ELECTRICALLY OPERATED BELL RINGING DECORATIVE DEVICE

John Petry, Bayside, N. Y., assignor to Raylite Electric Corp., Bronx, N. Y., a corporation of New York

Application July 1, 1950, Serial No. 171,610

7 Claims. (Cl. 340—398)

This invention relates to electrically operated animated bell ringing devices, and more particularly is directed to Christmas tree or other decorative display ornament including a bell type of sound producing means operated electrically through a portable wiring power supply such as may be used in trimming Christmas trees and for other decorative display or show purposes.

Among the objects of the invention is to generally improve animated devices of the character described comprising few and simple parts which are readily assembled to form neat and appealing decorative ornaments, which shall be reliable in operation, which shall smoothly function, which shall be rugged in construction and capable of withstanding rough handling, which shall be cheap to manufacture yet attractive in appearance, and which shall be efficient and practical to a high degree in use.

Other objects of the invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists of features of construction, combination of elements and arrangements of parts which will be exemplified in the construction hereinafter disclosed, the scope of the application of which will be indicated in the claims following.

In the accompanying drawing in which one embodiment of the invention is shown,

Figs. 1, 2 and 3 are front elevational, side elevational and top plan views, respectively, of an improved decorative electrically operated bell-ringing device suitable as an animated Santa Claus figure Christmas tree ornament constructed to embody the invention, Fig. 2 being partly broken away to expose the moving parts.

Fig. 4 is an enlarged cross-sectional view taken on line 4—4 in Fig. 1 showing the interior of said improved device with the mercury switch therein in a closed circuit position, the open circuit position of said switch being shown in dot and dash lines.

Figs. 5 and 6 are enlarged cross-sectional views taken on lines 5—5 and 6—6 in Fig. 4, respectively, showing a detail assembly and movable mounting of the switch parts and connections, and

Fig. 7 is a diagrammatic view of one of the improved devices shown in Figs. 1 to 3 connected in a portable plug-in electric power circuit.

Refferring in detail to the drawing 10 denotes an electrically operated decorative bell ringing device constructed to embody the invention, and in the form shown incorporates an animated Santa Claus figure adapted to be articulated with the ringing operation to form a Christmas tree ornament and for other show or decorative purposes.

As seen from Figs. 1 to 6, said device 10 may be constructed to have a horizontally extending base frame member 12a from opposite ends of which angular disposed channel-frame struts 16b projected therefrom for rigidity supporting a casing 11 in which the electrically operated mechanism indicated generally at 12 is housed at a spaced distance above the frame base 16a on which animated figure 13 upwards all in the manner hereinafter described.

Device 10 may have said mechanism 12 connected to a suitable electric supply power source in any well understood manner, and as here indicated in Fig. 7, has portable extension wiring 14 terminating in a conventional tap plug 14a at ends 14b thereof and the other ends 14c of wiring 14 connecting with series circuit therewith a tiltable mercury type switch 12a and solenoid magnet coil 12b which are both housed in casing 11, as is clear from Figs. 4 to 7.

Casing 11 may be constructed to have an upper section compartment 11u of circular cross-sectional shape formed with an outer wall which for strength and economy of production may be made of a sheet metal shell 11b having suitable insulating liner 11c extending along inner surface of shell 11b, a mid-portion of said shell 11b and liner 11c being pierced by an insulating thimble or bushing 15 through which wiring ends 14c pass into casing compartment 11u for connecting with switch 12a housed therein as is clear from Figs. 4—7.

As seen in Figs. 1, 3, 4, 5 and 6 wiring ends 14c after passing through bushing 15 from upper compartment 11u may be passed along the adjacent channel section strut 10b, and hence through bushing 15 provided in said strut 10b adjacent base 10a so that the wiring in and about device 10 is practically concealed.

Casing shell 11b may have an outwardly bulged or U-shaped portion 11d to provide clearance for closed end 12c of an elongated cylindrical shaped capsule 12d of switch 12a. Said outwardly bulged or U-shaped portion 11d may be provided with spaced slide seams 11e that may be removable and clamp with edges 11f of said casing shell 11b as shown in Fig. 5.

Extreme inward edge borders 11g of said portion 11d beyond seams 11e extend into said casing upper compartment 11u to provide supports for insulating block bearings 11u in which oppositely disposed outwardly extending stub shafts 12a from said switch capsule 12d are journaled for trunnioning said capsule 12d adjacent said closed end 12c thereof. The other end 12e of said capsule 12d opposite said closed end 12c may be provided with a tight sealed closure 12f of insulating cappling material having a central metallic connector terminal 12g provided with a head portion 12h positioned within capsule 12d and insulated therefrom. Free or tail end of terminal 12g extends beyond said capping seal 12f, and through a slack coil end 14d may be joined in circuit with one end of wiring jumper 14e connecting with solenoid magnet coil 12b.

