Dec. 20, 1949 A. A. LEIN 2,491,742

WALL FIXTURE ATTACHING DEVICE

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3 Sheets-Sheet 1

Fig. 4

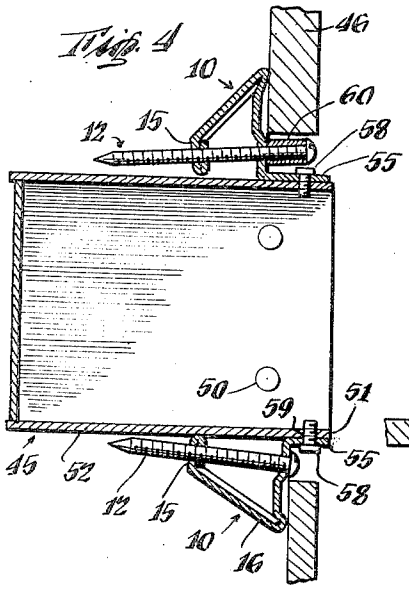


Fig. 3

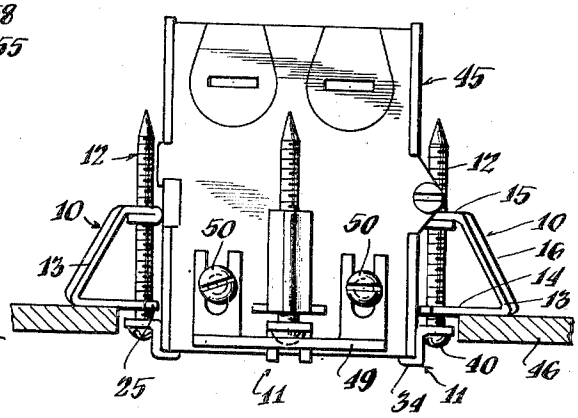


Fig. 1

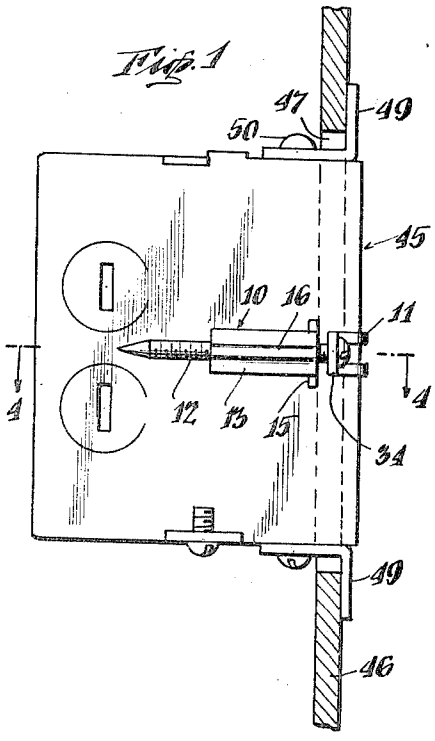
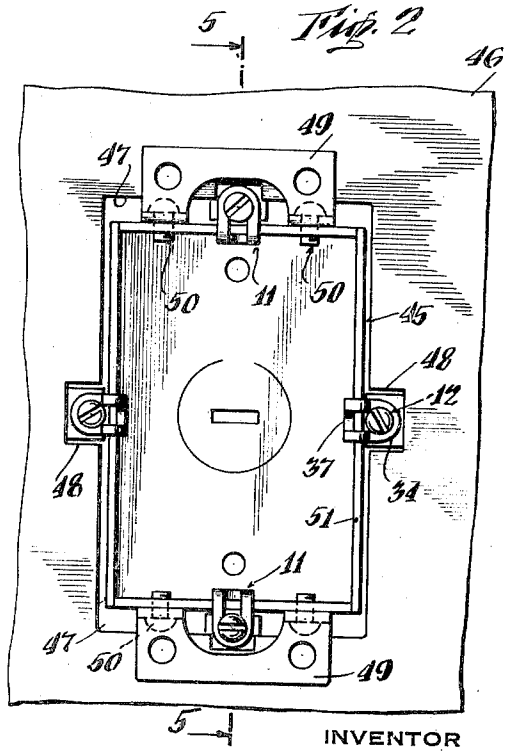


Fig. 2



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WALL FIXTURE ATTACHING DEVICE

