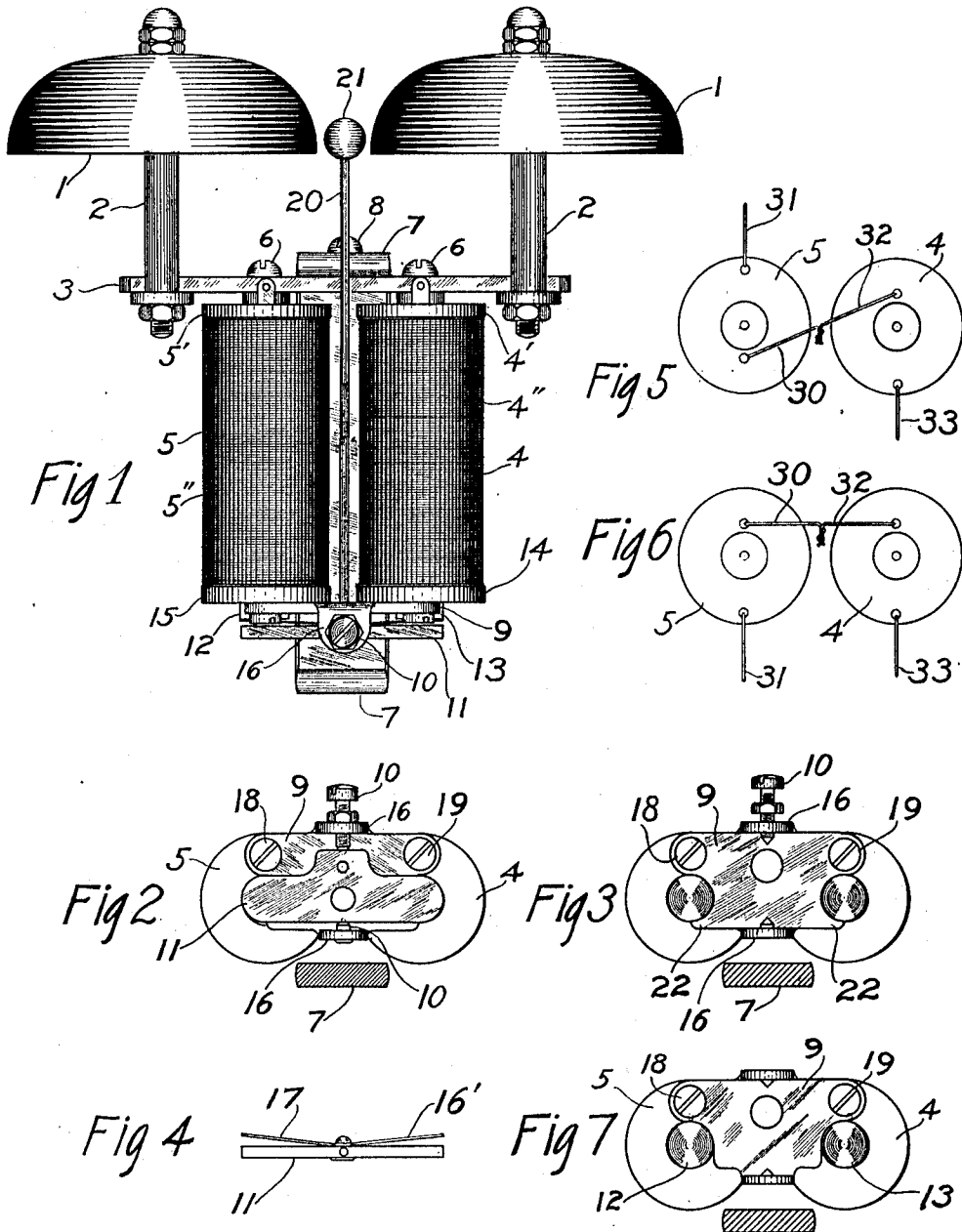


W. W. DEAN.
RINGER.

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Witnesses
E. A. Spurr.
Mary Mallery

Inventor
William W Dean
By J. O. Richey
His Attorney

UNITED STATES PATENT OFFICE.

WILLIAM W. DEAN, OF ELYRIA, OHIO, ASSIGNOR TO THE DEAN ELECTRIC COMPANY,
OF ELYRIA, OHIO, A CORPORATION OF OHIO.

RINGER.

1,022,065.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM W. DEAN, a citizen of the United States, residing at Elyria, county of Lorain, and State of Ohio, have invented certain new and useful Improvements in Ringers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to such ringers as are used in electrical work and more particularly to those which are used in connection with telephones and similar apparatus, though I contemplate the use of my ringer wherever such a device may be applied.

The improvement made by my invention relates more to the details of the ringer, the class being already fairly well developed. I aim to produce such an instrument which may be more conveniently assembled and easier repaired than those at present in use.

