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54 **Telephone bell assembly.**

57 A telephone bell assembly comprises first and second bells (1,2) and a hammer (3). The first bell (1) is inverted with respect to the second bell (2) and is arranged to overlap the second bell to reduce the width occupied by the assembly. The walls of the bells (1,2) are slotted (13,14,15) to enable the bells to nest one within the other to reduce the depth of the assembly. The hammer (3) is carried on an arm (8) driven by an electromagnetic motor unit (4) and is arranged within the overlapping portions of the bells (1,2).

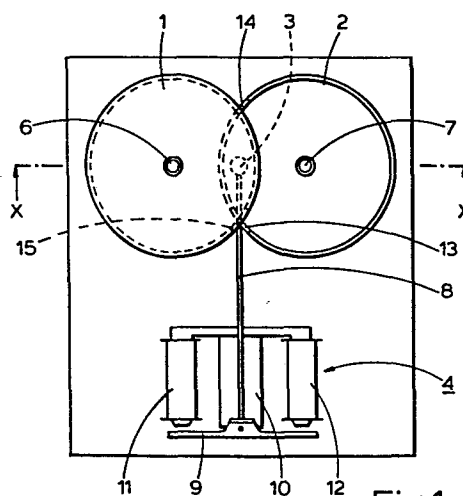


Fig.1

TELEPHONE BELL ASSEMBLY

The invention relates to a telephone bell assembly comprising two bells which are arranged to be struck alternately by a single hammer.

5 Conventional telephone bell assemblies comprise two bells each of a particular resonant frequency which are struck by a single hammer operated by an electromagnetic motor unit. The bells are placed on opposite sides of the hammer so that they are struck alternately as the hammer is swung from side to side by the motor unit.

10 Such bell assemblies are relatively bulky items which, while satisfactory in the traditional telephone instruments which have a relatively large volume, take an unacceptably large proportion of the interior volume of smaller instruments. In particular the depth of the instrument may be insufficient to house the conventional bell assembly. A possible solution to this problem, is to reduce the depth
15 of each bell but in order to maintain the same musical tone it is then necessary either to increase the diameter of the bell or to make the bell from thinner material. The preferred practical solution is to increase the diameter of the bells as thin bells do not possess the necessary robustness. This however will increase the overall
20 width of the assembly and again may cause the assembly to occupy an unacceptably large proportion of the interior space of the instrument.

It is an object of the invention to produce a more compact telephone bell assembly.

25 The invention provides a telephone bell assembly comprising two bells which are arranged to be struck alternately by a single hammer characterised in that one of the bells is inverted with respect to the other, that the mouths of the bells overlap and that the wall of at least one of the bells is slotted to enable the bells to nest one within the other. By overlapping the bells the width occupied
30 by the assembly can be reduced or an assembly having larger diameter bells may be accommodated in the same width and by slotting the bells a reduced depth may be achieved.

In an arrangement in which the bells are arranged symmetrically about the hammer, the hammer is located between the overlapping portions of the bells. With this arrangement the degree of overlapping of the bells is limited in that the hammer must be able to strike each bell within its limit of travel.

In an alternative asymmetric arrangement the hammer is arranged to strike the inside of the wall of one bell and the outside of the wall of the other bell. This arrangement allows a substantial overlapping of the bells to provide a particularly compact arrangement. It may also permit an easier adjustment of the bell position with respect to the hammer.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 shows a plan view of a first embodiment of a telephone bell assembly according to the invention.

Figure 2 is a cross-sectional elevation on line X-X of Figure 1,

Figure 3 is a plan view of a second embodiment of a telephone bell assembly according to the invention, and

Figure 4 is a cross-sectional elevation on line Y-Y of Figure 3.

The telephone bell assembly shown in Figures 1 and 2 comprises two bells 1 and 2, a hammer 3 and an electromagnetic motor unit 4. The bells and motor unit are mounted on a base plate 5, the bells being mounted by pillars 6 and 7. The electromagnetic motor unit comprises an arm 8 connected to an armature 9 which is pivoted on a permanent magnet 10. Two series connected coils 11 and 12 are mounted on either side of the magnet 10 and when connected to an a.c. ringing voltage cause the armature 9 to rock about its pivot as each end is in turn attracted towards the respective coil 11 or 12. The rocking of the armature causes the arm 8 on which the hammer 3 is mounted to swing from side to side thus causing the hammer to alternately strike the bells 1 and 2.

The bell 2 is inverted with respect to the bell 1 and is provided with two slots 13 and 14 to enable the depth of the assembly to be reduced by allowing the walls of bell 1 to pass through those of bell 2. The bell 1 is also provided with a slot 15 to allow the arm 8 to pass through the bell so that the hammer 3 can be located between the bells.

The bells 1 and 2 may be pressed from steel or brass sheet 0.030 inches thick and have a diameter of 2 inches. Bells of these dimensions and materials produce a tone similar to that of the conventional bell assembly. Different tones may be produced by altering these dimensions.

An alternative arrangement in which the bells can be overlapped to a greater extent is shown in Figures 3 and 4. In this arrangement the hammer 3 is located between the non-overlapping portions of the bells 1 and 2. The bell 1 is provided with three slots 20, 21 and 22 the slot 20 being provided to enable the arm 8 to pass through the wall of the bell 1 and the slots 21 and 22 being provided to enable the wall of bell 2 to pass through the wall of bell 1. It can be seen that with this arrangement only one of the bells need be slotted. It is necessary with the arrangement shown in Figures 3 and 4 to provide a hole in the base of bell 1 to allow the supporting pillar 7 of bell 2 to pass through bell 1 to the base 5. Alternative mounting arrangements could be used, for example a bracket attached to the base 5 could carry an arm which supports bell 2 or the bell 2 could be mounted on the body of a telephone instrument with the base 5 subsequently assembled into and mounted on the body so that the bells are located in the desired positions. Instead of providing the slot 20 in bell 1 the arm 8 could be cranked so that it passes over the wall of the bell 1 but the hammer 3 still strikes the walls of the bells. The arm 8 could further be cranked so that the motor 4 is not offset from the bells 1 and 2 thus providing an even more compact assembly.

