

June 16, 1931.

J. M. G. FULLMAN

1,809,840

OUTLET BOX CONNECTER

Filed April 18, 1930

2 Sheets-Sheet 1

Fig. 1.

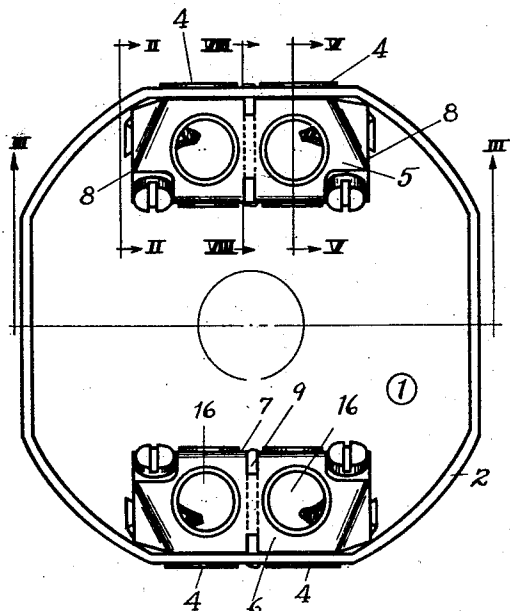


Fig. 2.

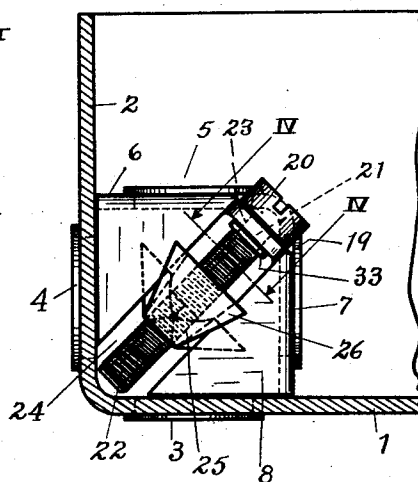


Fig. 3.

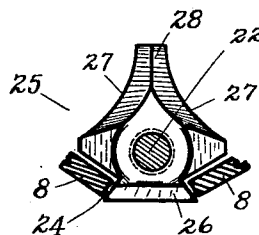
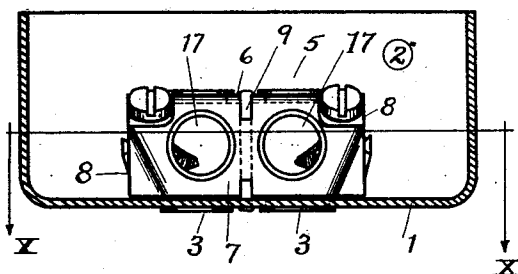


Fig. 4.

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2 Sheets-Sheet 2

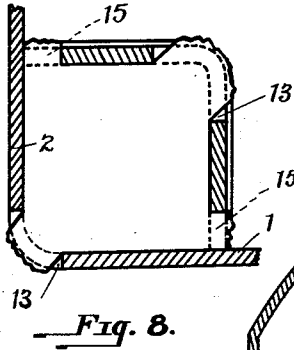


Fig. 8.

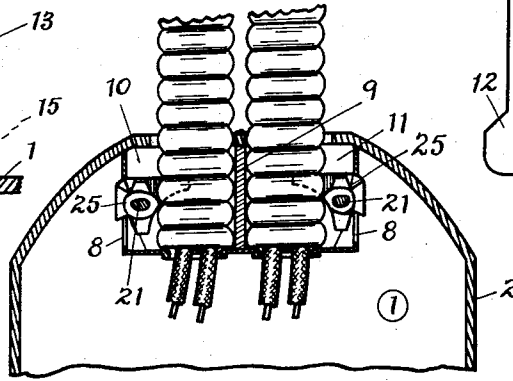


Fig. 10

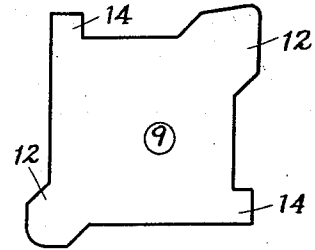


Fig. 9.

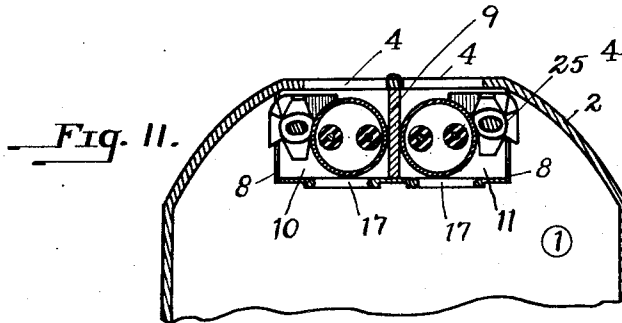


Fig. 11.

