No. 710,946. Patented Oct. 14, 1902.

C. L. BURLINGHAM.

ELECTRIC BELL.

(Application filed Nov. 2, 1901.)

(No Model.)

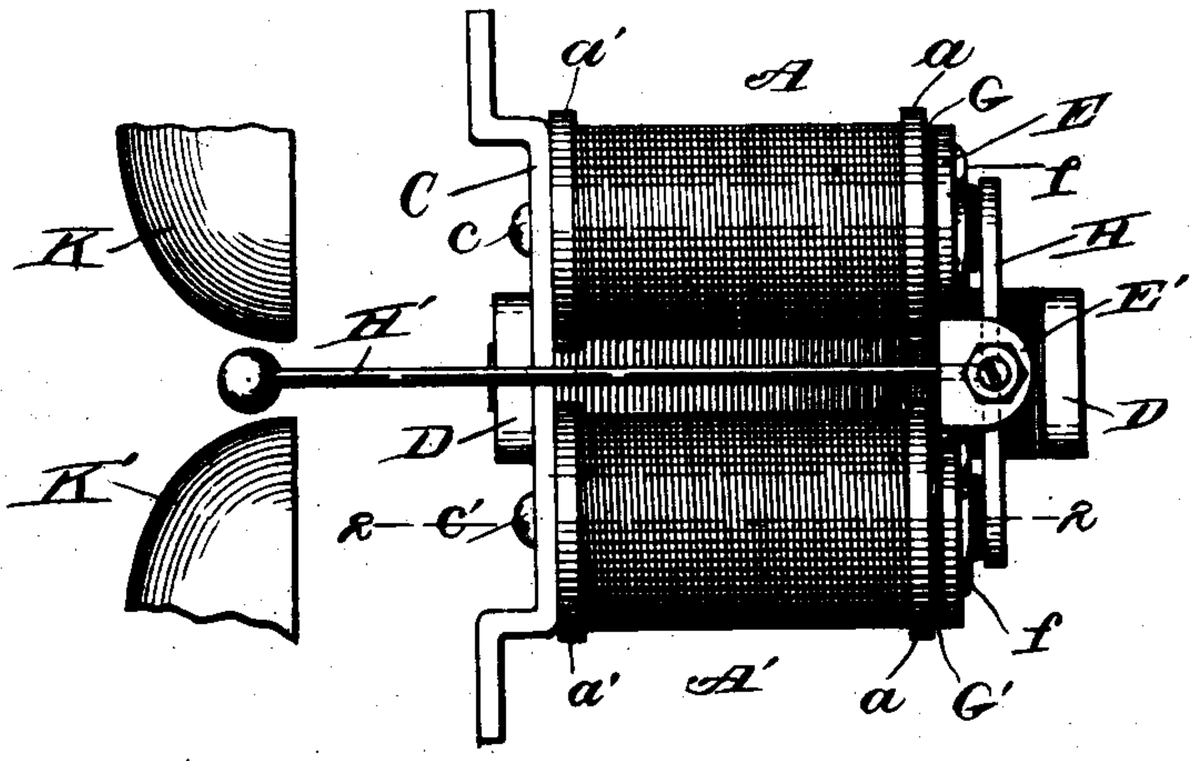


Fig. 1.

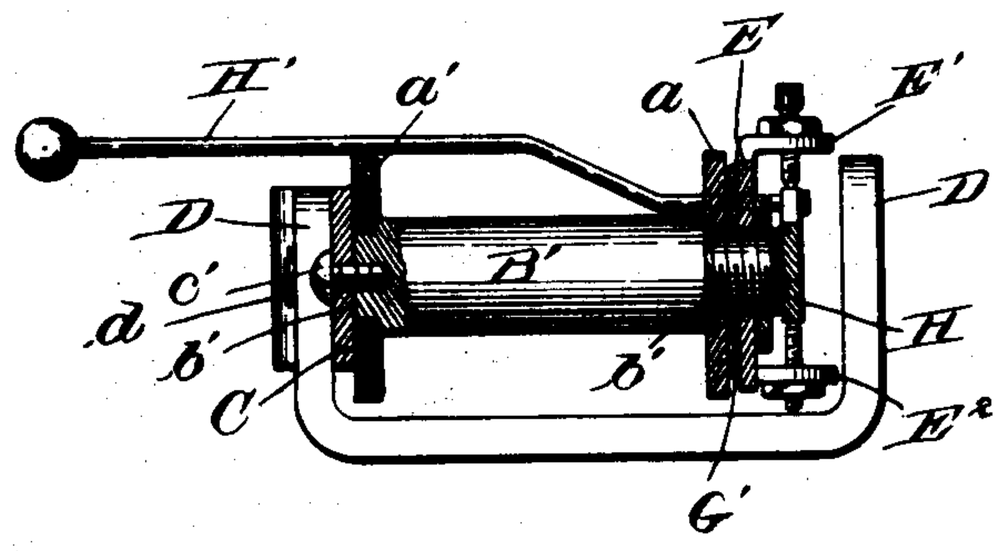


Fig. 2.

Fig. 4.

