(No Model.)

H. H. ELDRED.

ELECTRICAL APPARATUS.

No. 602,596. Patented Apr. 19, 1898.

Fig. 1.

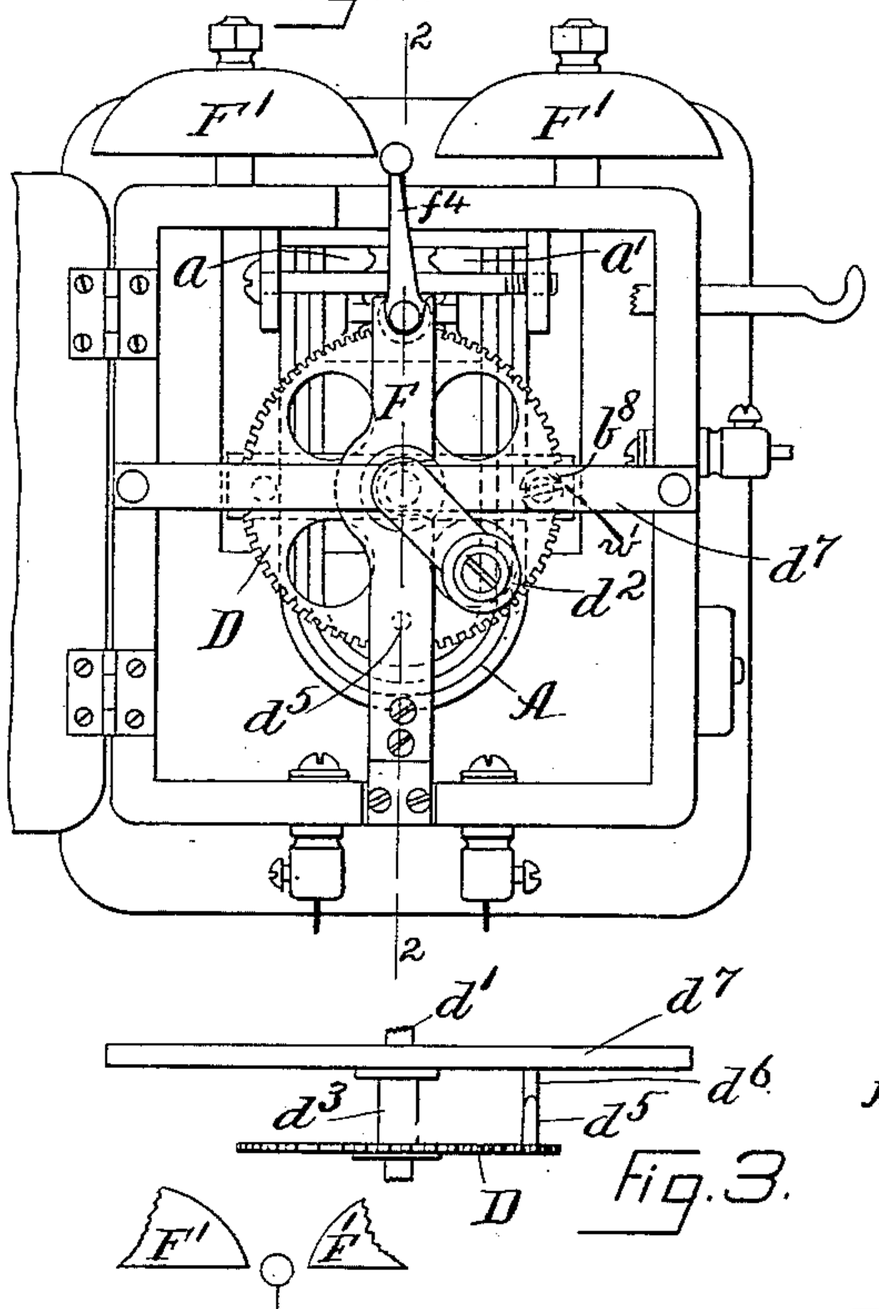
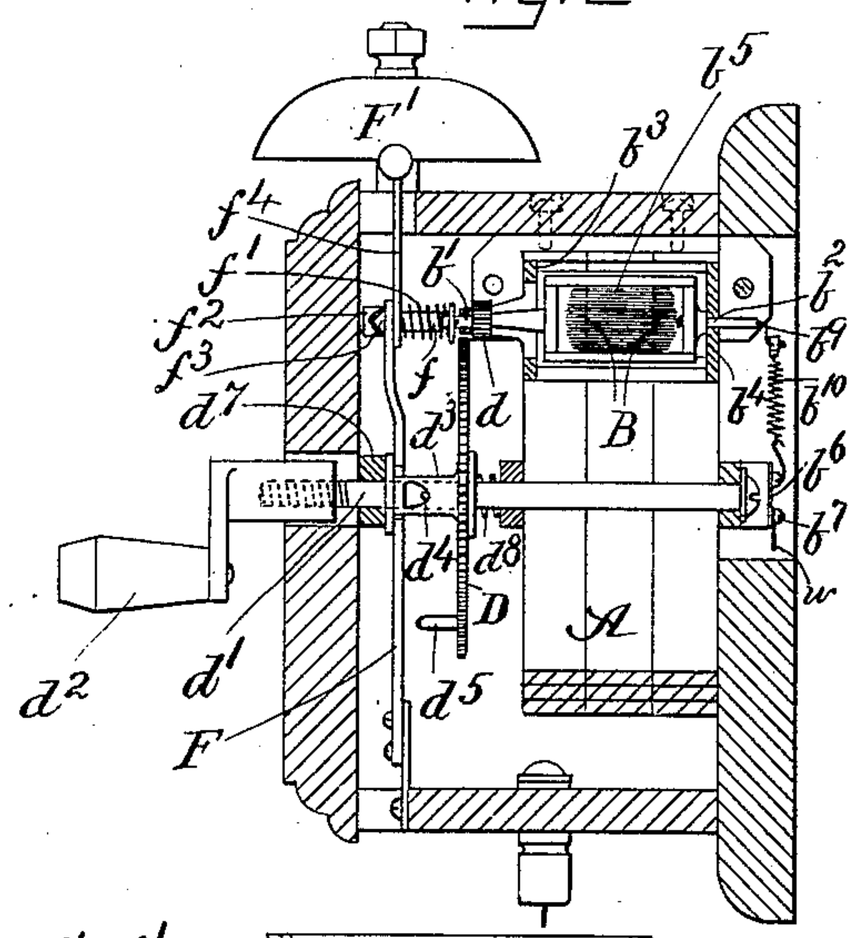