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Fig. 8

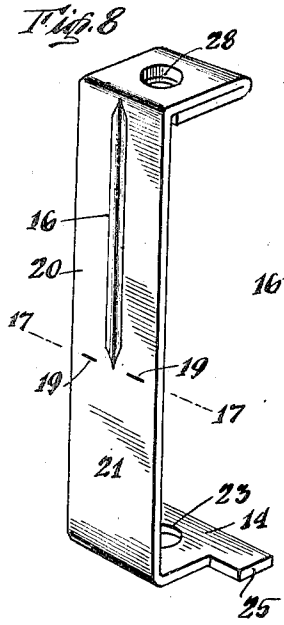


Fig. 11

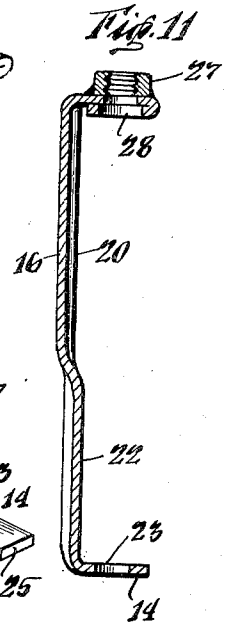


Fig. 5

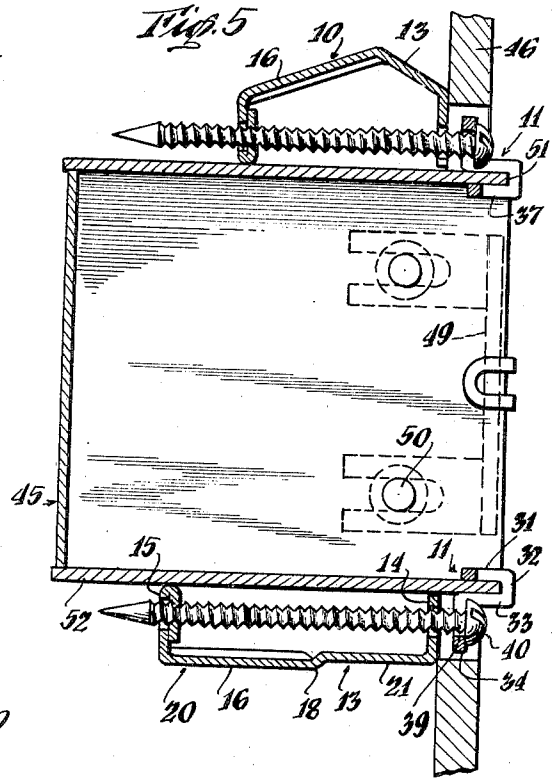


Fig. 9

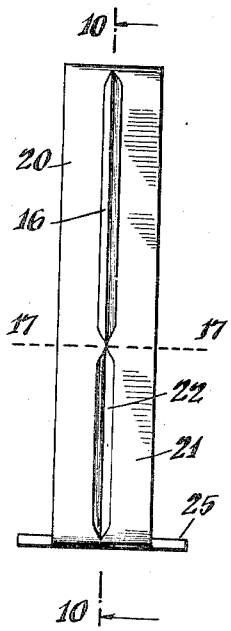


Fig. 10

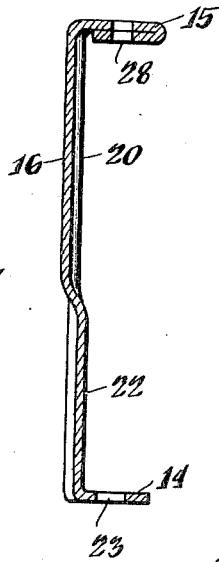


Fig. 6

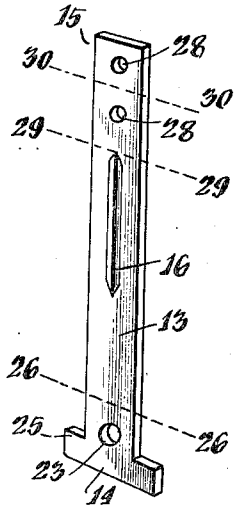
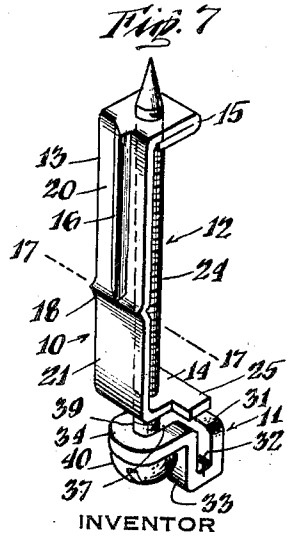


