No. 874,208.

PATENTED DEC. 17, 1907.

L. KIBLINGER.

POLE CHANGER.

APPLICATION FILED JULY 8, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

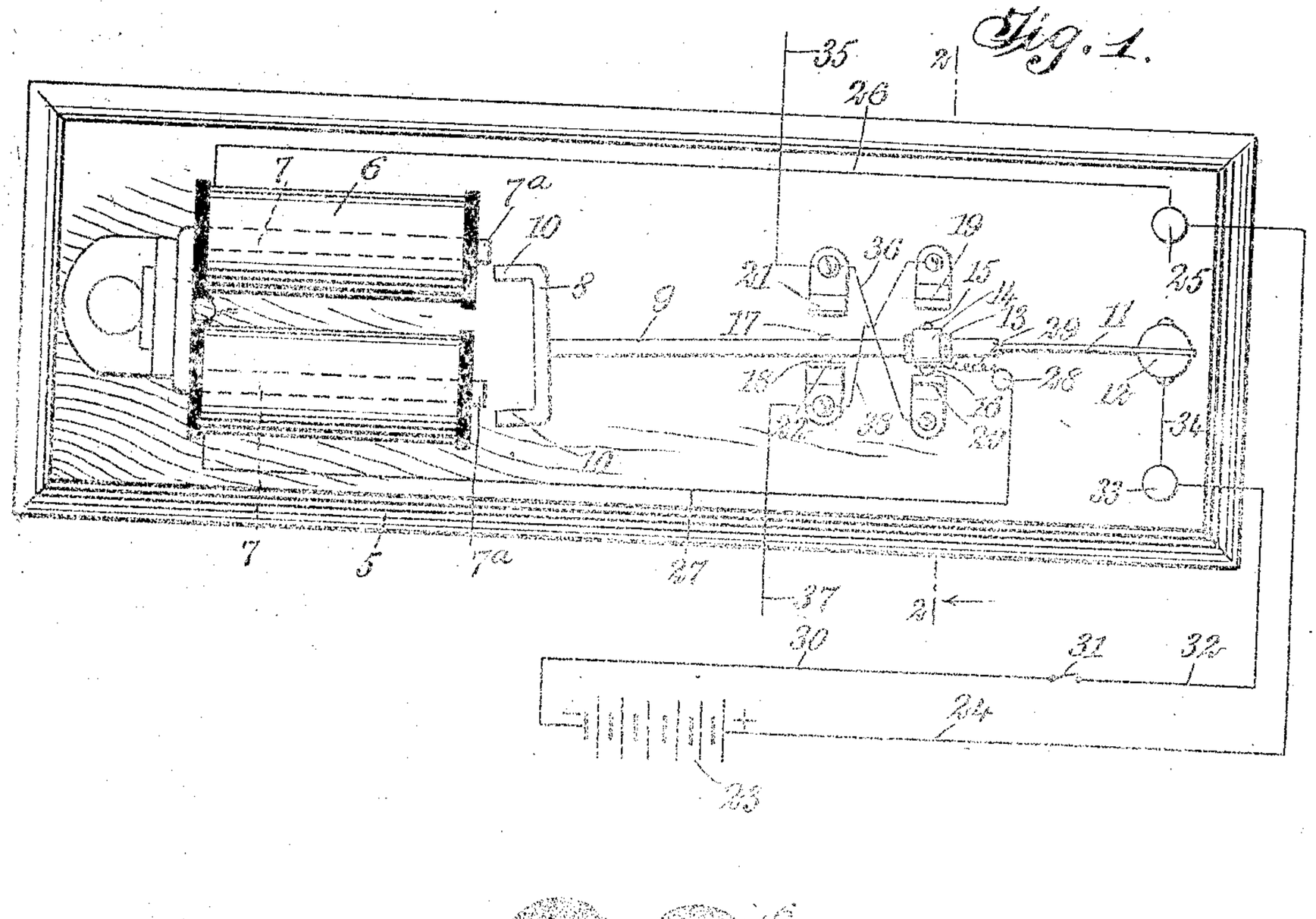
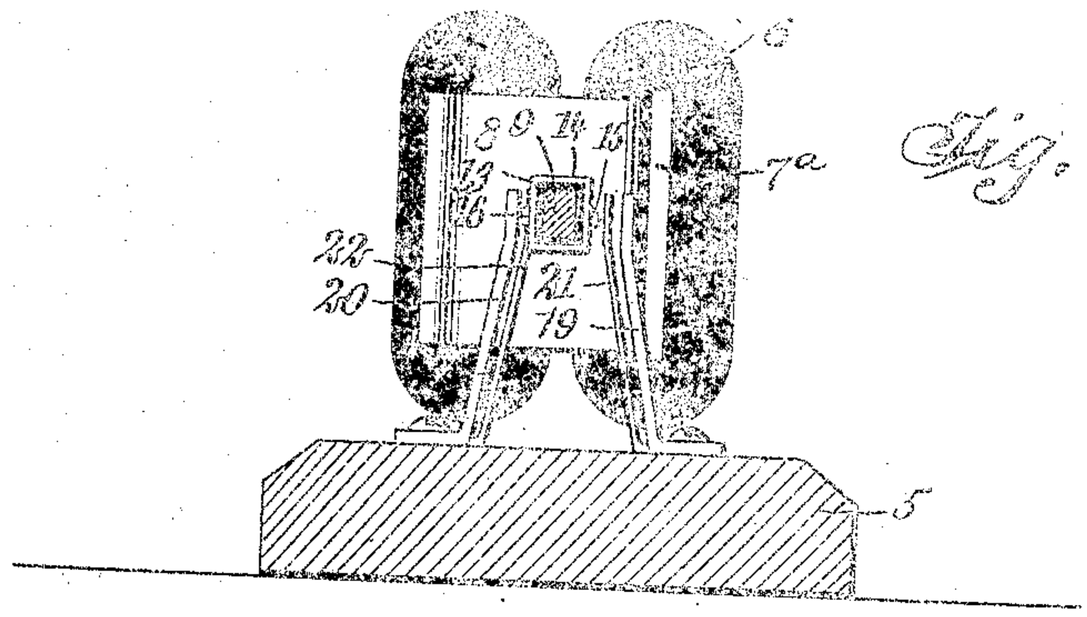


