

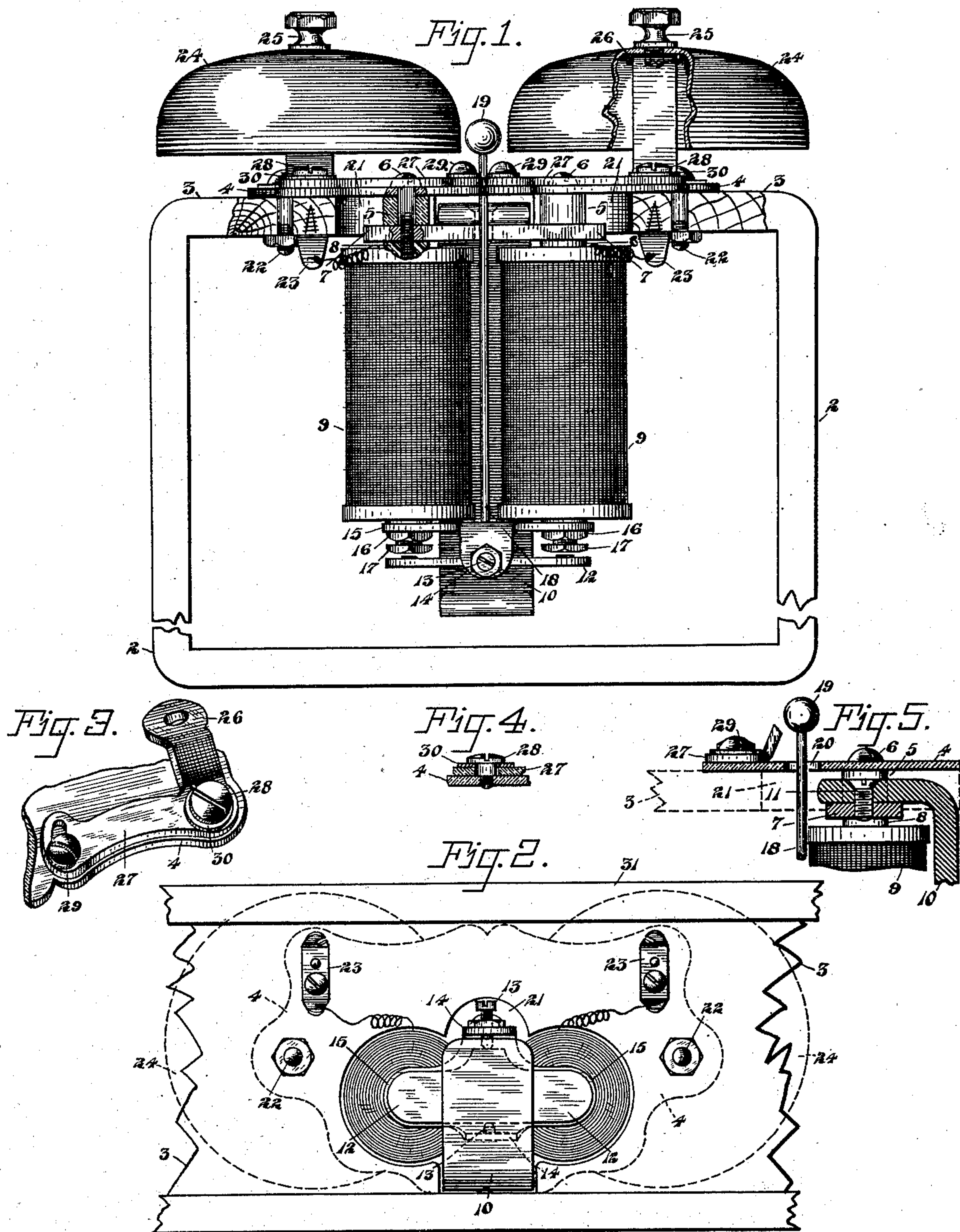
No. 750,288.

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A. M. KNUDSEN.  
RINGER.

APPLICATION FILED JUNE 6, 1902.

NO MODEL.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## RINGER.

SPECIFICATION forming part of Letters Patent No. 750,288, dated January 26, 1904.

