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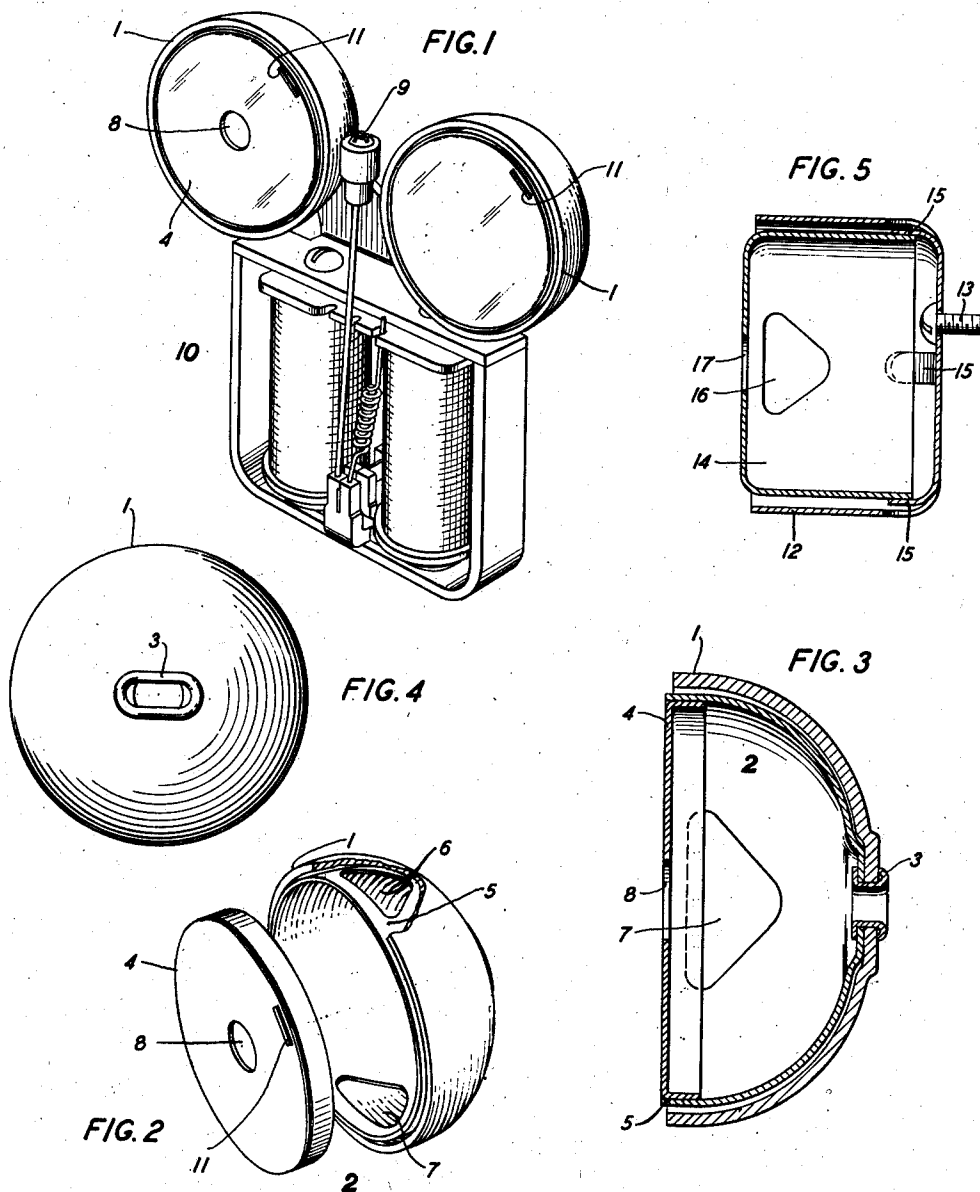
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RESONATOR FOR TELEPHONE BELLS