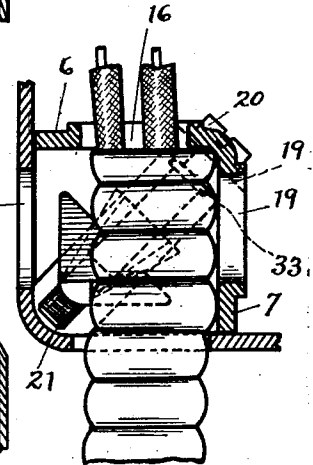


Fig. 7.

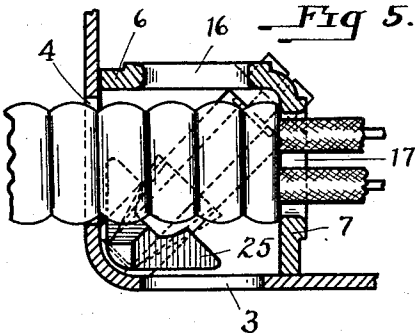


Fig. 5.

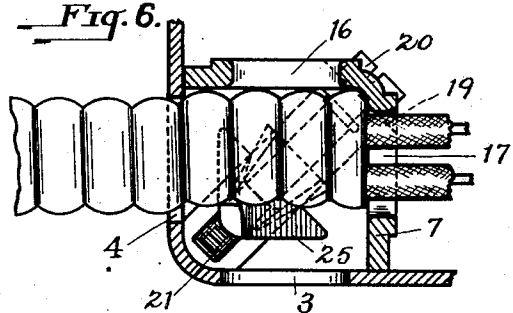


Fig. 6.

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UNITED STATES PATENT OFFICE

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OUTLET BOX CONNECTER

Application filed April 18, 1930. Serial No. 445,349.

In the accompanying drawings Figure 1 is a plan view of an uncovered outlet-box equipped with connectors embodying the invention in its preferred form. Figure 2 is a sectional elevation taken on the line II—II of Figure 1. Figure 3 is a sectional elevation taken on the line III—III of Figure 1. Figure 4 is a sectional view taken on the line IV—IV of Figure 2. Figures 5, 6 and 7 are sectional elevations all taken on the line V—V of Figure 1, but showing different conditions. Figure 8 is a sectional elevation taken on the line VIII—VIII of Figure 1. Figure 9 is an elevation of a partition member which is preferably included in the organization shown. Figures 10 and 11 are horizontal sections taken on the line X—X of Figure 3, Figure 10 showing in plan a pair of cables inserted through the side wall of the box, and Figure 11 showing in section a pair of cables inserted through the floor of the box. For the purpose of better illustration, Figures 2, 4, 5, 6, 7, 8 and 9 are drawn on a larger scale than Figures 1, 3, 10 and 11.

The body of the box, shown only conventionally, comprises the floor 1 and peripheral side walls 2, there being in the floor on opposite sides of the box pairs of adjacent aligned knock-out openings 3, 3, and in the side walls, near the floor and in alignment with the respective floor openings, the pairs of side knock-out openings 4, 4. One of the objects of the present invention is to provide an individual grip or clamping-member supported and operated by means altogether located within the box, and in small space, by means of which a cable inserted through either a floor-opening or a side-opening aligned in the same vertical plane may be secured firmly in place. For that purpose means are provided for causing the clamping-member to travel in a line which is inclined with respect to the cable; and the clamping-member is of such form as to enable it to engage the cable projected in either direction, while auxiliary means are also provided for guiding and retaining the clamping-member in its operative line of travel, thus imparting rigidity in a marked degree to the structure

as a whole. When, as is preferred, an inclined screw is employed for actuating the clamping-member, the actuating screw need not project through the box wall, nor need there be provided any seat or support for its tip, since it is held in proper position by the seat provided for its head within the box in conjunction with the auxiliary clamp-guide above mentioned.

