

No. 745,672.

PATENTED DEC. 1, 1903.

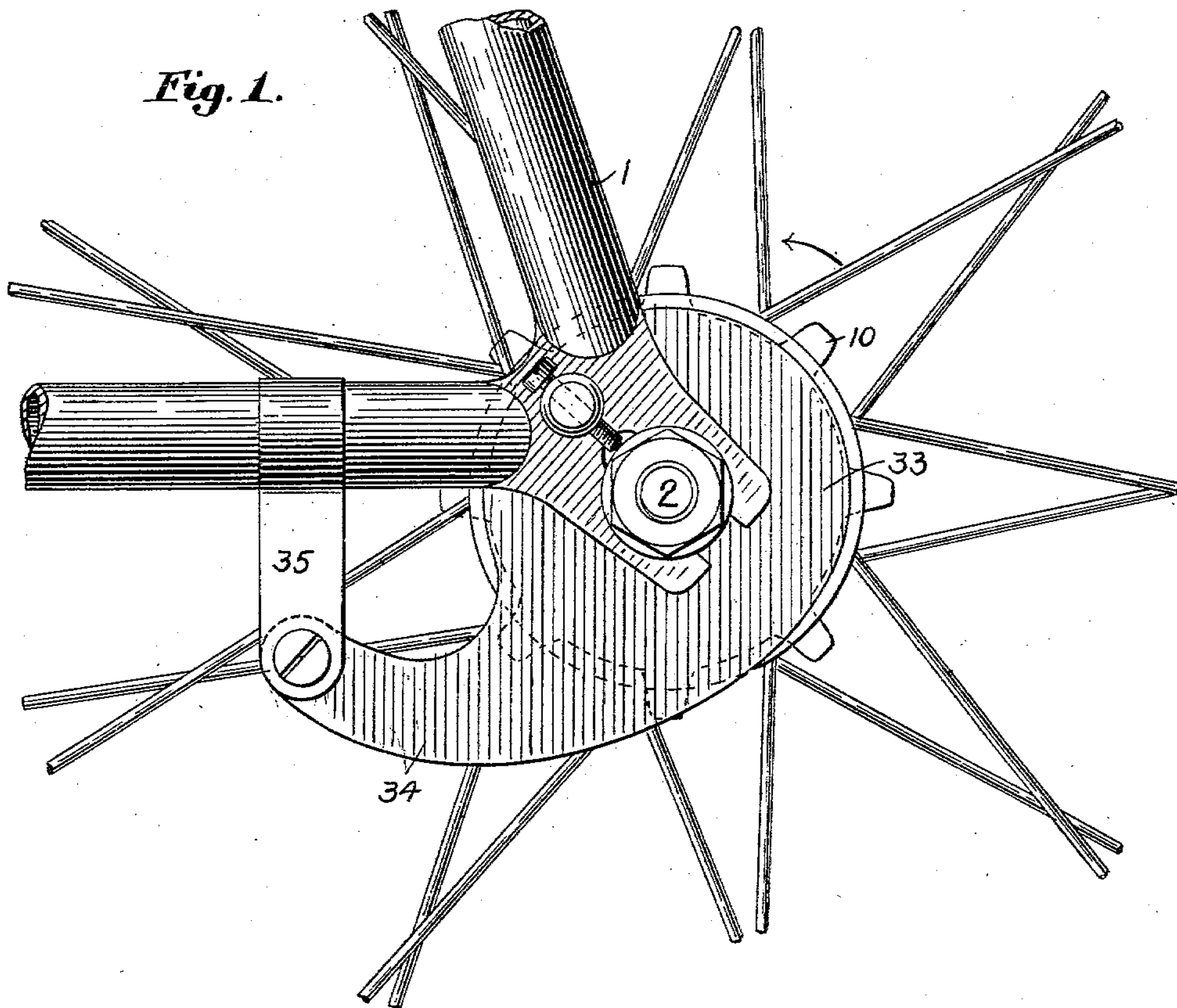
A. F. ROCKWELL.  
COASTER BRAKE.

APPLICATION FILED DEC. 13, 1900.

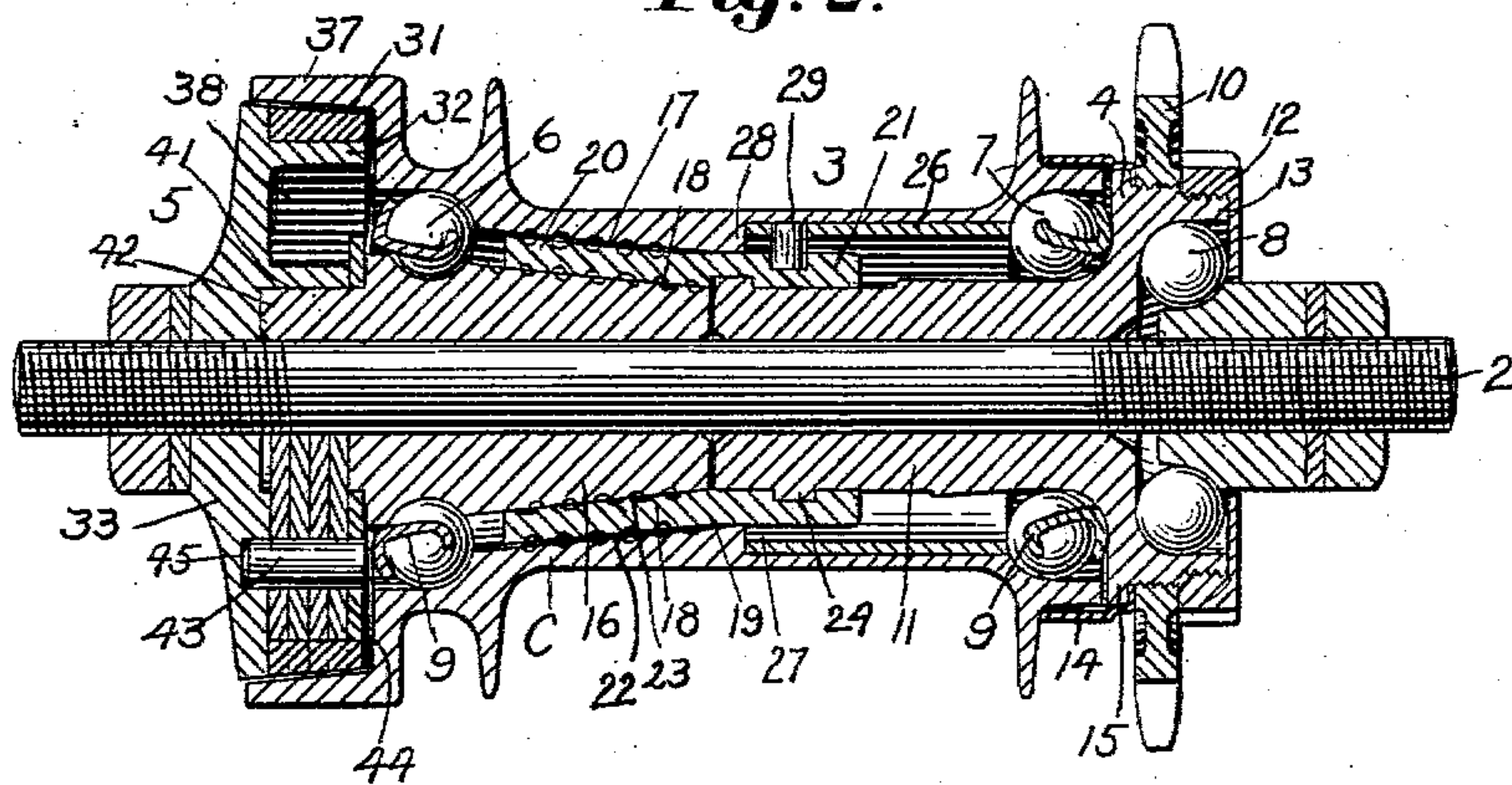
NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1.*



