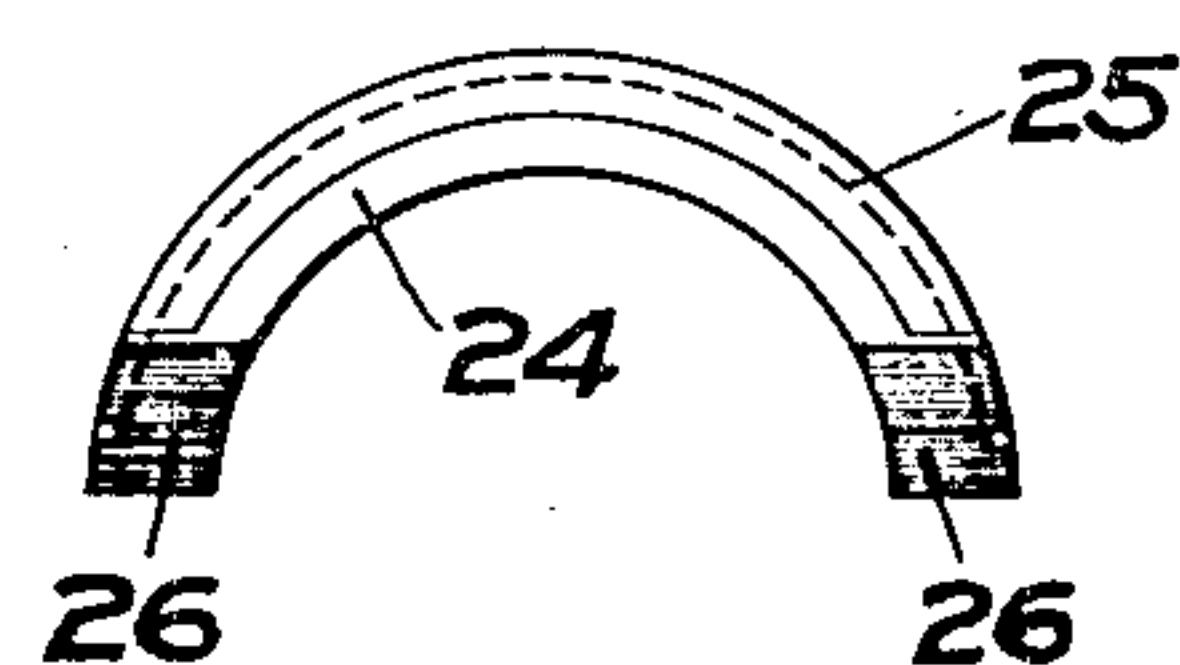


FIG. 12.



WITNESSES:

Clarence W. Carroll.
L. Thon.

INVENTOR:

Alexander P. Morrow
by O. J. S. S. S. S.
his Atty's

UNITED STATES PATENT OFFICE.

ALEXANDER P. MORROW, OF ELMIRA, NEW YORK.

BACK-PEDALING COASTER-BRAKE.

No. 882,159.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed July 6, 1905. Serial No. 268,591.

To all whom it may concern:

Be it known that I, ALEXANDER P. MORROW, a citizen of the United States, and resident of Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Back-Pedaling Coaster-Brakes, of which the following is a specification.

This invention relates to back pedaling coaster brakes, and consists in the apparatus hereinafter described and claimed.

In the drawings:—Figure 1 is a vertical section through a rear hub of a bicycle embodying this invention; Fig. 2 is an elevation of a hub containing the same invention, parts being removed to show the interior construction, and parts being shown in section; Fig. 3 is an elevation of a detail hereinafter described; Fig. 4 is a cross section on the line 4—4 of Fig. 3; Fig. 5 is an end view of clutch elements employed in the device; Fig. 6 is a vertical section on the line 6—6 of Fig. 5; Fig. 7 is a cross section on the line 7—7 of Fig. 6; Fig. 8 is an end elevation; Fig. 9 is a side elevation of the end for expanding the brake blocks; Fig. 10 is an elevation of the sprocket wheel, its sleeve and screw; and Figs. 11 and 12 are, respectively, a side elevation and an end elevation of one of the brake blocks.

