July 10, 1951 V. R. DESPARD 2,560,507

MOUNTING STRAP FOR INTERCHANGEABLE WIRING DEVICES

Filed June 18, 1948

FIG. 1.

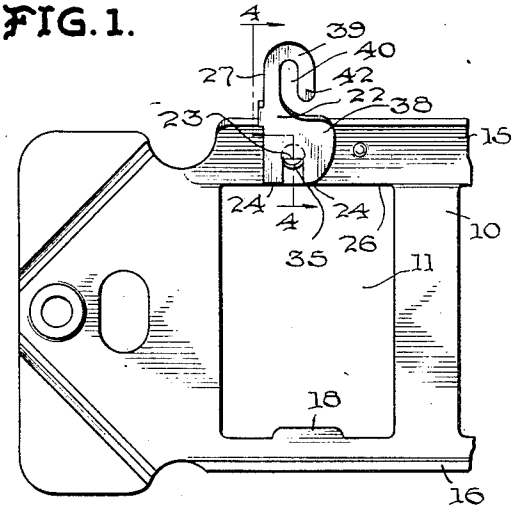



FIG. 2.

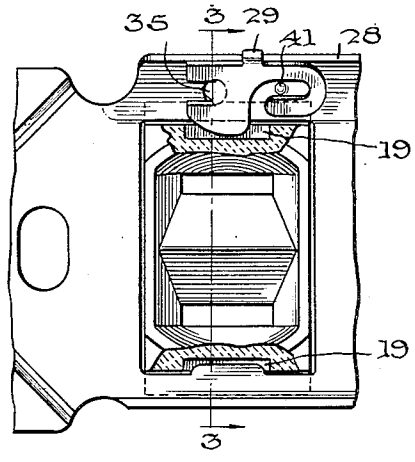



FIG. 3.

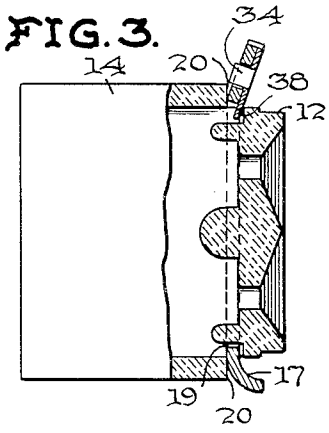



FIG. 5.

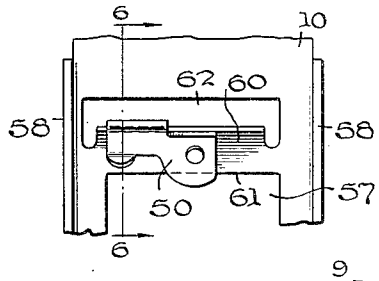
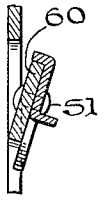



FIG. 6.



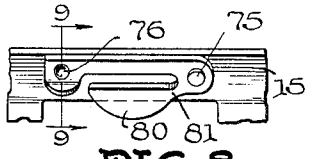
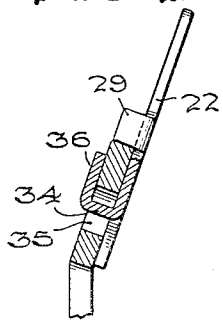




FIG. 8.

FIG. 4.



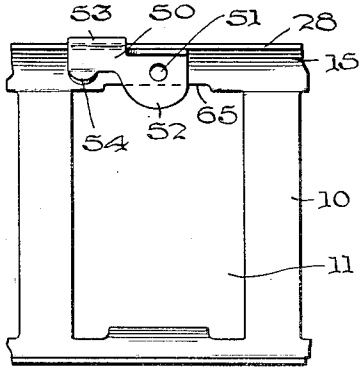




FIG. 7.

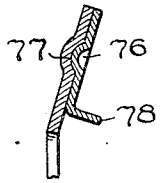



FIG. 9.

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## MOUNTING STRAP FOR INTERCHANGEABLE WIRING DEVICES

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Application June 18, 1948, Serial No. 33,756

6 Claims. (Cl. 174—53)

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This invention relates to mounting straps or bridge plates of the type adapted to span the front or open face of an outlet box and to receive and support therein one or more wiring devices of the interchangeable type, disclosed in general in reissue Patent No. Re. 19,092, granted February 20, 1934, to Victor R. Despard.

