Nov. 2, 1971 R. C. LAVERTY 3,616,514

STUD SUPPORTING TOOL

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FIG. 1

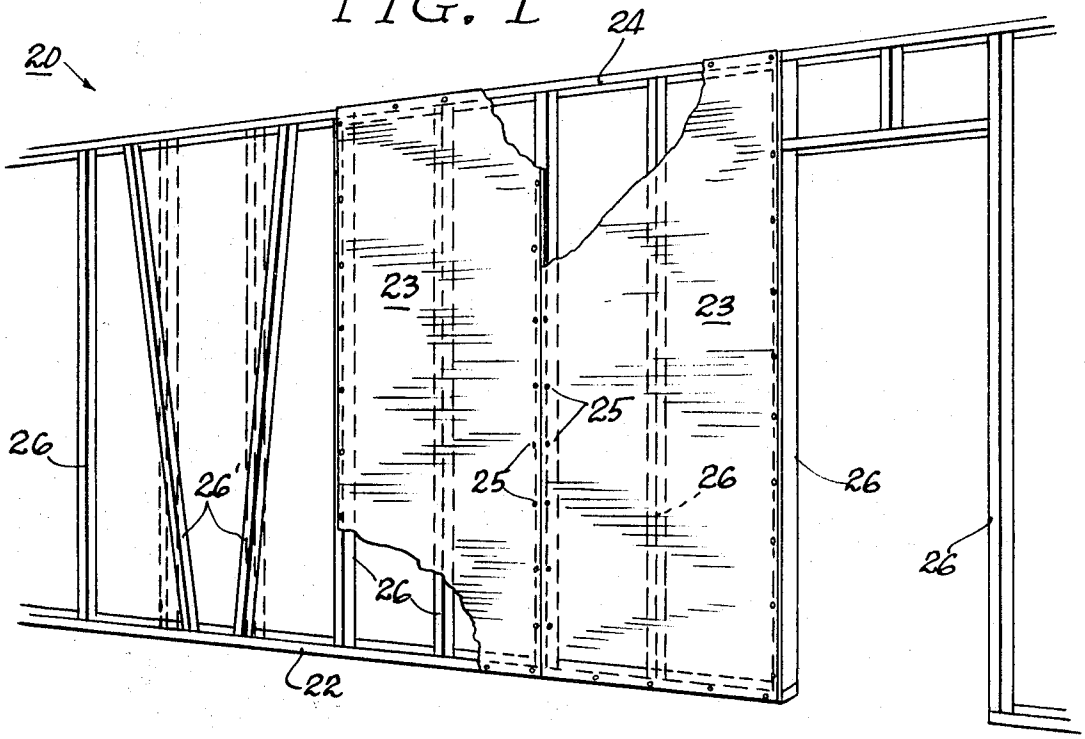


FIG. 2

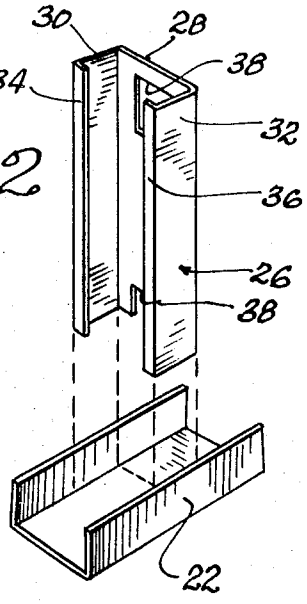
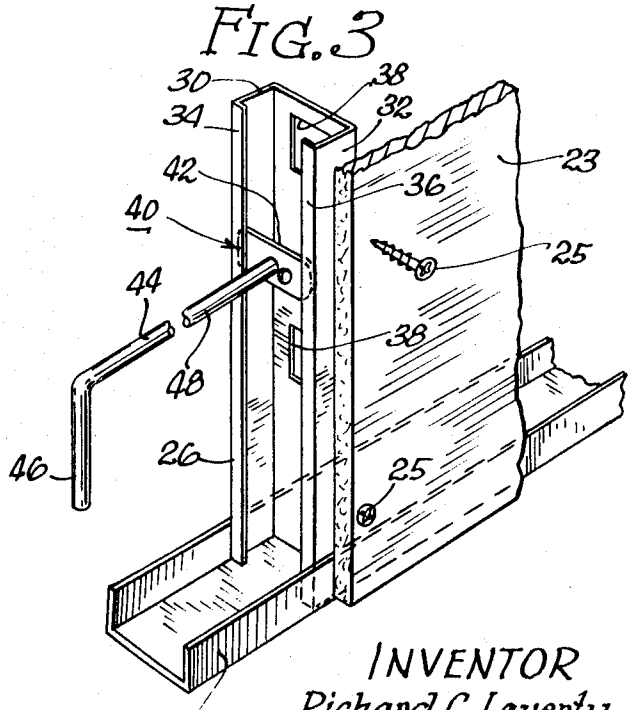


