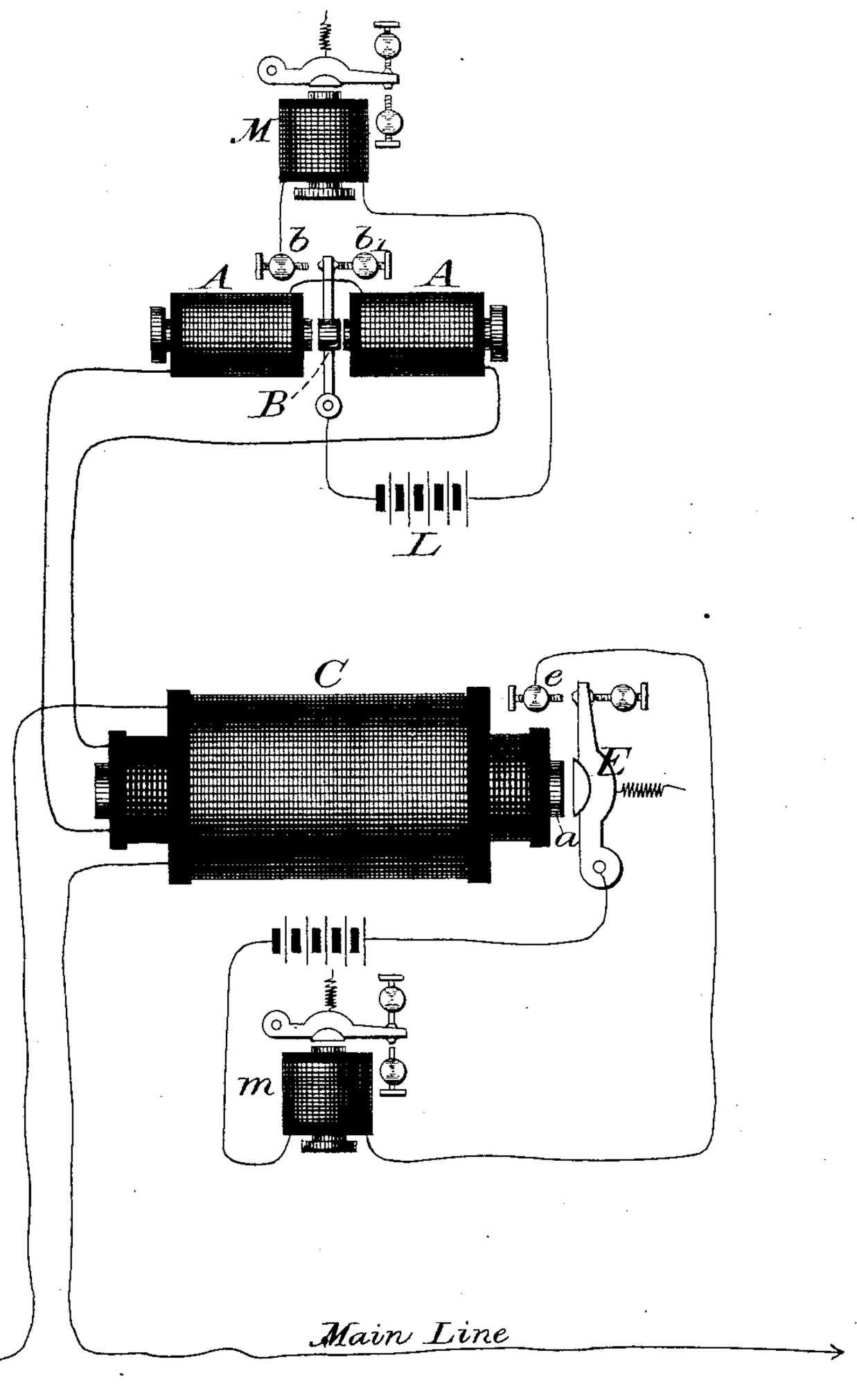
(No Model.)

J. W. STOVER.

TELEGRAPH RELAY.

No. 244,946. Patented July 26, 1881.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOSEPH W. STOVER, OF NEWTON, MASSACHUSETTS.

