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CLAPPER AND GONG ASSEMBLY FOR TELEPHONE RINGERS

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FIG. 1

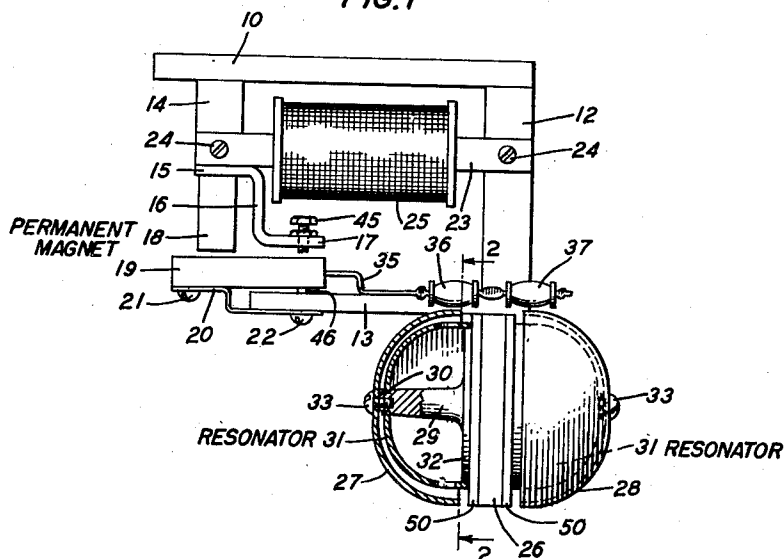


FIG. 2

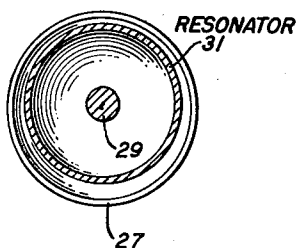
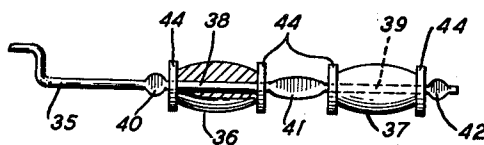


FIG. 3



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CLAPPER AND GONG ASSEMBLY FOR
TELEPHONE RINGERS

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5 Claims. (Cl. 340-402)

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This invention relates to signaling devices of the percussion type and more particularly to improvements in clapper and gong assemblies for telephone ringers.

The telephone ringer in general use comprises an electromagnetically controlled, vibratable clapper rod which supports at one end thereof a clapper, or clapper ball for operation between two gongs, the clapper and gongs being so relatively disposed that as the clapper rod is vibrated the clapper strikes the two gongs alternately to produce an audible signal. In such structures the clapper has been rigidly fixed to the clapper rod. A recent improvement in clapper and clapper rod assemblies, disclosed in my United States Patent No. 2,533,465, issued December 12, 1950, contemplates loosely mounting the clapper on the clapper rod. In such ringer designs where the clapper is disposed between the two gongs the clapper is caused to strike each gong on a different stroke of the armature to which the clapper rod is fixed. The location of the clapper between the gongs introduces design problems pertaining particularly to methods and means for adjusting the sound output of the ringer. Frequently such problems find their solutions in somewhat complex and difficult to maintain volume control instrumentalities.

It is the object of this invention to provide an improved design of telephone ringer and particularly one which permits a simplification of the mechanism required to control the sound output level thereof.

This object is attained in accordance with a feature of the invention by utilizing, in a telephone ringer, a novel clapper and gong assembly which permits each of two gongs to be struck simultaneously or in rapid succession on the same stroke of the ringer armature. More particularly, this invention contemplates a single clapper rod supporting two independently and loosely mounted clappers in tandem relation near its free, or operating end, and a pair of gongs mounted in opposed relation to each other and each in close proximity to a different one of the loosely mounted clappers. With such a structural arrangement both gongs are struck simultaneously or in rapid succession each by a different one of the clappers, on the same stroke of the clapper rod and, therefore, of the ringer armature incident to the energization of the usual ringer coil.

The invention will be better understood from the following detailed description when read with reference to the accompanying drawing in which:

Fig. 1 is a structural schematic, plan view, of a telephone ringer embodying the features of the invention;

Fig. 2 is a section taken along the line 2-2 of

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Fig. 1 looking in the direction of the arrows and illustrates the fact that the gongs are eccentrically mounted; and

Fig. 3 is an enlarged fragmentary view of the clapper and clapper rod assembly of this invention.

The electromagnetic circuit of the ringer disclosed in Fig. 1 has been chosen merely for purposes of illustration it being understood that the present invention is applicable to ringers in general and regardless of their electromagnetic design. The electromagnetic circuit disclosed is substantially identical to that illustrated in United States Patent No. 2,590,500, issued March 25, 1952 to H. A. Bredehoft and M. S. Richardson. It comprises a unitary iron structure having four substantially right-angularly disposed legs 10, 12, 13 and 14, the last of which terminates in an integrally formed section consisting of the right-angularly disposed integral elements 15, 16 and 17. The element 17 is located in spaced relation to the unattached end of leg 13 and effects an air-gap therewith.

Within the air-gap effected by the elements 17 and 13 an armature 19 is adapted to vibrate, being supported on one end of the leg 13 by means of the reed-type hinge 20. A screw or screws 21 secure one end of hinge 20 to the armature 19 near its outer end while a screw or screws 22 fix the other end of the hinge to the leg 13. The travel of the armature 19 may be adjusted by means of the adjusting screw 45 while contact between the armature and the leg 13 is prevented by a stop 46 which is carried by the armature as shown.

