April 21, 1925. 1,534,146

G. C. THOMAS, JR

FIXTURE STUD

Filed June 30. 1924

Fig. 1.

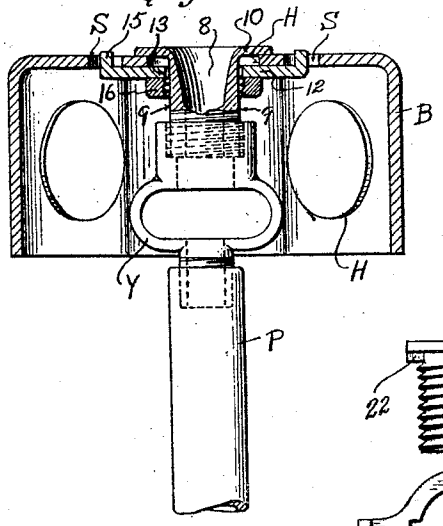
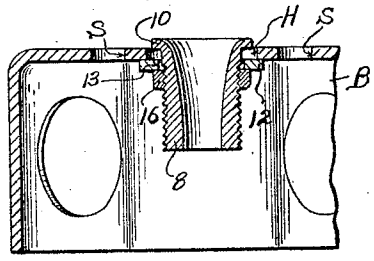


Fig. 2.



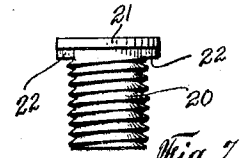


Fig. 7.

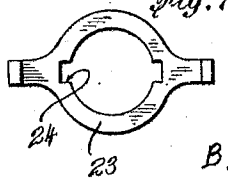


Fig. 3.

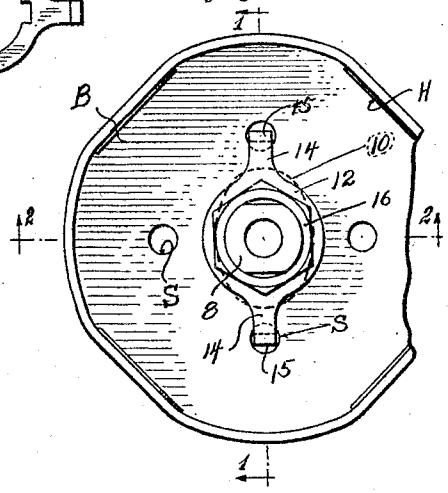




Fig. 4.

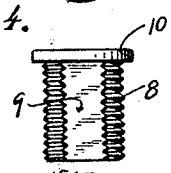


Fig. 5.

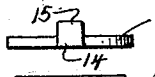
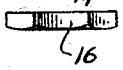


Fig. 6.



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UNITED STATES PATENT OFFICE.

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FIXTURE STUD.

Application filed June 30, 1924. Serial No. 723,091.

To all whom it may concern:

Be it known that I, GEORGE C. THOMAS, Jr., a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Fixture Studs, of which the following is a specification.

This invention relates to fixture studs for use in connection with electrical outlet boxes and which are used for installing and suspending electric light fixtures from outlet boxes.

An object, among others, is to produce a device for the purposes named which embodies means for attaching a shank or stud to the box without having to employ screws, together with a locking means which functions to properly center the shank of the fixture stud within the box and lock it against rotation; and the shank or stud locking means, particularly the improvements relating thereto, constitute one of the features of the invention.

An additional object of the invention is to produce improved fixture studs which are capable of being installed in a box from the bottom and inside of the box thereby enabling the electrician to fit the stud into service position after the box has been mounted in the ceiling of the building and without disturbing the plaster or other material surrounding the box.

Having the above principal objects and others in view, the invention has relation to a certain improved construction in fixture studs and combination of parts. Changes may be made without departing from the scope of the invention; and the accompanying drawings illustrate a form of the invention satisfactory to illustrate the general principles thereof.

Figure 1 illustrates a cross sectional view taken through an assembled box and fixture stud as on the line 1—1 of Figure 3; and this view shows how a supporting pipe or stem is suspended from the stud and reaches downwardly to hold an electric light fixture not shown.

Figure 2 illustrates a cross sectional view taken on the line 2—2 of Figure 3.

