

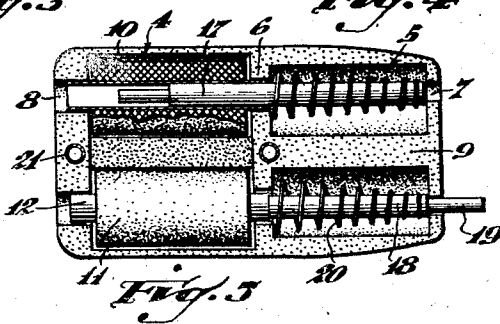
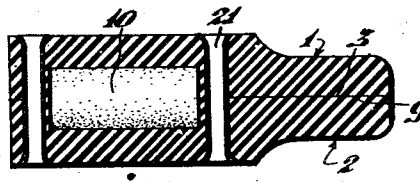
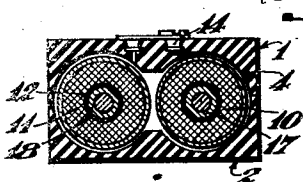
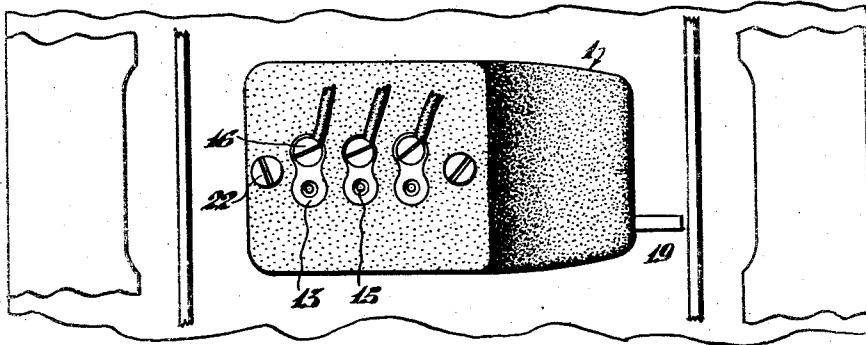
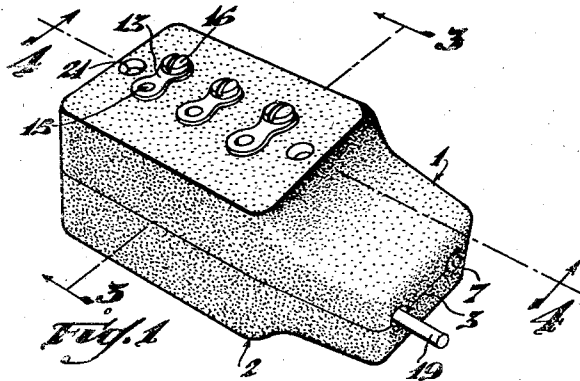
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C. E. WALTMAN

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OWER UNIT FOR ELECTRIC CHIMES

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INVENTOR.
Chauncey E. Waltman
BY Wood, Arcey, Kerson & Evans
Attorneys.

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POWER UNIT FOR ELECTRIC CHIMES

Chauncey E. Waltman, Chicago, Ill., assignor to
NuTone, Incorporated, New York, N. Y., a cor-
poration of New York

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This invention relates to an electric power actuating unit for a chime signal. This unit is especially adapted to be used in conjunction with chime signals of the type wherein a chime bar is placed adjacent a resonator chamber which is responsive to vibrations of the bar, and the invention is directed particularly to a striker unit subject to electrical control from a push button or the like for thrusting a striker against the chime bar to cause it to vibrate, whereby a signal is emitted from the resonator.

The principal objective of the invention has been to provide a self-contained unit which is small and compact, embodying one or more strikers and arranged to be placed adjacent a chime bar or in-between a pair of them so that one or both of the strikers may hit first one chime bar, then rebound to hit the other.

The purpose of this unit, as distinguished from the conventional coil and bracket assembly of the type used in the past, has been to rigidify the electrical elements in order that they do not become disassembled or inoperative after prolonged usage. Each time the chime is operated the striker unit is subjected to considerable vibration and, after a period of time, its parts and the mounting of it shake loose, whereupon the signal either fails to operate properly or chattering tones are sounded.

In the present construction one or more solenoid coils are encased snugly, preferably under slight compression, in a plastic moulded housing and this housing as a unit is fastened to the chime apparatus. The housing contains terminals to which leads taken from the solenoid coils are fastened in concealed relationship and the housing also preferably embodies provisions for containing springs through which the strikers are retracted after having been ejected through energization of the solenoid coils. If, after prolonged usage, this power unit fails it may be removed bodily from the chime and replaced by another like it, with the least inconvenience in installation and the least likelihood of damaging the other apparatus of the chime structure.

