

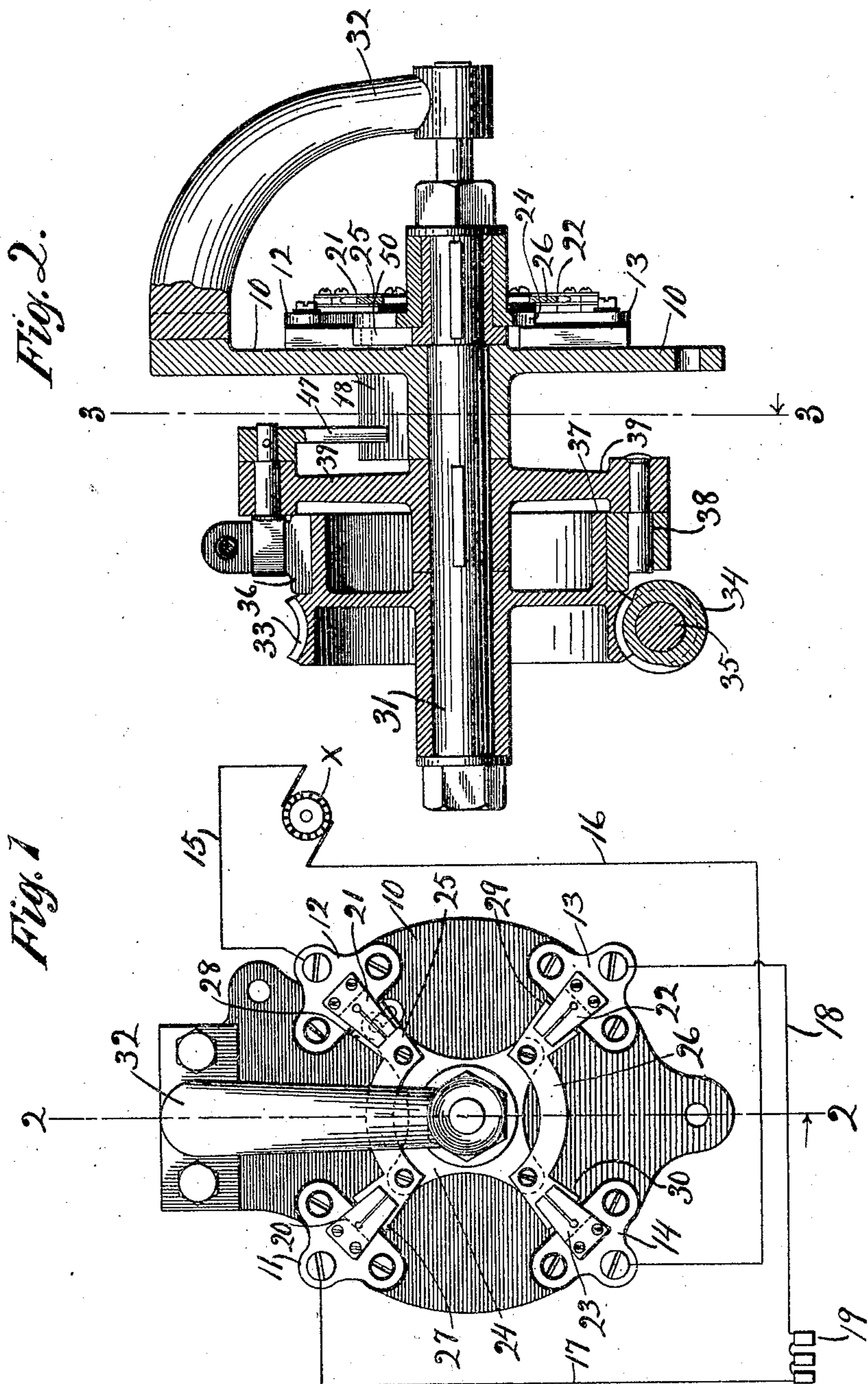
No. 819,160.

PATENTED MAY 1, 1906.

R. M. NEWBOLD.
POLE CHANGER.

APPLICATION FILED JULY 8, 1905.

