

(No Model.)

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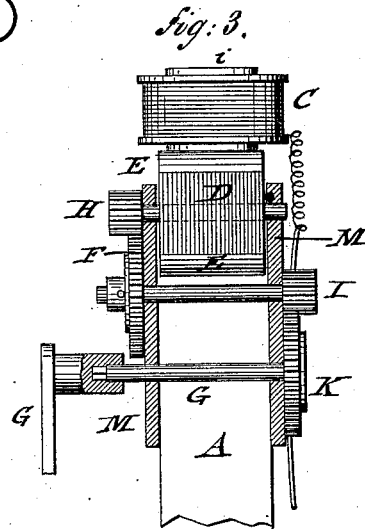
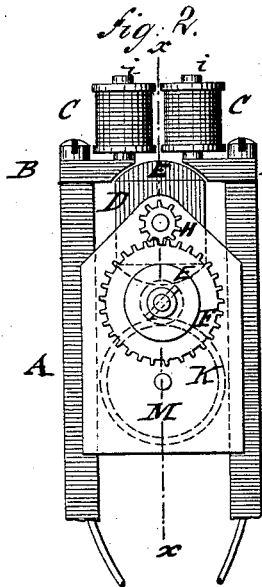
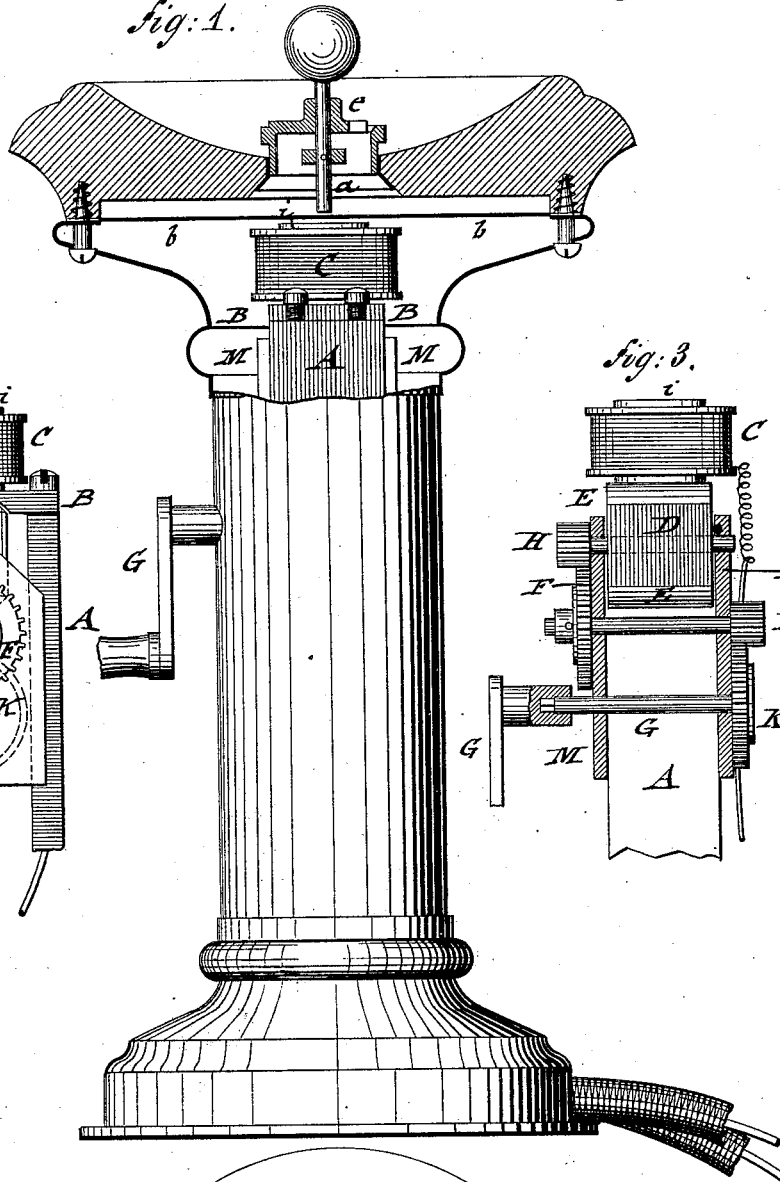
A. J. W. MÜNCH.

MAGNETO ELECTRIC SIGNALING ATTACHMENT FOR TELEPHONES.

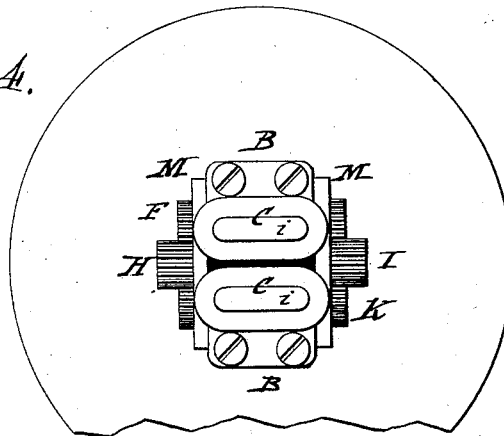
No. 304,121.

