

No. 751,474.

PATENTED FEB. 9, 1904.

I. DEUTSCH.
POLE CHANGER FOR DYNAMOS.

APPLICATION FILED MAY 14, 1903.

NO MODEL.

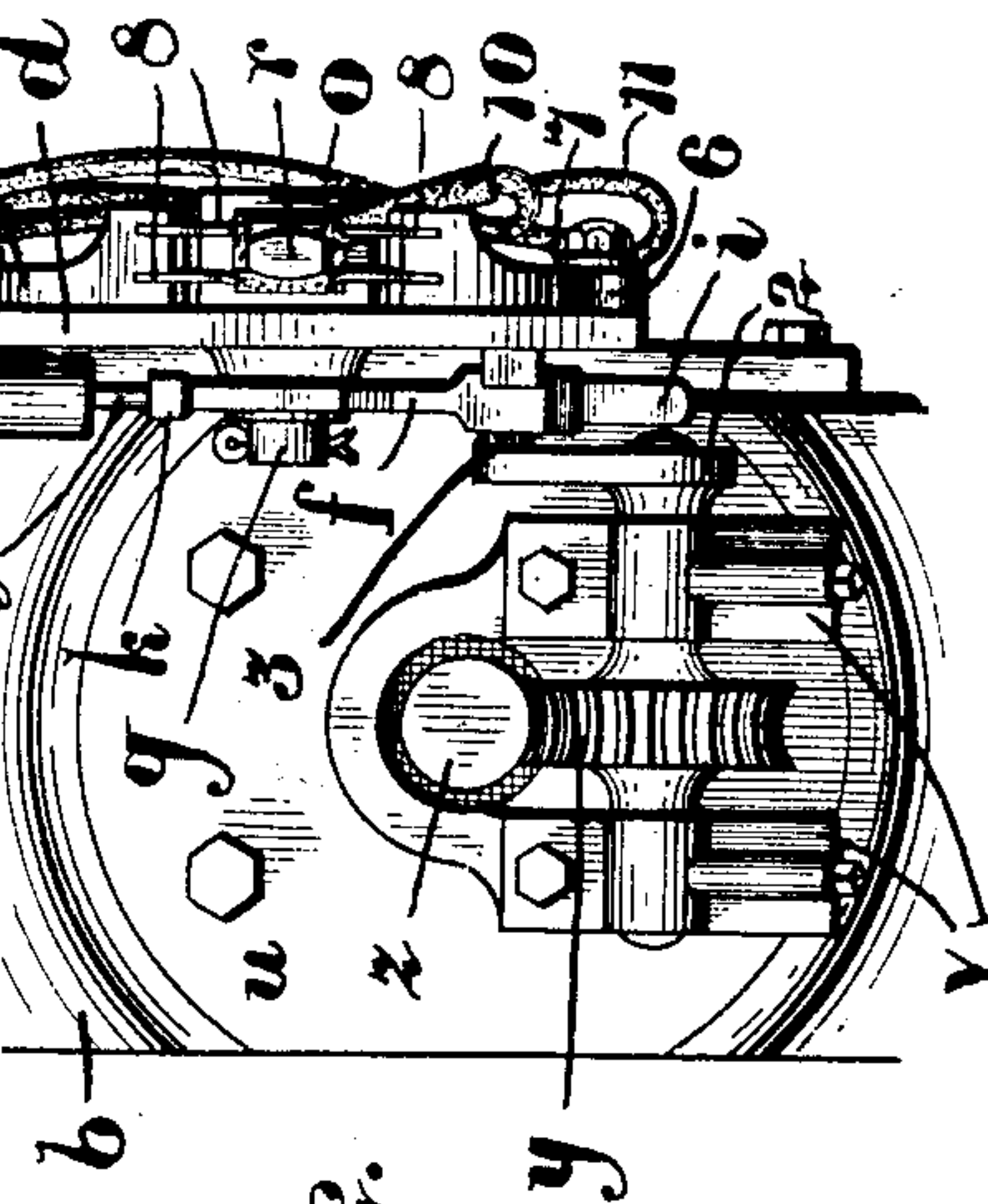
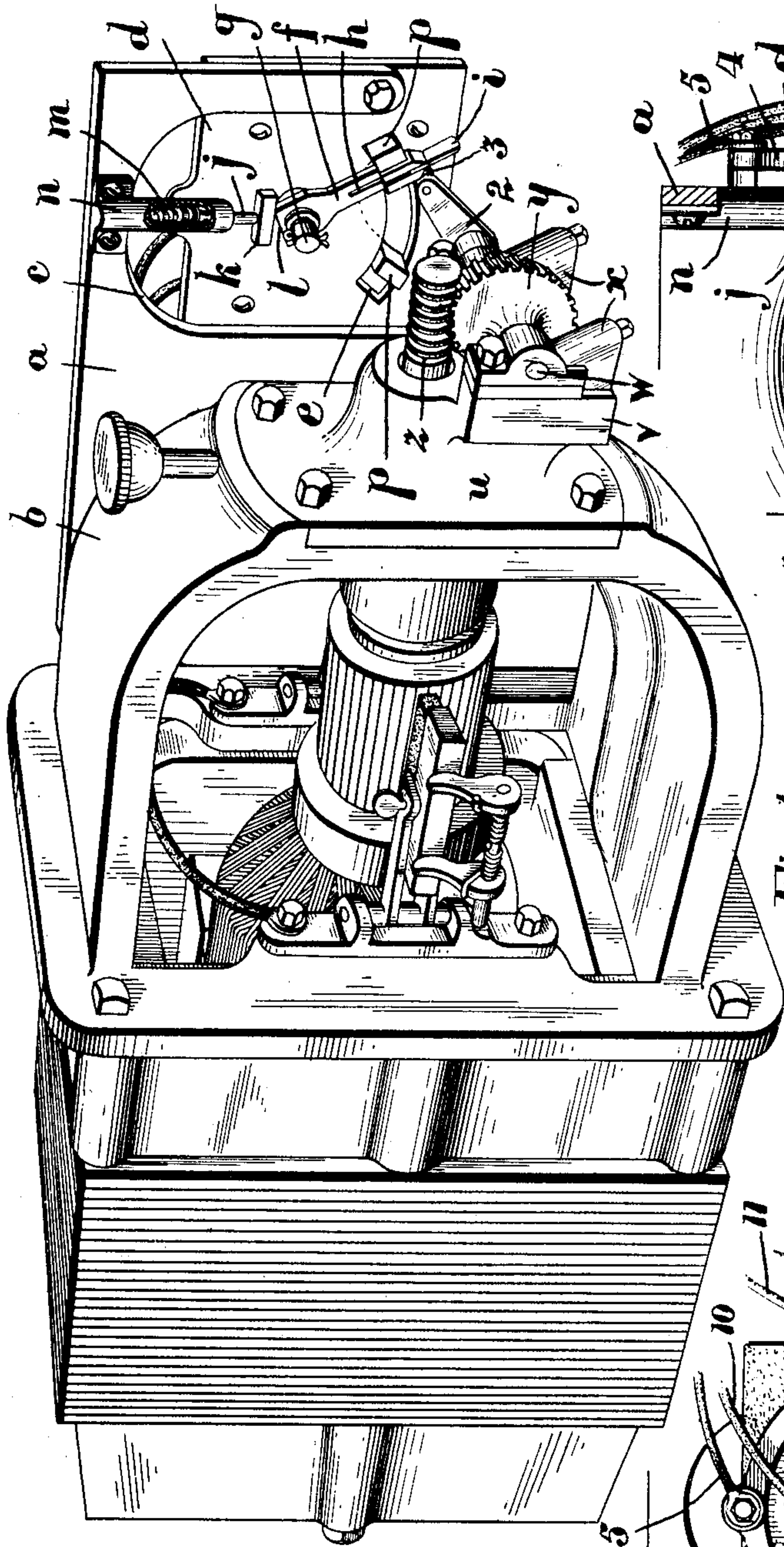