FIG. 3



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STUD SUPPORTING TOOL

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FIG. 4

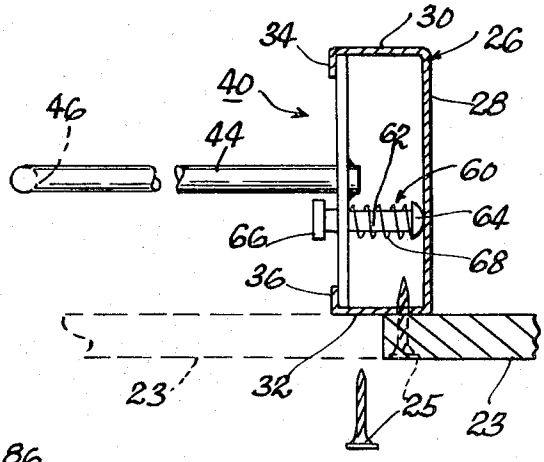


FIG. 5

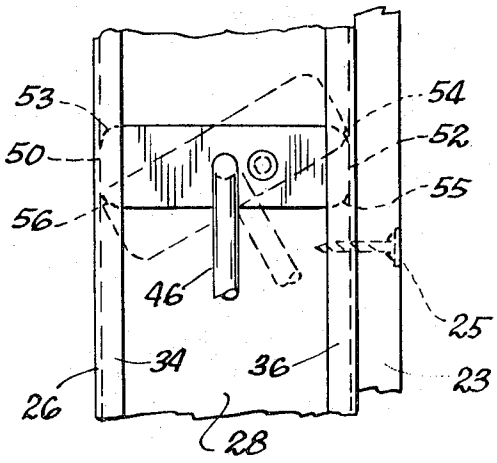


FIG. 6

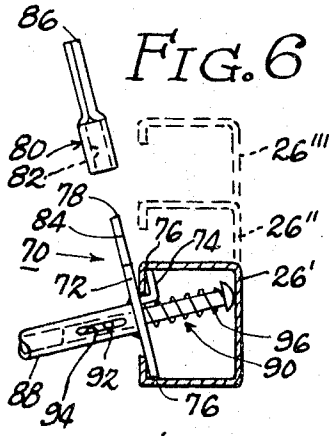


FIG. 7

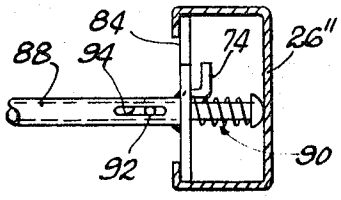


FIG. 8

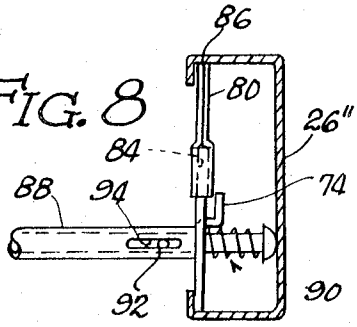


FIG. 9

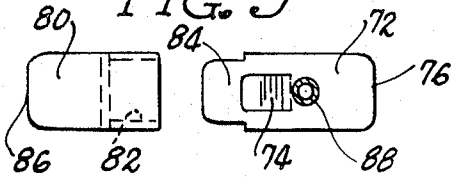


FIG. 10

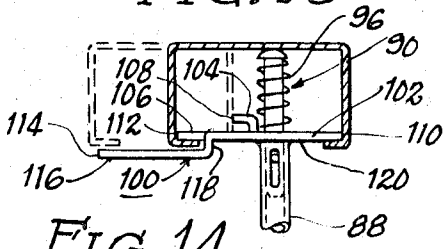


FIG. 11

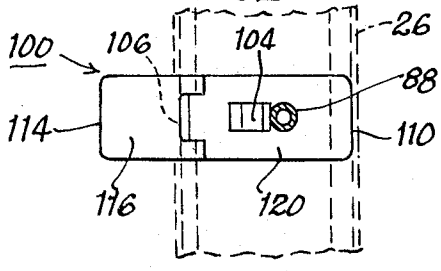


FIG. 14

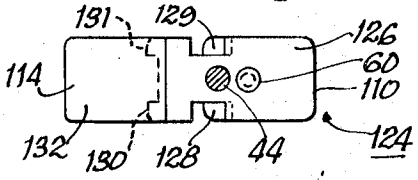


FIG. 12

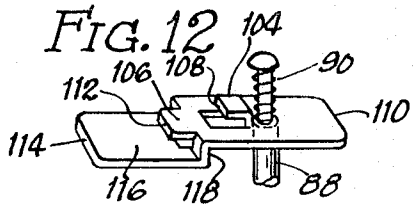
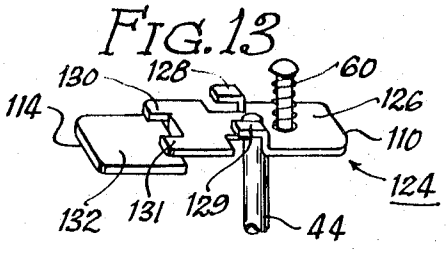


FIG. 13



United States Patent Office 3,616,514 Patented Nov. 2, 1971

3,616,514

STUD SUPPORTING TOOL

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Filed Mar. 30, 1970, Ser. No. 23,614
Int. Cl. B25b 3/00; E04g 21/16
U.S. Cl. 29—283 12 Claims

ABSTRACT OF THE DISCLOSURE

A tool used to prevent the channel-shaped metal studs used in drywall construction from bending during connection of the drywall to the metal studs. The tool includes a supporting member which maintains the width of the studs and resilient means carried by the supporting member which retains the supporting member in a desired position within a stud. A handle is connected to the supporting member for simple manipulation of the supporting member with respect to the stud.

FIELD OF THE INVENTION

This invention relates to a novel tool used to maintain the integrity of channel-shaped metal studs which are used in drywall construction, while the drywall is being fastened to the metal studs.

BACKGROUND OF THE INVENTION

In building construction wherein drywall is utilized, the two most conventionally used systems for framing include (1) "2 x 4" wood studs to which the drywall is fastened by nails or screws, and (2) generally U-shaped metal studs and furring channels to which the drywall is fastened by means of screws. At present, "2 x 4's" are generally used in private home construction while metal studs and furring channels are generally used in larger building construction. However, more use of metal studs and channels as framing materials in private home construction is expected in the future, because of the low cost and lightweight features of metal studs, the possible rapid erection thereof, and the excellent fire resistance properties of metal studs.

In drywall construction using metal studs, furring channels (sometimes called "stud tracks") are fastened to the floor and the framework is constructed using the metal studs as vertical supports. The top and bottom portions of the studs are fastened to the furring channels by means of sheet metal screws and the drywall panels are fastened to the studs and channels by means of wallboard screws.