*Fig. 2.*



WITNESSES

*Walter E. Loring*  
*E. M. Thompson*

INVENTOR

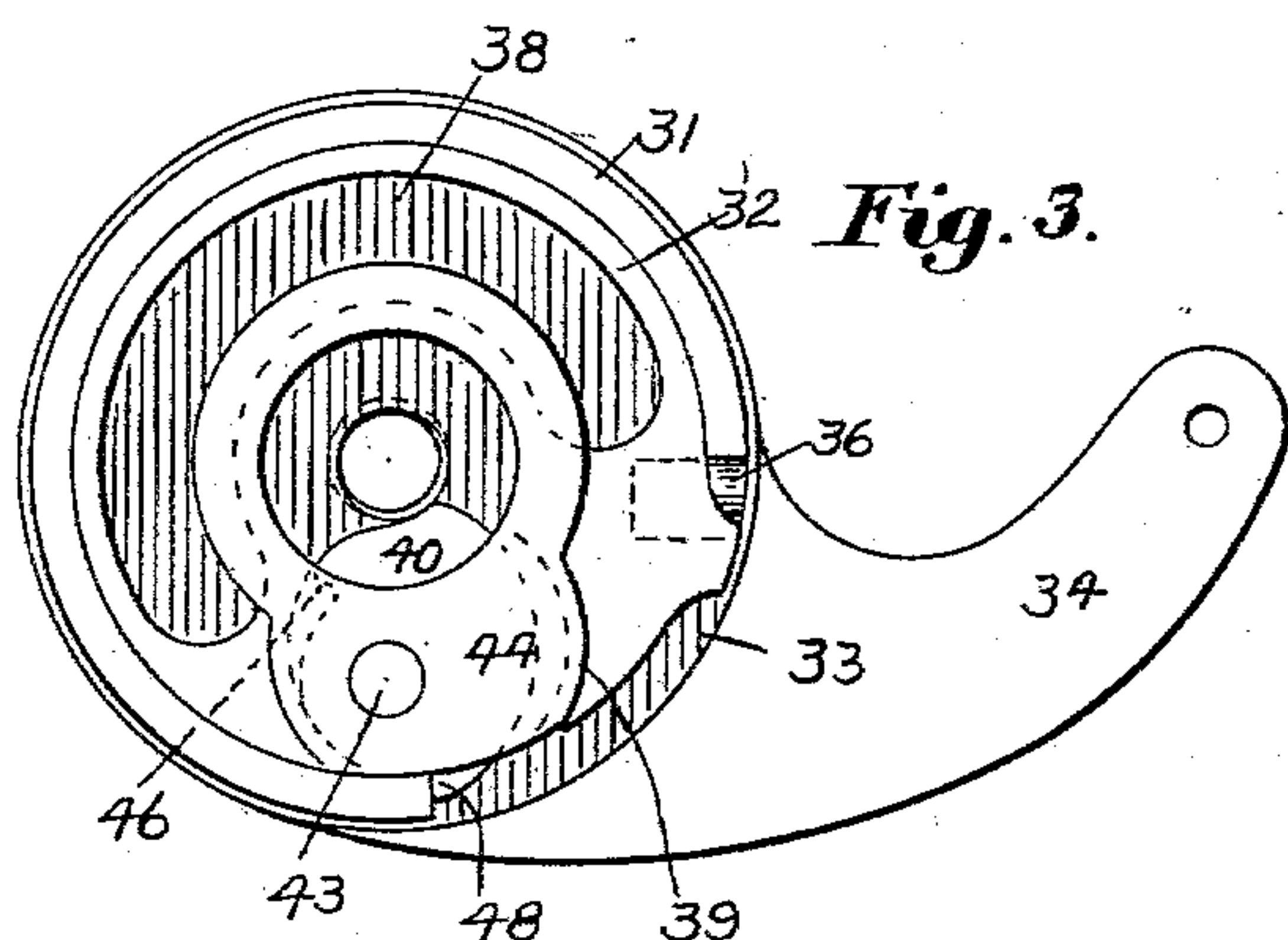
