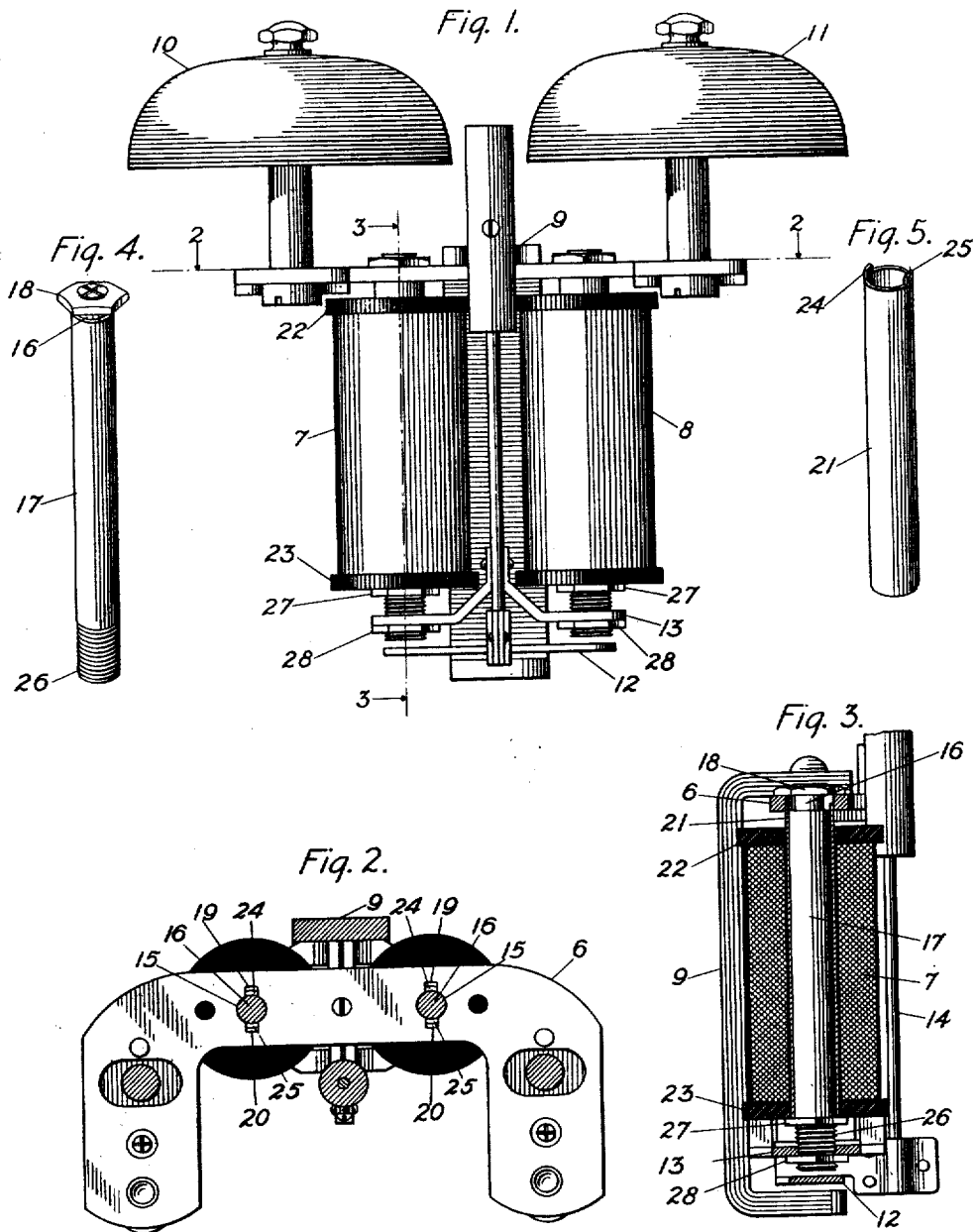


E. B. CRAFT.
HARMONIC RINGER.
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1,014,125.

Patented Jan. 9, 1912.



Witnesses:
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UNITED STATES PATENT OFFICE.

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HARMONIC RINGER.

1,014,125.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD B. CRAFT, citizen of the United States, residing at Hackensack, in the county of Bergen and State of New Jersey, have invented a certain new and useful Improvement in Harmonic Ringers, of which the following is a full, clear, concise, and exact description.

My invention relates to electromagnets, of the type in which an armature support is adjustably mounted upon the core, and its object is to provide an improved and simple construction whereby the normal position of the armature may be easily and accurately adjusted with respect to the end of the magnet pole.

In my invention, a member making threaded engagement with the armature support extends through the spool of the electromagnet and is rotatably adjustable therein to screw the armature support backward or forward. Preferably the cores of the electromagnet are rotatably mounted and themselves constitute the member engaging with the armature support, whereby said armature may be adjusted. The rotatable members may be carried by some fixed part of the structure, such, for example, as the yoke which bridges the coils. The coils may be wound on spools comprising sleeves adapted to loosely surround said rotatable members, means being preferably provided for holding the coils in fixed axial position so that they will be unaffected by the rotation of the members extending there-through.

