

No. 680,900.

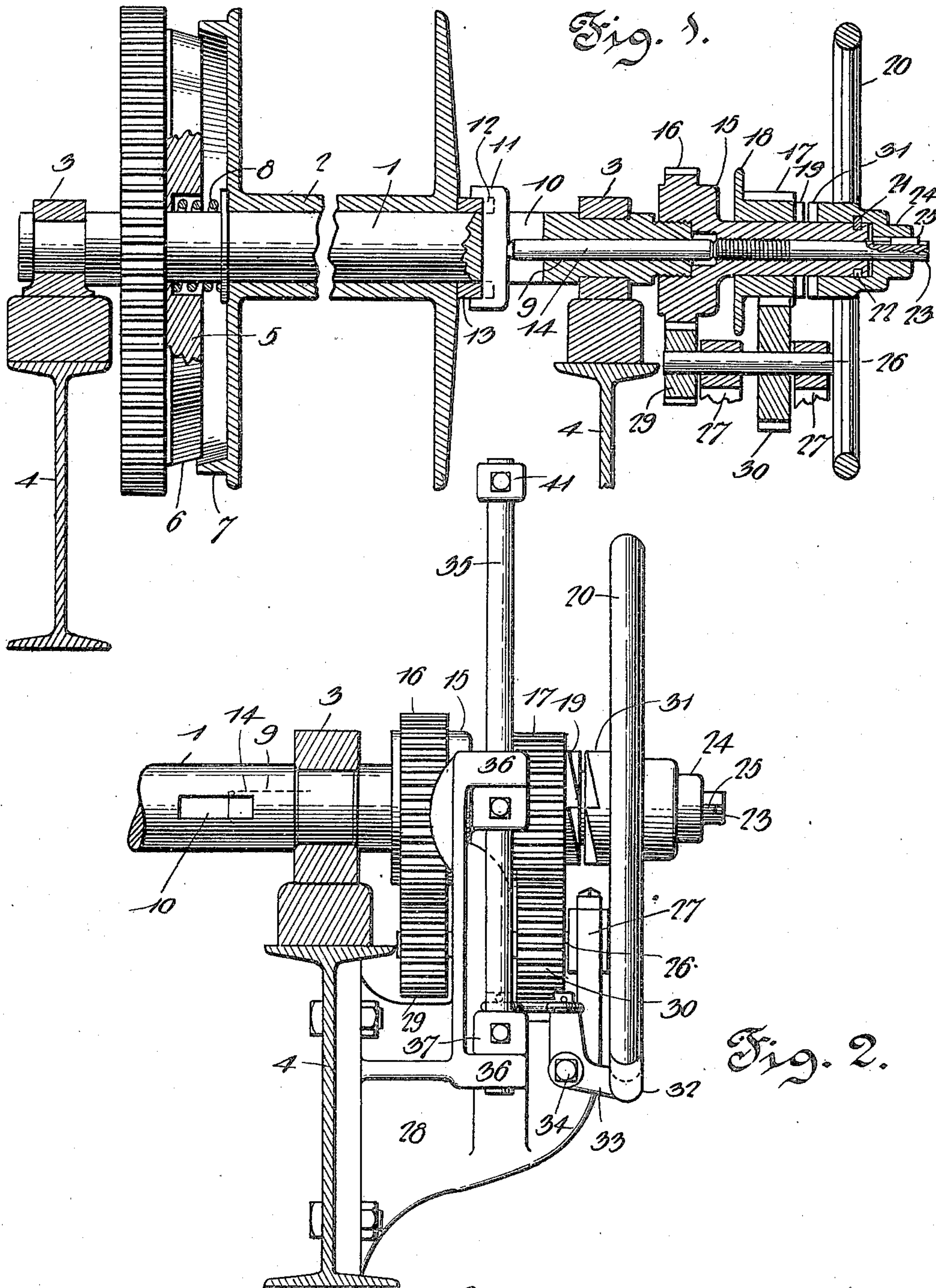
Patented Aug. 20, 1901.