Fig. 7



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Fig. 12

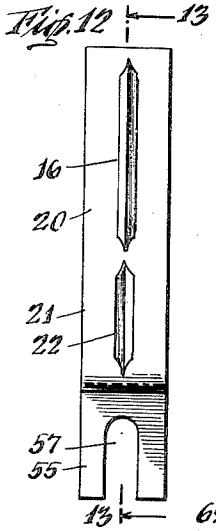


Fig. 13

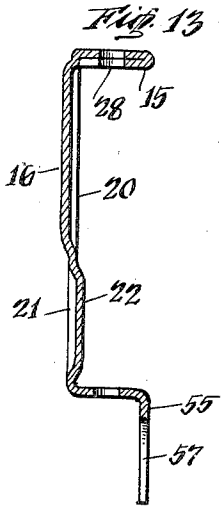
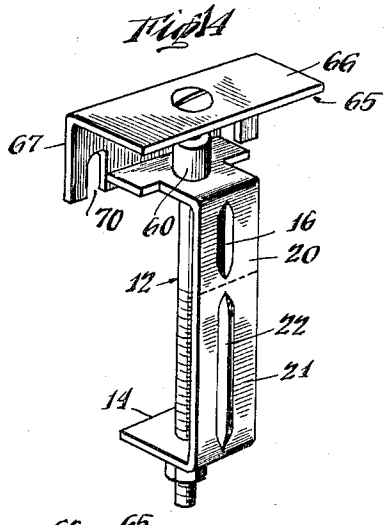


Fig. 14



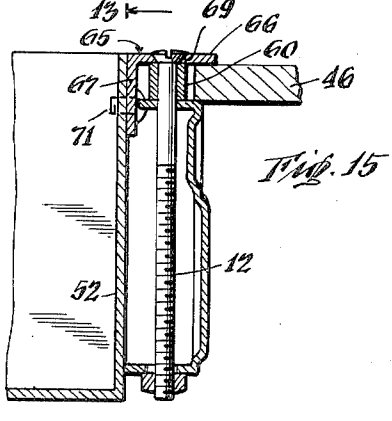


Fig. 15

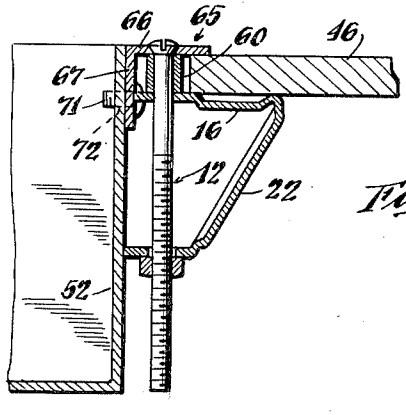


Fig. 16

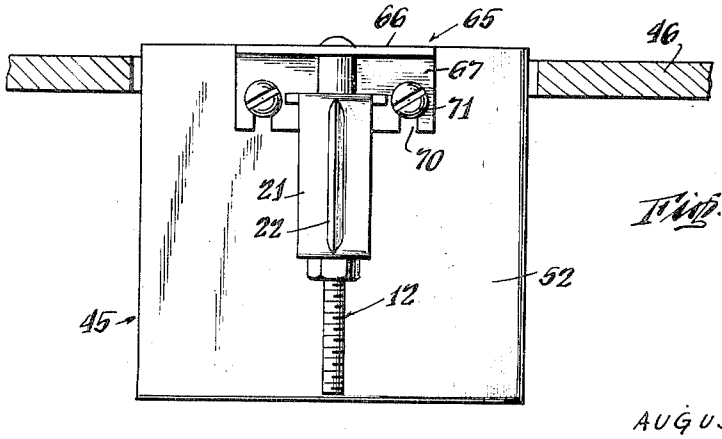


Fig. 17

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2,491,742

UNITED STATES PATENT OFFICE

2,491,742

WALL FIXTURE ATTACHING DEVICE

August A. Lein, Harrington Park, N. J.

Application February 1, 1947, Serial No. 725,772

6 Claims. (Cl. 248—205)

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This invention relates to improvements in wall fixture attaching devices and more particularly to an improved device for attaching such fixtures as electric switch boxes, electrical fittings, medicine chests and other box-like structures to building wall panels.

