Sept. 17, 1935. C. MILLER 2,014,442

SIGNALING DEVICE

Filed June 13, 1932 2 Sheets-Sheet 1

Fig. 1.

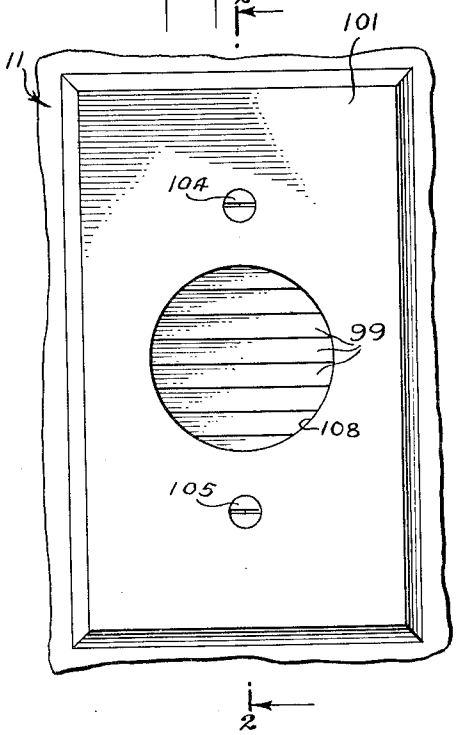


Fig. 2.

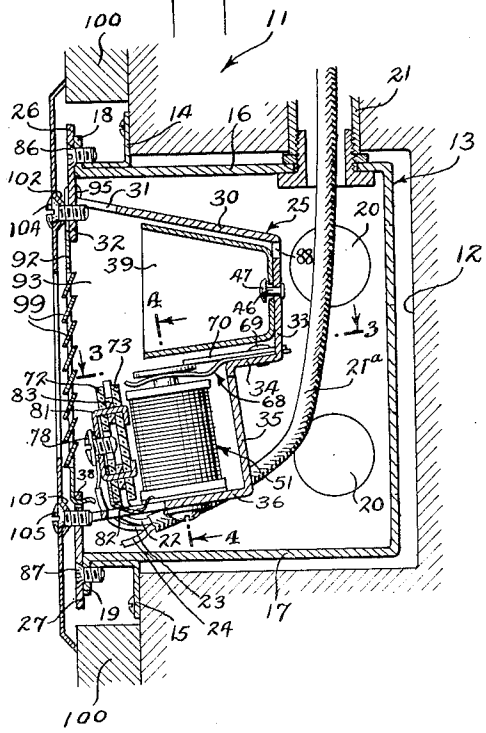


Fig. 3.

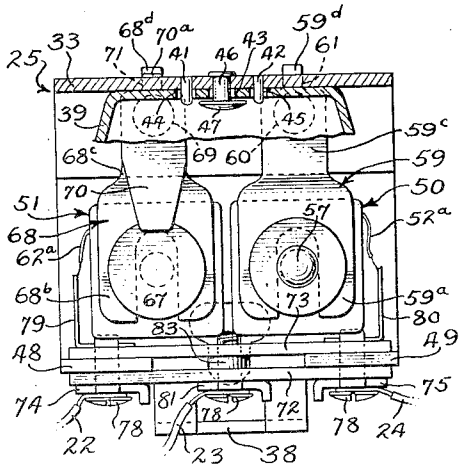
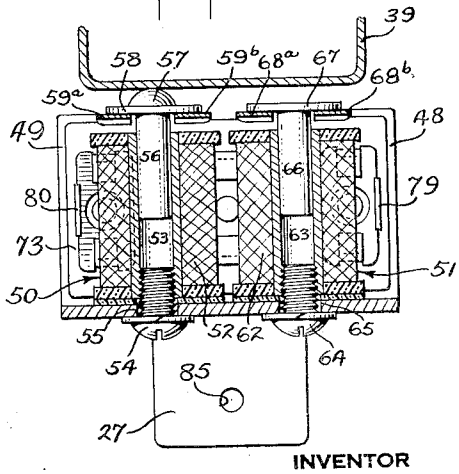


Fig. 4.



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Fig. 5.

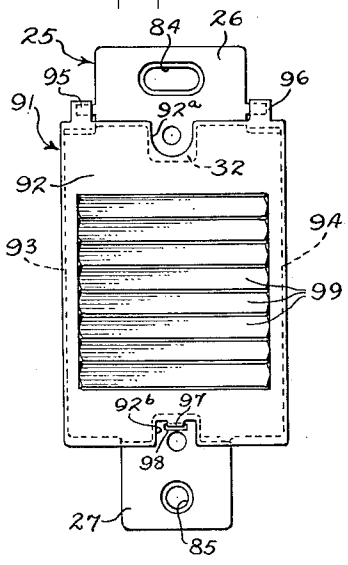


Fig. 6.