E. TURNEY.  
FRICTION CLUTCH.

(Application filed Jan. 12, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
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*John Garner*

*Edward Turney*, Inventor.  
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Attorneys

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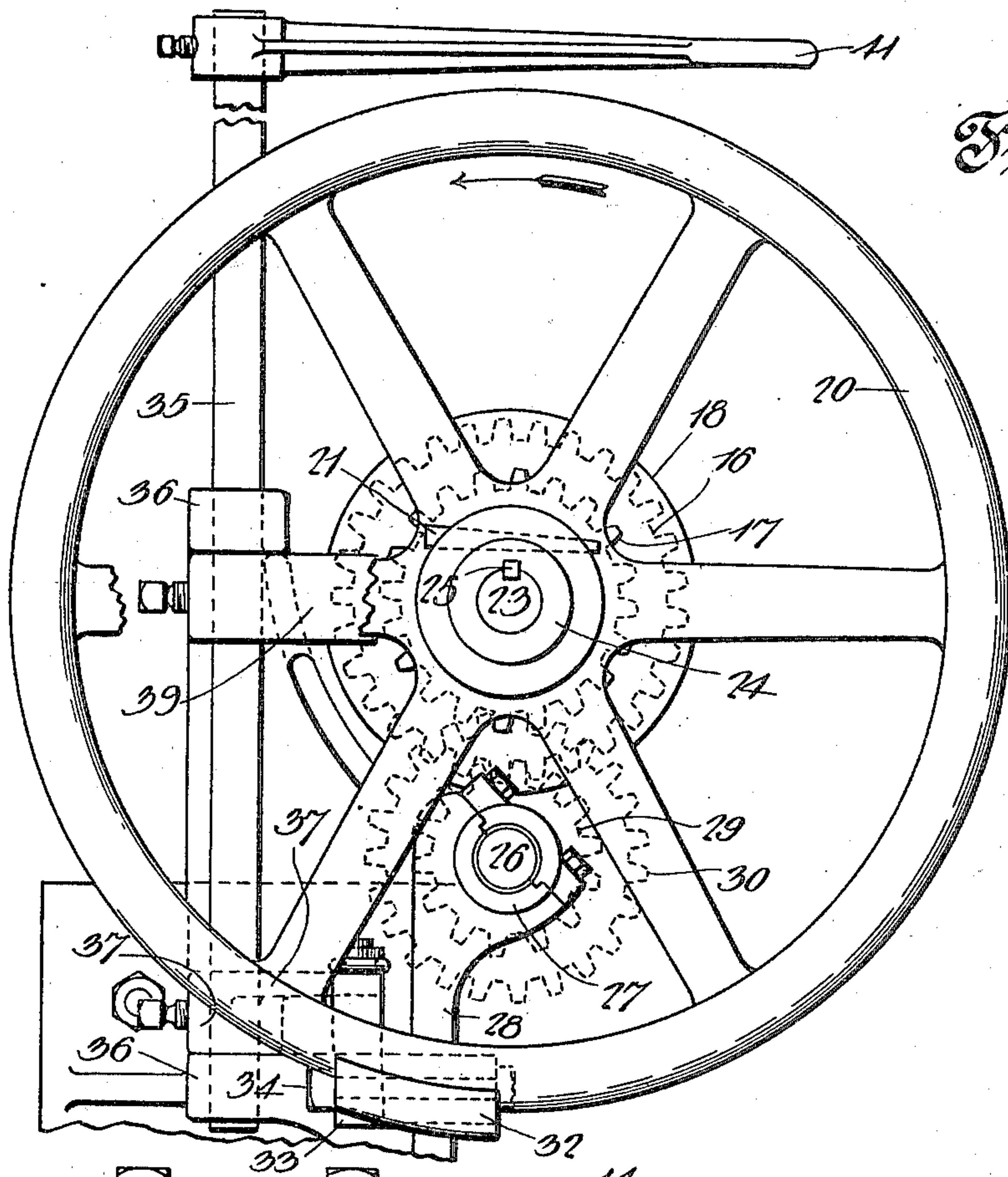


Fig. 3.