It is common practice to apply to the interior walls of building framing, composition wall board of various types. The attachment of electrical switch boxes, electrical outlets and like fixtures to wall board of this type is rendered difficult for the reason that nails and screws cannot be securely attached to the wall board. Where the wall board is not directly backed up by wood lath or other like members, it is necessary to insert a block of wood through the hole in the wall board which is to receive the fixture, and secure the wood block to the wall board or to the studding in a suitable manner to provide a framing around the fixture hole in the wall board to which the nails or screws intended to support the fixture may be firmly secured. Affixing fixtures in this manner is generally unsatisfactory due to the time consumed in installation, and the difficulty of effecting firm securement to the wood block in position to the rear of the wall board. Due to the inherent difficulties thus encountered in attaching the fixture to the wall board, it is often found that the fixture is not accurately centered, wiring difficulties are encountered, and the fixture itself becomes loose and wabbly during use.

An object of this invention is to provide an improved attaching device whereby electrical switch boxes, electrical outlets, medicine cabinets and other box-like structures and fixtures may be firmly and securely attached to wall built up of composition wall board, without the necessity of providing backing struts for the wall board in order to firmly support and secure the fixture in position.

Other objects and advantages of this invention will become apparent as the disclosure proceeds.

In accordance with this invention, an improved attaching device is provided which is simple in design and construction, economical to manufacture, and which provides means whereby electrical fixtures and box-like structures may be directly attached to wall board in a firm and secure manner with a minimum of effort and inconvenience. The attaching device may be constructed of simple parts, comprising essentially a fixture attaching member designed to grip or be secured to the edge or side wall of the fixture to be installed, a deformable clamp member designed to extend along the side wall of the fixture, and a screw connecting the attaching member and the clamp member in a manner so that when the screw head is manipulated, the clamp member will be deformed and drawn tightly against the rear face of the wall board so as to firmly hold the fixture thereto.

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The fixture attaching member may be formed as a hook member designed to engage the edge of the side wall of the fixture, or the attaching member may comprise an integral part of the clamp member, or the attaching member may comprise a projecting bracket, either integrally formed as a part of the fixture side wall or secured to the side wall by screws or the like.

The clamp member may be formed from light gauge sheet metal, which before application to the fixture presents a relatively straight body section having a leg section extending laterally from each end thereof. One of the leg sections is designed to be located adjacent the rear face of the wall board and is provided with a hole therein through which the threaded shank of the screw may freely extend. The leg section at the other end of the body section is designed to receive the lower end of the screw shank which extends through the hole therein. The hole in the last named leg section may be of such diameter as to have threaded engagement with the threaded screw shank, or if desired, a screw nut may be securely attached to this leg section with which the screw shank is designed to have threaded engagement. The body section of the clamp member is sufficiently deformable to permit bending transversely thereof so that when the screw is turned, one portion of the body section will be manipulated to swing outwardly to closely overlie and abut the rear face of the wall board, and the other portion of the clamp member will provide a bracing strut which extends from the wall board abutment portion at an inclined angle to the leg section which is engaged by the screw shank and drawn toward the head thereof when the screw head is turned.

The strut portion and also the abutment portion of the clamp member may be stiffened and reinforced by a rib which extends longitudinally thereof to the approximate bend line in the body section which defines the adjacent ends of the strut portion and the abutment portion. By the application of such reinforcing ribs to the strut portion and the wall board abutting portion of the clamp body, transverse bending of the clamp member at the proper location between the adjacent ends of the rib formations is assured.

This improved wall fixture attaching device provides means whereby box-like structures may

be quickly and firmly attached to wall paneling constructed from composition board. In applying a box-like fixture to the wall board, an appropriate dimensioned hole is cut in the wall board to accommodate the fixture, with the attaching members associated with such fixtures seating against the room-exposed face of the wall board. This improved attaching device is then positioned between the side wall of the fixture and the adjacent edge of the wall board. The screw head of the attaching device seats against the attaching member and is readily accessible from the interior of the room. The screw head is manipulated as by means of a screw driver, which manipulation deforms the clamp member to generally angular shape, the strut portion thereof causing the wall abutting portion thereof to swing outwardly so as to snugly and tightly overlie the rear face of the wall panel. The strut or bracing portion of clamp member is thus swung into an angular position so as to extend from the transverse bend line in the clamp body to the lower leg portion thereof, this leg portion being engaged by the threaded screw shank and drawn towards the head end of the screw.

The screw is manipulated to a point where the wall board abutting portion of the clamp member is firmly clamped against the rear face of the wall board. When this is accomplished, the screw head cannot further be readily manipulated. When these improved attaching devices have been applied to the fixture adjacent opposite sides thereof, or adjacent all four sides thereof as may be desired, it will be found that the fixture is firmly and rigidly held in position by the abutting flanges of the fixture which overlie the front face of the wall board and the abutting portions of the clamp members which overlie the rear face of the wall board, and with the wall board firmly clamped therebetween without damage or rupture of the wall board.