Fig. 2.

Fig. 1.

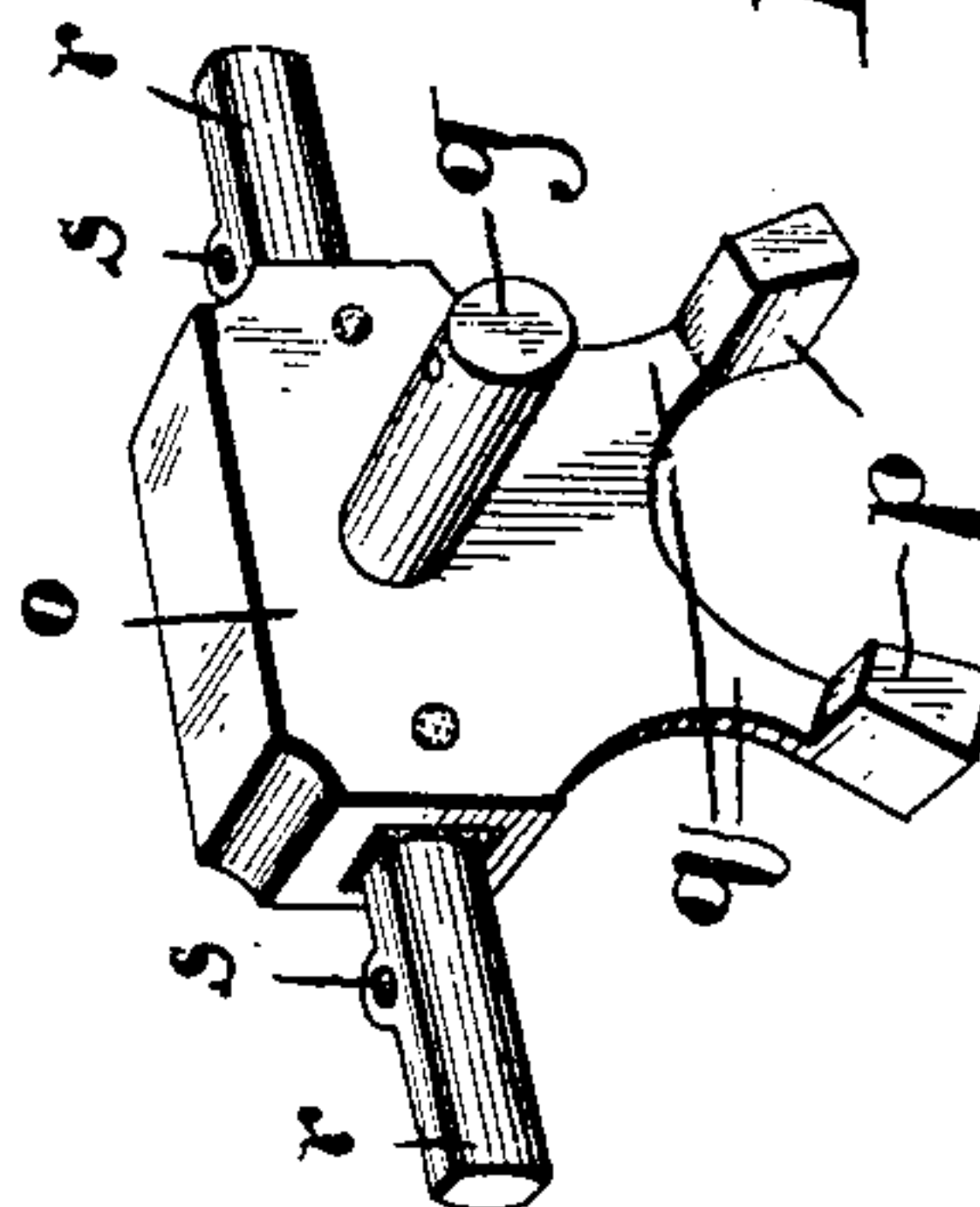


Fig. 4.