In some types of ringers now manufactured and used, the armature is carried by a yoke which is connected to the spool heads of the magnets. The armature is supported close to the yoke and covers a portion thereof. Screws or other fastening means are applied to the yoke for the purpose of fastening it to the spool heads. These fastening means are applied to the area of the yoke covered by the armature, making it impossible to remove the yoke without disarranging the adjustment of the armature. As it is frequently necessary to change a coil in the ringer, and as the adjustment determines the operation of the ringer and is difficult to make, this causes a great deal of trouble. This fastening means is applied to the coil in such a way as to make it impractical to interchange these coils without changing the circuit scheme, which is also inconvenient and impracticable. This is only one of the instances of the troubles which it is my aim to avoid, I having named this to illustrate some of the faults of modern practice.

I find that by applying the fastening means to the portion of the yoke not covered by the armature, I may disengage the fastening means without disturbing the adjustment of the armature. I also apply the fastening means in such a position that I may interchange the coils. For example, if I apply them on lines perpendicular to the

lines joining the centers of the magnet cores and both on the same side of that line, the coils will be interchangeable without disarranging the circuit connections. In the device shown, these fastening means are applied upon the perpendicular lines passing through the center of the core pieces or thereabout. This is a great convenience in operating a telephone or other lines of similar nature, as the troubleman need carry only one type of coil. Unless these coils are interchangeable, it is necessary to carry two, and in actual practice, one marked "R" and one marked "L" must be taken.

My invention will be best understood by reference to the following description when taken in connection with the accompanying illustration showing one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

Figure 1 is a front elevation of the ringer embodying my invention. Fig. 2 is an elevation of the bottom of the ringer with the permanent magnet broken away. Fig. 3 is a view of the same with the armature removed. Fig. 4 is a side elevation of the armature showing the separating springs. Figs. 5 and 6 are diagrams showing the circuit connections. Fig. 7 is an end elevation of a modified form.

Referring to the drawings and the embodiment of the invention there shown, I have illustrated the ringer gongs at 1—1 supported by posts 2—2 which are fastened to a magnetic yoke 3.

At 4 and 5 I show electro magnets, at 12 and 13 the magnet cores respectively, at 4' and 5' the spools, at 4'' and 5'' the windings mounted upon the spools. These magnets are supported substantially parallel to each other and extending in the same direction from the yoke 3, screws 6—6 being driven through the yoke into the upper ends of the cores.

At 7 I show a permanent magnet which is fastened by the screw 8 to the magnetic yoke 3 and extends substantially parallel to the magnets, and is bent around the lower end of the ringer. This magnet keeps the cores biased.

At 9 I show a non-magnetic yoke which extends from one magnet to the other at the lower end, being fastened by screws 18 and 19 to the spool heads 15 and 14 of the mag-

nets 5 and 4 respectively. At each side this yoke is bent over at 16 to form a bearing for the armature trunnions 10. The armature is shown at 11, being pivoted between the trunnions 10 and adapted to vibrate. Springs 16' and 17' are fastened to the center of the armature and engage the ends of the cores to prevent them from sticking and to assist in the "breaking away" from the poles. The armature is made to extend from the core 13 to the core 12 and is fastened close to the yoke 9 so that there is no room for the insertion of a tool between the two. Hitherto the screws 18 and 19 have been applied beneath the armature making it impossible to extract them for the purpose of taking out a magnet coil and placing on a second without disturbing the armature adjustment. I apply the screws 18 and 19, as will be clear from the drawing, to a portion of the yoke which lies outside the area covered by the armature. When the screws are applied beneath the armature, the coils cannot be interchanged. I show these screws applied on lines which are perpendicular to the line connecting the centers of the cores and passing through these centers, so that the coils may be removed and others inserted.

In manufacturing the magnet coils, the windings are placed upon the cores in the same direction making the coils similar in this respect. When in use, one of these magnets must attract the armature when the other is repelling it. In other words, one end of one magnet must be positive while the corresponding end of the other magnet is negative. Since the polarity of electro magnets is according to a well known law dependent upon the direction of winding, if these magnet coils are made mechanically similar they can be interchangeable at will, but when made with dissimilar parts, such as are employed in the prior art, for example with mounting means symmetrical instead of similar, these coils cannot be mounted in the relation shown in Fig. 6 without reversing the direction of current through one of the windings and changing the polarity of one of the magnets rendering the ringer useless. This will be clear if in considering Fig. 6 the current entering the magnet coil 4 at the outside terminal passes through the coil in a clockwise direction and in passing through magnet coil 5 passes in a counter clockwise direction. If the coil 5 were reversed and one inside terminal connected with an outside terminal, it will be understood that the current will pass through both coils in the same direction. To avoid this, it is necessary to make the connection shown in Fig. 5 where the mechanical arrangements are not similar for each coil and a right hand coil is substituted on a left hand position. Any such arrangement is undesirable. The armature 11, carries a clapper rod 20, upon

the end of which is mounted a clapper 21. This clapper strikes the gongs when the armature is vibrated. In this form, the yoke 9 carries lugs 22 and 22 which fit around the side of the core opposite the fastening means 18 and 19 and which serve to hold the yoke rigidly associated with the other parts.

