

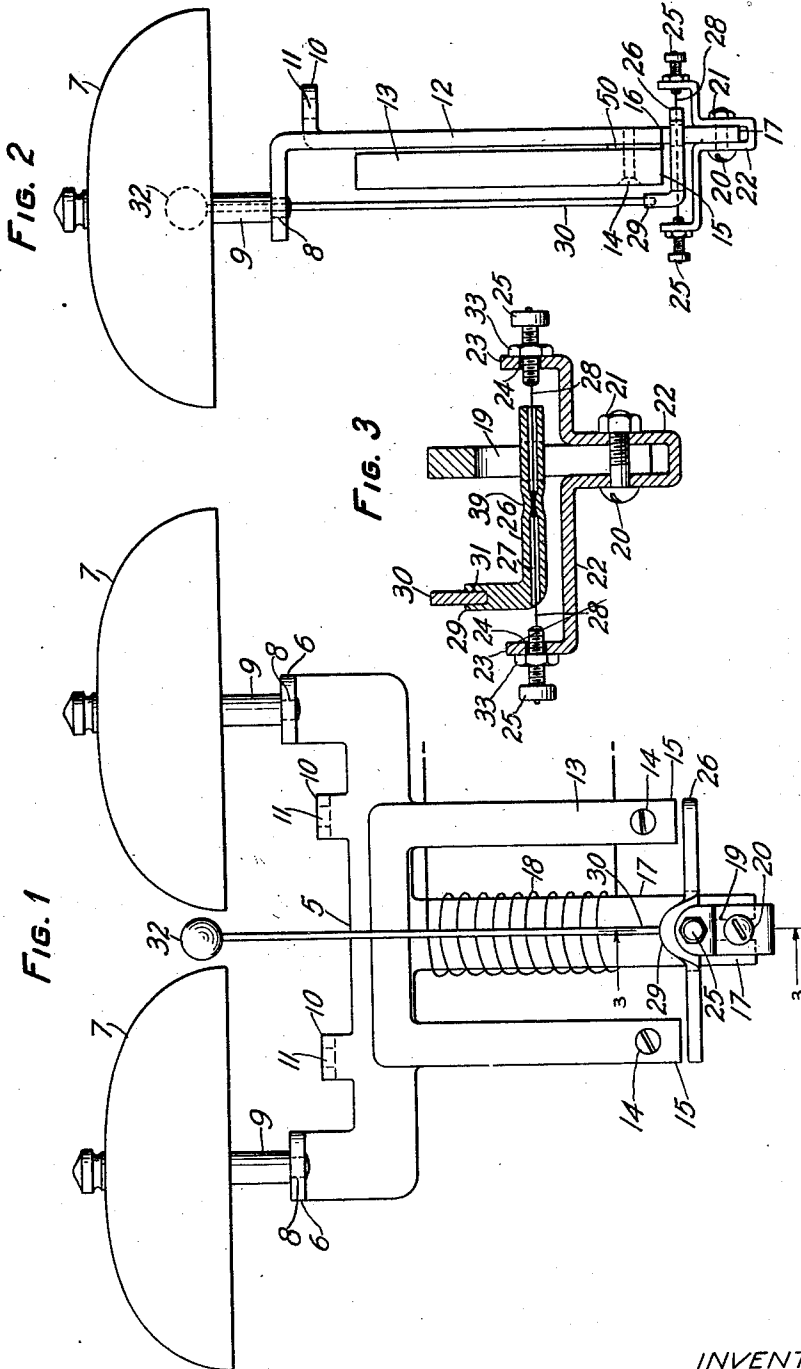
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E. W. GENT

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ELECTROMAGNETIC SIGNALING DEVICE

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INVENTOR
E. W. GENT
BY
Walter C. Kiesel
ATTORNEY

UNITED STATES PATENT OFFICE

EDGAR W. GENT, OF MORRISTOWN, NEW JERSEY, ASSIGNOR TO BELL TELEPHONE LABORATORIES, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

ELECTROMAGNETIC SIGNALING DEVICE

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This invention relates to electromagnetic signaling devices and in particular to ringers for telephones.

An object of this invention is to enable a ringer to be used without modification for operation upon alternating current or for operation as a biased ringer upon pulsating currents of different polarities such as are used in party line telephone systems.

Another object of this invention is to simplify the construction of a ringer and to enable the adjustment thereof, quickly and easily.

In party line telephone systems, as is well known, several telephones may be rung selectively on one metallic line by the "biased ringer" system. In this system, one set of ringers is adapted or biased to respond only to negative pulses sent over the line and another set of ringers is biased to respond only to positive pulses. The ringers are ordinarily biased by equipping them with an auxiliary spring which holds an armature against one of the pole pieces. A ringer biased in such a manner will operate when the current through the operating coil is in the proper direction to attract the free end of the armature.

According to one feature of this invention, a single operating coil is used for a ringer and the armature therefor is pivoted by means of a torsion wire suspension. The armature is attached at its midpoint to the midpoint of the torsion wire suspension. The free end of the armature carries the bell clapper and the outer ends of the wire suspension are so attached to a support that the suspension wire can be rotated so as to permit any amount of biasing in either direction or no material amount of biasing. With this method of biasing no auxiliary springs or other attachments are necessary.

According to another feature of this invention a single punched mounting serves for the support of all of the cooperating parts of the ringer and for mounting the assembled ringer.