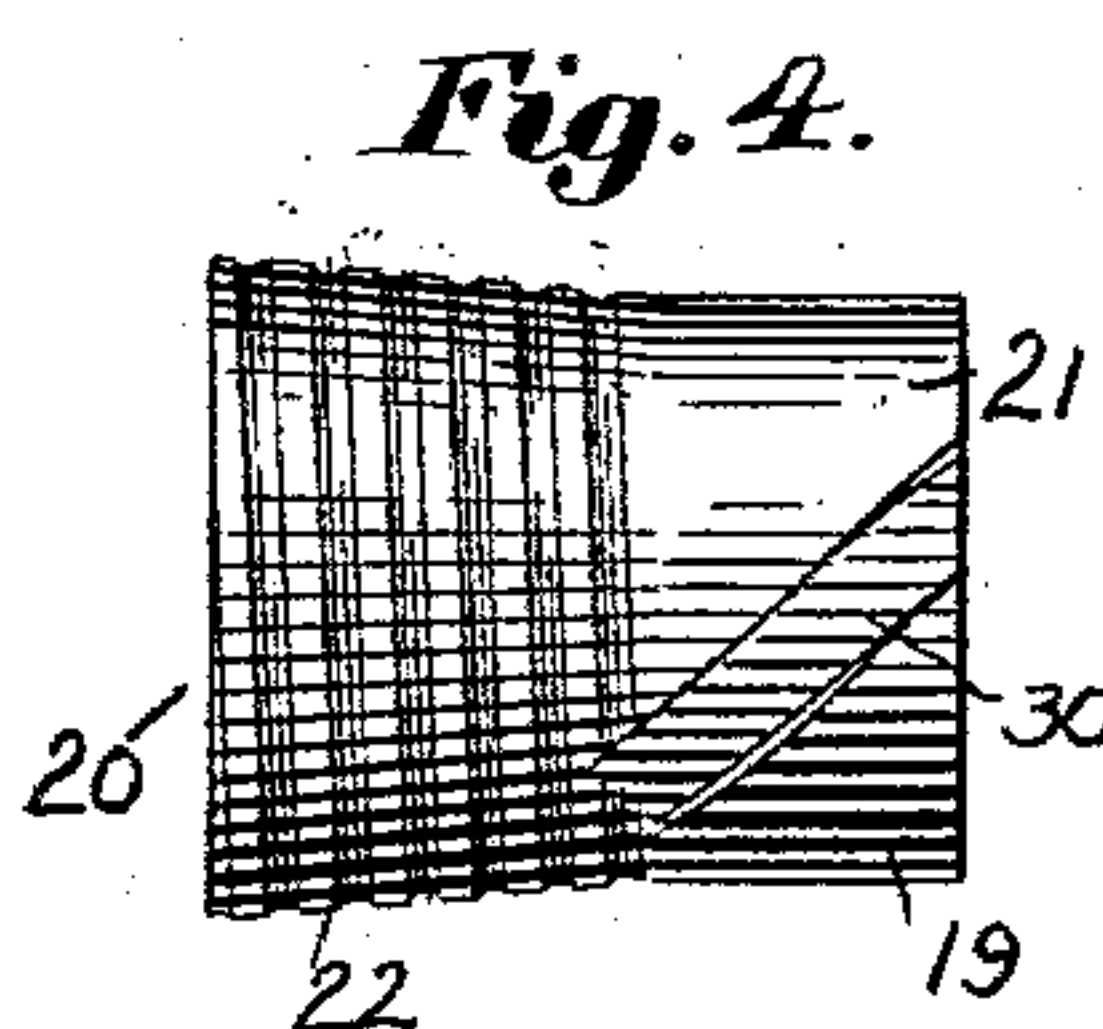
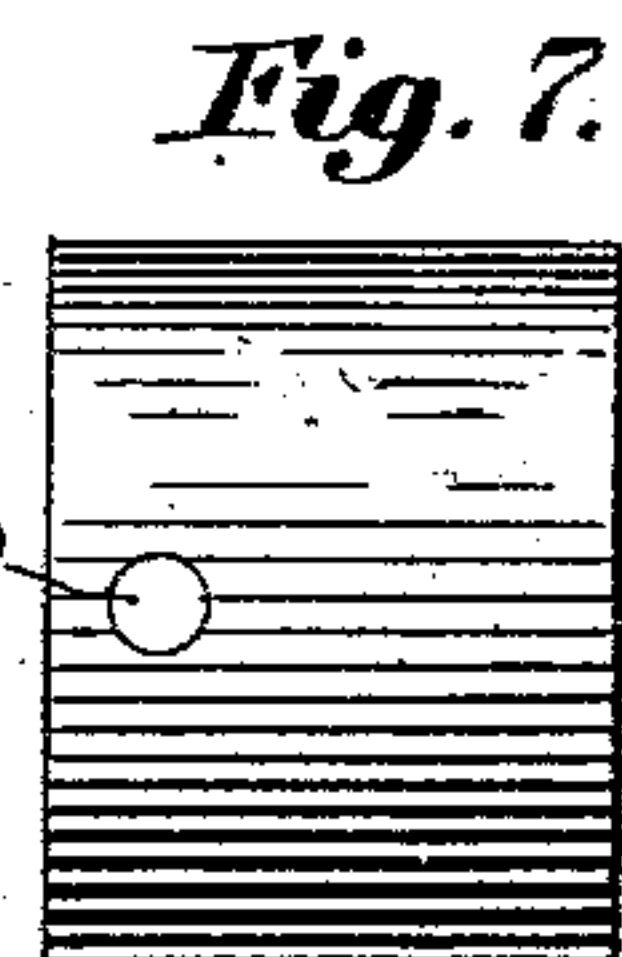