Figure 3 illustrates an underneath plan view of the fixture stud assembled within an electric fixture box.

Figure 4 illustrates a side and top elevation of an improved shank forming part of the fixture stud improvements.

Figure 5 illustrates a locking plate; and Figure 6 illustrates a nut for holding the parts in service position.

Figure 7 shows an improved modified form of the invention which is presented to show an alternate form of the locking means heretofore mentioned.

Those skilled in the art appreciate how cable boxes, outlet boxes B and the like are usually provided with knock-out openings H through which the electric conduit and wires are led into the box, and when the electrician is installing a ceiling fixture, the practice is usually to employ a yoke fitting Y anchored to a threaded shank of the fixture stud, the fixture stud shank being fastened to the box B. The fitting Y then carries a tubing or pipe P on the lower end of which an electric fixture is supported; and my invention is directed to improvements in a fixture stud adapted to support a fitting Y and pipe P from the box B. The yoke Y permits the wires to be passed down through the tube P to the light fixture. A plug knock-out hole H is usually provided in the upper wall of the box and it is this central opening in the box bottom to which a fixture stud is usually anchored. Furthermore, the box B is usually manufactured with secondary or small openings S grouped about the main central opening H already referred to, and these smaller openings contribute as means by which a fixture stud may quickly be installed in a box.

Referring further to the drawing there is illustrated a threaded shank 8, which in one form of the invention, may be made with opposite plane faces 9 which interrupt the threads of the shank and thus produce a threaded stud or shank of substantially reduced diameter and size as measured between the diametrical opposite plane faces 9. The shank is provided with a flanged head 10 preferably made elliptic or oblong in shape thereby providing a major axis defining the greater length of the head 10, and a minor axis defining the shorter dimension of the flanged head. The major axis of the flanged head 10 is preferably laid out in alignment with the diametrically opposite plane faces 9 which is to say that the plane of the parallel shank surfaces 9 are formed

right-angular to the major axis of the head 10. By referring to Figure 2, it is readily apparent how the shank 8 may be inserted from below and inside the box upwardly through a central opening H of the box B for the reason that the minor axis of the head 10 is slightly less than the diameter of the box hole H. However, the major axis of the head 10 is somewhat greater than the diameter of the box hole H, and therefore once the headed stud is in position, the flange 10 overlaps or overlies the upper and outer rim of the box hole H thereby positioning the threaded stud 8 centrally within the box hole H.

A locking plate comprises a body 12 punched with a central aperture 13 adapting the locking plate to pass over the shank 8 and rest in contact with the inner box bottom usually installed in inverted position as shown in the assembly views. The aperture 13 is preferably made the counter part of the double flat shank 8 thereby locking the shank 8 and plate 12 together preventing relative rotation between these two parts; and the locking plate firmly braces itself in the box against rotation and thus rigidly holds the shank 8 as will be seen. The locking plate is made with outstanding arms 14 turned down on the outer end thereof providing box bosses 15 which rest in the secondary box openings S. While one lock arm and boss 14—15 is usually sufficient, I preferably employ two bosses 15 disposed diametrically opposite one to the other. A lock nut 16 screws upon the threaded shank 8 thereby positively seating the locking plate 12 in embraced registry with the box openings S.

It is to be noted that the stud suspension head 10 overlies the upper rim of the central or main box opening H and that considerable clearance exists, as shown in Figure 1, between the flat sides 9 and periphery of the hole H. This clearance or looseness between the shank 9 and box hole H permits the mechanic to easily insert the shank head 10 upwardly through the hole H by an angular hooking movement. In order that the shank 8 thereafter be brought into axial alignment with the box hole H, the locking plate 12, which possesses a centering action, is inserted as shown in the assembly views, and the reach of the arms 14 sets the centering bosses 15 within the smaller box openings S which equidistantly places the longer overlying ends of the head 10 in firm contact with the outer box wall surfaces; and having snugly turned the lock nut 16 upwardly against the locking plate, the box and fixture stud are rigidly assembled thereby providing a depending threaded stud or shank 8 upon which may be secured the fitting Y carrying the depending pipe P or any other necessary appliance. Among the several advantages of this improved construction, one important feature rests in the fact that the fixture stud head may be projected through the box opening without disassembling the parts. The manufacturer furnishes the simple device already assembled so that the nut holds the locking plate on the shank, and the mechanic loosens the nut slightly to give freedom of motion whereupon the device readily attaches itself to the box.

