

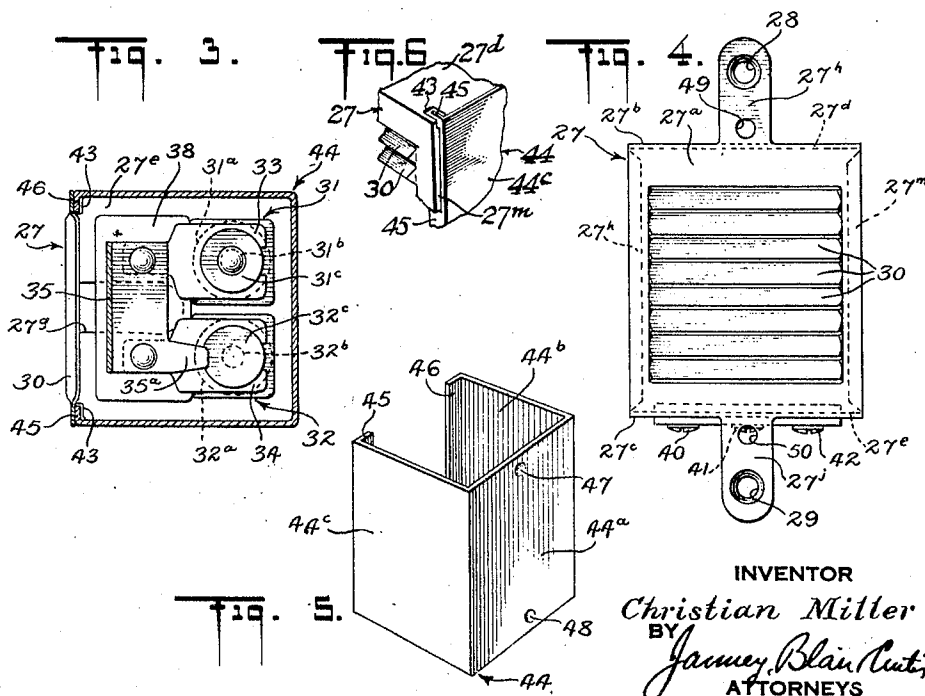
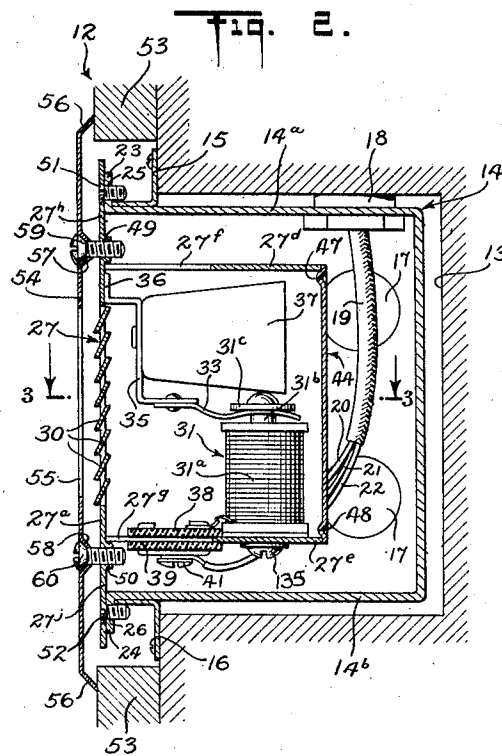
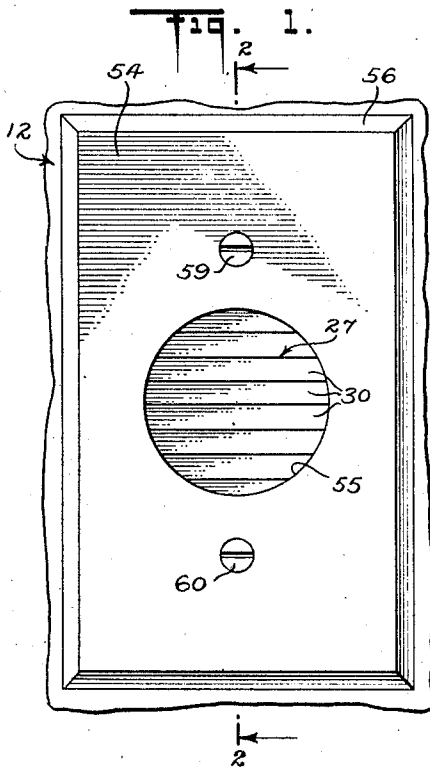
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SIGNALING DEVICE