One of the serious difficulties in using metal stud framing is that as the screw engages the metal stud, the portion of the stud in engagement with the screw tends to bend away from the screw because of the flexibility of the sheet metal forming the stud. Bending of the stud during engagement with a screw is a serious problem, as it necessitates the removal of the screw from the drywall and the bending back to normal of the stud by the workman.

In order to maintain the integrity of the stud so that it will not bend while being engaged by a screw, the workman has had to reach around the drywall and hold the stud with one hand while he used an electric tool to drive the screw through the wallboard into the stud. Since the ends of some studs are relatively sharp, holding the studs with the hand has occasioned many hand cuts and discomfort. Further, if the studs are spaced 24 inches from each other and the worker is attaching the wallboard to a centrally positioned stud, he would have to extend his hand 24 inches behind the wallboard in order to hold the stud in place while he was driving a screw

through the wallboard and into the stud. Such a procedure is very difficult if not impossible, and often a workman has to ask a companion workman to hold the centrally positioned stud while the first workman fastens a sheet of wallboard to it.

The inventor of the present invention has recognized the need for a mechanical tool that can be used to maintain the integrity of the stud while a screw is entering it, without necessitating direct manual holding of the stud. It is an object of this invention to provide a tool that is simple in construction, can be manufactured efficiently and economically, and can be easily and rapidly used by a workman to maintain the width of a metal stud while it is being engaged by a screw.

It is a further object of this invention to provide in accordance with certain embodiments of the invention, a single stud supporting tool that is capable of use with different size metal studs.

SUMMARY OF THE INVENTION

In accordance with the principles of the present invention, there is provided a tool for use in erecting walls formed of drywall and having a framework comprising elongated metal studs. The type of studs with which the tool of the present invention is useful have a generally U-shaped cross-sectional configuration with the sides of the U being substantially equal in size and parallel to each other, and the distance between the sides being defined as the width of the stud. Each stud has a back portion which is the bottom of the U and is substantially perpendicular to the sides, and each of the sides carries an inwardly turned flange that is substantially parallel to the back portion with the distance between the back portion and each flange being defined as the depth of the stud.

The tool of the present invention comprises a supporting member having a first abutment means for abutting an inside surface of the stud, which inside surface is substantially perpendicular to the back portion. The supporting member also has a second abutment means for abutting a generally opposing surface of the stud and the supporting member has means for contacting the inside surfaces of both of the flanges. The tool carries resilient means which are engageable with the inside surface of the back portion to bias the contacting means against the flanges thereby preventing movement of the supporting member toward the back portion unless a force is manually exerted on the supporting member to counteract the bias.

A manually grippable handle is connected to the supporting member and extends in a direction that enables an operator to position the supporting member within the stud and to manipulate the supporting member by exerting a force on the supporting member to counteract the bias.

In one embodiment of the invention, the supporting member comprises a metal plate with the first abutment means comprising an end of the plate and the contacting means comprising an undersurface portion of the plate adjacent the end of the plate. The second abutment means comprises the opposite end of the plate and another contacting means comprises an undersurface portion of the plate adjacent the opposite end of the plate.

In one embodiment of the invention, third abutment means are positioned intermediate the first and second abutment means for enabling the tool to be used with another size stud having a smaller width. The third abutment means has means for abutting a surface of the smaller stud that is perpendicular to the back portion thereof, and the third abutment means has an undersurface which is adapted for contacting the inside surface of one of the flanges of the smaller stud.

A more detailed explanation of the invention is provided in the following description and claims, and is illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view, partially broken, of a typical drywall framework using metal studs;

FIG. 2 is a schematic view in perspective form of a portion of a typical metal stud and a portion of a typical furring channel, showing in dotted lines the interengagement between the stud and channel;

FIG. 3 is a fragmentary perspective view of a stud supporting tool in accordance with the present invention, utilized in connection with a conventional drywall framework system;

FIG. 4 is a fragmentary top plan view of a stud supporting tool according to one embodiment of the present invention;

FIG. 5 is a fragmentary side elevational view of the stud supporting tool of FIG. 4;