As a means for supporting the individual clamp-actuating screws and for guiding the individual clamping-members in their respective lines of travel, I prefer to employ a housing 5 of general rectilinear form having a top-wall 6, a side-wall 7, and opposite end-walls 8, 8. This housing may be secured to the box walls by any suitable means. I prefer to employ for that purpose a partition plate 9 (Figure 9), which will serve to centrally divide the space within the housing into two compartments 10 and 11, said plate 9 having at its lower outer corner and at its upper inner corner the ears 12, which are passed through slots 13 in the lower corner of the box and the upper corner of the housing respectively and are riveted in place as shown in Figure 8. The plate 9 may also have supplemental ears 14 engaging slots 15 in the housing.

Openings 16, 16 for the passage of the cable conductors are formed in the top-wall 6 of the housing in alignment with the floor-openings 3, 3 and openings 17, 17 in the side-wall 7 of the housing in alignment with the side-openings 4, 4. Thus each compartment of the housing is provided with a pair of aligned horizontal bottom and top cable openings 3 and 16, and aligned vertical side cable openings 4 and 17, the centers of all four of said openings lying substantially in the same vertical plane. The edges of the openings 16 and 17 are preferably rounded or bushed in the usual way.

In the upper end corner of each compartment, that is to say, between the line of the cable-openings and the end-wall 8, there is formed an inclined seat 19 for the head 20 of the screw 21, the threaded shank 22 of which projects through the unthreaded hole 23 in the seat in an inclined position at or ap-

proximating an angle of forty-five degrees to the axis of a cable projected either horizontally or vertically through the compartment. The tip of the screw projects sufficiently beyond the line of passage of a cable in either direction to afford space for it to carry the clamping-member in its inactive or retracted position as to be explained presently and as shown in Figure 5. A washer 33 is compressed around the screw 21 immediately below the seat to retain the screw in place while the box is being handled. In the end-wall 8 of each compartment there is formed a guide, preferably such as the open slot 24, which is inclined at or approximating an angle of forty-five degrees to the axis of a cable projected either horizontally or vertically through the compartment.

The clamping-member 25 in its preferred form is shown in plan view in Figure 4. It is an internally threaded nut of generally triangular form having a rearwardly and upwardly projecting tail-piece 26 which lies in the slot 24. The tail-piece 26 is preferably of the dove-tail form shown, and it will be observed that the slot 24 is open at its lower end, so that the nut may be easily threaded upon the shank 22 of the screw 21 with the tail-piece in engagement with said slot. The edges of the opposite wings of the nut are in the form of segmental notches 27 of such radius as to approximate the radius of one of the knockout-openings 3 or 4, and to grip the surface of the cable projected through a knockout-opening, the surface of the nut being dished inwardly and upwardly from the edge 27, as indicated at 28.

Since the nut is held from turning by means of the tail-piece 26 engaging the slot 24 in the wall 8, the turning of the screw 21 will cause the nut to travel diagonally up and down upon the screw, so that in the upward movement of the nut one or the other of the segmental edges 27 will engage the surface of a cable projected through either a floor opening 3 or the corresponding side opening 4, and will clamp the cable firmly in place. Referring, for example, to Figure 5 of the drawings, there is shown a cable projected through one of the side openings 4, and the nut in inactive lowermost position. In Figure 6 the same organization is shown, with the nut drawn upwardly and engaging and clamping the cable in place. In Figure 7 there is shown a cable projected through the corresponding floor opening 3, and the nut drawn up and engaging the same.

In Figure 10 there are shown in elevation a pair of cables projected through a pair of adjacent side openings 4 in the wall of the box and clamped by nuts in their respective compartments. It will be observed that each cable is thus caused to bear against the inner edge of its knockout-opening 4 and against the partition 9, the latter holding the cable

against undue bending or twisting. It should be mentioned that the openings 17 in the side wall 7 of the housing are somewhat smaller in size than are the knockout-openings 4, so that the cut-away sharp edge of the cable armor rests against the inner face of the side wall 7, and the unarmored conductors are passed through openings 17. In like manner there are shown in Figure 11 a pair of cables projected into the box upwardly through the floor knockouts 3, 3, and the engaging edges of the opposite nuts 25 clamp the cable tightly against the inner edges of the knockout-openings and against the partition 9, as already stated.

Heretofore a single clamping-member having segmental notches has been employed to secure a pair of cables in an outlet-box, and in one position such clamping-member is arranged to grip both of the pair of cables inserted through a pair of knockout openings in the side wall, and in the other a pair inserted through the floor of the outlet-box. The clamping-member is provided with a centrally located threaded opening in engagement with a screw upon which it is caused to travel. Such structure is shown and described in Letters Patent No. 1,638,510. In another commercial structure the double clamping-member has been an angle-bar traveling upon a centrally located diagonally arranged screw operating through a central threaded hole in the apex of the angle, and having twin cable-engaging notches in each wing, so that without changing the location of the clamping-member and screw a pair of cables in parallel relation projected through either the side or the floor openings may be secured in place. Such structure is shown and described in Letters Patent No. 1,772,241.