Although the characteristic features of this invention will be particularly pointed out in the claims appended hereto, the invention itself and the manner in which it may be carried out, may better be understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which

Fig. 1 is a side elevational view of an electrical switch box mounted in a wall panel and held in place by the improved attaching devices,

Fig. 2 is a front elevational view of the switch box, this view showing the improved attaching devices associated therewith and attaching the box assembly to the surrounding wall panel.

Fig. 3 is an elevational view of one end of the switch box, this view further illustrating the manner in which the improved attaching devices secure the switch box assembly in position to the wall panel.

Fig. 4 is a cross sectional view of the switch box further illustrating the manner in which the improved attaching devices secure the switch box to the wall panel, this view being taken along line 4—4 of Fig. 1, the attaching devices being of the form illustrated in Figs. 12 and 13.

Fig. 5 is an enlarged cross sectional view of the switch box assembly in position on the wall panel, this view illustrating one of the attaching devices prior to deformation of the clamp member thereof, this view also illustrating one of the attaching devices having the clamp member thereof in process of deformation to grip the rear face of the wall panel, the attaching devices being of the form illustrated in Figs. 7 and 8.

Fig. 6 is a perspective view of the metal strip from which the clamp member may be formed.

Fig. 7 is a perspective view of one form of the improved attaching device as it appears when fully assembled prior to attachment to the fixture.

Fig. 8 is a perspective view of a clamp member of somewhat modified form.

Fig. 9 is an elevational view of a clamp member of further modified form.

Fig. 10 is a longitudinal cross sectional view of the modified clamp member shown in Fig. 9 as the same appears when viewed along line 10—10 of Fig. 9.

Fig. 11 is a longitudinal cross sectional view of a clamp member similar to that shown in Figs. 9 and 10, modified by the provision of a threaded nut attached to the lower leg section thereof with which the threaded shank of the screw is designed to engage.

Fig. 12 is an elevational view of a clamp member having a fixture attaching portion formed integral therewith.

Fig. 13 is a longitudinal cross-section view of the modified clamp member shown in Fig. 12 as the same appears when viewed along line 13—13 of Fig. 12.

Fig. 14 is a perspective view of another modified form of the improved attaching device having an angular bracket formed separately from the clamp member.

Fig. 15 is a vertical cross-sectional view of a section of the switch box assembly in position on the wall panel, this view also showing the attaching device illustrated in Fig. 14 in cross section prior to deformation of the clamp member.

Fig. 16 is a vertical cross-sectional view of a section of the switch box assembly in position on the wall panel, this view showing the attaching device illustrated in Fig. 14 after deformation thereof; and

Fig. 17 is a side elevational view of the attaching device illustrated in Fig. 14 in position on a side wall of the switch box.

Similar reference characters refer to similar parts throughout the several views and drawings of the specification.

This improved attaching device as illustrated in Figs. 1, 2, 3, 5, and 7 is formed from a clamp member 10, a hook member 11, and a screw 12. The clamp member 10 and the hook member 11 are preferably formed of light gauge corrosion resistant sheet metal capable of deformation as set forth hereinafter. Screw 12 may be a standard metal screw of sufficient length to pass through the wing section 34 of the hook member and the leg sections 14 and 15 of the clamp member prior to deformation thereof.

The clamp member 10 may be formed of a strip of sheet metal as shown in Fig. 6, presenting a body section 13 and leg forming sections 14 and 15 at each end thereof. The body section 13 may be stamped with an outwardly extending rib 16, which extends from the leg forming section 15 along the body section 13 for a distance of approximately three-fifths of the length of the body section 13, in order to strengthen the strut portion 20 thereof against bending. Immediately below the rib 16, means are provided to assure bending of the body section along a transverse line 17, which means is illustrated in Fig. 17 as a hip portion 18 stamped into the metal as shown in Fig. 7, or as short slits 19 as illustrated in Fig.

8, which serve to weaken the metal along the line 17 so that the metal is easily bendable along that line. The body section 13 is thus divided into a strut portion 20 and a panel abutment portion 21. The panel abutment portion 21 may also be stamped with a longitudinally extending rib 22 as illustrated in Figs. 9, 10 and 11.