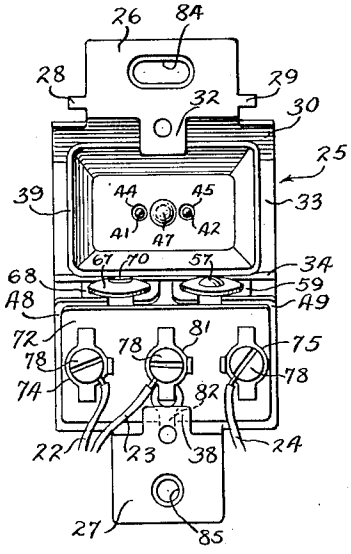


Fig. 7.

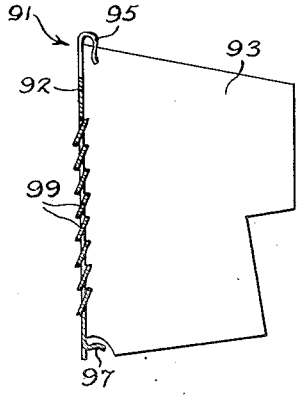


Fig. 8.

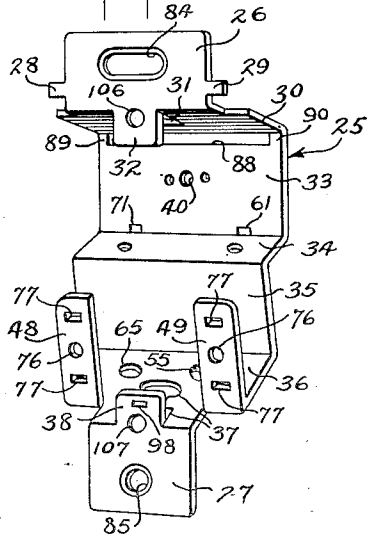


Fig. 9.

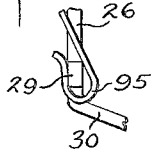
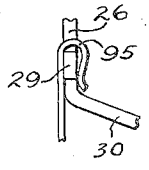


Fig. 10.



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Patented Sept. 17, 1935 2,014,442

UNITED STATES PATENT OFFICE

2,014,442

SIGNALING DEVICE

Christian Miller, New York, N. Y., assignor to Edwards and Company, Inc., a corporation of New York

Application June 13, 1932, Serial No. 616,852

16 Claims. (Cl. 177—7)

This invention relates to signaling installations and devices and more particularly to the construction of audible signaling devices such as electric buzzers, bells, and the like.

One of the objects of this invention is to provide a compact, practical, and durable audible signaling construction which will be reliable in action, capable of production on a quantity scale, and characterized by inexpensive construction of its individual parts and by ease and speed of assembly.

Another object is to provide an electric bell construction that will be small, compact, efficient, and capable of unimpaired action even though, insofar as certain features of my invention are concerned, limited in size. Another object is to provide a simple and inexpensive construction for an electric buzzer.

Another object is to provide a signaling installation that will be compact, neat in appearance, and well adapted to meet the varying requirements of hard practical use. Another object is to provide a signaling unit that is well protected, when installed or when in shipment. Another object is to provide an audible signaling unit that will be easy to install, connect and test. Other objects will be in part obvious or in part pointed out hereinafter.

This application is a continuation in part of my application Serial No. 502,651, filed December 16, 1930, now Patent No. 1,863,532, issued June 14, 1932.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings in which is shown one of various possible embodiments of my invention,

Figure 1 is a front view or elevation as the signaling apparatus appears when installed;

Figure 2 is a vertical central sectional view as seen along the line 2—2 of Figure 1;

Figure 3 is an enlarged sectional view as seen along the line 3—3 of Figure 2;

Figure 4 is a central sectional view on an enlarged scale as seen along the line 4—4 of Figure 2;

Figure 5 is a front view of the signaling unit ready to be installed;

Figure 6 is a front elevation of the signaling unit with certain parts removed in order to show the relation of other parts more clearly;

Figure 7 is a central vertical sectional view of a detached part of the signaling unit;

Figure 8 is a perspective view of the frame of the signaling unit;

Figure 9 is a detached view on an enlarged scale showing, in side elevation, a connection between certain parts of the signaling unit, showing the relation of these parts in one position, and

Figure 10 is a view similar to Figure 9 showing one of the parts in a different position.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring first to Figures 1 and 2, I have shown at 11 a wall which may be of any suitable character such, for example, as is usually employed in building construction and in this wall 11 I provide a recess 12 for receiving an outlet or conduit box 13, preferably of sheet metal and preferably of standard construction; illustratively the box 13 is of the single-unit type but, as more clearly appears hereinafter, the box may be of the multiple unit or gang type. The box may be secured in place in any suitable manner, for example by bracket-like members 14—15 positioned preferably on the upper and lower walls 16—17, respectively, of the box. The latter walls are provided also with suitable supporting means illustratively shown as taking the form of vertically directed flanges or lugs 18—19 which lie in a plane substantially coincident with the plane of the left-hand or open end of the box 13 as seen in Figure 2.