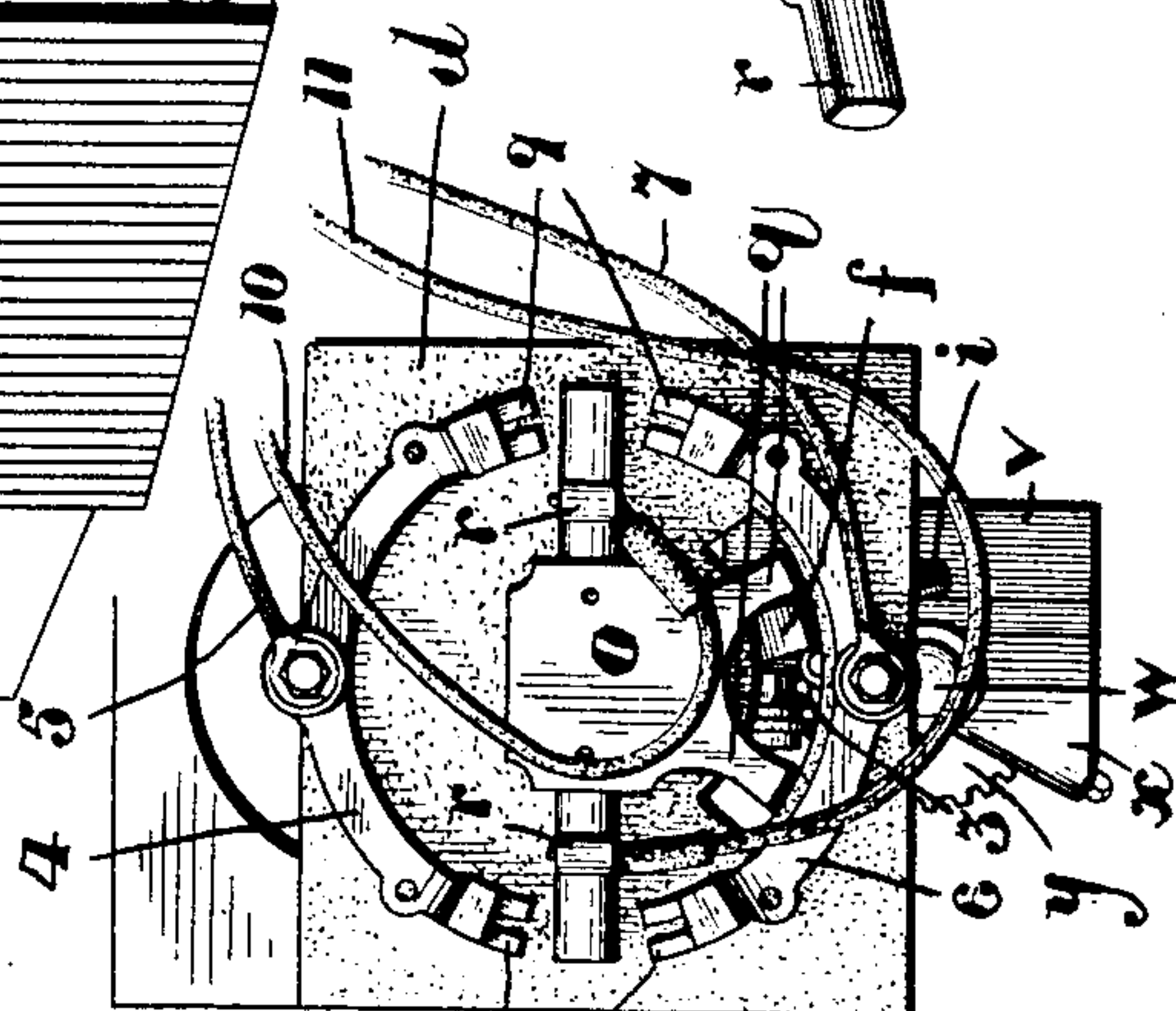


Fig. 3.

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POLE-CHANGER FOR DYNAMOS.

SPECIFICATION forming part of Letters Patent No. 751,474, dated February 9, 1904.

Application filed May 14, 1903. Serial No. 157,149. (No model.)

To all whom it may concern:

Be it known that I, ISIDOR DEUTSCH, a citizen of the United States of America, residing at Montreal, in the district of Montreal, in the Province of Quebec, Canada, have invented certain new and useful Improvements in Pole-Changers for Dynamos, of which the following is a specification.

My invention relates to improvements in pole-changers in dynamos, particularly direct-current dynamos, where the armature is revolved in either direction; and the object of the invention is to keep the polarity of the field-magnets constant irrespective of the direction of revolution and to devise a mechanism which shall be simple to manufacture and positive in the operation; and it consists, essentially, of a switch-lever having lugs, a suitable plate provided with a slot through which the lugs extend, a pivoted arm swinging between the said lugs, a worm on the armature-shaft, a worm-wheel having the spindle journaled in bearing-brackets projecting from the dynamo, and a crank on the end of the worm-wheel shaft designed to swing the pivoted arm at each revolution, the various parts being constructed in detail as hereinafter more particularly described.

Figure 1 is a perspective view of a dynamo provided with my pole-changer. Fig. 2 is an end view of my device. Fig. 3 is an elevation of the switch. Fig. 4 is a detail of the switch-lever.

Like characters of reference indicate corresponding parts in each figure.

a is a plate securely attached to and projecting beyond the frame b and having the opening c in the projecting portion.

d is a plate attached to the plate a over the opening c and having an arc-shaped slot e toward its lower end.

f is an arm pivotally swinging from the pintle g on the plate d .