Leg section 14 is pierced with a hole 23, of a diameter great enough so that the neck portion of the screw 12 may pass easily therethrough but not so large that the head 40 of the screw 12 may pass therethrough. The leg section 14 may also be provided with a foot flange 25 extending laterally from the sides thereof. The leg section 14 is bent inwardly along the bend line 26 at an angle of about 90° with respect to the body section 13.

Leg section 15 may be made of double ply metal having a hole 28 therein of a diameter such that the leg section 15 will be engaged by the threads of the threaded shank 24 of the screw 12. Leg section 15 is bent inwardly along bend line 29 at an angle of about 90° to the body section 13, presenting a leg section of double thickness of metal.

As an alternative construction, the leg section 15 of the clamp member 10 as shown in Fig. 11, may have a nut 27 welded over the hole 28 of leg section 15, the nut 27 being provided with an interior thread so that the threaded shank 24 of the screw 12 may be engaged thereby.

The hook number 11 may be formed of relatively light gauge sheet metal to present a retaining section 33, a bearing section 32, a flange section 31 and a wing section 34. The retaining section 33 and the flange section 31 are bent at an angle of 90° to the bearing section 32, thus forming a slot 37 therebetween, which is designed to fit snugly over the edge of a switch box or other box like structure which is to be affixed to the wall panel. The wing section 34 is bent laterally from the retaining section 33 at an angle of about 90°. A hole 39 is bored in the wing section 34 of such a diameter that the neck portion of the screw 12 may pass easily therethrough, but the head 49 of the screw 12 will not pass therethrough.

The hook number 11 and the clamp member 10 may also be formed from a single strip of metal, in which the retaining section 33 of the hook member 11 would be formed as a continuation of the leg section 14 of the clamp member 10, the wing section of the hook members being then eliminated.

The screw 12 is provided with a threaded shank portion 24 which preferably presents sharp and deep threads so that positive and secure engagement may be had with the hole 28 of the leg section 15, or with the interior threading of the nut 27.

Figs. 1, 2, 3 and 5 inclusive illustrate the manner of affixing a switch box 45 to a composition board wall 46. As more particularly illustrated in Fig. 2, a hole 47 is cut into the wall panel 46 of a size and shape so that the switch box 45 may fit easily therein. As the sides of the hole 47, slots 48 are cut in the wall panel through which the clamp member 10 and its associated hook member 11 and screw 12 may be inserted. The switch box 45 is provided at top and bottom with outwardly extending flanges 49, which may be formed as an integral part of the switch box 45, or which may be attached thereto by means of screws 50, as illustrated in Fig. 3. The flanges

49 are designed to abut against the front face of the wall panel 46.

The improved attaching device is assembled ready for use as shown in Fig. 7 by passing the screw 12 through the hole 39 in the wing section 34 of the hook member 11, through the hole 23 in the leg section 14 of the clamp member 10, and through the hole 28 in the leg section 15 of the clamp member 10, with the threaded shank portion 24 of the screw 12 engaging the circumference of the hole 28 in the leg section 15, or, in the exemplification illustrated in Fig. 11, engaging the interior threading of the nut 27.

The attaching device is passed through the slot 48 in the wall board 46, and the hook member 11 is fitted over the edge 51 of the side wall 52 of the switch box 45. The screw 12 is now tightened, the foot flange 25 on the leg section 14 seating against the side wall 52 of the switch box 45 to inhibit rotation of the clamp member 10. As the screw 12 is tightened, the clamp member 10 will bend along bend line 17, as illustrated in Fig. 5. When the screw 12 is fully tightened, the wall abutting portion 21 of the body section 13 of the clamp member 10 will fit closely and firmly against the back of the wall panel 46, and the box flanges 49 will be drawn firmly against the front face of the wall panel 46. The strut portion 20 of the body section 13 acts as a brace to prevent further bending of the wall abutment portion 21. The improved attaching device then forms a right triangle whose sides are made up of the screw 12, and the panel abutting portion 21, the strut portion 20 forming the hypotenuse thereof.

The switch box 45 will then be held firmly and securely in place by the interaction of the box flange 49 and the clamp member 10. After thus firmly fixing the switch box 45 in place, any further tightening of the screws 12 will tend to force the tip ends of the screws against the adjacent sides 52 of the switch box 45, to further rigidly secure the fixture in position.

It will be appreciated that the improved attaching device may be applied at the same location on the box 45 as the box flange 49, as illustrated in Fig. 2, since the box flange 49 does not interfere with the application or operation of the attaching device. The flanges and the clamp member may thus be directly opposed. A plurality of these improved attaching devices may be used, as illustrated in Fig. 2, in which four attaching devices are shown in place. It will also be appreciated that this improved attaching device may be used in connection with any type of box-like structure which a builder or home-owner may desire to incorporate in a wall composed of composition board.