Improvements in the methods of and means for supporting the interchangeable wiring devices in the bridge or strap are disclosed in Despard Patent No. 1,992,059, granted February 19, 1934, and in the Despard and Russell Patent No. 2,248,201, granted July 8, 1941. The embodiments of the invention disclosed in these several patents have long been and are still on sale on a commercial scale by several large manufacturers and have achieved wide popularity for home and office wiring and similar uses.

The present invention contemplates improvements in the mounting strap or bridge plate to increase the facility with which wiring devices may be inserted therein or removed therefrom in assembling various combinations of the same for use as required.

In the constructions disclosed in the last two mentioned patents the means for engaging and securing the wiring device neck to the walls of its opening in the bridge plate are an integral part of the plate and require the use of a tool for forming or deflecting them into the recesses in the neck for receiving them. A tool is also required to remove a wiring device from the bridge and difficulty may be experienced in reusing the latter thereafter.

It is a general object of the present invention to provide novel and improved locking or securing means for fastening wiring devices in their openings in mounting straps without the use of tools.

More particularly it is an object of the invention to provide bridge plates or mounting straps in which one side of each opening is fitted with fixed means to retain one side of the wiring device neck and in which the other side is equipped with a manually operable locking means which can be engaged with the neck or withdrawn without the use of any tools.

An important object of the present invention resides in the provision of a sheet metal locking element permanently articulated to the metal of the bridge and provided with a camming wedge for entering the receiving recess in the neck of a wiring device positioned in the receiving opening in the bridge.

Another important object of the invention resides in the arrangement of a sheet metal locking lever pivoted to the bridge, having a manipulating portion for engagement by the fingers, a camming wedge part for securing the wiring device in position, and a spring latch for holding the lever in locking position.

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One of the features contributing to the effectiveness of the locking means is the provision for mounting it on a wall of the bridge which is canted or tilted out of the plane of the bridge so as to project the wedging cam down into the wiring device receiving opening better to engage the recess in the neck of the device.

Another important feature of the preferred form of the invention resides in the one piece construction of the locking lever and its pivot and latch.

Other and further features and objects of the many embodiments of the invention will be clear to those skilled in the art from a consideration of the accompanying drawing and following specification, it being understood that such combinations and modifications of the embodiments illustrated may be made as fall within the scope of the appended claims without departing from the spirit of the invention.

In said drawing:

Fig. 1 is a fragmentary front elevation of a bridge provided with the preferred embodiment of the present invention, the bridge being of the three opening style to accommodate wiring devices side-by-side relation, the locking lever being shown in its open or retracted position;

Fig. 2 is a view similar to Fig. 1 but showing a wiring device in position and partially in broken section and with the locking lever in closed or locked position;

Fig. 3 is a transverse section taken on line 3—3 of Fig. 2;

Fig. 4 is a fragmentary section taken on broken line 4—4 of Fig. 1 illustrating the construction of the unitary pivot for the locking lever;

Fig. 5 is a fragmentary front elevation of a single opening mounting bridge equipped with a modified form of locking lever illustrated in the closed position;

Fig. 6 is a section on line 6—6 of Fig. 5;

Fig. 7 is an elevation of a fragment of a three opening bridge equipped with a locking lever of the type shown in Figs. 5 and 6 but showing a modification of the wall supporting the lever to facilitate the operation of the camming wedge;

Fig. 8 is a fragmentary elevation of a three opening bridge equipped with a further embodiment of the invention; and

Fig. 9 is a section taken on line 9—9 of Fig. 8.

This invention is illustrated in several embodiments, differing principally in details of construction of the locking lever, which is secured to the bridge plate or mounting strap to position the wiring device in an opening therein. The reference character 10 is applied in all figures to the bridge which is not substantially different from the type of bridge generally illustrated in Figs. 1, 2 and 3 of the Russell and Despard Patent 2,248,201, granted July 8, 1941.

The bridge plates as now manufactured occur in two general forms, that illustrated in Fig. 5 intended to hold only a single wiring device and with its major axis parallel to that of the bridge. In the other form of the plate, as shown in the remaining figures, three openings, for the reception of wiring devices, are provided arranged to hold them in side-by-side relation with their long axes transverse to that of the plate. These openings 11 are in general of rectangular formation and are sized to accommodate with only minimum or manufacturing tolerance the reduced rectangular neck 12 of any wiring device 14, such as a switch, outlet, pilot light, etc.

Each bridge is stamped from relatively heavy gauge sheet steel and is reinforced against bending by having its longitudinal edges bent up at a substantial angle to provide reinforcing flanges 15 and 16 as seen in several of the figures, notably Fig. 1. This not only affords greatly increased stiffness but provides extended edges against which the back face of the wall plate engages to give it added resistance to bending.

In accordance with the showing in the patent previously referred to, the flange 16 may merge into the plane surface of the plate on a relatively large radius 17 best seen in Fig. 3, to provide clearance beneath the plate close up to one end wall of each opening 11 for aid in inserting the neck of the wiring device. The lug 18, seen in Fig. 1, forms an extension of this flange on a continuation of curve 17, and projects but a short distance into opening 11 and has its ends spaced from the long sidewalls thereof. This lug is adapted to be inserted in a recess or slot 19 in the corresponding short wall of neck 12 of the wiring device when the same is presented at the proper angle into the plate opening. Such angle includes having the shoulder 20, which is just beneath the recess in the wiring device, abutting the curve 17 and the opposite end of the neck just ready to swing into the opening in the bridge. With the lug in the slot the wiring device is rotated about the lug as a pivot until the whole shoulder 20 fully engages the back face of the plate.

The corresponding recess 19 in the other short wall of the neck is now in the plane of the bridge plate and adapted and positioned to receive the locking device of the present invention. These recesses 19 in the neck walls are relatively short, in the direction of the neck length and have here a dimension not substantially greater than the thickness of the metal of the bridge plate. The lug 18 therefore has a relatively close fit in the recess and insures against any substantial movement of the wiring device in the plate. Furthermore the upper wall of each recess is engaged by an inclined surface to improve the action of drawing the shoulder 20 against the back surface of the bridge, as will be further described.

For the purpose of locking the wiring device in its opening in the plate, a separate manually



operable locking device or lever 22 is provided. In the preferred embodiment of Figs. 1 to 4, inclusive, such lever is stamped from relatively thin sheet steel in an integral construction including its pivot. As seen in Fig. 1 the lever is of odd and irregular shape, having a pivot axis 23 from which the short furcations 24 extend a distance equivalent to or less than the distance from the pivot axis to the edge 26 of the opening 11 in the plate. The straight rear or outer edge 27 of the locking lever is, when in the locking position, adapted to coincide with the edge 28 of the plate flange 15. It is equipped with a stop lug or flange 29 which engages against 28, as seen in Fig. 2, to limit the rotation of the locking lever about its pivot to the fully locked position shown there. The pivot for the locking lever is a narrow strip 34 struck down from the surface thereof and is formed from the metal cut from between the tabs 24 previously explained. It originally is directed rearwardly as seen at 34 in Fig. 4 and passes through a circular opening 35 in flange 15 having a close fit with the edges thereof. After the lever has been positioned on the flange 15 with the pivot tab 34 projecting through the opening the lower end of the tab is bent 90° as seen at 36 to have a close engagement with the back face of the bridge, thereby frictionally holding the lever in any position to which it may be rotated.

The important part of the locking lever is the camming wedge portion 38 which extends opposite the edge 27 with an increasing radius from the right hand tab 24 through approximately 90°, forming an involute type of cam which is projected gradually out beyond the edge 26 of the wiring device opening in the bridge as the lever is swung in a clockwise direction from the position shown in Fig. 1 to the position shown in Fig. 2. During this 90° movement the cam or wedging surface is slowly projected downwardly and inwardly to engage closely with the walls of the slot or groove 19 in the neck of the wiring device. The inclination of this engagement is controlled by the angle of flange 15 to the body of the bridge and is best seen in Fig. 3, where the cam portion 38 is seen engaging beneath the upper edge of the slot 19 in the neck of the wiring device. It thus engages in somewhat the manner of the lug 18 and insures a close bearing of the shoulder 20 against the under face of the bridge.

In order to provide for manipulating the locking lever the extension or end 39 is provided beyond stop flange 29. This is in the form of an open loop or link but still in the same plane as the major portion of the lever. Its opening or eye 40 is arranged to engage over the struck-up stud 41 formed in the flange 15 of the bridge member. The free and inwardly projecting end 42 of the locking loop is flexed when passing over the projecting stud 41 as the lever is brought to the locking position of Fig. 2, and then snaps down behind it to engage its side and securely latch or lock the lever in the holding position of Fig. 2, from which it can be removed only by an intentional force applied in a direction to lift the tab 42 over the stud 41 as will be appreciated. This insures against any unwanted loosening of the wiring device in the bridge under any conditions.

In the embodiment of Figs. 5, 6 and 7, the locking arm 50 is not substantially different in operation and construction from that in the preferred embodiment. It, too, is stamped from a

thin sheet of steel, but, instead of having an integral pivot, is attached to the flange 15 by means of a rivet 51. Its cam surface 52 is arranged about like that in the preferred embodiment and the finger piece of the lever has a stop flange 53 extending to its outer end and adapted to engage the upper edge 28 of flange 15 to limit the movement of the lever in the locking direction. A struck-up tab 56 adjacent the end of the lever provides convenient surface for operating the device either in the opening or closing direction. No locking mechanism is provided and none is necessary because of the use of a separate pivot-rivet which provides sufficient friction to insure the locking lever remaining in any position in which it is placed.

In Figs. 5 and 6 this same form of locking lever 50 is shown on a bridge member of the type having but a single opening 57 in which the wiring device is arranged with its long axis coincident with that of the bridge. This means then that the locking lever 50 must be arranged intermediate the edges of the bridge member rather than along one of the side flanges as shown in Fig. 7 or in the earlier figures. This arrangement permits the side flanges 58 of the bridge to be bent up at right angles to the body portion of the bridge. The different location of the locking lever 50 requires that it be arranged on a tilted intermediate web member 60 formed between the edge 61 of the opening 57 for the wiring device and a transverse slot 62. As seen in Fig. 6 this web member is tilted to insure the same inclination for the cam surface of the locking lever as is effected by the tilted flange 15 in the other embodiment. The opposite wall of the opening 57 for receiving the wiring device is of course provided with a lug similar to that shown at 18 in Fig. 1.

In Fig. 7 is shown a slight modification over the embodiments of Figs. 1 to 6, inclusive. Here the locking lever is applied to the three-opening bridge and thus is mounted on the flange 15, although this makes no difference in respect to the feature now to be described. The end wall of the opening adjacent to which the locking lever is mounted is recessed shallowly in the middle to provide a bay or enlargement 65. This in effect draws back the edge of the recess and makes more room for the entrance of the cam wedge portion of the locking lever, so that it has more ready access to the slot 19 in the neck of the wiring device in which it is to be received. It also permits the cam to spring below the slot 19 edge in case of any inaccuracies in fit, without interference by the edge of the plate opening. Obviously this recess 65 can be incorporated in any of the embodiments disclosed.

The final form of the invention is shown in Figs. 8 and 9. In this construction the locking lever is somewhat longer than in the other embodiments and has a separate rivet-like pivot 75 arranged at one end thereof almost in alignment with one of the long walls of the opening in the bridge. The opposite end of the lever is provided with a projection on the back face effected by dimpling the front face as seen in 76. This projection is adapted to be received in a correspondingly positioned depression 77 in the flange 15 of the bridge member, thus providing a stop and locking means determining both when the locking lever has been moved sufficiently far and insuring it remaining in this position until withdrawn by suitable pressure on the turned up finger tab 78, seen both in Figs. 8 and 9.



The locking cam in this particular embodiment is not a spiral about the pivot but a lenticular tab 80 secured only by a narrow spring tongue 81 to the main portion of the locking lever adjacent its pivot. This spring attachment permits the portion or tab 80 to bottom in the recess in the neck of the wiring device if desired, and to be resiliently held there when further movement of the lever is effected to drop the latch 76 into its recess 77. This construction, in common with the one illustrated in Figs. 5, 6 and 7, uses a separate rivet as a pivot, which may be adjusted to any degree of tightness desired for the operation of the mechanism and to insure its remaining in any position set until changed by manual manipulation.

All of the embodiments defined herein have in common a simplification of the mounting of wiring devices in their bridges, and each may be applied to either of the two common forms of bridge members.

Each of the fastening means includes a permanent lug for supporting one end of the neck of the wiring device by engaging in its recess, and is provided with a manually operable locking or wedging means for engaging the opposite recess in the neck and simultaneously drawing the shoulder of the wiring device against the rear face of the bridge to insure rigid and effective mounting thereof. All of the devices are operable without the need for any tools, which greatly facilitates the mounting of wiring devices and reduces the amount of time and labor involved in so arranging them. Furthermore, in the event that improper elements are inadvertently positioned in the mounting bridge, they can be quickly removed and/or replaced, and this can be done as often as desired without any tendency toward deforming or breaking the mounting elements so as to prevent their re-use. Each of the mounting elements has its cam so arranged in cooperation with its pivot and/or latching means as to insure remaining in engaged position under all conditions short of intentional removal.

I claim:

1. In an electric wiring apparatus, in combination, a bridge plate for mounting over an outlet box and having an opening with a pair of opposite walls; a wiring device for support by said plate and having a shoulder to engage the plate back, a neck protruding from said shoulder to extend through said opening with only tolerance clearance from said walls and a recess in each neck side adjacent said walls and extending outwardly along the neck from the shoulder a distance not substantially greater than the thickness of said plate; one of said walls having a permanent lug thereon for extension into one of said recesses, a flange inclined upwardly from the opposite wall of the opening and directed away from the shoulder engaging portion of the plate, and a locking lever of sheet metal pivotally secured to the said flange adjacent said opening and having a camming projection movable over and beyond the opening wall into the other neck recess.

2. In an electric wiring apparatus, in combination, a bridge plate for mounting over an outlet box and having an opening with a pair of opposite walls; a wiring device for support by said plate and having a shoulder to fit against the plate back adjacent said walls, a neck protruding from said shoulder to extend through said opening with only tolerance clearance from said walls and a recess in each neck side adjacent said walls extending outwardly along the neck from

the shoulder a distance not substantially greater than the thickness of said plate; one of said opening walls having a permanent lug thereon for engagement in one of said recesses, a sheet metal locking lever, an integral tongue projecting from said lever through a hole in said plate to pivot the lever on the plate adjacent the other wall of said opening, said plate adjacent said hole, lever and other wall being deflected up out of its plane and away from said shoulder and a cam projection on said lever for extension over said last wall substantially in the plane of said deflected portion and into the opposite neck recess to secure the wiring device in position in the opening.

3. For use with electric wiring apparatus, a bridge plate for mounting on an outlet box and having an opening with opposite walls to receive the neck of a wiring device, one of said walls having a lug projecting slightly into the opening, a portion of the plate adjacent the opposite wall being deflected out of the plane of the plate, a flat locking lever pivoted to said portion of the plate and movable thereover, and a coplanar projection on said lever for extension over the opposite wall to project into said opening.

4. For use with electric wiring apparatus, a bridge plate for mounting on an outlet box and having an opening with opposite walls to receive the neck of a wiring device, one of said walls having a lug projecting slightly into the opening, a portion of the plate adjacent the opposite wall being relieved for a space less than the length of said wall, a locking lever for the said neck including a curved element movable into said opening through the said relieved space, said lever being formed from sheet metal to include a stop flange.

5. A bridge member for a plurality of wiring devices each of which is equipped with a neck protruding from a shoulder and each adapted to be received closely and separately in a generally



rectangular opening extending transversely of said bridge with the shoulder abutting the bridge back, flanges extending upwardly from the long edges of the bridge, a pair of opposite walls defining the ends of each opening, one of said flanges having its inner edge coincident with the end walls on its side, each of said walls opposite said last mentioned flange having a centrally disposed lug projectiong slightly into said opening to engage in a recess in said neck, a neck locking device mounted adjacent the opposite wall and comprising a sheet metal locking lever having an integral mounting portion, a cam portion and a free end portion, and means including said last mentioned flange locating the mounting portion on said bridge in a position to project the cam portion over the adjacent wall opposite said lug and into said opening to engage a second recess in said neck.

6. The bridge member as defined in claim 5 in which the free end of the lever is formed as an elongated loop in which the inner end of the side facing the said opening is free and a lug struck-up from the bridge and cooperating with the free inner side of said loop to hold the lever snapped in locking position.

VICTOR R. DESPARD.


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