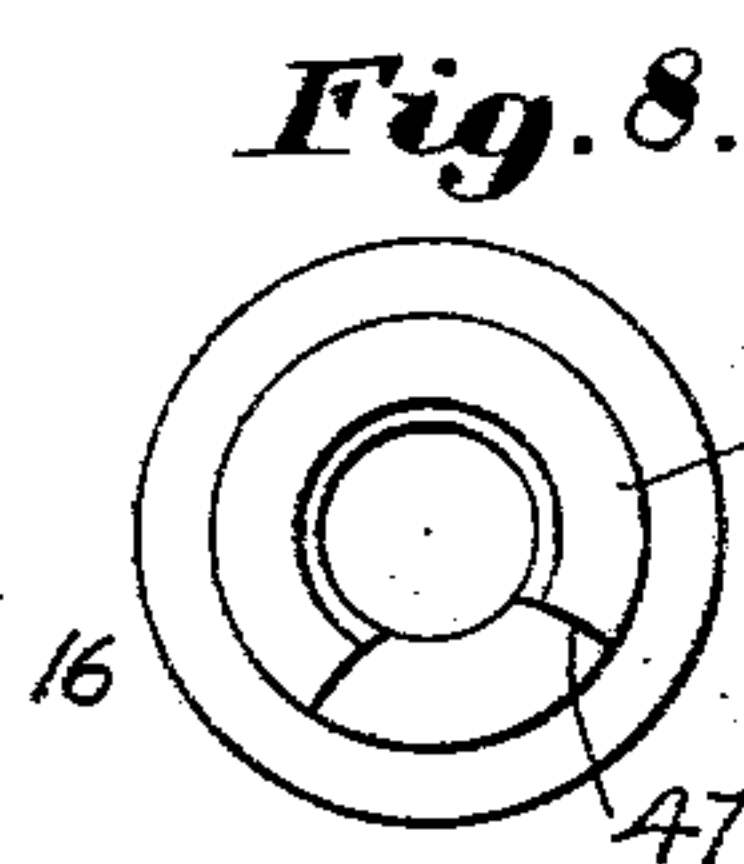
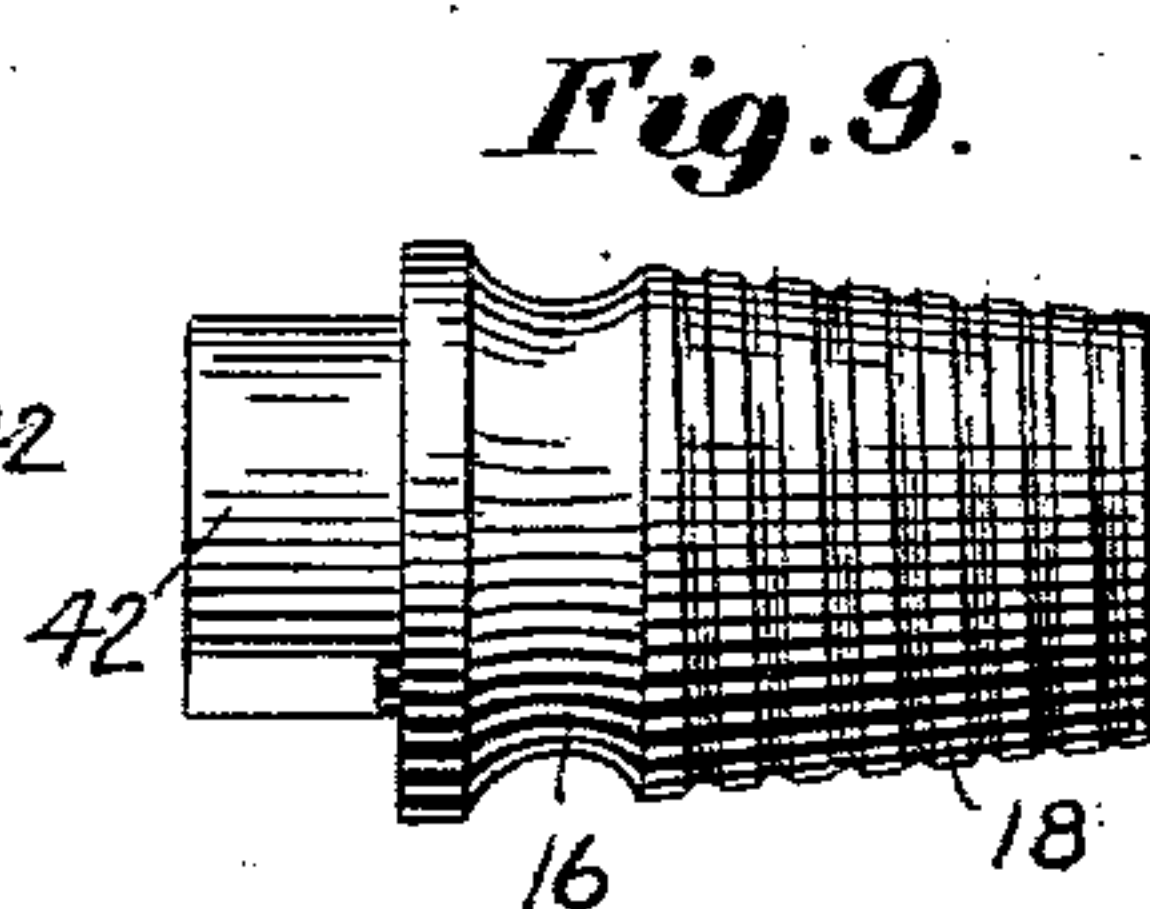
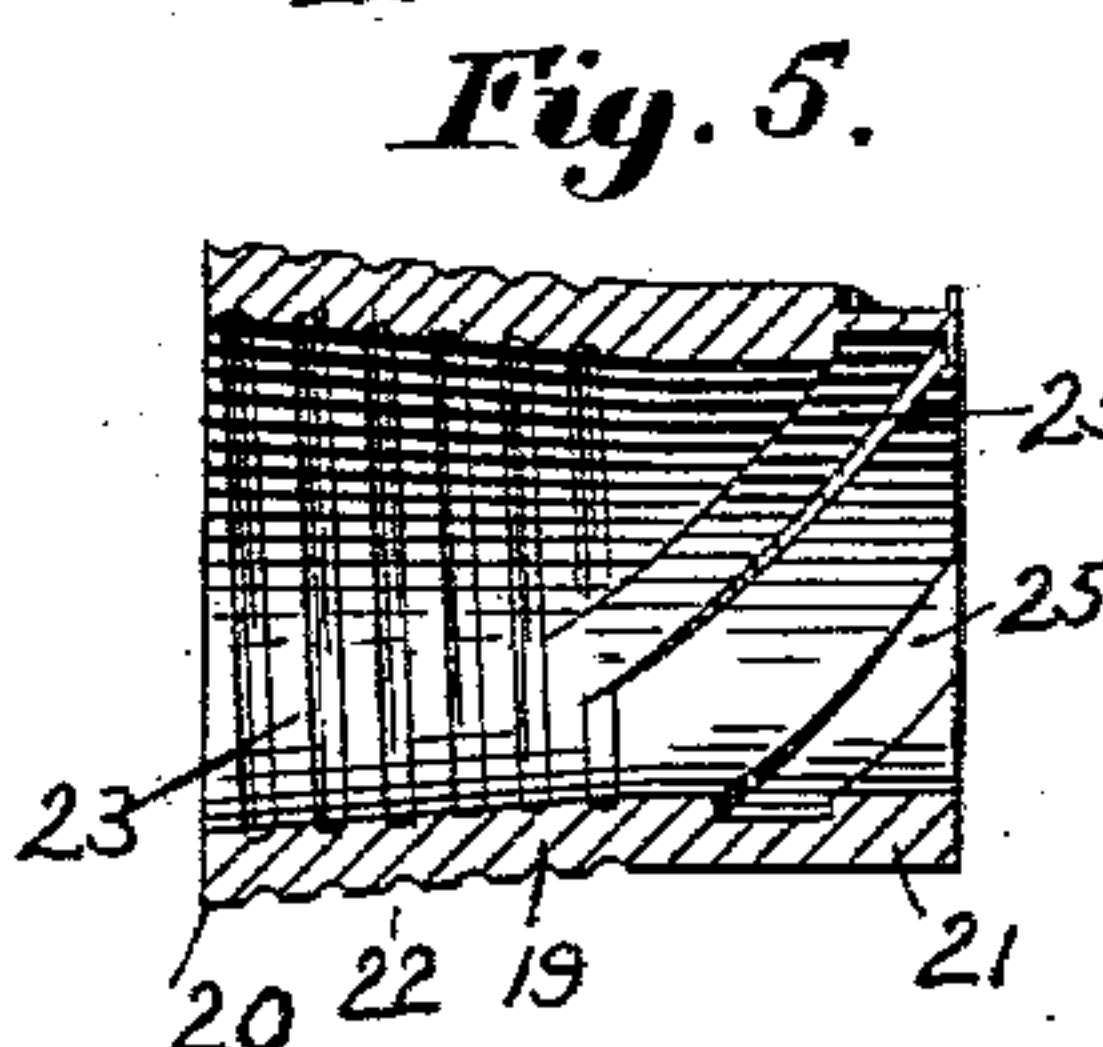
