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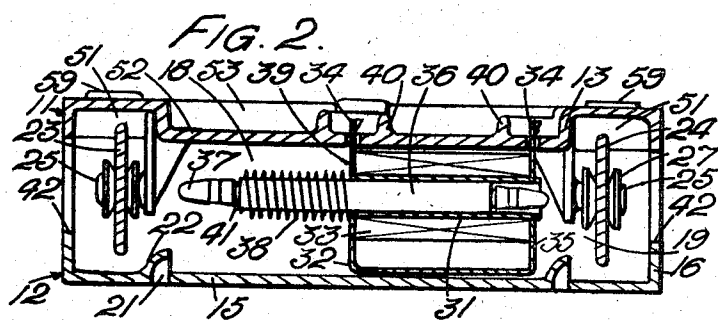
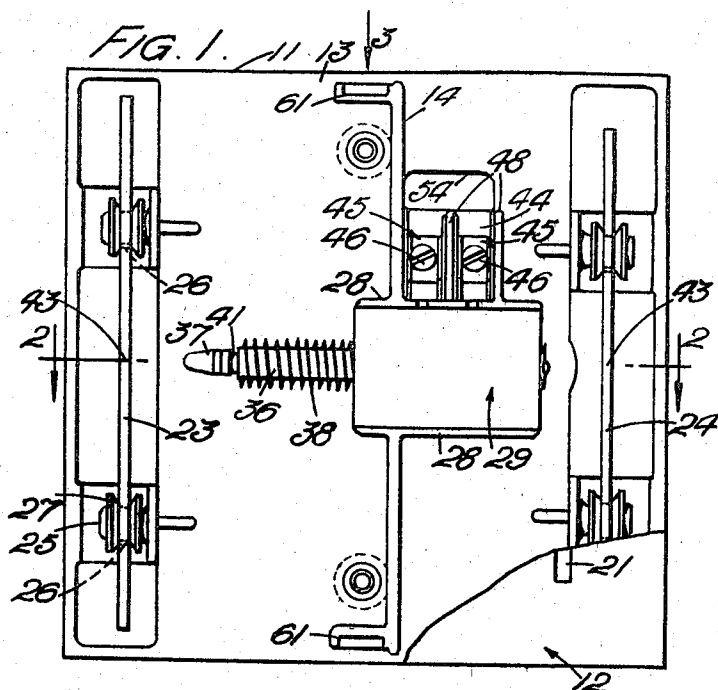
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ELECTRICAL SIGNALLING DEVICES

Filed June 22, 1965

2 Sheets-Sheet 1



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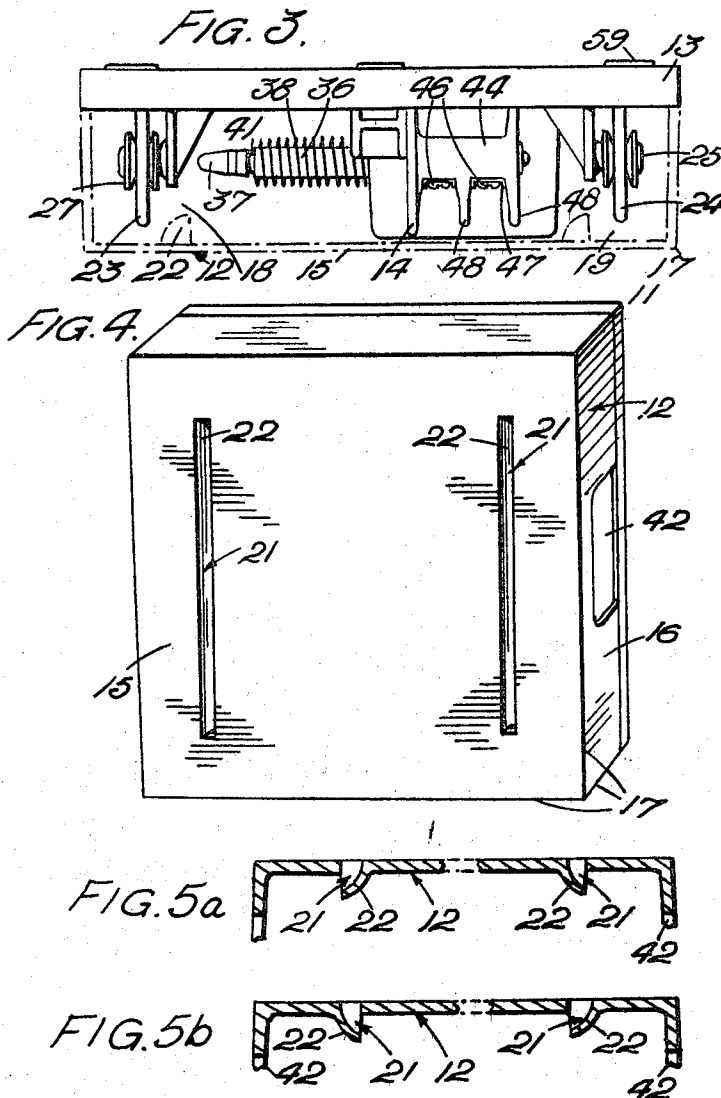
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ELECTRICAL SIGNALLING DEVICES

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1 Claim. (Cl. 116—169)

ABSTRACT OF THE DISCLOSURE

A door chime has tone bars struck when the chime is operated. Tuned resonating chambers for the tone bars are formed by the casing and provided in the cover are slots opening directly into the resonating chambers and extending parallel to the tone bars. The slots produce an effective outlet for sound and introduce a form of selective tuning usefully modifying the tonal quality of the output sound.

