

No. 670,264.

Patented Mar. 19, 1901.

R. WILLETTS.
FRICTION CLUTCH.

(No Model.)

(Application filed May 7, 1900.)

2 Sheets—Sheet 1.

Fig. 1.

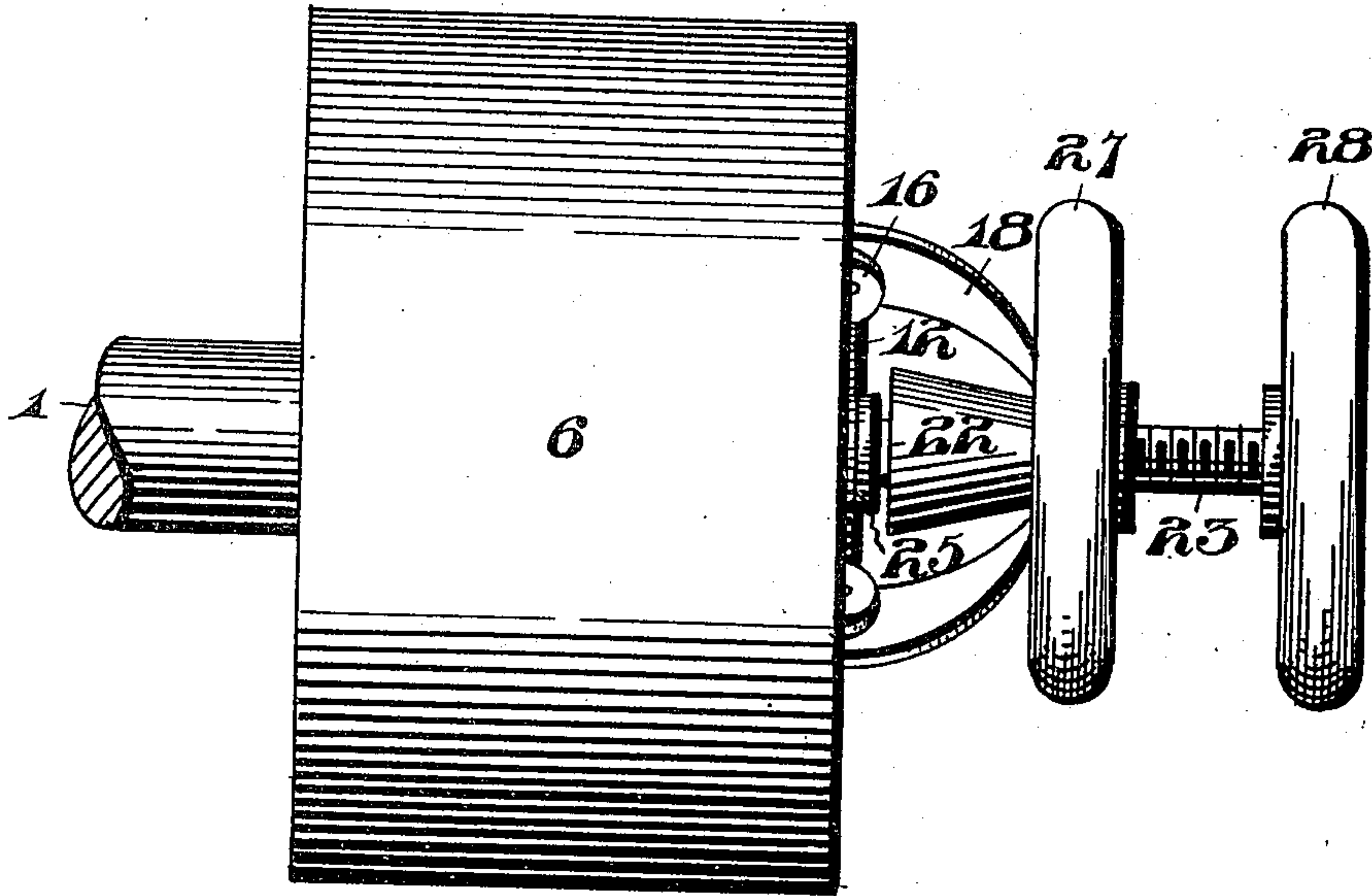
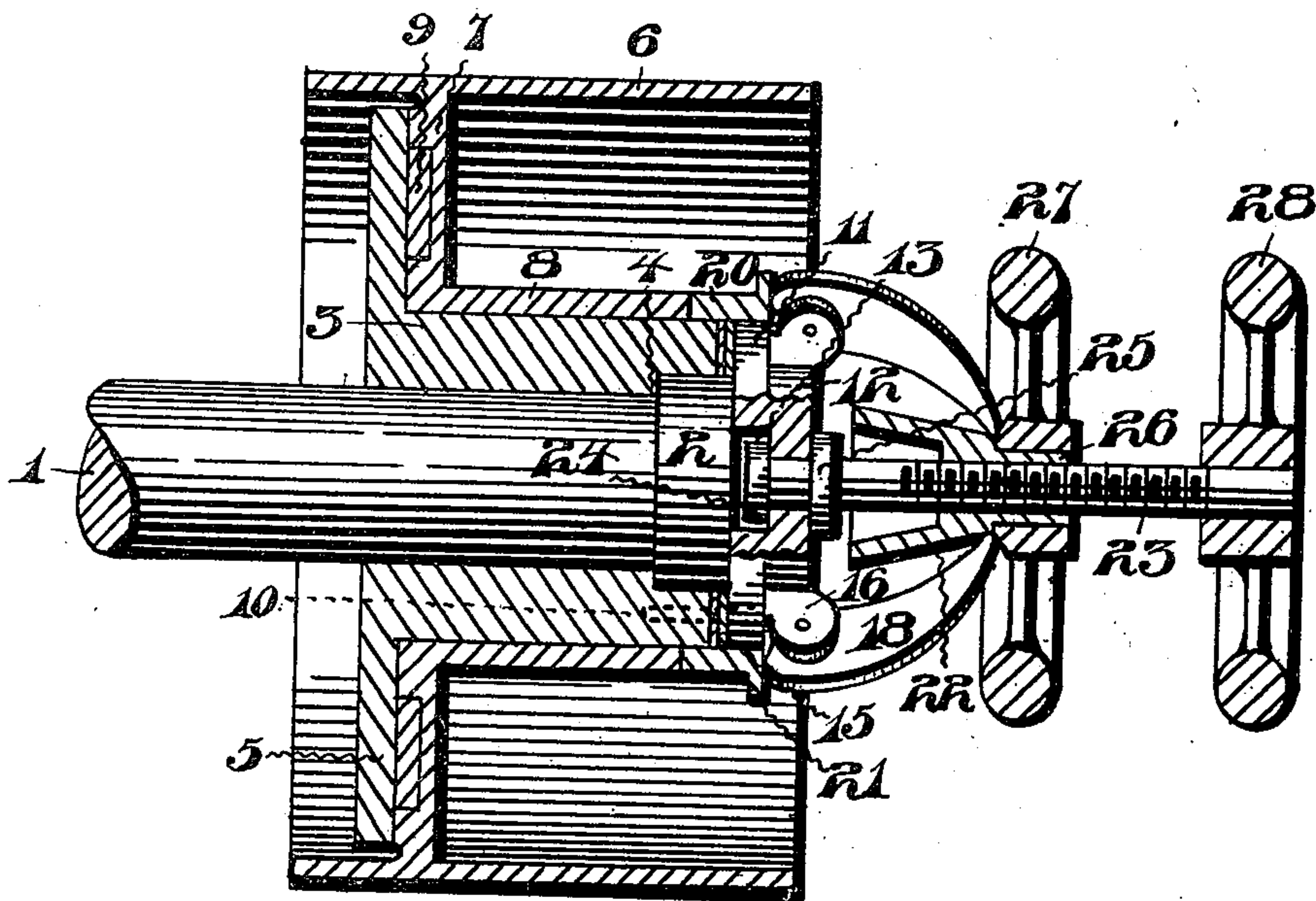