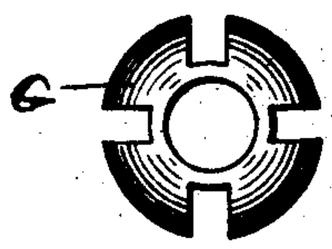
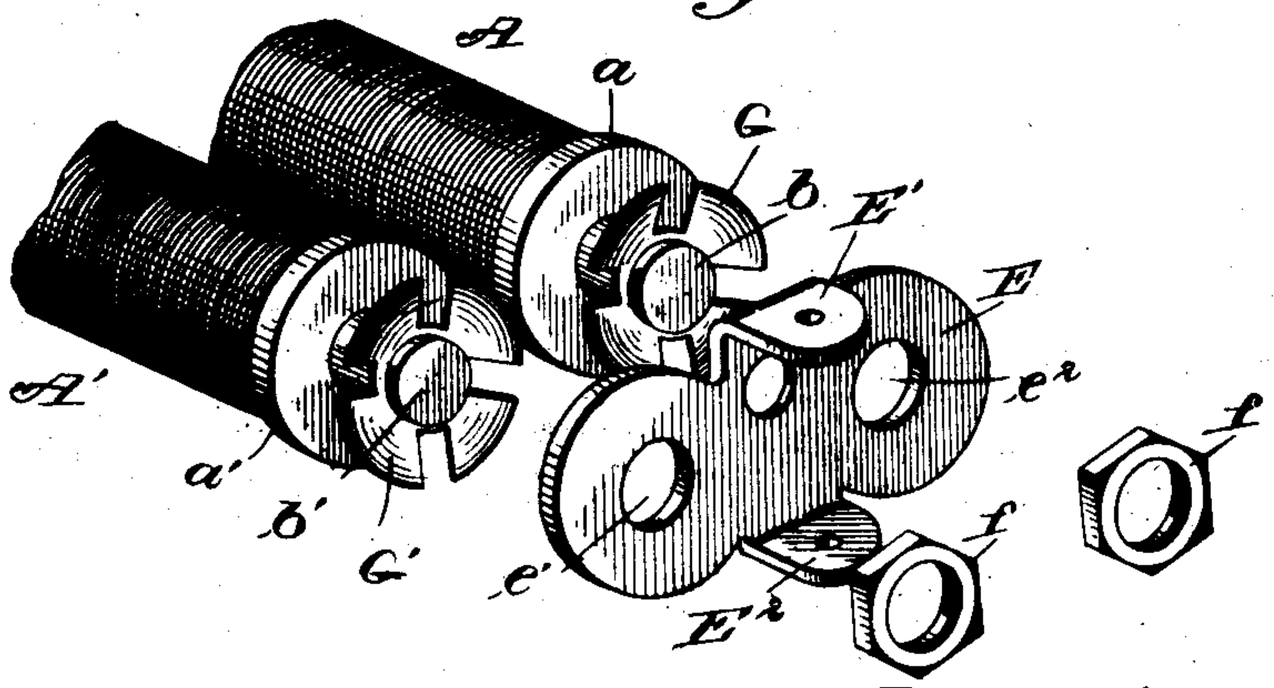


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ELECTRIC BELL.

SPECIFICATION forming part of Letters Patent No. 710,946, dated October 14, 1902.

Application filed November 2, 1901. Serial No. 80,855. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. BURLINGHAM, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Electric Bells; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates generally to electric bells, and more particularly to electric bells which are actuated by polarized electromagnets—such, for instance, as are commonly used as "ringers" in telephony.

In electric bells of the type referred to it is essential that the armature should be accurately and precisely located relative to the poles of the magnet, and in order that the armature may occupy a position at the requisite distance from the poles of the magnet it is frequently necessary to vary its location.

An object of my invention is to provide an electric bell of the character mentioned in which the distance between the armature and the poles of the magnet may be readily adjusted, so as to secure the best operation of the bell.

A further object of my invention is to provide an electromagnet in which the position of the armature relative to the poles of the magnet may be easily and accurately adjusted.

My invention, generally stated, consists in a bell actuated by a polarized electromagnet in which the armature is pivotally supported by a yoke adjustably mounted on the ends of the cores of the magnet.

My invention further consists in an electromagnet in which the armature is pivotally supported by a yoke adjustably mounted upon the projecting end of the core of the magnet, the adjustment of the yoke being secured by interposing a spring between the yoke and the end of the magnet, the amount of compression of the spring determining the position of the armature relative to the poles of the magnet.

My invention will be more fully described hereinafter with reference to the accompanying drawings, in which the same is illustrated as embodied in a convenient and practical form, and in which—

Figure 1 is a plan view of a polarized magnet adapted to serve as a telephone-ringer to which my improvement has been applied; Fig. 2, a vertical longitudinal section in line 2 2 of Fig. 1; Fig. 3, a perspective view of the ends of the magnet, the yoke, springs, and nuts being separated in order to better illustrate their construction; Fig. 4, an elevational view of one of the spring-washers.

Similar reference characters indicate the same parts in the several figures of the drawings.

