I. KITSEE.

TELEGRAPHY.

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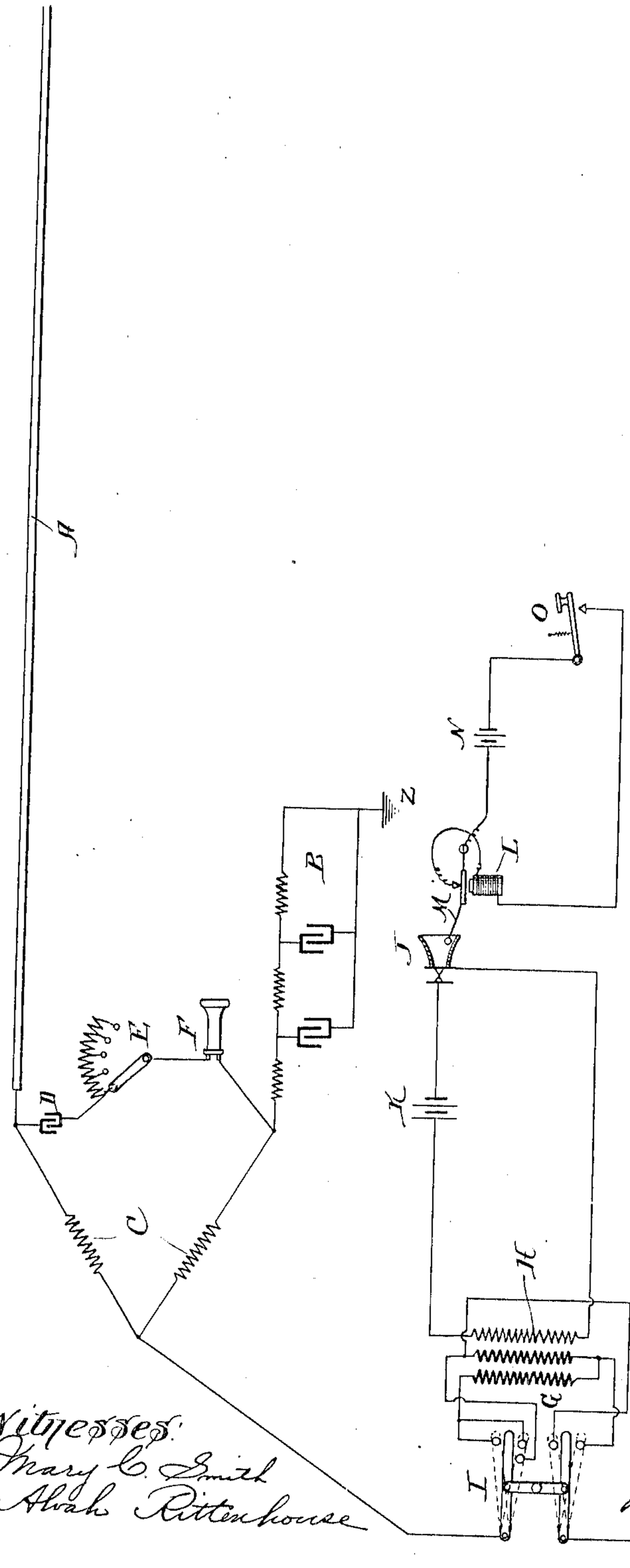

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UNITED STATES PATENT OFFICE.

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TELEGRAPHY.

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To all whom it may concern:

Be it known that I, ISIDOR KITSEE, citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Telegraphy, of which the following is a specification.

My invention relates to an improvement in telegraphy and has more special reference to the means for transmitting impulses in accordance with the Morse alphabet. The invention is more specially applicable to lines of great capacity, such for instance as underground or submarine cables. The transmission of induced currents, due to the making and breaking of a primary source, was found to be inapplicable to the transmission of submarine cables and was, therefore, discontinued on all such lines where the insulation has to be preserved and where such induced currents are liable to injure such insulation. In my experiments, I have found that even if it is impossible to transmit speech over such lines as submarine cables, it is possible to transmit impulses due to the variation of a resistance, such as a microphonic transmitter, if the change in the resistance in substantially alike for a shorter or longer time. I, therefore, have recourse to an arrangement substantially as illustrated in the drawing, described in this application, and more specially pointed out in the claim following this specification.

I have illustrated in the drawing one part of a cable embracing the usual arrangement for duplexing the same; but it is obvious that this arrangement may also be used on lines with large capacity without duplexing the same.

This drawing illustrates in diagrammatic view my invention and A designates the line; C the bridge-wires; B the artificial cable; Z the ground. So far the arrangement is exactly the same as now practised on most of the long distance submarine cables, but instead of using the double key, as now employed, and of using for each key a different pole of a source of current, I have recourse to the following arrangement: I use a source of current locally connected to a resistance adapted to be varied and connecting the circuit of said resistance to the primary of an inductorium, the secondary of which is connected in series to the line proper. I also make use of a second circuit embracing a source of current, a transmitting key, such as an ordinary Morse key, and means to vary the resistance with the aid of an electromagnet inserted in said circuit.

In the drawing, the source of current connected in the first named circuit is designated by K, the variable resistance by J; this variable resistance is here illustrated as one of the usual microphonic transmitters and is here provided with the usual transmitting mouth-piece; the primary of the inductorium is designated by the letter H and the secondary by the letter G. I have found that in accordance with the length of the line, it is best to vary the secondary and I have shown here one way in which to change the connection of said secondary with the aid of the switch I. This secondary is illustrated as to consist of two parts adapted to be connected with the aid of the switch, either in multiple arc or series as to each other. The second local circuit embraces a source of current N, the vibrating magnet L, and the key O. The vibrating magnet L is provided here with a clapper M and this clapper is adapted to tap the mouth-piece of the resistance J. In the cross wire of the bridge is inserted the condenser D and the resistance E. This resistance is adapted to be varied according to requirements with the aid of the switch I, in said line is also inserted the telephonic receiver F.

The operation of this device is as follows: As long as the key O is open, the vibrating magnet L is inoperative and the resistance J will, therefore, remain stationary. Should an operator desire to transmit messages in accordance with the Morse alphabet, then he depresses the key in the usual manner; a short time for a dot and a longer time for a dash. During the time of the depression of the key, the magnet L becomes operative and the clapper of same will tap on the mouth-piece of the resistance J, thereby altering this resistance and this will result in a variable current flowing through the primary H, inducing then impulses in the secondary G. These impulses will flow over the line and will make operative the ear-phone F for a longer or shorter time, in accordance with the time-unit that the key O is

depressed. I have sent such impulses over lines, the combined resistance and capacity of which were such, that no other impulses could be sent without having recourse to a very high electro-motive force which, as said above, is prohibited on such lines as submarine cables.

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

In telegraphy, means to transmit messages, in accordance with the Morse alphabet, said means embracing a variable resistance, a transmitting key, source of current, means to vary automatically said resistance by the depression of the key and means to impress thereby upon the line of transmission, a series of impulses of alternating polarity, said means embracing a series of coils and means to change the connection of said coils as to each other and the line.

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

ISIDOR KITSEE.

Witnesses:
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