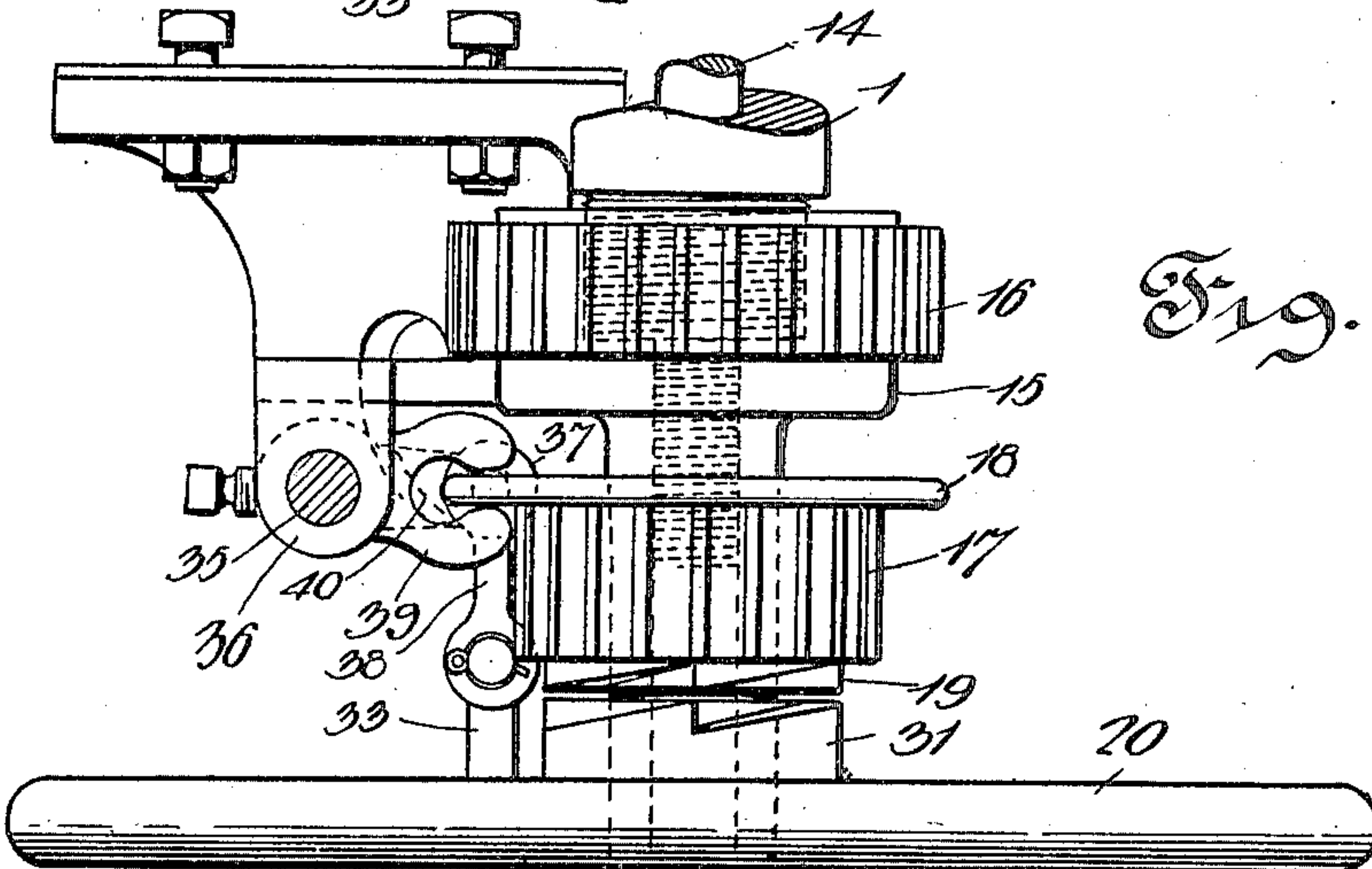


Fig. 4.

Witnesses

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# UNITED STATES PATENT OFFICE.

EDWARD TURNEY, OF PORTLAND, OREGON.

## FRICITION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 680,900, dated August 20, 1901.

Application filed January 12, 1901. Serial No. 43,047. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD TURNEY, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Friction-Clutch, of which the following is a specification.

My invention is an improved friction-clutch adapted for use on logging, hoisting, or stationary engines, and is an improvement on the friction-clutch for which Letters Patent of the United States No. 607,557 were granted to me and to my assignee, the Smith & Watson Iron Works, of Portland, Oregon, July 19, 1898.

One object of my invention is to provide an improved clutch which will reduce to a minimum the stress on the cable and the friction and wear on the working parts of the engine.

A further object of my invention is to effect improvements in the mechanism by which the clutch may easily and quickly be adjusted when the engine is running or is at rest to throw a winding-drum into or out of engagement with the driving-shaft.