This invention relates to electrical signalling devices.

According to this invention, there is provided an electrical signalling device having a casing, which casing comprises a base, and a cover removably fitted on the base, a tone bar mounted on the casing, the cover forming with the base a resonating chamber tuned to the natural frequency of vibration of the tone bar, and striker means for striking the tone bar, the cover being formed with a narrow slot opening into the chamber which slot extends parallel to the length of the tone bar. The device preferably comprises a deflector formed on the cover adjacent said slot for deflecting sound waves from the chamber through the slot.

In one convenient arrangement, the cover forms with the base two resonating chambers, each tuned to the natural frequency of vibration of an associated tone bar, the cover being formed with two slots, one opening into each resonating chamber, each slot extending parallel to its associated tone bar. Two deflectors may be formed on the cover for deflecting sound waves from respective resonating chambers through respective slots.

The casing preferably provides a wall to form a dividing wall common to the two chambers, and this wall is preferably parallel to both tone bars.

The deflector preferably directs the opening of its slot towards the corresponding tone bar.

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

FIGURE 1 is a plan view of a door chime of the invention with the cover largely cut away,

FIGURE 2 is a section on the line 2—2 of FIGURE 1,

FIGURE 3 is a view in the direction of arrow 3 in FIGURE 1,

FIGURE 4 is a perspective view of the front and to one side of the chime of FIGURE 1, and

FIGURES 5a and 5b show two modifications of a detail of FIGURE 2.

Referring to the drawings, a door chime has a casing comprising a one piece base 11 moulded from black thermoplastic material and a cover 12 moulded from white thermoplastic material. The base 11 has a square bottom portion 13 and an upstanding dividing wall 14 parallel to one pair of edges of the bottom. The cover 12 has a square flat front face 15 and flat side faces 16 with sharp edges 17 between the faces 15, 16. The side faces 16 taper outwardly from the front face. The cover 12 fits on to the bottom portion 13 and fits closely against

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the dividing wall 14, so that the base 11 and cover 12 form two separate resonating chambers 18, 19 which are separated from each other by the dividing wall 14. Two equal narrow tuning slots 21 are formed in the front face 15 of the cover 12 parallel to and one on either side of the dividing wall 14 on the base 11. The slots 21 have a length of approximately 70% of the front face length. The cover 12 is moulded with a quarter cylindrical deflector 22 behind each slot 21, so that the interior of the slot faces towards or away from the dividing wall 14. The deflectors 22 can both face the same way, as shown in FIGURE 2 or one deflector can be reversed, for example as shown in FIGURE 5a or FIGURE 5b. In one arrangement both deflectors face towards the dividing wall 14 and in the other both face away from the dividing wall.

Two tone bars 23, 24 are mounted on lugs 25 formed on the bottom portion 13 and lie with their main planes parallel to the dividing wall 14. The tone bars 23, 24 are of different lengths, the longer tone bar 23 occupying the larger resonating chamber 18. In this example, the shorter bar 24 is tuned to F $\sharp$, 1479.98 c./s. and the longer bar 23 to D, 1174.66 c./s. Each bar has two mounting holes 26 formed in it tangential to the nodes 29 of the fundamental vibration. The lugs 25 are encircled by soft rubber grommets 27 (35° Shore hardness) which pass through the mounting holes 26. The lugs 25 are separated by a distance a little greater than the internodal distance. When the door chime is mounted in its intended position on a vertical surface, with the planes of the bottom square and of the dividing wall 14 vertical, each bar 23, 24 is suspended at its upper mounting hole 26 where the grommet 27 and mounting hole 26 are tangential. The lower mounting hole 26 encircles but does not normally touch the grommet 27 so that the lower mounting hole merely serves to stabilise the tone bar.

The dividing wall 14 is formed in two parts with a gap at the center. At the inner ends of the two parts short transverse walls 28 are formed and striker unit 29 fills the space between the walls 28. The striker unit 29 has a hard brass tube 31 mounted in a soft iron U-frame 32. A solenoid 33 is wound on the tube 31 within the U-frame 32. Lugs 34 on the ends of the arms 35 of the U-frame 32 pass through the bottom 13 and are twisted (see FIGURE 2) to fix the U-frame 32 in position between the transverse walls 28. The twisted lugs 34 are surrounded by raised walls 40 on the underside of the bottom 13. The U-frame 32 extends to the top of the dividing wall 14 to close the gap in the dividing wall. A soft iron plunger 36 slides in the brass tube 31 and has nylon end caps 37 for striking the tone bars 23, 24. The lugs 25 and the striker unit 29 are positioned so that the plunger 36 strikes the bars 23, 24 at their central antinodes of vibration 43. A helical return spring 38 acts between the end 34 of the U-frame 32 and a groove 41 near the end of the plunger nearer the longer tone bar 23 so that the plunger 36 has a rest position protruding from the brass tube 31 towards the longer tone bar 23, as shown in FIGURE 2.