The walls of the box are provided with suitable knock-outs 20 through any one of which, illustratively the knock-out in the upper end wall 16, a conduit 21, buried in or carried through the wall 11 is brought to a suitable terminus inside of the box. The conduit 21 which may be of metal tubing, flexible or otherwise, carries insulated conductors which may take the form of a cable 22 carrying illustratively three conductors 22, 23 and 24 (Figure 2) to be connected to the signaling apparatus.

The signaling apparatus, preferably taking the form of an electric bell and an electric buzzer, the details of which are described hereinafter, includes a frame generally indicated at 25 which, by suitable successive stamping and punching operations, is given the form and shape substantially as is shown in Figure 8.

The frame 25 which, as hereinafter pointed out, forms part of a casing or housing is made of a suitable sheet metal whose maximum width, as is better shown in Figure 6, approximates the inner horizontal dimension of the outlet box 13 where

the latter is of the single unit type, this width being thus commensurate with the dimension or space usually allotted in practice to devices that are to be related to an outlet box of the multiple unit or gang type; the frame has upper and lower end or flange members 26—27 (Figure 8) which (Figure 2) preferably lie in the same plane and are spaced so as to rest against the supporting members 18—19 respectively of the box. As is better shown in Figures 6 and 8 the upper end member 26 is cut so as to leave lugs 28 and 29 projecting laterally therefrom, the lugs being preferably rectangular in cross-section. Thereupon, the sheet metal is bent as at 30 (Figures 8 and 2), the portion 30 being inclined to the plane of the end members 26—27 but being cut out as at 31 to leave a lug or ear 32 directed downwardly as an extension of the end member 26.

The inclined portion 30 extends inwardly into the box 13 whereupon it is bent to provide a portion 33 that extends preferably parallel to the plane of end members 26—27, members 30 and 33 being dimensioned to leave, as is shown better in Figure 2, a substantial spacing between themselves and the walls of the box 13, thus to leave ample room for utilization of any desired knock-out and for the bringing into the box of conductors through the knock-out.

Thence follows a portion 34 (Figures 8 and 2) making an angle with portion 33 substantially as the angle between the latter and portion 30, thus carrying the frame 25 in an outward direction for a short distance whence the frame is bent as at 35 at substantially 90° to the portion 34, a final portion 36, at right angles to portion 35, carrying the wall portions of the frame 25 back to the lower end member 27 (Figure 8). Portions 34—35—36 are also spaced substantially from the adjacent walls of the box 13 so that here also adequate space is left in the box 13 to permit selection of any suitable knock-out through which a conduit may be terminated and through which the conductors may be brought into the box; this is clearly shown in Figure 2.

The lower wall portion 36 of the frame 25 (Figures 8 and 2) is cut out as at 37 to leave a lug or ear 38 that projects upwardly toward the lug 32, preferably lying in the same plane with the latter and forming virtually an upward extension of the lower end member 27.

In the tapered recess formed by the wall portions 30—33—34 (Figures 2, 6 and 8) is accommodated a gong 39 made of any suitable metal and preferably tapered preferably with respect to both its horizontal and vertical axes and thus being snugly accommodated in the above-mentioned recess-like portion of the frame 25.

The gong 39 is relatively diminutive, due to the small space available, and in order to interfere as little as possible with its acoustic vibration when struck in a manner hereinafter described in detail, I provide an inexpensive and simple but effective mounting of the bell with respect to the frame 25. At about the central point in the wall portion 33 (Figure 8) I provide a hole 40 and mount on the portion 33, in any suitable manner, two metal pins 41 and 42 (see also Figure 3) which project into the angular recess of which portion 33 forms virtually the bottom. These pins may be riveted or force-fitted into suitable holes in the portion 33 and are rigid with respect to the latter.

As is better shown in Figure 3, the bottom wall of the gong 39 is provided with a relatively large central hole 43 and with two smaller holes 44 and 45, one on each side of the central hole 43 and having their centers spaced as are the centers of the portions 41—40—42.

The gong 39 is inserted into the tapered recess in the frame 25, pins 41 and 42 being received through holes 44 and 45, respectively, in the gong bottom, the holes being of larger diameter than the pins so as to form a relatively loose fit, permitting substantial play.