According to still another feature of the invention a punched permanent magnet with its poles terminating in the pole pieces of the ringer is employed.

Referring now to the drawings Fig. 1 is a front view of a single coil ringer constructed according to this invention. The operating coil is shown schematically for the purpose of more clearly illustrating the invention.

Fig. 2 is a side view of the ringer shown by Fig. 1 with the operating coil omitted.

Fig. 3 is an enlarged sectional view along the lines 3—3 of Fig. 1 and illustrates the torsion wire armature support.

The single piece soft iron punching or frame 5 has the integral extension 6—6 for supporting the signal gongs 7—7. The extensions 6—6 have the threaded holes 8—8 into which the gong studs 9—9 are screwed. The extensions 10—10 from the frame 5 have the holes 11—11 through which bolts (not shown) may be passed to secure the device to any suitable support. The frame 5 has two symmetrically arranged legs 12—12 to which the punched permanent magnet 13 is attached by means of screws 14—14. The magnet 13 is separated from the legs 12—12 by the thickness of the brass strip 50. The pole pieces 15—15 of the permanent magnet 13 are flush with the ends 16—16 of the legs 12—12 of the frame 5. By having the magnet separated from the soft iron frame, short circuiting of the magnet is avoided and the magnetic flux is concentrated, where it is needed, at the pole pieces.

The frame 5 has a centrally disposed leg 17 which extends between and is longer than the legs 12—12. This leg 17 serves as the core for the winding 18 of the operating coil and at its lower portion supports the armature assembly. The lower end of the leg 17 has a central slot 19 through which the screw 20 passes. The screw 20 on which the nut 21 is threaded serves to clamp the armature support 22 to the walls of the slot 19 in the leg 17. The support 22 has two vertically disposed portions 23—23 at each end thereof which contain the threaded holes 24—24 within which the machine screws 25—25 are screwed. The armature 26 has a small hole 27 through its center through which the wire 28 passes and it is indented at portion 29 so as to compress the metal around a portion of the hole 27 against a portion of the wire 28 and

thus rigidly secure the wire 28 to the armature 26. The hole 27 is of a slightly greater diameter than the wire 28 in order that the wire may act as a guide for the armature.

5 The ends of the wire 28 are welded or otherwise suitably secured to the outer ends of the screws 25, the length and tension of the wire 28 being so adjusted that the ends of the armature 26 are properly supported adjacent the pole pieces 15 of the magnet 13.

10 The upwardly extending portion 29 of the armature 26 has a hole 31 drilled therein which is of slightly less diameter than that of the bell clapper rod 30 one end of which is forced into the hole 31. The other end of the clapper rod 30 supports the bell clapper 32 which is arranged between the signal gongs 7—7 so as to strike them upon movement of the armature 26.

20 By loosening the nut 21 on the screw 20, the armature support 22 may be moved within the slot 19 of the central leg 17 towards or away from the pole pieces 15 of the magnet 13, thus providing a convenient method of adjusting the air gap between the magnet poles 15 and the armature 26.

The tension of the suspension wire 28 can be adjusted by rotating one or the other of the torsion screws 25. By rotating one of the screws 25 the suspension wire 28 is twisted to place it under torsion. Obviously by placing the suspension wire 28 under torsion in such a manner, the resistance of the armature 26 to motion is less in the direction of rotation of the suspension wire than in the opposite direction. The armature 26 may thus be biased to respond to pulses of the desired polarity. By variably rotating one or the other of the torsion screws 25 any amount of biasing towards either of the pole pieces 15 can be obtained. The lock nuts 33—33 serve to secure the torsion screws 25—25 in their proper positions.

What is claimed is:

45 1. An electromagnetic signaling device comprising a single piece punching having outwardly extending arms, a central downwardly extending arm and exterior arms extending parallel to said central arm, a U-shaped permanent magnet attached to said exterior arms, signal gongs mounted on said outwardly extending arms, an energizing coil surrounding said central arm, and an armature mounted on the end of said central arm in juxtaposition to said exterior arms and magnet, said armature supporting a striking member extending between said gongs.

60 2. An electromagnetic signaling device comprising a single piece punching having outwardly extending arms, a slotted central downwardly extending arm and exterior arms extending parallel to this central arm, a U-shaped permanent magnet attached to said exterior arms, signal gongs mounted on

said outwardly extending arms, an energizing coil surrounding said central arm, and an armature mounted on and extending through said slotted central arm in operative position to the ends of said magnet, said armature supporting a striking clapper extending between said gongs.

3. An electromagnetic signaling device comprising signal gongs, a clapper for striking said gongs, a U-shaped permanent magnet, an armature carrying said clapper and having its ends in juxtaposition to the ends of said magnet, a coil for receiving signal current whereby said armature is actuated, and a single piece punching of magnetic material having a frame portion for supporting said gongs and three parallel arms integral with said frame portion, the outer pair of said arms supporting said magnet and the central arm supporting said armature and serving as the core for said coil.

4. An electromagnetic device comprising a core of magnetic material, a coil about said core, a supporting frame integral with said core having a plurality of angularly extending pairs of arms in the same plane with said core, signal gongs mounted on one of said pair of arms, a clapper for striking said gongs, a permanent magnet mounted on another of said pairs of arms having a pole on either side of said core, and an armature carrying said clapper mounted on said core and having its ends in juxtaposition with the poles of said magnet.

In witness whereof, I hereunto subscribe my name this 14th day of January, 1929.
EDGAR W. GENT.