While both of said structures are commercially practical, and have been used with success, they both present the difficulty that when used to grip a pair of cables considerable care is necessary in adjustment, and if used to grip only a single cable there is more or less tilting and consequent strain upon the clamping-member. Also the cables are often deflected from their proper course. Furthermore, there is great difficulty experienced in adjusting either form of these clamping-members to properly bond for grounding a pair of different sized cables, operated on by the same clamp. It often happens in practice that one cable has been clamped in place within an outlet-box, and that later it is desired to install an additional cable. In such event it is necessary first to loosen the clamp, releasing the first installed cable, in order to permit the installation of the second cable. Frequently the first intalled cable escapes from the clamp, or is so misplaced as to make the task dangerous to the worker. That is

to say, the clamp sometimes engages the electrical conductors instead of the armor, thus grounding the electrical circuit, and necessitating the repetition of the clamping operation. If this defect be discovered after the plastering has been completed, as has often been the case, manifestly, great additional expenses ensue. It may still further be mentioned that the clamp-moving screws in many of these structures in use to-day project from the outlet-boxes with which they are associated. Such projection of screws is objectionable.

By the present invention the above mentioned difficulties are avoided. There is provided an individual clamping-member which can be operated to secure independently a cable projected through either a floor-opening or a companion side-opening, and operating in conjunction with an opposite wall or walls located close to the opening, so that the cable is firmly clamped in place, while the clamping-members are each easily adjusted, there are no members projecting through the box-wall, and a minimum of space is occupied within the box.

What I claim is:

1. The combination of an outlet-box for electrical conductors having a bottom-wall and a side-wall, of a partition fixed to and projecting inwardly and upwardly from said walls, an opening through each wall located at one side of said partition, a screw rotatably retained within said outlet-box, said screw being inclined inwardly and upwardly from the line of intersection of said walls, and a clamping-member mounted upon and in threaded engagement with said screw, whereby by turning said screw the said clamping-member is caused to travel thereon and to engage a conductor inserted through either of said wall-openings and bind it laterally against said partition.

2. The combination with an electrical outlet-box having arranged side-by-side a pair of wall openings for the passage of electrical conductors, of a housing within the box having opposite end walls arranged respectively on the opposite sides of said pair of box-wall openings, an intermediate partition between said box-wall openings, and an inner wall having openings arranged on opposite sides of said partition for the passage of said conductors, guides formed in said opposite end walls of the housing, a threaded screw rotatably mounted in said housing adjacent to each of said opposite end walls, and a clamping-member in threaded engagement with each screw and in traveling engagement with the guide in the adjacent end wall of the housing, whereby on turning the screw its associated clamping-member is caused to engage and to bind against said partition a conductor passed through the box-wall opening adjacent to said screw.

3. The combination with an electrical outlet-box having a peripheral side wall and a floor, a pair of openings for the passage of electrical conductors arranged side-by-side in said side wall and a pair of like openings arranged in said floor in alignment respectively with said side-wall openings, of a housing within the box having opposite end walls arranged respectively on the opposite sides of said group of wall and floor openings, an intermediate vertical partition between the aligned pairs of side and floor openings, and an inner wall having openings on opposite sides of said partition for the passage of said conductors, inclined guides formed in said opposite end walls of the housing, a correspondingly inclined threaded screw rotatably mounted in said housing adjacent to each of said end walls, and a clamping-member in threaded engagement with each screw and in traveling engagement with the guide in the adjacent end wall of the housing, whereby on turning the screw its associated clamping-member is caused to engage and to bind against said partition a conductor passed through either the side-wall opening or the floor opening adjacent to said screw.

4. The combination with an electrical outlet-box having arranged side-by-side a pair of wall openings for the passage of electrical conductors, of a housing within the box having an inner wall provided with openings for the passage of said conductors, a slot in the box-wall and a slot in the housing lying in a common plane passing between said wall-openings, a partition in said housing also arranged between said openings and having projections passing through said slots and bent inwardly to secure the housing in place, and means within the housing on opposite sides of said partition for binding against the opposite faces of said partition the conductors passed through said respective wall openings.

In testimony whereof I have hereunto set my hand.

JAMES M. G. FULLMAN.