A cylindrical permanent magnet 18 is mounted in any suitable manner on the ringer structure so that one end thereof abuts the outer face of element 15 and the other end thereof is located in spaced relation to the lower end of armature 19.

A core 23, preferably consisting of a plurality of laminations bridges the legs 14 and 12 and is secured thereto by screws 24. The core 23 parallels the leg 10 and supports a coil 25 in any well-known manner.

A gong support 26 comprising an integral extension of the iron portion of the magnetic circuit of the ringer extends at right angles from the leg 13 and in substantial alignment with the leg 12. While this member 26 is indicated as being formed integral with the magnetic circuit elements it is to be understood that it may be formed as a separate unit and be removably secured to the structure in any suitable manner so as to occupy the position illustrated.

Carried by the support 26 and fixed to each side thereof in any suitable manner are two gong posts 29, only one of which appears in the draw-

ing. Each gong post, in the illustration, terminates in an integral circular base 50 which is fixed to the support 26 and is provided with a boss 32 on the edge of which the circular edge of a cup-shaped resonator 31 is adapted to snugly fit. The gong posts 29 are so relatively disposed as to be substantially coaxial and extend in opposite directions from, and at right angles to the support 26. The upper end of each post is provided with a circular ledge, or shoulder on which the upper circular edge, effected by a correspondingly shaped aperture at the apex of the resonator 31 tightly fits. Thus the resonators are firmly fixed to their respective gong posts. A tapped axial hole in each post 29 accommodates a screw 33 which serves to secure the gongs in position on their respective posts. As more clearly shown in Fig. 2, the gongs 27 and 28 are eccentrically mounted on the gong posts.

A clapper rod 35, staked to the unhinged end of armature 19 supports near its outer or operating end two metal clappers 36 and 37. The clappers are loosely mounted on the rod 35 and are capable of a rotational as well as a limited longitudinal movement on bearing portions 38 and 39 of the rod. The lengths of the bearing portions 38 and 39 are defined by the flattened rod portions 40, 41 and 42, the rod portion 41 also determining the spacing between the bearing portions. If desirable, washers 44 may be used at each end of the clappers 36 and 37.

The clapper and clapper rod assembly is such that when the rod 35 is staked or otherwise secured to the armature 19 the clappers 36 and 37 are disposed adjacent the rims of the corresponding gongs 27 and 28 and the gongs are located on the same side of the clapper rod. Thus, as the armature-supported clapper rod 35 is vibrated incident to the energization of the ringer coil 25, each of the clappers strikes a different gong on the same stroke of the armature, that is, on the clockwise stroke of the armature viewing Fig. 1.

To vary the sound output level of the ringer it is only necessary to manipulate the adjusting screw 45 thereby regulating the travel of the armature 19. Initial adjustments may be made by rotating the gongs, it being understood that, because of the eccentric mountings of the gongs on the gong posts the spacing between the gongs and their respective clappers will be increased or decreased depending upon the direction in which the gongs are rotated.

It is believed not necessary to include in this specification a detailed description of the ringer operation incident to the energization of the coil 25 by ringing current since such may be found in the above-identified Bredehoft-Richardson copending application. It suffices to say that incident to the energization of the coil 25 by ringing current the armature-supported clapper rod 35 vibrates and each of the gongs 27 and 28 is struck by its corresponding clapper 36 or 37 on the overthrow of the rod immediately following engagement of the stop 43 with the pole-piece 13.

The advantages derived from loosely mounted clappers are set forth in my United States Patent hereinbefore identified.

The advantages derived from the novel clapper and clapper rod assembly of this invention are as follows:

(1) Elimination of the necessity for changing the gong spacing by moving one of the gongs as the armature travel is varied for volume control

thereby reducing the number of variables in ringer performance.

(2) Simplification of the mechanism necessary for controlling the sound output level of the ringer.

(3) Simplification of ringer adjustment technique by virtue of having to adjust gong clearance only in the non-operate position of the armature.

(4) Simplification of the adjustment of gong clearances since both gongs are eccentrically mounted.

(5) More uniform performance of the ringer at low armature travels by virtue of actuating the gongs on the same armature stroke.

(6) Improved ringer performance since there is no restriction on clapper rod motion due to operation of the clapper in limited space between the gongs.

What is claimed is:

1. In a telephone ringer, a pair of gongs mounted in opposed rim-to-rim alignment, a clapper rod, a pair of clappers mounted in tandem on said clapper rod, and means for mounting both said gongs on the same side of said clapper rod with each thereof adjacent to a different one of said clappers.

2. In a telephone ringer, a clapper rod, a pair of clappers mounted in tandem on said rod, a gong support, a pair of gongs, means on said support mounting said gongs thereon in opposed rim-to-rim relation, an armature, means including said armature for supporting said clapper rod relative to said gongs so that the exterior surface of each of said gongs is struck by a different one of said clappers on the same stroke of said armature when said armature is vibrated, and means for causing the vibration of said armature.

3. In a telephone ringer, the combination defined in claim 2 and in which the gongs are eccentrically mounted on said gong-mounting means.

4. In a telephone ringer, a pair of cup-shaped gongs, a clapper rod having one end fixed and the other end free, a pair of clappers mounted in aligned tandem relation on the free end of said rod, means mounting both said gongs on the same side of said rod with their rims juxtaposed so that each presents an area on its exterior surface to a different one of said clappers for simultaneous engagement thereby when said clapper rod is vibrated, and means for vibrating said clapper rod.

5. A telephone ringer in accordance with claim 4 and in which said mounting means includes fixed oppositely projecting coaxial gong posts, and means adjustably supporting each said gong on a different one of said posts in telescopic relation thereto.

REGINALD T. JENKINS.

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717,137	Thompson	Dec. 30, 1902
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