

No. 755,630.

PATENTED MAR. 29, 1904.

W. W. DEAN.
BELL.

APPLICATION FILED MAR. 24, 1902.

NO MODEL.

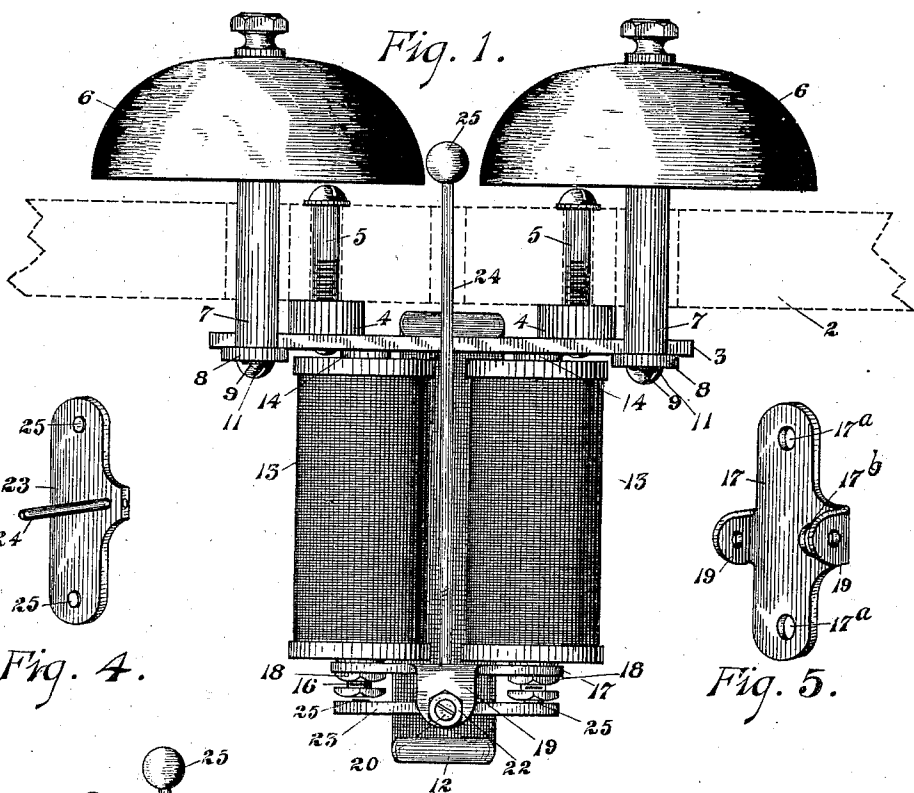


Fig. 4.

Fig. 5.

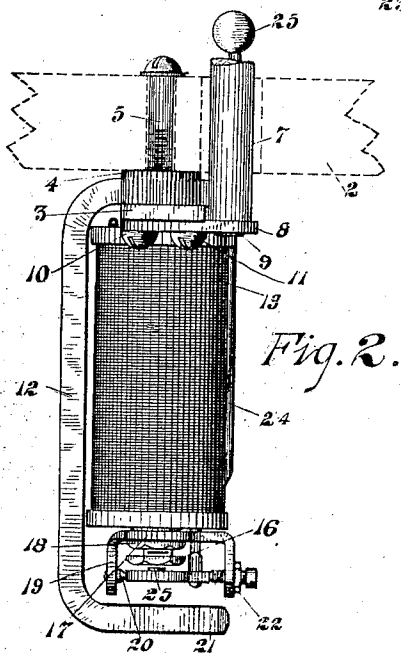


Fig. 2.

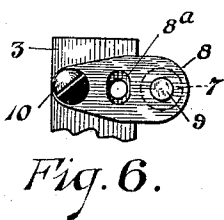


Fig. 6.

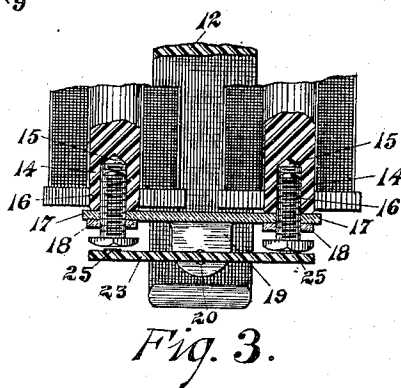


Fig. 3.

Witnesses.
R. H. Burford
Kempster B. Meier

Inventor:-
William W. Dean
by Robert Lewis Ames.
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM W. DEAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BELL.

SPECIFICATION forming part of Letters Patent No. 755,630, dated March 29, 1904.

Application filed March 24, 1902. Serial No. 99,637. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. DEAN, a citizen of the United States of America, and a resident of Chicago, county of Cook, and State of Illinois, have invented a certain new and useful Improvement in Bells, of which the following is a specification.

My invention relates to improvements in means for adjusting the operative relation of the armature of a polarized signaling-bell magnet and its actuating-poles. Such bells are commonly used in connection with subscribers' telephone sets.