A preferred embodiment of the power units of the present invention is illustrated in the drawing in which:

Figure 1 is a perspective view of the power unit.

Figure 2 is a fragmentary elevation showing the power unit mounted intermediate two chime bars which, in turn, are located adjacent two resonator chambers.

Figure 3 is a cross sectional view taken on the line 3-3 of Figure 1.

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

Figure 5 is a plan view showing one portion of the casing of the power unit removed to expose to view the actuating apparatus seated in the other section.

In the preferred structure shown in the drawing, the power unit includes a plastic moulded casing made up of two separable sections, which, as indicated generally at 1 and 2, are substantially alike and fit together along a mating line 3. Each casing unit contains at least one pair of concavities, indicated generally at 4 and 5, in substantial longitudinal alignment, the two cavities being separated by a laterally extending bridge wall 6. Entrance openings 7 and 8 enter the cavities through the respective end walls of the casing while the bridge wall 6 also is cut away, in longitudinal alignment with recesses 7 and 8 to form a seat.

The structure shown in the drawing is a power unit embodying two actuators and therefore the cavity structure just recited is repeated at the opposite side of a longitudinal dividing portion 9, whereby two electrical solenoids 10 and 11 may be accommodated, one in a cavity of each pair. This power unit therefore is suitable for use in a so-called two-tone chime. Each solenoid has a striker but the striker of one of them is arranged to be ejected in one direction to hit one chime bar, then rebound in an opposite direction and to hit the other bar before coming to rest, while the striker of the other unit is ejected in one direction to hit the one bar but is not permitted to rebound. In this manner the single note sounded from a push button at one point may be differentiated from the double note sounded from a push button at another point. In place of this double striker unit the invention may be utilized in structures in which single or multiple strikers are employed.

The electrical solenoids comprise core members 12 which are hollow and which preferably are sufficiently long so that the endwise portions of them may be seated respectively in the recess provided at their ends, e. g. the entrance opening 8 and the bridge wall recess 6. Wire is wound around these cores in the usual manner for a distance extending along the length of the core substantially equal to the length of the cavity in which the coil is to be fitted, whereby the walls delineating the ends of the cavity support the wire at the ends of the coil. A suitable tape wrapping may be put around the outside of the coil to facilitate the handling of it during man-

ufacture, but it is preferable that the dimensions of the openings in the housing be such that when the two housing portions 1 and 2 are placed together the coils just fit snugly in the recesses provided for them. In this manner the coils are held securely and are prevented from becoming shaken loose during usage of the apparatus.

At an exterior surface of the housing terminals 13 are provided. These may be moulded in place and they may be of the usual type having bosses 14 which fit down into the housing, with apertures 15 extending through the bosses, whereby the terminals from the coils may be passed up through the apertures 15, then fastened in place by means of a drop of solder. The terminals also contain the usual screw fasteners 16 through which electrical connections to them may be made.

Striker elements 17 and 18, made of suitable magnetically responsive material, are slidably mounted in the hollow cores of the solenoids 10 and 11. Each striker is provided with a striking tip 19 at one or both of its ends, depending upon whether it is to hit a chime bar at one end or both.

Compression springs 20, surrounding the striker members, are housed in the cavities 5, one end of the spring being buttressed against the bridge wall 6 while the other end of the spring grips the striker.

The two components of the housing which meet one another along the parting line 3 are joined to one another through hollow rivets 21, which are headed in recesses adjacent the upper and lower faces of the housing members respectively so as not to protrude therefrom. These rivets preferably pass through the center web 9 and, being hollow, permit screws 22 to be passed longitudinally through them for attachment of the unit to a wall or surface of the chime structure.

The housing shown in the drawing as previously indicated preferably is made up of mating sections which are substantially the same as one another so that the dividing line 3 occurs substantially at the mid portion between the opposite outer faces. It is also to be understood that the invention contemplates a structure in which the housing components are symmetrical. Inasmuch as the cavities 5 in which the striker springs are located are of somewhat reduced size this portion of the unit is reduced in thickness to conserve in weight and cost of the plastic moulding material.

The power unit as a whole, as may be seen, is a compact rigid structure in which all of the parts are thoroughly supported and secured. The unit is of substantial mass and, by its inertia, resists and dampens vibrations which are incidental to the actuation of the strikers. The entire unit is enclosed and the tolerances between the strikers and the solenoid cores may be such that a smooth striking action is obtained without danger that the plungers will become stuck after a short period of operation through the entrance of dirt or grease. Being of a non-metallic material the plastic moulded casing serves additionally to dampen the vibrations tending to cause the coil to move in its support and also to absorb vibrations which would otherwise be transmitted to the metal parts of the chime structure.

