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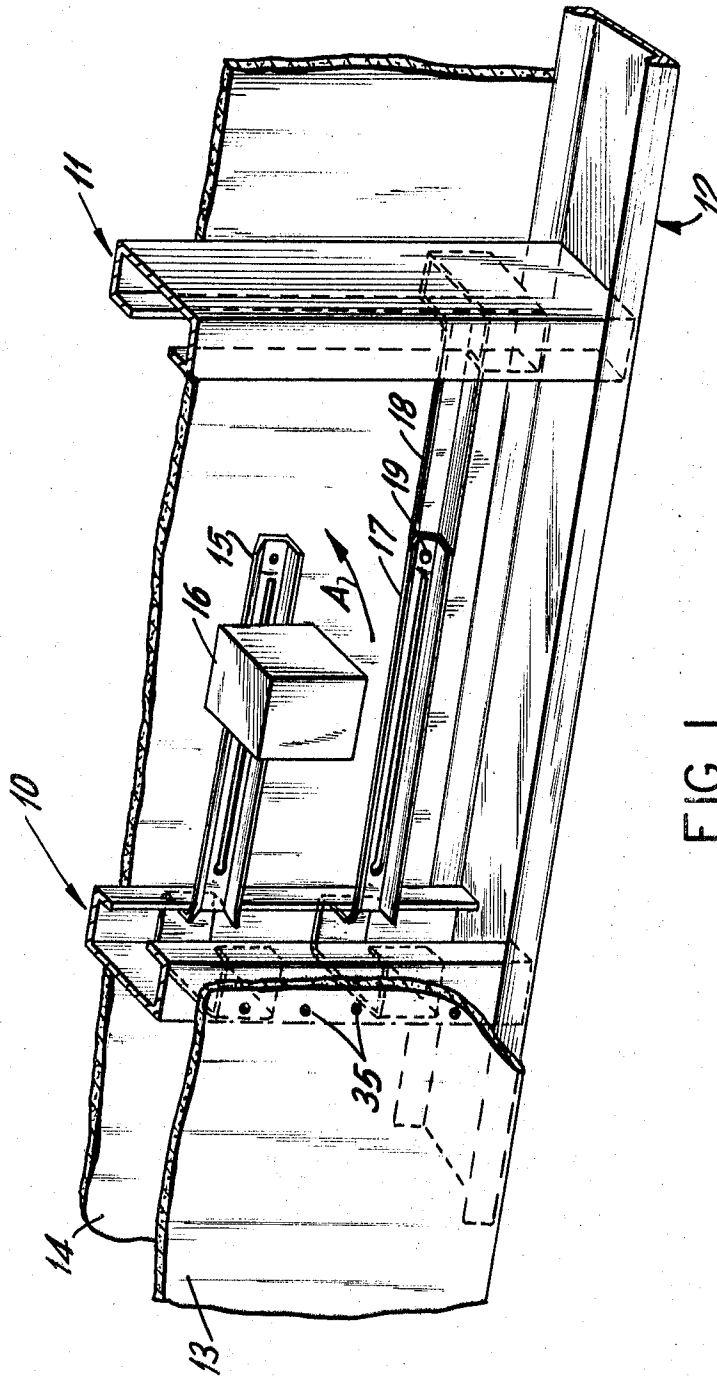
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3,528,636