Application filed June 6, 1902. Serial No. 110,432. (No model.)

*To all whom it may concern:*

Be it known that I, ANTON M. KNUDSEN, 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 Ringers, of which the following is a specification.

My invention relates to improvements in magneto ringers or bells for use in connection with telephone subscribers' instruments. It has for its object the provision of a ringer that is entirely self-contained and means whereby the same may be mounted in a box or upon other support without the necessity of disassembling the same or taking it apart, and thus disarranging or disturbing the adjustment of its several parts in any manner.

The invention further consists in the novel details of construction 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 are used throughout the several views to designate like parts, and in which—

Figure 1 is a front elevation of the device, showing parts broken away for the sake of clearness. Fig. 2 is a bottom view of the ringer and its support. Fig. 3 is a perspective view of the adjustable gong-supports. Fig. 4 is a section on the line 4-4 of Fig. 3, and Fig. 5 is a section through the center of the permanent magnet of Fig. 1.

In the figures, 2 designates the ordinary box upon a subscriber's telephone wall set in which a ringer is adapted to be placed, said box being also arranged to accommodate an induction-coil or other apparatus in its lower part, the said lower part being shown broken away in Fig. 1. The upper edge 3 of this box forms a support for the ringer, and while a box is shown it is apparent that the bell can be used in the same way with any suitable supporting member.

The ringer comprises a plate 4, (shown in dotted outline in Fig. 2,) upon the under side

of which the spacing-studs 5, preferably of brass, are placed. A soft-iron plate 7 is carried upon the lower ends of the studs 5, to the lower side of which plate the cores 8 of the magnet-coils 9 are fixed by the screws 6, which pass entirely through the plate 4, the spacing-studs 5, the ends of the plate 7, and then thread into the ends of the cores 8. By this means these parts are all secured together and to the under or inner side of the plate 4. A permanent magnet 10 is secured at its upper end to the central portion of the plate 7 by means of a suitable countersunk screw 11, the lower end of which extends beneath the armature 12, as shown in Fig. 1, to polarize the same. The armature 12 is pivoted centrally upon suitable pivots 13, carried in suitable lugs 14, extending downwardly from the sides of the armature-support 15, said armature-support being secured to the lower ends of the cores 8 by means of jam-nuts 16, placed upon screws or screw-bolts 17, threading into the lower ends of the cores 8 and forming adjustable pole-pieces therefor. The bell-tongue 18 is carried by the vibrating armature 12 and is provided with a ball or clapper 19 at its upper end, the said tongue passing through a suitable aperture 20 in the top plate 4. These parts are all carried upon the lower side of the plate 4 and are adapted to be inserted through an enlarged aperture 21, formed in the support 3, said aperture being of such dimensions, as shown in Fig. 2, as to permit these parts to be freely passed there-through, and at the same time the parts are so compactly arranged as not to require a large enough aperture in the plate 3 as to unduly weaken the same. The plate 4 is secured to the supporting-plate 3 by means of bolts 22, one at either end, said bolts passing through the plate 3 and having suitable nuts threading upon their lower ends. The ringer is thus securely held in place upon the plate 3 by the plate 4, which latter serves to strengthen the plate 3 and to entirely cover and conceal the aperture 21. Suitable terminal clips 23 are mounted upon the lower side of the plate 3,



to which the circuit-conductors may be connected at one end, while their opposite ends are connected with the conductors of the ringer-coils.

5 The gongs 24 are each secured by nuts 25 to the upper end of the arm 26 of a bell-crank or elbow lever support, the other arm, 27, of which is secured to the top plate by means of a pivot-screw 28 and washer 30 at the angle  
10 of the two arms, as shown in Fig. 4, and the clamping-screw 29, passing through a slot in the other end of the arm 27 to clamp the adjusted support in position. The arm 26 is inclined to the plane of the arm 27 and is raised  
15 above the plate 4, as shown in Figs. 1 and 3. By varying the position of the inner ends of the arms 27 of the gong-supports the distance between the gongs may be adjusted as desired. The plates 31 and 32, Fig. 2, indicate the  
20 usual front and back of box 2.