My invention is particularly useful in its application to bells and is illustrated herein by its embodiment in a telephone bell of the reed or harmonic type.

My invention will be more readily understood by reference to the accompanying drawing, in which—

Figure 1 is a front elevation of a telephone bell embodying my invention; Fig. 2 is a horizontal sectional view on the line 2—2 of Fig. 1; Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 1; Fig. 4 is a perspective view of the rotatable member or core of the electromagnet; and Fig. 5 is a perspective view of the sleeve of the spool which surrounds the core.

Referring to the drawings, 6 is a plate or

yoke carrying the coils 7 and 8 of the electromagnet, 9 is a permanent magnet, and 10 and 11 are gongs.

12 is the armature carried on a reed, which reed is in turn rigidly mounted upon the support 13.

14 is a tapper arm carried by the armature 12. The parts mentioned being well understood by those skilled in the art, are not herein described in detail.

The yoke 6 is formed with openings 15, each adapted to receive the shouldered end 16 of a core 17, said end after insertion in the opening being provided with a head 18 secured thereto in some suitable manner as by swaging. The cores 17 are thus rotatably mounted in the yoke 6. It will be observed, as shown in Figs. 3 and 4, that only the central circular portion of the opening 15 is filled by the cylindrical end 16 of the core, openings 19 and 20 being left unoccupied, the object of which will be hereinafter set forth.

Each spool of the electromagnet may comprise a sleeve 21 preferably of magnetic material, said sleeve carrying heads 22 and 23. The sleeves 21 are provided with projections 24 and 25 adapted to enter openings 19 and 20 when the spool is slipped over the core 17, whereby axial movement of the sleeves is prevented during the rotation of the core 17. The ends 26 of the core 17 are threaded and adapted to engage with threaded openings in the support 13, as shown more particularly in Fig. 3. Nuts 27 are provided for holding sleeves 21, cores 17 and yoke 6 in locked connection. Nuts 28 are provided for securing the cores rigidly to support 13.

With the construction described the armature support 13, and therefore the armature 12 carried thereby, may be moved bodily toward or from the electromagnet, or may be tilted, or may be made to undergo a combination of these movements by first loosening the nuts 27 and 28 and then turning the cores 17 by applying a wrench to the heads 18. The direction and extent of movement of each end of the support 13 will clearly depend upon the direction and extent of rotation of the corresponding core 17. Upon securing the desired adjustment of the armature with respect to the electromagnet,

the nuts 27 and 28 would of course be tightened, thereby locking the associated parts in rigid connection.

It will be readily understood that the sleeves 21 may be made of other material than iron, as, for example, some insulating material. Also it will be evident that while both ends of the support 13 are shown herein as adjustably mounted, one only of said ends might be so mounted, the other end being fixed. Such modifications I regard as clearly within the scope of my invention.

Having described my invention, I claim:—

1. The combination with an electromagnet and its armature, of a support for said armature, and a rotatable member extending through a coil of said electromagnet and having threaded engagement with said support.

2. The combination with the coils of an electromagnet and the armature of said magnet, of a support for said armature, and cores extending through said coils, said cores being rotatably mounted and in threaded engagement with said support.

3. The combination with the coils of an electromagnet, of a yoke bridging said coils, an armature, a support for said armature, and cores for said coils, said cores being rotatably carried by said yoke and in threaded engagement with said support.

4. The combination with a yoke, of cores rotatably carried by said yoke, sleeves surrounding said cores, coils surrounding said sleeves, an armature, and a support for said armature in threaded engagement with said cores.

5. The combination with a yoke, of cores rotatably carried by said yoke, sleeves sur-

rounding said cores, coils surrounding said sleeves, a projection upon each said sleeve adapted to engage with said yoke, an armature, and a support for said armature in threaded engagement with said cores.

6. The combination with a yoke, of cores rotatably carried by said yoke, a head for each said core, sleeves surrounding said cores, coils surrounding said sleeves, an armature, a support for said armature in threaded engagement with said cores, nuts for locking said sleeves, and nuts for securing said cores and support in rigid connection.

7. The combination with a yoke, of cores rotatably carried thereby, an armature, a support therefor in adjustable engagement with said cores, sleeves surrounding said cores, coils surrounding said sleeves, the said sleeves having ears or extensions adapted to engage slots in the yoke and thereby to prevent the said sleeves from rotating.

8. The combination with a yoke, of cores rotatably carried by said yoke, an armature, a support therefor in threaded engagement with said cores, sleeves surrounding said cores, coils surrounding said sleeves, each of said sleeves having a pair of locking ears adapted to engage slots in said yoke on opposite sides of the core extremity.

In witness whereof, I, hereunto subscribe my name this 19th day of January A. D. 1910.

EDWARD B. CRAFT.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."