The hole 43 in the gong bottom is somewhat larger than the hole 40 in the portion 33 (Figure 3) but their centers are substantially alined. I then insert through the hole 43 in the gong 39 and into the hole 40 in the portion 33 a rivet-like member or stud 46 (Figures 3 and 2) having a relatively large head 47 and secured in the hole 40 in any suitable manner, as by heading over its upper end as viewed in Figure 3 but the head 47 is spaced from the portion 33 by a distance greater than the thickness of the gong, thus allowing a certain amount of play in a horizontal direction as viewed in Figure 2 while the center hole 43 in the gong 39 is somewhat larger than the shank of the pin 46, allowing play in other directions.

Thus the gong is loosely mounted to the rigid frame 25 but whatever play is present in the mounting is insufficient to permit the tapered portions of the gong from swinging into contact with adjacent rigid portions of the frame or other parts, the pins 41—42 preventing undue relative rotation between the parts, to the same end.

It has been above pointed out that the end member 27 (Figure 8) is of less width than the major portions of the frame 25; this diminished width is achieved by shearing and bending lateral portions of the lower part of the frame 25, the portions being cut out of both the end member 27 and the lower wall portion 36 and being bent in a general upward direction to provide two horizontally spaced supporting arms 48—49 extending substantially parallel to the back wall portion 35 (Figures 8 and 2) and being of a length substantially similar to the vertical dimension of the portion 35; the relation of these parts is clearly shown in Figure 8, it being noted that there is thus virtually formed a recess or pocket bounded by the wall portions 35 and 36 and by the arms 48—49 and the parts carried by the latter, as described in detail hereinafter. In this pocket or recess is mounted the electromagnetic gong-striking mechanism generally indicated in the drawings and better shown in Figure 4 at 50 but proportioned so that another electromagnetic mechanism generally indicated at 51 may be accommodated in the same pocket or recess.

These mechanisms illustratively and preferably take the form of solenoids positioned with their axes extending at right angles to the wall portion 36 (Figures 2 and 8). The mechanism 50 includes a winding 52 wound between suitable insulating washers (Figure 4) and wound about a metal sleeve 53 whose lower end is threaded to receive a screw 54 which is passed through a hole 55 (Figures 4 and 8) in the wall portion 36 of the of the frame 25, the hole 55 being preferably positioned to one side of the center line of the frame 25, the screw 54 thus securing these parts rigidly to the wall portion 36.

The sleeve 53 which is preferably of a non-magnetic metal such as brass slidably guides a plunger or solenoid core 56 (Figure 4) made of a magnetic metal and having a head 57 for striking the gong 39. Immediately underneath the head 57 and secured thereto or integrally fo: with the core 56 is a disk member 58 under wh

as viewed in Figure 4, the arms 59a and 59b of a bifurcated leaf spring 59 (Figure 3) engage, one on each side of the core 56, thus to urge the core 56 upwardly (Figures 4 and 6) into engagement with the gong 39.

The leaf spring 59 has a shank portion 59c (Figure 3) which rests against the inner face of the wall portion 34 of the frame 25 to which it is secured as by a rivet 60.

To prevent swinging of the spring 59 around the axis of the rivet 60, the upper end of the shank portion 59c may be squared off (Figure 3) to rest snugly against the wall portion 33 which thus prevents such possible rotation.

As an additional safeguard against such rotation and to facilitate assembly, the wall portion 33 is provided with a hole 61 (Figures 3 and 8) which is alined with the hole 55 in the portion 36 and into the hole 61 is snugly received a tongue 59d (Figure 3) which is substantially an extension of the shank portion 59c of the spring. The interfitting between the tongue 49d and the hole 61 thus further prevents possible swinging of the spring 59 about the rivet 60.

The spring 59 is biased so as to hold the core 56—57 in contact with the gong 39. Hence, if the winding 52 is energized with a pulsating or alternating current, the core 56 is, under the control of spring 59 and of the magnetic flux produced by the winding 52, vibrated at a suitable rate, correspondingly to strike the gong 39 and set it into vibration.

Because of the mounting of the gong 39, as above described, onto the frame 25, the latter is prevented from interfering with or damping the acoustic vibration of the gong so that the intended or desired musical note or pitch of the gong is reliably produced.

The electromagnetic mechanism 51 (Figures 2, 3 and 4) has a mounting similar to that above described and its construction includes a solenoid winding 62 (Figure 4) wound upon the non-magnetic metal sleeve 63 between suitable insulating end disks, the lower end of sleeve 63 being threaded to receive a screw 64 that passes through an opening 65 in the wall portion 36 of frame 25, thus to secure the solenoid in place alongside of the mechanism 50 above described.

The sleeve 63 slidably guides a magnetic core 66 (Figure 4) whose upper end has secured thereto or integrally formed therewith an end disk 67 under which, as viewed in Figure 4, the arms 68a and 68b of a bifurcated spring 68 (see also Figure 3) extend to urge the core 66 upwardly as viewed in Figure 4.

