(No Model.)

# J. K. D. MACKENZIE.

## ELECTRICAL SIGNALING APPARATUS.

No. 305,611. Patented Sept. 23, 1884.

FIG. 1.

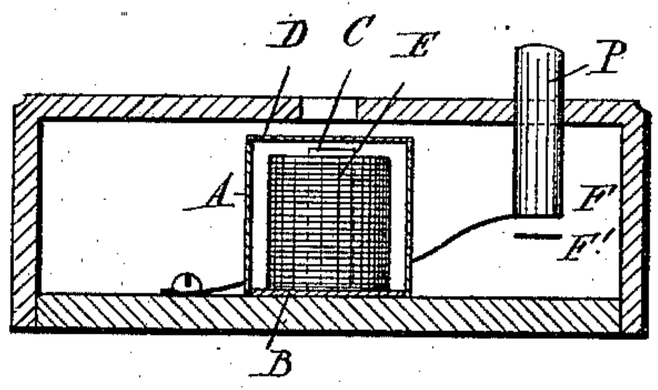



FIG. 2.

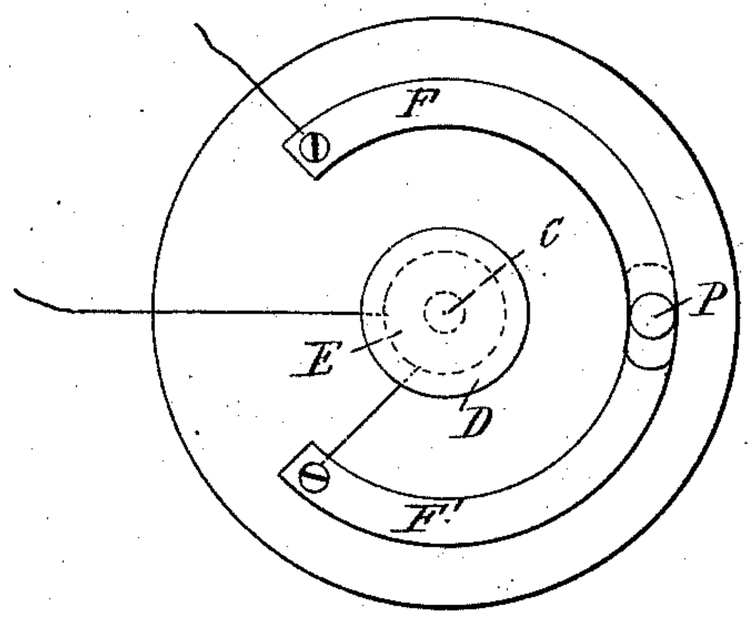
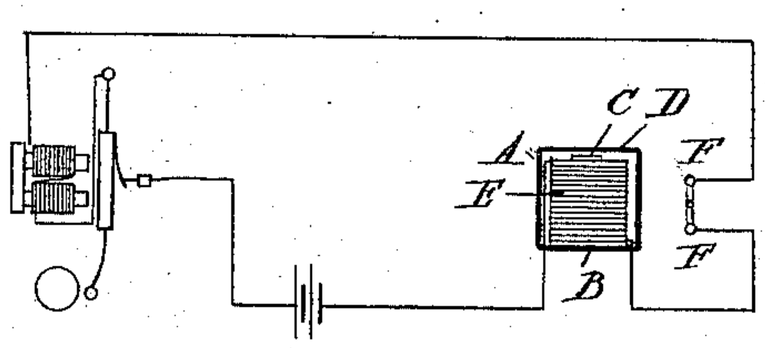



FIG. 3.

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# UNITED STATES PATENT OFFICE.

J. KENNETH D. MACKENZIE, OF WESTMINSTER, COUNTY OF MIDDLESEX, ENGLAND.

## ELECTRICAL SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 305,611, dated September 23, 1884.

Application filed June 11, 1884. (No model.) Patented in England May 27, 1884, No. 8,305.

*To all whom it may concern:*

Be it known that I, JAMES KENNETH DOUGLAS MACKENZIE, electrical engineer, a subject of the Queen of Great Britain and Ireland, and residing at 25 Queen Anne's Gate, Westminster, in the county of Middlesex, England, have invented a certain Apparatus for Indicating the Proper Working of Electrical Annunciators, (for which I have applied for a patent in Great Britain, No. 8,305, dated May 27, 1884,) of which the following is a specification.