Fig. 2.



WITNESSES

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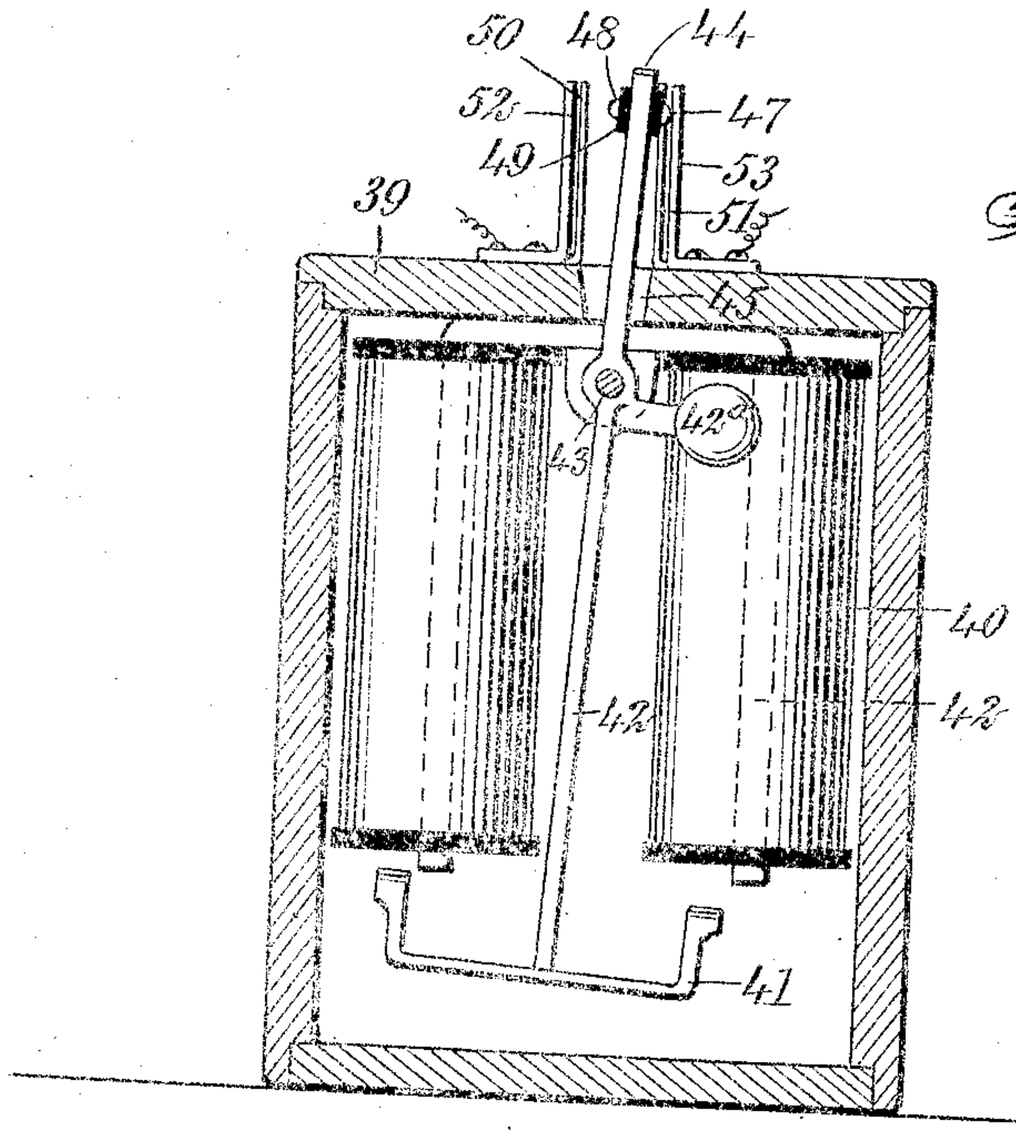