In the accompanying drawings, Figure 1 is a sectional view of a friction-clutch embodying my improvements. Fig. 2 is a partial side elevation of the same and partially a section of the same. Fig. 3 is an end elevation of the same. Fig. 4 is a partial top plan view of the same.

The shaft 1 for the spool or winding-drum 2 is journaled in bearings 3 on the frame or bed of an engine. The engine is not here shown, as it forms no part of my improvements, but portions of the frame or bed thereof are indicated by the reference-numeral 4. The spool or drum 2 is mounted loosely on the shaft and is adapted to move longitudinally thereon. The shaft is provided near one end with a clutch-disk 5, having a laterally-projecting flange or rim 6, and the spool or drum is constructed with a flange or rim 7, which is adapted to frictionally engage the flange or rim 6 when the spool or drum is moved outward against the tension of the spring 8, and thereby lock the spool or drum to the shaft 1 and cause the same to rotate therewith.

The shaft 1 is provided with a longitudinal axial bore or passage 9 in its inner end and with a transverse or radial slot 10, which communicates with the outer end of said bore. In the said slot 10 is fitted a jaw-shaped plate 11, which has a longitudinal movement in said slot and is provided with jaws at its extremities, which engage notched seats 12 in a sleeve or collar 13, which is loose on said shaft 1, adapted to move longitudinally thereon, and bears against the inner end of the drum or spool 2. In the bore 9 of shaft 1 is a longitudinally-movable pin 14, the outer end of which is swiveled or otherwise suitably connected to the plate 11. The inner end of the shaft 1 is screw-threaded, as shown, and to the same is screwed a sleeve-nut 15, formed with which or otherwise secured fast thereto is a gear-wheel 16. A gear 17, which is smaller or of less diameter than the gear 16, is loose and adapted to play longitudinally on the sleeve-nut 15 and is provided on one side, which I will call the "outer" side, with an annular flange 18. On the inner side of said gear 17 is formed a clutch member 19. A hand-wheel 20 is loose on the sleeve-nut 15 at the inner extremity of the latter and is secured against independent longitudinal movement thereon by a transversely-disposed key 21, which operates in an annular groove 22, with which said sleeve-nut is provided. A pressure-screw 23 engages the threaded bore of the sleeve-nut 15. A portion of the said pressure-screw is unthreaded, as shown, and the said hand-wheel 20 is provided with an extended hub 24, which forms a cap for the end of sleeve-nut 15 and in which the pressure-screw is centered, the said pressure-screw being longitudinally movable in the said extended hub of hand-wheel 20 and splined thereto, as at 25, whereby the said hand-wheel and pressure-screw are prevented from rotating independently of each other. The outer end of said pressure-screw abuts against the inner end of said pin 14.

A shaft 26 is journaled in suitable bearings 27 on a bracket 28, which is bolted to the frame or bed 4. Fast on the said shaft is a pinion 29, which engages the gear 16 and is of considerably less diameter than said gear. Also fast on said shaft 26 is a gear 30, which en-



gages the gear 17 and is of less width than the latter, so that said gear 17 is kept in engagement or mesh with said gear 30 when moved longitudinally on the sleeve-nut 15 by the means and for the purpose hereinafter described. On the outer side of the hub of hand-wheel 20 is formed a clutch member 31, which is adapted to be engaged by the clutch member 19 of gear 17 when the latter is moved in one direction on the sleeve-nut 15 to lock said hand-wheel to said gear 17. Gears 16, 29, 30, and 17 constitute a differential gear, as will be understood.

A friction-brake 32, which is adapted to be applied to the rim of hand-wheel 20, is carried by a bell-crank lever 33, which is pivotally mounted on the bracket 28, as at 34. A vertically-disposed rock-shaft 35 is journaled in suitable bearings 36, with which said bracket 28 is provided. Said rock-shaft has a rock-arm 37, which is connected to the bell-crank lever 33 by a link 38. Said rock-shaft is also provided with a rock-arm 39, having an open notch 40 in the outer end thereof, which engages the flange 18 of the loose endwise-movable gear 17 and is further provided with a half-lever 41, by means of which said rock-shaft may be turned. It will be understood that when said rock-shaft 35 is turned in one direction the brake 32 is moved thereby out of engagement with the hand-wheel 20, and that hence the hand-wheel, together with the pressure-screw 23, will rotate with the shaft 1 and at the same rate of speed. It will be further understood that when the rock-shaft is turned farther in the same direction the gear 17 will be moved outward on the sleeve-nut 15 to clutch the same to said hand-wheel and that when said rock-shaft 35 is turned in the reverse direction said gear 17 will be first unclutched from said hand-wheel and the brake 32 subsequently applied to the latter.