Spring 68 has a shank portion 68c which rests against the inner face of wall portion 34 to which it is secured as by the rivet 69 (Figures 2 and 3). The same rivet 69 also secures in place a rigid metal member 70 shaped substantially as is shown in Figures 2 and 3, projecting into the path of upward movement of the end disk 67 of the solenoid core 66, spring 68 holding the core up against the rigid member 70.

Member 70 and also the shank portion 68c of the spring 68 are squared off at their ends (see Figures 3 and 2) so as to abut against the wall portion 33, thus to prevent possibility of rotation of these parts about the axis of the rivet 69. Preferably, also, the shank 68c has a tongue 68d (Figure 3) which is of the same width as tongue 70a formed in member 70, these two tongues being snugly received into a hole 71, alined with the hole 65 in member 36, thus additionally to prevent such rotation and to facilitate proper alinement of the parts during assembly.

Energization of winding 62 of the mechanism 51 (Figure 2) by a suitable interrupted or pulsating or alternating current causes a vibration of the core 66 in a manner similar to that described in connection with the core 66 of the mechanism 50, but core 66 strikes the rigid member 70, rigidly connected to the rigid frame 25, causing a buzzing sound as distinguished from the musical note of the gong 39.

Supported by the arms 48—49 (Figures 2, 3, 6 and 8) and bridged thereacross is a connecting panel illustratively made up of two rectangularly shaped blocks 72—73 of insulating material, such as fiber, hard rubber, or the like, and dimensioned substantially as shown in the drawings, each supported on one side of the arms and being alined with each other. To these blocks and to the arms 48—49 are related two combined securing or clamping devices and terminal members 74—75 (Figure 6) and intermediate thereof is a similar device 81, all of which are shaped substantially as is better shown in Figure 2 where the member 81 is shown in vertical section, it being noted that the arms 48—49 are apertured as is better shown in Figure 8, each having a central round hole 76 and to each side of the hole 76 holes 77, the insulating blocks 72—73 being correspondingly apertured to mate with these holes when related to the arms.

The members 74—75, each having threaded therein a binding screw 78, are, as is better shown in Figure 2, U-shaped, their arms passing through the holes 77 (Figure 8) in the supporting arms 48—49 and through the holes in the blocks registering with the holes 77, whence the inner ends of the arms of the parts 74—75 are bent over (Figure 2) to clamp the fiber blocks to the supporting arms 48—49. Underneath the bent over ends of the parts 74—75 there are caught and clamped and thus electrically connected thereto (see Figure 3) L-shaped members 79—80 made of a sheet metal that may be easily soldered. The end 62a of winding 62 (Figure 3) is soldered to member 79 and is thus electrically connected to the binding post 74—78 while the end 52a of winding 52 is soldered to the member 80 and is thus placed in electrical connection with the binding post 75—78.

Intermediate of the members 74—75 (Figure 6) a similar member 81 having likewise threaded thereinto a screw 78 is passed through suitable apertures in the central portions of the insulating blocks 72—73 and clamped thereto but caught under the front portion of the member 81, as viewed in Figure 6, is a connecting tab 82 having a ring-shaped portion through which an arm of the member 81 extends, tab 82 being thus clamped by member 81 and electrically connected therewith.

Where clamping members 74 and 75 pass through and clamp together the insulating blocks 72—73 and the supporting arms 48—49, the intermediate member 81 (Figures 6 and 2) clamp together the insulating blocks 72—73, the intervening space being filled by a washer or shim 83 (Figure 2).

The connecting tab 82 extends downwardly as seen in Figure 6, whence it is bent toward the right, as viewed in Figure 2, to extend into the region intermediate of the two solenoids, the cut-out portion 37 (Figure 8) in the wall portion 36 being enlarged and given the shape indicated in Figure 3 so as to expose the tab 82 as well as the

two conductors leading from the windings 52—62 from the rear of wall portion 36, thus permitting the two conductor ends to be soldered to the tab 82 and thus to be electrically connected to the binding post 78—81.

The binding posts (Figures 6 and 2) will thus be seen to be mounted so as to be on the front portion of the signaling device and with the insulating panel formed by blocks 72—73 aids in closing in the electromagnetic reciprocating or vibrating mechanisms. To these binding posts the conductors 22—23—24 (Figures 2 and 6) brought into the outlet box 13 may be connected.

