

No. 871,168.

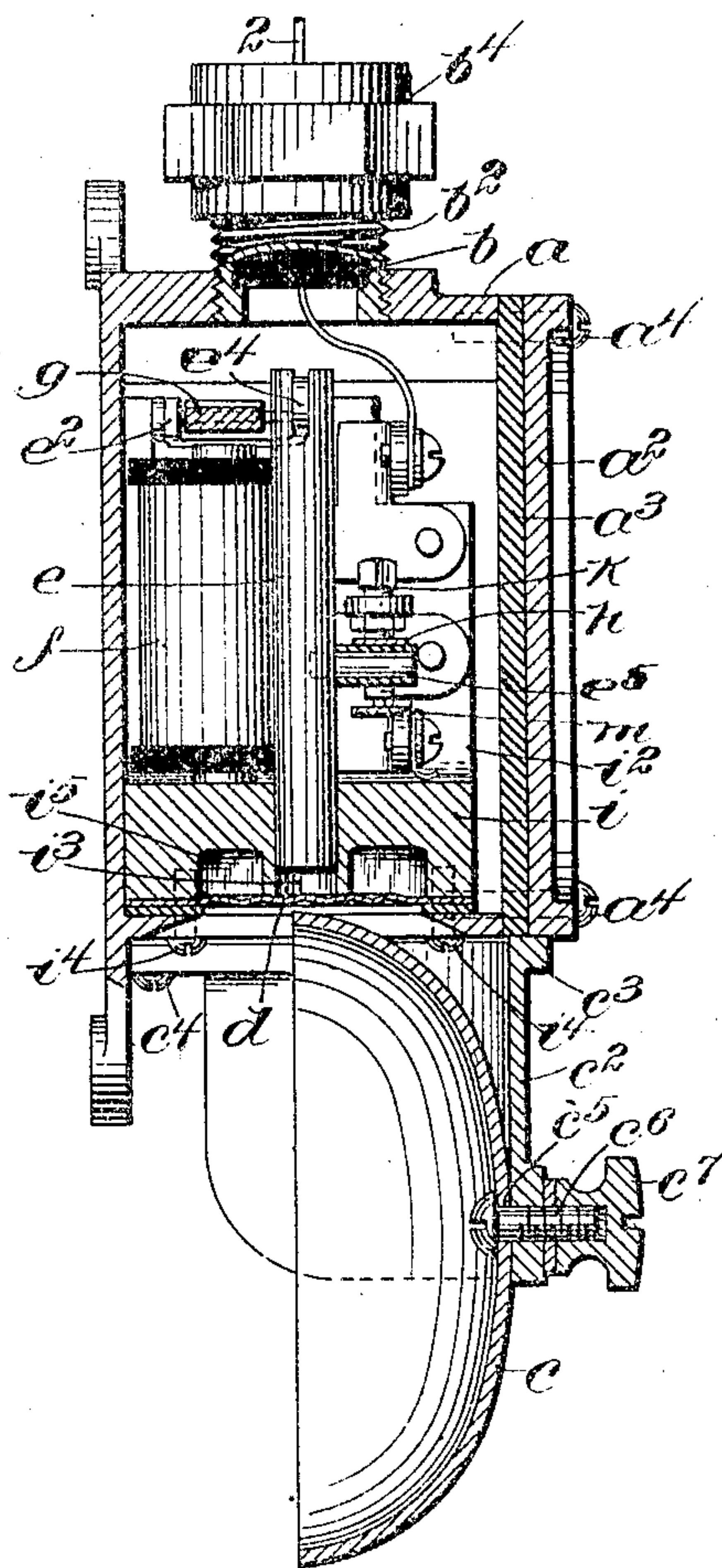
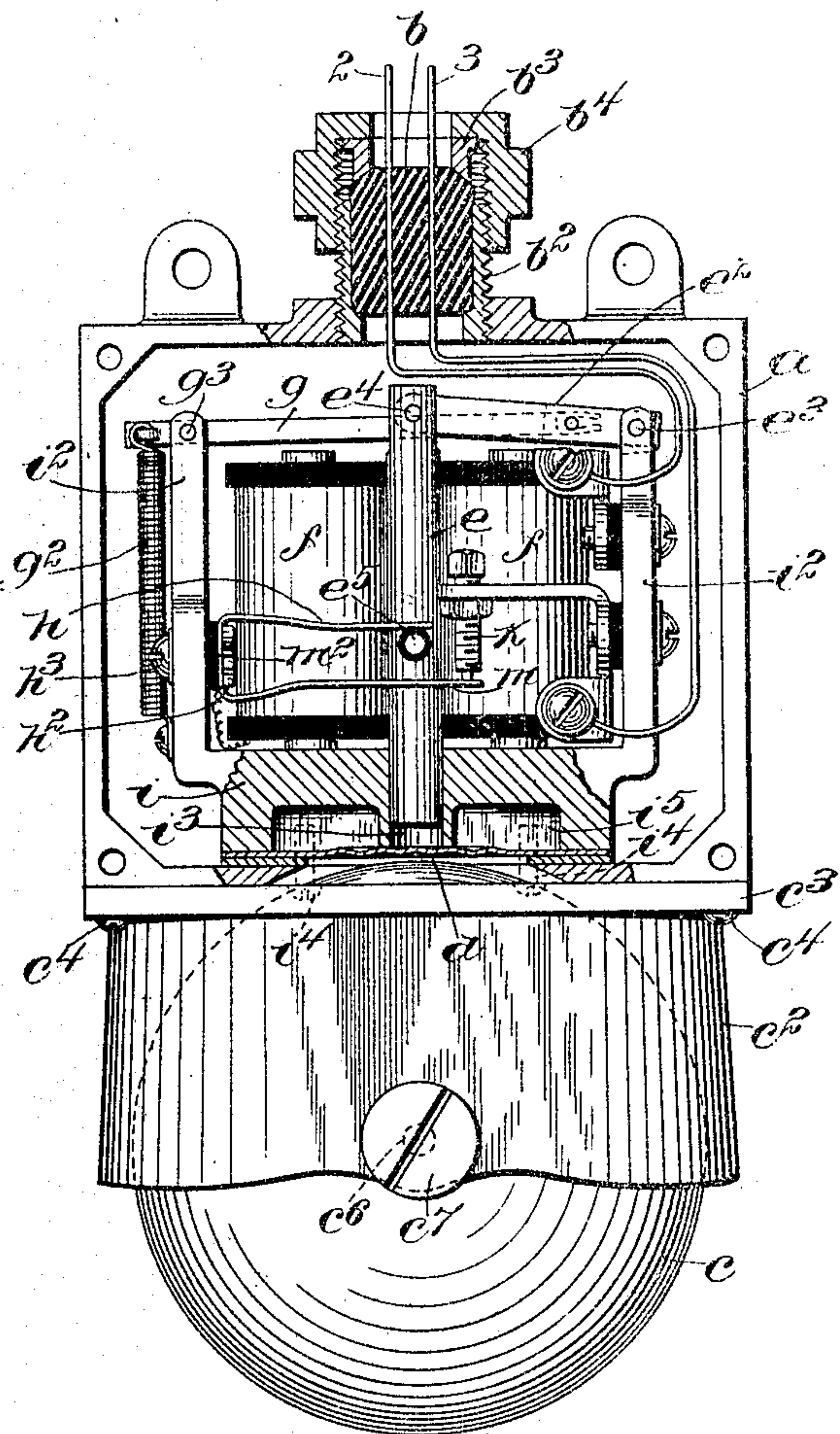
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H. J. HEENEY.
ELECTRIC BELL.