2 SHEETS—SHEET 1.



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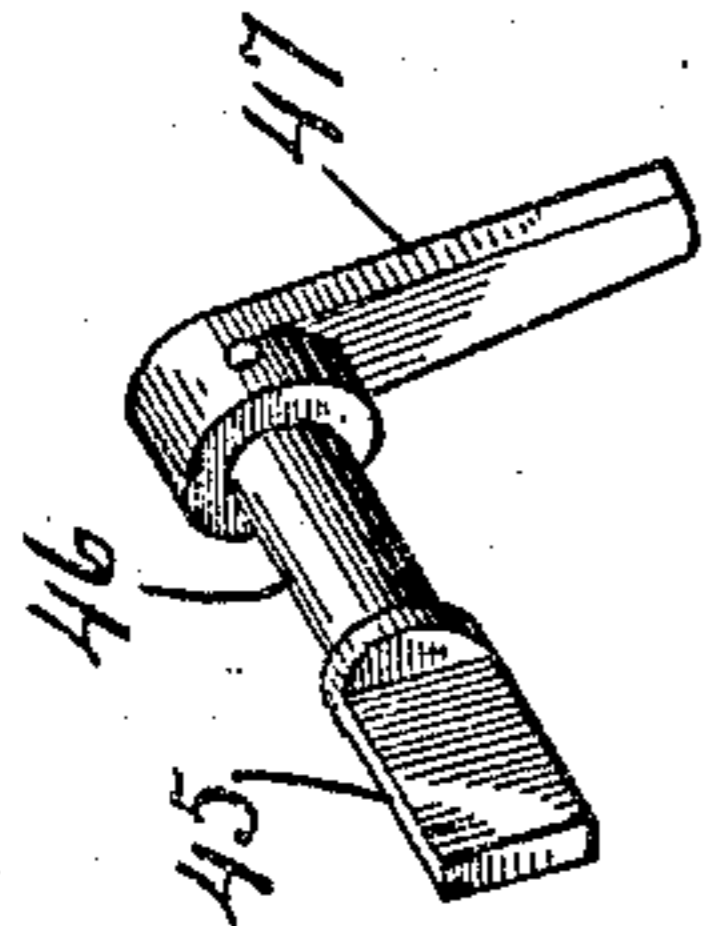