The end members 26—27 (Figures 6, 8 and 2) are provided with apertures 84—85, respectively, the former taking the form of a transverse slot, as shown in Figure 8, and the two apertures being vertically spaced by substantially the same distance as are the threaded openings (Figure 2) in the supporting members or ears 18—19 of the box 13, this spacing being preferably a standard spacing where the box 13 is of standard construction, the signaling units of which the frame 25 thus forms a part is thus inserted into box 13, end members 26—27 overlying supporting members 18—19, respectively (Figure 2) to which they are secured by screws 86—87. Inasmuch, however, as certain variations in conduit or outlet box constructions take place, particularly in the vertical dimensions thereof as viewed in Figure 2, difficulty is sometimes met with in thus relating devices of this character to the outlet box but I overcome these difficulties in a thoroughly practical way.

As is better shown in Figure 8, I stamp a slot 88 transversely of the frame 25 and preferably closely adjacent the junction of portions 30—33 the slot being relatively narrow but being of a length so as to leave relatively narrow portions 89—90 which are thus made to form the connection between portions 30 and 33, permitting the upper portions 26—30 of the frame 25 to be easily bent by hand with respect to the portion 30, thus to insure proper and speedy fitting of the signaling unit into the box and its attachment, as by screws 86—87, thereto.

The frame 25 forms upper, lower and rear closing walls to which, in order to completely enclose the signaling mechanism, I relate a complementary casing member generally indicated in Figures 5 and 7 at 91. Member 91 is made of sheet metal preferably and it has a front wall 92 and side walls 93—94, the latter being shaped substantially as is shown in Figure 7, and being spaced apart by a distance equal to about the maximum width of the frame 25, as viewed in Figure 6.

At its upper end the member 91 has two ears 95—96 (Figures 5 and 7) which are bent over as is better shown in Figure 7, to form yieldable loops which may be slid over and thus releasably engage the lugs 28—29 (Figures 6 and 8) that project laterally of the upper end member 26, the interconnection being better shown on an enlarged scale in Figure 10, the connection thus forming a hinged joint between members 25 and 95.

The lower end of the front wall 92 terminates in a yieldable tongue 97 (Figure 7) which is received in a slot 98 in the upper end of the lug 38 extending upwardly from the lower end member 27 of frame 25 (Figures 8 and 5).

When, therefore, member 91 is swung about its hinged connection so as to bring the front wall 92 thereof substantially into the plane of the end members 26—27 (Figure 2), front wall 92 closes over the front of the signaling mechanism and its panel connecting board, while the side wings 93—94 enclose the left and right-hand sides (as viewed in Figures 5, 6 and 8) of the signaling unit, these wings being shaped (compare Figures 7 and 8) to mate with and rest against the side edges of the portions 30, 33, 34, 35 and 36 of the frame 25, thus forming a complete enclosure, with member 25, of the operating and connecting terminals of the signaling unit.

In installing the unit in the box 13, member 91 is swung in clockwise direction, as viewed in Figures 7 and 2, disengaging the latch 97 from the slot 98, throughout an angle closely approximating 180° (see Figure 9), the spring loop 96, being more or less oval shaped, coacting with the rectangularly shaped lug 29 to hold the member 91 in its upwardly swung position; of course the loop 95 and the ear 28 forming the complementary hinge function the same way. Thus the member 91 is held out of the way, the mechanism may be tested, adjusted, or the like, and the electrical connections made thereto, whence member 91 may be swung from the position shown in Figuge 9 downwardly to the position shown in Figure 10, the spring loops 95—96 now acting to aid in holding the member 91 in completely closed position. Latch 97 engages and latches in the slot 98 and thus holds the member 91 releasably in its closed position.

The front wall 92 (Figures 5, 7 and 2) of member 91 is suitably apertured, preferably by transversely slotting it and bending the strip-like portions downwardly and outwardly to form a louver 99 which will be seen to extend over the front of the audible signaling mechanism, functioning to permit the ready transmission therethrough of the audible signals and to prevent entry into the mechanism of foreign matter, dirt, dust, or the like.

The apparatus having thus far been installed, the plastering or other finishing of the wall 11 may be completed, as is indicated at 100 in Figure 2, whereupon a finishing cover plate 101 (Figures 1 and 2) is put in place. Plate 101 is preferably a standard finishing plate and is provided with openings 102—103 (Figure 2), preferably countersunk, and spaced vertically by preferably a standard distance, to receive securing screws 104—105 which are threaded into threaded holes 106—107, respectively, and correspondingly spaced vertically and positioned in the lugs or ears 32—38 of the frame 25 (see Figures 6 and 8). The front wall 92 of member 91 is cut out as at 92^a and 92^b (Figure 5) to expose the securing ears 35—38 into which the screws 104—105 are threaded.

The cover plate 101 is dimensioned to extend beyond the end walls of the box 13 and to overlap the finished wall 100 (Figures 1 and 2), thus leaving an outer neat and trim appearance. If the parts should be misalined so that the cover plate 101 is not plumb the tranverse slot 84 (Figures 5, 6 and 8) in the end member 26 permits the enclosed signaling unit to be swung about the axis of the lower screw 87 that passes through the lower end member 27 by an amount sufficient to bring the cover plate 101 into the desired plumb position.