If, after a period of operation, this unit of the apparatus becomes out of repair it may be removed simply by dismantling the electric connections and removing the fastening screws 22

whereupon a similar unit may be reinstalled without demounting the chime from the wall.

Having described my invention, I claim:

1. An electro-magnetic power unit for an electric chime, comprising a moulded plastic casing comprised of separable sections having cavities therein, constituting a recess extending longitudinally of the casing, a coil having a hollow core member seated within said recess, a striker member slidably within said core member, terminal members supported on said casing at a face thereof and being in electrical interconnection with the terminals of said coil, and means for holding said separable sections together to support the coil and striker therewithin.

2. A power unit for actuating an electric chime, comprising a casing having a circular opening therein and having bores of reduced diameter communicating with said circular opening at the opposite ends thereof, a solenoid coil disposed within said circular opening and having a hollow core member seated, at its endwise portions, within said bores of reduced diameter, and an electric striker slidably disposed within said hollow core member.

3. A power unit for actuating an electric chime, comprising a casing consisting of mating sections having cavities delineating a circular opening and bores of reduced diameter communicating with said circular opening at the opposite ends thereof, a solenoid coil disposed within said circular opening and having a hollow core member seated, at its endwise portions, within said bores of reduced diameter, and an electric striker slidably disposed within said hollow core member.

4. An electro-magnetic striker unit for an electric chime, comprising a moulded plastic housing having an elongated cavity therein, a wall extending transversely across said cavity and said housing having bores entering said circular opening from the endwise portions of said housing and extending through said wall, a solenoid coil disposed in the cavity at the one side of said wall and having a hollow core member seated in the opening through said wall and in the opening at one end of said housing, a striker disposed within said core member, and a spring member disposed in said cavity at the other side of said wall and around said striker for returning the striker after it has been propelled by said coil.

5. A power unit for actuating an electric chime, comprising a housing having an elongated cavity therein, a solenoid coil fitted snugly within said cavity and supported against vibration and disassembly by said housing at one end of said opening, a wall portion extending across said opening adjacent one end of said solenoid, a striker slidably mounted in said solenoid coil and having a portion extending therefrom into the remainder of said cavity at the opposite side of said wall, and a spring for retracting said striker after actuation by said solenoid, having one end supported against said wall portion and having the other end attached to said striker.

6. A power unit for actuating an electric chime, comprising a pair of solenoid coils arranged in spaced substantially parallel relationship, striker members respectively slidably carried by said coils and a sectional plastic moulded housing of block-like external form surrounding said solenoid coils and extending therebeyond at one end thereof, the said housing embracing said coils snugly and the extended portion thereof being hollow in alignment with said coils, and spring

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means, in alignment with said coils, respectively contained within said extended portion, the said spring means being attached respectively to said striker members for retraction thereof after the striker members have been actuated by said solenoid coils.

7. A power unit for actuating an electric chime, comprising, a solenoid core member, a hollow casing having its interior configured to provide seats for the endwise portions of said solenoid core member, a solenoid coil surrounding said core member and having its external periphery engaged by inner wall surfaces of said housing for support thereof and a magnetically responsive striker slidably carried within said core member for actuation by said solenoid coil.

8. A power unit for actuating an electric chime, comprising a hollow moulded casing having a portion at its interior extending longitudinally thereof to divide the casing into longitudinal compartments, and each longitudinal compartment having a wall portion extending transversely thereof, dividing the said longitudinal compartment into pairs of aligned cavities, a solenoid

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noid coil seated and sustained in one cavity of each pair, an electromagnetic striker slidably carried by each of said solenoid coils and having a portion thereof extending into the other cavity of the pair, and spring members housed within the other cavity of each pair, the said spring members surrounding said strikers and having one end attached thereto while the opposite ends are supported respectively against the faces of said transverse walls.

9. A power unit for actuating an electric chime, comprising a plastic moulded casing consisting of similarly configured plastic moulded sections fitting one against the other to form a housing, delineating cavities for snugly embracing a solenoid coil installed therein, a solenoid coil mounted in said cavities, said moulded sections having transverse bores therein in alignment with one another, and hollow rivets extending through said transverse openings, the said rivets being headed at their opposite ends to hold said sections in assembly.

CHAUNCEY E. WALTMAN.