FIG. 6 is a fragmentary, exploded top view of a stud supporting tool according to the second embodiment of the present invention, with different size studs shown in dashed line representation;

FIG. 7 is a fragmentary top view of the stud supporting tool of FIG. 6, being used with an intermediate size stud;

FIG. 8 is a fragmentary top view of the stud supporting tool of FIG. 6, being used with a large size stud;

FIG. 9 is an exploded side elevational view of the stud supporting tool of FIG. 6;

FIG. 10 is a fragmentary top view of a stud supporting tool according to a third embodiment of the present invention;

FIG. 11 is a side elevational view thereof;

FIG. 12 is a fragmentary perspective view thereof;

FIG. 13 is a fragmentary perspective view of a stud supporting tool according to a fourth embodiment of the present invention; and

FIG. 14 is a bottom plan view thereof.

DETAILED DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS OF THE INVENTION

The drywall framing system **20** illustrated in FIG. 1 includes horizontal furring channels **22** which are fastened to the floor, horizontal furring channels **24** which are fastened to an upper support and vertical metal studs **26** which extend between channels **22** and **24**. Channels **22** and **24** are conventional generally U-shaped sheet metal channels which are widely used in building construction and studs **26** are generally U-shaped sheet metal studs which are also widely used in drywall construction. Each of studs **26** comprises a back **28** and sides **30** and **32** extending parallel to each other and perpendicular to back **28**. Sides **30** and **32** are equal in size and side **30** carries an inwardly turned flange **34** that is parallel to back **28**. Side **32** carries an inwardly turned flange **36** that is also parallel to back **28** and coplanar with flange **34**. The perpendicular distance between side **30** and side **32** is defined as the width of the stud and the perpendicular distance between each of the flanges and back **28** is defined as the depth of the stud.

Back **28** of stud **26** defines apertures **38** through which electrical lines can be passed and maintained between adjacent drywall panels. In constructing the framework, the channels **22** are anchored to the floor in the conventional manner and sheet metal screws are extended through the sides of channels **22** into the sides of the metal studs **26**. After the studs are connected to the channels, the drywall panels **23** are fastened to the sides of the studs with wallboard screws **25**, in a manner shown in FIG. 1.

Floating studs **26'** are utilized where it is not certain where the end of the drywall panel will be located. In order to prevent the end of the drywall panel from being located only a short distance past a vertical stud, studs **26** are not connected to channels **22** and **24** until the drywall is in place.

At any time when a screw is being forced into the side of a metal stud, the side has a tendency to bend away from the screw, most particularly when the metal studs are being connected to the channels and when floating studs are used. In order to maintain the integrity of the stud while a screw is being forced into it, a stud supporting tool is provided according to the invention. Tool **40** includes a supporting member **42** having a handle **44** connected thereto and extending outwardly therefrom. The main body **48** of the handle is perpendicular to the supporting member **42** and a grasping portion **46** of the handle extends perpendicular to the main body **48**. Main body **48** is preferably approximately 12 inches long so that grasping portion **46** can be grasped by the operator and the tool can be manipulated with respect to studs which are as far as 24 inches from the end of a drywall panel.

Supporting member **42** is a generally rectilinear piece of sheet metal having flattened ends **50** and **52**, and rounded corners **53**, **54**, **55** and **56**. Ends **50** and **52** are spaced a distance equal to the width of a stud with which the tool is to be used, and form abutment means for abutting the inside surfaces of sides **30** and **32** of stud **26** and maintaining the width of the studs. The width of supporting member **42** is less than the distance between flanges **34** and **36** so that the supporting member can be placed inside the stud. The rounded corners are useful to enable the operator to insert the supporting member **42** into the inside of the stud while the supporting member is extending substantially vertically and to rotate the supporting member, as shown most clearly in FIG. 5, until ends **50** and **52** of the supporting member **42** engage the inside surfaces of sides **30** and **32**. If the corners of the supporting member were not rounded, during rotation of the supporting member the sides of the studs would be spread apart a relatively great distance and undesirable bending of the studs might occur.