A hub 1 of usual form is employed in this device, which is provided with cups 2 and 3 for its ball bearings. At one end of the hub is the sprocket wheel 4 suitably fastened upon a sleeve 5 that extends within the hub, and has upon it the screw threads 6. This sleeve and the sprocket wheel may be called the driver. The outside of the sleeve constitutes a cone corresponding with the ball bearing cup 3. The said sleeve has also an internal cup 7 for a ball bearing, the cone 8 of which is carried by the axle 9.

A driving clutch and a brake are provided, which are actuated by a device controlled by the backward or forward rotation of the sprocket wheel 4 and the sleeve 5. Upon the threads 6 of said sleeve runs a nut or block 10, having upon it two wedges 11 and 11, as shown most clearly in Figs. 8 and 9. The nut is adapted to move in guide-ways parallel to the axle in a brake sleeve. In the form shown, the nut has splines or feathers 12 upon it, having the faces 13 parallel to each other and to the axis of the nut. The brake carrier 14 has a clutch member 15 at one end that is adapted for

engagement with a similar clutch member 16 upon the hub. These two clutch members, as shown in Fig. 2, may be toothed in order to engage each other positively. The brake carrier 14 carries also a ring 17 inside and concentric with the clutch member 15, which is pressed forward from the carrier 14 by means of a series of springs 18 set in sockets in the ring, and pressing with their free ends against the end of the brake carrier. The action of these springs forces the ring 17 against an abutment 19 adjacent to the clutch member 16, so as to tend to disengage the two clutch members 15 and 16. In the present form of the device, the abutment 19 is made as a part of a ring carrying the clutch member 16, which is rigidly fastened into the interior of the hub 1.

On the other end of the brake carrier 14 is another clutch member 20 that is adapted to engage a clutch member 21 on a stationary member or block 22 that may be fastened upon the axle 9, and which is held stationary by a brake arm 23, which is fastened to the frame of the bicycle in any suitable way. The block 22 in the present case forms the cone of the ball bearing, of which the cup 2 is an element.

The brake carrier 14 has a peripheral groove in which lie the brake members 24, which may carry shoes 25, if desired, as in the form shown. The brake members 24 are semicircular, as shown in Figs. 11 and 12, and at their contiguous edges have beveled portions 26 for coöperation with the wedges 11 on the nut 10. The splines 12 on the nut 10 run in slots 27 in the brake carrier 14, so that said wedges can move only axially. The backs of the wedges are adapted to abut against a face 29 on the brake carrier 14, when the nut is moved in one direction, and the angular faces of the wedges strike on the beveled faces 26 of the brake members and separate said brake members to press them against the interior of the hub, when the nut is moved in the other direction. A wire spring 30 passes around the two brake members, preferably in a groove in them, and keeps the said brake members in position on the brake carrier, and at the same time tends to contract them when the wedges 11 are out of action.

The interior of the sleeve 5 may run on a portion of the axle, such for instance as the enlargement 31 thereof.

In order to tend to disengage the members

20 and 21 of the brake clutch, one of said members, such as the block 22, carries the ring 32 that is held in place by the nut 33 having a portion overlapping a portion of
 5 said ring 32, and springs 34 interposed between the ring 32 and the block 22 tend to press the ring away from the block and to force the brake carrier 14 so far away from the block 22 that the clutch members 20 and
 10 21 are separated. The member 21 of the brake clutch and the member 16 of the driving clutch are at such a distance apart that the brake carrier 14, when held by the rings 17 and 32, is in an intermediate position with
 15 both clutches disengaged, and, of course, for this purpose the brake carrier 14 must have a length less than the distance between the clutch members 21 and 16.