CLAIMS:

1. A telephone bell assembly comprising two bells which are arranged to be struck alternately by a single hammer characterised in that one of the bells is inverted with respect to the other,
5 that the mouths of the bells overlap, and that the side wall of at least one of the bells is slotted to enable the bells to nest one within the other.

2. A telephone bell assembly as claimed in Claim 1, in which the hammer is located between the overlapping portions of the bells.
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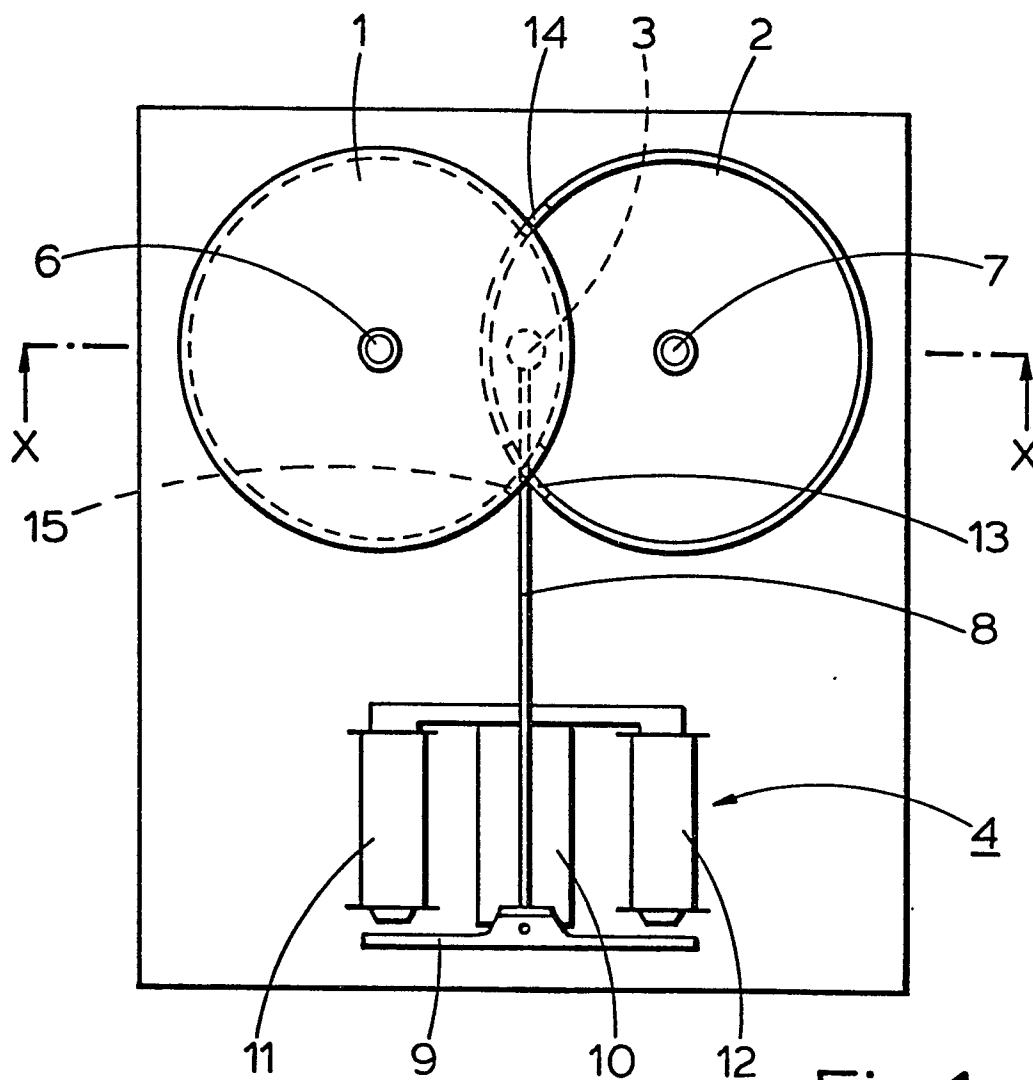


Fig.1

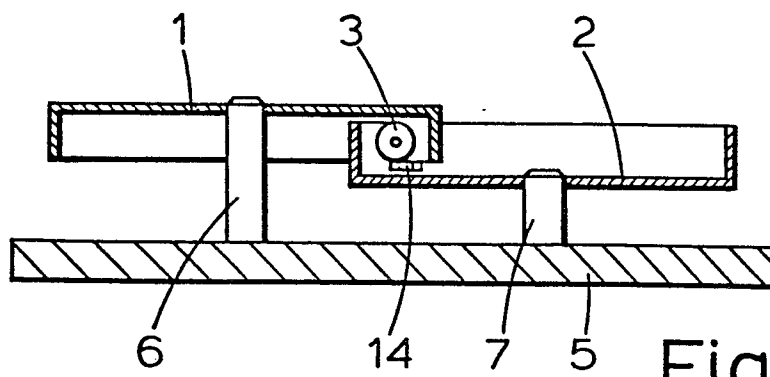


Fig.2