Patented Aug. 26, 1884.

*Fig. 1.*



*Fig. 4.*



WITNESSES:

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(No Model.)

2 Sheets—Sheet 2.

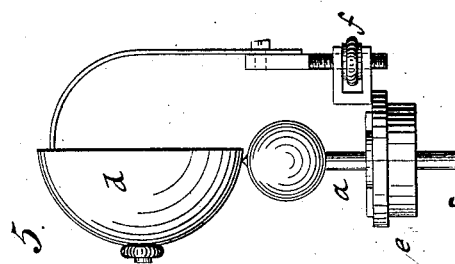
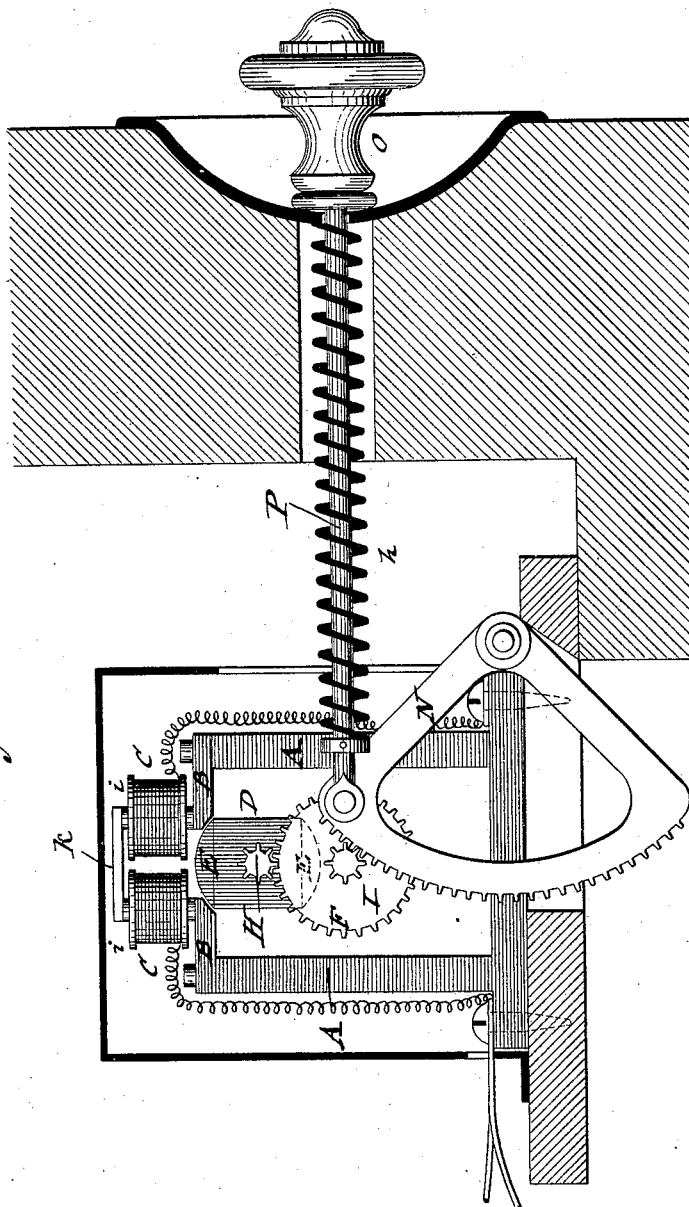
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Fig. 6.



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Fig. 5.

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# UNITED STATES PATENT OFFICE.

AUGUST J. W. MÜNCH, OF BERLIN, GERMANY.

MAGNETO-ELECTRIC SIGNALING ATTACHMENT FOR TELEPHONES.

SPECIFICATION forming part of Letters Patent No. 304,121, dated August 26, 1884.

Application filed March 8, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUST JULIUS WILHELM MÜNCH, a subject of the Emperor of Germany, residing at the city of Berlin, Prussia, Germany, have invented certain new and useful Improvements in Signaling Attachments to Telephones, of which the following is a specification.

This invention has reference to an improved signaling attachment to telephones by which the use of a battery for the transmission of signals is avoided and the signals transmitted by means of induction-currents generated in connection with the induction-coils of the telephone.

The invention consists of a telephone of that class having a horseshoe-magnet, an armature arranged intermediately between the pole ends of the magnet, and means whereby the same is rotated so as to generate induction-currents in the induction-coils of the magnet which actuate either the diaphragm or the diaphragm and a vibrating sounding device arranged in contact therewith.

In the accompanying drawings, Figure 1 represents a side elevation, partly in vertical central section, of a telephone with my improved signaling attachment. Fig. 2 represents a detail side view with the telephone casing or shell removed. Fig. 3 is a vertical transverse section on line *xx*, Fig. 1; Fig. 4, an end view of the magnet and its induction-coils. Fig. 5 is a detail showing a modified construction of the signaling device, and Fig. 6 shows a vertical longitudinal section, showing the signaling attachment applied to a house-telegraph.

Similar letters of reference indicate corresponding parts.