In further consideration to the locking means, reference is made to Figure 7 showing a cylindrical threaded shank 20 having complete screw threads together with a head 21 which may have the same construction or oblong design as already described. However, this headed shank is provided with improved anchorage means in the way of one or more bosses or lugs 22 the height of which is necessarily less than the thickness of the box wall so as not to interfere with the locking plate. A centrally apertured lock plate 23 has reach arms and bosses similar to the structure already described, but one or more internal notches or recesses 24 are provided therein which fit over and register with the bosses 22 of the headed shank and thereby establishes a locking relation to positively prevent turning of the fixture shank when the parts are assembled in a box. In this construction, I preferably align the stud or studs 22 with the minor axis of the head 21 thereby conserving the clearance between the threaded shank and box opening which is desirable because the head more readily passes through the box opening without removing the locking plate or nut.

What I claim is:

1. In combination, an electrical fixture box having openings therein, a fixture supporting shank, an elliptical flange formed on one end of the shank and adapted to be passed through the standard size opening of the box and overlap said opening thus disposing the other end of the shank concentrically in the box opening, said flange resting directly on the outside box wall, means embracing a shank and engaging the box serving to lock the shank and box against relative motion, and means clamping the embracing means in operative position.

2. In combination, an electrical fixture box having openings therein, a fixture supporting shank, an elliptical flange formed on one end of the shank and adapted to be passed through the standard size opening of a box and overlap said opening thus disposing the other end of the shank concentrically in the box opening, said flange resting directly on top of said box wall, a locking plate engaging the box and shank thereby preventing relative motion between the

parts, and a nut screwed onto the shank against the locking plate.

3. A fixture stud and electrical fixture box in combination, comprising a box having a main opening and adjacent secondary openings, a threaded fixture supporting stud disposed in the main opening, means carried by the stud capable of being projected thru the main opening from the inside of the box and overlapping the rim of said main opening on the outside of the box, a locking plate disposed over the stud and lying against the inner box wall, bosses carried on the locking plate engaging the adjacent secondary apertures serving to prevent movement of the stud, and means carried on the inner stud end serving to hold the locking plate and bosses in locked position.

4. A fixture stud and electrical fixture box in combination, comprising a box having a main opening and adjacent secondary openings, a threaded fixture supporting stud disposed in the main opening, an oblong flange integral with the stud and having a minor axis less than the diameter of the main opening in the box and having a major axis greater than the said opening, said flange capable of being projected through but at the same time overlap the box main opening thereby suspending the stud by the flange from the box, a locking plate disposed over the stud and lying against the inner box wall, bosses carried on the locking plate engaging the adjacent secondary apertures serving to prevent movement of the stud, and a jam nut screwed upon the threaded stud against the locking plate.

5. In combination, electrical outlet box and fixture stud improvements, comprising a box with an opening therein, a threaded stud, an elliptical flange made integral on the stud and movable in and out of the opening from the inside of the box suspending the stud from the box wall opening, said threaded stud made with a flat plane clearance surface thereon designed to permit substantial lateral relative movement between the flanged stud and box for the purpose of enabling a large flange to be hooked through the box opening, a locking plate provided with a central opening, said locking plate opening made the counterpart of the flat plane stud design which performs the double purpose of preventing the rotation of the stud and serves to hold the flange in overlapping relation with the box opening, and means carried by the threaded stud to jam the locking plate in position.

6. In combination, electrical outlet box and fixture stud improvements, comprising a box with an opening therein, a threaded stud, an elliptical flange made integral on the stud and movable in and out of the opening from the inside of the box suspending the stud from the box wall opening, said threaded stud provided with opposite flat surfaces right angular to the major axis of the elliptical flange thereby providing clearance space between the box opening and stud enabling a long major axis elliptic flange to be inserted through the box opening, a locking plate provided with a central opening, said locking plate opening made the counterpart of the flat plane stud design which performs the double purpose of preventing the rotation of the stud and serves to hold the flange in overlapping relation with the box opening, and means carried by the threaded stud to jam the locking plate in position.