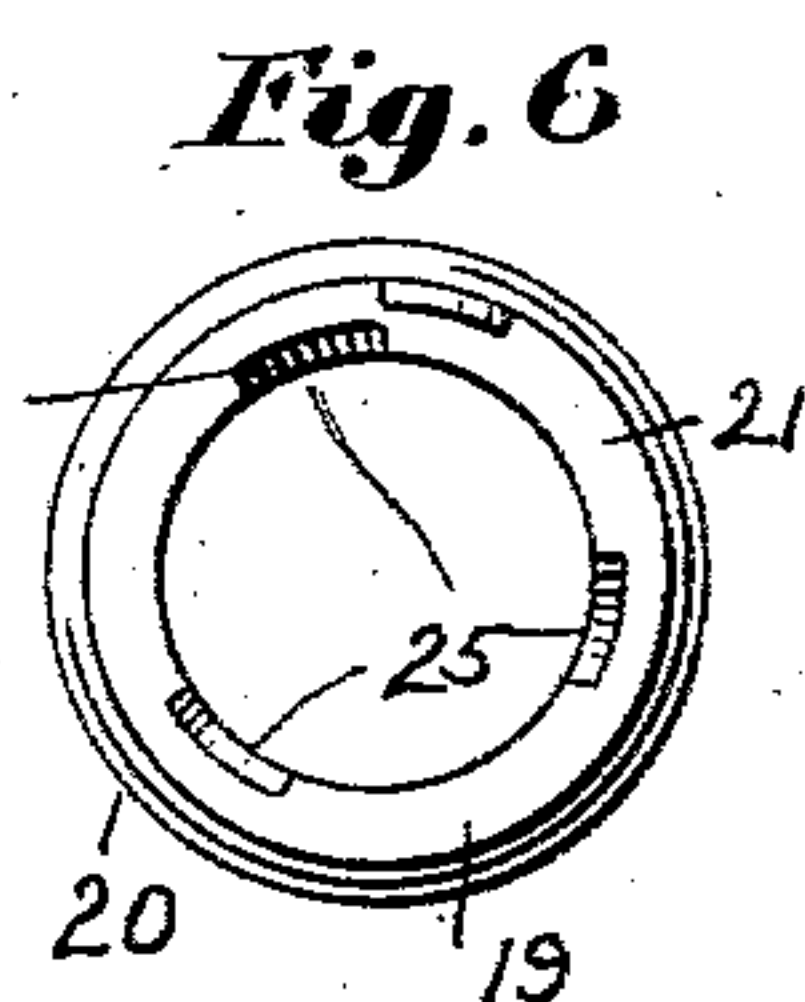
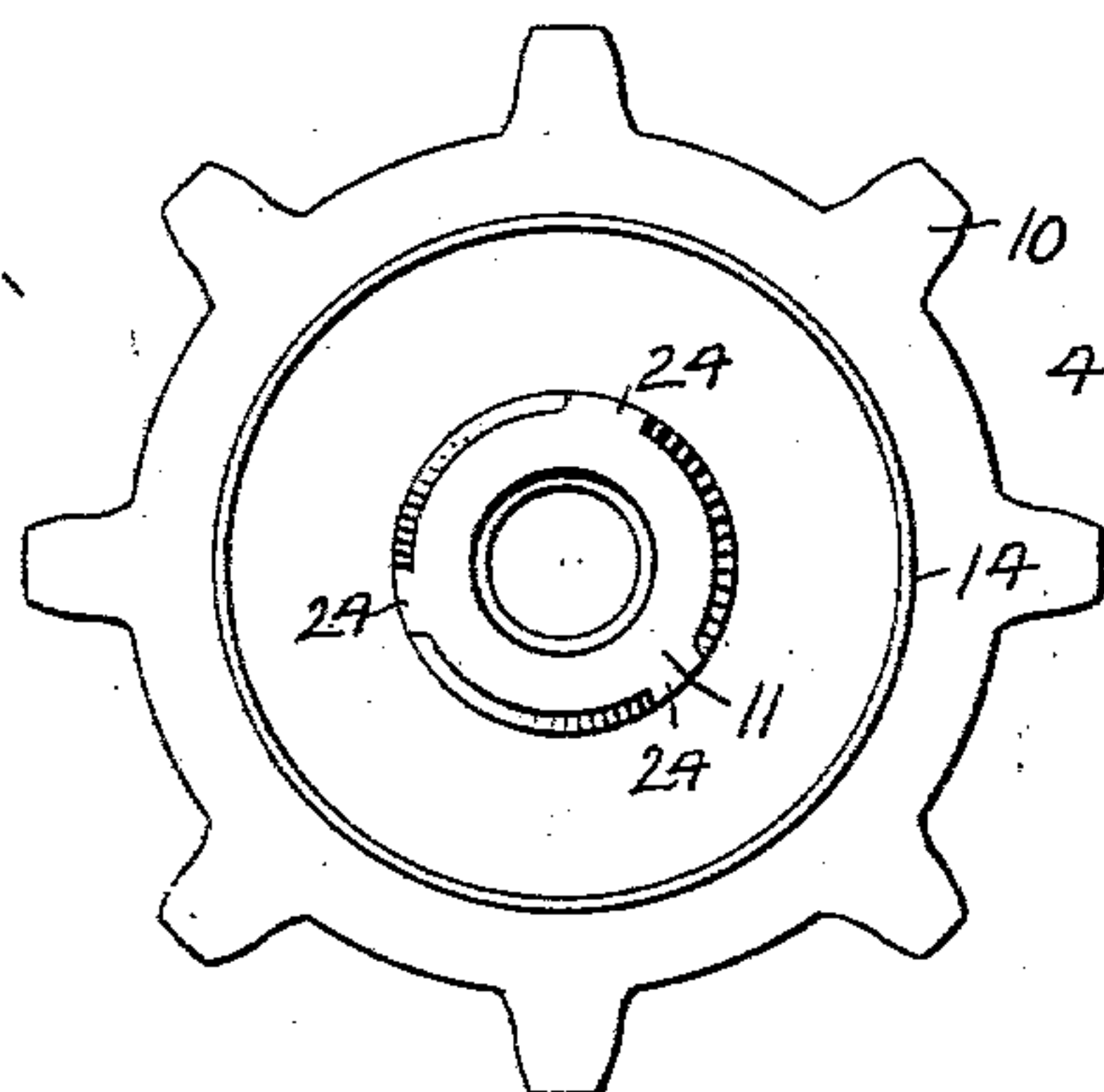
