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H. HUBBELL, JR

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SCREWLESS SWITCH AND RECEPTACLE IN OUTLET BOXES

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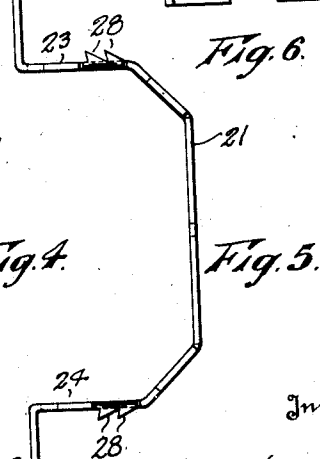
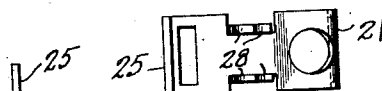
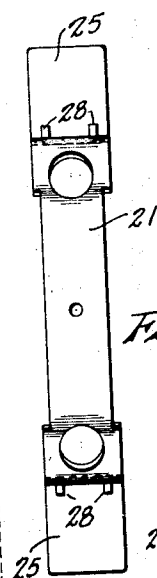
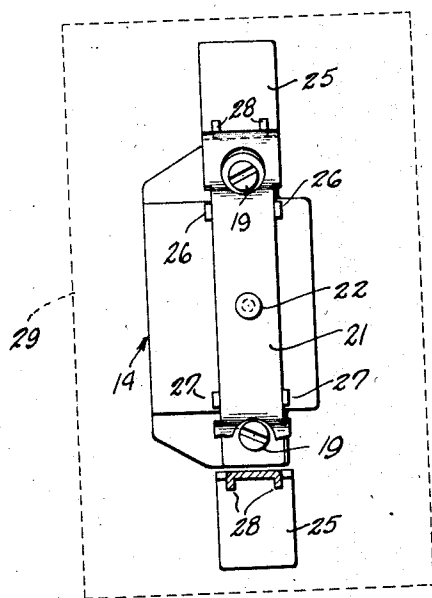
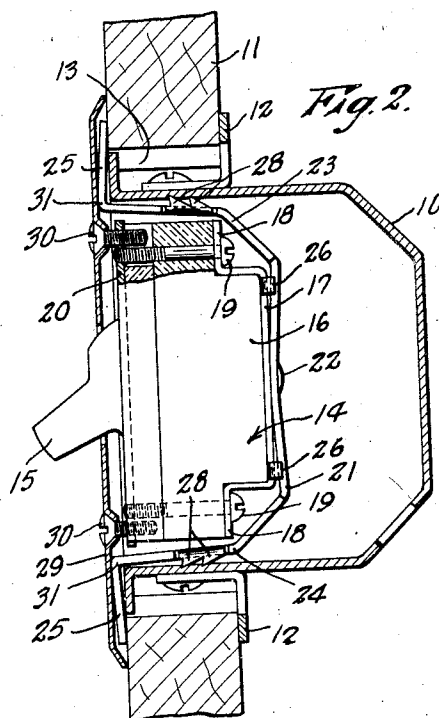
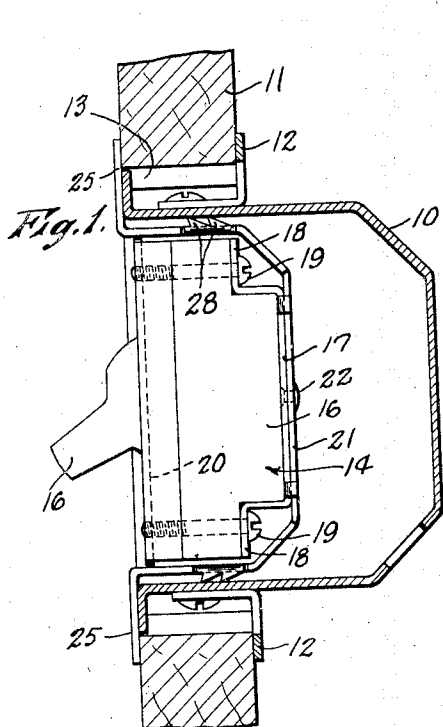


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Inventor

Harvey Hubbell Jr.