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SIGNALING DEVICE

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18 Claims. (Cl. 177-7)

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

5 One of the objects of this invention is to provide an inexpensive, compact, and rugged signaling construction and installation of the above-mentioned character adapted particularly for rapid manufacture and inexpensive and speedy
10 installation. Another object is to provide a signaling unit capable of rapid manufacture on a quantity scale and capable of reliable and dependable action in practical use. Another object is to provide a signaling unit construction of the
15 above-mentioned character which will be well protected both in transit or shipment and when installed. Another object is to provide a construction of the above-mentioned character in which the individual parts may be rapidly and
20 inexpensively manufactured and assembled. Other objects will be in part obvious or in part pointed out hereinafter.

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 drawing in which is shown one of various possible embodiments of my invention,

Figure 1 is a front elevation of the signaling installation;

35 Figure 2 is a central vertical sectional view as seen along the line 2-2 of Figure 1, certain parts, however, being shown in elevation;

Figure 3 is a vertical sectional view as seen along the line 3-3 of Figure 2;

40 Figure 4 is a front elevation, as seen from the left in Figure 2 or Figure 3, of the signaling unit;

Figure 5 is a perspective view on a smaller scale of part of the enclosing means forming part of the signaling unit; and

45 Figure 6 is a fragmentary perspective view showing how part of the enclosing means is held in assembled relation to the rest of the enclosing means.

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

Referring now more particularly to Figures 1 and 2 of the drawing, there is shown at 12 a wall such as is employed in usual building construction work and which may be of any construction.
55 The wall 12 is provided in any suitable way with

a recess 13 of a sufficient size to receive therein a sheet metal outlet or conduit box 14 preferably of standard construction and illustratively of the single-gang type. The upper and lower end walls 14^a and 14^b of the box are provided with suitable lugs, brackets, or the like, indicated at 15 and 16 by which the box may be secured in place in the recess 13 of the wall 12. The box is provided with appropriate knock-outs 17 in its walls through any one of which a conduit 18 (Figure 2), of metal or other tubing, flexible or otherwise and buried in or carried through the wall 12, may be brought into the box 14 so that the cable 19 carrying conductors 20, 21 and 22, for example, may, with the latter, be brought into the box. The conductors are to be connected to the signaling apparatus which is to be mounted in the box 14.

The box 14, as above noted, is preferably of any usual standard construction and is accordingly provided with supporting means such as flanges or ears 23 and 24 provided respectively with threaded openings 25 and 26 spaced apart vertically by a standard distance; these openings, moreover, are threaded to receive suitable screws, all for a purpose more clearly described below.

The signaling unit includes a sheet metal stamping generally indicated at 27 (see also Figure 4) which is shaped to provide a front portion 27^a of a width closely approximating the width of a standard outlet box where the latter is of the single-gang size and is of a length approximating that of the vertical dimension of the interior of the box 14; the sheet metal member 27 is bent at 27^b and 27^c at right angles to the plane of the front portion 27^a to provide upper and lower end members 27^d and 27^e (Figures 2, 4 and 3), thus to provide upper and lower walls integrally formed with the front wall 27^a.

These upper and lower end walls 27^d and 27^e are cut out as at 27^f and 27^g (Figure 2) to leave lugs or ears 27^h and 27ⁱ (Figures 2 and 4) that extend along the center line of the member 27 (Figure 4) and extend also substantially in the plane of the front wall 27^a (see Figure 2). These extensions or lugs 27^h and 27ⁱ are of sufficient length to extend over and rest against the supporting portions 23 and 24 of the box 14 (Figure 2) and are provided with holes 28 and 29 (Figure 4) spaced apart by the same distance as are the holes 25 and 26 in the supporting ears 23 and 24 of the box 14.