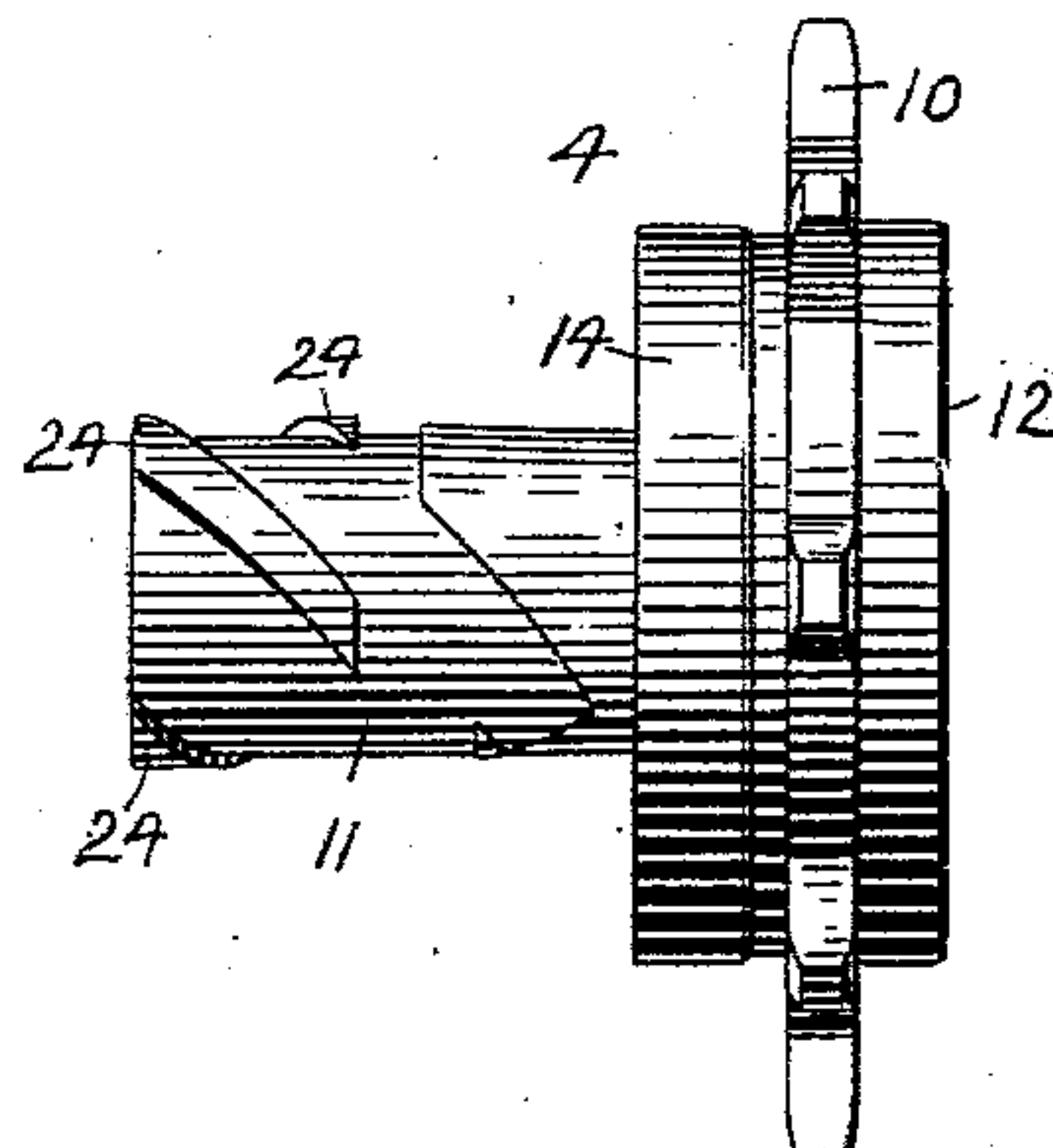
*Albert F. Rockwell*  
*By his Attorney,*  
*T. Hart Anderson*