A resilient means **60** in the form of a spring biased plunger, is carried by supporting member **42**. Resilient means **60** comprises a plunger having a body portion **62**, a head **64**, a retaining member **66** for limiting the outward movement of the plunger, and a spring **68** biasing the plunger outwardly toward the back portion **28** of the stud. Plunger **60** is movable axially within an aperture defined by supporting member **42**.

Resilient member **60** enables supporting member **42** to be placed inside a stud, rotated and when tension on the handle **44** is released, the spring bias urging the head **64** in the direction of the back portion **28** will urge supporting member **42** into engagement with the inner surfaces of flanges **34** and **36**. In this manner, movement of the supporting member **42** toward back portion **28** is prevented unless a force is manually exerted on the supporting member to counteract the spring bias.

Conventionally, metal studs used in drywall construction come in three different sizes. Conventional studs are generally 1⅜ inches in depth and have widths of either 1⅝ inches, 2½ inches or 3⅝ inches. Referring to FIGS. 6, 7, 8 and 9, it is seen that a tool is disclosed therein that is useful for maintaining the width of studs of all three conventional sizes. Tool **70** comprises a supporting member **72** formed of sheet metal and having struck therefrom an upstanding lug **74**. The end surface **76** of lug **74** and the end **76** of supporting member **72** are spaced a distance that is substantially equal to the width of the smallest size stud **26'**. The end **78** of support member **72** and the end **76** of support member **72** are spaced a distance that is substantially equal to the width of an intermediate size stud **26''** and, when used in connection with an intermediate size stud, the operation with tool **70** is substantially the same as the operation with tool **40**.

In order to use tool **70** with the largest size stud **26'''**,

a sleeve member **80** is provided. Sleeve member **80** is formed of two pieces of sheet metal and has an opening **82** which allows the sleeve member **80** to be fitted onto end portion **84** of supporting member **72**. When sleeve member **80** is fitted onto end portion **84**, an increase in the distance between opposite ends of the supporting member is provided whereby the distance between end **86** of the sleeve and end **76** of supporting member **72** is substantially equal to the width of the largest metal stud **26'''**.

In the embodiment of the tool illustrated in FIGS. 6–9, a handle **88**, connected to the underside of supporting member **72**, is hollowed to receive a portion of plunger **90** which is constructed and operates similarly to the construction and operation of plunger **60**. However, a pin **92** is carried adjacent the bottom of the plunger **90** to ride within a slot **94** defined by the handle **88**. In this manner, the plunger is maintained in axial alignment with the handle and outward movement of the plunger is restrained as the plunger is acted upon by the bias of spring **96**.

In the embodiment of FIGS. 10–12, a single tool is provided for use with all three conventional sizes of metal studs, without requiring a separate sleeve member as with the embodiment of FIGS. 6–9. The tool **100** illustrated in FIGS. 10–12 has a handle and plunger system of the FIGS. 6–9 embodiment. Of course, both the FIGS. 6–9 embodiment and the FIGS. 10–12 embodiment could have a handle and plunger system that is identical to the handle and plunger system of the FIGS. 3–5 embodiment.

The supporting member **102** of tool **100** is formed of a unitary piece of sheet metal and has struck therefrom a first lug **104** and a second lug **106**. Lug **104** operates in a manner identical to the operation of lug **74** of the FIGS. 6–9 embodiment, as the end surface **108** of lug **104** and the end surface **110** of supporting member **102** are spaced a distance that is substantially equal to the width of the smallest conventional metal stud. The end surface **112** of lug **106** and end surface **110** are spaced a distance that is substantially equal to the width of the intermediate size conventional metal stud and the end surface **114** of supporting member **102** and end surface **110** are spaced a distance that is substantially equal to the width of the largest size conventional metal stud. As shown most clearly in FIG. 10, end portion **116** is bent at portion **118** to extend in a different plane from portion **120** of supporting member **102**. It is seen from FIG. 10 in particular, that lug **106** is substantially coplanar with portion **120** while lug **104** lies in a plane parallel to the plane of portion **116** but on opposite sides with respect to the plane of portions **106** and **120**.