It has been common heretofore in signaling-bells to vary the distance between the poles of the magnet and the armature by adjusting the position of the support upon which the armature is mounted. This is objectionable, however, for the reason that a complicated and expensive construction is required to obtain a satisfactory apparatus. Moreover, such devices are ordinarily inconvenient and difficult to adjust and require skilled labor to manipulate the same.

It is the object of my invention to provide a bell in which the necessity of adjusting the armature or its support is avoided, whereby a simple and rigid construction is obtained, and to secure at the same time all the advantages of a structure in which means are employed to vary the distance between the armature and the poles of the magnet. In order to accomplish these results, I provide the bell-magnet with adjustable poles or pole extensions or pieces, whereby the armature may be rigidly mounted and secured in position and the poles of the magnet readily adjusted in their relation to the armature without in any manner affecting or disarranging the same. The bell is further provided with an armature-support rigidly secured upon the ends of the cores of the magnet-coils, and the extensions of the cores or adjustable pole-pieces are also employed to secure the said support in place, whereby said adjustable pole-pieces accomplish a double function.

The invention also consists in the novel con-

struction and combinations of parts hereinafter described, and particularly pointed out in the appended claims, reference being had to the accompanying drawings, forming a part of this specification, in which the same reference characters designate like parts throughout the several views, and in which—

Figure 1 is a front elevation of the invention. Fig. 2 is a side elevation thereof with the gongs omitted. Fig. 3 is a sectional view showing the construction of the core extensions. Fig. 4 is a detail of the armature. Fig. 5 is a detail of the armature-support, and Fig. 6 is a detail of the bell-support.

In the figures the numeral 2 indicates a supporting plate or piece, such as the wall of the subscriber's instrument-box, upon which the bell is adapted to be mounted. The bell comprises in its framework a top plate 3, upon the upper face of which suitable spacing blocks or washers 4 are mounted and through which suitable securing-screws 5 are adapted to pass and which thread into the plate 3 to secure the bell in place upon the support 2. The gongs 6 of the bell are carried upon the upper ends of posts 7, extending through slots or apertures in the support 2 and mounted at the lower ends upon arms 8, any desired means being employed, such as the upset or headed portion 9, to secure them in position upon the arms. The arms 8 are secured at their opposite ends by means of screws 10 to the lower face of the top plate 3. In order to adjust the position of the gongs, slots 8^a, Fig. 6, are formed in the arms 8 and screws 11 are passed through the slots and thread into the plate 3. When the gongs are brought into the desired position, the screws 11 are tightened to secure the arms 8 as adjusted.

A permanent magnet 12, which consists, as usual, of a tempered-steel bar, is formed in the shape shown in Fig. 2, and is secured at its upper end, as by suitable screws or other suitable manner, to the upper side of the top plate 3, while its lower end extends beneath the armature of the magnet and serves to

polarize the same. The magnet-coils 13 are mounted upon cores 14, secured in any desired way to the lower face of the top plate 3. The lower ends of the cores are provided with threaded apertures 15, into each of which the adjustable pole-piece forming the extension of the core, which in this instance takes the form of the screw or bolt 16, is threaded. Upon the screw or bolt 16 a plate 17, forming the armature-support, is carried, suitable apertures 17^a therethrough for the screws 16 being formed one at each end. A lock or check nut 18 is placed upon the screw 16 outside of the plate 17 and serves to secure the support 17 firmly in position and at the same time to act as a lock or check nut to maintain the screw or bolt 16 in the desired adjusted position. The supporting-plate 17, Fig. 5, is provided upon opposite sides, midway of the cores, with ears or lugs 19, which receive the pivots 20 and 21 for the armature, the latter taking the form of a screw threading through one ear or lug 19 and provided with a lock-nut 22, while the former may, as shown, be permanently riveted or fixed in position in the ear or lug 19. The armature 23, Fig. 4, is mounted to vibrate upon the pivots 20 and 21 and is arranged to carry the tongue 24, which passes through an aperture 17^b in the plate 17, thence upwardly through the plate 2. It is provided at this end with a ball or clapper 25, adapted to strike the gongs 6 of the bell when the armature is vibrated. The screws or bolts 16, which form extensions of the cores 14, are adjusted to the desired position to bring them into efficient working position with reference to the ends of the armatures 23, whereby the magnetic lines of force have to pass through only a small air-gap. A piece of non-magnetic material 25 is affixed to the armature at each end to prevent the same from striking against and sticking to the extension 16 of the core.

The operation in general does not differ from prior devices. When an alternating current is passed through the coils 13 of the magnets, the cores are magnetized alternately in reverse directions, and owing to the influence at the same time of the permanent magnet the armature is rapidly vibrated. The magnetic circuit is completed between the cores at their upper ends by the top plate 3 and at the lower ends by the armature. By adjusting the screws, bolts, or extensions 16 the ends of the pole-pieces may be fixed in the desired position with reference to the armature and at the same time the armature and its support are rigidly and permanently secured in position. The extensions thus perform the mechanical functions of holding the armature-support in place as well as to vary the length of the cores. It is therefore seen that the device of my invention has all the advantages and accomplishes all the practical results of the devices of the prior art and is not hampered by complication of parts and apparatus. It is

also efficient in operation, economical in construction, and inexpensive to manufacture.