A. F. ROCKWELL.  
COASTER BRAKE.

APPLICATION FILED DEC. 13, 1900.

NO MODEL.

2 SHEETS—SHEET 2.

*Fig. 3.**Fig. 4.**Fig. 7.**Fig. 8.**Fig. 9.**Fig. 5.**Fig. 6.**Fig. 10.**Fig. 11.*

WITNESSES

Walter E. Lombard  
E. M. Turbington

INVENTOR

Albert F. Rockwell,  
By his Attorney,  
W. H. Anderson



## UNITED STATES PATENT OFFICE.

ALBERT FENIMORE ROCKWELL, OF BRISTOL, CONNECTICUT.

## COASTER-BRAKE.

SPECIFICATION forming part of Letters Patent No. 745,672, dated December 1, 1903.

Application filed December 13, 1900. Serial No. 39,700. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT FENIMORE ROCKWELL, a citizen of the United States, residing at Bristol, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Coaster-Brakes; and I do hereby 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.

The present invention relates to improvements in controlling mechanism for bicycles and the like, and more particularly to certain improvements in coaster-brake mechanism.

The present invention is more particularly directed to certain improvements on the device disclosed in an application for Letters Patent of the United States filed by Harry Pond Townsend, dated the 10th day of October, 1898, Serial No. 693,117; and it has for its object mainly to improve the clutch connection between the driver and the hub and brake mechanism.

Another object is to greatly simplify the parts and to render them capable of being easily assembled and to greatly strengthen and render more positive the action of the device.

To the above ends the present invention consists of the devices and combinations of devices which will be hereinafter described and claimed.

The present invention is shown in the accompanying drawings, in which—

Figure 1 shows a portion of the rear frame of a bicycle with my improved coaster-brake applied thereto. Fig. 2 shows a longitudinal sectional view through the hub of the rear wheel and the coasting-brake mechanism. Fig. 3 shows an inner face view of the braking and its support. Figs. 4, 5, and 6 show, respectively, a side elevation and sectional and end elevations of the movable clutch member. Fig. 7 shows a side elevation of the clutch-controller. Figs. 8 and 9 show, respectively, end and side elevations of the brake-actuator. Figs. 10 and 11 show, respectively, end and side elevations of the driver.

Similar reference characters will be employed throughout the specification and drawings to designate corresponding parts.

In the drawings, 1 indicates a portion of the rear frame of a bicycle, in which is supported in the usual manner the axle 2.

Upon the axle 2 is mounted the hub 3, and at one end of the hub the driver 4, and at the opposite end the brake mechanism 5.

The hub 3 is supported to turn upon ball-bearings 6 and 7 and the driver upon a ball-bearing 8. The balls of the bearings 6 and 7 are contained in ball-retainers 9, but as they form no part of the present invention a description thereof is deemed unnecessary.

The driver consists of a toothed wheel 10, which may be provided with sprocket-teeth, as shown, for use in chain-driven wheels or with any suitable form of gear-teeth for use in chainless wheels. The driver also comprises a long sleeve 11, which is mounted to turn on the axle 2 and is projected within the hub 3 and about which said hub is free to turn.

The toothed wheel 10 and sleeve 11 may, if desired, be formed integrally with each other; but it is preferred to form them as shown, wherein the toothed wheel 10 is provided with internal screw-threads which engage mating threads upon the enlarged end of the sleeve 11, it being locked thereon by means of a combined nut and dust-cap 12, screwed upon a threaded portion 13 of the sleeve 11.

A dust-guard 14 is held between the toothed wheel 10 and a flange 15 of the sleeve 11 and projects over the space between the end of the hub and the enlarged end of the sleeve, thus preventing the entrance of dust and dirt into the bearings and the internal mechanism.

The driver 4 is designed to be connected to the hub 3 when turned in a forward direction and to the brake mechanism 5 when turned in a backward direction, as in "back pedaling," and when the driver is held stationary by the rider through the pedals or is turned forward at a less rate of speed than the wheel is turning the hub is disconnected from the driver, and the wheel is permitted to move forward by its own momentum or by gravity, as in descending a grade, while the rider maintains control of the pedals, which is known as "coasting."

The brake mechanism comprises a brake-actuator 16, which is mounted to freely turn



upon the axle 2 to actuate the brake, and it is designed to be turned backward to actuate the brake by the driver when backward pressure is applied to the driver, as in back ped-

5 aling.

Suitable clutch mechanism is arranged to connect the driver with the hub upon a forward turning of the driver and with the brake-actuator to apply the brake upon a  
10 backward turning of the driver, and it is in this clutch mechanism, which will now be described, that the gist of the present invention resides. This clutch mechanism comprises a clutch socket or face 17, located  
15 upon the interior of the hub 3, and a tapered clutch-face 18, formed on the brake-actuator 16, the clutch-faces 17 and 18 being substantially parallel to each other with a space between, as clearly shown in the drawings.

A movable clutch member connected with the driver-sleeve is designed to engage the clutch-face 17 or the clutch-face 18, accordingly as the driver is turned forward or backward. This movable clutch member consists  
25 of a sleeve 19, which at one end is formed bell-shaped or flaring, as at 20, and at its other end substantially cylindrical, as shown at 21. The flaring end of the movable clutch member is interposed between the clutch-  
30 face 17 of the hub and the clutch-face 18 of the brake-actuator and is provided with an external clutch-face 22, designed to engage the clutch-face 17, and an internal clutch-  
35 face 23, designed to engage the clutch-face 18. A lateral movement of the tapering movable clutch member will cause it to become connected with the hub or the brake-actuator, according to the direction in which it is moved. This lateral movement is imparted by the  
40 driver 4, and for this purpose the driver-sleeve 11 of said driver is provided with external spiral ribs 24, which engage corresponding spiral grooves 25, formed on the inner surface of the cylindrical portion 21 of the movable clutch member.  
45

The operation of the parts as so far described is as follows: The hub 3 is normally disconnected from the driver 4 and the brake mechanism 5. If the rider desires to propel  
50 the wheel forward, he turns the pedals (not shown) in a forward direction, and the pedals by suitable connecting devices (not shown) impart a forward turning movement to the driver. This causes the driver-sleeve to turn  
55 relatively to the movable clutch member, and by means of the complementary ribs and grooves the movable clutch member is moved toward the right as the device is shown in Fig. 2, thus causing the clutch-faces 22 and  
60 17 to become engaged and connecting the driver and hub for forward propulsion of the wheel. If it is desired to coast, the rider retards the pedals, whereupon the forward turning of the hub will cause the movable clutch  
65 member to turn with relation to the driver-sleeve, and thus move toward the left, dis-

connecting the hub and permitting the wheel to advance freely while the rider still retains his feet on the pedals. If it should be desired to actuate the brake to retard the wheel, back  
70 pressure is applied to the pedals, which causes the driver to turn backward, thus moving the movable clutch member to the left as the device is shown in Fig. 2 and causing the clutch-  
75 faces 23 and 18 to become engaged, connecting the driver and brake-actuator, when further back pressure will bring the brake mechanism into operation.

I desire to particularly call attention at this point to the relative location of the clutch-  
80 faces on the hub, brake-actuator, and movable clutch member, it being noticed that the flaring part of the movable clutch member almost fills the space between the clutch-faces on the hub and brake-actuator, so that but a  
85 slight lateral movement of the movable clutch member is necessary to shift its connection from the hub to the brake-actuator or from the brake-actuator to the hub, and thus there is none of that objectionable loose and jerky  
90 action of the pedals which is present in those coaster-brakes requiring a considerable range of movement of the driver and the movable clutch member to shift the connection.