Fig. 3.

Fig. 2



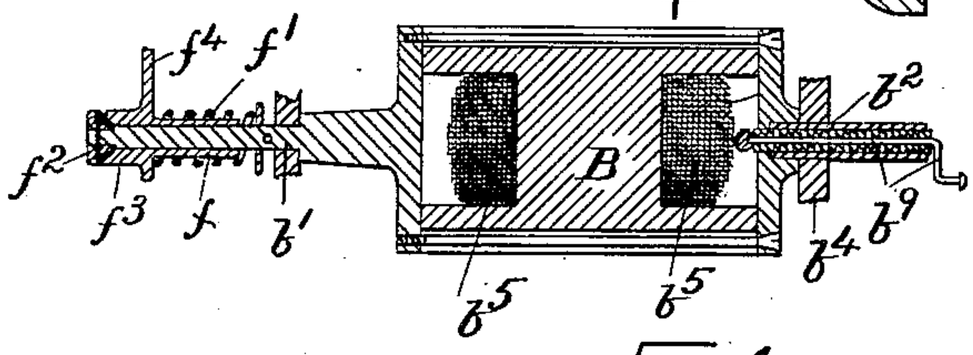


Fig. 4.

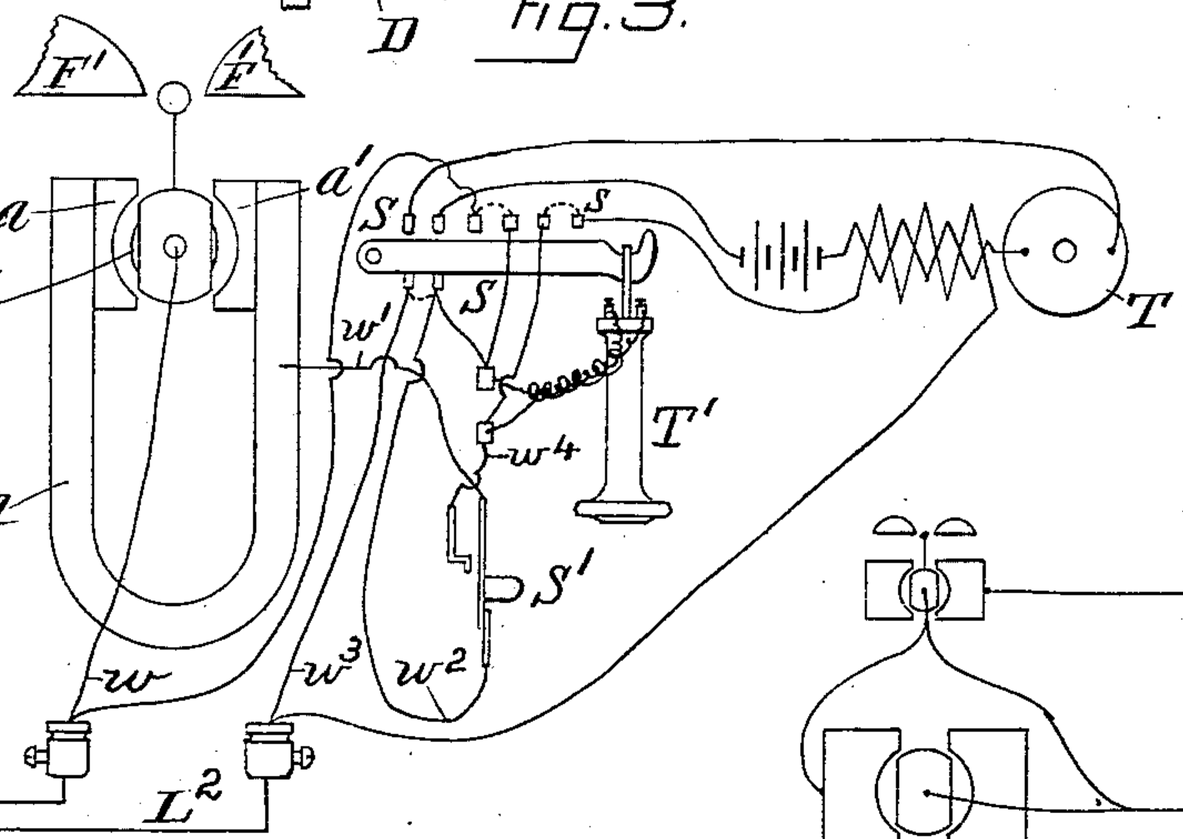


Fig. 7.

Fig. 5.

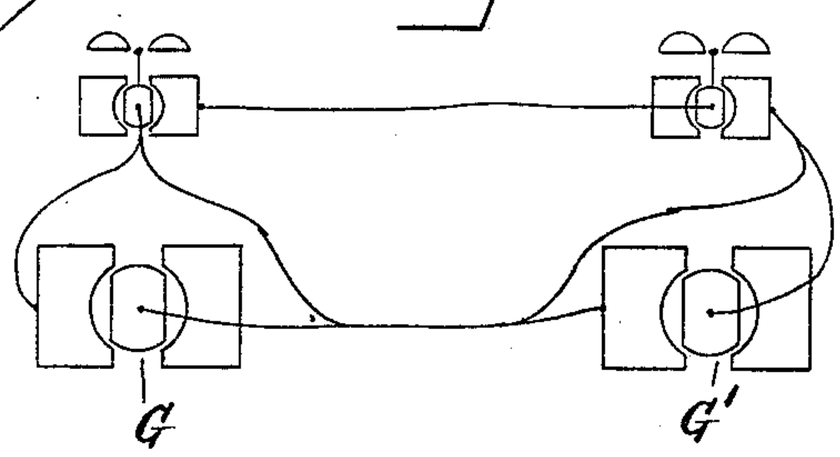


Fig. 6.