The front wall portion 27^a (Figures 2 and 4) is apertured in any suitable way, preferably by providing therein horizontally extending but verti- 55

cally spaced cuts, the intervening horizontal strips of metal being bent outwardly and downwardly (Figure 2) at a suitable angle, thus to provide louvers 30. The louvers 30 cover an area which leaves a peripheral or marginal portion of the front wall 27^a above the louver 30, as appears better in Figure 4, and in case the sheet metal employed is somewhat light in thickness, I may and preferably do reinforce the front wall 27^a by means of vertically extending side marginal flanges 27^k and 27^m (Figure 4) which are preferably bent inwardly and flush against the inside face of the wall portion 27^a. Thus, the latter is assured of adequate rigidity.

To one of the end walls, preferably the lower one and hence end wall 27^e and at its right-hand end as viewed in Figures 2 and 3, I mount side by side two electromagnetic devices generally indicated at 31 and 32, respectively. These are conveniently and preferably in the form of solenoids provided respectively with windings 31^a and 32^a within which operate and slide cores 31^b and 32^b urged in an upward direction as viewed in Figure 2 by bifurcated leaf springs 33 and 34, respectively, the springs engaging underneath the disk-like heads 31^c and 32^c, respectively, of the cores 31^b and 32^b.

The detailed construction of these electromagnetic devices and their mounting, as by screws 135 (Figure 2) are not dealt with herein inasmuch as they may take the form described in my co-pending application Serial No. 502,651, filed December 16, 1930, to which reference may be made in this respect.

The leaf springs 33 and 34 are secured as by rivets to a sheet metal bracket 35 shaped as is better shown in Figures 2 and 3 and whose upper end is secured to the inside face of the front wall 27^a as by spot welding, as is indicated in Figure 2 at 36.

To the intermediate vertical portion of the bracket 35 I secure in any suitable manner a gong 37 arranged substantially as shown in Figure 2 and thus positioned to be engaged by the hammer head of the core 31^a of the device 31, leaf spring 33 urging the core 31^a upwardly and holding it in contact with the gong 37.

As is better shown in Figure 3, the lower horizontal portion of the bracket 35 which is made of a suitably rigid piece of sheet metal and has an extension 35^a of sufficient length to extend over the disk-like part 32^c of the core 32^b, the disk-like head being held in contact with the rigid extension 35^a by the leaf spring 34.

If, now, the windings 31^a and 32^a are energized by a suitable varying or pulsating current, illustratively an alternating current such as the 60-cycle current usual in household lighting systems, each pulse of current draws down the cores of the solenoids against the action of the leaf springs which return the cores at suitable speed when the current pulse diminishes to a suitable minimum value, thus causing the core 31^a to strike the gong 37 and the core 32^b to strike the rigid extension 35^a of the bracket 35. This step is repeated for the successive pulses or cycles and in the one case the gong is made to produce a musical note and in the other case the rapid striking of the rigid extension 35^a causes a buzzing sound.

As is better shown in Figure 2 and as is also indicated in Figure 4, I mount upon the lower end wall 27^e and intermediate of the front wall 27^a and of the electromagnetic devices a connecting panel or terminal board which prefer-

ably takes the form of two rectangularly shaped sheets of insulating material 38 and 39 made of hard rubber, fiber, or the like, the one being upon the inner face and the other upon the outer face of the end wall 27^e, the end wall 27^e being suitably apertured. The terminal board 38-39 carries a suitable number of connecting terminals or binding posts illustratively three in number and indicated at 40, 41 and 42 (Figure 4), being insulated from the sheet metal supporting parts by the insulating members 38-39.

The upper or inner parts of the terminals as viewed in Figure 2 are connected permanently to the windings 31^a and 32^a. For example, one end of each of these windings may be connected to a common binding post, such as the binding post 41, the other end of the winding 31^a may be connected to the binding post 40, and the other end of the winding 32^a may be connected to the binding post 42. Thus, the lower or exposed parts of these binding posts as viewed in Figures 2 and 4 and which may take the form of screws as indicated, are available to have the conductors 20, 21 and 22 (Figure 2) connected thereto.