Filed Dec. 9, 1937

2 Sheets-Sheet 1



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FIG. 6

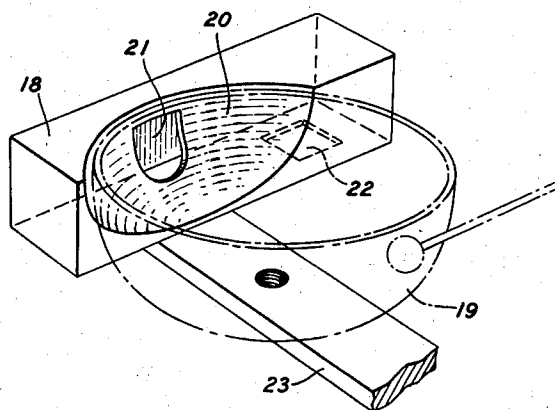
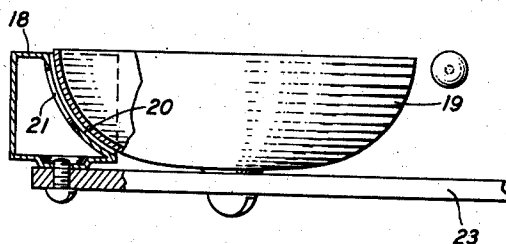


FIG. 7



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RESONATOR FOR TELEPHONE BELLS

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6 Claims. (Cl. 116—148)

This invention relates to telephone systems and more particularly to means for amplifying and improving the sound of bells used in telephone sets at subscribers' stations, which is the desired
5 object.

Until very recently, the types of telephones installed at subscribers' stations have been such as to permit the use of telephone ringers equipped with bells or gongs of sufficient size and shape to produce a volume of sound adequate for almost all except the most extreme conditions but with the advent of what is known as the combined desk set in which all the subscriber's set equipment including the ringer is housed in the base of a desk instrument, it has been necessary to reduce the size of the component parts, particularly the ringer, including the bells or gongs, to such an extent that the sound volume has necessarily been quite materially lowered. In most
10 locations these smaller ringers are still sufficiently loud but conditions sometimes arise, such as in large offices, factories and other places of business, and in some residences, where a stronger, and in some cases, a more distinctive signal is
15 required.

A feature of the present invention whereby the foregoing object is attained resides in concentrically mounting a partially closed resonator having a resonating air chamber within the individual bells or gongs, and properly tuning it, whereby the fundamental tone of the bell or bells is reinforced and improved in quality and distinctiveness.

The invention will be understood from the following description and accompanying drawings, in which:

Fig. 1 shows a standard telephone ringer for use in a so-called combined desk set equipped with gongs or bells having resonators mounted therein
20 in accordance with the present invention;

Fig. 2 shows an enlarged perspective view of one of these gongs with the cover of the resonator removed;

Fig. 3 shows an enlarged cross-section of the same gong showing the method for mounting the resonator within the gong;

Fig. 4 shows the top or front of the same gong;

Fig. 5 shows a slightly different structure of gong and resonator in which the resonator is easily rotatable with respect to the gong after the gong has been fastened in the proper position with respect to the clapper of the ringer.

Fig. 6 shows, in perspective, an alternative form of the invention in which a resonator of rectangular proportions and having a depression in
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one of its sides shaped to the contour of the bell is located externally of the gong; and

Fig. 7 is a sectional view of the resonator and gong of Fig. 6.

The same reference characters appearing in the different figures represent the same part of the structure.

Referring to the drawings, 1 is a conventional bell or gong of brass or other resonant metal, either pressed or cast to the desired shape; 2 is a resonator of hemispherical shape which, in accordance with the present invention, lies within the gong 1 and is rigidly attached thereto at the inner apex of the gong by means of the hollow rivet member 3; 4 is a tightly fitting cover or cap for the bell-shaped body portion 5 of the resonator which, due to the desirability of maintaining as small an amount of clearance as possible between the resonator and gong, is made to fit inside the opening of the body 5. The body portion 5 has two diametrically opposed triangular openings 6 and 7 of predetermined dimensions located near the opening or rim thereof.

The cap or cover portion 4 may have an opening 8 of a predetermined diameter for the purpose of tuning the resonator to a desired pitch or tone.

In Fig. 1 the left-hand resonator cap 4 is shown with such an opening but the right-hand cap has not, which is due to the fact that the thickness of the left-hand gong is slightly greater than that of the right-hand gong and hence has a higher pitch which requires a slight tuning to give the desired tonal qualities to the combination.

