

No. 759,121.

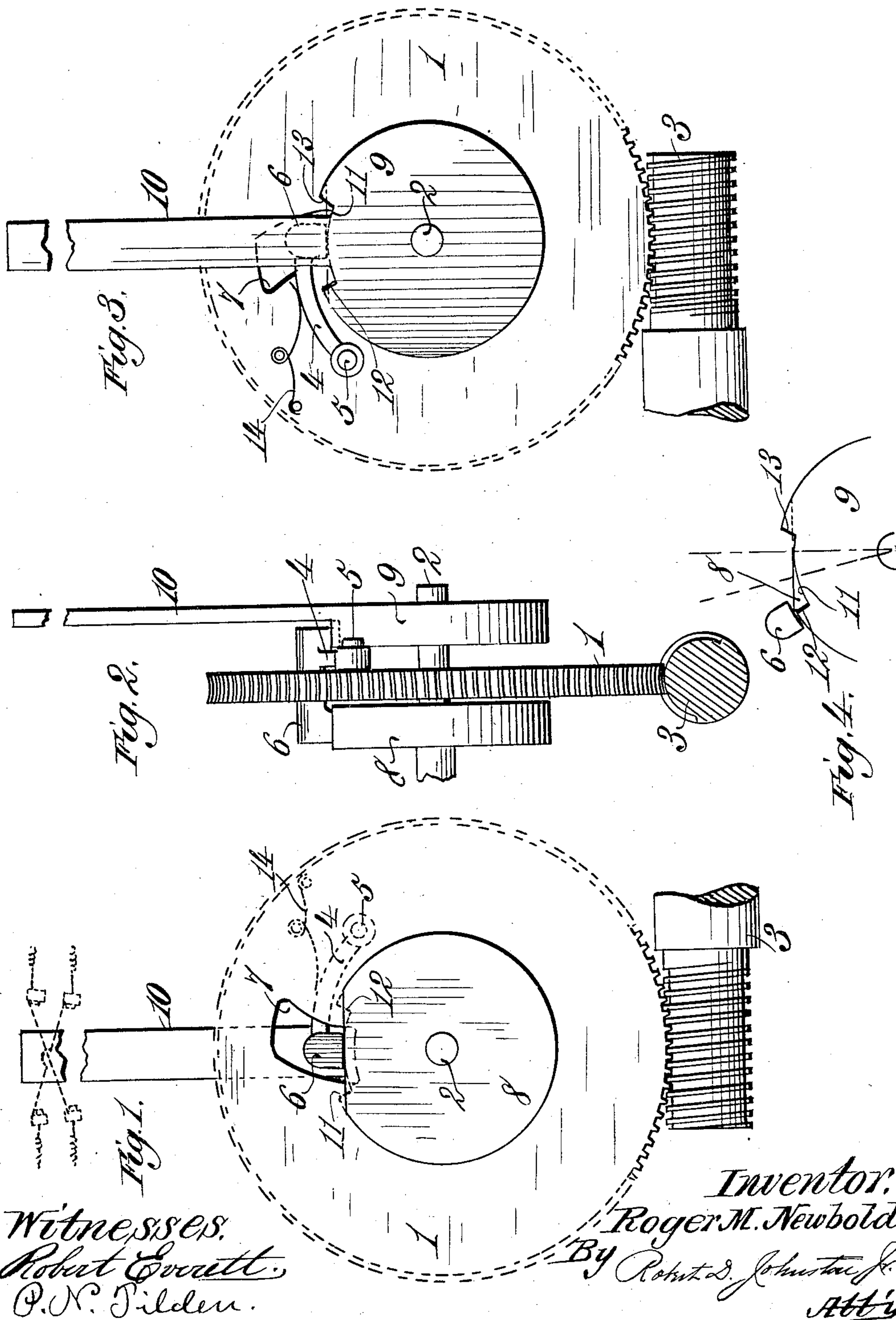
PATENTED MAY 3, 1904

R. M. NEWBOLD.

POLE CHANGER.

APPLICATION FILED AUG. 19, 1903.

NO MODEL.



UNITED STATES PATENT OFFICE.

ROGER M. NEWBOLD, OF BIRMINGHAM, ALABAMA.

POLE-CHANGER.

SPECIFICATION forming part of Letters Patent No. 759,121, dated May 3, 1904.

Application filed August 19, 1903. Serial No. 170,062. (No model.)

To all whom it may concern:

Be it known that I, ROGER M. NEWBOLD, a citizen of the United States, residing at 710 North Twenty-first street, Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Pole-Changers, of which the following is a specification.

My invention relates to a novel and improved pole-changing mechanism designed particularly for use in systems for lighting, heating, or ventilating railway-cars wherein the current is supplied by a dynamo driven from the car-axle. The constant reversals in the direction of the movement of the car require the employment of a device to maintain the same polarity of the current in the main leads to the work-circuit and batteries which will be simple and positive in its action and operate with a minimum wear or friction.

It is the object of my invention to provide a pole-changer to meet these requirements which comprises the construction and arrangements of parts hereinafter described, and more particularly pointed out in the claims, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is a side elevation of my improved pole-changing mechanism. Fig. 2 is an end elevation. Fig. 3 is a reverse side elevation to that shown in Fig. 1. Fig. 4 is a detail view showing the relative positions of the stationary cam-wheel and the recessed wheel carrying the switch-arm when the latter has been operated by the pawl, which revolves with the worm-wheel, omitted for the sake of clearness.