7. A fixture stud embodying a threaded shank, an elliptic shaped suspension flange made on one end of the shank, a freely movable lock plate carried by the shank, means on the lock plate for registering with openings in a box, and means for holding the plate on said shank.

8. A fixture stud embodying a threaded shank, an elliptic shaped suspension flange made on one end of the shank, a lock plate removably carried by the shank, a locking boss made on the plate adapted to engage a box opening, and means for holding the plate on said shank.

9. A fixture stud embodying a threaded shank, an elliptic shaped suspension flange made on one end of the shank, a lock plate removably carried by the shank, a pair of diametrically opposite arms integrally formed on the plate, said ends of the arms being turned down to form spaced locking bosses, and means for holding the plate on said shank.

10. A fixture stud comprising a threaded shank made with opposite flat plane surfaces running from end to end, a flanged suspension head made on one end of the shank, a locking plate movably free on the shank with an opening therethrough which is the counterpart of the cross sectional contour of the shank, and a nut carried on the shank.

11. A fixture stud comprising a threaded shank made with opposite flat plane surfaces running from end to end, an oblong suspension flanged head made on one end of the shank and having its major axis running through the aforesaid flat surfaces at right angles to the planes thereof, a locking plate with an opening therethrough which is the counterpart of the cross sectional contour of the shank, and means holding the locking plate on the shank.

12. A fixture stud comprising a threaded shank made with opposite flat plane surfaces running from end to end, an oblong suspension flanged head made on one end of the shank and having its major axis running through the aforesaid flat surfaces at right

angles to the planes thereof, a locking plate with an opening therethrough which is the counterpart of the cross sectional contour of the shank, arms integral with and reaching out from the locking plate, a boss carried on the end of each arm, said plate and bosses acting to centralize and firmly hold the aforesaid shank in position, and means holding the locking plate on the shank.

13. In combination, an electrical fixture box having openings therein, a fixture supporting shank, an elliptical flange formed on one end of the shank and adapted to be passed through an opening of the box and overlap said opening thus disposing the other end of the shank concentrically in the box opening, a loose plate engaging the box and shank, locking means associated with the loose plate and shank fixing said plate and shank together thereby preventing relative motion between the parts, and a nut screwed onto the shank against the loose plate.

14. Improvements in combination boxes and fixture studs therefor, comprising a box with an opening, a shank, a head on the shank overlapping the box opening and disposing the shank centrally within the opening, a plate confined on the shank abutting the box and having the box wall disposed between the plate and head, means forming part of the shank and plate structure acting to fix said shank and plate against relative movement, means operating to fix said plate and box together against relative movement, and means carried by the shank to hold all parts together.

15. Improvements in combination boxes and fixture studs therefor, comprising a box with an opening, a shank, a head on the shank overlapping the box opening and disposing the shank centrally within the opening, a plate confined on the shank abutting the box and having the box wall disposed between the plate and head, means forming part of the shank and plate structure acting to fix said shank and plate against relative movement, said box provided with a secondary opening, a boss integral with the plate reaching into the secondary opening and acting to rigidly anchor the plate to the box, and a lock nut screwed onto the shank against the plate.

16. Improvements in combination boxes and fixture studs therefor, comprising a box with an opening, a shank, a head on the shank overlapping the box opening and disposing the shank centrally within the opening, a plate confined on the shank abutting the box and having the box wall disposed between the plate and head, said plate being perforated and fitting upon the shank, a shouldering interlock means established between the shank and plate holding the parts against relative rotation, said shouldering interlock means freely permitting longitudinal motion between the plate and shank, means carried by the plate and box for rigidly fixing these parts against relative rotation when assembled, and lock nut means holding all parts together.

17. A fixture stud comprising a threaded shank, an oblong head formed thereon, a boss integrally formed therewith, a locking plate carried on the shank and having a recess registering with the boss to secure the parts together against rotation, and a lock nut to hold the parts together.

In testimony whereof I affix my signature.

GEORGE C. THOMAS, JR.