Nov. 2, 1948. G. L. BOSSARD 2,452,897

MOUNTING FOR ELECTRIC CHIME SIGNAL DEVICES

Filed Nov. 22, 1946 2 Sheets-Sheet 1

FIG. 1

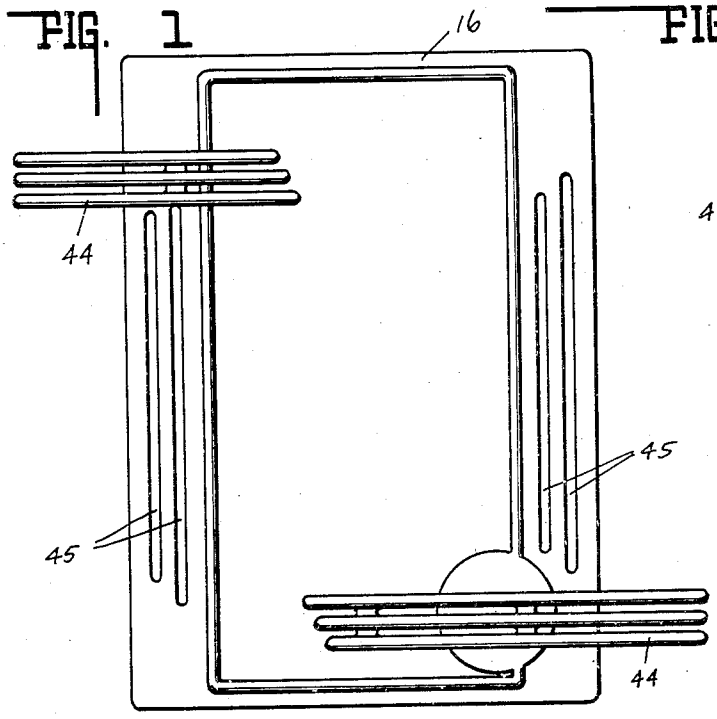


FIG. 4

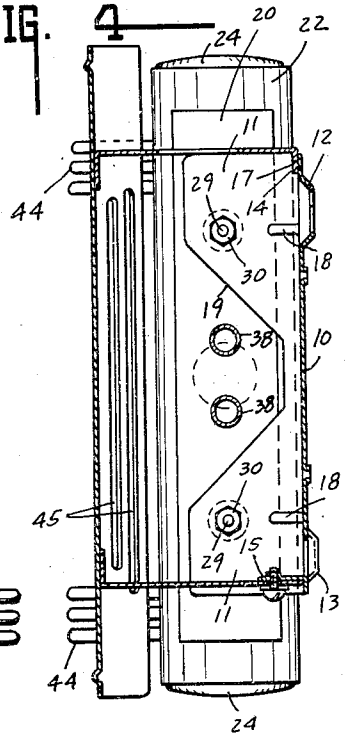
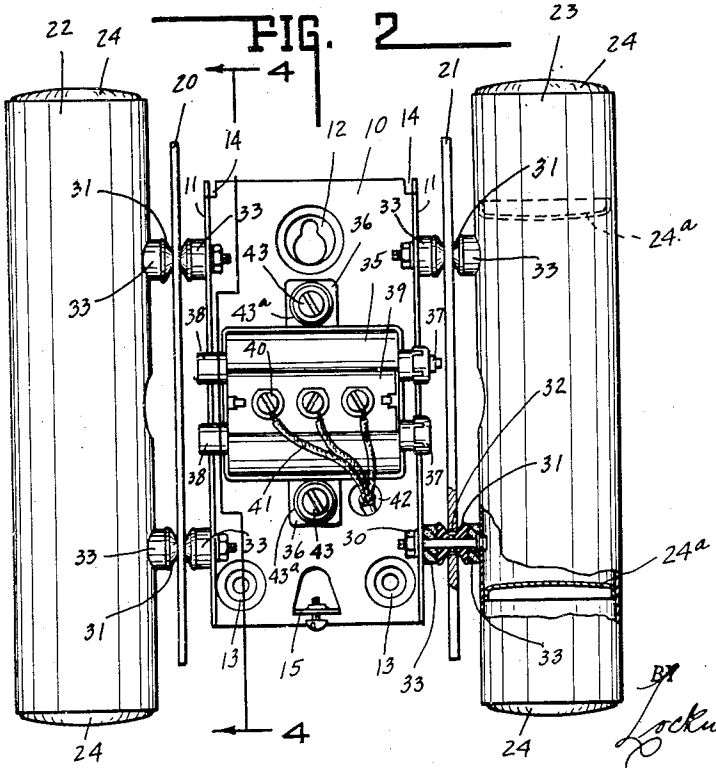