At the outer edge portions of the junction between the upper and lower end walls 27^d and 27^e with the front wall portion 27^a, these end walls are notched as is better indicated at 43 in Figure 3 with respect to the end wall 27^e. After the parts of the signaling unit have been assembled as, above described, the unit is closed by a sheet metal member 44 shaped substantially as is shown in Figure 5. The member 44 has a back wall 44^a and side walls 44^b and 44^c whose free ends are bent toward each other to form flanges 45 and 46. The part 4 is shown in Figure 5 on a reduced scale but it is dimensioned in vertical cross-section so that the upper and lower end walls 27^d and 27^e may be fitted within and between the walls of the member 4, the latter having a length at least equal to the outside vertical spacing of these end walls.

The member 44 is made, as above noted, of a suitable sheet metal and is slid over the vertically aligned end walls 27^d and 27^e, the flanges 45 and 46 entering and being guided by the notches 43 (Figure 3) in the upper and lower end walls 27^d and 27^e (see also Figure 6); this sliding movement is continued until these end walls close the upper and lower open ends of the member 44, the back wall 44^a of which having depressions 47 and 48 (Figures 5 and 2) which, due to the yieldability of the sheet metal spring over and in between the upper and lower end walls, as is better shown in Figure 2, thus preventing vertical displacement of the closure member 44. Thus, this signaling mechanism is completely housed or enclosed though the binding posts 40, 41 and 42 will be seen to be accessible from the exterior while the louvered front wall 30 freely permits the emission of the sound produced by the audible signaling devices thus enclosed.

The extensions or lugs 27^h and 27ⁱ are provided with threaded openings 49 and 50 having preferably a spacing as is pointed out below; as is shown in Figure 4 these openings are on the center line of the unit and are aligned with the openings 28 and 29. Where the sheet metal employed is relatively light, I may and preferably do draw the metal of the attaching lugs 27^h and 27ⁱ into the form of short tubes, as is better shown in Figure 2, in order thus to provide a greater axial length of metal for the threading of these holes.

The conductors having been brought through a knockout and thus into the box 14 may be con-

connected to the binding posts 40, 41 and 42 of the signaling unit, the operation of the latter and of the circuits tested, and the unit mounted in or secured to the box 14 by screws 51 and 52 (Figure 2) which pass through the holes 28 and 29 in the unit and are threaded into the holes in the supporting portions 23 and 24 of the box. The parts are mounted so that the outward slope of the louvers 30 (Figure 2) is outward and downward, the front wall 27^a, together with the upper and lower end walls 27^d and 27^e and the walls of the member 44 (Figure 5) completely enclose the signaling mechanism, thus preventing any parts of the latter from being contacted by the cable or conductors brought into the box 14 whether the cable or conductors serve only the signaling mechanism alone or not. Thus, the intended operation of the mechanism cannot be interfered with by accidental or other contact therewith of parts or conductors inside the box. Moreover, the enclosed unit will be seen to leave sufficient room between itself and the walls of the box for accommodating the cables or conductors irrespective of which wall in the box the conductors are brought through.

The finishing or plastering or what-not of the wall 12 may now be proceeded with, it being noted that during these wall-finishing operations, the installed mechanism is well protected and safeguarded from access thereto of foreign matter and after the wall has been finished, the finishing or plastering or paneling or the like thereof being indicated in Figure 2 at 53, a finishing or cover plate 54 is applied and preferably this finishing plate takes the form of a standard cover plate which also preferably has a central opening therein. For example, it may take the form of a plate having a substantially round opening such as is used to exposed therethrough an outlet connection for the reception of a plug, and by way of illustration I have shown the plate 54 as taking this form, having a substantially round opening 55 therein. The plate may be of sheet metal or any other suitable construction and is of dimensions sufficiently greater than those of the outlet or conduit box 14 that the plate 54 overlaps the latter and contacts with the finished wall 53, the plate being peripherally flanged or beveled as at 56, if desired.