In the operation of the tool of the FIGS. 10–12 embodiment, when the tool is used with the smallest size conventional metal stud, ends **108** and **110** abut the inner side walls of the metal stud. When used with an intermediate size conventional metal stud, ends **112** and **110** abut the inner ends of the stud and when used with the largest size conventional metal stud, ends **114** and **110** abut the inner walls of the largest size stud.

It is seen that using the construction illustrated in FIGS. 9–12, the handle **88** must be placed much closer to end **110** than to end **114**, when lugs **104** and **106** are struck out from the supporting member in the manner indicated in FIGS. 9–12. In the FIGS. 13 and 14 embodiment, tool **124** comprises a supporting member **126** having lugs **128** and **129** struck upwardly therefrom and having extending portions **130** and **131** forming the mid portion with lower extension **132** formed by bending the sheet metal piece at **134**.

The FIGS. 13–14 construction operates in a similar manner to the operation of the FIGS. 10–12 construction, but as shown most clearly in FIG. 14, the construction of the FIGS. 13–14 embodiment enables the handle **44** to be more centrally located than the handle **88** of the FIGS. 9–12 construction. As illustrated in FIG. 13, the handle **44** and plunger **60** carried by supporting member **126** is similar in construction and operation to the handle and plunger illustrated in the FIGS. 3–5 embodiment, but of course the handle and plunger arrangement could be similar to the handle and plunger arrangement of the FIGS. 6–9 embodiment.

It is seen that a tool has been provided that is simple in construction, and has the ability to maintain the integrity of a stud while a drywall panel is being fastened to the stud with a screw. A worker can use the tool to reach studs which are a distance from the side of the panel, where otherwise he would need cooperation with another worker in handling the stud. In accordance with certain embodiments of the invention, a single tool is capable of use with different size metal studs.

Although illustrative embodiments of the invention have been shown and described, it is to be understood that various substitutions and modifications may be made by those skilled in the art without departing from the spirit and scope of the present invention.

What is claimed is:

1. A tool for use in erecting walls formed of drywall panels and having a framework comprising elongated metal studs having a generally U-shaped cross-sectional configuration with the sides of the U being substantially equal in size and parallel to each other and the distance between the sides being defined as the width of the stud, each stud having a back portion which is the bottom of the U and is substantially perpendicular to the sides, and each of the sides carrying an inwardly turned flange that is substantially parallel to the back portion with the distance between the back portion and each flange being defined as the depth of the stud, said tool comprising a supporting member having a first abutment means for abutting an inside surface of said stud which inside surface is substantially perpendicular to said back portion and a second abutment means for abutting a generally opposing surface of said stud, said supporting member having means for contacting the inside surfaces of both of said flanges; resilient means engageable with the inside surface of said back portion to bias said contacting means against said flanges thereby preventing movement of said supporting member toward said back portion unless a force is manually exerted on said supporting member to counteract said bias; and a manually grippable handle connected to said supporting member and extending in a direction that enables an operator to position said supporting member within said stud and to manipulate said supporting member by exerting a force on said supporting member to counteract said bias.

2. A tool as described in claim **1**, wherein said supporting member comprises a metal plate with said first abutment means comprising an end of said plate and said contacting means including an undersurface portion of said plate adjacent said end of said plate.

3. A tool as described in claim **2**, wherein said second abutment means comprises the opposite end of said plate and said contacting means further includes an undersurface portion of said plate adjacent said opposite end of said plate.

4. A tool as described in claim **1**, wherein said first abutment means comprises an upstanding lug the undersurface of which comprises said means for contacting the inside surface of one of said flanges.

5. A tool as described in claim **1**, said second abutment means being adapted to abut the inside surface of the other side of said stud, said first and second abutment means being spaced a distance substantially equal to the width of a stud with which the tool is to be used.