Fig. 3.

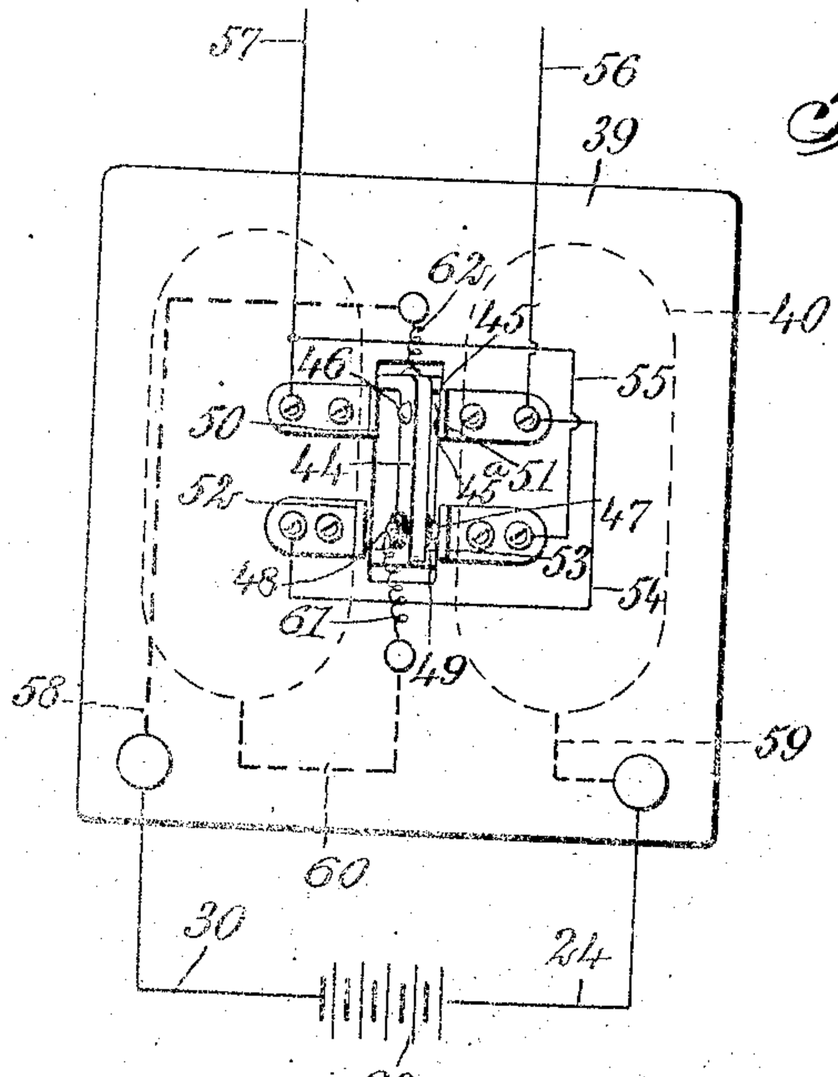

Fig. 4.

