C. J. ERICKSON.

POLE CHANGER.

APPLICATION FILED AUG. 11, 1906.

1,036,817.

Patented Aug. 27, 1912.

2 SHEETS—SHEET 1.

Fig. 2.

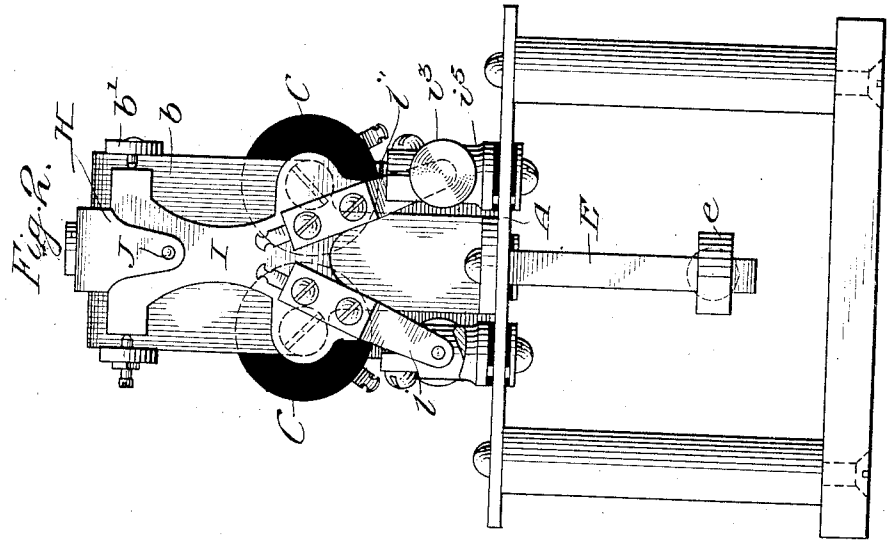
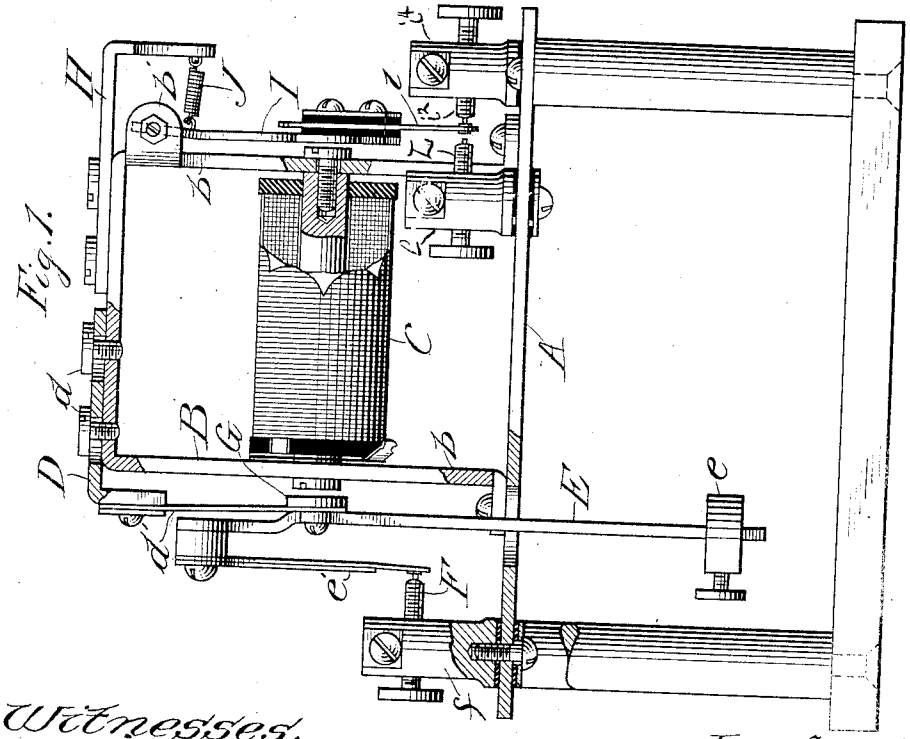


Fig. 1.



Witnesses.

R. H. Bumpfrind

Mae Campbell

Inventor:

Charles J. Erickson.

By Bulkley & Sinnard

Attorneys.

C. J. ERICKSON.

POLE CHANGER.

APPLICATION FILED AUG. 11, 1906.

1,036,817.

Patented Aug. 27, 1912.