Fig. 2.



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2 Sheets—Sheet 2.

Fig. 3.

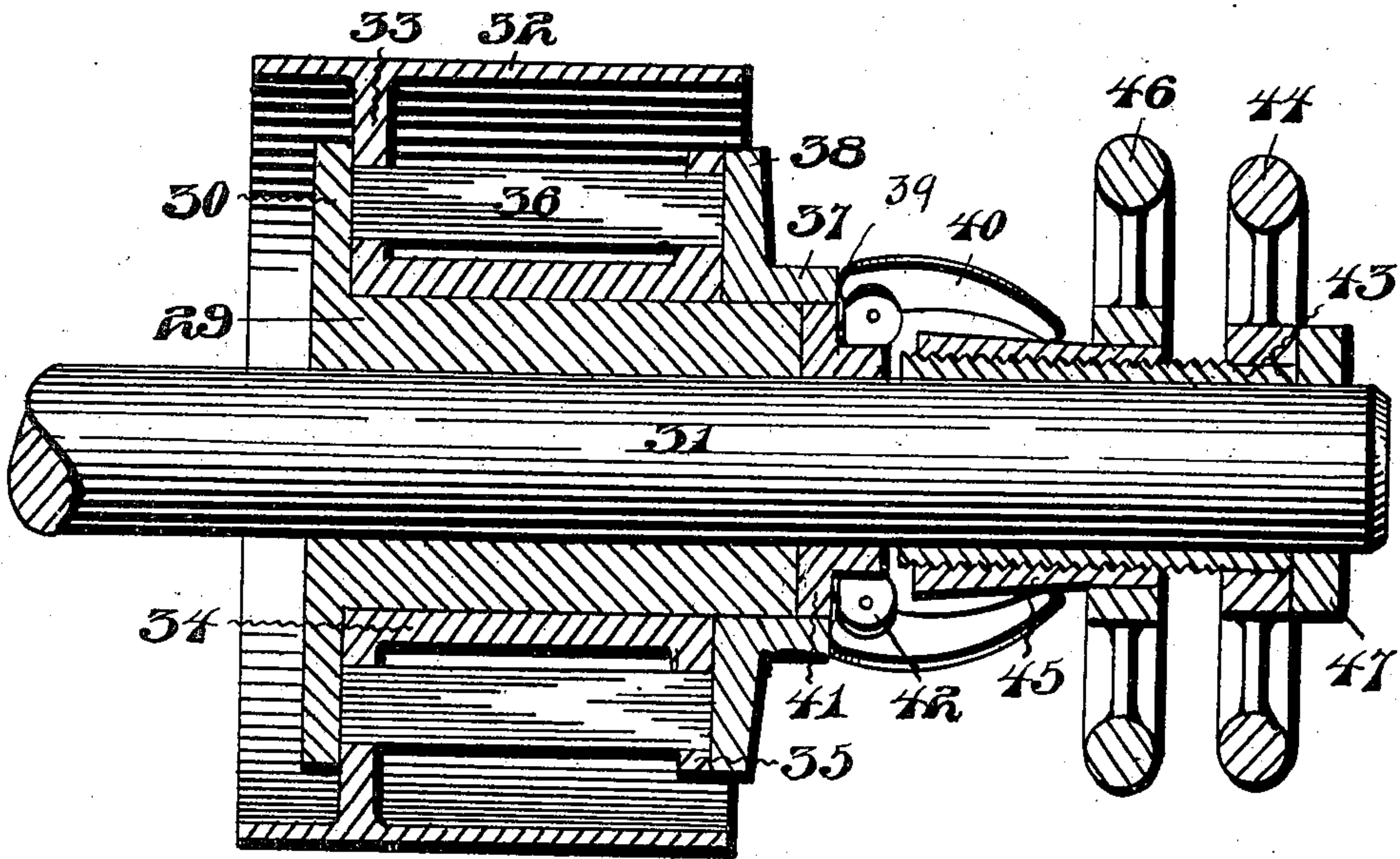


Fig. 4.

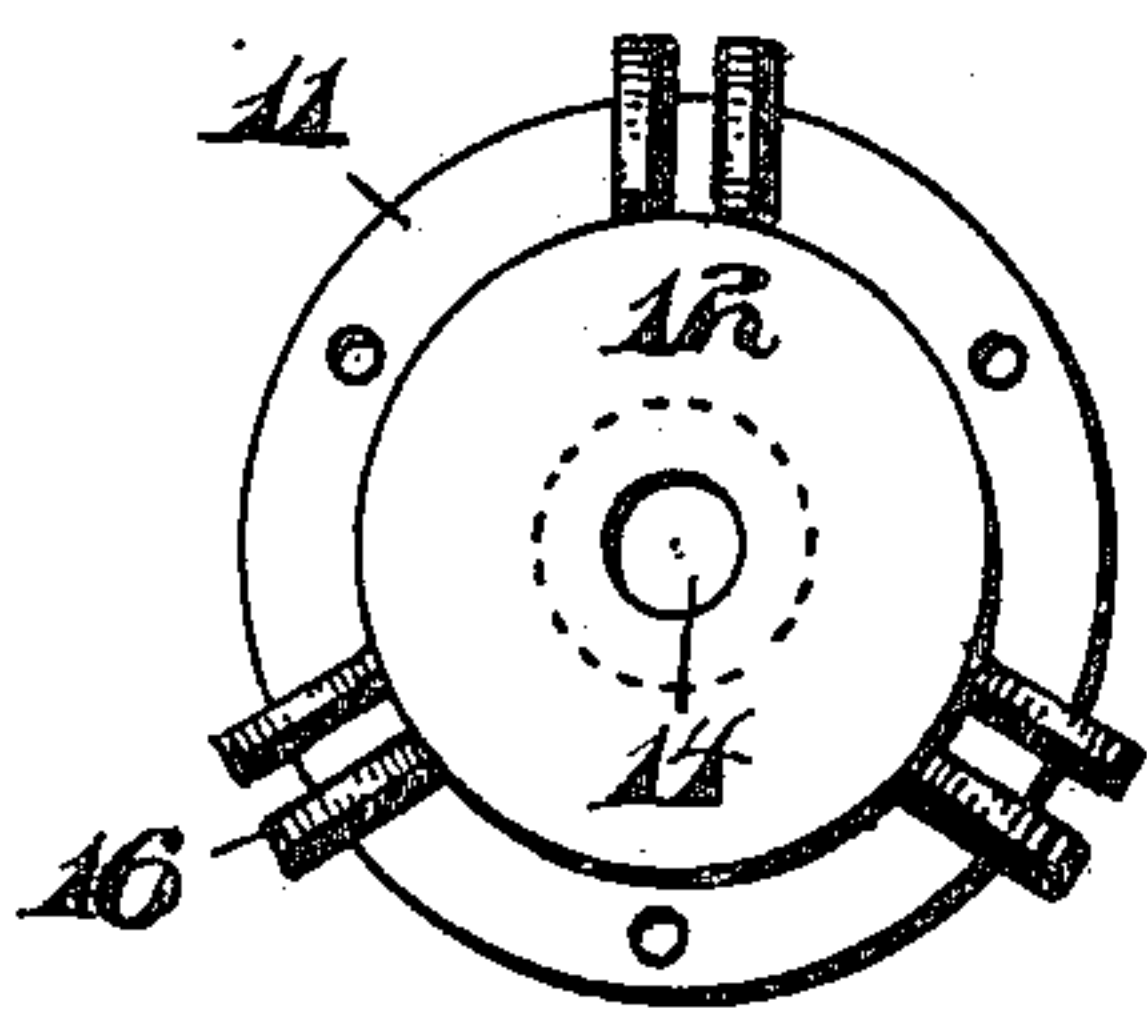


Fig. 5.

