Aug. 14, 1956 R. J. GOOD 2,758,810

OUTLET BOXES AND FIXTURE STUDS

Filed June 3, 1953 2 Sheets-Sheet 1

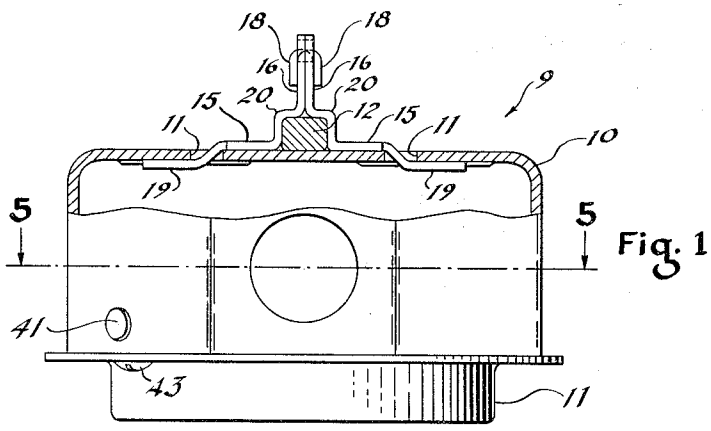


Fig. 1

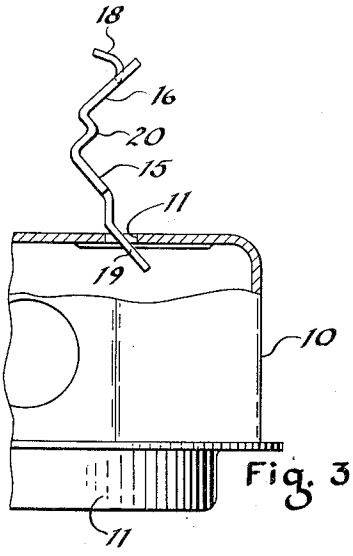


Fig. 3

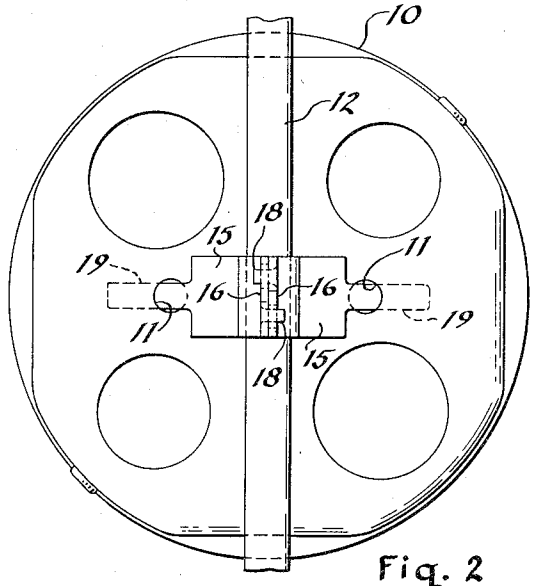


Fig. 2

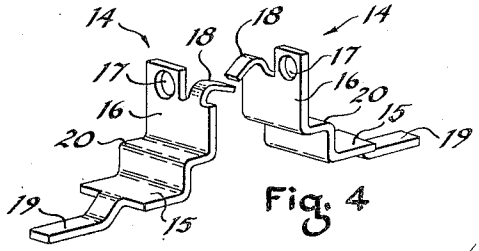


Fig. 4

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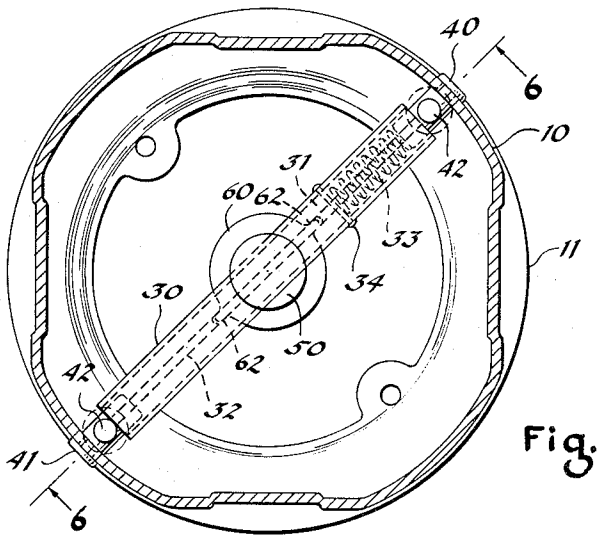