SUPPORT BRACKET FOR ELECTRICAL FIXTURES

Filed March 7, 1969

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

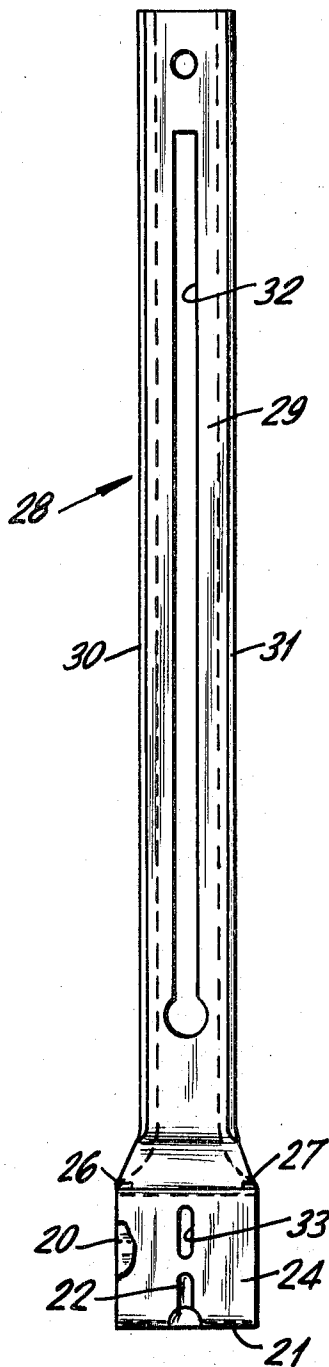


FIG. 2

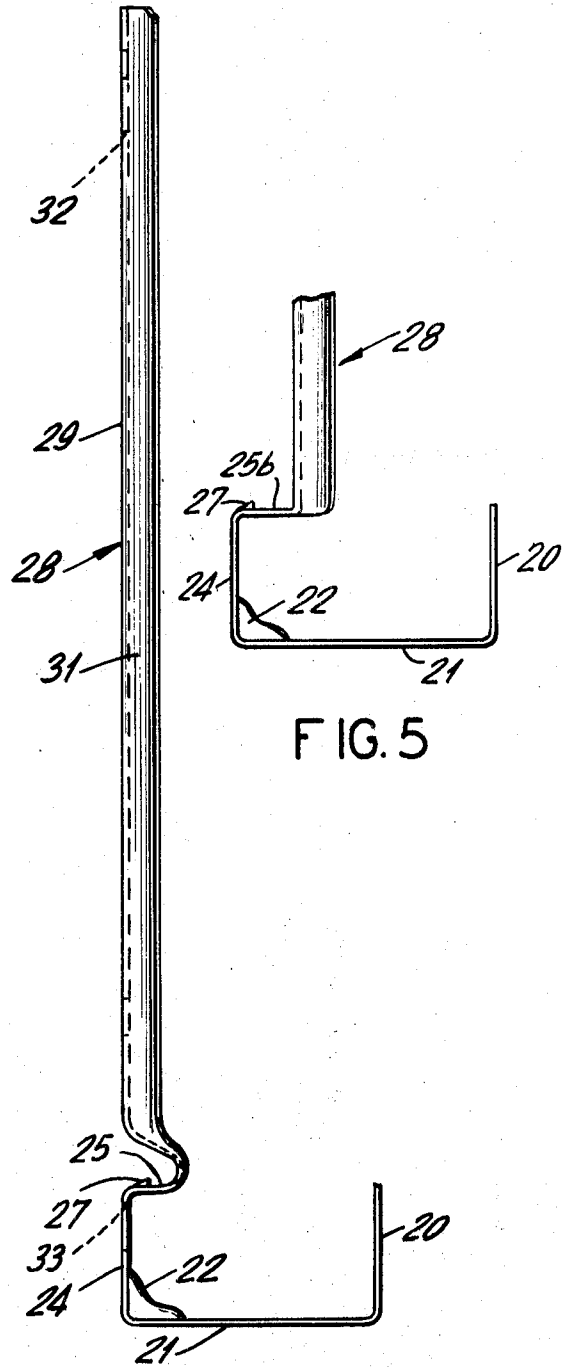


FIG. 3

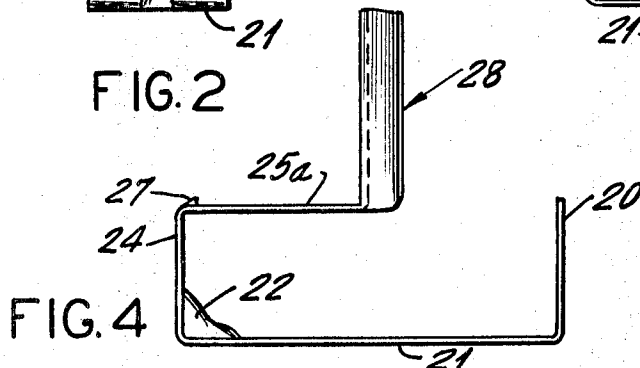


FIG. 4

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FIG. 6

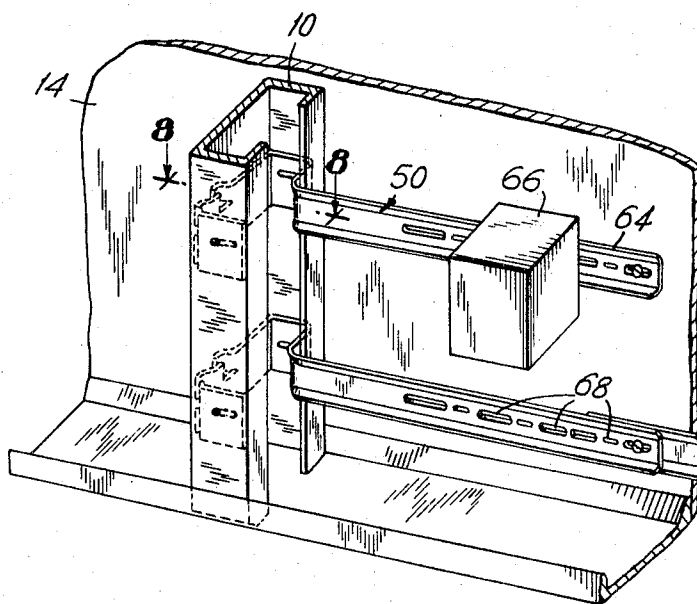


FIG. 7

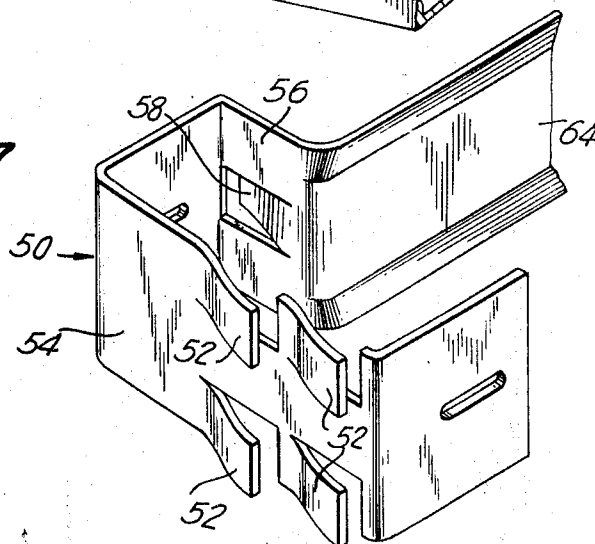
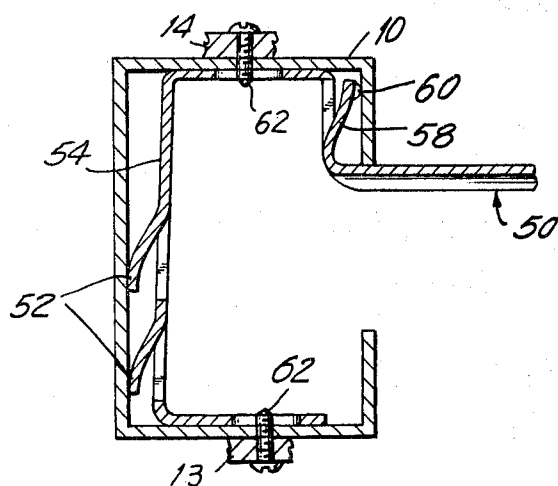


FIG. 8



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SUPPORT BRACKET FOR ELECTRICAL FIXTURES

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Continuation-in-part of application Ser. No. 647,362,
June 20, 1967. This application Mar. 7, 1969, Ser.
No. 808,717

Int. Cl. E04b 1/00

U.S. Cl. 248—205

10 Claims

ABSTRACT OF THE DISCLOSURE

A metal bracket adapted to engage the inside surface of a sheet metal channel shaped wall stud including a horizontally extending arm member adapted to support an electrical fixture and a U-shaped base portion of a configuration so as to fit tightly within the channel shaped wall stud.

The present invention is a continuation-in-part of application Ser. No. 647,362, filed June 20, 1967, and now abandoned.

The present invention relates to building construction and more particularly, to support brackets used in wall construction, to which brackets, electrical fixtures may be attached.

The most widely used method of traditional building construction uses a wooden frame, i.e., "balloon" construction. Wooden frames are used in almost all private houses and as interior walls in industrial and business constructions. The frame is of 2 x 3 or 2 x 4 vertical wood stud members to which are nailed the interior and exterior wall materials, such as interior dry wall, i.e., gypsum, board. This type of wall is load-bearing and relatively inexpensive, but it is not fireproof because of its wooden frame.