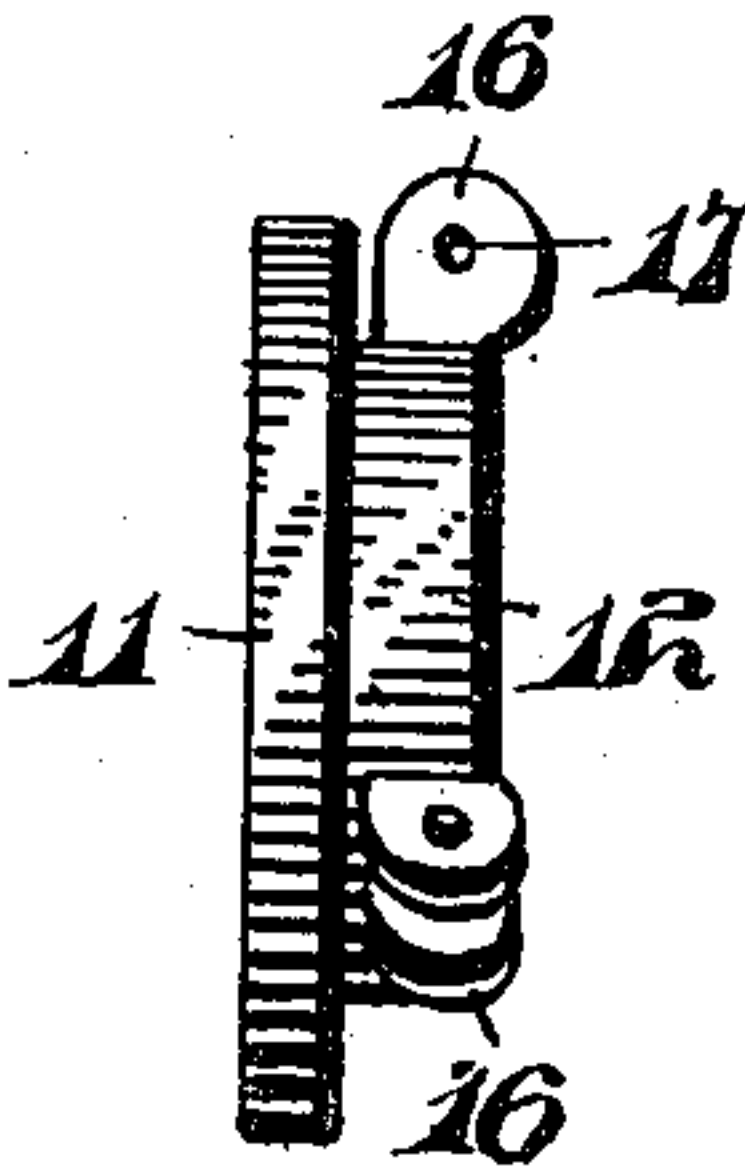


Fig. 6.

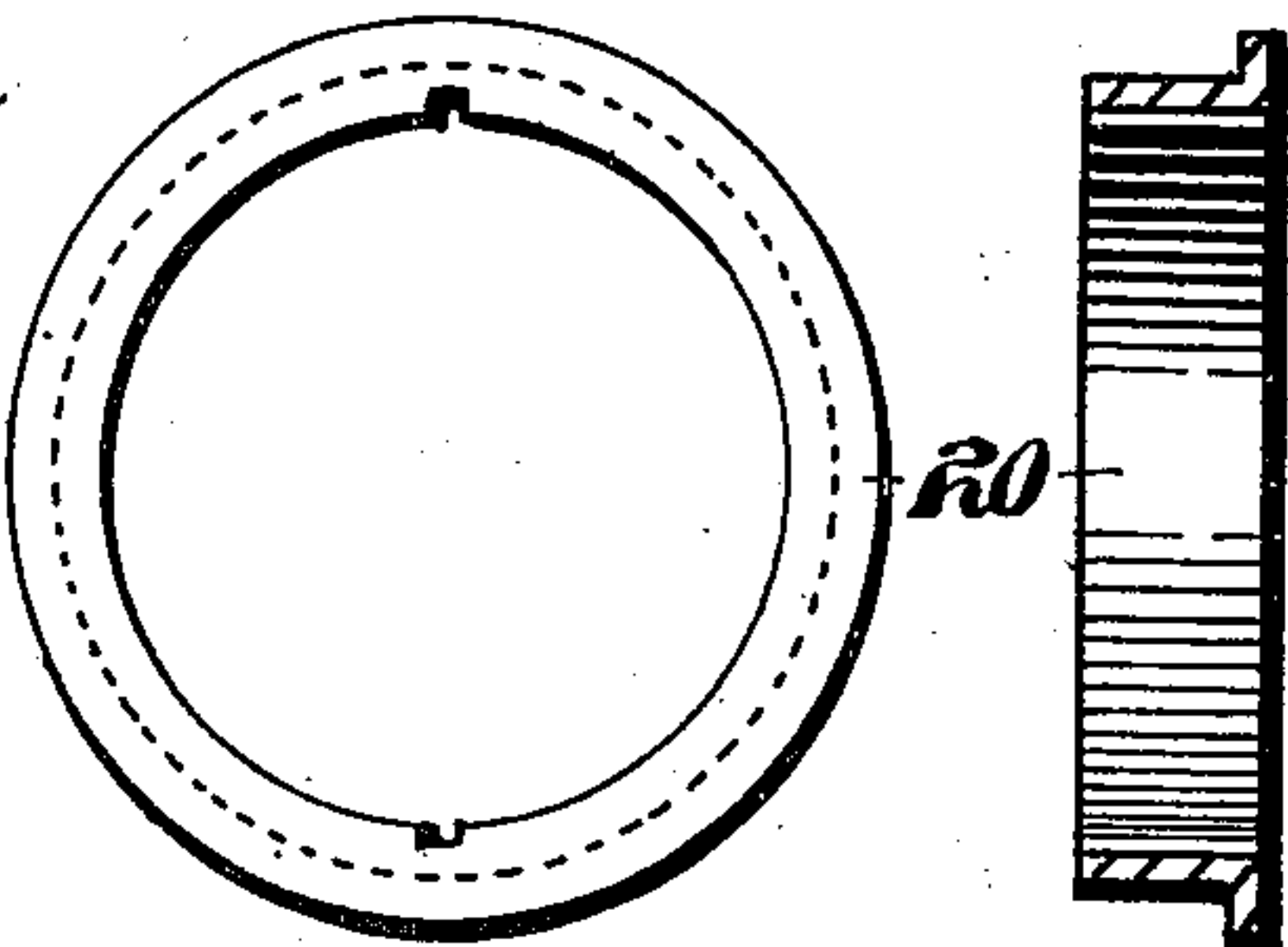


Fig. 7.