Fig. 5

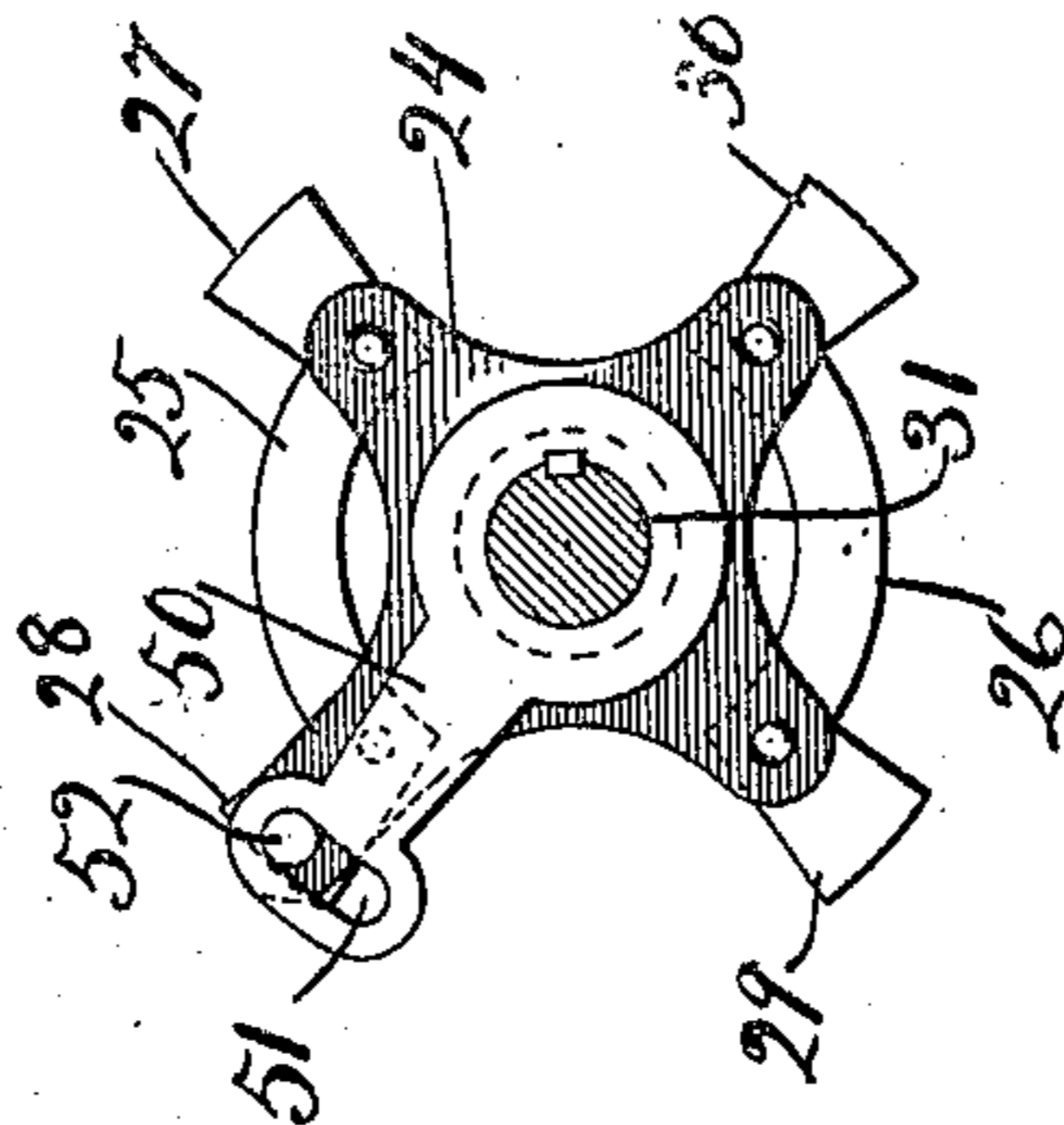


Fig. 4

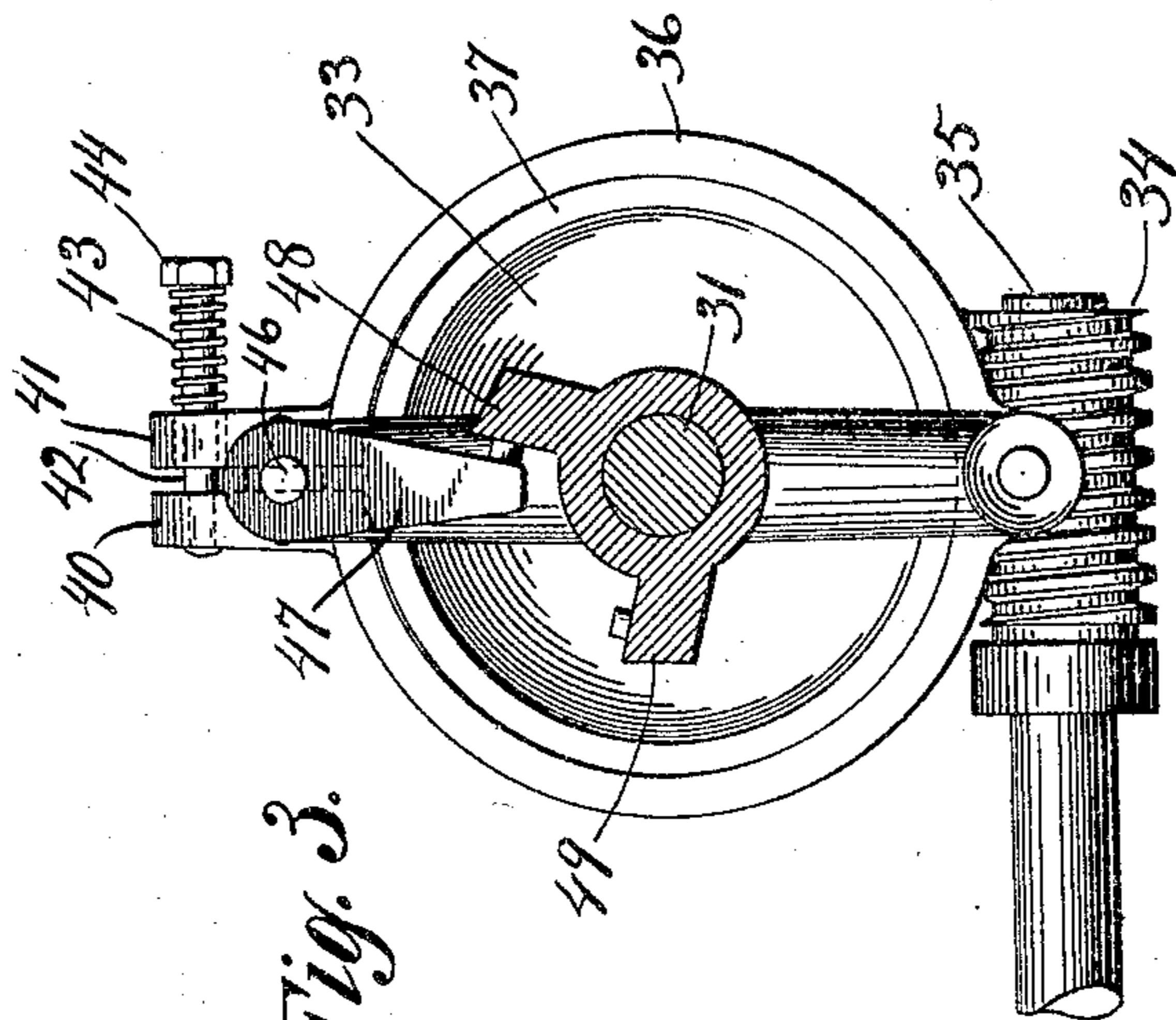


Fig. 3

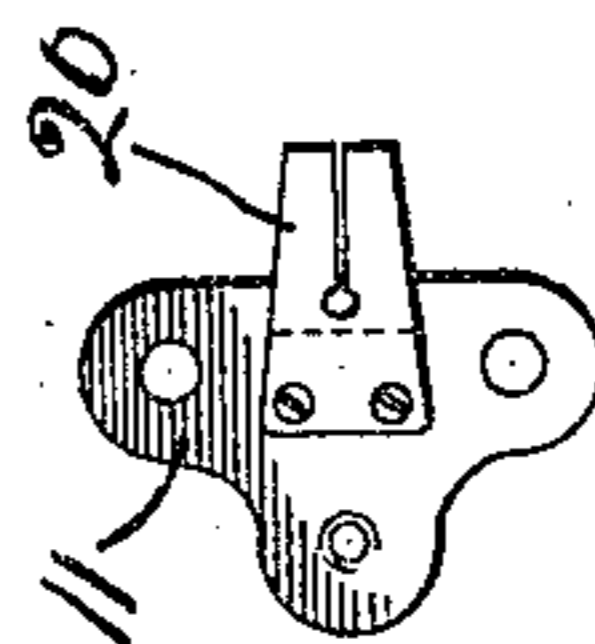


Fig. 7

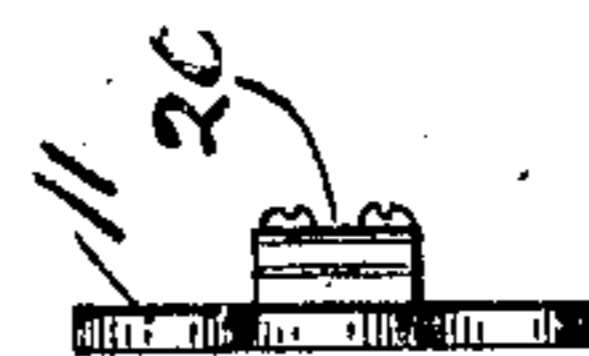


Fig. 6

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UNITED STATES PATENT OFFICE.

ROGER M. NEWBOLD, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO THE
ADAMS & WESTLAKE COMPANY, A CORPORATION OF ILLINOIS.

POLE-CHANGER.

No. 819,160.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed July 8, 1905. Serial No. 268,829.

To all whom it may concern:

Be it known that I, ROGER M. NEWBOLD, a citizen of the United States, and a resident of Louisville, county of Jefferson, and State of Kentucky, have invented certain new and useful Improvements in Pole-Changers, of which the following is a specification and which are illustrated in the accompanying drawings, forming a part thereof.

The invention relates to automatic pole-changers for use in connection with electric circuits served by a reversible dynamo and used in connection with devices requiring a uniform direction of current. One situation in which such circuit is used is in the so-called "axle-generation train-lighting system," in connection with which there is employed a storage battery and in which the direction of rotation of the armature of the dynamo is reversed with each reversal of direction of travel of the car.

The object of the invention is to provide a simple but efficient pole-changing mechanism; and it consists in the structure hereinafter described and which is illustrated in the accompanying drawings, in which—

Figure 1 shows a front elevation of the switch mechanism, the electric circuit being diagrammatically represented. Fig. 2 is a sectional view on the line 2 2 of Fig. 1. Fig. 3 is a sectional view on the line 3 3 of Fig. 2. Figs. 4, 5, 6, and 7 are details of various parts of the mechanism.

A plate 10 carries the switch mechanism and is adapted for attachment to any suitable support. When used in connection with a train-lighting system, it may constitute a part of the wall of the dynamo-casing. (Not shown.) Four terminal plates 11, 12, 13, and 14 are attached to the plate 10 and are equally spaced about a common center. The branches 15 16 of the circuit of the dynamo X lead to the terminal plates 12 and 14, and the two branches 17 18 of the work-circuit lead from the terminal plates 11 and 13 to any suitable electric device—as illustrated, the storage battery 19. Each of the terminal plates is provided with a contact plate or brush 20 21 22 23.