While the invention has been described with particular reference to the details of construction, I do not wish to be so limited, for it is apparent that various changes, alterations, and substitutions may be made therein and still not depart from its scope or principle.

What I therefore claim is—

1. In a signaling-bell, the combination with the operating-magnet thereof and its cores, of an armature for said magnet supported in front of and at an unvarying distance from said cores, an extension for the forward end of each core to extend the magnetic circuit of the magnet toward the armature, said extensions being connected with the body portion of the cores by means of overlapping portions so as to be independently adjustable axially of said cores and to maintain the continuity of the metallic path for the magnetic lines of force as well as to vary the relation of said extensions with respect to the said armature, and means for securing said extensions and cores together in adjusted positions, substantially as described.

2. In a signaling-bell, the combination with the operating-magnet and its cores, of an armature therefor supported at an unvarying distance from and adapted to be actuated by said magnet and cores, each core having a cylindrical bore in its forward end, an extension of the core having a stem fitting within the said bore and capable of being fixed in different longitudinal positions therein, whereby the poles of the magnet can be adjusted with reference to the armature and axially of the body of the core and secured in adjusted position, substantially as described.

3. In a signaling-bell, the combination with the magnet-coils and cores therefor, each core having a threaded aperture in the forward end thereof, an extension of the core having a stem threaded into said aperture to permit the same to be adjusted axially of the core into various longitudinal positions and to be secured in such positions, and an armature supported at an unvarying distance from and adapted to be actuated wholly by the magnetism from said extensions, substantially as described.

4. In a signaling-bell, the combination with the magnet and its cores, of pole-pieces for said cores, an armature, said pole-pieces being adjustable with reference to the armature, and a support for the armature secured in fixed relation to said cores by the said pole-pieces, substantially as described.

5. In a signaling-bell, the combination with the magnet and its cores, of adjustable pole-pieces for said cores capable of a fixed and permanent adjustment therewith, an armature in operative relation with said pole-pieces, the adjustment of said pole-pieces serving to vary their positions with respect to the armature, and a support for the armature secured in un-

varying relation to the forward ends of said cores by said pole-pieces, substantially as described.

6. In a signaling-bell, the combination with a two-coil magnet having a core for each coil, of an adjustable extension for each core, an armature in operative relation with said extensions, and a support for the armature carried by the said cores and secured thereto by the said extensions, substantially as described.

7. In a signaling-bell, the combination with a pair of coils and a core for each coil, a screw-bolt threaded into the end of each core, a supporting-plate carried upon said screw-bolts, check-nuts upon said bolts outside of the supporting-plate to secure the plate in position, and an armature mounted upon the said plate in operative relation with the heads of said screw-bolts, substantially as described.

8. In a signaling-bell, the combination with the operating-magnet thereof and its cores, said cores extending beyond the forward ends of the magnet-coils, an armature-supporting plate placed against the forward ends of said cores screws passing through said supporting-plate and into the cores, lock-nuts upon said screws outside of the plate and clamping the plate against the ends of the cores regardless of the longitudinal adjustment of the screws in the cores, and an armature pivoted intermediate its ends upon said support and having its ends in operative relation with the heads of said screws, substantially as described.

9. In a signaling-bell, the combination with a magnet having a pair of coils, of a core for each coil, a plate to which the rear ends of said cores are fixedly secured, said plate serving to complete the magnetic circuit of said cores and also as a supporting-plate by means of which the bell is secured in position, the forward ends of said cores being provided with threaded apertures, pole-pieces for said cores having threaded stems engaging said threaded apertures, whereby said pole-pieces are adjustable longitudinally of said cores, an armature piv-

oted between its ends and disposed in front of the ends of said pole-pieces in operative relation therewith, and a bell-tongue carried by said armature, substantially as described.

10. In a signaling-bell, the combination with a magnet having a pair of coils and a core for each coil, of a plate to which the rear ends of said cores are fixedly secured, gongs for the bell carried upon said plate, said plate serving to complete the magnetic circuit of said cores and to serve as a supporting-plate for the bell by which it is secured in position, the forward ends of said cores extending beyond the magnet-coils, an armature-support placed against said forward ends, screws extending through said support and into said cores, set-nuts upon said screws outside of said supporting-plate and binding the armature-support in place against the ends of the cores independently of the longitudinal position of the screws, rearwardly-extending lugs upon said armature-support intermediate its ends, an armature pivoted between said lugs and having its ends in operative relation with the heads of said screws, a bell-tongue carried by said armature and extending rearwardly toward the gongs, and a permanent magnet secured at one end to said supporting-plate and having its other end in proximity with the pivoted armature to polarize the same, substantially as described.

11. In an alternating-current bell-ringer the combination with an electromagnet, of an armature responsive thereto, a threaded stud facing said armature and adapted to enter the core of said magnet, and a check-nut threaded on said stud for fixing said stud in position, substantially as set forth.

Signed by me at Chicago, county of Cook, State of Illinois, this 22d day of March, A. D. 1902.

WILLIAM W. DEAN.

Witnesses:

KEMPSTER B. MILLER,
ROBERT LEWIS ARNES.