Fig. 8.

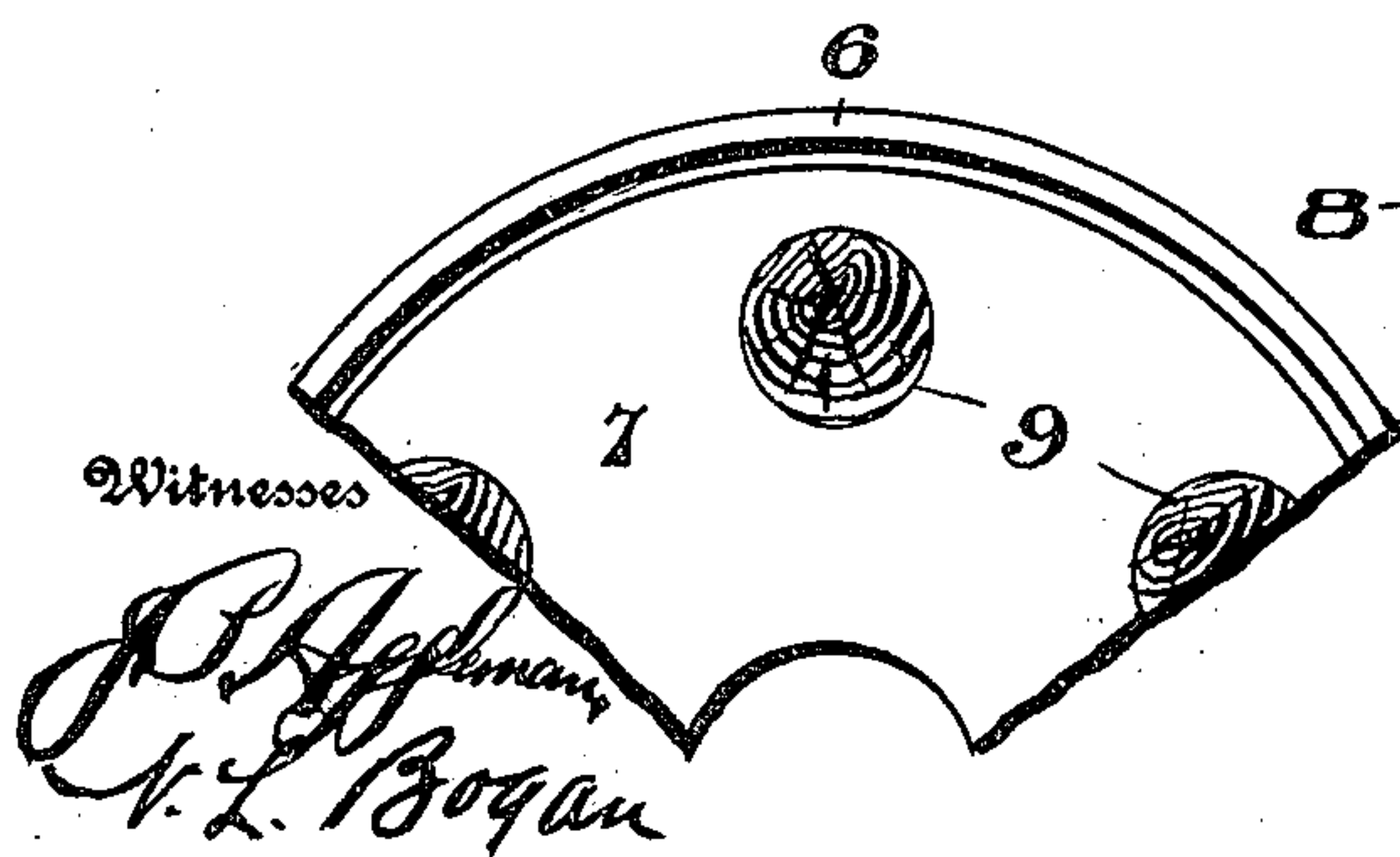


Fig. 9.

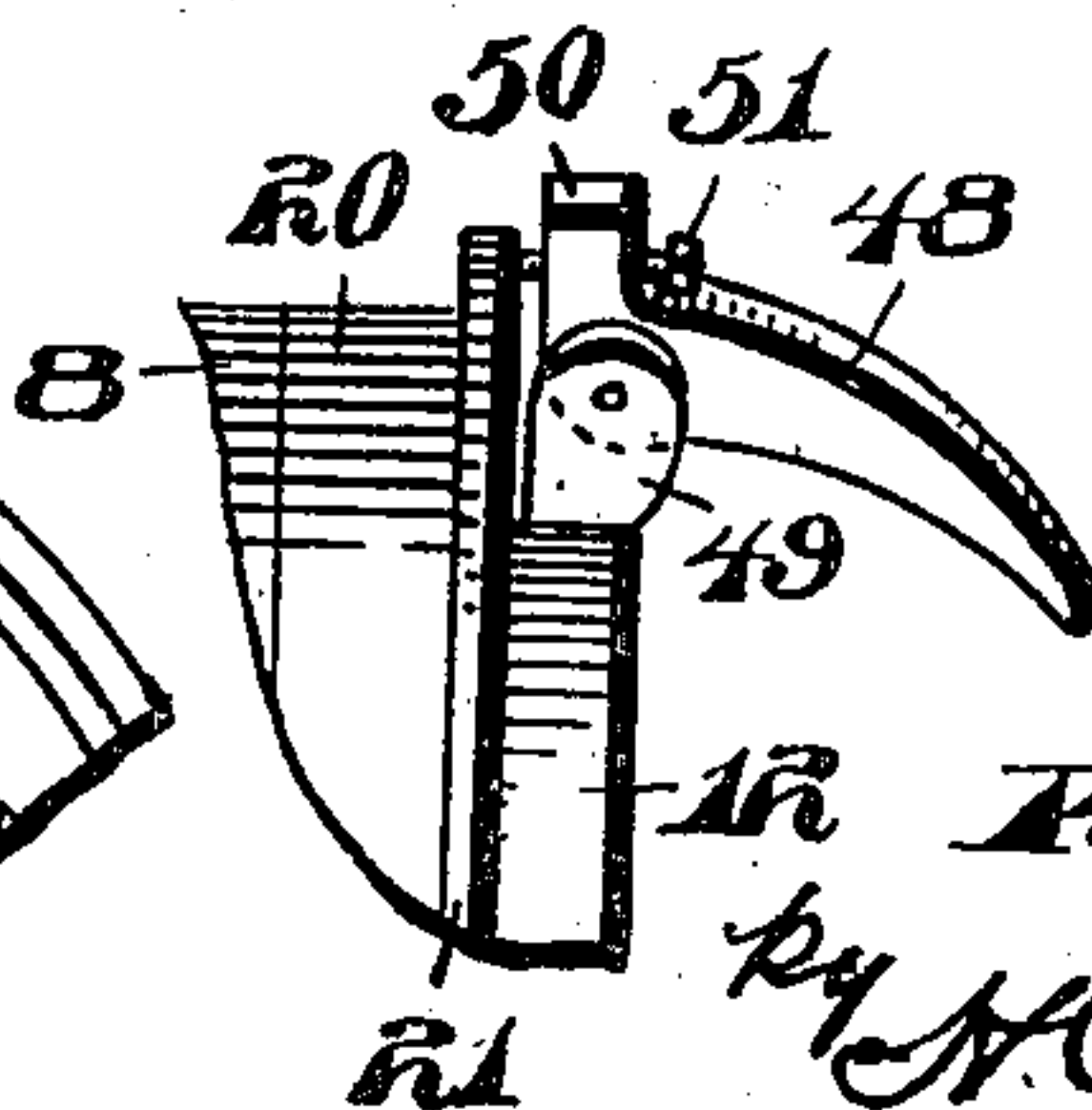
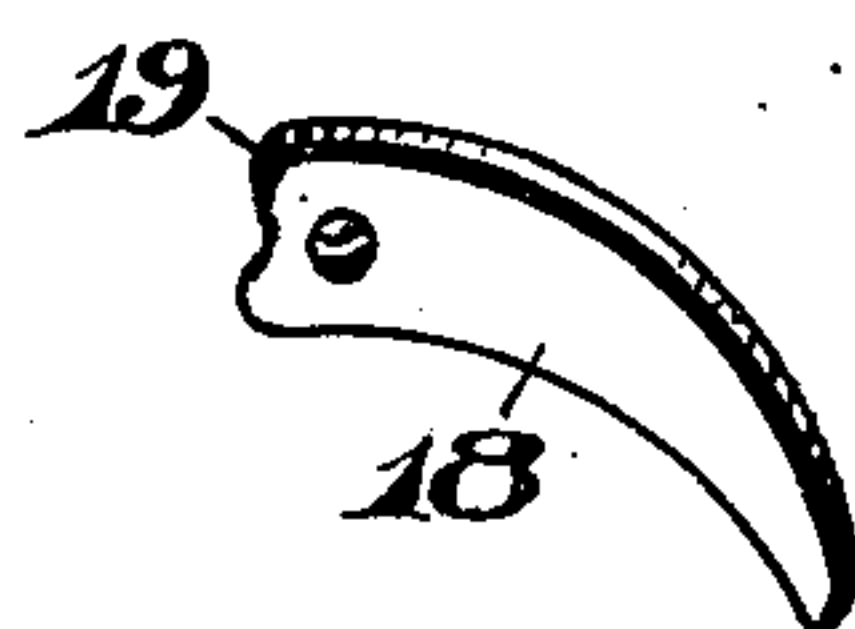


Fig. 10.



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UNITED STATES PATENT OFFICE.

REUBEN WILLETTS, OF BUTLER, PENNSYLVANIA, ASSIGNOR TO THE BRADEN
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FRICITION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 670,264, dated March 19, 1901.

Application filed May 7, 1900. Serial No. 15,715. (No model.)

To all whom it may concern:

Be it known that I, REUBEN WILLETTS, a citizen of the United States of America, residing at Butler, in the county of Butler and State of Pennsylvania, have invented certain new and useful Improvements in Friction-Clutches, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in friction-clutches and clutch-pulleys, and is particularly adapted for use in connection with machines of all descriptions which are operated by means of a drive-shaft with pulley-belt connections.

15 The invention aims to provide a clutch mechanism for gradually connecting and disconnecting a line of shafting without causing any jar or slackening the speed of the motor-power.

20 The invention further aims to provide a powerful and effective clutch mechanism for friction-clutch pulleys, which will operate with but little wearing of the parts and when in clutching engagement will securely hold the clutched parts from slipping.

25 The invention still further aims to construct a friction-clutch mechanism which shall be extremely simple in construction, strong, durable, efficient in its operation, and comparatively inexpensive to manufacture.

30 With the above and other objects in view the invention finally consists of the novel construction, combination, and arrangement of parts to be hereinafter more fully described, and specifically pointed out in the claims.

35 In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate corresponding parts throughout the several views, in which—

40 Figure 1 is a side view of my improved friction-clutch. Fig. 2 is a longitudinal sectional view thereof. Fig. 3 is a longitudinal sectional view of the arrangement of the various parts when used in connection with a line of shafting. Fig. 4 is a front view of the connecting-plate which carries the operating mechanism. Fig. 5 is a side view thereof. Fig. 6 is a front elevation of the operating-band. Fig. 7 is a vertical sectional view there-

of. Fig. 8 is a front elevation of a portion of the frictional pulley, showing embedded in the web portion thereof a series of wooden blocks 55 for increasing the frictional engagement of the web of the hub of the drive-shaft. Fig. 9 is a side view of a portion of the shaft and connecting-plate, showing a modified form of lever carrying the adjusting-screw. Fig. 10 60 is a perspective view of one of the operating-levers as shown in Figs. 1, 2, and 3.

Referring to the drawings by reference-numerals, 1 indicates a drive-shaft provided on one end with a head 2 and carrying a hub 3, 65 which is suitably connected to the shaft 1, so that it will revolve therewith, and having an offset or shoulder 4 formed on the inner face thereof, which abuts against the head 2 of the shaft. The hub 3 has formed at one end an up- 70 wardly-extending annular flange 5. Mounted upon the hub 3 is a clutch-pulley 6, formed with an integral web 7 and hub portions 8. The web portion 7 is adapted to frictionally engage the annular flange 5 of the hub 3. To 75 increase its frictional engagement, the web is formed with a series of recesses, in which are embedded blocks of wood of any suitable character, as at 9. The hub of the pulley is of less length than the hub 3 of the shaft. 80

The hub 3 is provided with a series of openings to receive bolts or other fastening means 10 (indicated by dotted lines in Fig. 2) for securing thereto a concentric connecting plate or disk 11, having an outwardly-extending 85 annular offset 12, formed with a centrally-arranged chamber 13, registering with a centrally-arranged opening 14. Mounted upon the bolts between the plate or disk and hub 3 is a series of adjusting-washers 15, the func- 90 tion of which will be hereinafter described. Formed integral with the outer face of the plate or disk 11 is a series of outwardly-extending keepers 16, which are arranged in pairs and provided with an opening 17 to re- 95 ceive a suitable pin for pivotally securing thereto the operating-levers 18. These levers are formed in a curvilinear manner, and at their pivoted ends are formed with knuckles 19. 100

Mounted upon the hub 3 and periphery of the plate or disk 11 is an operating-band 20, having one end formed with an outwardly-extending annular flange 21. This band is

mounted in such a manner upon the hub 3 that it will revolve therewith and at the same time permit of a longitudinal movement when engaged and operated by the knuckle of the levers 18 to force the same against one end of the hub of the pulley 6 to bring the web of the pulley into frictional engagement with the flange 5 of the hub 3, so that the pulley will revolve with the shaft and hub. The levers are brought into and out of engagement with the operating-band 20 by means of the cone 22, which is interiorly screw-threaded and mounted upon a screw-threaded operating-rod 23, which at one end extends through the opening 14 into the chamber 13, and is secured to the offset or shoulder 12 by means of the collar 24. Reference-numeral 25 indicates a stop-collar mounted on the rod at the front of the shoulder or offset 12 for limiting the movement of the rod 23. The upper portion of the cone is cut away, as at 26, and has suitably connected thereto a hand-wheel 27, moving the cone upon the screw-threaded rod 23 to release the pressure of the levers upon the operating-band 20.

The end of the rod 23 has suitably connected thereto an operating-wheel 28 for bringing the levers into engagement with the band 20 for forcing the pulley into frictional engagement with the hub 3. By this arrangement of the wheels 27 and 28 the release and engagement of the levers with the operating-band 20 can be accomplished without any inconvenience. The mechanism is so set up that the wheels 27 28 and rod 23 will not revolve with the shaft or pulley, the end of the levers revolving upon the periphery of the cone 22.

In Fig. 3 I have shown a modified form of construction used in connection with line of shafting when it is desired to release and clutch one pulley of a series without discontinuing the operation of the remaining pulleys, and this modified form consists of a hub 29, provided with a flange 30, and it is suitably keyed to the shaft 31. Mounted upon the hub 29 is a pulley 32, provided with an integral web 33 and hub portion 34. This construction of hub is provided with an outwardly-extending annular flange 35, which is provided with an opening in alignment with the opening formed in the web, in each of which is secured a piece of wood 36 to increase the frictional engagement with the flange 30, and the operating-band 37, having the enlarged flange 38, which abuts against the flange 35 of the hub 34. The band 37 is mounted upon the hub 29 in such a manner that it will revolve therewith and will permit of the longitudinal movement when engaged by the knuckle 39 of the operating-levers 40. Suitably secured to the end of the hub 29 is an annular collar 41, carrying a series of keepers 42, provided with suitable openings to receive means for pivotally securing the levers thereto. Mounted upon the shaft 31 is a sleeve 43, exteriorly screw-threaded, as shown, and

connected at its outer end to the operating-wheel 44. Mounted upon the screw-threaded portion of the sleeve 43 is a hollow cone 45, which is interiorly screw-threaded and meshes with the screw-thread of the sleeve 43. One end of this cone 45 is connected to the operating-wheel 46. The ends of the levers 40 rest upon the cone 45, and the movement thereof causes the release and engagement of the levers with the operating-band 37. The shaft 31 is provided with a suitable stop-collar 47. The operation of this modified form is the same as the construction set forth in Figs. 1 and 2.

The washers 15 are provided on the bolts 10 to overcome any wear between the web of the pulley and the flange of the hub. These washers permit of the adjusting of the plate or disk 11. In Fig. 9 I have shown a modified form of adjustment, which consists of a lever 48, pivotally connected to the keepers 49 and provided with an offset 50, having the adjusting-screw 51 operating therethrough. The adjusting-screw engages the operating-band, causing the frictional engagement of the web of the pulley with the flange of the hub. This screw can be adjusted to overcome any wear upon the flange of the hub and web of the pulley.

From the construction herein shown and described it will be seen that when the levers are turned on their fulcrums by means of the cone the knuckle of the former will engage the operating-band, forcing the same against the hub of the pulley, and bring the web of the pulley into frictional engagement with the flange of the hub, securely retaining the same in position, and the parts will revolve simultaneously. This action is caused by the operation of either the wheel 28 or 44. The release of the levers is effected by means of the operation of either of the wheels, driving the cone outwardly and forcing the knuckle of the levers into engagement with the operating-band. When it is desired to release the levers, either of the wheels 27 or 46 is operated, forcing the cone inwardly and permitting the levers to ride upon the same and release the former. It will be evident that the frictional engagement is between the web of the pulley and the flange of the hub and that the release of the levers can be easily effected by means of the wheels.

The hand-wheels 27 28 are provided for the following reason: When the clutch is revolving, the hand-wheels 27 28 will revolve therewith by the slight friction on the end of the rod 23 within the collar 25. Hence when the engine is running over by holding wheel 27 wheel 28 will continue to rotate and cause wheel 27 to travel inward and release the clutch, or by holding wheel 28 wheel 27 will travel outward and tighten the clutch. When the engine is running under, the operation is reversed. This obtains an automatic release or the engagement of the clutch with the pulley by holding either one of the hand-wheels.

It is thought the many advantages of my

improved construction can be readily understood from the foregoing description, taken in connection with the accompanying drawings, and it will be noted that various changes
 5 may be made in the details of construction without departing from the general spirit of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by
 10 Letters Patent, is—

1. In a friction-clutch, the combination with the drive-shaft provided on one end with an integral head, and the hub 3 mounted on said shaft to revolve therewith and provided
 15 with an offset to engage the said head, said hub having an integral flange at its one end, of a clutch-pulley comprising an integral hub and web, the latter adapted to frictionally engage the flange of the hub 3, means circum-
 20 ferentially arranged in said web of the clutch-pulley for increasing the frictional engagement thereof with the flange of the hub 3, a concentric connecting plate or disk bolted to the end of the hub 3 and provided with an
 25 outwardly-extending annular offset, said offset having a centrally-arranged opening, a series of adjusting-washers mounted between the connecting plate or disk and the end of the hub, said plate or disk having integral
 30 keepers peripherally arranged in pairs, operating-levers pivoted in said keepers and provided on their pivoted ends with knuckles, an operating-band mounted on the hub and inclosing the adjusting-washers and connect-
 35 ing plate or disk, said band provided with an integral flange, and being capable of rotary and longitudinal movement, a threaded operating-rod having its one end mounted in the opening in the connecting plate or disk
 40 and held by collars mounted on the rod at each side of the annular offset, a cone mounted upon said threaded rod with which the free ends of the operating-levers engage, said cone being reduced at its smaller end, a hand-

wheel mounted on said reduced end of the
 cone for moving the cone upon the threaded
 rod, and a hand-wheel mounted on the outer
 end of said rod for actuating the latter to
 cause the engagement of the knuckle ends of
 the operating-levers with the operating-band, 50
 as and for the purpose set forth.

2. In a friction-clutch, the combination with a drive-shaft provided with an integral head, and a hub provided with an integral
 flange, said hub being mounted on the drive- 55
 shaft to revolve therewith and having an offset to engage the head of the drive-shaft, of a pulley mounted on said shaft and provided with an integral web and hub portion, said
 web portion adapted to frictionally engage 60
 the flange, means arranged in said web portion for increasing the frictional engagement thereof with the flange, a series of adjusting-
 washers mounted on the head of the shaft, a
 rotating and longitudinally-movable operat- 65
 ing-band mounted on the hub and adapted to engage the hub of the pulley for causing the frictional engagement of the pulley-web and
 hub-flange, a connecting-plate secured to the
 headed end of the drive-shaft, a series of op- 70
 erating-levers pivotally connected at their one end to said plate, a threaded rod mounted in said plate, collars mounted on the rod for holding the same against longitudinal
 movement, a cone mounted upon said thread- 75
 ed rod, a hand-wheel mounted on the smaller end of said cone for moving the latter on the rod, and a hand-wheel mounted on the outer
 end of the rod for forcing the operating-le-
 vers into engagement with the operating- 80
 band, as and for the purpose described.

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

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