Capsule 12d which may be formed of metal may have a terminal connector 12f projecting therefrom at a spaced distance from said free end of terminal 12g, said connector 12f being joined in circuit with one of the wiring ends 14c through a slack coil end 14f as is clear from Fig. 7.

As circuit making and breaking means, a drop or globule 17 of mercury is confined in capsule 12d which completes the electrical circuit when said capsule 12d is downturned with globule 17 lodged between terminal connection head 12h and the adjacent wall of the capsule 12d as shown in full lines in Figs. 4 and 7. Said capsule 12d has stub shafts 12a thereof positioned closer to the closed end 12c than to the seater end 12f so that when device 10 rests on a horizontal level surface capsule 12d will, due to gravity, normally be in said full line circuit closing position.

Casing 11 as seen from Figs. 4 to 6 may also be constructed to have a lower section compartment 11u situated under upper section compartment 11u adjoining and communicating with the latter, said lower compartment 11u, as here shown, may be of circular cross-section shape of slightly less diameter than upper compartment 11u with outer sheet metal shell 11b of the latter extended down as at 11f provided with an interturn bottom side 11k to enclose solenoid magnet coil 12b. Lower com-
apartment shell extension 11j may be provided with suitable insulating liner 11m and extreme end portion 14f of one of the wiring ends 14c may be extended through lower compartment 11h to connect with solenoid magnet coil 12b as is clear from Figs. 4 to 7.

Solenoid magnet coil 12b in lower compartment 11h may be formed with an axial bore in which a vertically disposed freely slidable core plungor or armature 12k made of permeable material, such as steel or iron, is mounted, said armature 12k passing through casing bottom side 11k. Upper end 12k of said armature 12k may be provided with suitable resilient shock absorbing means, such as a helical wound compression spring 12m which may terminate in a capping disc 12p that is of sufficient diameter to serve as a stop for seating on the upper insulating side 12q of solenoid 12b to limit the down movement of armature 12k. Said capping disc 12p on retraction of armature 12k into the solenoid magnet coil 12b is constructed and arranged to yieldably lift the capsule sealed end 12f thereby tilting capsule 12d for movement from the full line to the dotted line position to interrupt by breaking the circuit through globule 17, compression spring 12l extending within said fitting 18 over said crank arm end 16a as shown in Figs. 1 and 4.

Crank arm 16 has end 16b opposite said free end 16a secured to turn with a horizontal mounted bar 16c which may be journaled for rotation between spaced apart bearing brackets 10c supported from struts 10b. Said bar 16c may carry to swing therewith sound producing means such as one or more conventionally constructed bells 16d each having a clapper 16e.

As seen from Figs. 1 to 3, 4, and 7, bar 16c may be positioned in spaced offset relation with respect to armature lower end 12f and at a spaced distance above frame base 10a and said Figure 13. The latter when in the form simulating Santa Claus, may be provided with upper and lower arm portions 13a and 13b, respectively, hinged at shoulders and elbow 13c and 13d, respectively. Hand end 13e of said Figure 13 which when positioned as shown in Figs. 1 to 3 may be connected through a wire or string 13f extending down from lower end of fitting 18 so that armature 12k on being drawn into solenoid magnet coil 12b and released will articulate arm portions 13a and 13b to correspond with motions simulating bell ringing operation with the simultaneous swinging of bells 16d.

After constructing and assembling animated bell-ringing device 10 as described above and shown in Figs. 1 to 4 and wired as shown in Fig. 7 to receive electric power, the operation and utility of the invention will be apparent.

Device 10 may be supported on a Christmas tree, incorporated in other forms of decorative and display paraphernalia or used as an independent unit supported by means of frame base 10a on a horizontal surface 5 and connected to tapping plug 14a to a household or commercial electric supply source (not shown) through portable extension wiring 14 in the well understood manner as is clear from Fig. 7. Magnet coil of solenoid 12b will be energized since normally armature 12k is dropped down with switch 12a in a closed circuit position, shown in full lines in Figs. 1, and 4, the circuit then being completed between wiring ends 14c in passing successively from capsule terminal connector 12i, capsule 12d, globule 17 in circuit making or "on" position, terminal connector 12g, jumper 14e, and solenoid magnet coil 12b. Solenoid magnet coil 12b will then be energized and will slidingly draw or raise, that is, retract armature 12k elevating capping disc 12p to tilt switch capsule 12d tripping on bearing 11f from the full line position to the dotted line position shown in Fig. 4. In the steady raised or extreme up-stroke of armature 12k the tilting of switch 12a is such as to cause globule 17 to flow from said circuit making or switch "on" position toward capsule closed end 12f to a switch "off" position thereby breaking the circuit between terminal connector 12i and 12g and the wall of capsule 12d. Armature 12k will thereafter be released on discontinuance of the magnetic effect due to deenergizing of solenoid 12b, and will be dropped due to gravity to an extreme down stroke position as limited by said disc 12p seating on the upper side of solenoid 12b. These up and down strokes of armature 12k will rock crank arm 16 and swing bar 16c and bells 16d to produce sounds on being struck by clappers 16e.

