

Dec. 31, 1940.

F. MASON

2,227,227

MUSICAL CHIME

Filed Dec. 1, 1938

3 Sheets-Sheet 1

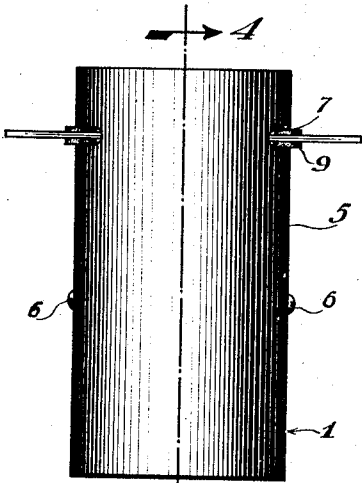


Fig. 1

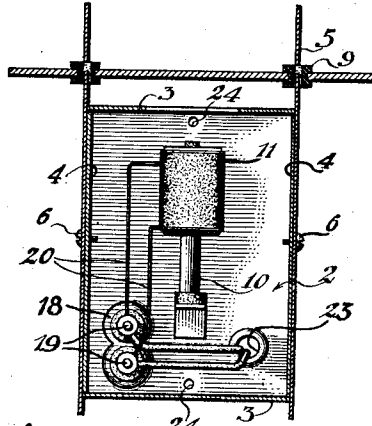


Fig. 3

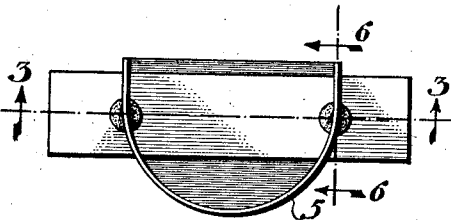


Fig. 2

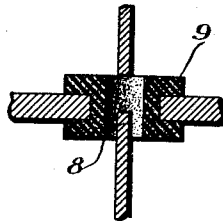


Fig. 12

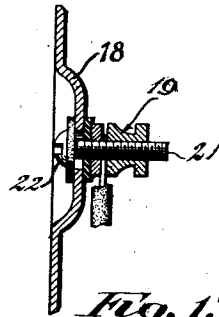


Fig. 13

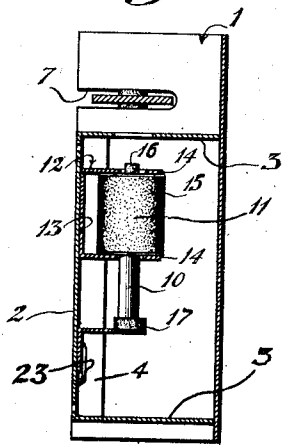


Fig. 4

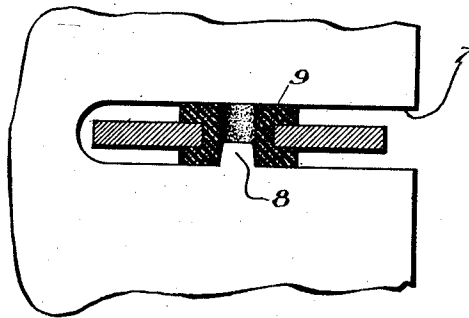
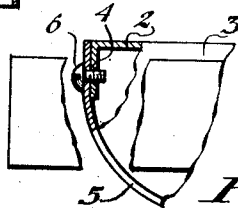


Fig. 6



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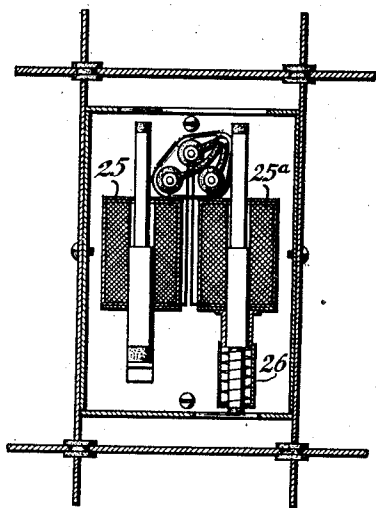