2 SHEETS—SHEET 2.

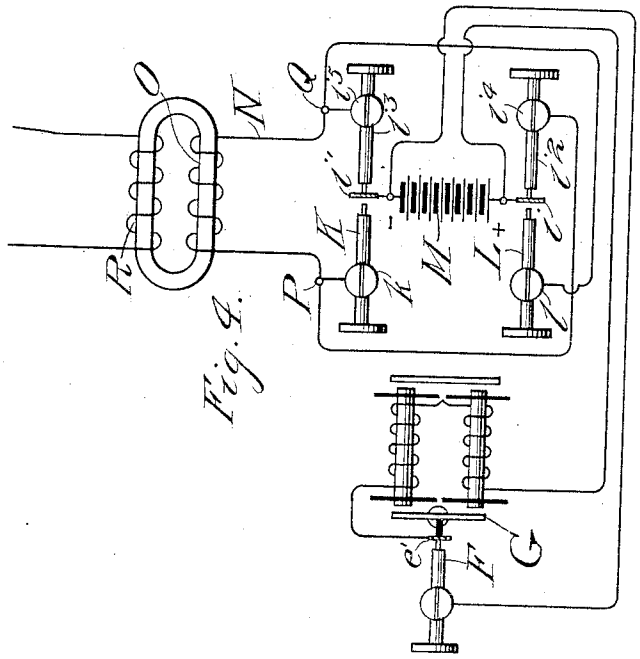


Fig. 4.

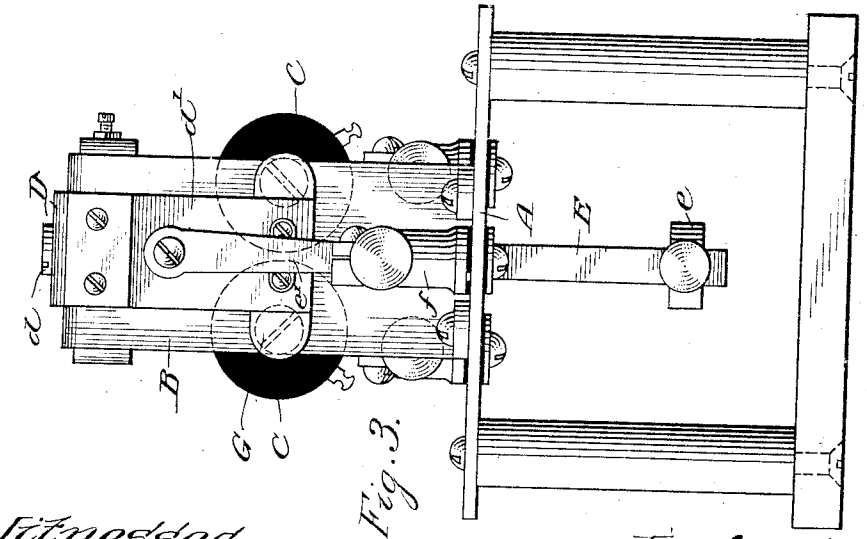


Fig. 3.

Witnesses.

R. H. Bumford

W. Lee Campbell

Inventor:

Charles J. Erickson.

By Bulkley & Durand.

Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES J. ERICKSON, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO FIRST TRUST AND SAVINGS BANK, TRUSTEE, OF CHICAGO, ILLINOIS.

POLE-CHANGER.

1,036,817. Specification of Letters Patent. **Patented Aug. 27, 1912.**

Application filed August 11, 1906. Serial No. 330,192.

To all whom it may concern:

Be it known that I, CHARLES J. ERICKSON, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Pole-Changers, of which the following is a specification.

My invention relates to pole-changers for use in automatically converting the current of a battery or other source into an alternating current suitable for use, for example, in operating bells or ringers, such as the bells or ringers of a telephone system.

Generally stated the object of my invention is the provision of an improved and highly efficient pole-changer.

Special objects of my invention are the provision of improved means for reversing the flow of current; the provision of improved means for mounting and operating the pendulum of a pole-charger; the provision of a pole-changer having an operating circuit which is entirely independent and distinct from the generating circuit; and the provision of certain details and features of improvement and combinations tending to increase the general efficiency and serviceability of a pole-changer of this particular character.

To the foregoing and other useful ends, my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a pole-changer embodying the principles of my invention, certain portions being shown in section to more clearly illustrate the construction. Fig. 2 is an end elevation of the same. Fig. 3 shows the other end of the said pole-changer. Fig. 4 is a diagram of the circuits of the said pole-changer.