FIG. 2



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FIG. 3

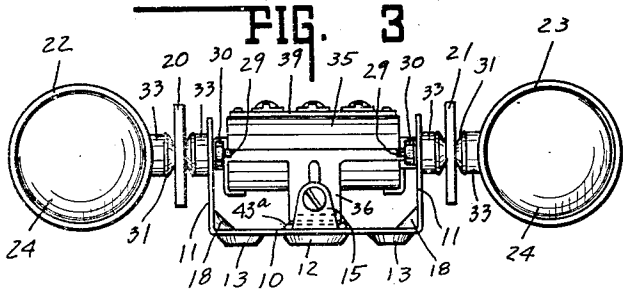


FIG. 6

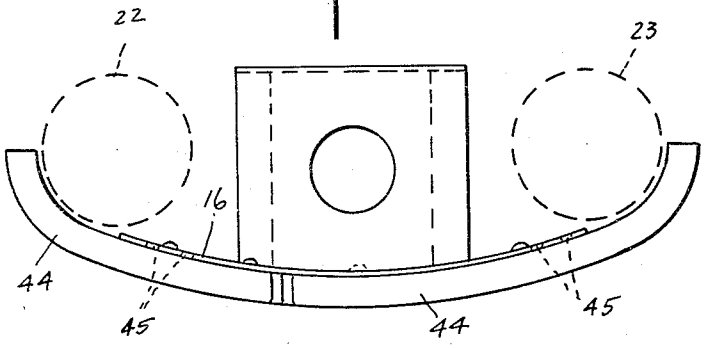
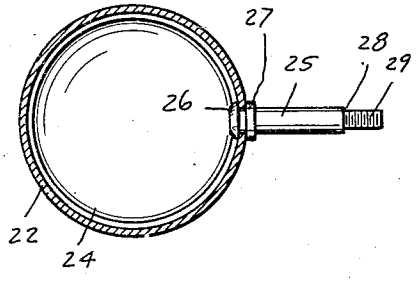


FIG. 5



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MOUNTING FOR ELECTRIC CHIME SIGNAL DEVICES

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4 Claims. (Cl. 177—7)

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This invention relates to a signal device, particularly an electromagnetic actuated chime wherein electromagnetically controlled strikers are positioned for striking oppositely mounted tonal bars or tubes, reference being made to my Letters Patent No. 2,307,104, granted January 5, 1943, entitled "Signaling device."

It is the object of the invention to improve upon signaling devices of this character, particularly in respect to the constructional arrangement and mounting of the several parts such as to facilitate assembly and mounting and accordingly effect economy in production.

One feature of the invention resides in the supporting frame for the several units such as to minimize dampening effect of the tonal vibrations and give free play to the sound waves, eliminating false resonating and compression between the supporting structure and tone bars. This is accomplished by providing a channel type of supporting frame having a back plate from which forwardly extending side walls or supporting webs extend, but wherein said webs are cut away intermediate their ends to eliminate the creation thereby of objectionable resonator chambers opposing the true resonator chambers in the form of tubes, and thereby causing a dampening effect of the tonal vibrations. By providing the cut away portions, free play is given to the sound waves, eliminating such false resonating and any compression of the sound waves between the webs and tone bars supported thereby.

Another feature of the invention resides in the structure of the supporting frame to provide a simple form of three point suspension upon a supporting wall or the like such as to space the back plate of the frame therefrom irrespective of any irregularities in the surface thereof, and wherein said three point suspension comprises countersunk securing devices also acting to provide for reinforcement of the back plate; the spacing from the wall, or the like by the three point suspension providing ample space for the wiring connections such as to prevent interference with the tonal bars and strikers.