Fig. 7

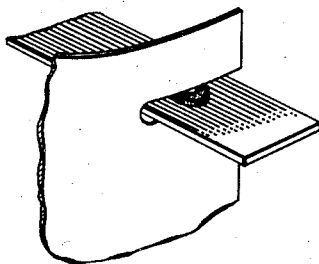


Fig. 8

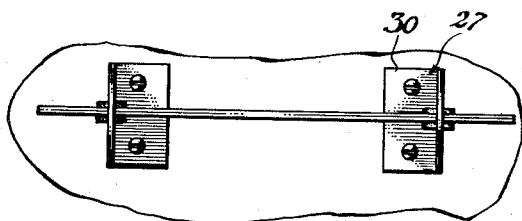


Fig. 9

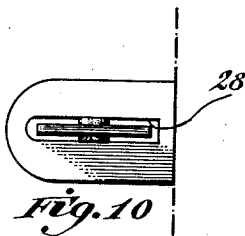


Fig. 10

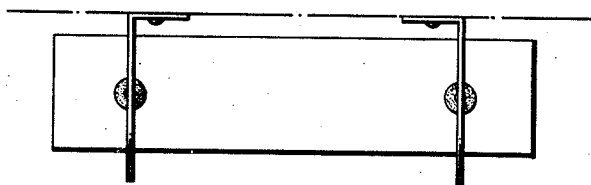


Fig. 11

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Fig. 14

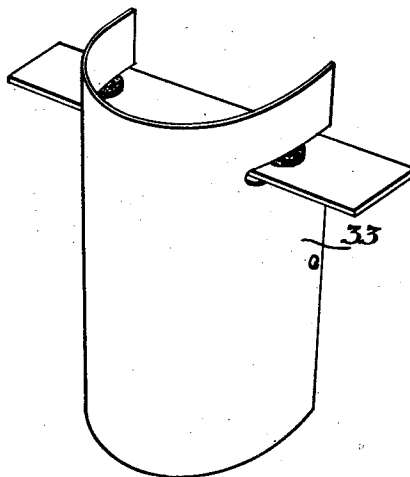
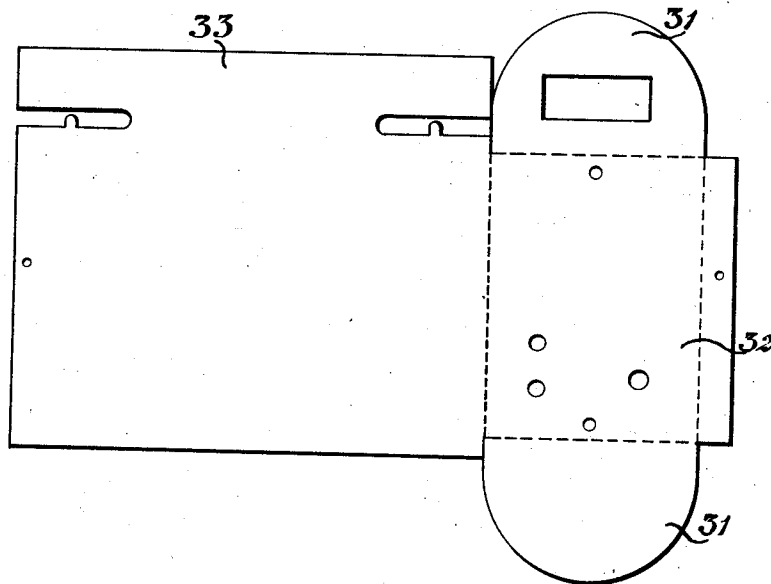


Fig. 15

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UNITED STATES PATENT OFFICE

2,227,227

MUSICAL CHIME

Fred Mason, Covington, Ky., assignor to Nutone Chimes Inc., New York, N. Y., a corporation of New York

Application December 1, 1938, Serial No. 243,405

3 Claims. (Cl. 177-7)

This invention relates to chime signals of a type in which a tone bar is associated with a resonator for amplification of the sound vibrations of the tone bar when it is struck.

A primary objective of the present invention has been to provide a simple and inexpensive device of this general type, suited particularly for use in the homes and offices for signalling purposes.

The invention contemplates a chime assembly in which the resonator box is formed of sheet metal, so as to constitute a flat sided base and a hood over the base with heads for the hood completing the box structure and being integral with it. Electro-magnetic striker means, for instance, a solenoid having a movable armature, is secured and housed within the box. The hood also preferably includes a portion extending beyond one of the heads. This portion is employed to constitute a support for a chime bar beyond one of the heads of the box, and the head adjacent the chime bar is apertured so that the box resonates and therefore amplifies the sound when the chime bar is vibrated.

In the devices of the past various contrivances have been used for supporting the tone bars. These bars are mounted to vibrate freely upon their nodal axes so that the vibrations are not dampened by the mounting structure. An objective of the present invention has been to provide a very simple mounting for the tone bar but one which also does not dampen or disturb the vibrations.