The plate 54, as is common and standard practice, is provided with two vertically spaced openings 57 and 58, countersunk, for the reception of screws to attach it in place. In Figure 2 the screws 59 and 60 are shown and they are threaded into the openings 49—56 in the signaling unit which, for this purpose, are spaced vertically by the same distance as are the plate openings 57—58.

In thus attaching the plate 54, the opening 55 is brought over the apertured or louvered front wall 27^a of the signaling unit and thus the emission of the signaling sounds from within the unit is greatly facilitated while the louvers 30 continue to guard against the entry into the signaling mechanism of dirt, dust, or other foreign matter.

Thus, it will be seen that there has been provided in this invention a signaling apparatus and installation in which the various objects hereinabove noted, together with many thoroughly practical advantages, are successfully achieved. It will be seen that the construction is thoroughly practical, is inexpensive, is easy to install, and has a great many practical advantages.

As many possible embodiments may be made

in 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 drawing is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. A signaling unit comprising, in combination, a sheet metal casing having a louvered front wall and provided with upper and lower end walls extending substantially at right angles to the front wall and having extensions substantially in the plane of the front wall adapted to rest against and be secured to the supporting portions of an outlet box, said end walls having notches in their edges, electric signaling means mounted between said end walls, a terminal board carried by one of said end walls and having a binding post exposed outwardly thereof and in electrical connection with said signaling means, said casing having side and back walls formed as a unit, and means provided on said unit for detachable engagement with the notches in said upper and lower end walls.

2. A signaling unit comprising, in combination, a sheet metal casing having a louvered front wall and provided with integrally formed upper and lower end walls bent at right angles to the front wall and having extensions substantially in the plane of the front wall adapted to rest against and be secured to the supporting portions of an outlet box, said end walls having notches in their side edges, electric signaling means mounted between said end walls, a terminal board carried by one of said end walls and having a binding post exposed outwardly thereof and in electrical connection with said signaling means, said casing having its side and back wall formed by a sheet metal member of U-shaped cross-section provided with inwardly directed flanges adapted to take into the notches in said end walls, whereby said U-shaped member is readily attachable thereto or detachable therefrom.

3. A signaling unit comprising, in combination, a sheet metal casing having a louvered front wall and provided with integrally formed upper and lower end walls bent at right angles to the front wall and having extensions substantially in the plane of the front wall adapted to rest against and be secured to the supporting portions of an outlet box, said end walls having notches in their side edges, electric signaling means mounted between said end walls, a terminal board carried by one of said end walls and having a binding post exposed outwardly thereof and in electrical connection with said signaling means, the notches in said upper and lower end walls being vertically aligned, and a member substantially U-shaped in cross-section and forming the side and back walls of said casing, said member having inwardly directed flanges in the side wall portions thereof received into said aligned notches, whereby said U-shaped member may be slid onto or off of said end walls.

4. A signaling unit comprising, in combination, a sheet metal casing having a louvered front wall and provided with upper and lower end walls extending substantially at right angles to the front wall and having extensions substantially in the plane of the front wall adapted to rest against and be secured to the supporting portions of an outlet box, said end walls having notches in their side edges, electric signaling means mounted between said end walls, a terminal board carried by one of said end walls and having a binding

post exposed outwardly thereof and in electrical connection with said signaling means, the notches in said upper and lower end walls being vertically aligned, a member substantially U-shaped in cross-section and forming the side and back walls of said casing, said member having inwardly directed flanges in the side wall portions thereof received into said aligned notches, whereby said U-shaped member may be slid onto or off of said end walls, and means for holding said U-shaped member against unintentional sliding of the latter when it is in place.

5. A signaling unit comprising, in combination, a sheet metal casing having a louvered front wall and provided with opposed end walls extending substantially at right angles to the front wall and having extensions substantially in the plane of the front wall adapted to rest against and be secured to the supporting portions of an outlet box, said end walls having notches in their side edges, electric signaling means mounted between said end walls, a terminal board carried by one of said end walls and having a binding post exposed outwardly thereof and in electrical connection with said signaling means, the notches in said opposed end walls being vertically aligned, a member of yieldable sheet material substantially U-shaped in cross-section and forming the other opposed walls of said casing, said member having inwardly directed flanges in the side wall portions thereof received into said aligned notches, whereby said U-shaped member may be slid onto or off of said end walls, and means utilizing the yieldability of the sheet material of said U-shaped member and coacting with a part of one of said opposed walls for releasably holding said U-shaped member against sliding movement relative to said end walls in the direction of removal.

6. A signaling unit comprising, in combination, a sheet metal casing having a louvered front wall and provided with opposed end walls extending substantially at right angles to the front wall and having extensions substantially in the plane of the front wall adapted to rest against and be secured to the supporting portions of an outlet box, said end walls having notches in their side edges, electric signaling means mounted between said end walls, a terminal board carried by one of said end walls and having a binding post exposed outwardly thereof and in electrical connection with said signaling means, the notches in said opposed end walls being vertically aligned, a member substantially U-shaped in cross-section and forming the side and back walls of said casing, said member having inwardly directed flanges in the side wall portions thereof received into said aligned notches, whereby said U-shaped member, with its flanges moving along said aligned notches, may be slid onto or off of said end walls and spaced projections on said U-shaped member for coacting with an end wall edge for limiting the sliding movement thereof relative to said end walls and for preventing said flanges from moving out of disengagement with their respective notches.

7. A signaling unit comprising, in combination, a sheet metal casing having a louvered front wall and provided with integrally formed upper and lower end walls bent at right angles to the front wall and having extensions substantially in the plane of the front wall adapted to rest against and be secured to the supporting portions of an outlet box, audible signaling means mounted between said end walls, said casing

having side and back walls formed as a unit, and means for detachably securing the latter to the remainder of said casing.

8. A signaling unit comprising, in combination, a sheet metal casing having a louvered front wall and provided with spaced end walls extending substantially at right angles to the front wall and having extensions substantially in the plane of the front wall adapted to rest against and be secured to the supporting portions of an outlet box, electric signaling means mounted between said end walls, an insulating terminal board carried by one of said end walls and having a binding post, conductive means permanently connecting said post with said electric signaling means, said binding post being exposed exteriorly of said end wall and thereby adapted to have an extraneous conductor secured thereto, closure means forming the sides and back for said casing, and means detachably interlocking with at least one of said wall members for holding said closure means in place.

9. In construction of the character described, in combination, a conduit box having a knock-out in a wall thereof and having supporting means provided with threaded openings in opposed end walls thereof, a sheet metal member having a louver therein, said sheet metal member being dimensioned to substantially close the open end of said conduit box and having extensions resting against the supporting means on the end walls of said box, signaling means carried by said sheet metal member on that side thereof facing inwardly of said box, screws passed through said extensions and threaded into the openings in said supporting means for securing said member in place, and a cover plate secured to said member and overlapping said box.

10. In construction of the character described, in combination, a conduit box having a knock-out in a wall thereof and having supporting means provided with threaded openings in opposed end walls thereof, a sheet-like member bridged across the open end of said box and extending substantially in the plane of said supporting means and resting on said supporting means, screws threaded into the openings in said supporting means for securing said member in place, said member having a portion intermediate of its ends that is of an area to substantially close the open end of said box, signaling means carried by said member on that side thereof facing inwardly of said box, said member having spaced threaded openings therein, a cover plate overlapping said member, and screws threaded into said spaced threaded openings in said member for securing said cover plate to the latter.

11. In construction of the character described, in combination, a sheet metal member having an intermediate louvered portion and end members bent at right angles thereto, signaling means carried by said member and positioned intermediate of said end members, and detachable means for completing the enclosing of said signaling means.

12. In construction of the character described, in combination, a sheet metal member having an intermediate louvered portion and end portions adapted to rest against and be secured to the supporting portions of an outlet box, said sheet metal member extending substantially in the plane of said supporting portions, signaling means carried by said member and mounted adjacent the inner face of said member, a member

substantially U-shaped in cross section and forming side and back walls for bridging over and covering said signaling means, the side wall portions of said U-shaped member having edge flanges extending in a plane substantially parallel to that of said sheet metal member, and means securing said flanges and hence said U-shaped member to said sheet metal member.