A further feature of the invention resides in the form and structure of the supporting frame wherein it is provided with reinforcing ribs to prevent buckling of the back plate or webs, or misalignment of the parts assembled and carried thereby due to the long leverage exerted thereon by the tonal bars and resonator chambers. This structure serves to reinforce the side walls or webs and prevent their distortion relative to the back plate. Consequently, the solenoid actuated striker will at all times strike the tonal bar correctly, obtaining maximum tone volume. The top and bottom cover brackets, as well as the front cover plate are provided with openings for free passage of sound waves. Such arrangement eliminates interference with the free flow of sound waves past the actuating unit, and also effectively prevents any wiring from touching the tonal bars and thereby dampen and alter their tonal characteristics, thereby acting as a wire guard of simple construction.

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The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

Fig. 1 is a front elevation of the signal device.

Fig. 2 is a front elevation of the operative structure with the front cover removed.

Fig. 3 is a bottom plan view of the structure shown in Fig. 2.

Fig. 4 is a section taken on the line 4—4 of Fig. 2 showing the cover plate mounted thereon.

Fig. 5 is a cross section through one of the resonator tubes showing the mounting stud thereon.

Fig. 6 is a top plan view of the signal device cover.

In the drawings there is illustrated a signal device in the form of electromagnetic actuated chimes wherein there is provided a supporting frame including a back plate 10 and forwardly extending webs forming the side walls 11. The back plate is provided with triangularly spaced countersunk openings, one at the top thereof indicated at 12 and two at the bottom indicated at 13 for receiving suitable securing screws for fastening the frame to a support such as a wall or the like. The triangularly spaced countersunk portions provide a three point suspension such as to accommodate the frame to an irregular surface in spaced relation thereto for providing wiring space.

The back plate is notched at its upper corners as indicated at 14, and at its bottom is provided with a bracket 15 carrying a locking screw for removably securing a cover plate 16 thereto, said cover plate being provided with fingers 17 to interlock with the notches 14 and a recess in its lower end for locking engagement with the bracket 15.

The webs 11, being angularly disposed to the back plate are reinforced near their lower and upper ends by the struts 18 formed therein which permits them to be cut away at their central portion without materially decreasing their structural strength. Each of the webs 11 is formed

with a V-shaped cut away portion 19 for elimination of any obstruction to the free play of the sound waves and thereby avoiding false resonating and tone compression. Said cut away portions 19 are opposite and coextensive with the more effective tonal area of the tonal bars 20, 21 carried thereby.

Said tonal bars are each associated with a spaced resonator tube 22, 23, respectively. Each of said tubes is sealed at its opposite ends by the closure caps 24. They each are provided with a pair of mounting studs 25, so arranged that they support the tubes adjacent each end thereof and in mathematical relation to their corresponding support of the tonal bars, such as centrally of the upper and lower halves thereof, respectively. Said studs are riveted to their respective tubes so as to be rigidly secured thereon through the usual clamping action of the riveted head 26 and opposed shoulder 27. At a prescribed distance from the tube each of said studs is formed with an end thrust bearing shoulder 28 and a threaded end portion 29 for receiving a locking nut 30.

Each stud carries a rubber grommet 31 mounted within an aperture 32 in the tonal bars 20, 21 in knife-edge engagement with the peripheral edges thereof. Carried by the stud between the grommet and resonator tube on the one side and the grommet and the web 11 on the other side there are sponge rubber spacing washers 33. Thus, the resonator tubes are each supported in spaced relation on opposite sides of the webs 11 and the respective tonal bars 20, 21 are mounted in association therewith and in spaced relation therebetween, having a knife-edge support on the stud mounted grommets in a manner to minimize any dampening of their tonal vibration.

Intermediate and centrally of said tonal bars there is an electromagnetic actuating unit in the form of a housing 35 formed with outwardly extending bracket supports 36 and enclosing the actuating solenoids for electromagnetic operation of the striking plungers 37 carried by the plunger tubes 38 supported within the solenoids, as shown in my application, Serial Number 690,874, filed August 16, 1946, for "Electromagnetic device." Said unit carries a terminal plate 39 having terminals 40 with which the wiring 41 is connected leading through an aperture 42 in the back plate 10 to a suitable source of current. The bracket supports 36 are secured to the back plate by the screws 43 with interposed rubber grommets 43a which serve to prevent operative noises from reaching the supporting wall.

The above described structure is such that upon the upper solenoid in the housing 35 being energized its double acting striker 37 will strike the bar 20, and upon it being deenergized the opposite end thereof will be driven from the tube 38 to strike the bar 21. The lower solenoid is single acting so that when energized the striker 37 contained within its tube 38 will strike the bar 20 and upon being deenergized it will be returned to its starting position so there will be only the one tone. The bars 20, 21 are, therefore, struck in their central area with the major vibration thereof between the supporting grommets 31 and directly opposite the cut away portions 19 of the webs 11 so that the sound waves generated thereby are unobstructed and may impact directly with the resonator tube associated with the tone bar.