6. A tool as described in claim **2**, wherein said end of said plate is linear at one portion thereof with the corners of said plate being rounded to enable said plate to be turned within said stud without overexpanding the width of the stud.

7. A tool as described in claim **3**, including third abutment means positioned intermediate said first and second abutment means for enabling the tool to be used with

another size stud having a smaller width, said third abutment means having means for abutting a surface of said another size stud that is perpendicular to the back portion thereof, said third abutment means having an undersurface which is adapted for contacting the inside surface of one of said flanges of said another size stud.

8. A tool as described in claim **7**, including fourth abutment means positioned intermediate said first and third abutment means for enabling the tool to be used with a third size stud, said fourth abutment means having means for abutting a surface of said third size stud that is perpendicular to the back portion thereof, said fourth abutment means having an undersurface which is adapted for contacting the inside surface of one of said flanges of said third size stud.

9. A tool as described in claim **1**, wherein said handle and said resilient means are coaxial.

10. A tool as described in claim **1**, including a sleeve member for connection to said supporting member to provide an increase in the distance between opposite ends of said supporting member.

11. A tool for aiding in fastener-type assembly of drywall panels to studs formed of generally channel-shaped cross-section with a longitudinal opening therealong and which have limited rigidity and hence normally tend to skew, or twist, in response to force applied by the fastener during the operation of securing the drywall panel to the stud, said tool comprising, in combination, an elongated supporting member of a length to transversely span the width of the longitudinal opening but of a width less than the width of the longitudinal opening; handle means for manipulating the supporting member to selectively enter or leave the longitudinal opening and to move to a position to span the opening and brace the stud; means for engaging opposed wall portions of the stud with the ends of the supporting member when in spanning position; and resilient means for automatically retaining the supporting member in said spanning position.

12. A tool for use in erecting walls formed of drywall panels and having a framework comprising elongated metal studs having a generally U-shaped cross-sectional configuration with the sides of the U being substantially equal in size and parallel to each other and the distance between the sides being defined as the width of the stud, each stud having a back portion which is the bottom of the U and is substantially perpendicular to the sides, and each of the sides carrying an inwardly turned flange that is substantially parallel to the back portion with the distance between the back portion and each flange being defined as the depth of the stud, said tool comprising a supporting member formed of a unitary sheet metal plate having a first end thereof for abutting the inside surface of one side of said stud, said end of said plate being linear at one portion thereof with the corners of said plate being rounded to enable said plate to be turned within said stud without overexpanding the width of the stud, a second end of said plate for abutting the inside surface of the other side of said stud, said first and second ends of said supporting member being spaced a distance substantially equal to the width of a stud with which the tool is to be used, the undersurface portions of said plate adjacent the ends thereof comprising means for contacting the inside surfaces of both of said flanges; a spring biased plunger carried by said plate and being engageable with the inside surface of said back portion to bias said contacting means against said flanges thereby preventing movement of said supporting member toward said back portion unless a force is manually exerted on said supporting member to counteract said bias; and a manually grippable handle connected to said supporting member and extending in a substantially perpendicular direction with respect to said supporting member to enable an operator to position said supporting member within said stud and to manipulate said supporting member by exerting a force on said supporting member to counteract said bias, said sheet metal plate having a lug struck therefrom in a direction opposite the direction of said handle whereby an end surface of said lug is perpendicular to said back surface and is adapted for contact with an inside surface of a smaller size stud which inside surface is perpendicular to said back surface, the undersurface of said lug comprising means for contacting the inside surface of the flange carried by the smaller size stud, whereby said tool is adaptable for use with two different size studs.

References Cited

UNITED STATES PATENTS

1,083,145	12/1913	Salucci	72—482
2,527,157	10/1950	Snyder et al.	81—3 X

THERON E. CONDON, Primary Examiner

N. ABRAMS, Assistant Examiner

U.S. Cl. X.R.

52—749; 72—479; 81—3 R; 269—3