13. In construction of the character described, in combination, a sheet metal member having an intermediate louvered portion and end portions adapted to rest against and be secured to the supporting portions of an outlet box, said sheet metal member extending substantially in the plane of said supporting portions, signaling means carried by said member and mounted adjacent the inner face of said member, sheet metal means connected to the rear face of said sheet metal member and forming at least three covering walls extending substantially at right angles to each other and complementary to the intermediate portion of said sheet metal member, thereby to substantially enclose said signaling means on at least four sides thereof, one of said covering walls being apertured, and a terminal board of insulating material having a plurality of binding posts closing the aperture in said wall while exposing the binding posts there-through.

14. In construction of the character described in combination, a sheet metal member having end portions adapted to rest against the supporting portions of an outlet box and having an intermediate apertured portion of substantial area, said sheet metal member having spaced portions thereof bent at substantially right angles thereto to form spaced bounding walls, a gong, electromagnetic gong-striking mechanism, and means mounting said gong and mechanism in the space between said apertured portion and said bounding walls with at least one of them secured to one of said walls.

15. In construction of the character described, in combination, a conduit box having a knock-out in a wall thereof and having supporting means, electromagnetic signaling mechanism, and means relating said mechanism to said outlet box, said means comprising two complementary sheet metal means shaped so that, when placed together, they form a complete hollow enclosure, means mounting said signaling mechanism within said enclosure and between said two sheet metal means, one of said two sheet metal means being flanged at an end thereof and the flanged end engaging the other of said sheet metal means, means acting through said flanged end for holding said two complementary sheet metal means together, and means securing said assembled complementary sheet metal means to the supporting means of said conduit box.

16. In construction of the character described, in combination, a conduit box having a knock-out in a wall thereof and having supporting means, signaling means comprising a gong and

electromagnetic gong-striking mechanism, and means assembling said signaling means to said conduit box, said assembling means comprising two complementary sheet metal means shaped so that when assembled to each other there is formed thereby a completely enclosed space therebetween, means mounting said gong-striking mechanism within said space, means mounting said gong to one of said sheet metal means, one of said two sheet metal means having an area and shape to substantially match the open end of said conduit box and thereby form substantially a closure for the latter, and means securing said assembled complementary sheet metal means to the supporting means of said conduit box, thereby to hold said sheet metal means in box-closing position.

17. In construction of the character described, in combination, a sheet metal casing having a louvered front wall provided with opposed end walls extending substantially at right angles to the front wall, said front wall having extensions substantially in its plane adapted to rest against and be secured to the supporting portions of an outlet box, electric signaling means mounted to the rear of said louvered front wall and between said opposed end walls, a member of sheet material substantially U-shaped in cross-section and forming, when assembled to said louvered front wall, the three remaining walls of said casing and thereby completely enclosing said electric signaling means, a terminal board carried by one of said casing walls to the rear of said front wall and having a binding post exposed outwardly of said casing and in electrical connection with said signaling means, and means holding said U-shaped member in assembled relation to said front wall.

18. In construction of the character described, in combination, a conduit box having a knock-out in a wall thereof and having supporting means, signaling means comprising a gong and electromagnetic gong-striking mechanism, and means assembling said signaling means to said conduit box, said assembling means comprising two complementary sheet metal means, one of said two sheet metal means having an area and shape to substantially match the open end of said conduit box and thereby form substantially a closure for the latter, and the other of said sheet metal means comprising means of sheet material substantially U-shaped in cross-section and forming, when assembled to said one sheet metal means, a casing-like structure enclosed on at least four sides thereof, means mounting said gong and gong-striking mechanism within said casing-like structure, and means securing said assembled complementary sheet metal means to the supporting means of said conduit box, thereby to hold said one sheet metal means in box-closing position and said U-shaped member interiorly of said box.

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