Fig. 5

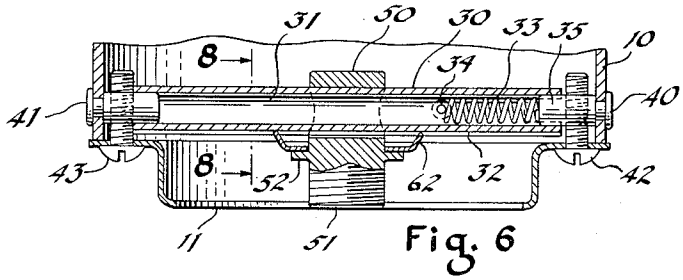


Fig. 6

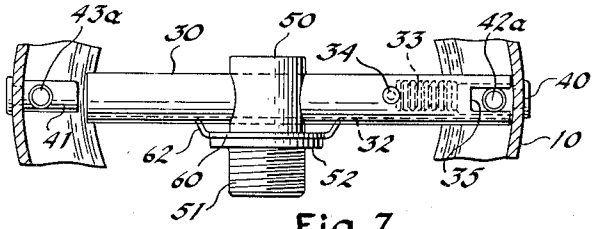


Fig. 7

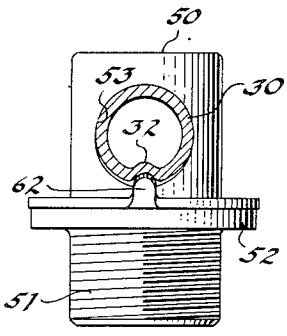


Fig. 8

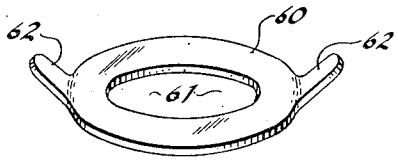


Fig. 9

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OUTLET BOXES AND FIXTURE STUDS

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4 Claims. (Cl. 248—343)

This invention relates generally to improvements in outlet boxes and fixture studs.

An object is to provide a more simple and efficient method of hanging electric fixtures from outlet boxes.

Another object of the present invention is to provide improved means by which a fixture stud can be readily inserted and fastened within an outlet box either before or after the box has been placed in operative position.

Another object is to provide a new and novel retaining means for suspending outlet boxes from a hanger bar bridging adjacent joists and rafters.

Another object is to provide a fixture stud which can be readily fastened within the lower and more accessible portion of an outlet box in such manner that it will be properly positioned for attachment of an electric fixture.

Still another object is to provide a fixture stud which can be adjusted after an electric fixture has been attached thereto.

A further object is to provide an improved fixture stud for outlet boxes which is simple and rugged in construction as well as being quicker and more convenient to install.

Another object of the present invention is to provide an improved outlet box characterized by its structural simplicity, the ease of assembly of its parts, its strong and sturdy nature and its low manufacturing costs.

Other features of this invention reside in the arrangement and design of the parts for carrying out their appropriate functions.

Other objects and advantages of this invention will be apparent from the accompanying drawings and description and the essential features will be set forth in the appended claims.

Heretofore, most outlet boxes have been equipped with fixture studs at the time of installation. These studs were always located at the top of the outlet box, such boxes having varying depths which necessitated the use of extension pieces in order to extend the stud from the top to the bottom of the box. This was required in order to make it possible to hang an electric fixture therefrom.

The extension pieces passed through the entire vertical length of the box, took up a great deal of space and made working conditions extremely difficult, especially when it was desired to pull in the wires and hang electric fixtures. The wires had to be forced and jammed around such extension pieces. In so doing, the wires often became frayed or otherwise damaged and created a dangerous fire hazard. If the wires were pulled into the box before the extensions were installed, an equally bad situation existed when attempting to couple the extension pieces one upon the other. In this instance, the wires offered a serious obstacle and it was only with great patience and the consumption of much time that the workman was able to fit the extension pieces. More time was thereafter wasted in trying to adjust the level of the stud to that of the plaster line of the room so that the electric fixture might be mounted in a workmanlike

manner. It should be remembered that most outlet boxes seldom exceed four inches in lateral width. This is hardly enough space for a man to reach into with his hands and especially is this the case when the box is well filled with electric wires. Thus, the workman must probe with special tools until he has cleared a path through the maze of wires in order to attach the extension pieces. The above mentioned problems are always present in outlet boxes that are suspended from supporting bars which bridge adjacent joists and rafters.