An oscillating plate 24 carries a pair of switch-plates 25 26, each provided with terminals, as 27 28 29 30, the members of each pair of which are so spaced as to simultaneously engage two of the contact-plates—as

shown, the plate 25 uniting the contact-plates 20 and 21 and the plate 26 uniting the contact-plates 22 and 23.

The parts being disposed as illustrated, the dynamo-lead 15 is connected with the branch 17 of the work-circuit and the dynamo-lead 16 is in connection with the branch 18 of the work-circuit. Upon a shifting of the plate 24 through ninety degrees the dynamo-lead 15 and the branch 18 will be connected, as will also the dynamo-lead 16 and branch 17.

The plate 24 is carried and actuated by a shaft 31, journaled in the plate 10 and a bracket-arm 32 projecting therefrom. The shaft 31 is actuated from the dynamo, preferably indirectly by means of a worm-wheel 33, driven by a worm 34 on the armature-shaft 35. The worm-wheel 33 is loose upon the shaft 31, and its connection therewith is through a split friction-band 36, encircling an annular flange 37 of the wheel and secured at 38 to a cross-arm 39, keyed upon the shaft. The meeting ends of the split band 36 are provided with a pair of outstanding lugs 40 41, which are united by means of a bolt 42, fixed in one of the lugs and projecting loosely through the other and carrying an expansion-spring 43, which reacts between the outer face of the latter lug and the bolt-head 44 to force the lugs together and compress the band 36 upon the flange 37. A cam-block 45 lies between the lugs 40 41 and is carried by a shank 46, journaled in one end of the cross-arm 39 and carrying an inwardly-directed crank-arm 47, which coöperates with a pair of stop-lugs 48 49 formed on the plate 10.

When the band 36 has been carried by the worm-wheel 33 a sufficient distance to throw the switch from one of its positions to the other, the crank-arm 47 encounters one of the stops 48 49, and the cam-block 45 is thereby turned to spread the lugs 40 41, and thus expand the band 36 sufficiently to allow the flange 37 to slide upon its inner face.

Upon reversal of direction of the shaft 35 the band 36 is carried in the opposite direction, the spring 43 throwing the jaws 40 41 together as soon as the crank-arm 47 ceases to press against the stop-lug. In order to insure this contraction of the friction-band, provision is made for lost motion between the shaft 31 and the switch-carrying plate 24. To this end the plate 24 is loosely mounted upon the shaft and is connected therewith by

means of a crank-arm 50, keyed to the shaft 31 and having a segmental slot 51 for receiving a pin 52, fixed in the plate 24. The arm 50 is thereby permitted to travel a distance 5 equal to the length of the slot 51 before it actuates the switch, and the action of the spring 43 therefore always provides for a sufficient frictional grip of the band upon the flange 37 to insure the immediate shifting of the cam 10 45 to permit the contraction of the band upon the reversal of direction of the shaft 35 and consequent increase of friction sufficient to throw the switch.

I claim as my invention—

15 1. In a pole-changer, in combination, an oscillatable switch; a rotatable member; a spring-closed friction-band operatively connected with the switch and frictionally engaging the rotatable member; and means for 20 spreading the band as the switch reaches the end of its travel.

25 2. In a pole-changer, in combination, a rotatable member; a spring-contracted friction-band encircling such member; a switch; and loose connection between the band and switch, whereby the band actuates the switch but has a degree of movement independent thereof.

3. In a pole-changer, in combination, a rotatable member; a split, spring-compressed 30 friction-band encircling such member; a cam for expanding the band and traveling therewith; stops for turning the cam in opposition to the band-contracting spring; a switch; and an arm traveling with the band and having 35 a segmental slot engaging an appurtenance of the switch.

4. In a pole-changer, in combination, a shaft; a four-pointed oscillatable switch free 40 on the shaft; a crank-arm fixed to the shaft and having a segmental slot engaging an appurtenance of the switch; a cross-arm fixed to the shaft; a worm-wheel loose on the shaft and having an annular flange; a split friction-band encircling the flange and fixed to 45 the cross-arm; an oscillatable cam mounted upon the arm and located between the ends of the band and adapted to spread them; a crank-arm carried by the cam; and fixed stops in the path of the last-named crank- 50 arm.

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