I do not claim herein the feature of the adjustable pole-pieces 17 of the magnet-cores, since in its individual capacity it forms no part of my invention.

25 From the foregoing it is evident that I have produced a ringer which is at once simple, complete, durable, and efficient and which is entirely self-contained, so that it may be installed without the necessity of disassembling  
30 the same to any extent, as is required in the ordinary ringer.

Another important advantage is that the gongs are always at the same distance from the front face of the box and the same pleasing  
35 appearance of the mounted device may always be secured, whereas with the bells in which the supporting-plate is secured to the inner face of the box the gongs may be close to or far from the outer face, according to the  
40 thickness of the wall of the box, which often varies, and it is sometimes even necessary to use different lengths of posts for the gongs. In this bell the adjustment is made at the time of assembling and is not required to be ad-  
45 justed after mounting, as is the case with all other styles of similar bells.

What I therefore claim is—

1. In a polarized signaling-bell, the combination with a supporting-plate adapted to be  
50 secured to the outside of a suitable box, of gongs upon the outer side of said plate and adjustably carried therefrom, magnet-coils and associated parts including a permanent magnet carried upon the inner side of said plate  
55 and adapted to project through the wall of and into said box, whereby the mountings of the said gongs and their distances from the outside of the said box is independent of the thickness of the walls thereof, substantially  
60 as described.

2. The combination with an inclosing box, of a self-contained bell including assembled and adjusted gongs and electro and permanent

magnets, one wall of said box having an aperture, and means, carrying said gongs upon  
65 one side and said magnets upon the other, for bodily mounting said bell upon said wall of the box without disassembling the same or disturbing its adjustment by passing the said  
70 magnets through said aperture from the outside and securing the bell in place thereon with the said magnets inside the box and the said gongs outside, substantially as described.

3. The combination with an inclosing box having an aperture formed in one of its walls,  
75 of a self-contained signaling-bell having a supporting escutcheon-plate fitting over said aperture on the outside of the said wall, said plate being secured to the said wall and concealing the said aperture therein, magnet-coils  
80 for the bell carried upon the inner side of said plate and projecting through said aperture into the said box, and gongs for the bell upon the outer side of said plate, whereby the said  
85 self-contained bell may be mounted upon the box with its magnets within the same and its gongs outside without disassembling the same and a finished and neat appearance is presented when the bell is so mounted, substantially  
90 as described.

4. The combination with an inclosing box having an aperture in one of its walls, of a self-contained signaling-bell comprising a supporting-plate, magnet-coils and associated  
95 parts mounted upon the inner side of said plate within the limits of said supporting-plate and adapted to readily pass through said aperture, whereby the bell may be mounted upon the box by passing the said coils and associated parts through said aperture into the  
100 box and securing the said plate to the outer face of the said wall, said plate forming an escutcheon for the said aperture and concealing the same when secured in place, and gongs for the bell upon the outer side of said plate and  
105 carried thereby, substantially as described.

5. The combination with a self-contained polarized signaling-bell comprising a supporting escutcheon-plate, a pair of magnet-coils  
110 and the associated permanent magnet and armature secured to the inner side of said plate and all within the outer limits thereof, a pair of gongs adjustably mounted upon the outer side of said plate, and a bell-tongue extending from said armature through said plate  
115 and carrying a hammer or ball in operative relation with said gongs, of an inclosing box having an aperture formed in one of its walls of sufficient size to permit said magnet-coils and associated parts to readily pass there-  
120 through but small enough to be covered and concealed by said plate, whereby said bell may be readily mounted on said box by passing the said coils and associated parts through said aperture and securing said plate to the  
125 outer face of said box-wall without the neces-

sity of disassembling the bell or disturbing  
the adjustment of its gongs, whereby the said  
aperture is concealed and the distance of the  
gongs from the outer face of the box is inde-  
5 pendent of the thickness of the walls thereof  
so that a neat appearance is always presented,  
substantially as described.

Signed by me at Chicago, county of Cook,  
State of Illinois, this 16th day of May, 1902.

ANTON M. KNUDSEN.

Witnesses:

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