A further problem arises in connection with concrete construction wherein the outlet box is not suspended from a supporting bar but is embedded in and supported by concrete. Most standard boxes have holes in the top for purposes of stud mounting. Such holes must be closed in concrete construction to keep concrete from running into the box during the pouring process. This is usually achieved by stuffing paper wadding into said holes. Such wadding must be removed after the concrete solidifies. These are both additional time-consuming steps which add to the total cost of installing the outlet box. Oftentimes, the paper wadding is negligently placed so that the concrete seeps into the box and solidifies about the threaded portion of the studs. The workman must then remove such concrete before he can install the extension pieces. This often becomes a formidable task for the workman when it is remembered how small and inaccessible is the space in which he must work, and the maze of wires through which he must probe before ever reaching the stud mounting at the top of the box.

My improved outlet box and fixture stud eliminates all of the above difficulties. It provides an adjustable fixture stud which is fastened to the lower and more easily accessible portion of the outlet box. No longer are extension pieces required. This in turn makes the job of pulling in wires a comparatively simple one. The workman does not have to probe through a multitude of wires in order to fasten extension pieces; thus the danger of broken wires, poor connections and resultant fire hazards is practically non-existant.

Furthermore, in concrete construction, my outlet box is made with a completely closed top portion and no openings are required since the fastening means for the stud are all located in the bottom portion of said outlet box. With the absence of such top openings, there is no possibility of concrete reaching the interior of the box. One of the prime advantages achieved in the use of my device is the great saving in time of installation. The fixture stud is designed to be at the proper height with respect to the plaster line of the wall for hanging the electric fixture immediately upon insertion of said stud into the outlet box.

A further saving in time of installation can be had through the use of my novel clamp for suspending the outlet box when used in connection with a supporting bar.

Other objects and advantages will appear from the following description of an illustrated embodiment of the present invention.

In the drawings,

Fig. 1 is a front elevational view of the outlet box with a portion cut away to show the novel clamp and its inter-relation with said outlet box.

Fig. 2 is a top plan view of the outlet box and clamp.

Fig. 3 is an enlarged detail view of a portion of Fig. 1 showing the pivotal connection between the outlet box and one-half of the clamp.

Fig. 4 is a perspective view of the two clip members forming retaining means for the outlet box.

Fig. 5 is a horizontal cross sectional view taken on the plane of section line 5—5 of Fig. 1 showing my novel fixture stud fastened to the outlet box.

Fig. 6 is a vertical sectional view of the removable fixture stud in operative position with respect to the outlet box taken substantially on the plane of section line 6—6 of Fig. 5.

Fig. 7 is a detailed fragmental view of the bottom of the outlet box showing the removable fixture stud in the process of being inserted upon the retaining means of the outlet box.

Fig. 8 is a vertical sectional view of the adjustable fixture stud taken on the plane of section line 8—8 of Fig. 6.

Fig. 9 is a perspective view of the spring retainer means.

Referring now to Figs. 1 to 4, an outlet box **9** comprising a cup shaped housing **10**, opening downwardly, is suspended from a supporting bar **12** which normally bridges two spaced joists or beams. A plaster ring **11** is fastened to the bottom of the box. The outlet box **9** is fastened to the bar **12** by retaining means comprising two similar half-clamp members **14** as best seen in Fig. 4. Support bar **12** generally extends between adjacent joists or beams. Each of said members **14** is substantially L-shaped having two main portions **15** and **16**. The portion **15** lies upon the top surface of housing **10**. An offset tongue **19** extends longitudinally outward from the portion **15** and passes through apertures **11** formed in the top of housing **10** and then extends along the inner surface of said top portion. The portion **16** lies in a plane substantially perpendicular to that of portion **15**. The outer end of the portion **16** contains an aperture **17** and a lip or lug **18** positioned adjacent one another. A depression **20** is provided at the intersection of the portions **15** and **16**. In operation, two such half-clamps are used jointly. The tongue **19** is inserted into the aperture **11** as shown in Fig. 3. The aperture **11** is of such size as to allow a degree of pivotal movement of each clip **14**. In this manner, two opposed half-clamps are brought into interlocking relationship about the bar **12**. The lip **18** of each clip enters the aperture **17** of the opposed clip. The surfaces of the portions **16** are brought into contiguous relationship. Depressions **20** cooperate to form an opening which receives the supporting bar **12**. The lips **18** are turned over so that their inner surfaces abut the surfaces of the opposed clip portion **16** as seen in Figs. 1 and 2. In this manner, the clip is securely locked and the outlet box is safely suspended from the bar **12**. The locking operation is facilitated when a pair of pliers is used to squeeze the lip **18** into a locking engagement with the opposed clip **14**.