In the form of the invention illustrated in Figs. 4, 12 and 13, the hook member 11 is dispensed with, the clamp member 10 having as a part thereof an attaching section 55 adapted to be attached to the side 52 of the switch box 45. The attaching section 55 may be made as an extension of leg section 14, and is bent outwardly therefrom at an angle of about 90°. The attaching section 55 may be provided with a slot 57 by means of which the attaching section 55 may be adjustably secured to the side wall 52 of the switch box 45 as by means of a screw 58, the screw 58 being in threaded engagement with a hole 59 in the side wall 52 of the box fixture.

In installing a switch box 45 by means of an attaching device in the form illustrated in Figs. 4, 12 and 13, the attaching section 55 of the

clamp member is secured to the side wall 52 of the switch box 45 in such a position that when the box flanges 49 abut against the front face of the wall board 46, the bend line 26 of the clamp member will be in the same plane as the rear face of the wall panel 46. The screw 12 is passed through the hole 23 and the threaded shank 24 thereof engaged with the edges of hole 28 or with the threads of nut 27. The switch box 45, with the attached clamp member 10, is passed through the wall panel hole 47 until the box flanges 49 abut against the front face of the wall 46. The screw 12 is now turned, thus deforming the clamp member 10 until the wall abutting portion 21 of the body section 13 fits snugly against the rear face of the wall panel 46, thus drawing the box flanges 49 firmly against the front face of the wall panel 46, thus clamping the box fixture 45 firmly in position.

If the wall panel 46 is of unusual thickness, so that it is inconvenient to manipulate the screw 12 when the head 40 thereof is seated against the leg section 14 of the clamp member, a collar member 50 may be telescoped on the screw 12 before it is passed through the hole 23 and engaged with the hole 28 of the clamp member or the nut 27. Thus the head 40 of the screw 12 may be maintained in a position where it may be easily manipulated, the thrust of the screw head 40 being communicated to the leg section 14 through the collar member 60.

In the form of the invention illustrated in Figs. 14, 15, 16 and 17 the box flanges 49 may be dispensed with, bracket members 65 taking their places. The bracket member 65 may be formed of sheet metal, and consists of a small panel abutting section 66 and a box-securing section 67, the panel abutting section 66 extending at an angle of about 90° from the box-securing section 67. The panel abutting section 66 is provided with a hole 69 to receive the neck portion of the screw 12. The box-securing section 67 of the bracket member 65 may be provided with slots 70, by means of which the bracket member 65 may be adjustably secured to the side wall 52 of the box fixture 45, as by screws 71 engaging threaded openings 72 in the box side wall 52.

In installing a switch box 45 by attaching devices as illustrated in Figs. 14 to 17 inclusive, the bracket member is attached to the box side wall 52 as by screws 12 inserted through the slots 71 in the bracket member. The screw is passed through the hole 69 in the panel abutting section 66 of the bracket member and also through the hole 23 in the leg section 14 of the clamp member 10, with the threaded shank 24 of the screw 12 engaging the edge of the hole 28 in the leg section 15, or the threads of the nut 27. The box fixture 45 is then inserted into the panel hole 47 until the panel-abutting section 66 of the bracket member 65 is in contact with the front face of the panel 46. The screw 12 is then turned, deforming the clamp member 10 until the wall abutting portion 21 of the body section 13 fits snugly and tightly against the rear face of the wall 46, thus clamping the panel 46 firmly between the wall abutting portion 21 of the clamp member 10 and the wall-abutting section 66 of the bracket member 65.

Improved attaching devices made in accordance with this invention are simple and sturdy in construction, and may be economically fabricated, at low cost. These attaching devices facilitate the installation of all types of box-like structures in walls built of composition board. The use of backing frames behind the wall board to support the weight of the box may also be eliminated thereby effecting substantial economies in the cost of installation.

While certain novel features of the invention have been disclosed herein, and are pointed out in the annexed claims, it will be understood that various omissions, substitutions, and changes may be made by those skilled in the art without departing from the spirt of the invention.