In Fig. 7, I show a modification. Here the yoke is cut away from the side of the cores opposite the position of the fastening means. This yoke carrying the armature and associate parts may be removed from the magnet the whole as a unit structure, without disturbing the armature. In manufacturing, the whole may be assembled and mounted upon the spool heads as a unit structure.

While I have shown these special modifications only, it will be apparent to those skilled in the art that numerous and extensive departures from the details shown may be made without departing from the spirit of the invention.

I claim—

1. In a ringer, the combination of a pair of gongs, a magnetic yoke, a pair of electro-magnets each consisting of a core, a spool and a coil mounted thereon, said magnets attached at one end to the magnetic yoke and arranged parallel to each other, a non-magnetic yoke connecting the other ends of the magnets, an armature pivoted to said non-magnetic yoke, means to attach said non-magnetic yoke directly to the heads of said spools, said means being accessible without removing the armature from the yoke, a clapper adapted to strike the gongs and a clapper rod carrying the same supported by the armature.

2. In a ringer, the combination of a pair of gongs, a magnetic yoke, a pair of electro-magnets each consisting of a core, a spool and a coil mounted thereon, said magnets attached at one end to the magnetic yoke and arranged parallel to each other, a non-magnetic yoke connecting the other ends of the magnets, an armature pivoted to said non-magnetic yoke, said non-magnetic yoke supported by said spools, either of said magnets being removable from said combination without disturbing the armature, a clapper adapted to strike the gongs and a clapper rod carrying the same supported by the armature.

3. In a ringer the combination of a pair of gongs, a magnetic yoke, a pair of electro magnets, each consisting of a core, a spool and a coil mounted thereon, said magnets attached at one end to said magnetic yoke, a non-magnetic yoke connecting the other ends of the magnets, means to attach said yoke to the spool heads of the magnets, an armature mounted on said non-magnetic yoke and covering a portion of the area

thereof, said means being applied to the area not covered by the armature and being removable without disturbing said armature, a clapper adapted to strike said gongs and a clapper rod carrying said clapper supported by said armature.

4. In a ringer the combination of a pair of gongs, a magnetic yoke, a pair of electro magnets, each consisting of a core, a spool and a coil mounted thereon, said magnets attached at one end to said magnetic yoke, a non-magnetic yoke connecting the other ends of the magnets, screws to attach said yoke to the spool heads of the magnets, an armature mounted on said non-magnetic yoke and when so mounted covering a portion of the area thereof, said screws being applied to the area uncovered by the armature and being removable without disturbing said armature, a clapper adapted to strike said gongs and a clapper rod carrying said clapper and supported by the armature.

5. In a ringer the combination of a pair of gongs, a magnetic yoke, a pair of electro magnets each consisting of a core, a spool and a magnet winding, said magnets attached at one end to said magnetic yoke and arranged parallel to each other, a non-magnetic yoke attached to the other ends of the magnets and supported therefrom, connecting means to attach said non-magnetic yoke and the spool heads together, said magnets being interchangeable without disarranging the circuit connections thereof, an armature pivoted on said non-magnetic yoke, a clapper rod carried by said armature and clapper

per thereon adapted to strike the gongs when the armature is vibrated.

6. In a ringer the combination of a pair of gongs, a magnetic yoke, a pair of electro magnets each consisting of a core, a spool and a magnet winding, said magnets attached at one end to said magnetic yoke and arranged parallel to each other, a non-magnetic yoke attached to the other ends of the magnets, screw means to attach said non magnetic yoke and the spool heads together, an armature carried by said non-magnetic yoke, said magnets being removable and interchangeable without disturbing said armature or disarranging the circuit connection arrangement, a clapper rod carried by the armature and a clapper thereon adapted to strike said gongs when the armature is vibrated.

7. In a ringer, the combination of a pair of gongs, a magnetic yoke, a pair of electro magnets connected at one end to said magnetic yoke, a unitary structure consisting of a non-magnetic yoke, an armature mounted thereon, a clapper rod and a clapper, said unitary structure connected directly to the spool heads at the other ends of the magnets and being removable as a unit from said ringer.

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

WILLIAM W. DEAN.

Witnesses:

MARY MALLY,
F. O. RICHEY.