Referring now to Figs. 5, 6 and 7, my improved fixture stud and support comprises a tubular shaft **30**. Said shaft is provided with a hollow center **31** extending throughout its entire length; however, it could be a solid cylindrical shaft having bored ends. The shaft **30** has a longitudinally extending groove **32** on its outer surface. One hollow end of said shaft is provided with a coil spring **33** which has its innermost end retained in place by a pin **34**. The outer end of this spring does not extend beyond the end of the shaft. The shaft has two diametrically opposite, longitudinally extending slots **35** extending inwardly from the end containing spring **33**. The slots **35** are narrower than spring **33**. Said slots are shown to be substantially 90° out of phase with the groove **32**.

A fixture stud **50** has an aperture **53** in its upper portion to slidably receive the shaft **30** as seen in Fig. 8. The lower portion **51** of said stud is threaded so that an electric fixture may be hung therefrom. An annular retainer member **60** shown in Fig. 9 having a central aperture **61** and two diametrically opposed upstanding lugs **62** is carried on the stud **50** by means of shoulder **52**. The retainer member **60** is constructed of spring steel or other suitable material. The stud **50** is received in the aperture **61** while the lugs **62** engage in the groove **32** of shaft **30**. In this manner, the stud is prevented from revolving about the shaft **30** and yet is allowed to slide freely along the entire length of said shaft. The groove **32** is positioned to lie on that surface of the shaft between the diametrically opposed slots **35**, so that shaft **30** will rest on its strongest end portions when an electric fixture is hung from stud **50**.

The shaft **30** retaining the stud **50** is attached to the lower portion of the outlet box by means of two diametrically opposite pins **40** and **41**. Said pins are fastened to the interior of the housing wall **10** by riveting as shown in Figs. 5 and 6 or welding or any other suitable means. Said pins are tapped at **42***a* and **43***a* so as to provide threaded apertures to receive the screws **42** and **43** respectively. Said screws provide fastening means for holding plaster ring **11** on the bottom of the outlet box housing **10**.

In assembling the shaft and stud within the outlet box, the end of the shaft containing the spring is slightly tilted and telescopingly sleeved upon the pin **40**; the slots **35** are then brought into receiving registry with the screw **42** allowing the shaft to slide past the screw until its end abuts the inner surface of the housing wall **10**. In Fig. 7, the shaft is shown in this position of pre-assembly. Spring **33** is seen to be under compression. At this point, the opposite end of the shaft terminates short of the pin **41**, as seen in Fig. 7. The shaft is then brought into axial registry with said pin **41** and telescopingly sleeved upon the pin **41** until the end of shaft **30** abuts the screw **43**. The slotted end of the shaft will still be retained on the pin **40**; however, it will have retracted far enough for its end to clear the screw **42** as seen in Figs. 5 and 6. Spring **33** tends to maintain the shaft in the position shown in Figs. 5 and 6.

The shaft **30** is revolved about its own axis until the stud **50** extends vertically downwardly and outward through the open end of housing **10** so that its outermost end reaches a level that is flush with the plaster line A as seen in Fig. 6. This rotative movement of the shaft **30** disalines the slot **35** with respect to the screw **40** and thereby brings the slot **35** into a locking or retaining engagement with the screw **40**. Thus, when the stud is in operative position, the shaft will be securely locked upon the pins **40**, **41** and between the screws **42** and **43**.

It can readily be seen that my novel fixture stud may be used in connection with both timber and concrete construction. For normal concrete construction the top of outlet box **10** is completely closed with no opening whatsoever. This construction assures the complete exclusion of concrete from the interior of the box. The novel fixture stud is easily inserted after the installation of the outlet box.

When using my invention in connection with bar hangers which are adapted to be fastened between joists, it is only necessary to punch two small apertures in the top of the outlet box and therein attach my novel clamp retaining means. Again, the fixture stud may be inserted after the outlet box has been completely installed. From the above disclosure it should now be apparent that a great saving of both time and money will result through the use of my invention.

In view of the foregoing description, taken in conjunction with the accompanying drawings, it is believed that a clear understanding of the construction, operation and advantages of the device will be quite apparent to those skilled in this art.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention, the same is susceptible to certain changes fully comprehended by the spirit of the invention.