The cover plate 101, thus secured in place, will be seen (Figure 2) to overlie the front wall 92 of the complementary casing member 91 and, though the latter is latched in place, the cover plate dependably locks the complementary casing

against displacement with respect to the member 25. Preferably the cover plate 101 is provided with a suitable aperture which may be of any suitable construction in order to permit easier transmission therethrough of the audible signals transmitted through the louver 99, and illustratively (Figure 1) I utilize a single aperture such as is formed in standard cover plates that are now used for other purposes, such as for outlets, and in Figure 1 I have shown this opening 108 as being substantially circular in shape. Thus though the cover plate 101 has a large opening therein, the louvers 99 still effectively protect the signaling mechanism from entry thereinto of foreign matter.

Though the signaling mechanism together with the panel board is entirely enclosed, it will be seen, as is better indicated in Figures 6, 8 and 2, that the conductors that lead to the binding posts on the panel board easily enter into the casing through the openings provided or left to either side of the narrower portion of the lower end wall portion 36 (Figure 8) of the frame 25.

It will thus be seen that there has been provided in this invention a signaling apparatus and installation in which the various objects hereinabove mentioned, together with many thoroughly practical advantages, are successfully achieved. The construction is compact, dependable in action, easily installed, and easily made accessible for adjustment, testing of the connections, or the like. Moreover, the apparatus and installation will be seen to effectively meet the varying conditions of hard practical use.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In signaling construction, in combination, a sheet metal box having conductors led thereinto, a sheet metal frame secured across the open end of said box and bent to extend inwardly into the latter, electric signaling means carried on that side of said frame toward the open end of the box, a terminal connector carried by said frame on the said side of the latter for the connection thereto of one of said conductors, said terminal connector being thereby accessible from the open end of the box, means of U-shaped cross-section forming front and side walls for said bent frame to enclose with the latter said signaling means and said terminal connector, and a cover plate over said front wall and secured to said frame and overlapping said box.

2. In signaling construction, in combination, a sheet metal box having conductors led thereinto, a sheet metal frame secured across the open end of said box and bent to extend inwardly into the latter, electric signaling means carried on that side of said frame toward the open end of the box, a terminal connector carried by said frame on the said side of the latter for the connection thereto of one of said conductors, said terminal connector being thereby accessible from the open end of the box, means of U-shaped cross-section forming front and side walls for said bent frame to enclose with the latter said signaling means, means detachably connecting said U-shaped means to said frame, and a cover plate overlying the front wall of said U-shaped means and secured to said frame.

3. In signaling construction, in combination, a sheet metal box having conductors led thereinto, a sheet metal frame secured across the open end of said box and bent to extend inwardly into the latter, electric signaling means carried on that side of said frame toward the open end of the box, a terminal connector carried by said frame on the said side of the latter for the connection thereto of one of said conductors, said terminal connector being thereby accessible from the open end of the box, means of U-shaped cross-section forming front and side walls for said bent frame to enclose with the latter said signaling means, means hingedly connecting said U-shaped means to said frame to permit access to said signaling means, and a cover plate overlapping said front wall and detachably secured to said frame.

4. In signaling construction, in combination, a sheet metal box having conductors led thereinto, a sheet metal frame secured across the open end of said box and bent to extend inwardly into the latter, electric signaling means carried on that side of said frame toward the open end of the box, a terminal connector carried by said frame on the said side of the latter for the connection thereto of one of said conductors, said terminal connector being thereby accessible from the open end of the box, means of U-shaped cross-section forming front and side walls for said bent frame to enclose with the latter said signaling means, means hingedly connecting said U-shaped means to said frame and including means for releasably holding said U-shaped means in position when swung away from said frame, and a finishing plate overlapping said front wall and detachably secured to said frame.

5. In signaling construction, in combination, a sheet metal box having conductors led thereinto, a sheet metal frame secured across the open end of said box and bent to extend inwardly into the latter, electric signaling means carried on that side of said frame toward the open end of the box, a panel board carried by said frame on the said side thereof and thereby positioned to be accessible from the said open end of said box, connecting terminals on said panel board for connection thereto of said conductors, and closure means for said box.

6. In signaling construction, in combination, a sheet metal box having conductors led thereinto, a sheet metal frame secured across the open end of said box and bent to extend inwardly into the latter, electric signaling means carried on that side of said frame toward the open end of the box, a panel board carried by said frame on the said side thereof and thereby positioned to be accessible from the said open end of said box, connecting terminals on said panel board for connection thereto of said conductors, an apertured closure member secured to said frame for closing over said signaling means and said panel board, and a finishing plate covering over the front end of said box.