Whereas the tonal bars herein shown are of different thickness by means of which different tones are obtained, it is obvious that they may be of the same thickness, but of different lengths. However, it is found that bars of equal length but of different thickness have manufacturing advantages in respect to time and die cost over bars of different lengths. Inasmuch as the bars 20 and 21 are of different tonal characteristics, their respective resonator tubes 22, 23 must have corresponding tonal characteristics. Thus, the tube 23, being associated with the thicker tone bar 21, has a correspondingly shorter chamber. This is effected by dividing it with internal end walls 24a. Otherwise, the resonator tube 23 without such internal end walls 24a would be of less length externally than is herein shown.

The cover plate 16 is in the form of an arcuate shell having outwardly and inwardly curved ribs 44 partially embracing the tubes 22, 23 and provided with a series of elongated slots 45 extending vertically on each side thereof opposite the tonal bars for free passage of the sound waves. Also, the top and bottom portions of said cover are only coextensive in width with the width of the back plate 10 so that the space in which the tonal bars vibrate is open and unobstructed by the cover both at the bottom and top thereof. While one form and design of cover plate 16 is herein shown, said cover plate may be of different design or structure, as for instance comprising an enclosing housing, without departing from the invention.

While the forms of the device herein shown and described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to such precise forms thereof, and that changes may be made therein without departing from the scope of the invention as defined in the appended claims.

The invention claimed is:

1. A signal device including a back plate, webs extending forwardly from each side of said plate at right angles thereto, said webs being cut away throughout the central portions thereof, resonator tubes mounted on said webs in lateral spaced and parallel relation thereto, tone bars supported by said webs between and in spaced relation to said tubes, respectively, and an electromagnetic actuating unit secured to said back plate having laterally operating strikers for selectively striking said tone bars substantially centrally thereof to set up sound waves opposite the cut away portion of said webs, whereby said webs will not interfere with said sound waves and the tonal quality and volume of said bars and resonator tubes.

2. A signal device including a supporting bracket having side walls adjacent each end thereof cut away centrally for providing an open space throughout a substantial central portion thereof, an electromagnetic actuating unit secured centrally of said bracket having strikers operable through the open space of said walls, a tone bar and associated resonator tube supported by each of said walls opposite the open portions thereof positioned to be selectively struck by said strikers, and a three point suspension and spacing structure formed on said bracket comprising outwardly formed apertured bosses, one of said bosses being positioned centrally of said side walls adjacent one end thereof and a pair of said bosses being positioned adjacent the other end thereof in spaced relation.

3. A signal device including a back plate having forwardly extending side walls cut away a substantial distance throughout the central portion thereof, tone bars supported in parallel

spaced relation to said side walls, an electromagnetic actuating unit secured to said back plate between the cut away portions of said walls having strikers for selective striking engagement with the respective tone bars, resonator tubes supported with said tone bars in parallel spaced relation thereto and on the opposite side thereof from said walls, respectively, and a cover plate removably mounted upon said back plate embracing said tone bars and extending over said tubes with elongated apertures therein opposite said tubes, said cover plate having rearwardly extending supporting webs for interlocking engagement with the upper and lower ends of said back plate and within the space between said tone bars and tubes to avoid interference with the free passage of sound waves therefrom.

4. A signal device including a back plate having forwardly extending side walls cut away at the center through a substantial portion of the length thereof, an electromagnetic actuating unit secured to said back plate having laterally actuable strikers operable through the cut away portion of said walls, a tone bar supported in parallel spaced relation on each side of said walls

exteriorly thereof positioned to be struck substantially centrally thereof by said strikers, bosses formed on said back plate to extend rearwardly therefrom and apertured to receive mounting screws for securing and supporting said plate in spaced relation to the mounting therefor, and a terminal plate secured to the front of said unit for receiving electric wire connections extending through an aperture in said back plate from the space provided by said bosses, said side walls acting to protect said tone bars from contact by said wires.

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REFERENCES CITED

The following references are of record in the file of this patent:

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2,307,104	Bossard	Oct. 8, 1935