I have illustrated my invention as applied to a telephone-ringer of common construction comprising a polarized magnet, the oscillation of the armature of which vibrates the clapper, causing it to strike two bells between which it is located.

Reference characters A and A′ indicate the coils of the magnet, which are wound around cores B′. The ends of the cores are reduced, thereby forming shoulders which are engaged by washers *a* and *a′*. The ends of the cores which project through the washers *a* and *a′* support a metallic bracket C by means of screws *c* and *c′*, extending through such bracket into the reduced ends of the cores. A permanent magnet D is secured to the bracket C by means of a screw *d* and extends around the magnet, terminating adjacent to the armature H. The reduced ends *b* and *b′* are screw-threaded and pass through the yoke E. Nuts *f* are screwed upon the ends of the cores to retain the yoke in place. The yoke is provided with ears E′ and E², which serve through interposed adjustable bearings as supports for the armature H. The bell-clapper H′ is secured to the armature and is located between two bells K and K′.

The ringer above described is not claimed as novel and need not be further described in detail either as to its construction or operation.

In order that the position of the armature with respect to the poles of the magnet may

be adjusted, it is necessary that the yoke E, which supports the armature, should be adjusted upon the reduced ends *b* and *b'* of the cores and when adjusted firmly retained in position.

In order to permit the movement of the yoke E upon the reduced ends of the cores, I interpose yielding elements—such, for instance, as spring-washers—between the ends of the spools of the magnet and the yoke E and regulate the amount of compression of such yielding elements by means of nuts *f*, which are screwed upon the ends of the cores.

While I do not wish to limit myself to any particular form of spring, I have found in practice that a spring-washer such as illustrated in the drawings, particularly Fig. 4, may satisfactorily be used.

The spring-washers G and G' may be readily located between the ends of the spools and the yoke by placing them around the reduced ends of the cores, which serve as poles for the magnet, and then placing the yoke E in position with the poles passing through the openings E' and E² therein, after which the nuts F may be screwed upon the ends of the poles. If in the use of the magnet it is desirable that the armature should be located nearer the pole-pieces, the nuts *f* are turned further upon the pole-pieces, which compresses the springs G and G' and forces the yoke E nearer the ends of the spools. If, on the other hand, the armature is located at an insufficient distance from the poles, the nuts *f* may be slightly unscrewed, thereby permitting the springs to expand, which moves the yoke slightly away from the ends of the spools, and consequently the armature is moved a little farther away from the poles.

While I have shown the cores as reduced at their ends to form shoulders against which the washers *a* and *a'* engage, it is not necessary that such shoulders should be formed, as the tension of the springs G and G' is such that they readily yield when the nuts are turned upon the screw-threaded ends of the cores, thereby avoiding any injury to the coils which might result from their forcible compression when the washers are moved toward the spools by the turning of the nuts upon the screw-threaded poles.

While I have illustrated my improvement as applied to a polarized magnet, it is evident that it is equally applicable to other forms of magnets in which the armature is supported upon the end of the core of the magnet. It is also evident that magnets provided with my improvement may be used for purposes other than that of actuating bells. I do not, therefore, wish to limit myself to the use of the same in the specific form illustrated in the drawings.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the character described, the combination with a magnet having a core projecting therefrom, of an armature, and a support to which the armature is pivoted mounted upon the core, and means engaging said core for adjusting said support thereon, substantially as described.

2. In a device of the character described, the combination with a polarized magnet having cores projecting therefrom, of a yoke mounted on the cores, means engaging the cores for adjusting the yoke thereon, and an armature pivotally supported by said yoke in proximity to the poles of the magnet, substantially as described.

3. In a device of the character described, the combination with the magnet having a core projecting therefrom, of an armature, a support for the armature adjustably mounted on the core, a spring interposed between the magnet and said support, and means for moving the support toward the magnet and thereby compressing said spring, substantially as described.

4. In a device of the character described, the combination with a polarized magnet having cores projecting therefrom, of a yoke having openings through which the cores extend, yielding elements interposed between said yoke and the ends of the magnet, and means engaging the cores for compressing said yielding elements, substantially as described.

5. In a device of the character described, the combination with a magnet having a core projecting therefrom, of an armature, a support for the armature through which the core extends, a spring interposed between said support and the magnet, and a nut screwed upon the end of the core, substantially as described.

6. In a device of the character described, the combination with a polarized magnet having cores projecting therefrom, of a yoke having openings through which the cores extend, spring-washers interposed between said yoke and spools of the magnet, and nuts secured upon the ends of the cores whereby the compression of the spring-washers is regulated and the position of the armature relative to the poles of the magnet adjusted, substantially as described.

7. In a magneto-bell, the combination with a pair of electromagnets, of an armature-support having openings through its ends, an armature pivotally mounted upon said support at a point between the cores of said magnets, springs located around the holes through and bearing against said support and tending to move the same away from the cores of the magnets, and a separate device for adjusting the compression of each spring thereby regulating the position of the support with respect to the cores of the magnets.

In testimony whereof I sign this specification in the presence of two witnesses.

CHARLES L. BURLINGHAM.

Witnesses:
J. P. WIBORG,
GEO. L. WILKINSON.