7. In signaling construction, in combination, a sheet metal box having conductors led thereinto, a sheet metal frame secured across the open end of said box and bent to extend inwardly into the latter, electric signaling means carried on that side of said frame toward the open end of the box, a panel board carried by said frame on the said side thereof and thereby positioned to be accessible from the said open end of said box, connecting terminals on said panel board for connection thereto of said conductors, an apertured closure member secured to said frame for closing

over said signaling means and said panel board, means hingedly connecting said closure member to said frame to permit it to be swung relative thereto to give access to said panel board, and a finishing plate closing over said box.

8. In signaling construction, in combination, a sheet metal box having conductors led thereinto, a sheet metal frame secured across the open end of said box and bent to extend inwardly into the latter, electric signaling means carried on that side of said frame toward the open end of the box, a panel board carried by said frame on the said side thereof and thereby positioned to be accessible from the said open end of said box, connecting terminals on said panel board for connection thereto of said conductors, an apertured closure member secured to said frame for closing over said signaling means and said panel board, means hingedly connecting said closure member to said frame to permit it to be swung relative thereto to give access to said panel board, means for holding said closure member when swung away from said frame, and a finishing plate covering over said box.

9. In signaling construction, in combination, a sheet metal box having conductors led thereinto, a sheet metal frame secured across the open end of said box and bent to extend inwardly into the latter, electric signaling means carried on that side of said frame toward the open end of the box, a panel board carried by said frame on the said side thereof and thereby positioned to be accessible from the said open end of said box, connecting terminals on said panel board for connection thereto of said conductors, an apertured closure member secured to said frame for closing over said signaling means and said panel board, means hingedly connecting said closure member to said frame and including means releasably holding said closure member in at least one position into which it is swung, and a finishing cover plate closing over said box.

10. In signaling construction, in combination, a sheet metal frame having end portions adapted to rest against the supporting means of an outlet box and provided with upper and lower wall portions and an inner wall portion, signaling means carried by said frame in the space between said wall portions, one of said wall portions having a part cut and bent to extend in the general direction of the plane of said end portions and on that side of said frame toward the open end of said box, and a connecting terminal carried by said bent part.

11. In signaling construction, in combination, a sheet metal frame having end portions adapted to rest against the supporting means of an outlet box and provided with upper and lower wall portions and an inner wall portion, signaling means carried by said frame in the space between said wall portions, one of said wall portions having a plurality of parts cut and bent to extend in a plane intermediate of the plane of said end portions and said inner wall portion, an insulating panel board carried by said parts, and connecting terminals carried by said panel board.

12. In signaling construction, in combination, a sheet metal frame having end portions adapted to rest against the supporting means of an outlet box and provided with upper and lower wall portions and an inner wall portion, signaling means carried by said frame in the space between said wall portions, one of said wall portions having a plurality of parts cut and bent to extend in a plane intermediate of the plane of said end portions and said inner wall portion, an insulating panel board carried by said parts, and connecting terminals carried by said panel board, at least a portion of said signaling means being accommodated between said panel board and said inner wall portion.

13. In signaling construction, in combination, a sheet metal frame having end portions adapted to rest against the supporting means of an outlet box and provided with upper and lower wall portions and an inner wall portion, signaling means carried by said frame in the space between said wall portions, one of said wall portions having a plurality of parts cut and bent to extend in a plane intermediate of the plane of said end portions and said inner wall portion, an insulating panel board carried by said parts, and connecting terminals carried by said panel board, said signaling means comprising a plurality of electromagnetic devices accommodated in the space between said panel board and said inner wall portion.

14. In signaling construction, in combination, a sheet metal frame having end portions adapted to rest against the supporting means of an outlet box and provided with upper and lower wall portions and an inner wall portion, signaling means carried by said frame in the space between said wall portions, one of said end wall portions being independent of said signaling means and the junction between said end wall portion and said inner wall portion being weakened to permit ready adjustment by bending of said end wall portion.

15. In signaling construction, in combination, a sheet metal box having conductors led thereinto, a sheet metal frame secured across the open end of said box and bent to extend inwardly into the latter, electric signaling means carried on that side of the frame toward the open end of the box, said frame having a part extending along said signaling means on that side of the latter toward the open end of the box, a terminal connector carried by said part of said frame for connection thereto of one of said conductors, and closure means for said box.

16. In signaling construction, in combination, a sheet metal box having conductors led thereinto, a sheet metal frame secured across the open end of said box and bent to extend inwardly into the latter, electric signaling means carried on that side of the frame toward the open end of the box, said frame having spaced portions extending along said signaling means on that side of the latter toward the open end of the box, a panel board carried by said spaced portions and having thereon connecting terminals for connection thereto of said conductors, and closure means for said box.

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