In the preferred construction, the hood is slotted for reception of the chime bar, and tangs traverse the slots for positioning the chime bar in the slot. Resilient mounting means are employed intermediate the hood and the chime bar so that the vibrations of the bar are not dampened by the mounting.

A preferred embodiment of the invention is illustrated in the accompanying drawings, in conjunction with several modifications.

In the drawings,

Figure 1 illustrates a face view of a chime unit of the present invention.

Figure 2 is a top plan view.

Figure 3 is a face sectional view taken on the line 3-3 of Figure 2.

Figure 4 is a side sectional view and is taken on the line 4-4 of Figure 1.

Figure 5 is an enlarged fragmentary sectional view showing the manner in which the hood is held in place.

Figure 6 is a side sectional view taken on line 6-6 of Figure 2, showing details of the chime bar support.

Figure 7 is a sectional view similar to Figure 3, and illustrates a chime unit employing two tone bars and individual striker means for sounding different signals.

Figure 8 is a fragmentary perspective view of the chime bar mounting shown in detail in Figure 6.

Figures 9, 10 and 11 are face, side and plan views, respectively, of a modification of the support structure in which bracket pieces are employed for the support means in place of the hood itself.

Figure 12 is an enlarged fragmentary sectional view showing the arrangement of the tangs of the tone bar mounting.

Figure 13 is an enlarged cross sectional view of one of the binding posts.

Figure 14 is a further modification showing the blank outline of a piece of metal suited for the complete formation of the resonator and chime bar support; and

Figure 15 is a perspective view showing the blank of Figure 14 bent and formed into a resonator unit.

In the drawings, the resonator box is indicated generally at 1. This box comprises a flat base piece 2 from which heads 3 are bent and laterally extended. In the preferred construction the resonator box is of a semi-circular form in order that the finished unit be of simple yet pleasing appearance. Other configurations may be employed instead of the semi-circular shape, if desired. Flanges 4 are struck from the base at the marginal edges intermediate the heads 3 and, next, a hood 5 is configured to complement the formation of the heads and extend over them, so that the terminal edges of the hood are flush with the base. The hood is fastened to the base by means of the screws 6 which extend through the hood into threaded engagement with the flanges 4, or by other suitable means, such as rivets or sheet metal tangs or clamps. When the latter are employed they preferably are struck from the hood to extend over the base.

The hood of the unit extends beyond the heads and opposing sides of it are slotted as at 7 for free reception of a tone bar, and tangs 8 traverse the slots. In the preferred construction the unit is of such width that it corresponds with the spacing of the nodal axes of the tone bar that

is to be employed. Therefore the chime bar is carried at its nodal axes by the hood supports. The volume of the resonator box is such that the box resonates when the tone bar is struck; in this manner the sound of the tone bar is amplified.

A grommet 9 of rubber or suitable yielding material is disposed within the aperture of the tone bar and the grommet is then disposed over the tang 8. It is preferable that the thickness of the grommet correspond substantially to the width of the slot and it is also preferable that the tang be extended only partially across the slot, so that the grommet can be compressed to slip over the tang and then be permitted to expand to prevent unintentional displacement or removal of the chime bar from its mounting. The construction, however, is adapted for use in several modified forms. For example, the tang may be sufficiently long to extend across the entire width of the slot, in which case the mounting is completed, first by bending the tang away from the slot, slipping the bar carrying the grommet over the tang and then bending the tang back into alignment. On the other hand, the grommet may extend around the chime bar at the nodal axes in place of through an aperture in it, and in this case a pair of tangs is employed for positioning the grommet in between them in the slot. The end of the slot may be employed as a stop for the one side of the grommet, while another tang may be employed at the entrance to the slot as a keeper. The advantage of the structure resides in its simplicity and in the fact that no means extraneous to the support are required for keeping the bar in position.

At a point adjacent the tone bar the head 3 of the resonator is apertured for admission of sound thereto and for passage of the armature 10 of the electro-magnetic striker unit 11. The striker unit preferably is comprised of a U-shaped bracket 12 having a base 13 mounted upon the base piece of the housing as, for instance, by spot welding. The arms 14 of the bracket extend from the base to carry an electro-magnetic winding 15 intermediate them. This winding is constructed in the usual manner and contains a suitable core which is bored for reception of the armature 10. The armature carries a striker head 16 for vibrating the bar while the opposite end of the armature is provided with a resilient stop 17 that normally rests upon an angle bracket 18 which is mounted upon the base. The solenoid and striker unit is of conventional construction and for that reason it is not described in detail.