In buildings having non-load-bearing separation walls, such as steel frame apartment houses, the walls are often of the same wooden frame construction in preference to masonry walls, which are heavier and more expensive. Recently there has been introduced a separation wall system using vertical studs of sheet metal channels. The wall board is attached to the channel studs by self-tapping metal screws. The wall board can then be used itself as the wall, or be covered with a second wall board or with plaster. This type of wall is not load-supporting, but compared with wood-frame construction, it is inexpensive and fire resistant.

This type of metal frame wall construction poses a problem as to the installation of electrical fixtures, such as electrical outlet boxes. Sometimes the box may be screwed directly to the metal stud. But often the box must be located between studs. The United States Gypsum Company, which sells the metal studs, currently recommends that a wood piece span two studs and be screwed to the studs and that the fixture be fastened to the wooden cross-piece (see Specification Bulletin 1197-1967 at page 4). This type of cross member is time-consuming to install and not fireproof.

It is the objective of the present invention to provide a support bracket for metal studs used in metal frame wall construction, which bracket is easy and rapid to install, fireproof, and relatively strong and inexpensive.

In accordance with the present invention, a sheet metal bracket is provided. The bracket has a U-shaped base. The base is dimensioned to be adapted to the standard sizes of the metal stud channel. One or more corners (or one or more sides) of the base has gripping protrusions or an extending bead. The base is integral with an arm extension formed in the shape of a channel. The

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base may be made adaptable to fit channels which vary in size.

The bracket may be snapped into a metal stud channel and will be held in place by its spring action and by its gripping protrusions. If desired, the bracket may also be held by a screw. The electrical outlet box, or other fixture, is secured by a screw and nut in an elongated slot in the arm of the bracket. Two brackets may be joined, for example by a bolt and nut, with one bracket held in one stud and its attached bracket held in the next facing stud. The two brackets form a cross-member, providing a stronger support for fixtures than a single bracket.

Other objectives of the present invention will be apparent from the following detailed description, taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of the wall construction using near its top one bracket of the present invention, and also showing two of the said brackets forming a cross-piece;

FIG. 2 is a front view of the bracket of the present invention;

FIG. 3 is a side view of the bracket of FIG. 2;

FIG. 4 is a side view of a second embodiment of the bracket of the present invention;

FIG. 5 is a side view of a third embodiment of the bracket of the present invention;

FIG. 6 is a perspective view similar to FIG. 1, of a further embodiment;

FIG. 7 is an enlarged perspective view of the base portion of the embodiment of FIG. 6; and

FIG. 8 is an enlarged cross-sectional view taken along lines 8-8 of FIG. 6.

The wall construction, shown in FIG. 1, is a relatively inexpensive and fire-resistant construction adapted for buildings in which the wall does not need to support the roof or another structure. The wall includes a plurality of vertically aligned metal channel studs 10 and 11. The studs are usually regularly spaced 16 to 24 inches apart. The bottoms of the studs 10 and 11 fit into and are fastened to metal channel track 12, which is fastened to the floor. A track channel member (not shown) similar to floor member 12, is fastened to the ceiling and the tops of the vertical channels fit into and are fastened to the ceiling track. Covering layers 13 and 14 of dry wall, i.e., gypsum (plaster) wallboard, such as sheet rock, are fastened to the channel studs 10 and 11, for example by self-tapping metal screws 35. The wallboard layers 13 and 14 may, if greater thickness is desired, be covered by a second layer of wallboard. In an alternative construction, within the scope of the invention, the metal channel studs 10 and 11 may be covered by a layer of rocklath, which is a paper-covered gypsum material. The rocklath may serve as a base for plaster coating, or a covering layer of tile or other decorative material. The space between the studs 10 and 11 may be wholly or partly filled with sound- and temperature-insulative material, such as mineral filler batts.

The channel studs 10 and 11 come in standard widths of 1½, 2½, 3½ and 4 inches.

A bracket 15 is secured within a stud 10. An electrical outlet box 16 is fastened to bracket 15. A bracket 17, similar to bracket 15, is secured within stud 10, and another similar bracket 18 is secured within stud 11. The brackets 17 and 18 are connected together by a nut and bolt 19. An electrical fixture (not shown) may be connected to the cross-piece formed by brackets 17 and 18.