The object of my invention is to provide a means by which the proper working of an electric bell or other annunciator is indicated at the distant push or contact, or at other desired place where the sound of the bell or annunciator cannot itself be heard, which means shall be automatic, simple, and inexpensive. The person operating the push or contact will thus be certain that the bell is ringing, and that the circuit is in proper working order. The means I employ according to my invention for obtaining this result consist in employing the well-known property of iron, which is that of emitting a sound when magnetized or demagnetized. For this purpose I arrange an electro-magnet in the annunciator-circuit, the core of which is magnetized and demagnetized when the contact is made and the said circuit is acting properly, and in combination with this I use a piece or disk of iron, which may form part of the core magnetically, and which emits sounds as the core is magnetized and demagnetized.

In carrying my invention into effect I may take a box, preferably round, formed of iron of any convenient size, and fasten to the inside of the bottom a small core of soft iron almost the height of the box. Around this core of soft iron I place a bobbin or helix of wire, which forms part of the annunciator-circuit. Over the other end of the soft-iron core, but not touching it, and fastened to the edge of the box, I place a disk of thin iron, forming a lid or cover, and also, preferably, the opposite pole of the soft-iron core. The box is thus closed completely. The two ends of the wire forming the before-mentioned bobbin or helix are led out through and insulated from the side of the box, and are connected in the circuit of the annunciator. When contact is made in the circuit, the current flows round the bobbin or helix of my indicator along the line around the electro-magnets of the annunciator through the break-and-make arrangement and back to the source of electricity. While the current is flowing it magnetizes the core of soft iron, and each time the circuit is interrupted or broken by the break-and-make arrangement of the annunciator the magnetism of the soft-iron core is lost and a sound is given out. When the break-and-make arrangement again completes the circuit, the magnetism of the core is renewed and a sound is again given out, and this sound, caused by the magnetization and demagnetization of the iron, continues to be given out so long as the bell is being rung. I prefer to polarize the lid, as hereinbefore mentioned, as the effect is thereby increased. If the annunciator failed to act, or the circuit be not completed, the core would not become magnetized, and therefore no sound would be given out by my indicator. I combine my indicator with any contact-maker or ordinary bell push or pull.

In order that the said invention may be fully understood, I shall now proceed more particularly to describe the same, and for that purpose shall refer to the several figures on the annexed sheet of drawings, the same letters of reference indicate corresponding parts in all the figures.

Figure 1 represents in section, and Fig. 2 in plan, an apparatus arranged according to my invention, and is shown in combination with an ordinary contact-maker.

A is the iron box; B, the bottom to which is attached the soft-iron core C, around which is the bobbin or helix E.

D is the iron lid or cover of the box A, and attached thereto opposite the end of the core C.

F F′ are the two contact-springs, and P is the push. Fig. 3 is a theoretical diagram of connections, showing the bell and battery. In Fig. 3, when F F′ are joined, the current flows from the battery round the bobbin or helix E to the bell round the magnets through the make-and-break arrangement and back to the battery, thereby polarizing the core C and the lid D, and causing the said lid to emit a sound. The make-and-break arrangement of the bell now comes into action and the circuit is interrupted, thereby demagnetizing the core C and the lid D, and causing it again to emit a

sound. I find that this sound, caused by demagnetization, is louder than that caused by magnetization, and therefore my apparatus is capable of being used as a means of transmitting messages orally. This interrupted and intermittent sound is kept up so long as the contact between F and F′ is maintained and the battery-current lasts. Other electrical power than that produced by batteries may be used, and the instrument may be combined with any apparatus in which electric bells are used—such as telephone call-bells.

I have shown in the drawings the lid of the box as connected with the core, so as to be polarized thereby; but I do not necessarily limit myself to this.

I claim—

In an electrical annunciator-circuit, the combination, with the make-and-break apparatus at the distant station, of an electro-magnet at the sending-station, adapted to be magnetized and demagnetized by the action of the make-and-break apparatus, and an iron disk or box and connections, arranged and adapted to coact with said electro-magnet, substantially as hereinbefore set forth.

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

J. KENNETH D. MACKENZIE.

Witnesses:

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