The base 2 is embossed inwardly as at 18 to receive a pair of binding posts 19 to which leads 20 from the solenoid winding are connected. The binding posts are mounted upon screws 21 extending through apertures centrally of the embossings, so that the heads 22 of the screws do not extend beyond the plane of the base. This is shown in detailed view in Figure 13 and the construction is preferred so that a flat base is provided for convenient mounting of the unit upon a flat wall. It may here be noted that the unit as a whole is subject to considerable vibration when it is operated, and it is very desirable, if not requisite, that it be arranged for firm mounting in order that it will not be shaken loose during continued usage.

The base also is provided with an aperture 23 through which the lead wires from a suitable

transformer or switch are taken to the binding posts, for actuation of the device. A pair of apertures 24 are provided for the reception of mounting screws.

The structure that has been described is a very simple one in which the entire resonator unit is made up of only two pieces of sheet metal which are of very simple configuration. The hood constitutes the support for the tone bar and a pair of rubber grommets is all that is necessary for completing the assembly of the sound instrument.

Figure 7 illustrates a signal unit in which two solenoids and respective tone bars for them are employed for signalling from two points. In this construction the tone bars are located respectively adjacent the opposite end heads. A pair of solenoids is employed, one of these, 25, being single action and the other, 25c, having a compression spring 26 in engagement with its armature for double action. The opposite heads of the resonator contain apertures for passage of the armatures of the solenoids into striking engagement with the respective tone bars. When the solenoid 25 is energized its armature is moved to strike the upper tone bar and return to rest. Upon energization of the solenoid 25c, its armature strikes the upper bar, then drops when the solenoid is deenergized and hits the lower bar to sound a second signal. The spring 26 cushions the armature as it drops and also returns it to operative position after the second bar has been struck. Therefore, one signal is produced when the solenoid 25 is energized and two signals are sounded when the solenoid 25a is actuated.

Figure 8 shows a perspective view of the mounting structure in which the hood of the resonator chamber is employed for supporting the tone bar. Figures 9, 10 and 11 illustrate a modification in which separate brackets are used for the tone bar support. These brackets 27 are preferably of angle shape and contain slots 28 for reception of the vibratable chime. The bases 30 of the brackets are provided with apertures for the mounting of them upon a suitable base and the arrangement for mounting and keeping the chime bar in position is in accordance with the structure previously described.

In place of utilizing separable sheet metal sections for constituting the resonator box, it may, if desired, be formed of a single sheet of metal which is blanked and configured as shown in Figures 14 and 15. In this case the head portions 31 extend from opposite ends of the base portion 32 as previously described, and the hood portion 33 is extended from a marginal edge of the base for housing the heads by bending the hood around them to complete the resonator box.

This construction is particularly suited for the manufacture of chimes in which the resonator boxes are to be sealed against opening, so that the interior mechanism may not be tampered with. In both this modification and the structure previously described the sheet metal structure is very simple to form and configure at a minimum of cost, and yet the units themselves produce tones of which the clarity and purity are equal to, if not better than the more expensive instruments that heretofore have been available.

Having described my invention, I claim:

1. A chime device, comprising, a resonance box formed of a sheet metal base including a pair of heads bent laterally from it, a cover

forming a hood for the base and the heads, with the heads apertured for emission of sound, a pair of chime bars extending through the cover outside the box but adjacent the respective heads thereof, and striker means for vibrating the chime bars secured and housed within the box and carried by the base.

2. A chime device, comprising, a resonance box formed of sheet metal constituting a flat sided base and a hood over the base, heads integral with the box providing end closures therefor, with one of the heads being apertured for the emission of sound, a tone bar laterally traversing said box through apertures in the hood and resiliently attached thereto, and striker means secured and housed within the box for striking the tone bar.

3. In a chime device, a housing comprising integral sections bent from a sheet metal blank, which comprises a hood portion containing a pair of apertures adapted to receive a chime bar therebetween when the hood portion is bent to form a hood, a base portion extending from an edge of the hood portion adjacent one of said apertures, and head portions extending from opposite edges of said base portions, the heads being adapted to be bent from the base and the hood portion being adapted to be bent to form an enclosure with the heads and base, one of the head portions containing an aperture for the emission of sound from the housing which is thus constituted.

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