My improved signaling attachment to telephones is specially adapted to telephones which are used both as transmitters and receivers, and in which a horseshoe-magnet is employed, to the pole ends of which the induction-coils are applied. The horseshoe-magnet A is provided with pole-pieces B B that extend inwardly at right angles to the legs of the magnet A, while the cores of the induction-coils C C are arranged at right angles to the pole-piece B B, as shown clearly

in Fig. 2. Between the legs of the horseshoe-magnet A and its pole-pieces B B is arranged a rotating armature that is formed of a prismatical brass block, D, which is provided at two opposite sides with segmental pieces E, of soft iron. The inner ends of the pole-pieces B B are cut off concentrically to the armature-segments E E, which latter are arranged close to the pole-pieces B B, but without forming frictional contact with the same. The armature D E is provided with a transverse shaft that turns in bearings of side plates, M, which extend transversely from one leg of the magnet A to the other, as shown in Fig. 2. The armature-shaft is provided with a pinion, H, and is rotated by the transmitting gear-wheels F, I, and K and the crank-shaft G, as shown in Fig. 3. Whenever by the rotation of the armature D E one of the segmental pieces E arrives intermediately between the pole-pieces B B, as shown in Fig. 2, the magnetism in the cores of the induction-coils C C is weakened. As soon as the segmental piece E leaves the pole-pieces B B the cores of the induction-coils C C have again the full magnetic force of the magnet A. When the next segmental piece E passes between the pole-pieces B B, the magnetism of the cores of the induction-coils is weakened again, and so on. The alternating diminution and augmentation of the magnetism in the cores of the induction-coils produce induction-currents of considerable force, which cause the diaphragms of the telephones in the same circuit to be vibrated, so that they are audibly sounded. The induction-currents are also strong enough to set a bell signaling device in motion. The effective action of the signaling attachment depends to some extent on the rapid rotations of the armature.

The entire attachment is made small enough, so that, with the exception of the crank-shaft G, it may be arranged inside of the cylindrical casing of the telephone, as shown clearly in Figs. 1, 2, and 3.

If desired, the armature may also be arranged in a position at right angles to that shown in Fig. 1, in which case the segmental pieces E of the armature would rotate at right angles to the pole-pieces and act upon the

same at the same time, so that the horseshoe-magnet is quickly opened and closed.

If it be desired to increase the characteristic noise that is produced by the vibrating diaphragm *b*, the central opening of the mouth-piece of the telephone is arranged with a star-shaped guide-piece, *e*, the hub of which guides a pin, *a*, with enlarged head, said pin resting upon the diaphragm *b*, as shown in Fig. 1. The vibrations which are imparted to the diaphragm *b* by the alternating action of the armature D E upon the magnetic poles of the induction-coils C C are transmitted to the pin *a*, which receives thereby a vertically-reciprocating motion. The rapid concussions of the pin *a* upon the diaphragm *b* produce a noise of considerable strength. If it be desired to make the signal still more audible, a bell, *d*, is arranged near the head of the pin *a*, which acts as a striker. The bell *d* is adjusted by a set-screw, *f*, at the end of its supporting-arm toward the head of the pin *a*, as shown in Fig. 5.

The same signaling attachment may also be used in connection with house-telegraphs, in which case the disposition shown in Fig. 6 is used. In this case the cores *i* of the induction-coils C C are preferably connected by a bar, *k*, whereby the inductive action of the coils is increased. The armature D E is set in motion by a knob, O, at the end of a rod, P, which oscillates a toothed segment, N, that revolves a pinion, I, gear-wheel F, and pinion H on the armature-shaft. A strong spiral spring, *h*, is interposed between a collar on the rod P and a fixed point outside of the same. By pulling the knob the armature is quickly revolved, and thereby induction-currents of sufficient strength produced for actuating a signal-bell.

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

1. The combination, with a telephone of that class having a horseshoe-magnet and induction-coils applied to the pole ends of the same, of an armature located between the pole ends of the magnet, and means whereby said armature is quickly rotated, so as to generate induction-currents for working either the diaphragms of the telephones in circuit therewith or a suitable signaling device, substantially as set forth.

2. The combination of a telephone having a horseshoe-shaped magnet and induction-coils applied to the pole ends of said magnet, an armature located between said pole ends and transmitting gear-wheels, and a crank-shaft for revolving the armature, substantially as set forth.

3. The combination, in a telephone of that class having a horseshoe-magnet and induction-coils attached to the pole ends of the magnet, of an armature located between the pole ends, means for revolving the armature, and a signaling device actuated by the diaphragm and guided in the opening of the mouth-piece of the telephone, substantially as set forth.

4. The combination, with a permanent magnet, A, having pole-pieces B B, induction-coils C C, supported on the pole ends *i i*, an armature, D E, located between the pole-pieces B B, and means whereby the armature is quickly rotated so as to generate induction-currents, by which a suitable signaling device may be actuated, substantially as set forth.

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

AUGUST J. W. MUNCH.

Witnesses:

GERARD W. V. NAWROCKI,  
B. ROY.