In order that maximum tone amplification is obtained with gongs equipped with resonators as described, it is necessary that one of the openings 6 or 7 of each resonator be opposite the point of the respective gong 1 struck by the clapper 9 or 90 degrees therefrom. This requirement makes it desirable that the resonator be rotatably adjustable with respect to the gong in order that after the gongs are properly positioned with respect to the clapper, the resonator can be turned to locate the side opening either opposite the clapper or 90 degrees away from it.

A somewhat different structure of resonator or gong from that of Figs. 1 to 4, by which the foregoing requirement is satisfied is shown in Fig. 5 in which the gong 12 is fastened to the framework of the ringer by a screw 13 eccentrically located in the base of the gong. The resonating chamber consists of an inverted cup-shaped member 14 held in position within the gong by clips 15 which are punched inwardly from the gong and 90 degrees apart. By this arrangement
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the gong can be rotated on its eccentric mounting screw 13 until it is in the proper position with respect to the clapper and after it is fastened in that position by the screw, the resonating chamber can be rotated so that the diametrically opposed openings 16 are either opposite the point of the gong struck with the clapper or 90 degrees therefrom. The resonator 14 of this figure may have a tuning opening 17 if desired.

10 In Fig. 6 an alternative form of the invention is shown which consists of a partially closed resonator 18 forming a resonating air chamber of rectangular proportions, said chamber having a depression 20 in one of its sides shaped to the contour of the bell 19, an opening 21 in the depressed portion of the chamber wall and a second opening 22 in one of the other sides of the chamber which openings are relatively small in comparison with the chamber cavity and mounting means 23 to position the resonator in close proximity to the bell so that the depressed portion surrounds a portion of the bell but does not come in contact with it.

25 The openings 11 in the resonator cover or cap 4 of Figs. 1 to 3 are merely to provide means for removing the cover when desired and serve no other specific purpose.

30 It has been noted that a distinctive change in the tone of telephone ringer gongs has been obtained by equipping them with resonators of the type described, the fundamental tone being raised approximately fifteen decibels and highly damped. Aside from an increase in the sound output or loudness, which is desirable in some ringer locations, the distinctive tone of ringers so equipped over ringers not having resonators is also of value when two or more telephone are located in close proximity to each other.

What is claimed is:

40 1. The combination with a telephone bell, of a partially closed resonator mounted therein, said resonator being formed with a resonating air chamber, said chamber having two small openings in the walls thereof substantially 180 degrees apart and near the mouth of the bell.

45 2. In a sound resonating and amplifying arrangement for telephone bells, a resonator formed with a resonating chamber, said resonator having

a wall of substantially the same contour as the bell, but of slightly less diameter, concentrically mounted within the bell, a cover for the mouth of the resonating chamber and two small openings in the chamber wall located near the large end thereof and substantially 180 degrees apart.

3. In a telephone ringer, a bell, a partially closed resonator forming a resonating air chamber of rectangular proportions having a depression in one of its sides shaped to the contour of the bell, an opening in the depressed portion of the chamber wall and a second opening in one of the other sides of the chamber, said openings being relatively small in comparison with the chamber cavity, and means for mounting said resonator in close proximity to the bell so that the depressed portion surrounds a portion of the bell but does not come in contact therewith.

4. A telephone bell having a resonator mounted therein, said resonator being formed with a resonating air chamber of substantially the same contour as the bell, said chamber having its large end covered and having two separate openings in the side wall opposite the inner face of the bell rim and diametrically opposite each other, and means for tuning said chamber to resonate with the fundamental pitch of the bell comprising an opening of predetermined size in the chamber cover.

5. In a telephone ringer, a bell-shaped gong and a partially closed resonator, of substantially the same contour as the bell, concentrically mounted therein, said resonator being formed with a resonating air chamber having two small openings in the sides thereof located near the mouth of the bell and substantially 180 degrees apart.

6. The combination with a resonator comprising a resonating air chamber having two small openings in the walls thereof, of a telephone bell external to said resonator and mounted in close proximity thereto, and a clapper arranged to strike said bell near its mouth, one of said resonator openings being located in such a position that it is near a point on the mouth of the bell which is a multiple of 90 degrees from the point thereon struck by said clapper.

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