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Fig. 1.

Fig. 2.



Witnesses:
Jas. J. Maloney.
W. J. Conway.

Inventor:
Henry J. Heeney,
by J. P. and H. J. Simmons
Attys.

UNITED STATES PATENT OFFICE.

HENRY J. HEENEY, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HOLTZER CABOT ELECTRIC COMPANY, A CORPORATION OF MASSACHUSETTS.

ELECTRIC BELL.

No. 871,168.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed February 12, 1906. Serial No. 300,591.

To all whom it may concern:

Be it known that I, HENRY J. HEENEY, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Electric Bells, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to an electric bell, the purpose of the invention being to obtain a bell of this kind for out-door use, or for use on ship-board, in which the vital parts, that is to say, the electro-magnets, contacts, &c., will be thoroughly inclosed in a waterproof case.

The invention further relates to certain details of construction and arrangement of the electro-magnet, armature, &c., which will be more fully hereinafter described.

A further feature of the invention consists in means for adjusting the gong or bell proper with relation to a diaphragm which forms a tight inclosure of the case between the striker and the gong; it being obvious that the gong should be near enough to the diaphragm to receive the blow, and, at the same time, not too near to interfere with the sound vibrations.

Figure 1 is a front elevation, partly in section, of a bell embodying the invention, with the cover of the inclosing case removed; Fig. 2 is a vertical section through the middle of the instrument.

Referring to Fig. 1, the operating mechanism for the bell is completely inclosed in a water-tight casing *a*, the said casing being shown as a box open at the front and provided with an inclosing cover *a*² with an interposed washer *a*³, so that the said cover can be held in place by means of screws *a*⁴ to afford a water-tight seal. The case is also provided with an opening at the top for the terminal conductors 2 and 3 which are shown as passing through openings in a block of yielding material *b*, such, for example, as rubber, which is contained in a tube or nipple *b*² having an external screw thread for insertion into the opening in the top of the case. The tube or nipple *b*² also contains a compressing member *b*³ which can be forced into contact with the part *b* by means of a coupling nut *b*⁴, thus compressing

the member *b* upon the terminal conductors to make a water-tight fit.

The bell *c* is supported outside of the casing adjacent to a diaphragm *d* which is herein shown as a piece of thin sheet metal, preferably corrugated, which completely closes an opening at the bottom of the case *a*. The striker *e*, which is wholly inclosed within the casing, is arranged to strike directly on the diaphragm through which the blow is imparted to the bell, the bell being in the field of impact of the striker. It is desirable, therefore, that the distance between the bell and the diaphragm should be easily and delicately adjusted in order that the diaphragm may be sufficiently near to the bell not to interfere with the force of the blow given by the striker, and, at the same time, sufficiently far from the bell not to interfere with the vibrations thereof.

As herein shown, the bell *c* is supported in a member *c*² which projects downward from the bottom of the case, having a supporting flange *c*³ secured to the bottom of the case by means of screws *c*⁴. In the construction shown, the member *c*² is in the form of an inclosing hood, so as to aid in the protection of the bell itself.

For purposes of adjustment, the bell is shown as provided with an opening *c*⁵, through which extends a supporting screw *c*⁶ which coöperates with a clamping screw or nut *c*⁷ at the outside to hold the bell in position. The opening *c*⁵ is made slightly out of alinement with the axis of the bell, so that the bell thus supported is in the nature of an eccentric, it being obvious, therefore, that by loosening the nut *c*⁷ and turning the bell on the screw *c*⁶, the periphery thereof which receives the blow may be adjusted in its position relative to the diaphragm *d*. The bell may be operated either as a single striker or as a vibrator, the mechanism which operates the striker *e* being wholly inclosed in the case *a*.

As herein shown, the case contains an electro-magnet *f* arranged to attract an armature *g* provided with a restoring spring *g*², the said armature *g* being of sufficient length to extend across the pole pieces of the electro-magnet *f*, and being connected at the end opposite its pivot *g*³ with an arm *e*² pivoted at *e*³, and connected at *e*⁴ with the striker *e*. The point of connection between

the armature g and the arm e^2 is relatively near to the pivotal support e^3 , so that a relatively small movement of the armature g will produce a sufficient movement of the 5 striker e to give a good hard blow. Furthermore, this arrangement is such that the armature g , having so small a movement, lies close to the cores of the electro-magnet; thus being in a strong magnetic field. This 10 construction renders the bell adaptable for use with currents having a wide variation of voltage.