The shifting of the movable clutch member  
95 is caused by a relative turning movement of the driver-sleeve 11 and said clutch member, such relative movement taking place during the time that the movable clutch member is moving from one connection to the other.  
100

In order to insure that such movement will instantly occur upon a change in the direction of pressure on the pedals, there is provided a clutch-controller comprising a sleeve  
105 26, which is substantially cylindrical and which is fitted loosely in a chamber 27 within the hub 3, such sleeve bearing at one end against a shoulder 28 on the hub and at its opposite end against the balls of the bearing  
110 7. This sleeve 26 carries at its inner end a stud or pin 29, which engages a spiral groove 30, formed in the exterior of the cylindrical end of the movable clutch member 19 and extending in the opposite direction to the interior grooves 25. The function of this clutch-  
115 controller is to act as a drag or retarder to the movable clutch member and prevent its turning with the driver-sleeve until it has moved laterally the distance required to form its connection with the hub or with the brake-  
120 actuator. While this clutch-controller is a desirable feature, it is not an essential feature, as the device would be effective without it. Still it insures a more effective operation, and I prefer to employ it.  
125

Like the construction of the application referred to, the brake of the present invention comprises an expansible brake-ring; but in several details the brake mechanism has been modified and improved, as will now appear.  
130

The brake-ring 31 is mounted upon a substantially cylindrical bed or support 32, lo-



cated at the inner face of a disk or plate 33, mounted upon the axle 2 and provided with an arm 34, which is connected by means of a strap 35 to the horizontal bar of the frame 1, so that said brake-support is held immovable against the braking action. The brake-ring 31 at one end is held from movement as by means of a hardened stop-pin 36, and its opposite end is designed to be moved in the direction of movement of the hub, whereby to expand said ring and bring it into contact with the inner surface of a brake drum or flange 37, carried by the hub and surrounding said brake-ring, as clearly shown in Fig. 2.

The brake support or bed 32 is preferably cut out, as shown at 38, for lightness, and is also cut out at 39, forming a recess or seat for the brake-expanding lever 40 and a bearing 41 for the reduced end 42 of the brake-actuator 16.

The brake-expanding lever is pivotally mounted upon a stud or pivot 43, which is supported at one end in a plate 44, surrounding and supported by the reduced end of the brake-actuator, and at its opposite end in a seat 45, formed in the plate 33. The plate 44 at its lower end fits between the walls of the cut-out portion 39 and is thus held from moving and forms a firm support for the brake-expanding lever 40.

The brake-expanding lever 40 may be formed in a single piece, if desired; but it is economically formed, as shown, of several similarly-shaped pieces, and said lever at its upper end is provided with a shoulder 46, which is arranged to be engaged by a shoulder 47, formed by notching the reduced end 42 of the brake-actuator. At its lower end the brake-expanding lever is provided with a shoulder 48, which engages the free end of the brake-ring.

The operation of the brake mechanism is as follows: A turning of the brake-actuator 16 by the backward turning of the driver in back pedaling will cause the shoulder 47 to rock the lever 40 about its fulcrum 43, and thus move the free end of the brake-ring in the direction of turning of the hub, which is revolving in the direction of the arrow shown in Fig. 1, and this causes the brake-ring to be expanded and thrown into contact with the inner face of the brake drum or flange 37, which as it is moving in the direction of expansion of the brake-ring has a tendency to still further expand such ring and reinforce its frictional engagement.

It is believed that the operation of the device has been sufficiently described in connection with the foregoing description of its form and arrangement, and a further description thereof is deemed unnecessary.

It is of course to be understood that while the embodiment of my invention which I have illustrated and described is the preferred form thereof said invention is not, however, restricted thereto, the gist of the invention re-

siding in the complementary clutch connections between the driver and the hub and brake mechanism, and in so far as I am at present advised of the state of the art I believe I am the first to provide in devices of this character a movable clutch member comprising a flaring sleeve which is interposed between complementary clutch members on the hub and brake mechanism and brought into engagement therewith by a lateral movement.

Having described my invention, I claim as new and desire to protect by Letters Patent of the United States—

1. The combination with a wheel-hub and brake mechanism, of a driver, a flaring clutch-sleeve interposed between complementary clutch-faces on the hub and brake mechanism, and an operative connection between said clutch-sleeve and driver, substantially as described.

2. The combination with a wheel-hub and brake mechanism, of a driver therefor, a laterally-movable clutch member having interior and exterior clutch-faces interposed between and arranged to engage complementary faces on the hub and brake mechanism, and connections between the driver and movable clutch member arranged to move said clutch member laterally, substantially as described.

3. The combination with a wheel-hub and a brake, of a driver for the hub and brake, a brake-actuator, clutch-faces on the wheel-hub and brake-actuator, a flaring clutch-sleeve interposed between the clutch-faces on the wheel-hub and brake-actuator, and connections between the driver and the clutch-sleeve for connecting said clutch-sleeve with the hub or brake-actuator, substantially as described.

4. The combination with a wheel-hub having an interior clutch-socket, of a brake mechanism comprising a brake-actuator having a tapered clutch-face, a flaring clutch-sleeve interposed between the clutch-socket on the hub and the clutch-face of the brake-actuator, a driver, and connections between the driver and the clutch-sleeve for moving said sleeve laterally to cause it to connect said driver with the hub or the brake-actuator, substantially as described.

5. The combination with a hub and brake mechanism, of a driver therefor, a movable clutch member, complementary clutch members on the hub and brake mechanism, a spiral connection between said driver and movable clutch member, and a clutch-controller having a pin engaging a spiral groove in the movable clutch member, substantially as described.

6. The combination with a hub and brake mechanism, of a driver therefor, a movable clutch member, complementary clutch members on the hub and brake mechanism, a spiral connection between the driver and the movable clutch member and a clutch-con-



troller engaging the movable clutch member and movable relatively thereto, substantially as described.

7. The combination with a hub and brake  
5 mechanism, of a driver therefor, a movable clutch member, complementary clutch members on the hub and brake mechanism, means actuated by the driver for moving the movable clutch member, and a clutch-controller

provided with a pin-and-groove connection 10 with the movable clutch member, substantially as described.

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

ALBERT FENIMORE ROCKWELL.

Witnesses:

CHAS. R. RILEY,  
E. D. WHITMAN.