The pivoted arm f has a longitudinal slot h therethrough.

i is a tongue inserted in the slot h and having a limited longitudinal movement therein.

j is a rod having a cross-head k , which is spring-held against the top l of the pivoted

arm f by the inclosed coil-spring m , contained in the casing n , secured to the plate a .

o is the switch-lever, located on the opposite side of the plate d and having the lugs p on the lower extensions q projecting through the arc-shaped slot e in the plate d .

r represents contact-arms projecting from the switch-lever o and insulated therefrom and having the orifices s to receive the wires 10 and 11, connected to the brushes of the dynamo.

The pintle g , on which the arm f is pivotally swung, extends through an orifice in the plate d from the switch-lever o , to which it is securely attached.

u is one of the end bearing-plates of the armature-shaft, and v represents projecting brackets.

w is a shaft journaled in the bearings x , supported by the projecting brackets v .

y is a worm-gear secured to the shaft w .

z is a worm at the end of the armature-shaft operating the gear y .

2 is a crank having the roller 3, which engages the pivoted arm f at each revolution of the shaft w .

4 is an arc of conducting material customary in pole-changers, suitably insulated from and superimposed on the plate d and having the field connection-wire 7 leading therefrom.

6 is an arc of conducting material correspondingly arranged on the plate d to the arc 4 and having the field-connection wire 7 leading therefrom.

8 represents spring-contact points at the corresponding extremities of the arcs 4 and 6, respectively, and are designed to receive and hold the contact-arms r .

9 represents spring-contact points at the corresponding extremities of the arcs 4 and 6, respectively, and are designed to be engaged by the contact-arms r .

Having described the various parts in detail, I shall now more particularly explain the operation thereof.

Assuming that the pole-changer is in its mid-position and that the switch is open—that is to say, not in contact in any dynamo con-

nection. When the armature revolves in either direction, the worm at the end of the armature-shaft, which projects beyond the bearing, operates the gear, causing the shaft *w* to revolve. The crank 2, turning with the shaft *w* through the roller 3, engages one surface of the pivoted arm *f*, forcing the other surface against one of the lugs *p*, projecting from the switch-lever *o*, and as the armature-shaft continues to turn the roller engaging the pivoted arm pushes the lug over in the slot *e* until the arms *r* of the switch-lever *o* each contact with one of the spring-contacts 8 and one of the spring-contacts 9, respectively, and assuming that the wire 10 is positive the position of the arms *r* must be reversed in order that the said wire 10 may become negative. With the revolving of the armature-shaft in the opposite direction the wire 10 becomes negative and must be connected to the negative field, and this is accomplished by the roller 3 engaging the pivoted arm *f* on the opposite side and pushing the other lug around in the arc-shaped slot until the arms *r* engage the reversing and corresponding contact-points 8 and 9. The continuous revolution of the armature-shaft in one direction will not affect the position of the arms after the switch has been thrown over, as the pivoted arm *f* just swings as far as the lug on each revolution of the shaft *w* and is brought back to its central position always by the pressure of the cross-head *k* of the rod *j* on the top *l* of the said pivoted arm. In this connection it must be explained that the tongue *i* has a most important bearing in the workability of this device, as the said tongue has a limited movement in the slot in the pivoted arm, and the combined effects of the pressure of the cross-head on the top of the pivoted arm and the contact of the roller and the tongue will absolutely prevent any jamming of the end of the pivoted arm and the roller on the sudden reversal of the direction in revolving of the armature-shaft.

The bearings for the shaft *w* being supported by brackets from the plate of the armature-shaft bearing, the roller may be removed with great ease when desired to repair the machine.

What I claim as my invention is—

1. In a pole-changer, the combination with the armature-shaft, of a dynamo, of a switch-lever having suitable contact-arms and lower extensions provided with projecting lugs, a plate having an arc-shaped slot through which the lugs extend, and means operated from the armature-shaft for altering the position of the lugs in the slot, as and for the purpose specified.

2. In a pole-changer, the combination with the armature-shaft of a dynamo, of a switch-lever having suitable contact-arms and lower extensions provided with projecting lugs, a

plate having an arc-shaped slot through which the lugs extend, and a pivoted arm having its lower extremity located between the said lugs, and means operated from the armature-shaft for actuating said pivoted arm, as and for the purpose specified.

3. In a pole-changer, the combination with the armature-shaft of a dynamo, of a switch-lever having suitable contact-arms and lower extensions provided with projecting lugs, a plate having an arc-shaped slot through which the lugs extend, a pivoted arm having its lower extremity extending between the lugs, and flattened at its upper end, a spring designed to exert pressure on the flattened upper end, and means operated from the armature-shaft for actuating the pivoted arm, as and for the purpose specified.