The shaft 1 is continuously revolved when the engine is in operation. When it is desired to cause the drum to rotate with the shaft to wind the cable thereon, the shaft 35 is turned by the hand-lever in such manner as to apply the brake to the hand-wheel 20, and thereby retard the rotation thereof and also unclutch the gear 17 from the hand-wheel. The pressure-screw 23 being splined to the hand-wheel, as hereinbefore described, the rotation of the pressure-screw is hence also retarded; but, the sleeve-nut 15 continuing to revolve with the shaft, the pressure-screw is moved endwise in said sleeve-nut toward the drum, caused to also move the pin 14 and plate 11 in the same direction, and hence move the drum against the tension of the spring 8 into friction engagement with the friction-disk 16.

To release the drum 2 from the shaft 1 when the latter is in rotation, the shaft 35 is turned by the hand-lever in such manner as to disengage the brake 32 from the hand-wheel and

clutch the gear 17 to said hand-wheel, thereby through the differential gear causing said hand-wheel and the pressure-screw 23 to rotate in the same direction as the shaft, but at a higher rate of speed, thereby moving the pressure-screw outward in the sleeve-nut 15, releasing the pin and enabling the spring 8 to unclutch the members 6 7 of the shaft 1 and drum 2, respectively. Hence the drum may be clutched to and unclutched from the shaft 1 at will while the latter is revolving and without the necessity of first stopping the machine. Moreover, the friction between the drum and the shaft may be so regulated while the shaft is in rotation by the means and in the manner hereinbefore stated as to enable the drum to pay out the cable at the desired rate of speed. When the shaft 1 is at rest, the drum may be clutched thereto or unclutched therefrom manually by means of the hand-wheel and its connections, as will be understood.

I do not desire to limit myself to the precise construction and combination of devices hereinbefore described, as modifications may be made therein without departing from the spirit of my invention. Neither do I limit myself to the use of my improved friction-clutch in connection with a winding-drum, as the same may be employed in other connections, as is manifest.

Having thus described my invention, I claim—

1. The combination of a revoluble shaft having a fixed clutch member, an endwise-movable, loose clutch member on said shaft, a traveling or pressure screw, adapted when moved endwise to operate said loose clutch member, means to rotate said pressure-screw independently of said shaft, and to permit said pressure-screw to be revolved by said shaft, means to retard the rotation of and to release said pressure-screw, and a differential gear, including a clutch, to communicate rotary motion of said shaft to said pressure-screw and accelerate the rotation of the latter, substantially as described.

2. The combination of a revoluble shaft having a fixed clutch member, an endwise-movable loose clutch member on said shaft, a sleeve-nut fast with said shaft, an endwise-movable pressure-screw engaged by said sleeve-nut and adapted to operate said endwise-movable loose clutch member, a wheel revoluble with said sleeve-nut, means to retard the rotation of said wheel and a differential gear including a clutch, to connect said wheel to said shaft and rotate said wheel and said pressure-screw at a higher rate of speed than said shaft, substantially as described.

3. The combination of a revoluble shaft having a fixed clutch member, an endwise-movable loose clutch member on said shaft, a sleeve-nut fast with said shaft, an endwise-movable pressure-screw engaged by said



sleeve-nut and adapted to operate said end-  
wise-movable loose clutch member, a wheel  
revolvable with said sleeve-nut, a differential  
gear, including a clutch, to connect said  
5 wheel to said shaft, and communicate power  
from the latter to the former and rotate said  
wheel and said pressure-screw at a higher  
rate of speed than said shaft, a brake for said  
wheel, and means to operate said brake and

said differential-gear clutch, substantially as is  
described.

In testimony that I claim the foregoing as  
my own I have hereto affixed my signature in  
the presence of two witnesses.

EDWARD TURNEY.

Witnesses:

H. H. NEWHALL,

W. J. LYONS.