The making and breaking of the circuit operations through switch 12a will continue in successive cycles reciprocating armature 12k as long as electric power is provided to tap plug 14a and the swinging of bells 16d controlled to produce at desired intervals pleasing sound effects with the attractive animation of Figure 13 by articulation of arm portion 13a and 13b as is clear from the full and dotted line positions thereof shown in Fig. 2.

In providing the ends of armature 12k with shock absorbing springs as described above smooth operation free from jarring is attained.

It will thus be seen that there is provided an animated bell ringing device of the character described whereby the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use. As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a decorative electrically operated bell-ringing device of the character described including a base, struts upstanding from said base, a bell swingably supported from said struts, at one level above said base, a solenoid magnet coil connected in an electric circuit supported between said struts over said base at a level above said bell, an armature slidably mounted to extend through said solenoid coil for actuation thereby, a switch positioned over said solenoid coil in the path of movement of the armature for making and breaking said circuit on reciprocation of said armature, a figure carried by said base having an articulatable appendage extending below the level of said bell, and linkage members interconnecting said armature, bell and appendage to ring the bell and simulate bell ringing movements by said appendage on reciprocation of said armature when making and breaking the circuit through said switch.

2. In a decorative electrically operated bell-ringing device of the character described as defined in claim 1 in which said switch is mounted for tilting movement in the making and breaking of said circuit and said solenoid positioned to reciprocate the armature vertically, said armature having an upper end fitted with a resilient stop member to actuate said switch in the latter to a circuit breaking position.

3. In a decorative electrically operated bell-ringing device of the character described as defined in claim 1 in which said switch is mounted for tilting movement in the making and breaking of said circuit and said solenoid positioned to reciprocate the armature vertically, said linkage members including a loose-connection fitting and a resilient element carried at a lower end of said armature to cushion the bell ringing movements.

4. In a decorative electrically operated bell ringing
device of the character described as defined in claim 1 in which said switch is mounted for tilting movement in the making and breaking of said circuit and said solenoid positioned to reciprocate the armature vertically, said armature having an upper end fitted with a resilient stop member to contact said switch in tilting the latter to a circuit breaking position, said linkage members including a loose-connection fitting and a resilient element carried at a lower end of said armature to cushion the bell ringing movements.

5. In a decorative electrically operated bell-ringing device of the character described as defined in claim 1 in which said switch and coil are enclosed in a casing having an upper compartment for said switch and an adjoining lower compartment for said coil with the armature extending down beyond said lower compartment.

6. In a decorative electrically operated bell ringing device including a mercury switch connected in circuit with a solenoid magnet coil having a vertically disposed axial bore, a sliding magnetizable armature cooperatively mounted to extend in said bore effective to raise said armature into said bore when said coil is energized and to be gravity lowered when said coil is deenergized, said switch having a metallic capsule shaped body closed at one and open at the other end thereof, said body being trunnioned adjacent said closed end on insulating bearings, an insulating closure for said capsule body open end formed with a through-extending current carrying terminal, said body and terminal being connected in said circuit by a mercury globule to provide make and break switch operations when the armature is lowered by gravity and when the armature is thereafter raised, respectively, said armature carrying a loose connection fitting connecting with a linkage for actuating a bell ringing operation, a shock absorbing spring element incorporated in said fitting for cushioning the movement of said linkage, and a shock absorbing end portion carried by said armature for resiliently contacting said switch.

References Cited in the file of this patent

UNITED STATES PATENTS

186,572 Hughson January 23, 1877
684,906 Brown October 22, 1901
1,383,977 Bowman July 5, 1921
1,647,858 Dunham November 1, 1927
1,740,355 Johnston December 17, 1929
2,027,879 Piscione January 14, 1937
2,302,421 Cristofoli November 17, 1942
2,456,777 Gibson December 21, 1948
2,513,577 Malme July 4, 1950
2,515,439 Bronson July 18, 1950
2,546,389 Damast March 27, 1951
2,593,917 Pettit April 22, 1952
2,600,070 Nicolvo June 10, 1952
2,663,013 Bronson December 15, 1952

FOREIGN PATENTS

127,873 Switzerland September 17, 1928