The cover 12 is formed with wide and short sound apertures 42 opposite the central antinodes 43 of both tone bars 23, 24.

A terminal block 44 is formed in the smaller resonating chamber 19 adjacent the dividing wall 14 and a transverse wall 28 for two terminals 45 connected respectively to the ends of the solenoid 33. The terminals 45 are formed by self-tapping screws 46 screwed through self-retaining terminal strips 47 fitting in a groove 50 in the block over the ends of the solenoid 33. The edges of the strips 47 are turned upwards around the sides of the screw heads to aid retention of the connecting wires. The block 44

is formed with high fins 48 to prevent accidental touching of a terminal 45 or short circuiting of the two terminals 45.

The bottom 13 is formed as two shallow channels 51 running under the tone bars 23, 24 and a central portion 52 joining the top of the channel sides. This arrangement provides greater depth of the resonating chambers at the tone bars and a wiring channel 53 under the central portion 52 of the bottom. A hole 54 is provided in the central portion 52 adjacent the terminal block 44 for wires from the wiring channel 53 to reach the terminal block 44. The rim of the bottom has a knock-out at each end of the central portion 52 for entry of wiring. The bottom 13 is provided with levelling projections 59 on the underside of each end of both channels 51 to compensate for uneven fixing surfaces. At each end of the wall 14 the bottom 13 has a latch 61 which co-operates with a nose on the edge of the cover 12 to hold the cover in position.

The solenoid 33 is connected through a switch to a power supply, which may be for example a battery, a transformer transforming the mains supply to a low voltage or the mains supply itself. The terminal block fins 48 are an important safety feature when the mains supply is used.

On closing of the switch, the solenoid 33 is energized so that the plunger 36 is drawn into the tube 31. The momentum of the plunger carries it on to strike the shorter tone bar 24. The plunger 36 rebounds to the position in the tube 31 where the attraction of the solenoid 33 balances the force of the return spring 38. On release of the switch, the plunger 36 is returned by the spring 38 to strike the longer tone bar 23. The plunger 36 then rebounds to its rest position shown in FIGURE 2.

The closing and opening of the switch causes both tone bars 23, 24 to be struck in turn. The air in both resonating chambers 18, 19 is set in vibration and the vibrations are deflected by the deflectors 22 forwardly through the front face 15 of the cover 12 besides the vibrations escaping from the sound apertures 42 at the sides 16 of the cover 12.

In the arrangement of the deflectors 22 shown in FIGURE 2, both slots 21 appear substantially the same whatever the view point. In the alternative arrangements shown in FIGURE 5, the two slots have contrasting appearances when viewed from one side of the centre line of the chime. When viewed from one side of the centre line of the chime, the deflector 22 of one slot 21 can be seen, whereas the interior of the chamber can be seen through the other slot 21. The interior of the chamber normally appears

dark, whereas the deflector 22 is normally of light-coloured material, to give a contrasting appearance.

It has been found that the slots 21 in the cover 12 modify the sound output from the chime. It is believed that the slots 21 liberate or emphasize some frequencies in the signal from the tone bars. The deflectors 22 may be omitted if desired, but, when provided, bestow an attractive appearance to the chime and prevent the mechanism of the chime being clearly visible through the slots 21.

I claim:

1. An electrically operated sound signalling device including;

a base member having a flat bottom portion divided by an upstanding wall member,

a removable cover member having a top, which forms a front face of said signalling device and a peripheral flange depending from said top,

said flange being fitted tightly against the bottom portion of said base member and the top of said cover being fitted tightly against the upstanding wall member of said base member to form first and second tuned enclosures,

first and second tone bars fastened to said base member, respectively, within said first and second enclosures,

electrically operated striker means mounted intermediate said tone bars on the upstanding wall member of said base member for striking said tone bars, said cover member being formed with first and second narrow slots opening, respectively, into said first and second tuned enclosures,

each slot being oriented adjacent and parallel to a respective tone bar.

References Cited

UNITED STATES PATENTS

390,169	9/1888	Hudson	84—189
1,863,532	6/1932	Miller	340—392
2,014,444	9/1935	Miller	340—393
2,194,507	3/1940	Lord et al.	340—392
2,333,875	11/1943	McMullen	116—169
2,452,897	11/1948	Bossard	84—405
3,246,321	4/1966	Doggart	340—392
2,549,157	4/1951	Auth et al.	116—169
3,012,538	12/1961	Roseman	116—169

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