Wooster & Davis

Attorneys

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SCREWLESS SWITCH AND RECEPTACLE
IN OUTLET BOXES

Harvey Hubbell, Jr., Bridgeport, Conn.

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12 Claims. (Cl. 247—20)

This invention relates to new and useful improvements in means for mounting switches, outlet receptacles and the like, in wall boxes.

An object of the invention is to provide a means for mounting switches, outlet receptacles and the like in wall boxes without the use of screws or similar securing means.

Another object is to provide a means for mounting outlet receptacles and switches and the like in wall boxes in such a manner that after the usual closure or cover plate is applied the position of the switch or receptacle in the box may be shifted to straighten it or otherwise correct its position without removing the cover or finishing plate.

A further object is to provide a means for mounting switches, outlet receptacles and the like in wall boxes, which means permits of the switch or receptacle being pressed into the box and moved or shifted from side to side therein but prevents casual withdrawal of the switch or receptacle from the box.

An additional object is to provide a means having the characteristics stated and wherein the switch or receptacle is held in the wall box by means of spring pressure.

Yet another object is to provide a means for the purpose and having the characteristics stated and wherein the switch or outlet receptacle is held in the wall box by spring means, the spring means including a tooth so placed as to tend to dig into the wall of the box and prevent casual movement of the switch or receptacle in a direction outwardly of the box.

A further object is to provide a means for mounting a switch or outlet receptacle or other electrical convenience in a wall box, which means includes means whereby the switch or receptacle may be placed in a desired adjusted position with respect to the front edge of the box to compensate for the improper locating of the box.

Still another object is to provide a means for mounting a switch, outlet receptacle or other electrical convenience in a wall box, which means includes means brought into forceful engagement with a wall of the wall box on the tightening of the screws employed for securing the usual cover or finishing plate in position.

A more specific object is to provide a means for mounting a switch or the like in a wall box which means includes a spring means carried by the part to be mounted and having a tooth whereby the part and spring means may be pushed into the wall box and is held against casual withdrawal therefrom but is shiftable therein, the

spring means being so arranged and constructed that on the tightening of the screws employed for securing the cover or finishing plate the said tooth is caused to dig into a wall of the box.

The invention also includes certain features of construction, combination and arrangement of parts as will be hereinafter described and particularly pointed out in the claims.

Additional objects and advantages will also appear from a consideration of the following detailed description taken in connection with the accompanying drawing wherein an embodiment of the invention as applied to the mounting of a switch is shown. However, it will be clear that the invention is not limited in its application to the mounting of switches or to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention or the scope of the appended claims to which claims reference should be had for a definition of the invention.

In the drawing:

Fig. 1 is a vertical sectional view through a wall box and showing a switch mounted therein by the means of the present invention;

Fig. 2 is a view somewhat similar to Fig. 1 but showing the parts after the wall plate has been secured in position;

Fig. 3 is a rear view showing the mounting means of the invention assembled on a switch, a portion of the means at the lower end of the switch being broken away;

Fig. 4 is a view of the mounting spring or strap alone;

Fig. 5 is an edge thereof; and

Fig. 6 is an end elevational view of the mounting spring or strap.

As has been suggested the mounting means of the present invention is in its broad concept adapted for mounting switches, outlet receptacles or other electrical conveniences in wall boxes. Therefore, while in the drawing and description the invention is shown and described as applied to the mounting of a switch in a wall box it is to be understood that this is only by way of disclosing the invention as applied to the mounting of one type of convenience and that the invention is not limited to use in the mounting of switches but comprehends the mounting of any electrical convenience in a wall box. Consequently, whenever in the description reference is made to a switch it will be understood that this is for the purpose of disclosing one practical application or use of the means of the invention and that wherever in the claims reference is made to an

"electrical convenience" the term is intended to apply to any switch, outlet receptacle or other electrical convenience.