TELEGRAPH-RELAY.

SPECIFICATION forming part of Letters Patent No. 244,946, dated July 26, 1881.

Application filed June 9, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. STOVER, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Telegraphic Relays, of which the following is a specification.

My invention relates to certain improvements in telegraphic relays, the object of which is to provide a compound relay which may be operated both by the secondary currents of an induction-coil and by changes in the magnetism of the core of the induction-coil itself. To this end I employ an ordinary relay, having a polarized armature, in combination with and included in the secondary circuit of an induction-coil. I also cause the magnetism of the core of the induction-coil to actuate an armature which performs the office of a second and independent relay, making and breaking the circuit of a local battery as often as it is attracted and released by the magnetization and demagnetization of the core.

The accompanying drawing represents a side elevation, partly in diagram, of an apparatus embodying my invention.

Referring to the drawing, A A represent two small straight electro-magnets having their poles facing each other on opposite sides of a polarized armature, B.

b is a contact-point connected with a local battery, L, in such a manner that the local circuit is completed through the armature B whenever it rests against the contact-point.

b' is an insulated fixed stop for the purpose of limiting the play of the armature B.

The coils of the electro-magnets A A are both included in the secondary circuit of an induction-coil, C, whose primary conductor is in circuit with the main line.

E is an armature which is actuated by the magnetic attraction of the core of the induction-coil, and operates in the manner of an ordinary relay, completing a circuit through the contact-point *e* whenever the current of the main line renders the core *a* magnetic.

Since the strength of the secondary or induced current of an induction-coil depends, for the most part, upon the variations which take place in the magnetism of the soft-iron core, the direct effect of the changes of the current in the primary coil being comparatively small, it is desirable to so construct the coil as to secure the maximum of magnetization from a weak current. This I accomplish by using for the primary circuit of the induction-coil many convolutions of thin wire, which produce a strong magnetic effect in the core with a weak current.

The secondary current required to work the relay to the best advantage in a short circuit is one of quantity rather than intensity, and is not required to overcome a great amount of resistance. I therefore prefer to use a comparatively small number of convolutions of thicker wire for the secondary circuit of the induction-coil.

The secondary circuit may be wound directly upon the core and the primary outside of it, or vice versa. I prefer, however, to make use of the former arrangement.

The electro-magnets A A in the circuit of the secondary coil are so wound that poles of opposite polarity are presented to each other. Between these poles the polarized armature is allowed to vibrate, the electro-magnets co-operating to throw it to and fro, after the manner of the ordinary polarized relays, at each reversal of the current. Two independent telegraphic receiving-instruments, M and *m*, which may be sounders, bells, recording apparatus, or other desirable substitute therefor, may thus be actuated by a single induction-coil included in the circuit of the main-line. It is obvious that each of these instruments will independently respond to all signals transmitted through the main line by closing and breaking the circuit. The receiving-instrument M, which is actuated by the polarized armature B, may also be operated from a distant station without affecting the other armature, E. This may be done by means of a key or other transmitting device, which is constructed so that when opened it does not break the circuit of the main line, but acts to decrease its strength by throwing in a resistance or otherwise. A sudden increase or decrease in the strength of the primary current without actually interrupting it will set up induced currents in the secondary coil and operate the polarized armature, and thus signals may be sent through the main circuit which will be received upon the receiving-instrument M, and not upon the receiving-instrument *m*.

I am aware that it is not new to actuate a relay or other receiving instrument by the secondary current of an induction-coil the primary circuit of which is included in the main line, and I do not broadly claim such an apparatus.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of an induction-coil having its primary conductor included in the main line, and a polarized relay included in the circuit of its secondary wire, with an independent armature for controlling a local circuit actuated by the direct magnetic attraction of the core of said induction-coil.

2. The combination, substantially as hereinbefore set forth, of an induction-coil having its primary wire included in the main-line circuit, a polarized armature actuated by the secondary or induced currents traversing the secondary wire of said coil, and a neutral armature actuated by the primary currents traversing the primary wire of said coil.

In testimony whereof I have hereunto subscribed my name this 11th day of May, A. D. 1881.

JOS. W. STOVER.

Witnesses:
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