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ELECTRICAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 602,596, dated April 19, 1898.

Application filed April 4, 1896. Serial No. 586,230. (No model.)

To all whom it may concern:

Be it known that I, HORACE HAMLINE ELDRED, of Brooklyn, Kings county, State of New York, have invented a new and useful Electrical Apparatus, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of the apparatus, the door of the box being opened to show the mechanism. Fig. 2 is a section on line 2 2 of Fig. 1 with the door closed. Fig. 3 is a detail showing the contact of pins d^5 d^6. Fig. 4 is a central section, on an enlarged scale, through the armature and shaft. Figs. 5, 6, and 7 are diagrammatic illustrations.

One feature of my invention is a magneto instrument made up of a magnet, an armature, a vibrating arm, means to connect and disconnect the vibrating arm and the armature-shaft, mechanism to revolve the armature, and means to connect and disconnect that mechanism and the armature-shaft, so that when the mechanism for revolving the armature is disconnected and the vibratory arm connected the proper current through the coil of the armature will oscillate the armature and vibrate the arm carried on the armature-shaft; but when the arm is disconnected and the mechanism for revolving the armature connected the armature can be revolved to generate the current, which will cause the armature of a like instrument to oscillate.

In the drawings, A is the magnet, a a' its pole-pieces, and B the armature-core, mounted on journals b' b^2, which turn in bearings in the cross-pieces b^3 b^4, which are fast to the pole-pieces a a'. One end of the armature-coil b^5 is electrically connected to the core B of the armature, and the other end of the armature-coil is insulated from the armature-core and the hollow journal b^2 and goes to the plate b^6, which is insulated from the frame of the machine and which carries binding-post b^7 for wire w from line-wire L'. Wire w' from the other line-wire L^2 is held by binding-post b^8, which is not insulated from the frame of the machine. The armature-coil is thus connected to the line-wires L' L^2 and made part of the signaling-circuit. As it is desirable that the armature should always come to rest in the same position—namely, the position for oscillation when a proper current flows through its coil b^5—I connect the insulated end of the armature-coil to the small crank-shaft b^9, which passes through and is fast in hollow journal b^2 and is insulated from that journal, and connect the crank on shaft b^9 by means of spring b^{10} with insulated plate b^6.

The armature is revolved by gear D and pinion d, fast on journal b', and gear D is revolved by power applied to its shaft d' through winch d^2. Gear D is connected to its shaft d' by means of hub d^3 and pin d^4, working through a cam-slot in hub d^3, so that when shaft d' is rotated by its winch d^2 the pin d^4 engages the cam-slot in hub d^3 and carries gear D around until pin d^5 engages pin d^6, fast to cross-piece d^7, when pin d^4, fast to shaft d', rides on cam-slot in hub d^3, moving gear D sidewise to bring it into mesh with its pinion d, thus revolving the armature. Gear D is thus moved against spring d^8, and when the gear D is moved endwise against spring d^8 shaft d' is also moved endwise, thus holding gear D in mesh with pinion d until winch d^2 is released, when spring d^8 raises gear D clear of pinion d and also moves shaft d' back again. When gear D is thus moved sidewise to mesh with gear d, the bar F is carried with it and moves sleeve f on journal b' and against spring f' until the clutch f^2 f^3 is disengaged, leaving journal b' free to revolve, and as journal b' is fast to and one of the journals of armature B armature B is not prevented from revolving by arm f^4 of the bell-hammer, which arm is fast to sleeve f; but when gear D is out of mesh with pinion d sleeve f and arm f^4 are raised by spring f' and arm f^4 is clutched by clutch f^2 f^3 to journals b' of armature B and prevents armature B from revolving, so that the current compels armature B to oscillate when it flows through its coil, the knob on the end of arm f^4 striking the gongs F'.