In order to cushion the recoil of the striker e in response to the action of the 15 spring g^2 , the said striker is arranged to cooperate with a spring h , herein shown as secured by means of a nut h^2 on a screw h^3 supported in one of the uprights i^2 of the frame member i , which uprights afford the 20 supports for the magnet and for the armature g and arm e^2 . This spring h is engaged by a projection e^5 from the side of the striker in the upward movement of said striker. If the bell is to be used as a vibrator, a circuit breaker is employed, said circuit breaker 25 being herein shown as consisting of an adjustable stationary contact k which cooperates with a movable contact m which is arranged to be acted upon by the projection 30 e^5 in the downward movement of the striker e . For convenience in construction, the said member m may consist of an extension of the spring h , the entire spring h , m , being separated by insulating material m^2 from 35 the supporting member i .

The supporting member i is provided at the base with an opening i^3 , which constitutes a guide for the striker e , and the diaphragm d is clamped to the bottom of the 40 case by means of said supporting frame. The said frame is held in place by screws i^4 inserted through the under wall of the case a . The under part of the frame i is hollowed out over the diaphragm, as indicated at i^5 , 45 so as not to interfere with the free operation thereof, but the guide portion for the striker is extended into contact with the diaphragm, thereby preventing the said diaphragm from setting up vibrations after the blow has been 50 struck.

What I claim is:

1. In an electric bell, the combination with an electro-magnet; an armature, and a 55 striker operated thereby; of an inclosed casing for said electro magnet, armature and striker; a gong supported outside of the casing in the field of impact of said striker; a diaphragm forming a part of the wall of said 60 casing, and being interposed between said striker and said gong; and means for preventing said diaphragm from vibrating.

2. In an electric bell, the combination with an electro-magnet and a longitudinally 65 movable striker operated thereby; of a casing to contain said electro magnet and

striker; a cover for said casing; a washer interposed between said cover and said casing to constitute a water-tight seal; electric 70 conductors to energize the said electro magnet; a flexible member provided with openings for said conductors; means for compressing said flexible member to hermetically seal the same around said conductors; a gong outside of the casing in the path of impact of said 75 striker; a diaphragm forming part of the wall of the casing and interposed between said striker and said gong; and means for preventing said diaphragm from vibrating.

3. In an electric bell, the combination with an electro-magnet, an armature and a 80 striker operated thereby; of an inclosed casing for said parts; a gong supported outside of the casing in the field of impact of said striker; a diaphragm forming a part of the 85 wall of said casing and being interposed between said striker and said gong; means for preventing said diaphragm from vibrating; and means for adjusting the position of said gong with relation to said diaphragm.

4. In an electric bell, the combination 90 with an inclosed case provided with a diaphragm in one wall; of striking mechanism inclosed in said case; a hood-shaped supporting member connected with the wall of said case of which said diaphragm forms a part; 95 a clamping member supported in said supporting member; and a circular gong provided with an opening slightly out of alignment with its center, said supporting member extending through said opening in said 100 gong.

5. An inclosed casing; a bell-striker and operating means contained therein; a diaphragm forming part of the wall of said casing; a fixed part within the casing lying in 105 contact with the diaphragm near the middle thereof; and a bell outside the casing close to, but not in contact with, the diaphragm.

6. In an electric bell, the combination with a hermetically sealed casing; of an 110 electro-magnet contained therein; a reciprocating striker also in said casing; an arm having a stationary pivotal support at one end, and being pivotally connected with said striker at the other end; a pivotally 115 supported armature for said electro magnet connected with said pivotally supported arm; a diaphragm constituting an inclosing part of said casing, and being in the path of the said striker; and a bell outside of the 120 casing, and in the field of impact of said striker to receive blows therefrom through said striker.

In testimony whereof, I have signed my name to this specification in the presence of 125 two subscribing witnesses.

HENRY J. HEENEY.

Witnesses:

W. E. COVENEY,

HENRY J. LIVERMORE.