The construction of the brackets 15, 17 and 18 is shown in FIGS. 2 and 3. The bracket is formed from a strip of sheet steel, for example ¼ inch thick galvanized steel, but brass or aluminum or other metals or plastics may also be used. If made of plastic, the bracket may be hot-

formed, molded or extruded to shape. The bracket may also be made by the diecasting or sand-casting of metal. The base of the bracket is in the form of a sharp-cornered U. The first side portion 20 of the base is integral with the bottom portion 21. An indented rib 22 is pressed into the metal joining the bottom portion 21 to the second side portion 24. Rib 22 provides stiffness to its corner. The side portions 20 and 24 are of the same length as the sides of the channel of the metal stud for which the bracket is adapted. The length of bottom portion 21 is likewise adapted to fit the bottom of the stud's channel. For example, if the stud is 2½ inches wide at its exterior, the length of the bottom portion may be 2.43 inches and the depth after installation sufficient to support an outlet box 2½ inches deep.

The second side wall 24 leads into an integral flange portion 25 at a right angle to side wall 24. The corner between flange portion 25 and side portion 24 is particularly designed to grip the inside corner of the stud channel. For this purpose two sharp protruding ears (teeth) 26 and 27 are staked at the ends of the corner. Preferably these teeth are ¼ inch wide (for a bracket 1¼ inch wide). Alternatively, the corner is made with a protruding bead or is machined or built up to have a sharp edge.

The flange portion 25 leads to an integral extending arm 28 curved back from flange portion 25. Arm 28 is formed in the shape of a U-channel with a bottom 29 and side walls 30 and 31. This shape provides stiffness to the arm even though relatively thin metal is used. The bottom 29 of arm 28 has an elongated slot (key slot) 32. This slot 32 permits the outlet box or other fixture to be fastened anywhere along the length of the slot by means of a bolt through the slot. Slot 32 also enables two brackets to be joined by their arm portions, forming a cross-piece between studs, in spite of various distances between studs, by means of a fastener connected through both slots. Three or more slots and various holes are provided in the sides of the U-shaped base. These openings are dimensioned to locate, hold and fasten various sheet metal or self-tapping and wallboard screws, as well as wallboard fasteners and staples.

The bracket of the present invention supports the back end of an outlet box or other fixture. The front of the fixture is fastened to the wall board or other wall material.

In operation, it is desired to install an electrical fixture between metal channel studs. The U-shaped base of the bracket is positioned in the channel. Such positioning is started by placing side wall portion 20 in the channel of the stud with the bracket held outward toward wall 13 in FIG. 1. The bracket is then pushed in the direction of arrow A until it locks itself into the stud. The bracket is held in position by its internal spring tension acting against the walls of the stud channel. The gripping protrusions hold and lock the U-shaped base into the stud channel. If desired, a screw may be placed through slot 32 in the bracket to hold the bracket in position. The back end of the fixture is then attached to the bracket.

The length of the flange portion 25, shown by flanges 25a and 25b in FIGS. 4 and 5, respectively, depends upon the depth of the fixture and the dimensions of the studs.

The installation of the bracket is simple and fast. The bracket provides a fireproof support for electrical fixtures.

Modifications may be made in the present invention within the scope of the subjoined claims. For example, a second flange, similar to flange portion 25, may be added to the end of side portion 20 and at right angle to it. Gripping protrusions or notched and bent protruding teeth may be used in one, two, three or all four corners of the U-shaped base. Gripping protrusions or teeth may be added to one or more sides of the U-shaped base. Protrusions may also be added to lock into the openings of the stud channels. Various holes, plain or threaded, may be substituted for the key slot of the bracket.

As another modification, the first side portion 20 may be omitted from the bracket. This modification is particularly

useful when used with narrow stud members. The bracket for the narrow stud is constructed with a base having a bottom portion 21, a side wall 24, a flange portion 25 having gripping means 27 at its corner, and an extending arm 28.

A further embodiment is shown in FIGS. 6-8. In practice channel studs 10 varied in width and depth. While the channels were to have uniform dimensions along their length, they oftentimes varied from ¼ to ¾ of an inch, which in channels having a width of from 1½ to 4 inches, is substantial and oftentimes causing the bracket to slip in the channel.