In the early stages of building construction wall boxes and electrical wiring are installed and when the building is substantially completed, lath and plaster or other wall material having been applied, the electrical installation is completed and the cover or face plates for the wall boxes are applied. Heretofore, the switch, outlet receptacle or the like has ordinarily been mounted or secured in the wall box by means of a pair of screws threaded through a strap on the switch or receptacle and into flanges or lugs on the box. The openings through which the screws pass in the strap are elongated to provide for lateral adjustment of the switch or receptacle in the box whereby the same may be properly positioned. After the switch is positioned and secured by these screws the cover plate is applied and secured by screws passing into the strap. After this work has been completed it is often discovered that the switch or outlet is not properly positioned in the box and that consequently the cover plate is not properly positioned to align with moulding, door frames and the like.

It is then necessary to remove the cover plate and remove or loosen the screws fastening the switch or other convenience to the wall box and to make another attempt at properly positioning the convenience in the box after which the screws are tightened and the cover plate applied. Thus, it will be seen that the switch or outlet receptacle or other convenience is mounted by the "cut and tried" method and that on each attempt to properly position the convenience in the wall box four screws must be operated and that considerable time and effort is lost in this work. The present invention provides a means whereby the switch, outlet receptacle or other convenience may be mounted in a wall box and properly positioned or aligned therein without the loss of time.

Referring in detail to the drawing, at 10 is shown a conventional wall box which may be secured to a base board or panel 11 as by means of screws passing through clips 12 on the wall box. As here disclosed the wall box 10 is mounted in an opening 13 in the base board or panel 11 and has its front edge flush or substantially flush with the front or forward face of the panel or base board. This is usual construction and has no particular relation to the means of the present invention since in so far as the present invention is concerned the wall box may be mounted by any suitable means.

While as previously stated the means of the present invention is adapted for mounting any electrical convenience it is herein disclosed as employed in the mounting of a snap switch 14 including an operating handle 15 and a body 16 within which is included the usual spaced contacts and the shiftable switch element adapted to be operated by the handle 16. Disposed against the inner or rear side of the body 16 is a strap 17 having ears 18 through which screws 19 pass. At the outer or front side of the body 16 and surrounding the handle 15 is a yoke 20 and the screws 19 pass through the body and are threaded into the respective ends of the yoke 20 whereby to secure the strap 17 and the yoke to the body and also to secure the portions of the body together. The yoke 20 has a further function as will later appear.

A substantially U-shaped strap like spring

member 21 has its bight portion secured to the strap 17 by means of a rivet 22 passing through the central portion of said bight portion of the spring 21. The arms 23 and 24 of the spring 21 are disposed to extend along the sides or ends of the body 16 of the switch and the free ends of these arms are out-turned or angularly disposed as shown at 25. Strap 17 carries spaced pairs of lugs 26 and 27 and the lugs of each pair are disposed one at each side or edge of the bight portion of the spring at points spaced from the rivet 22 whereby turning movement of the spring with the rivet as an axis is prevented.

Portions of each of the arms 23 and 24 are out-turned and broached and hardened to provide teeth 28. As disclosed in the drawing two of these teeth 28 are formed at each edge of each of the arms of the spring member 21 although it will be understood that more or less teeth may be provided and that if desired the teeth may be disposed along the longitudinal axes of the arms rather than at their edges as disclosed. The function of the teeth 28 is to secure the switch 14 or other electrical convenience as the case may be within the wall box 10.

With the spring 21 mounted on the switch or other convenience as described the switch may be easily installed in a wall box. It is but necessary to insert the switch into the box as shown in Fig. 1 and owing to the resiliency of the spring 21 the arms 23 and 24 of the spring tend to move away from the sides or ends of the body of the switch and thereby bring the teeth 28 into engagement with opposite walls of the wall box. Since the teeth 28 are sharpened or pointed at their ends they tend to dig into the wall of the box and any effort to simply draw the switch from the box will result in a further digging of the teeth into the wall of the box.

However, the switch may be shifted laterally in the box so as to properly position it and if necessary one end of the switch may be shifted without shifting the other end thereof so that the switch may be straightened after being disposed in the box. To remove the switch from the box it is first necessary to press the arms 23 and 24 of the spring 21 toward each other or toward the body of the switch whereby to draw the teeth 28 out of engagement with the walls of the wall box. This may be done by engaging the end portions 25 of the arm with the thumbs.

Should the wall box be improperly positioned, as for example should its open end not be flush with the plaster of a wall, then the device of the present invention will serve to properly position the switch with respect to the surface of the wall as the ears 25 engage the surface of the wall and properly position the member 16. With the open end of the wall box below the surface of the plaster the switch will simply be inserted until the end portions 25 of the arms of the spring engage the plaster and the switch will then be properly positioned. The teeth 28 on the arm will function as before to secure the switch against casual withdrawal from the wall box. It will be evident that this construction and arrangement permits considerable adjustment or variation in the positioning of the parts as it is only necessary that the device extend sufficiently into the box so that the teeth can engage the walls of the box to be securely held therein, or it can be inserted until ears 25 engage the front end of the box.

After the switch is inserted into the wall box as shown in Fig. 1 a wall or cover or finishing plate 29 is, of course, applied. This plate extends

over the opening 13 in the wall and also extends over the end portions 25 of the spring 21. The plate is secured to the switch by screws 30 passing through the plate and threadable through the end portions of the yoke 20 as clearly shown in Fig. 2. After the screws 30 have been threaded through the yoke 20 sufficient to maintain the plate 29 in place, the plate may be shifted to properly position or align it and this shifting movement of the plate will, of course, result in a shifting and proper positioning or aligning of the switch.

When the plate is properly positioned the screws 30 are tightened and as these screws are tightened the switch 14 is drawn toward the cover plate. This action occurs since the edges of the plate are in engagement with the wall and the plate may not therefore move toward the switch. As the switch is moved toward the plate 29 the portions 31 of the arms 23 and 24 of the spring 21 engage the under-side of the cover plate and also the teeth 28 engage the walls of the box and the spring may not therefore move outwardly of the wall box with the switch. This results in a spreading or forcing apart of the arms 23 and 24 with the result that the more the screws 30 are tightened the more the teeth 28 are forced against the opposite walls of the box 10.

The action that takes place will be readily appreciated when it is noted that the outward movement of the switch 14 results in a similar movement of the rivet 22 and as this rivet moves outwardly it carries the central portion of the spring with it and since the arms of the spring may not also move outwardly of the wall box they tend to spread apart. When the cover plate is properly secured after a tightening of the screws 30 the switch is securely held or locked in the box 10 and the cover plate cannot be pried loose since it also is securely anchored by the spring, or by the teeth of the spring, being attached to the switch 14.

From the foregoing it will be apparent that by the means of the present invention switches, outlet receptacles or other electrical conveniences may be easily mounted in wall boxes and may be quickly adjusted or aligned therein without the necessity of repeatedly removing the cover plate and re-adjusting the convenience by the cut and try method. When the screws 30 are tightened the whole device including this plate are securely locked in position. Also, it will be appreciated that while the invention is shown as applied to the mounting of the switch it is not limited to such use but may also be applied to the mounting of outlet receptacles and the like.

Having thus set forth the nature of my invention what I claim is:

1. In an electrical convenience, a body, spring means carried by the body to engage opposite side walls of a wall box, and said spring means carrying teeth having sharp ends adapted to be pressed into engagement with and dig into the opposite side walls of the box by the spring means to mount the convenience in the box.

2. In an electrical convenience, a body, a substantially U-shaped spring having arms and a bight portion, means connecting the bight portion of the spring to the body, the arms of said spring having teeth with sharp ends adapted on the insertion of the convenience into a wall box to yieldingly engage and dig into the opposite walls of said box to mount the convenience in the box, and said arms having their free end portions bent laterally away from each other to provide stops

to limit movement of the spring and body into the wall box.

3. In an electrical convenience, a body, a substantially U-shaped strap having spring arms and a bight portion, means connecting the bight portion of the strap to the body, teeth on the arms of said strap, and said teeth having sharp ends adapted on the insertion of the convenience into a wall box to be pressed by said arms to dig into the surfaces of the opposite walls of said box to mount the convenience in the box.

4. In an electrical convenience, a body, spring means carried by the body, teeth on the spring means having sharp ends to engage the walls of a wall box to mount the convenience in the wall box, and means whereby on the securing of a cover plate to the body the teeth are forced to dig into the walls of the wall box.

5. In an electrical convenience, a body, a substantially U-shaped strap having arms and a bight portion, means connecting the bight portion of the strap to the body with the arms of the strap disposed at the sides of the body, a wall box adapted to receive said convenience, teeth on said arms of the strap having sharp ends to engage opposite side walls of the box to mount the convenience in the box, a plate for covering the convenience and box, screws passing through the plate and securing the plate to the convenience, and said screws adapted on being tightened to draw the convenience forwardly in the box and force the teeth of the strap against the walls of the box.

6. In an electrical convenience, a body, a substantially U-shaped strap having arms and a bight portion, means connecting the bight portion of the strap to the body with the arms of the strap disposed at the sides of the body, teeth on the arms of said straps, a wall box adapted to receive said convenience, said teeth on the arms of the strap having sharp ends to engage opposite side walls of the box to mount the convenience in the box, a plate for covering the convenience and box, screws passing through the plate and securing the plate to the convenience, and said screws adapted on being tightened to draw the convenience forwardly in the box and force the teeth on the arms of the strap against the walls of the box.

7. In an electrical convenience, a body, a substantially U-shaped strap having arms and a bight portion, means connecting the central portion of the bight portion of the strap to the body with the arms of the strap disposed at the sides of the body, a wall box adapted to receive said convenience, teeth on the arms of the strap having sharp ends to engage opposite side walls of the box to mount the convenience in the box, a plate for covering the convenience and box, screws passing through the plate and securing the plate to the convenience, and said screws adapted on being tightened to draw the convenience forwardly with the end portions of the arms of the strap engaging the plate whereby to force the arms outwardly of the body and force the teeth against the walls of the box.

8. In an electrical convenience, a body, a substantially U-shaped strap having arms and a bight portion, means connecting the bight portion of the strap to the body with the arms of the strap disposed at the sides of the body, a wall box adapted to receive said convenience, teeth on said arms of the strap having sharp ends to engage opposite side walls of the box to mount the convenience in the box, a plate for covering the convenience and box, a yoke on the con-

venience, screws passing through the plate and into the yoke and securing the plate to the convenience, and said screws adapted on being tightened to draw the convenience forwardly in the box and force the teeth against the walls of the box.

9. In combination, a switch having a body, a substantially U-shaped strap having arms and a bight portion, means connecting the central portion of the bight portion of the strap to the body with the arms of the strap disposed at the sides of the body, a wall box adapted to receive said convenience, teeth on the arms of the strap having sharp ends to engage opposite side walls of the box to mount the convenience in the box, a plate for covering the convenience and box, a yoke on the forward face of the switch body, screws passing through the plate and into the yoke and securing the plate to the switch, and said screws adapted on being tightened to draw the convenience forwardly with the end portions of the arms of the strap engaging the plate whereby the arms are forced outwardly with respect to the body and the teeth are forced against the walls of the box.

10. In an electrical convenience, a body, spring means on said body, a tooth on said spring means having a sharp end, said body and spring means adapted to be inserted into a wall box, and said

spring means acting to press said tooth into engagement with a side wall of the wall box and cause the tooth to dig into such wall to prevent casual withdrawal of the body from the wall box.

11. In an electrical convenience, a body, spring means on said body, a tooth on said spring means having a sharp end, said body and spring means adapted to be inserted into a wall box, said spring means acting to press said tooth into engagement with a side wall of the wall box and cause the tooth to dig into such wall to prevent casual withdrawal of the body from the wall box, said spring means including a portion extending laterally of the body and limiting movement of the body into a wall box, and said portion providing means adapted to be manipulated to compress said spring means and draw the tooth out of engagement with a wall of the box whereby the body may be withdrawn from the box.

12. In an electrical convenience, a body, spring means carried by the body, teeth operated by the spring means having sharp ends to engage a side wall of a wall box on insertion of the body into the wall box, and means whereby on the securing of a cover plate to the body the teeth are forced into engagement with and to dig into the wall of the wall box.

HARVEY HUBBELL, Jr.