In that form of my invention shown in the drawings the current generated by revolving the armature is an alternating current, and that current when it flows through the coils of a like armature, as B' in Fig. 6, will oscillate armature B', when that armature is prevented from revolving by connecting its journal with its arm f^4, and conversely when ar-

mature B′ is disconnected from arm f^4 and revolved the current generated by it will cause armature B to oscillate, when armature B is prevented from revolving by connecting its journal with its arm f^4; but obviously the generators may be so constructed that the current generated by one armature may be a pulsating current and yet compel the other armature to oscillate when it is prevented from revolving by its arm f^4, as will be clear to all skilled in the art, for this feature of my invention is an instrument whose armature is adapted to revolve in order to generate and is prevented from revolving and compelled to oscillate when a proper current flows through its coil.

One advantage of my apparatus, which in the form shown is in itself both a call-bell and a generator, is that two or more of them in one circuit make up a signaling system with only one coil for each apparatus instead of one coil for the generator and a separate coil for the bell, as heretofore—that is, in all prior magneto signaling systems the complete apparatus at each station consisted, necessarily, of a magnet armature and coil for the generator and a separate magnet armature and coil for the bell or other signaling device, while in my system one magnet armature and coil serves for both, and the cost is thereby materially decreased, as will be clear from comparing the diagram Figs. 5 and 6, one of which shows the essentials of my system and the other the essentials of the prior system.

In the system now in vogue, Fig. 5, the operation of either of the generators G or G′ will operate both signaling instruments, so that when the person calling hears his own bell he knows that the circuit is complete, and in my system when used as a part of a telephone-circuit I have devised an arrangement of shunts and switches whereby the current generated may be caused to flow through the coil of the telephone, producing a buzzing sound, which will assure the person calling that his line is complete. This feature of my invention consists in the combination of one of my instruments, which is adapted for use both as a motor to give a signal and as a generator to actuate a distant motor, with a telephone and a line which is at one time a signaling-line and at another time a telephone-line, and switches to normally keep the telephone and its connections out of line, and yet permit the receiving-telephone to be in circuit with the signaling-line when the armature of the instrument is revolved to generate a signaling-current in order that the signaling-current shall, when desired, flow through the coil of the receiving-telephone and produce a buzzing sound.

Fig. 7 is a diagram fully illustrating this feature of my invention. The coil of the armature B is connected with the line L′ L² on one side by wire w and on the other side by wires w', w^2, and w^3 and switches S and S′. The switch S serves to cut out the receiver T′, primary-circuit battery, induction-coil, and transmitter T, as usual, when in the position shown in the diagram, and to cut in the coil of armature B by connecting the two lower switch-points of switch S, as shown in the diagram; but when the lever of switch S is released it is pressed up by a spring (not shown in the diagram) and connects the upper switch-points, thereby cutting in the telephonic apparatus and cutting out the coil of armature B.

In calling the lever of switch S will be held down, connecting the lower switch-points, as shown in the diagram, and one terminal of the coil of armature B will be connected to line by the wires w', w^2, and w^3, and to bring the receiver T in the signaling-circuit the button of switch S′ will be pressed, disconnecting wires w' and w^2 and connecting wires w' and w^4, thus causing the signaling-current to flow through receiver T, as will be clear from the diagram.

What I claim as my invention is—

1. In combination a magneto instrument made up of a magnet and an armature mounted on a shaft; a vibrating arm; means to connect and disconnect that arm with the shaft of the armature of the magneto instrument; mechanism to revolve the armature-shaft; and means to connect and disconnect that mechanism with the armature-shaft; whereby the magneto instrument may be caused to vibrate the arm, when the arm is connected and the revolving mechanism disconnected, and may be used as a generator when the arm is disconnected and the revolving mechanism connected.

2. In a telephonic apparatus a magneto instrument for signaling; a receiver; a signaling-circuit including the armature of the signaling instrument; a telephone-circuit; a switch as S to cut out the receiver and transmitter from the signaling-circuit; and a second switch as S′ to bring the receiver into the signaling-circuit all substantially as described.

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