The operation of the device is as follows:
 20 Assuming that as usual the sprocket wheel 4 is on the right hand side of the bicycle, upon forward driving the sleeve 5 will be turned and its screw threads 6 will shift the nut 10 toward the right in Fig. 1, so that the nut, or,
 25 as in the present case, the rear ends 28 of the wedges 11 will force the brake carrier 14 toward the right, compressing the springs 18 under the ring 17, and causing engagement between the clutch member 15 on the brake
 30 carrier and the clutch member 16 on the hub. When this engagement occurs and the forward pedaling is continued, the driver mechanism is rigidly locked to the hub, so that the hub may be driven thereby. If now the
 35 pedals are held stationary, the sprocket wheel 4 and sleeve 5 become stationary also, while the hub 1 continues its rotation. The pressure of the springs 18 through the ring 17 against its abutment 19, together with the
 40 momentary tendency of the brake carrier 14 to move with the hub, separate the clutch members 15 and 16, but the clutch members 20 and 21 are not thus engaged. Remembering that in this position the brakes and
 45 brake shoes are not in contact with the hub, it will be seen that the hub can revolve freely, while the pedals and the parts above mentioned remain stationary and the wheel free, or, in other words, the bicycle may coast;
 50 but if the rider back pedals, the motion of the sprocket wheel 4 and of the sleeve 5 is contrary to that occurring when forward driving occurs, and the nut 10 is shifted toward the left in Figs. 1 and 2, forcing the ring 32
 55 ahead of it, and compressing the springs 34 until engagement occurs between the clutch members 20 and 21, whereupon, because the clutch member 21 is always stationary, the brake carrier 14 becomes stationary, and on
 60 further back pedaling the nut 10 is carried farther toward the left, thereby causing forcible separation of the brake members 24 through the action of the wedges 11, until a sufficient braking pressure occurs against the
 65 hub. On stopping the backward pressure,

or upon resuming forward pedaling, the ring 32 forces the brake carrier 14 away from the stationary block 22, and the coasting or forward driving operation above described may be produced.

It will be noted that this device is particularly adapted for easy repair, dismounting and assembling. The brake carrier 14 is itself a block carrying the driving and braking clutches, and the brake shoes and the
 75 actuating nut 10 with its wedges are also carried in and by said brake carrier. The stationary block 22 and the brake arm 23, together with the separator for the brake clutch, are all carried by the axle 9, so that these parts
 80 may be inserted into the hub, after the brake carrier and its connected parts have been inserted into the hub. These two insertions occur from the left hand end in Fig. 1. Thereupon the driving mechanism, including
 85 the threaded sleeve 5, is inserted from the other end of the hub and the cone 8 is screwed upon the axle 9, thus assembling all the parts.

What I claim is:—

1. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle having a brake clutch member, a shiftable brake carrier having
 95 clutch members for cooperating with the brake clutch member and with the driving clutch member and carrying one or more movable brake shoes, a shiftable nut carried by said brake carrier and having wedge
 100 means for actuating said brake shoes when the nut is moved in one direction and means for causing engagement of the driving clutch when the nut is moved in the other direction, and driving means for operating said nut.

2. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle and having a brake clutch member, a shiftable brake carrier having
 110 clutch members for cooperating with the brake clutch member and with the driving clutch member and carrying one or more movable brake shoes, a shiftable nut carried by said brake carrier and movable relatively
 115 thereto and having wedge means for actuating said brake shoes when the nut is moved in one direction and means for causing engagement of the driving clutch when the nut is moved in the other direction, and driving
 120 means for operating said nut.

3. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle and having a brake clutch
 125 member, a shiftable brake carrier having clutch members for cooperating with the brake clutch member and with the driving clutch member and carrying one or more brake shoes movable relatively to said car- 130

rier, a shiftable nut carried by said carrier and axially movable in ways therein, and provided with wedge means for actuating said brake shoes when the nut is moved in one direction and with means for engaging the driving clutch members when the nut is moved in the other direction, and driving means for operating said nut.

4. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle and having a brake clutch member, an axially shiftable brake carrier situated between the said driving clutch member and the said brake clutch member and having clutch members for cooperating therewith and carrying one or more movable brake shoes, a shiftable nut carried by said brake carrier and having means for actuating said brake shoes when the nut is moved in one direction and with means for causing engagement of the driving clutch members when the nut is moved in the other direction, and driving means for actuating said nut.

5. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle having a brake clutch member, a shiftable brake carrier having clutch members for cooperating with the brake clutch member and with the driving clutch member and carrying one or more movable brake shoes, a shiftable nut carried by said brake carrier and having wedge means for actuating said brake shoes when the nut is moved in one direction and means for causing engagement of the driving clutch when the nut is moved in the other direction, driving means for operating said nut, and spring means for simultaneously separating the driving clutch members and the brake clutch members.

6. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle and having a brake clutch member, a shiftable brake carrier having clutch members for cooperating with the brake clutch member and with the driving clutch member and carrying one or more movable brake shoes, a shiftable nut carried by said brake carrier and movable relatively thereto and having wedge means for actuating said brake shoes when the nut is moved in one direction and with means for causing engagement of the driving clutch when the nut is moved in the other direction, driving means for operating said nut, and spring means for simultaneously separating the driving clutch members and the brake clutch members.

7. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle and having a brake clutch

member, a shiftable brake carrier having clutch members for cooperating with the brake clutch member and with the driving clutch member and carrying one or more brake shoes movable relatively to said carrier, a shiftable nut carried by said carrier and axially movable in ways therein, and provided with wedge means for actuating said brake shoes when the nut is moved in one direction and with means for engaging the driving clutch members when the nut is moved in the other direction, driving means for operating said nut, and spring means for simultaneously separating the driving clutch members and the brake clutch members.

8. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle and having a brake clutch member, an axially shiftable brake carrier situated between the said driving clutch member and the said brake clutch member and having clutch members for cooperating therewith and carrying one or more movable brake shoes, a shiftable nut carried by said brake carrier and having means for actuating said brake shoes when the nut is moved in one direction and with means for causing engagement of the driving clutch members when the nut is moved in the other direction, driving means for actuating said nut, and spring means for simultaneously separating the driving clutch members and the brake clutch members.

9. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle having a brake clutch member, a shiftable brake carrier having clutch members for cooperating with the brake clutch member and with the driving clutch member and carrying one or more movable brake shoes, a shiftable nut carried by said brake carrier and having wedge means for actuating said brake shoes when the nut is moved in one direction and means for causing engagement of the driving clutch when the nut is moved in the other direction, driving means for operating said nut, a spring actuated ring between the members of the brake clutch for separating the same, and a spring actuated ring between the members of the driving clutch for separating the same.

10. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle and having a brake clutch member, a shiftable brake carrier having clutch members for cooperating with the brake clutch member and with the driving clutch member and carrying one or more movable brake shoes, a shiftable nut carried by said brake carrier and movable relatively thereto and having wedge means for actuating said brake shoes when the nut is moved

in one direction and with means for causing engagement of the driving clutch when the nut is moved in the other direction, driving means for operating said nut, a spring actuated ring between the members of the brake clutch for separating the same, and a spring actuated ring between the members of the driving clutch for separating the same.

11. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle and having a brake clutch member, a shiftable brake carrier having clutch members for cooperating with the brake clutch member and with the driving clutch member and carrying one or more brake shoes movable relatively to said carrier, a shiftable nut carried by said carrier and axially movable in ways therein and provided with wedge means for actuating said brake shoes when the nut is moved in one direction and with means for engaging the driving clutch members when the nut is moved in the other direction, driving means for operating said nut, a spring actuated ring between the members of the brake clutch for separating the same, and a spring actuated ring between the members of the driving clutch for separating the same.

12. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle and having a brake clutch member, an axially shiftable brake carrier situated between the said driving clutch

member and the said brake clutch member and having clutch members for cooperating therewith and carrying one or more movable brake shoes, a shiftable nut carried by said brake carrier and having means for actuating said brake shoes when the nut is moved in one direction and with means for causing the engagement of the driving clutch members when the nut is moved in the other direction, driving means for actuating said nut, a spring actuated ring between the members of the brake clutch for separating the same, and a spring actuated ring between the members of the driving clutch for separating the same.

13. In a back pedaling brake for cycles, a hub having a driving clutch member, a stationary block adapted to be attached to the frame of the cycle having a brake clutch member, a shiftable brake carrier having clutch members for cooperating with the brake clutch member and with the driving clutch member and carrying one or more movable brake shoes, a shiftable block carried by said brake carrier having wedge means for actuating said brake shoes when the block is shifted in one direction, and means for causing the engagement of the driving clutch when the block is shifted in another direction, and driving means for shifting said block.

ALEXANDER P. MORROW.

Witnesses:

RALPH D. WEBSTER,
L. D. WHITTIER.