4. In a pole-changer, the combination with the armature-shaft of a dynamo, of a switch-lever having suitable contact-arms and lower extensions provided with projecting lugs, a plate having an arc-shaped slot through which the lugs extend, a pivoted arm having its lower extremity extending between the lugs, and flattened at its upper end, a rod having an inverted cross-head spring-held against the upper end of the pivoted arm, and means operated from the armature-shaft for actuating the said pivoted arm, as and for the purpose specified.

5. In a pole-changer, the combination with the armature-shaft of a dynamo having a worm at its outer end, of a switch-lever having suitable contact-arms and lower extensions provided with projecting lugs, a pivoted arm depending between the lugs and spring-held in a definite position, a gear-wheel meshing with the aforesaid worm, a shaft journaled in suitable bearings in the dynamo-frame, and operated by the worm and gear, and a crank having a roller at the end thereof and securely attached to the extremity of the said shaft, and coacting with the arm, as and for the purpose specified.

6. In a pole-changer, the combination with the armature-shaft of a dynamo, of a switch-lever having projecting lugs from lower extensions, a plate having an arc-shaped slot through which the lugs extend, a pivoted arm depending between the lugs and longitudinally slotted toward its lower end, a tongue having a limited movement in said slot, and extending downwardly therefrom, and means operated from the armature-shaft for altering the position of the lugs in the arc-shaped slot, as and for the purpose specified.

7. In a pole-changer, the combination with the armature-shaft of a dynamo having a worm at its outer end, of a switch-lever having suitable contact-arms and lower extensions provided with projecting lugs, a gear meshing with the aforesaid worm, a shaft rotated by said gear and journaled in suitable bearings

in the dynamo-frame, a crank at the end of said shaft designed to engage the pivoted arm, as and for the purpose specified.

8. In device of the class described, in combination, a worm at the end of the armature-shaft, a gear, the gear-shaft having a crank at one of its ends, and bearings for said gear-shaft extending from the outer bearing member of the armature-shaft bearing and carried thereby in removal, as and for the purpose specified.

9. In a device of the class described, in combination, a plate having an arc-shaped slot extending therethrough, a switch-lever having lower extensions and projecting lugs therefrom, and supported in the said plate by a suitable spindle, an arm pivotally swinging from said spindle on the obverse side of the plate from the switch-lever, and depending between the lugs, a rod having a cross-head abutting the upper end of the pivoted arm, a spring contained in a suitable casing and designed to maintain a continuous pressure of the cross-head on the pivoted arm, a shaft having a crank at the end thereof designed to engage the pivoted arm, and a worm-and-gear mechanism operating said crank upon the revolving of the armature-shaft in either direction, as and for the purpose specified.

10. In a device of the class described, a switch-lever suitably journaled in a plate having lower extensions, and lugs therefrom extending through an arc-shaped slot in the plate, and an arm pivotally swung on the spindle and spring-held in a definite position between the projecting ends of the lugs, as and for the purpose specified.

11. In device of the class described, the combination with the armature-shaft, and a pivoted switch-lever provided with suitable contact-arms designed to coact with suitable contacts, of means attached to such lever and designed to be returned to a definite intermediate position after each operation, and means between the aforesaid means and the armature-shaft for changing the position of the aforesaid means, as and for the purpose specified.

12. In a device of the class described, the combination with the armature-shaft, and a pivoted switch-lever provided with suitable contact-arms designed to coact with suitable contacts, of means attached to such lever and designed to be held normally in a definite intermediate position, an arm secured to the spindle of the switch-lever, and means interposed between the armature-shaft and the switch-lever for changing the position of the switch-lever and consequently the arm, as and for the purpose specified.

13. In a device of the class described, the combination with the armature-shaft and a pivoted switch-lever having suitable projections and provided with suitable contact-arms designed to coact with suitable contacts, of a pivoted arm designed to engage the said projections, a crank engaging the said pivoted arm, means for operating said crank from the armature-shaft, and means in the pivoted arm for a limited upward movement, as and for the purpose specified.

14. In a pole-changer the combination of a worm on the armature-shaft, a worm-wheel meshing therewith, a shaft upon which the gear is fixed, a crank on the said shaft to rotate therewith, switch means and a single pivoted lever operated by the said crank and in turn operating the switch means, as and for the purpose specified.

Signed at Montreal, in the district of Montreal, in the Province of Quebec, Canada, this 11th day of May, 1903.

ISIDOR DEUTSCH.

Witnesses:

R. T. TROTTER,
MAY MADDEN.