What is claimed is:

1. An attachment device for securing a wall fixture to a wall panel which includes, a deformable metal clamp member having a relatively straight body section deformable when in fixture attaching position, and a leg section extending in the same direction from each end of the body section, said deformable body section having a deformable panel abutment portion bendably hinged to a relatively rigid, non-deformable brace portion, and an elongated adjustment screw extending through the leg sections of said clamp member, means associated with the leg section next adjacent said brace portion providing for threaded engagement with the threaded shank of said screw, said screw being manipulable to draw said last named leg section toward the head portion of said screw whereby to swing the abutment portion of said clamp member from a position extending substantially parallel to the longitudinal axis of the shank portion of the screw to a position extending substantially at right angles thereto, and substantially simultaneously to swing said brace portion of the clamp member from a position extending substantially parallel to the longitudinal axis of the screw shank into an angular bracing position between said abutment portion and said screw shank and at an acute angie to said abutment portion.

2. An attachment device for securing a wall fixture, inset into an opening in a wall panel, to the adjacent edge of the wall panel which includes, a fixture engaging member having a fixture engaging portion and a lateral extending wing portion, a deformable clamp member having a relatively straight body section deformable when in fixture attaching position, and a leg section extending in the same direction from each end of the body section, said deformable body section having a panel abutment portion bendably hinged to a relatively rigid and non-deformable brace portion, and an elongated adjustment screw having the head portion thereof designed to seat against said lateral extended wing portion and a shank portion extending through the leg sections of said clamp member, said screw being operative to draw the leg section adjacent the tip end of the screw shank towards the head portion of the screw whereby to swing the panel abutting portion of the clamping clamp member into pressing engagement against the rear face of the panel and to swing the bracing portion of the clamp member into inclined bracing position between the panel abutment portion of the clamp member and the screw shank and at an acute angle to said abutment portion.

3. A device for securing an inset wall fixture to a wall panel which includes, a fixture engaging member having a hook portion designed to engage the edge of the fixture and a wing portion extending laterally therefrom, a deformable clamp member having a relatively straight body section deformable when in fixture attach-

ing position, and a leg section extending laterally from each end of the body section, and an elongated adjustment screw having the head portion thereof designed to seat against said lateral extending wing portion and a shank portion designed to extend through aligned holes in the leg sections of said clamp member, and threaded means associated with that leg section which is most remote from the head portion of the screw having threaded engagement with the threaded shank portion of said screw.

4. A device for securing an inset wall fixture to the adjacent edge of a wall panel which includes, a fixture engaging member having a hook portion designed to engage the fixture and a wing portion extending laterally from said hook portion, a deformable metal clamp member having a relatively straight body section deformable when in fixture attaching position, and a leg section extending laterally from each end of the body section, and an elongated adjustment screw having the head portion thereof designed to seat against said lateral extending wing portion and the shank portion designed to extend through aligned holes in the leg sections of said clamp member, threaded means associated with that leg section which is most remote from the head portion of the screw, said screw being operative to draw said threaded leg portion towards the head portion of the screw whereby to draw the body section of said clamp member into pressing engagement against the rear face of the panel, the leg portion nearest to the head of the screw being provided with lateral flanges whereby rotation of the clamp member during deformation thereof is inhibited.

5. An attachment device for securing a wall fixture to a wall panel which includes, a deformable metal clamp member having a relatively straight body section deformable when in fixture attaching position, and a leg section extending laterally from each end of the body section, aligned holes extending through said leg sections, threaded means designed to receive an adjusting screw associated with one of said leg sections, said deformable body section having a

panel abutment portion bendably hinged to a brace portion, said body section being bendable from relatively straight to angular form when said adjusting screw is manipulated, a fixture engaging portion, said fixture engaging portion having a slot therein whereby the said clamp member may be adjustably secured to a wall fixture.

6. An attachment device for securing a wall fixture, inset into an opening in a wall panel, to the adjacent edge of the wall panel which includes, a fixture engaging member having a fixture engaging portion and a lateral extending wing portion, the said laterally extending wing portion being designed to overlie the front face of the panel, a deformable metal clamp member having a relatively straight body section deformable when in fixture attaching position, and a leg section extending from each end of the body section, said deformable body section having a deformable panel abutment portion bendably hinged to a brace portion, and an elongated adjustment screw having the head portion thereof designed to seat against said laterally extended wing portion and a shank portion extending through the leg sections of said clamp member, said screw being operative to draw the leg section adjacent the tip end of the screw shank towards the head portion of the screw whereby to swing the panel abutting portion of the clamping clamp member into pressing engagement against the rear face of the panel and to swing the bracing portion of the clamp member into inclined bracing position between the panel abutment portion of the clamp member and the screw shank.

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REFERENCES CITED

The following references are of record in the file of this patent:

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