What I claim is:

1. An outlet box comprising a housing, said housing being open at one end, a pair of first and second opposed pins fastened to the interior walls of said housing, said pins positioned in the same plane near the open end of said housing, each of said pins containing a screw, a shaft member extending between said pins, a spring retained within one end of said shaft, opposed longitudinal

slots extending inwardly from the spring retaining end of said shaft, said shaft having a length greater than the distance between the inner ends of said pins, a first end of said shaft containing said spring being telescopingly slidable upon said first pin, said slot allowing the shaft to slide past said screw to a distance wherein the second end of said shaft clears said second pin, said shaft then being in axial registry with said pin, said second end of said shaft telescopingly engaging said second pin wherein each end of the shaft telescopingly engages its associated pin, said spring maintaining said shaft in said position, a groove extending axially over the entire length of said shaft, a fixture supporting member slidably mounted on said shaft, a spring steel retainer member cooperating with said groove to maintain said fixture supporting member at an angle of approximately 90° to the axis between said slots, a plaster ring fastened to said open end of said housing by means of said screws.

2. An outlet box comprising a housing, said housing being open at one end, a pair of first and second opposed pins extending into and secured to the interior of said housing, said pins located on the same level adjacent the open end of said housing, a screw threaded into each of said pins adjacent the inner side wall of said housing and extending outwardly through said open end, a shaft member extending between said pins, an axial bore contained in each end of said shaft member, a spring retained in one of said bored ends, opposed slots extending inwardly on the spring containing end of said shaft, said shaft having a length greater than the distance between the inner ends of said pins, a first spring containing end of said shaft being telescopingly slidable upon said first pin, said slots providing means for said shaft to slide past said screw contained on said pin, wherein the second end of said shaft clears said second pin, the second end of said shaft telescopically engages said pin and abuts the screw contained in said pin, wherein each end of the shaft telescopingly engages its associated pin, said spring tending to maintain the shaft in this position, said shaft being slightly rotated about its axis to disalign the slots with respect to said screw and thereby lock the shaft between said screws on said pins, a groove extending axially over the entire length of said shaft, a fixture supporting member slidably mounted on said shaft, a spring steel retainer member mounted on said fixture support, said retainer member frictionally engaging said groove and maintaining said fixture support in a vertical outwardly extending position when the shaft is in a locked position, a plaster ring attached to the open end of said housing by means of said screws.

3. An outlet box comprising a housing, said housing being open at one end, a pair of first and second opposed axially aligned pins secured to said housing and extending into the interior thereof, said pins being located adjacent the open end of said housing, a screw threaded into each of said pins at right angles to the pin axis and adjacent the inner side wall of said housing and extending outwardly through said open end, a shaft member extending between said pins, there being an axial bore contained in each end of said shaft member, a spring retained in one of said bored ends, opposed slots extending axially inwardly from the spring containing end of said shaft, said shaft having a length greater than the distance between the inner ends of said pins, a first spring containing end of said shaft being telescopingly slidable upon said first pin, said slots providing means for said shaft to slide past said screw contained on said pin wherein the second end of said shaft clears said second pin, the second end of said shaft telescopically engages said pin and abuts the screw contained in said pin, wherein each end of the shaft telescopingly engages its associated pin, said spring tending to maintain the shaft in this position, said shaft being slightly rotated about its axis to disalign the slots with respect to said screw and thereby lock the shaft between said screws on said pins, a groove extending axially over the entire length of said shaft, a fixture supporting member slidably mounted on said shaft, a spring steel retainer member mounted on said stud, said retainer member frictionally engaging said groove to maintain said stud substantially perpendicular to the plane of the opening of said housing when the shaft is in a locked position.

4. An outlet box comprising a housing, said housing being open at one end, a pair of first and second opposed axially aligned pins secured to said housing and extending into the interior thereof, said pins being located adjacent the open end of said housing, a screw threaded into each of said pins at right angles to the pin axis and adjacent the inner side wall of said housing and extending outwardly through said open end, a shaft member extending between said pins, there being a bore extending axially in each end of said shaft member, a spring retained in one of said bores, opposed slots extending axially inwardly from the spring-containing end of said shaft, said shaft having a length greater than the distance between said pins, a first spring containing end of said shaft being telescopingly slidable upon said first pin, said slots providing means for said shaft to slide past said screw contained on said pin wherein the second end of said shaft clears said second pin, the second end of said shaft telescopically engages said pin and abuts the screw contained in said pin, wherein each end of the shaft telescopingly engages its associated pin, said spring tending to maintain the shaft in this position, said shaft being rotatable through 90° about its axis to disalign the slots with respect to said screw and thereby lock the shaft between said screws on said pins, a groove extending axially along the entire length of said shaft, a stud slidably mounted on said shaft, a spring steel retainer member mounted on said stud, said retainer member frictionally engaging said groove to maintain said stud in a vertical outwardly extending position when the shaft is in a locked position.

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