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LEE KIBLINGER, OF JACKSON, LOUISIANA

POLE-CHANGER.

No. 874,208. Specification of Letters Patent. Patented Dec. 17, 1907.

Application filed July 8, 1907. Serial No. 382,582.

To all whom it may concern:

Be it known that I, LEE KIBLINGER, a citizen of the United States, and a resident of Jackson, in the parish of East Feliciana and State of Louisiana, have invented a new and Improved Pole-Changer, of which the following is a full, clear, and exact description.

My invention relates to pole changers, my more particular object being to provide a form of pole changer in which the momentum of the vibrating hammer is employed in such a way as to increase the abruptness of the make-and-break.

My invention further relates to improving the magnet used in the pole changer so as to enable this magnet to exert a greater attraction for the portion serving as an armature.

My invention relates still further to certain details of construction for improving the general efficiency of the instrument.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view showing one form of my pole changer, in which the hammer swings in a horizontal plane and in which the hammer is powerfully attracted by the special form of magnet; Fig. 2 is a vertical section upon the line 2—2 of Fig. 1, looking in the direction of the arrow, and showing the special form of magnet with broad pole pieces both acting at the same time upon the swinging hammer or armature; Fig. 3 is a view partly in section and partly in side elevation, of another form of my pole changer in which the armature swings in a vertical plane; and Fig. 4 is a plan view of the construction shown in Fig. 3 and showing the arrangement of the contacts and the parts associated therewith.

Mounted upon a base 5 is an electromagnet 6 of horse-shoe form and provided with flattened cores 7 terminating in flattened pole pieces 7^a of opposite polarity. An armature 8 of substantially U shape in cross section is mounted upon a rod 9 and is provided with poles 10 adapted to register with the poles 7^a. This rod 9 is provided with a resilient portion 11 constituting a spring and held in a post 12 which is bifurcated for the purpose. Encircling the rod 9 is a sleeve 13 of insulating material preferably hard rubber, and encircling this sleeve is a ring 14 of metal provided with contact points 15, 16 of metal, preferably platinum.

Contact points 17, 18 are mounted directly upon the rod 9. Stationary contact springs 19, 20 are disposed oppositely to each other so as to be engaged by the contact points 15, 16, and similarly contact springs 21, 22 are disposed opposite the contact members 17, 18.

From a battery 23 a wire 24 leads to a binding post 25, the latter being connected by a wire 26 with the magnet 6. From this magnet a wire 27 leads to a binding post 28, and this post is connected by a wire 29 with the metallic sleeve 14.

From the battery 23 a wire 30 leads to a switch 31, and from the latter a wire 32 leads to a binding post 33. Connecting this binding post with the post 12 is a wire 34. A service wire 35 is connected with the contact spring 21, and from this spring a wire 36 leads to the contact spring 20. Another service wire 37 leads to the contact spring 22, which is connected by a wire 38 with the contact spring 19.

The operation of the form shown in Figs. 1 and 2 is as follows: The spring 11 is curved slightly so that the rod 9 is normally held in such position that the contact point 18 engages the contact spring 22. Suppose, now, that the service wires 35, 37 are connected up with an instrument through which the direction of the current is to be alternated. Suppose, now, that the operator closes the hand switch 31. A circuit is completed as follows: battery 23, wire 24, binding post 25, wire 26, magnet 6, wire 27, binding post 28, wire 29, metallic sleeve 14, contact point 16, contact spring 20, wire 36, service wire 35, through instrument in which the current is to be alternated, then returning through wire 37, contact spring 22, contact point 18, rod 9, wire 34, binding post 33, wire 32, switch 31, and wire 30, back to battery 23. This energizes the magnet 6 and causes both of its poles to attract the corresponding poles 10 of the armature 8. This causes the hammer to be swung violently toward the pole pieces and this movement breaks contact between the contact points 16, 18 and their respective contact springs 20, 22, so as to momentarily open the circuit. The momentum of the armature carries it into its extreme position, thereby causing contact point 17 to engage the contact spring 21,