The same reference-numerals refer to the same parts throughout the drawings.

A worm-wheel 1, rotatably mounted on an axle 2, engages a screw-shaft 3, which rotates with or is rotated by the armature of a dynamo-electric machine driven from a reversible source of motion, such as a car-axle. The worm-wheel which is geared at a ratio of about one hundred and five to one, turns whenever the armature revolves, but at a correspondingly lower rate, and carries with it a pawl 4, mounted on an axis 5, projecting from the side of said wheel. The head 6 of this pawl, disposed

transversely of its stem, extends on one side through an opening 7 in wheel 1 and rests upon a fixed wheel 8, having a flattened or cam surface in its upper periphery, while the other side of the pawl's head rides on the peripheral circumference of the pole-changing wheel 9, of the same diameter as wheel 8, which carries integral therewith the switch-arm 10. This wheel 9, which is capable of a limited rocking movement on the axle 2 sufficient to enable the arm 10 to engage the two sets of contact-points to reverse the current, has in its upper periphery a recess 11, into which the pawl 4 will drop as the worm-wheel 1 rotates.

When the pole-changer wheel 9, with its arm 10, is in a neutral position, as shown in Figs. 1 to 3, the pawl 4 will rest equally on the flat surface of wheel 8 and in the recess in wheel 9. If now the armature commences to be rotated in a direction which will cause the pawl 4 to ride around wheels 8 and 9 from right to left or counter-clockwise, its head 6 as it is moved across the flat surface of wheel 8 will be gradually raised until it rides on the circumference; but before it has moved this far it will have engaged edge 12 of the recess 11 and moved the wheel 9 until by riding up on the circumference of wheel 8 it will be lifted out of the recess. The wheels 8 and 9 will then be in the position shown in Fig. 4, and it is evident that so long as the direction of the armature's rotation is not reversed the pawl as it rides around the wheels will drop from edge 13 of recess 11 onto the flat surface of wheel 8, which will ride it over the edge 12, so that it will have no work to do whatever, nor will there be any unnecessary wear of parts, for the spring 14, which bears against the pawl, exerts only sufficient pressure to hold it to its work. Now if the direction of armature rotation be reversed the pawl as it moves around will ride down the flat surface of wheel 8 until it engages edge 13 of recess 11 in wheel 9, when it will shove the pole-changer over until the wheel 8 rides it out of the recess and the circuits have been reversed, when it will continue to ride on wheel 8, as before described. This wheel 8 being stationary and of equal diameter with wheel 9 would never permit the pawl to enter the re-

cess in the latter wheel but for the fact that it has a flattened surface or portion. Hence the pawl can only act against an edge of recess 11 when it is opposite to and projects 5 above this flattened surface, as does the edge 13 in Fig. 4. The opening 7 in wheel 1 permits of the pawl having sufficient free vertical play to perform the functions required of it.

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

1. In a pole-changer, a rotating element, a pivoted pawl carried thereby, a movable contact-piece, projections on said contact-piece 15 which are engaged by said pawl to move said contact-piece over switch-contacts upon each reversal in the direction of rotation of said element, and means to hold said pawl out of operating engagement with said projections 20 after said arm has been shifted.

2. In a pole-changer, a rotating element, a pivoted pawl carried thereby, a recessed contact-piece which is directly engaged and shifted by said pawl upon each reversal of the rotation of said element, and means to hold said 25 pawl out of operative engagement with said contact-piece at other times.

3. In a pole-changer, a rotating element, a movable contact element, a stationary element, and a pawl carried by said rotating element which rides on said other elements and engages a recess in said contact element only upon a reversal of said rotating element. 30

4. In a pole-changer, a rotating element, a pawl carried thereby, a contact device which is engaged and shifted by said pawl upon each reversal of the rotation of said element, and a stationary plate which rides said pawl out of operative engagement with said contact device at other times. 35 40

5. In a pole-changer, a rotating element, a pawl carried thereby, a stationary curved

plate having a flattened surface, a similarly-curved contact-plate having a recess into which said pawl drops and engages a side thereof to move said contact-plate in the direction of its rotation after which said stationary plate rides it out of operative engagement with said contact-plate until its direction of rotation is reversed. 45 50

6. In a pole-changer, a worm-wheel driven from an armature-shaft, a pawl carried thereby which rides on a stationary cam, and a contact-plate having two shoulders, one of which is engaged by said pawl upon each reversal of its motion after which said cam will lift said pawl clear of the shoulder last engaged while it rides freely over the other shoulder. 55

7. In a pole-changer, a reversible armature-shaft, a rotating element carrying a pivoted pawl and driven by said shaft at a relatively lower rate of speed, switch-contacts, a switch-arm engaging said contacts and provided with projections, one of which is engaged by said pawl upon each reversal of its direction of rotation to shift said arm, in combination with means to disengage said pawl from said projections after each shifting movement of said arm. 60 65

8. In a pole-changer, a reversible armature-shaft, a speed-reducing gear-wheel driven by said shaft, a pawl carried by said wheel and engaging a cam-plate and a contact-piece to move the latter on each reversal of its rotation, said cam acting to ride said pawl out of operative engagement with said contact-piece after it has once been moved by said pawl in the direction of its rotation. 70 75

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

ROGER M. NEWBOLD.

Witnesses:

R. D. JOHNSTON,
WILLIAM E. FORT.