As thus illustrated, my improved pole-changer comprises a suitable support or body-frame A upon which is mounted a U-shaped support or frame B. The electro-magnets C, C are arranged horizontally in the same plane, and have their end portions suitably secured to the vertical portions *b* of the said frame. Upon the top of said frame the mounting D is adjustably secured in place by screws *d* and provided with a downwardly-extending spring d^1. The pendulum E has its upper end secured to the said spring and its lower end provided with an adjustable weight *e*. The said pendulum is provided with circuit-controlling or interrupter springs e^1, the longer of which bears against the stationary contact F, which latter is mounted in a suitable binding post *f*. The pendulum E carries the armature G, which latter is arranged in operative relation to the cores or pole-pieces of the electro-magnets. At the other end of the structure a bracket-piece H is secured to the top of the frame B. Ears b^1 are provided on the said frame and serve as a point of pivotal connection or mounting for the swinging armature I. This armature, it will be seen, carries the terminal springs *i* and i^1, which latter are held normally against the stationary contacts i^2 and i^3, these contacts being mounted in suitable binding posts i^4 and i^5. This normal position of the armature I is maintained by a spring J which connects the upper end of the armature with the bracket-piece H. The normally disengaged stationary contacts K and L are mounted in binding posts *k* and *l*, and are adapted to be engaged by the springs i^1 *i*, respectively, when the armature I is attracted by the electro-magnets.

Referring to Fig. 4, it will be seen that the battery M is connected in series with the windings of the two electro-magnets, as well as with the contacts e^1 and F. With this arrangement the electro-magnets attract the armatures G, and in so doing open the energizing circuit in which their coils or windings are included. The pendulum E then swings back and causes the contacts e^1 and F to close together, thus restoring the energizing circuit. This more or less rapid interruption in the flow of energizing current through the electro-magnets is thus controlled by the armature G, the whole constituting what is ordinarily known as an interrupter. This intermittent energizing of the electro-magnets causes a corresponding energizing of the armature I. It will alsn be seen by inspecting Fig. 4 that this operating circuit is independent of and totally distinct from the generating circuit N, which generating circuit includes the primary O of a transformer or induction-coil. As illustrated, the contact i^2 and the contact K are both connected to the same side of the circuit at P. On the other hand the contacts i^3 and L are both connected

with the opposite side of the circuit at Q. The springs i and i^1 are connected respectively with the positive and negative poles of the battery M and normally engage the contacts i^2 and i^3, as shown more clearly in Fig. 4. When the armature I is attracted, however, then these springs engage the contacts L and K, and in this way the flow of current in the circuit N is reversed. Normally, the current flows from the positive pole of the battery through the spring i, then through the contact i^2, through the wiring of the circuit N, through the induction-coil winding O, thence through the contact i^3 and the spring i^1 to the negative pole of the battery. When the armature I is attracted the flow of current is then from the positive pole of the battery through the spring i, through the contact L, through the wiring of the circuit N, through the said winding of the induction-coil, thence through the contact K and the spring i^1 to the negative pole of the battery. In this way the rapid vibration of the armature I cause a constant reversal of the current in the circuit N and a consequent inductive generation of an alternating current in the secondary R of the said induction-coil, which latter may be connected with the circuit or switches from which the alternating current is to be taken for any useful purpose.

The frequency of the current developed by the pole-changer may be varied or changed by sliding the weight e up and down, or by varying the thickness of the spring d^1, as may be desired.

What I claim as my invention is:—

1. In a pole changer, an operating circuit, a generating circuit, an interrupter in the operating circuit, electromagnets in said operating circuit provided with an armature for actuating said interrupter, an independent armature for said magnets provided with contacts controlling the generating circuit, and stationary contacts coöperating with said armature contacts for causing an intermittent reversal of the flow of current in the said generating circuit, said last-mentioned armature being independent of the said interrupter, the two armatures being disposed at opposite ends of the magnets, said operating circuit being independent of and distinct from the said generating circuit, for the purpose set forth.

2. In a pole changer, an operating circuit, a generating circuit independent of and distinct from said operating circuit, an electromagnet provided with means including a plurality of armatures for controlling both circuits, and a source of current, common to both circuits.

3. In a pole changer, an electromagnet, two independently operating armatures for said magnet disposed at opposite ends thereof, an interrupter operated by one of said armatures, current-flow reversing contacts operated by the other armature, a pendulum carried by the armature which operates the interrupter, and circuit controlled by said armature.

4. In a pole changer, an electromagnet, means for energizing said magnet, an interrupter operated by said electromagnet, adapted to intermittently interrupt the flow of energizing current through the magnet, an armature independent of said interrupter and intermittently attracted by the intermittent energizing of the electromagnet, a generating circuit, and contacts operated by said last-mentioned armature adapted for intermittently reversing the flow of current in said generating circuit, said armatures disposed at opposite ends of said magnet.

5. In a pole changer, a battery, an operating circuit, a generating circuit independent of and distinct from said operating circuit, each circuit, however, including said battery, and an electromagnet provided with devices for controlling both circuits, which devices consist of two independently vibratory armatures and contacts therefor.

6. In a pole changer, a circuit interrupter, a circuit reverser, and a single magnet having devices for operating both the interrupter and the reversed, which devices consist of two independently vibratory armatures and contacts therefor.

Signed by me at Chicago, Cook county, Illinois, this 9th day of August, 1906.

CHARLES J. ERICKSON.

Witnesses:
EDWARD D. FALES,
JOHN ERICKSON.