and similarly causes the contact point 15 to engage the contact spring 19. The circuit is therefore again completed as follows: battery 23, wire 24, binding post 25, wire 26, magnet 6, wire 27, binding post 28, wire 29, metallic sleeve 14, contact member 15, contact spring 19, wire 38, service wire 37, through instrument (not shown) in which the current is to be reversed, returning by wire 35, contact spring 21, contact member 17, rod 9, spring 11, wire 34, binding post 33, wire 32, switch 31, wire 30, back to battery 23. Contrasting this circuit with the one previously traced, it will be seen that the current passes through wires 35, 37 in a direction contrary to that which it pursued in the circuit first traced.

Owing to the curvature or set of the spring 11, the instrument must always start when the switch 31 is closed, for the reason that the current has a free escape through the contact point 18 and spring 22.

It will be seen that each successive pull of the magnet 6 causes the rod 9 to be thrown first in one direction and then in the other, the rod being always in rapid motion at the time when contact is made and broken.

Referring to Figs. 3 and 4, most of the working parts are inclosed within a casing 39. A magnet 40 is suspended from the top of this casing and a hammer 41 is mounted rigidly upon the lower end of an armature lever 42. The latter is hung from a pivot 43. A plate 44 is rigidly connected with the armature lever 42 and projects upwardly through a slot 45 in the casing 39. The contact points are shown at 45^a, 46, 47, 48, the two contacts last mentioned being insulated from the plate 44 by a sleeve 49 of insulating material preferably hard rubber. Contact springs 50, 51, 52, 53 are engaged by the movable contact points 46, 45^a, 48, 47, in a manner which will be well understood by reference to the contact mechanism shown in Fig. 1.

A wire 54 connects the contact spring 52 with the contact spring 51. A wire 55 connects together the contact springs 50 and 53. A wire 56 is connected with the contact spring 51 and with the wire 54. A wire 57 is connected with the contact spring 50 and with the wire 55. The magnet 40 is connected with wires 58, 59. A wire 60 connects the magnet with a wire 61 leading to the contact point 48, and a wire 62 connects the member 44 with a wire 58.

The resiliency of the contact springs 50, 51, 52, 53 is alone sufficient to throw the plate 44, and consequently the armature lever 42, in either direction after the completion of the stroke in that direction. In the form shown in Figs. 3 and 4, as well as in the form shown in the other figures, the momentum of the hammer carries it past the magnet poles, the movement necessary for this purpose serving to break the circuit at the exact instant when the hammer is closest to the magnet poles.

The armature lever is maintained in such position as to enable the machine to start by virtue of a weight 42^a which always insures a contact sufficient to enable the current to flow as soon as turned on.

The operation of the form shown in Figs. 3 and 4 will be readily understood. The contacts are made and broken substantially as above described with reference to the other figures, and the direction of the current changed accordingly.

While for convenience I show my invention as applied to pole changers, it should be noted that I do not limit myself thereby, for the reason that various changes may be made in the construction of the device and in the uses to which it is applicable, without departing from the spirit of my invention.

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

1. The combination of a magnet provided with a flat pole, an armature provided likewise with a flat pole adapted to register with said flat pole of said magnet, means for mounting said armature so that the same can swing in a plane crossing the short diameter of said flat poles, and a contact connected with said magnet, said contact being so disposed that the swing of said armature opens said contact.

2. The combination of a bi-polar magnet a single swinging member disposed adjacent thereto, a substantially U-shaped armature mounted upon said swinging member and provided with poles adapted to mate the poles of said bi-polar magnet, said armature being mounted to swing back and forth across the poles of said magnet without touching the same, and contact mechanism to be opened and closed by movements of said swinging member.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LEE KIBLINGER.

Witnesses:
GEO. W. BROWN,
J. M. NORSWORTHY.