Bracket 50, as best seen in FIG. 7 overcomes this sloppiness in dimensions, by having tabs 52 outwardly sprung from the bottom portion 54 of the generally U-shaped base. Similarly, flange 56 has a tab 58 outwardly sprung. Tabs 52 and 56 yieldingly engage the side walls of channel 10, even if the dimensions of the channel are larger than standard. Tabs 52 and 56 are urged inwardly by channel 10, as seen best in FIG. 8, and hold bracket 50 firmly in place. While two pairs of tabs 52 are shown struck from bottom portion 54, one pair or even one tab, preferably centrally positioned, may be used.

If flange 56 has a tab 58 sprung from it, preferably the tab has gripping means on it, such as at 60, instead of the flange as in the other embodiments. If desired, a screw 62 is used to fasten the wallboard, not shown, to the channel, which in turn aids in securing bracket 50 in position with respect to the channel.

Bracket 50 has an extending arm 64, which has a series of slots 68 to aid in fastening outlet box 66.

While tabs struck from the base have been shown, resiliently outwardly directed protuberances may also be used to engage the inner walls of the channel.

Bracket 50 may be used with a channel accurately dimensioned, since tabs 52 and/or tab 58 are urged inwardly and become flush with the surface of the base.

What I claim is:

1. A bracket for supporting an electrical fixture to a metal channel stud, comprising a one-piece elongated member formed of resilient material having a base at one end, an extending arm, a flange interconnecting said base and arm, and gripping means;

said base having as connected portions, a first side wall, a bottom, and a second side wall, said side walls being at substantially right angles to said bottom and extending in the same direction;

said flange being positioned substantially at right angles to said second side wall adjacent its end;

said gripping means extending outwardly from the elongated member in channel stud-engaging position;

said arm extending from the end of said flange opposite its end adjacent said second side wall and in generally the same direction as said side walls;

said walls of said base and said flange adapted to engage a complimentary channel stud, said side walls of said base and said flange being pressable into engagement with said channel and being so spaced from each other as to provide gripping pressure against the engaged portions of the channel stud and urging said gripping means against said channel stud for securing the arm and fixture thereto.

2. A bracket as in claim 1, and having elongated holes in the said side walls of said base and in the bottom of said base, said elongated holes adapted and dimensioned to hold said base, said elongated holes adapted and dimensioned to hold and grip sheet metal screws, thereby upon tightening said sheet metal screws said bracket is additionally held to metal stud.

3. A bracket as in claim 1, wherein said arm has an elongated slot and is shaped in the form of a channel.

4. A bracket as in claim 1, wherein said gripping means is disposed adjacent the corner between said flange and said second side wall.

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5. A bracket as in claim 1 wherein said gripping means are protruding ears.

6. A bracket for supporting an electrical fixture to a metal channel stud, comprising a one-piece elongated member formed of resilient material having a base at one end, an extending arm, and a flange interconnecting said base and arm;

said base having as connected portions, a first side wall, a bottom, and a second side wall, said side walls being at substantially right angles to said bottom and extending in the same direction;

said flange being positioned substantially at right angles to said second side wall adjacent its end;

said arm extending from the end of said flange opposite its end adjacent said second side wall and in generally the same direction as said side walls;

said elongated member having a yieldable portion extending outwardly from its surface in channel stud engaging position;

said walls of said base and said flange and said yieldable portion adapted to engage a complimentary channel stud, said side walls of said base and said flange and said yieldable portion being pressable into engagement with said channel and being so spaced from each other as to provide gripping pressure against the engaged portions of the channel stud for securing the arm and fixture thereto.

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7. A bracket as in claim 6, wherein said yieldable portion extends outwardly from the surface of said base for yieldably engaging a corresponding wall of said channel.

8. A bracket as in claim 6, wherein said yieldable portion extends outwardly from said flange for yieldingly gripping the corresponding wall of said channel.

9. A bracket as in claim 7 wherein said yieldable portion extends outwardly from the surface of the bottom of said base for yieldably engaging the bottom of the channel.

10. A bracket as in claim 9, wherein said yieldable portion is a tab struck from the bottom of the base.

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ROY D. FRAZIER, Primary Examiner

J. F. FOSS, Assistant Examiner

U.S. Cl. X.R.

248—221, 300

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,528,636 Dated September 15, 1970
Inventor(s) GEORGE SCHMIDT

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the Specification:

Column 1, line 44 - Change "og" to --of--.

In the Claims:

Claim 2, lines 4 - 5, delete "to hold said base, said elongated holes dapted and dimensioned".

SIGNED AND
SEALED
DEC 8 - 1970

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents