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Surowiecki

(54) **WALL CONSTRUCTION**

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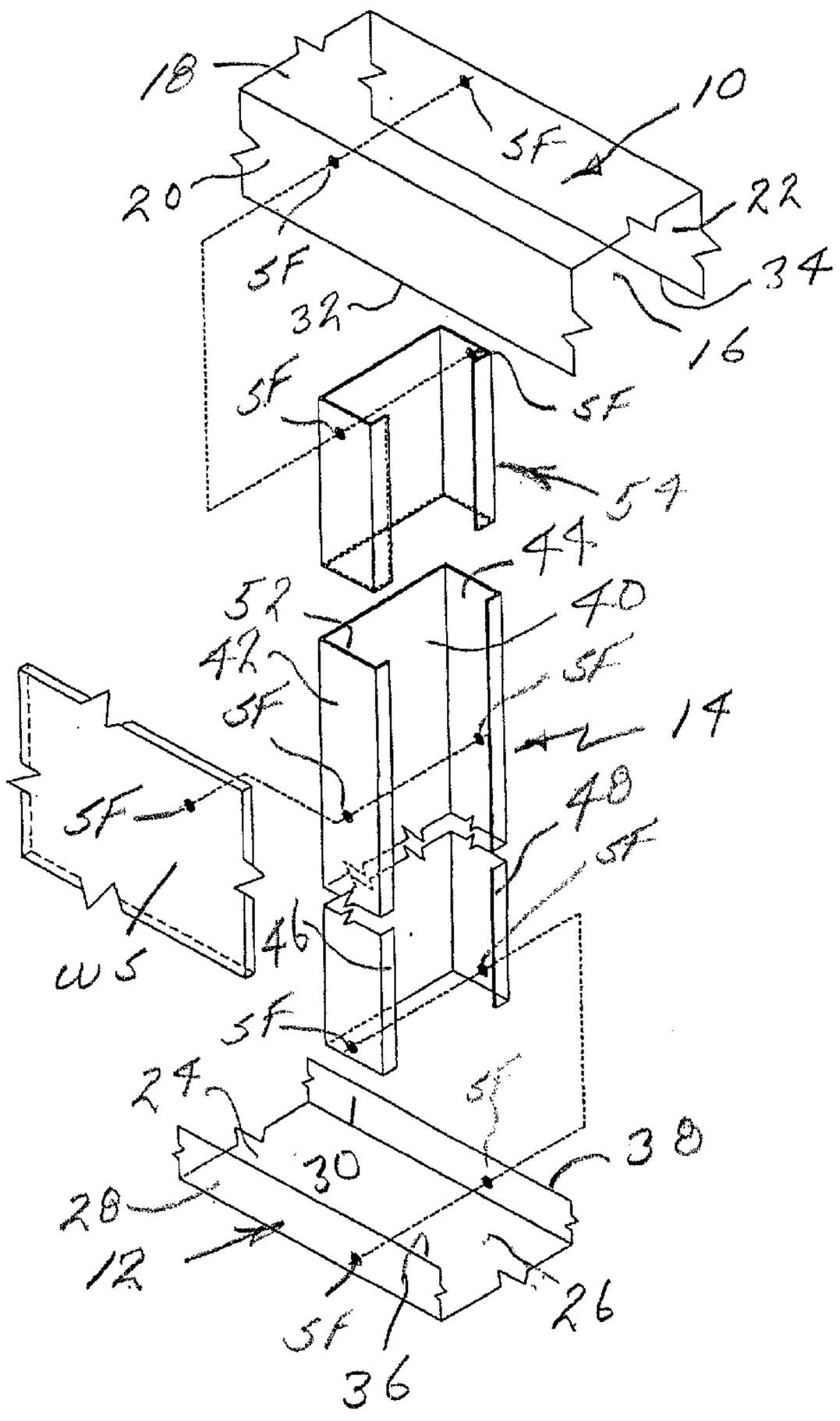
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(57) **ABSTRACT**

A downwardly opening upper channel member **(10)** is positioned above an upwardly opening lower channel member **(12)**. A lower end portion of a stud **(14)** is received in the lower channel member **(12)**. A clip **(54)** is received in an upper end portion of the stud bracket **(10)**. The clip **(54)** has an upper portion that is connected to the upper channel member **(10)**. It also has a lower portion that extends downwardly into an upper end portion of its stud **(14)**. The upper channel member **(10)** has opposite side flanges **(20, 22)** that include lower edges **(32, 34)** the stud **(14)** has an upper butt end that is positioned above the lower edge **(32, 34)** is below an upper web portion **(18)** of the upper channel member **(10)**. The upper portion of the clip **(54)** is connected to the upper channel member **(10)**. The clip **(54)** is free to move vertically with respect to the stud **(14)**. In a wall construction, wallboard sheeting WS is connected to the stud **(14)** and the lower channel member **(12)** but not to the upper channel member **(10)**. As a result, relative vertical movement is permitted between the upper channel member **(10)** and the rest of the wall which includes the stud **(14)**, the lower channel member **(12)** and the wallboard sheeting WS.



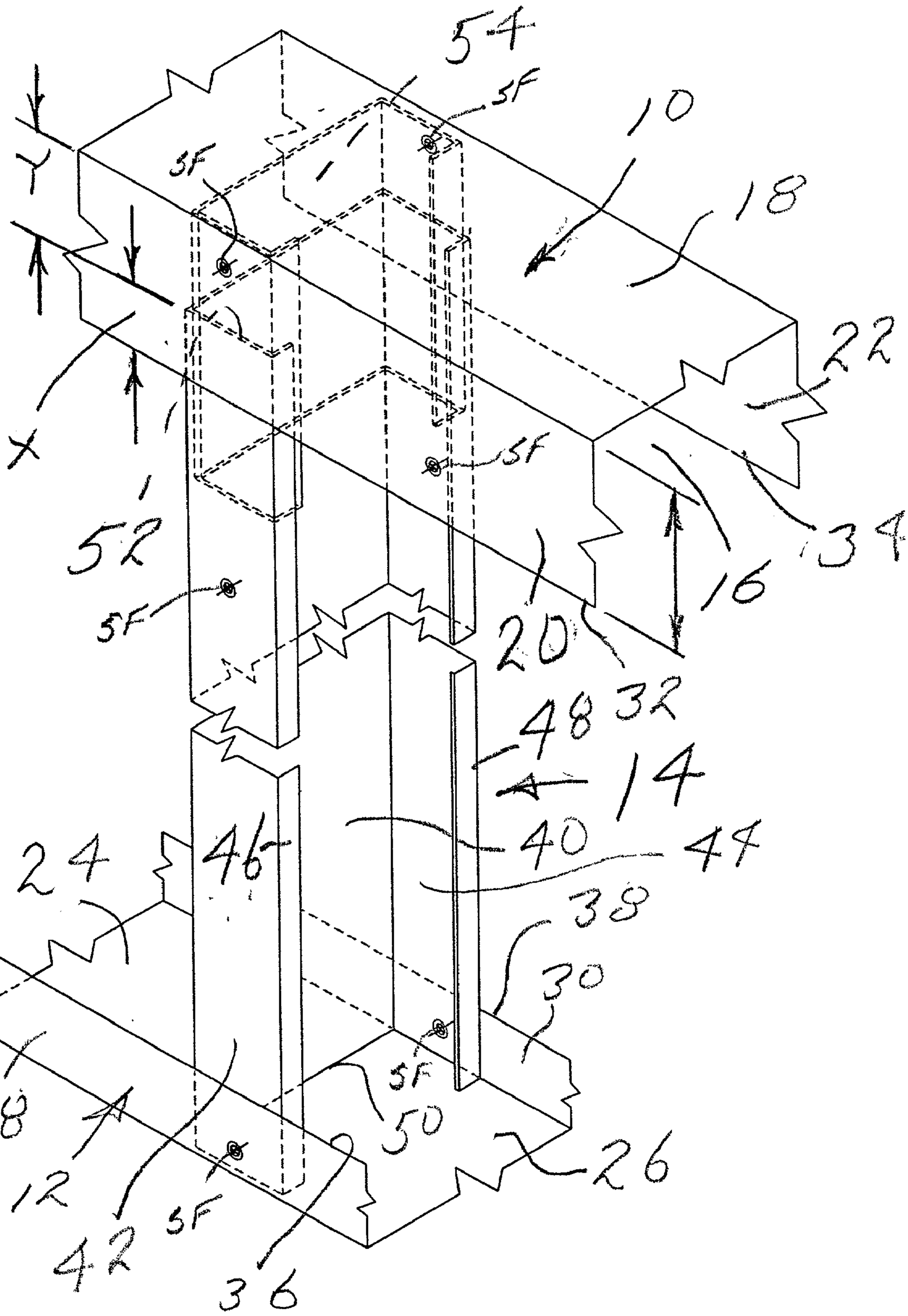

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FIG. 1

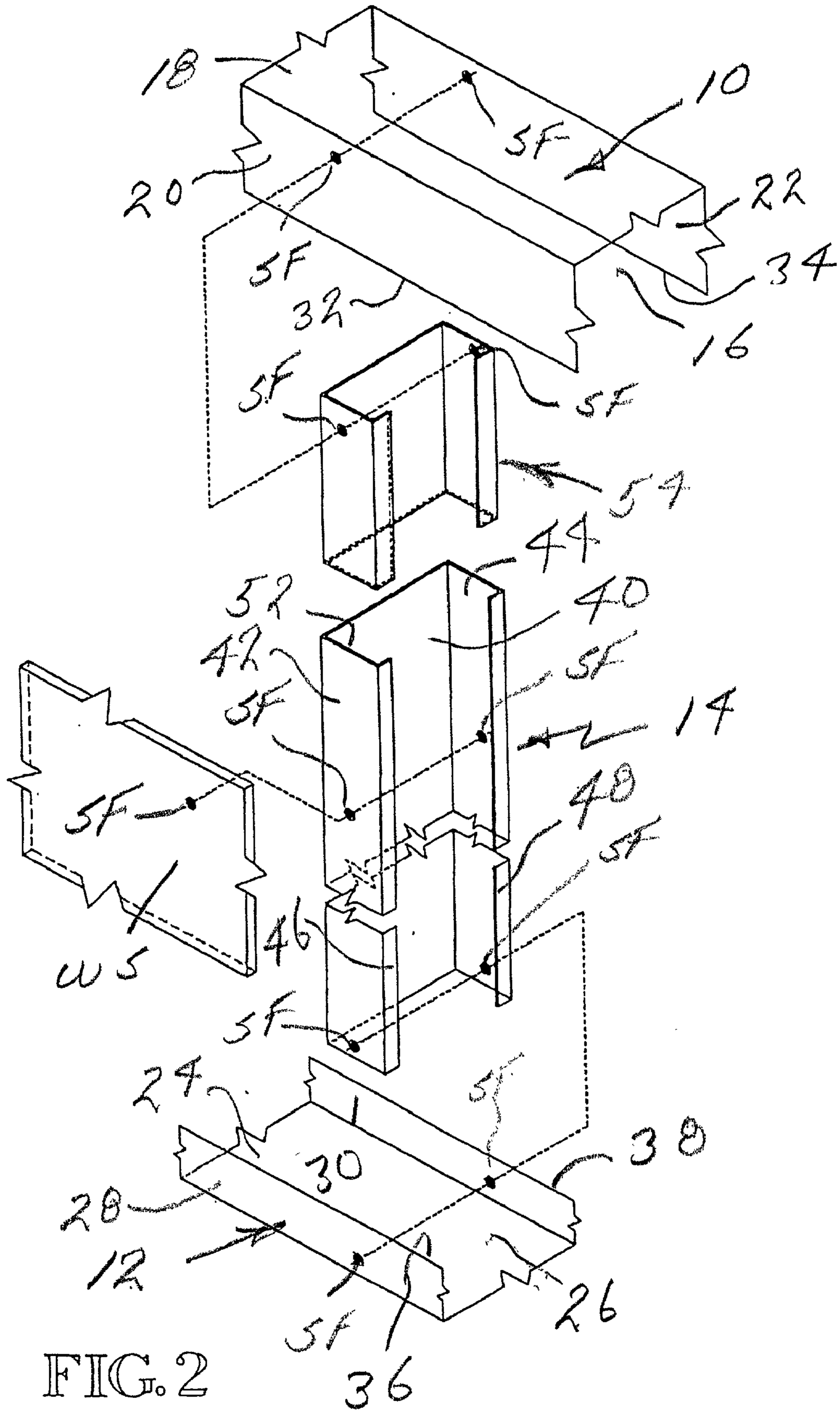

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FIG. 2

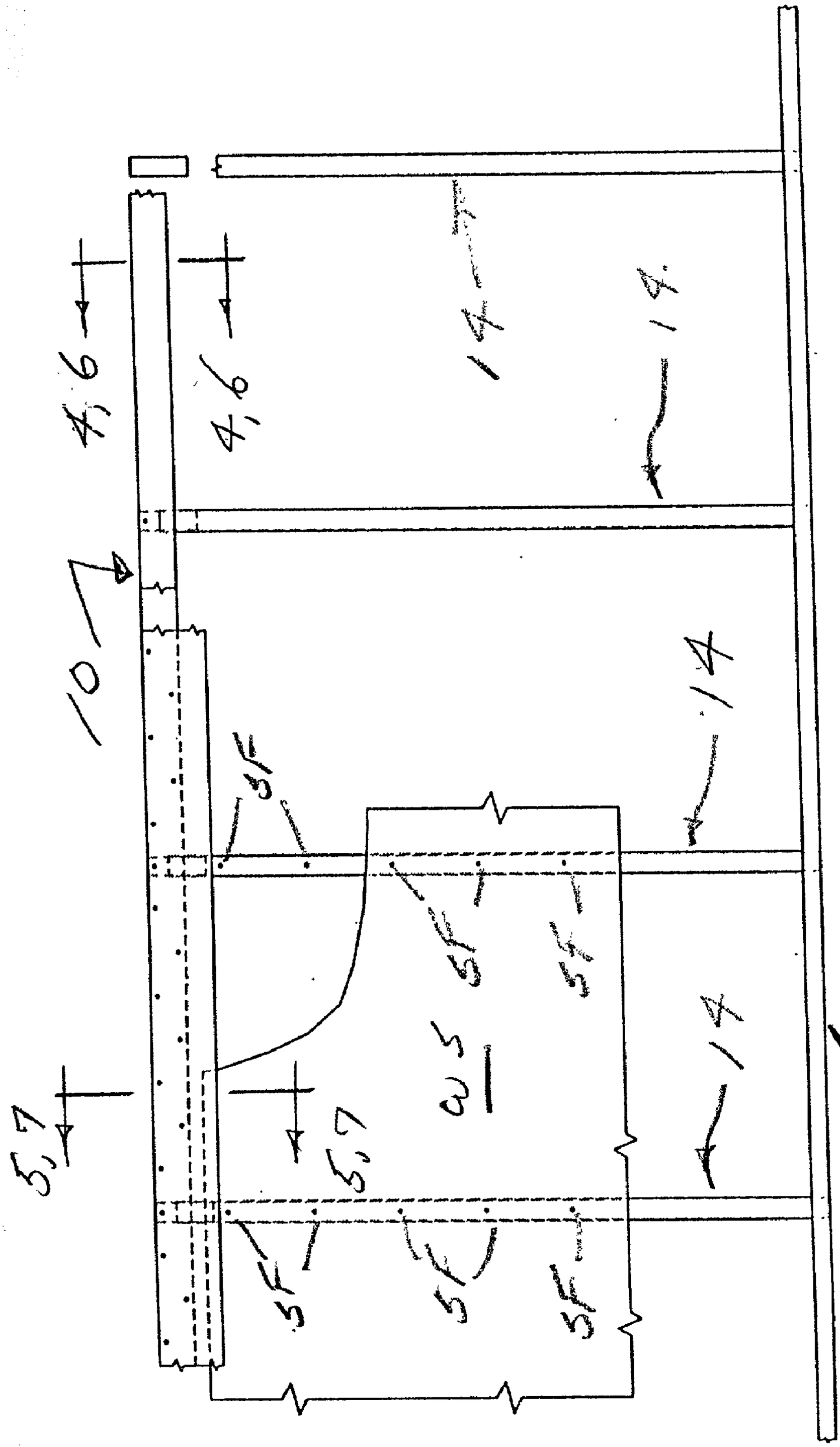


FIG. 3

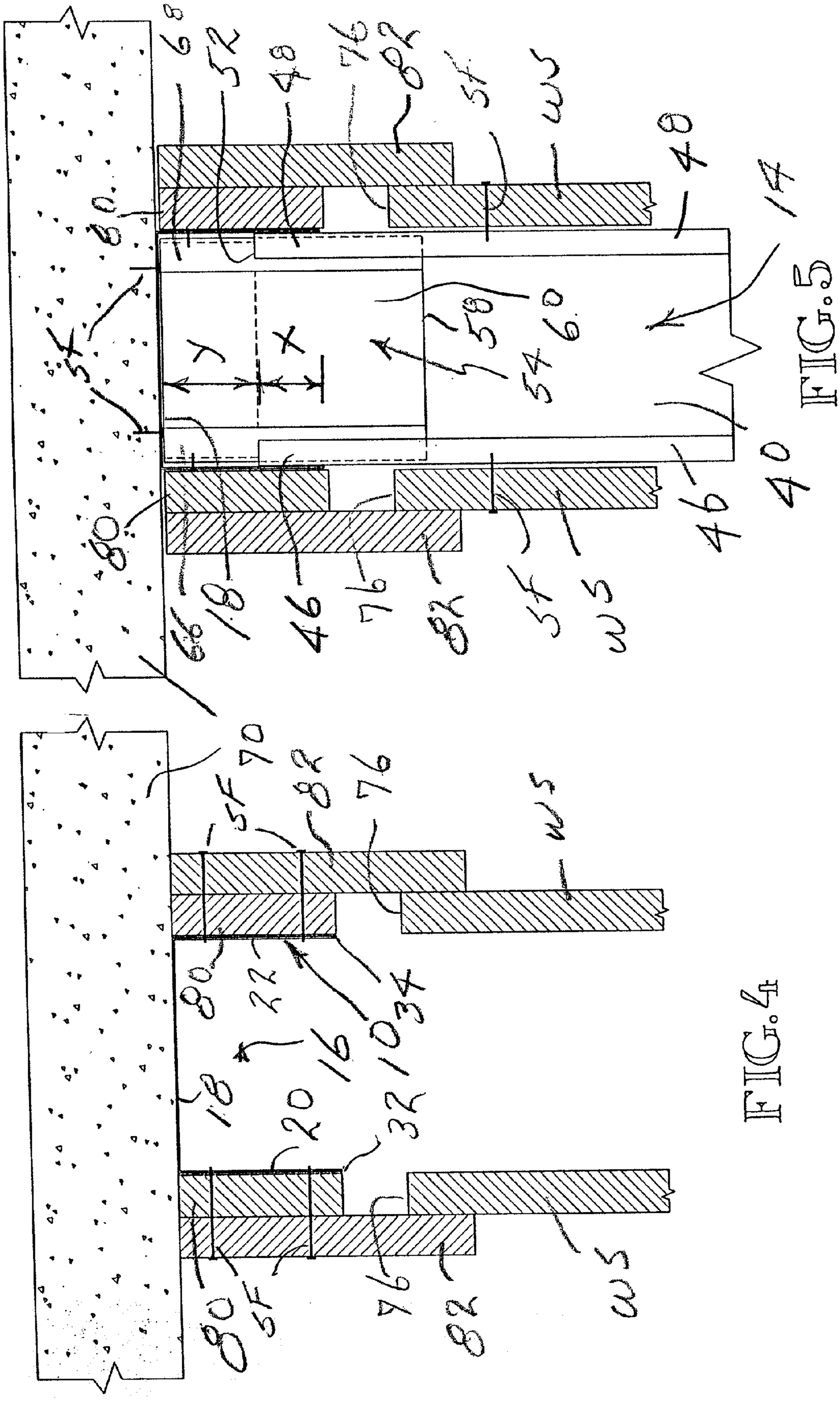

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FIG. 5

FIG. 4

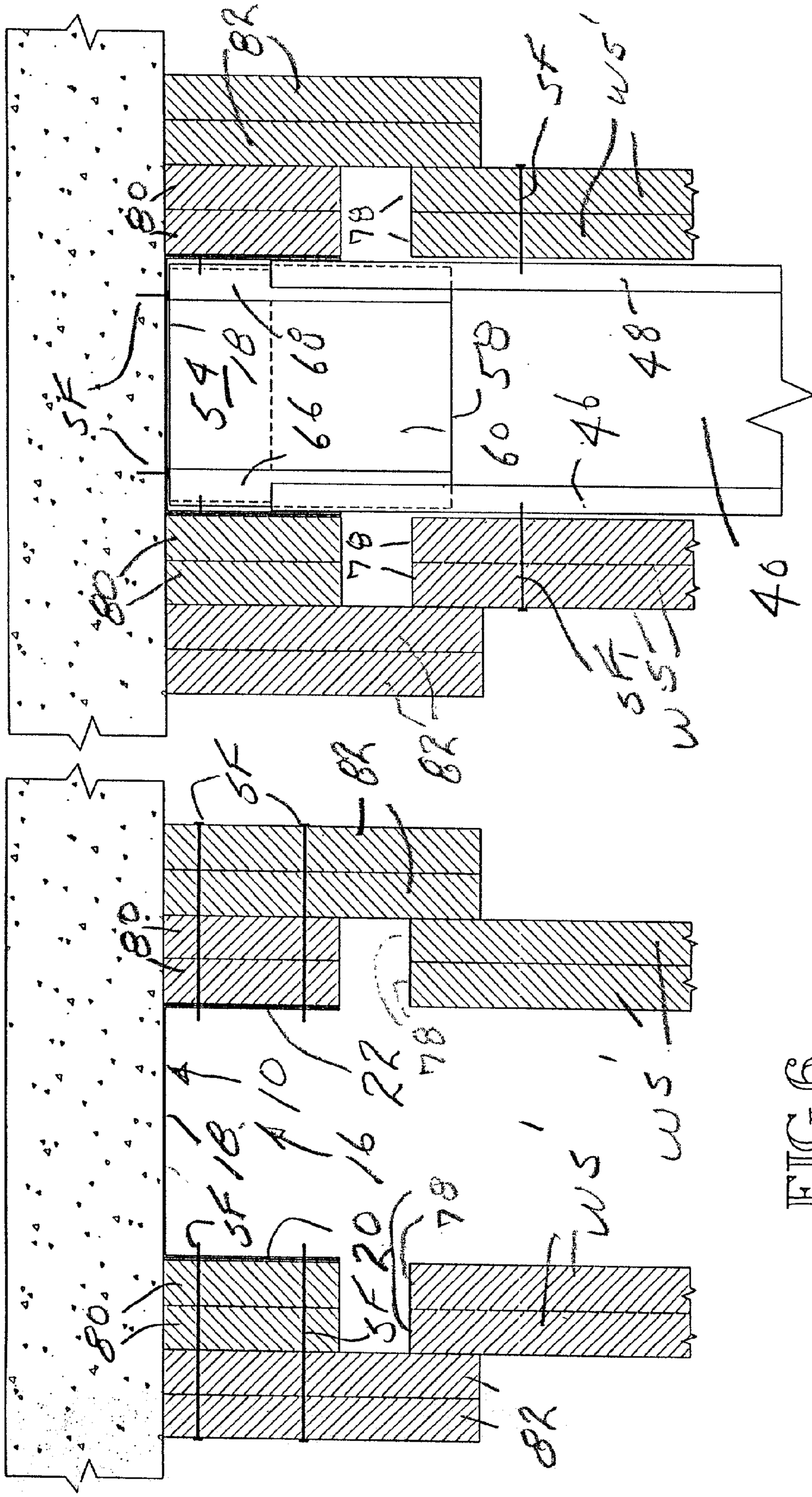

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FIG. 7

FIG. 6

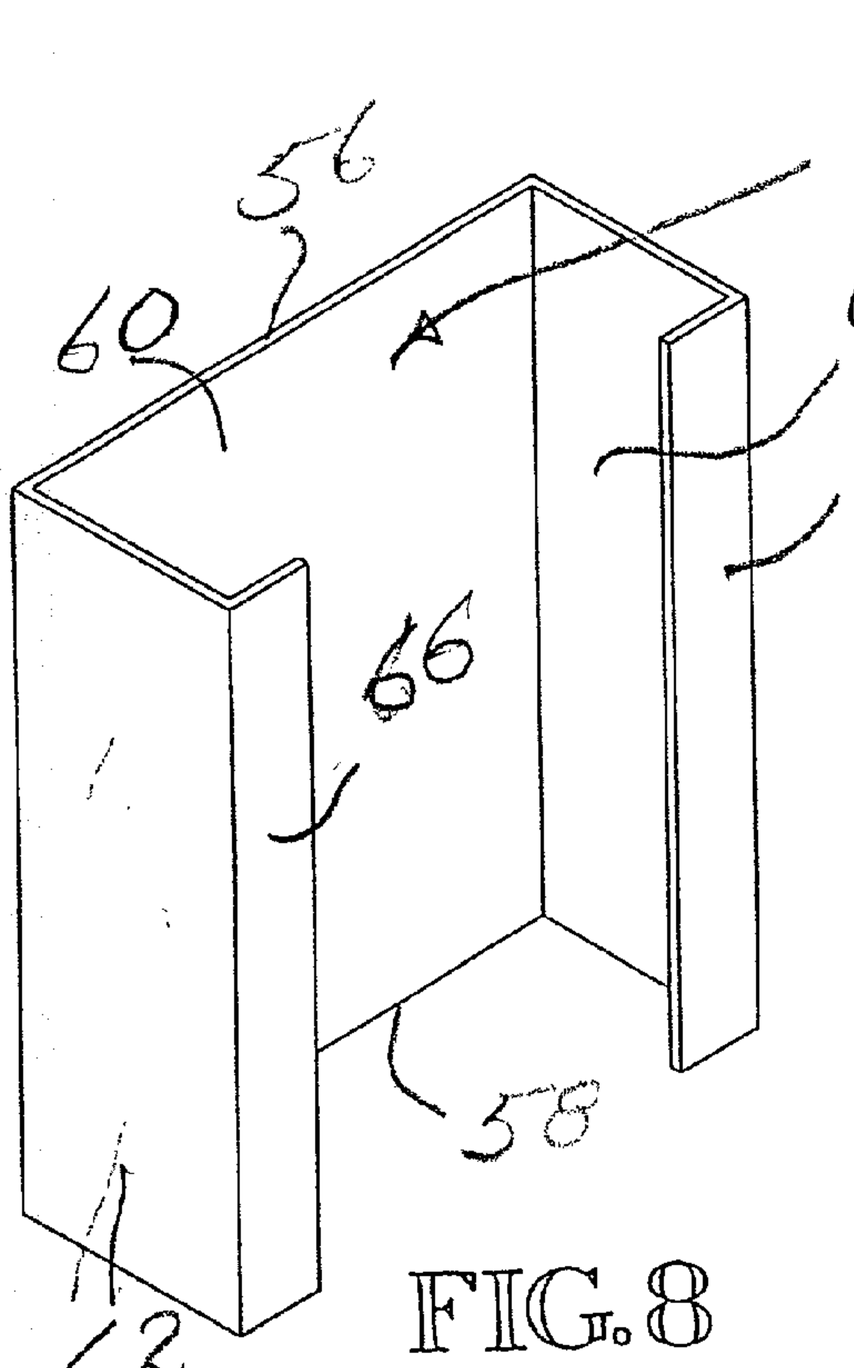


FIG. 8

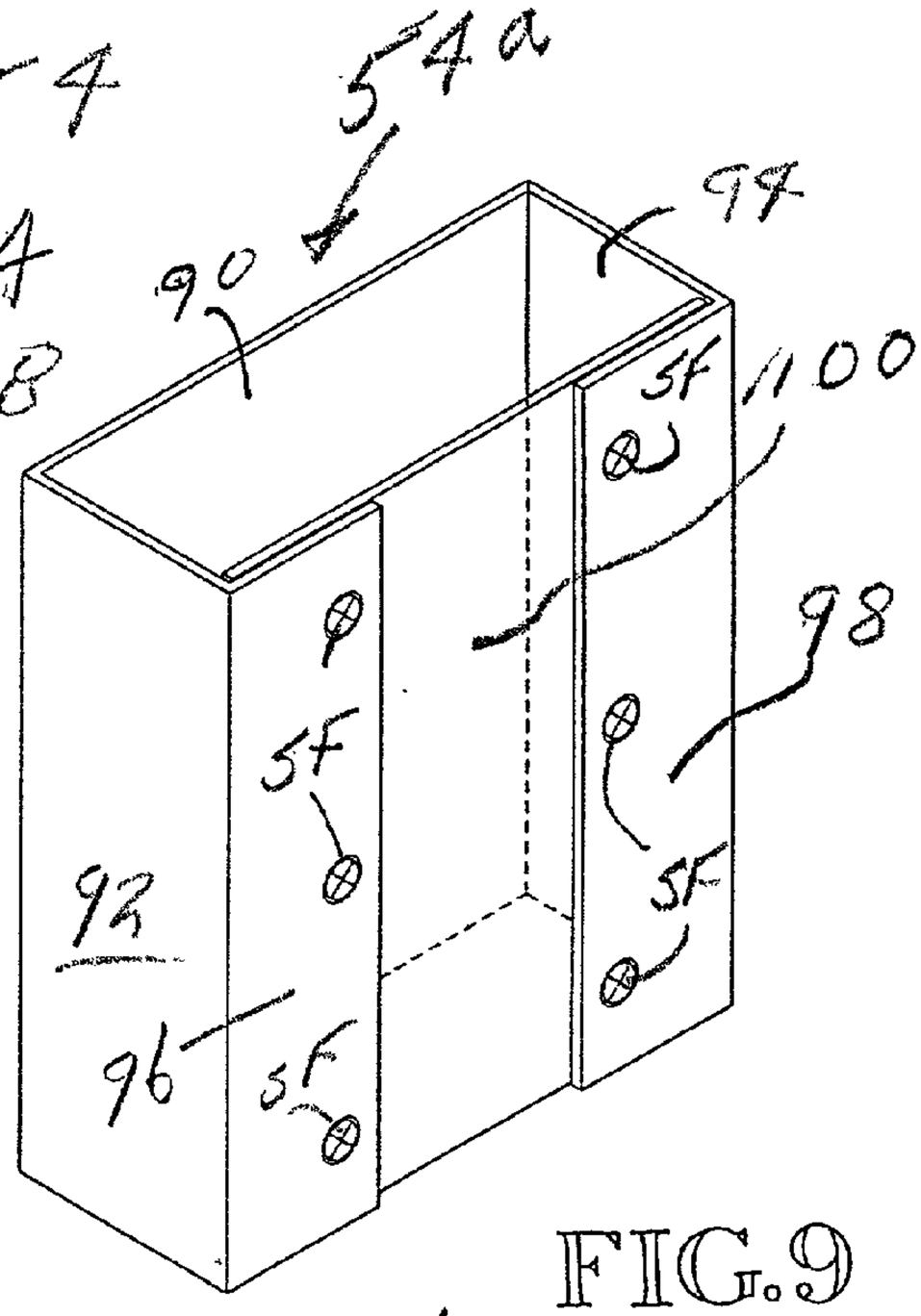


FIG. 9

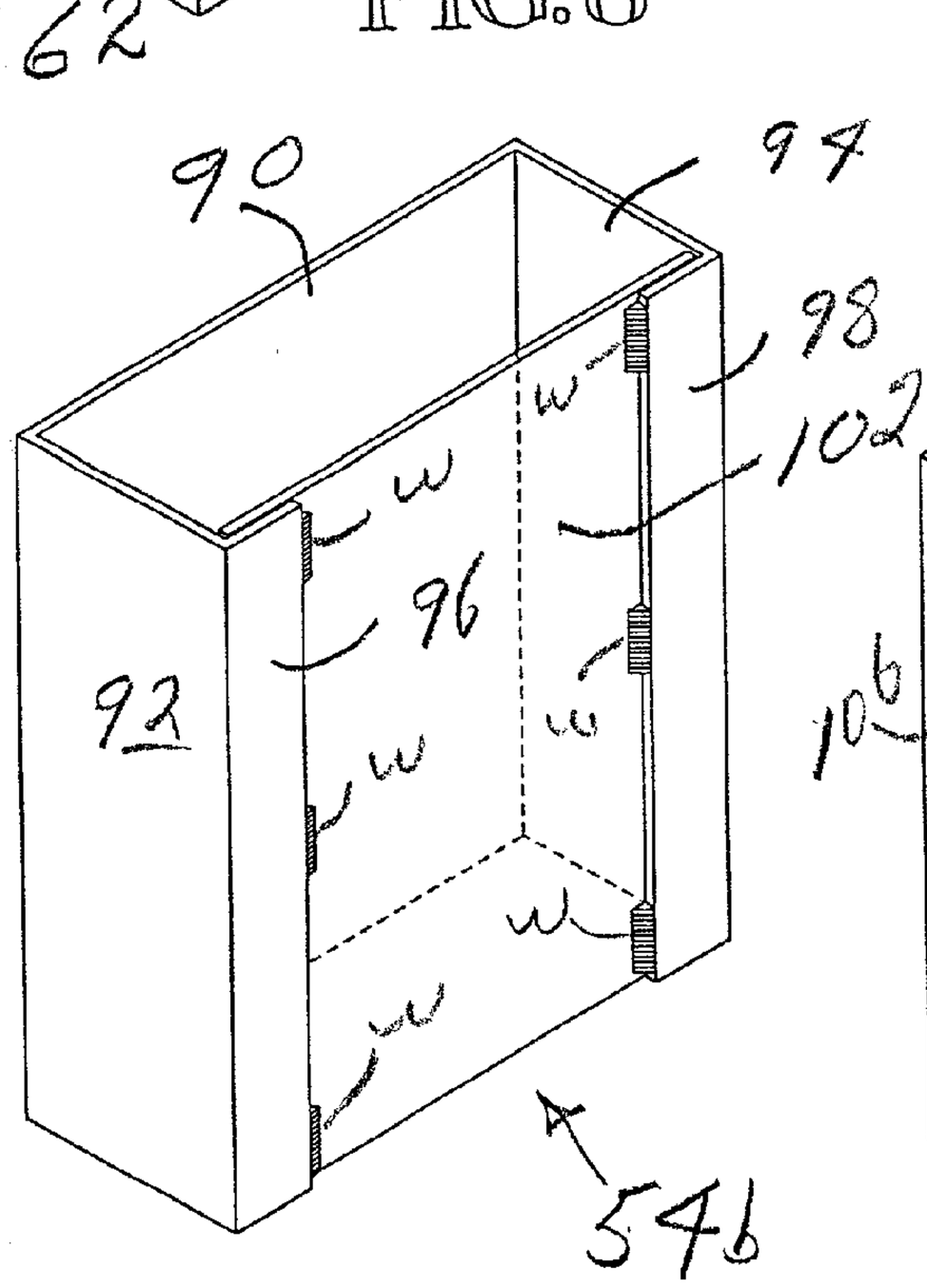


FIG. 10

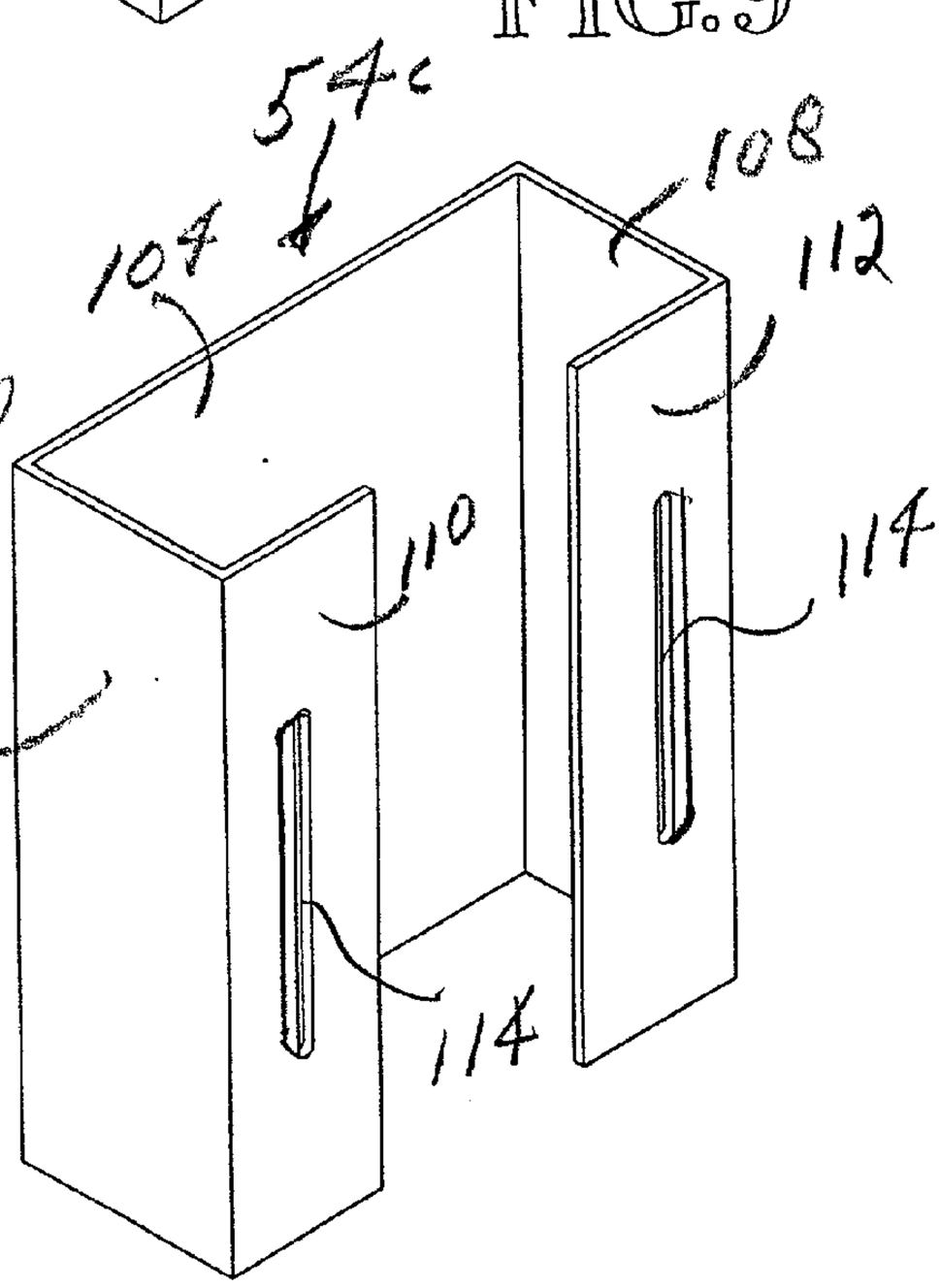


FIG. 11

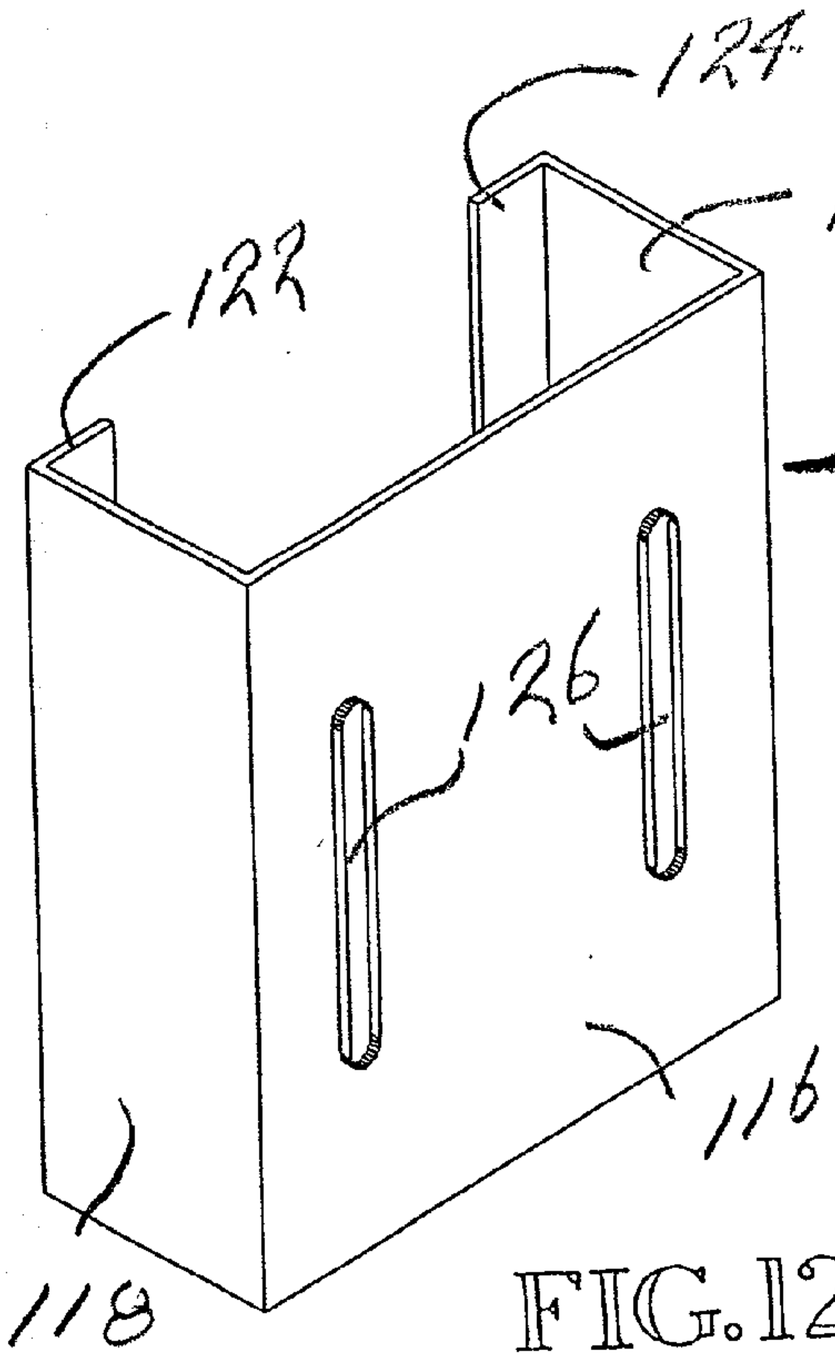


FIG. 12

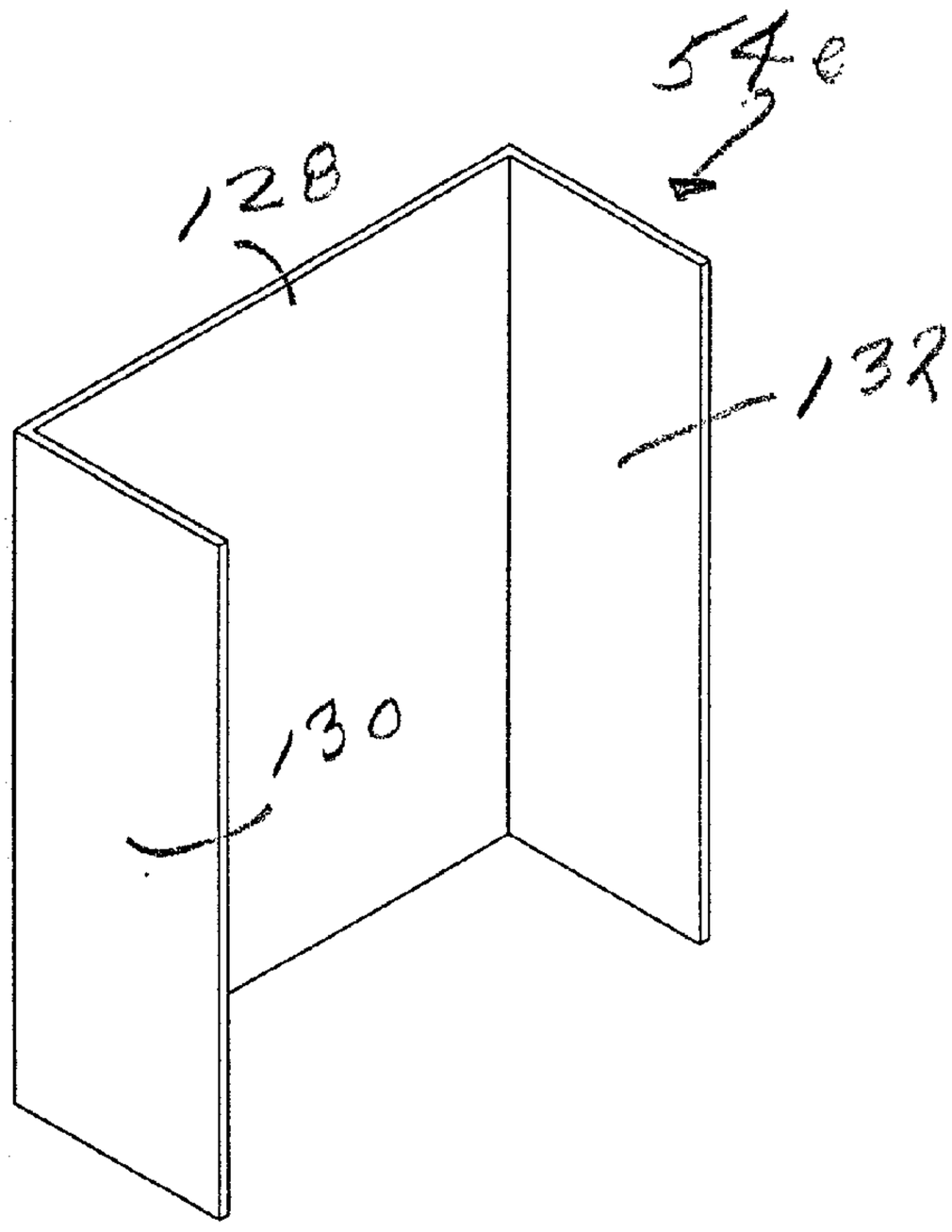


FIG. 13

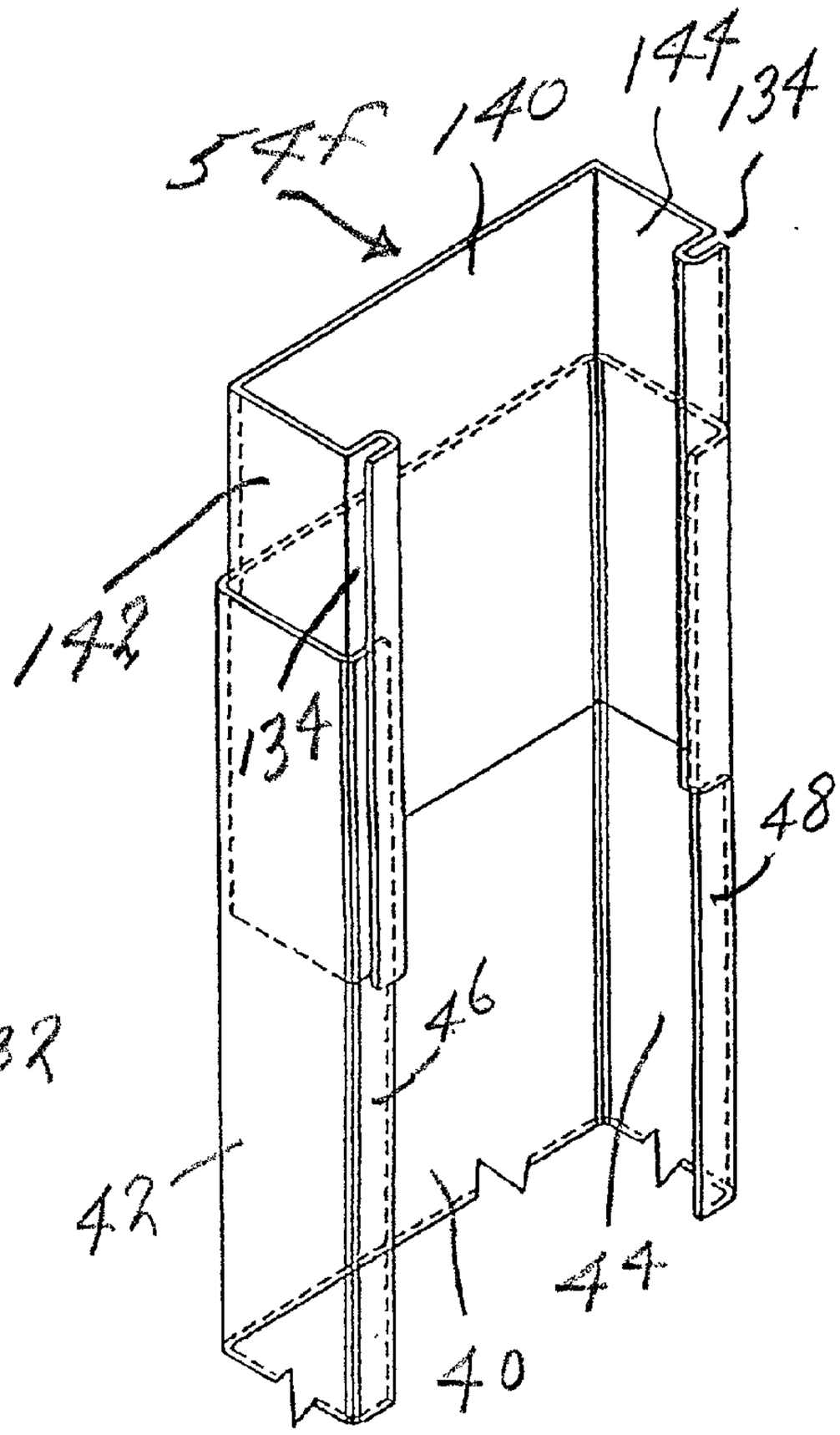


FIG. 14

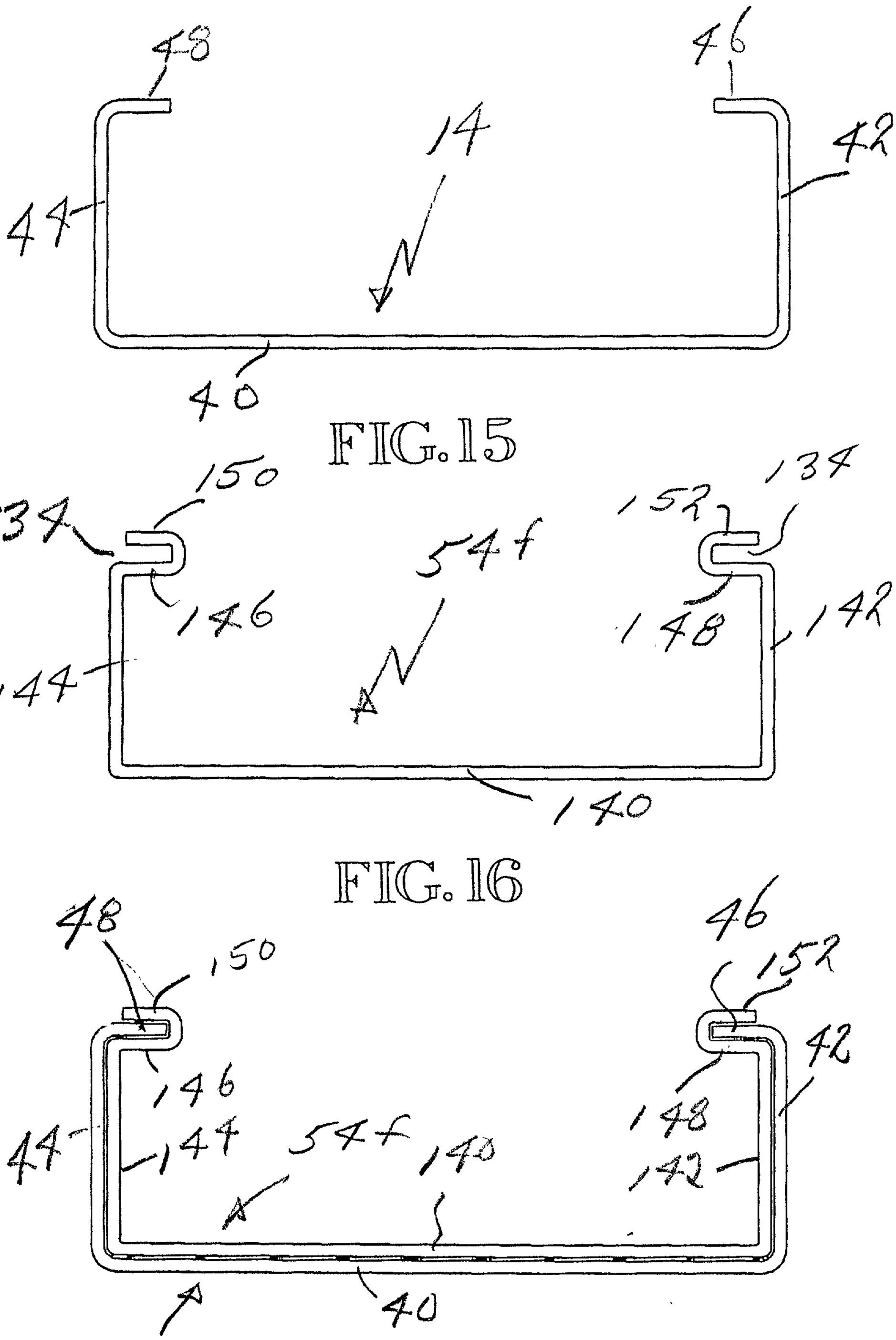


FIG. 15

FIG. 16

FIG. 17

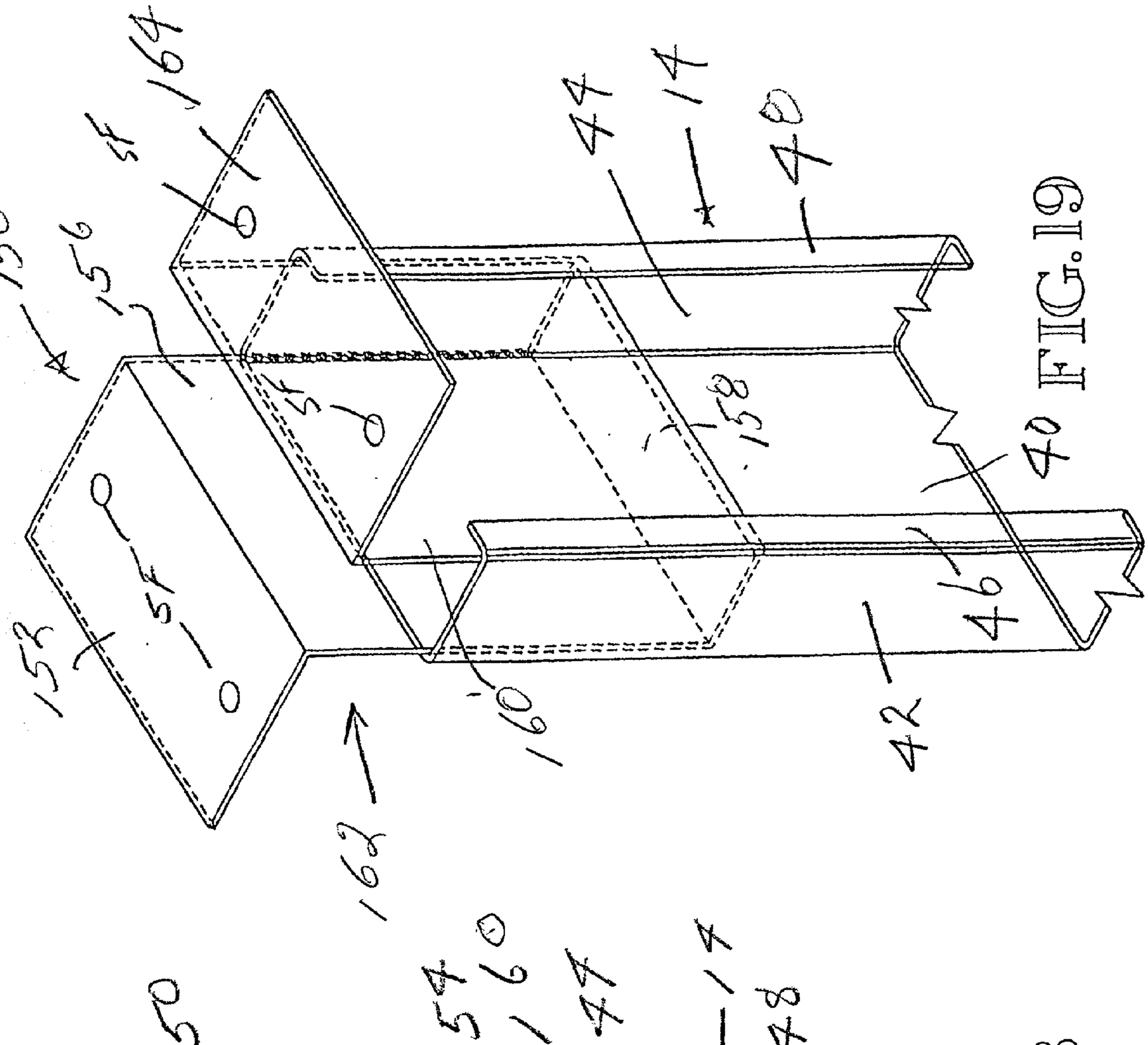

150
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138

FIG. 19

FIG. 18

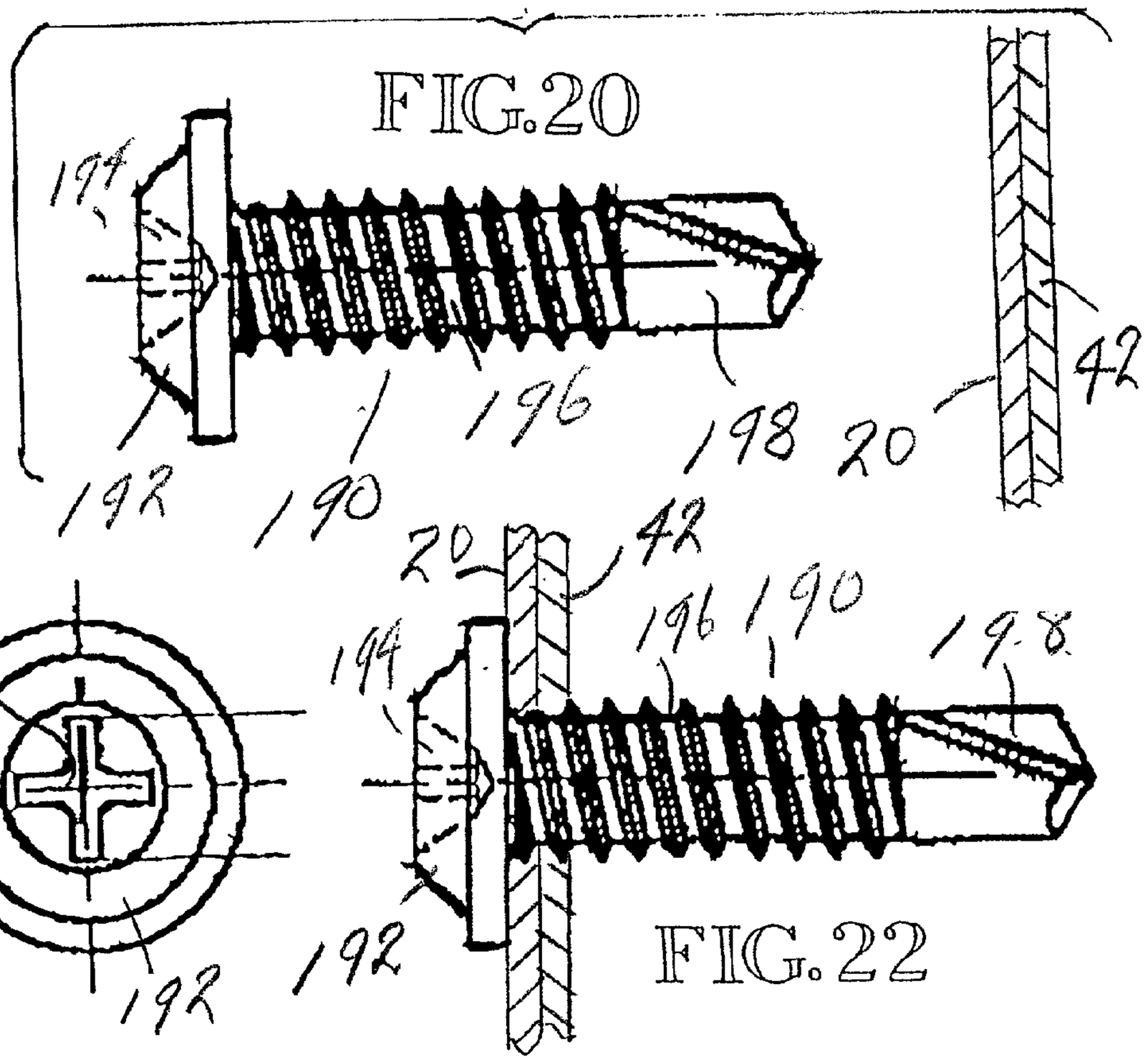


FIG. 20

FIG. 22

FIG. 21

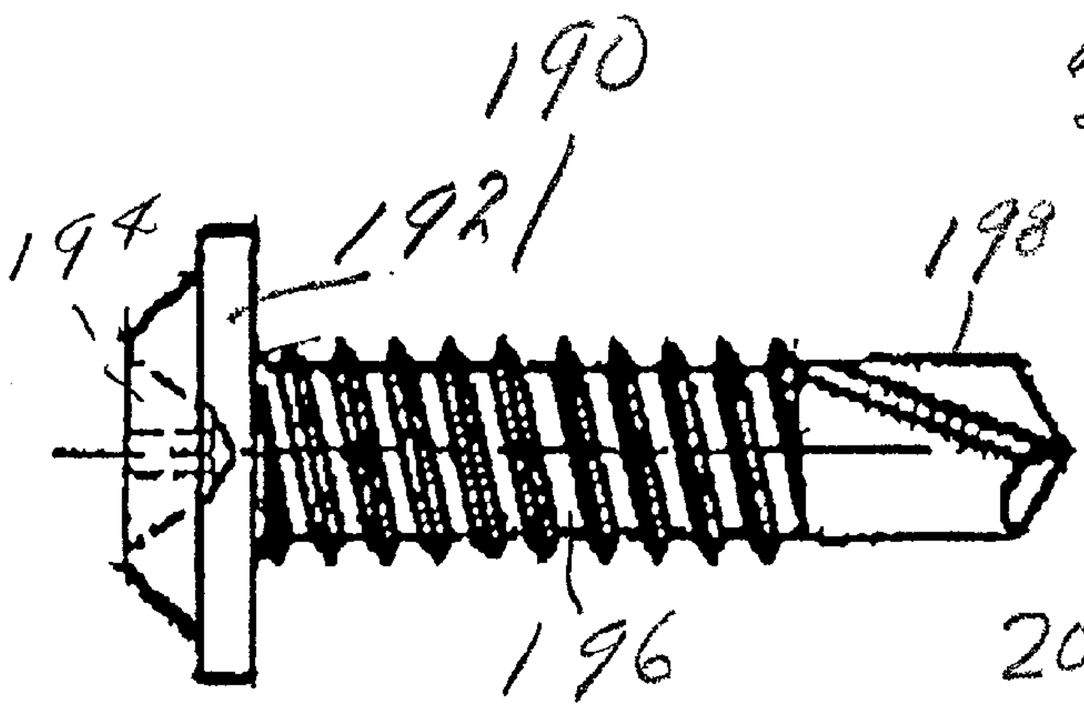
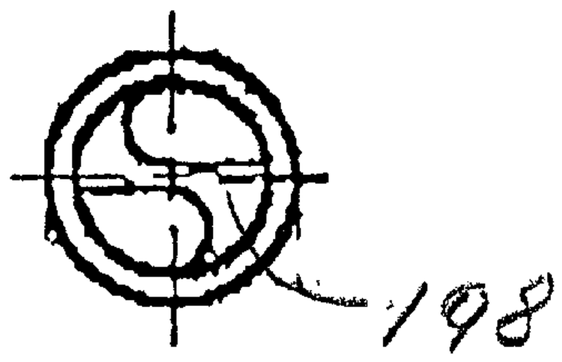


FIG. 23



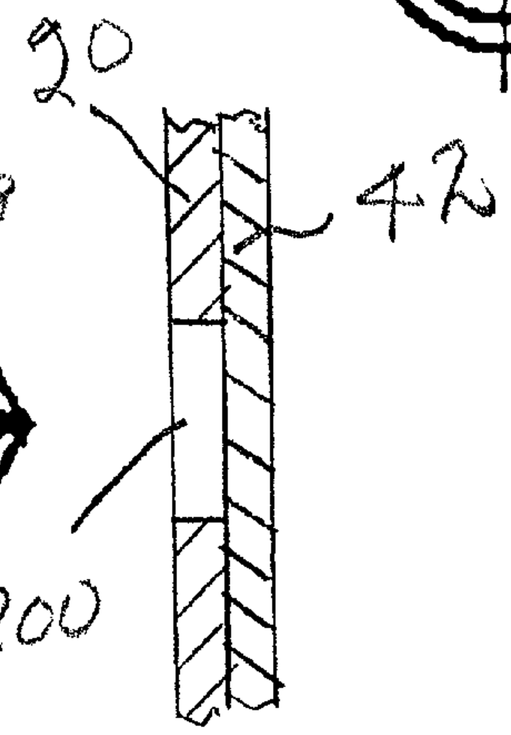


FIG. 24

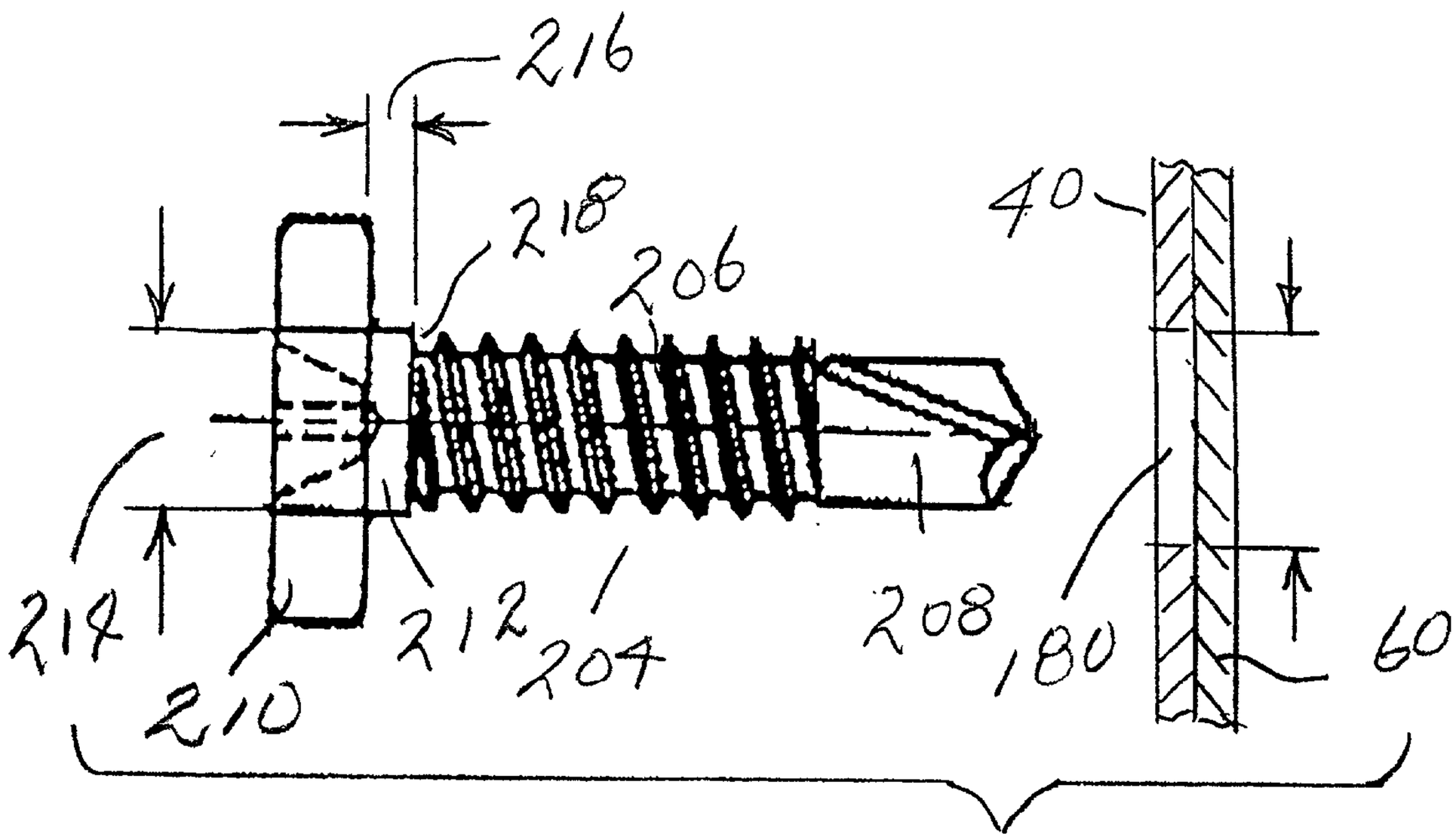


FIG. 25

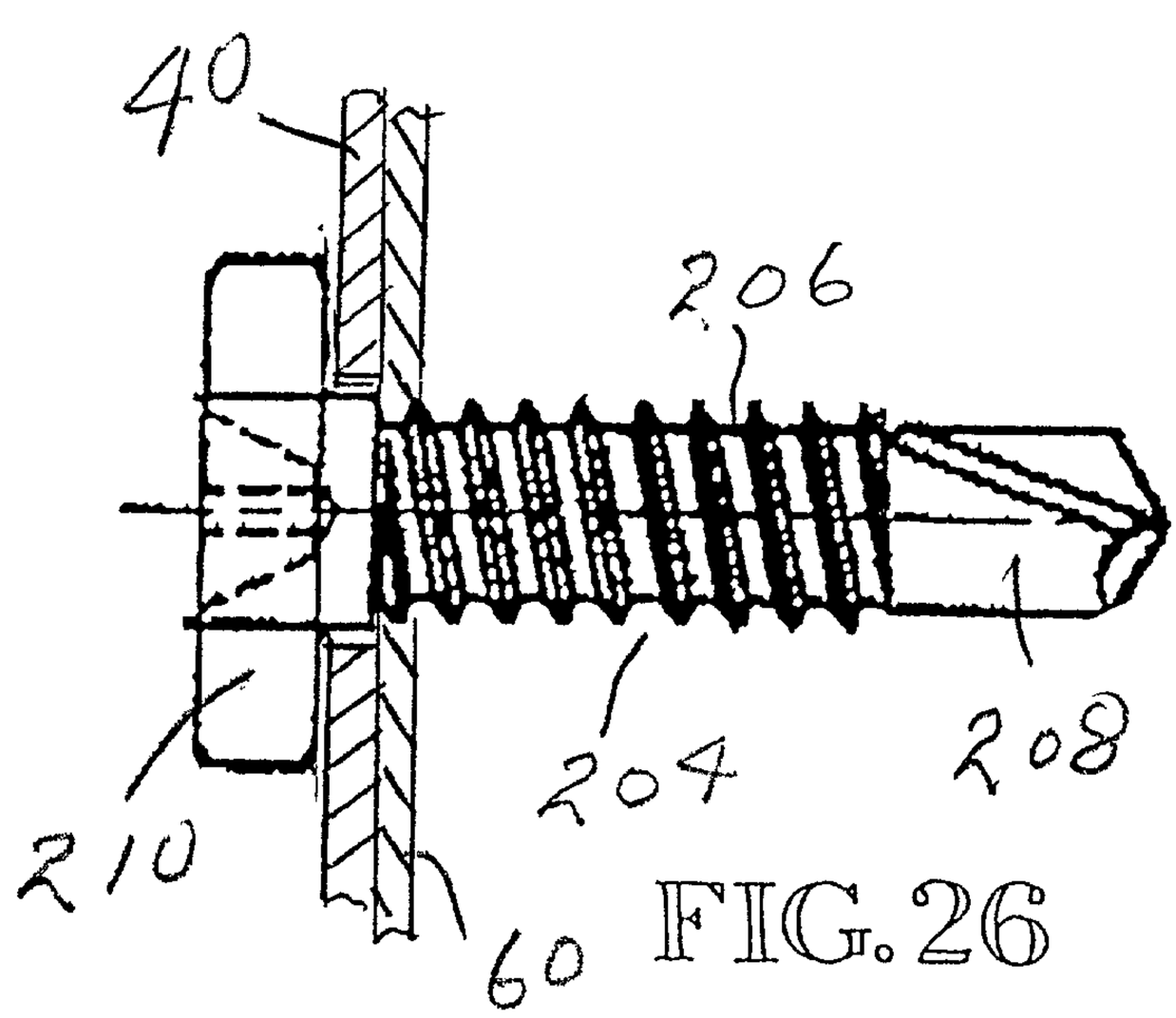


FIG. 26

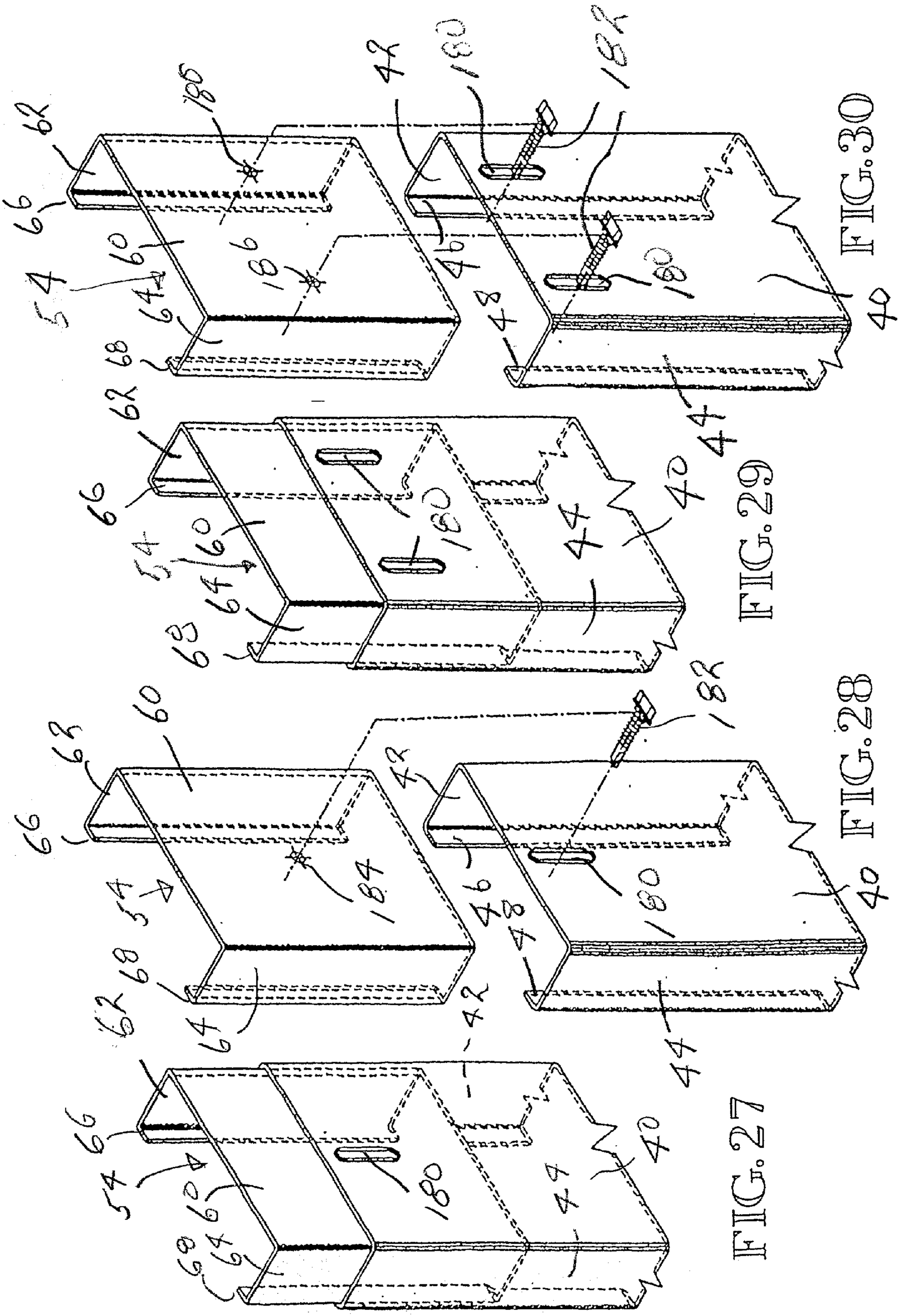


FIG. 30

FIG. 29

FIG. 28

FIG. 27

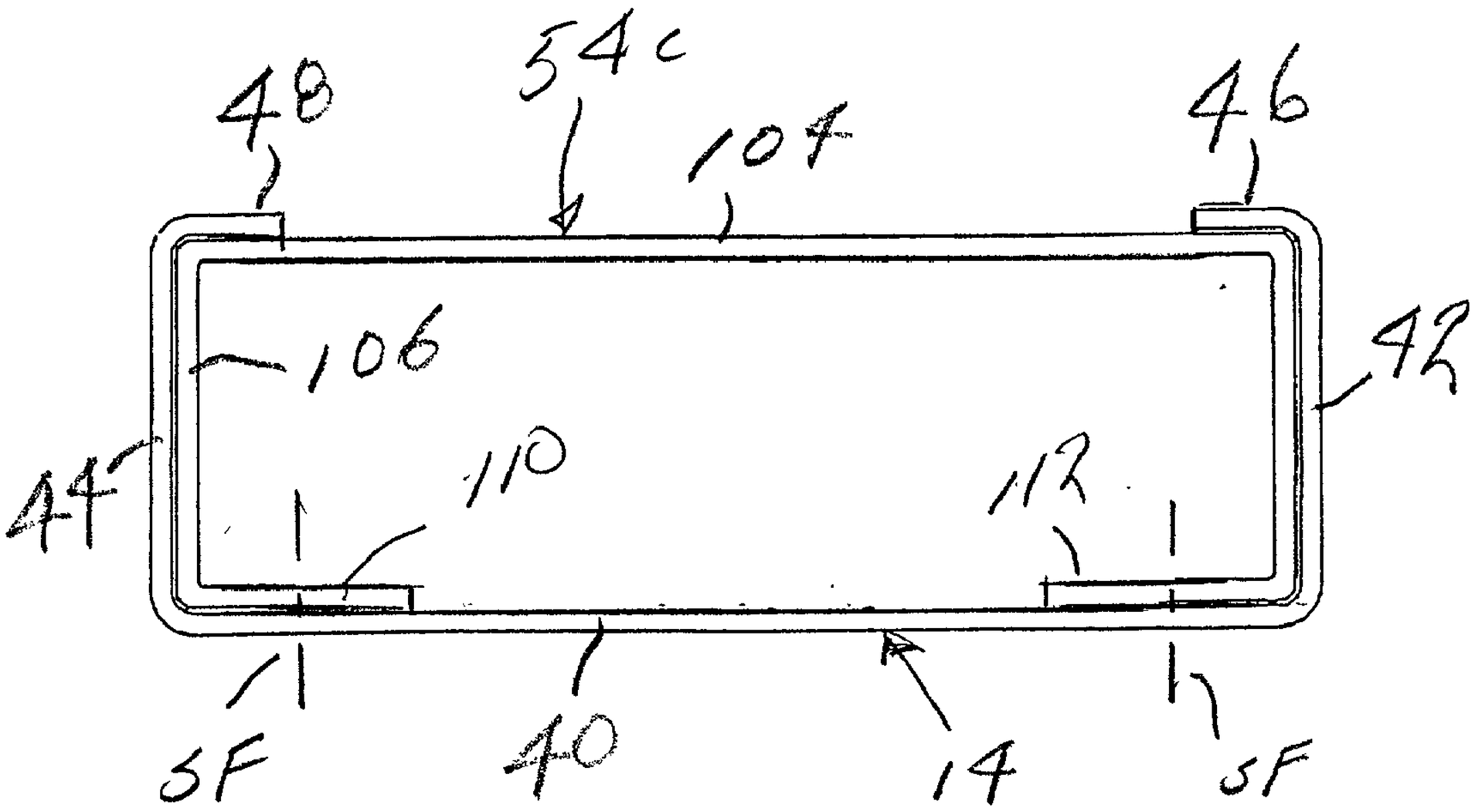

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5F

FIG. 31

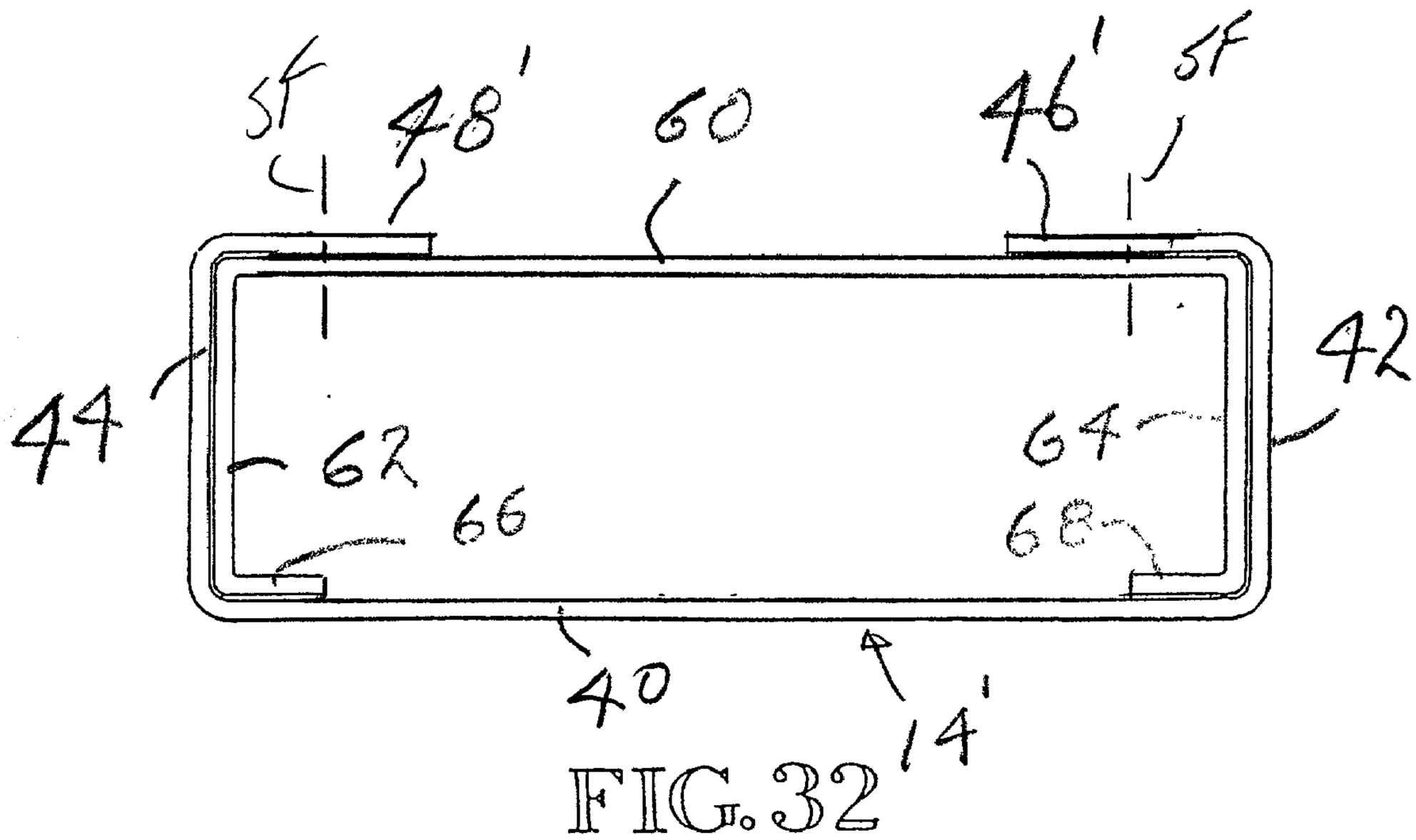
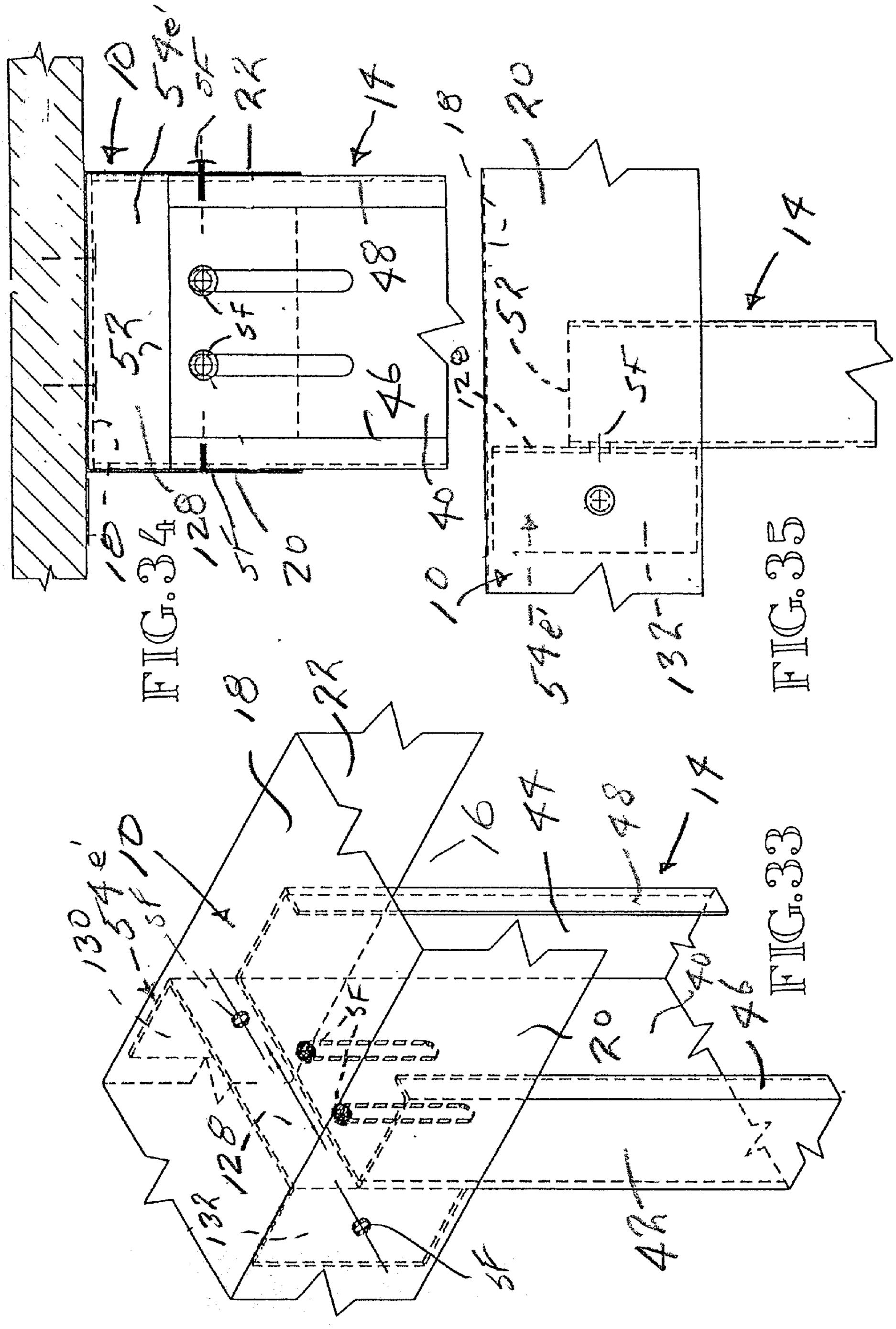

5F
48'
60
46'
5F
42
44
62
64
66
68
40
14'

FIG. 32


10
54e
52
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14
18
20
48
54
52
46
12e
34
128
12
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54e
132
FIG. 34
FIG. 35
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54e
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FIG. 33

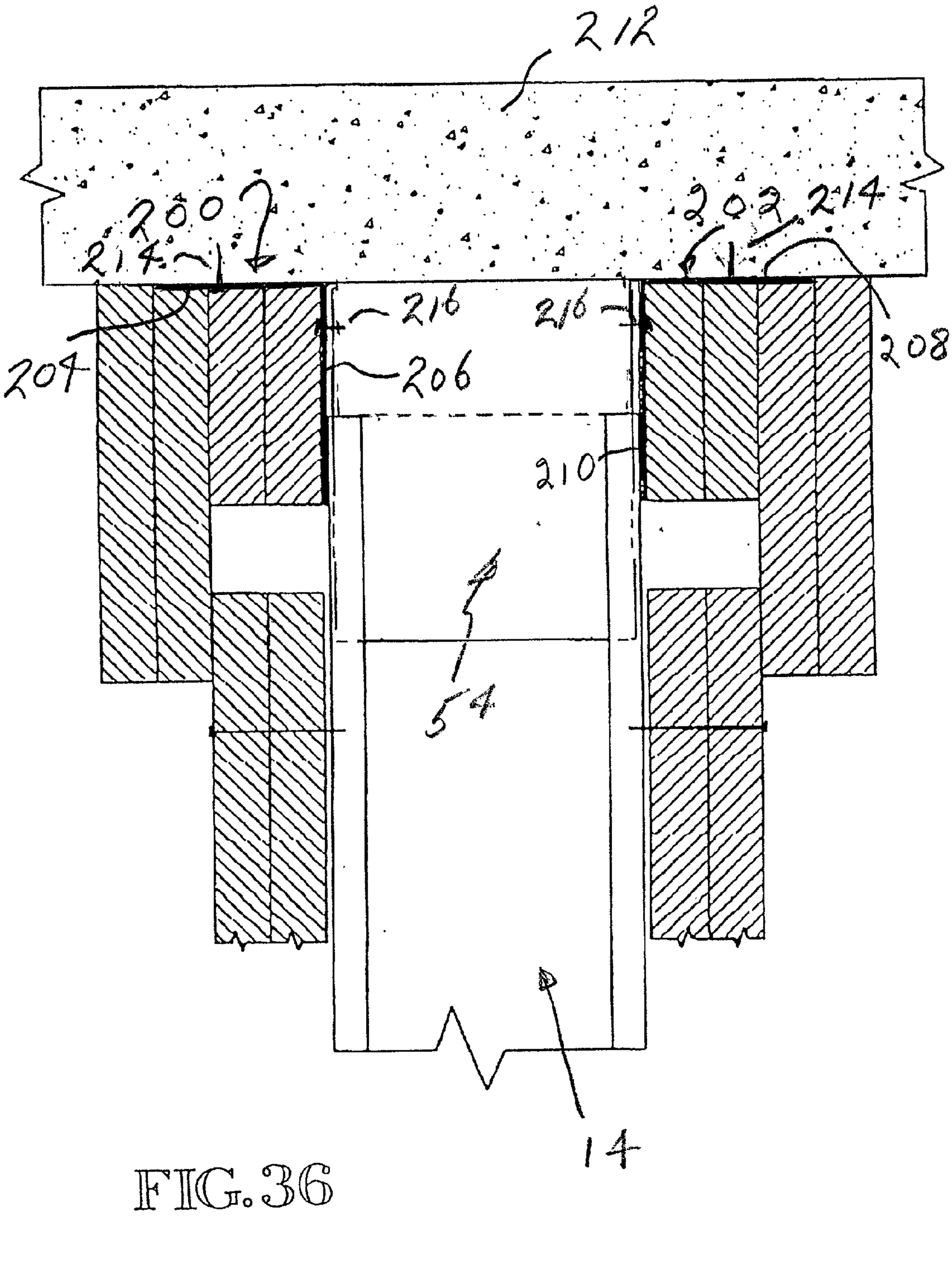


FIG. 36

WALL CONSTRUCTION

TECHNICAL FIELD

[0001] This invention relates to wall structures composed of metal framing and wallboard sheeting connected to the framing. More particularly, it relates to a simple way of providing for relative movement between an upper channel member, or header, and the rest of the wall, in response to wall movement such as may occur during an earthquake, for example.

BACKGROUND OF THE INVENTION

[0002] It is well known to use metal framing in building wall construction. Commonly, the framing comprises a downwardly opening upper channel, or header, an upwardly opening upper channel, or footer, and vertical studs extending between the channels and having end portions that are within the channels. An advantage of using metal framing members is that they provide a strong frame structure that can be configured to accommodate for movement of the buildings such as occurs during an earthquake, without resulting in damage to the wall of which the framing is a part.

[0003] Typically, the upper channel member is secured to an upper concrete structure and the lower channel member is secured to a lower concrete structure. During an earthquake, and at other times as well, there is relative movement between the two concrete structures. It is necessary that the framing that extends between the concrete structures be able to accommodate the relative movement without damage to the framing and the wall of which it is a part. Relative movement between the two concrete structures can be caused by earthquakes, roof loads, expansion and contraction, loading and unloading upper floors in multi-story buildings, settling, and wind loads, for example.

[0004] U.S. Pat. No. 5,127,203, granted Jul. 7, 1992, to Robert F. Paquette, and U.S. Pat. No. 5,127,760, granted Jul. 7, 1992, to Todd A. Brady, each discloses the use of vertical slots in the flanges of overhead channels, for receiving screws that are used to secure upper end portions of the studs to the overhead channels. The overhead channels are provided with a plurality of slots so that a stud can be selectively positioned at a number of locations along the channel length. Screw fasteners are inserted through the slots and are then screwed into the upper end portions of the studs. In response to movement of the building, the upper channel member is movable relative to the studs and the wallboard that is connected to the studs. A problem with this use of slots is that constructing the upper channel members to include the slots is an added expense. Also, the slots weaken the metal. It often becomes necessary to use a heavier gauge metal to compensate for the loss in strength caused by use of the slots. This adds addition expense as heavier gauge metal is more expensive than lighter gauge metal.

[0005] U.S. Pat. No. 5,685,121, granted Nov. 11, 1997, to Frank DeFrancesco and Joseph Domenick Palumbo, discloses a use of a two-section stud. The upper end of the upper section is an upper channel and the lower end of the lower section is in a lower channel. The upper section is telescopically received within the lower section and includes a pair of slots that extend throughout a substantial portion of the length of the upper section. A problem with this construction is that the location of the slots cannot be determined for sure and the fasteners used may end up securing the lower section to the upper section. The installers must place the wallboard sheeting on the studs and then drill through the sheeting and the outer flange of the lower section of the stud at locations which are outwardly of the slots in the upper sections of the studs. If a screw fastener is not in alignment with a slot, it will screw into the metal bordering the slot. As a result, the upper and lower sections of the stud will be screwed together and relative movement between the two will be prevented. In such an event, the two sections of the stud are not free to move relative to each other in response to seismic or other forces to which the wall may be subjected. Also, it is difficult and expensive to make the long slots, to provide the upper section with a flared upper end, and to provide the upper section with the longitudinal V-shaped flanges that are a part of the system. Also, considerable more steel is needed in a wall that uses the two-section stud of this system.

[0006] There is a need for a wall construction that permits movement of the upper channel member relative to the rest of the wall in a positive manner without adding substantial manufacturing and/or installation costs. A principal object of the present invention is to provide such a wall structure.

BRIEF SUMMARY OF THE INVENTION

[0007] A wall structure to which the present invention relates comprises a downwardly opening upper channel member that includes an upper web and a pair of spaced apart side flanges depending from the upper web to the lower edges. The upper web and the side flanges form a channel space below the upper web and between the side flanges. The wall structure also includes a plurality of vertically extending studs that are horizontally spaced apart. Each stud includes an upper end portion and an upper butt end. The upper end portions of the studs are received in the channel space, with the butt ends of the studs positioned above the lower edges of the side flanges of the upper channel member. According to the invention, each stud is provided with a clip. Each clip comprises an upper portion that is received in and secured to the upper channel member, and a lower portion that extends downwardly from the upper portion into the upper end portion of its stud. The lower end portion of each clip is snuggly received within, and preferably makes frictional engagement with, the upper end portion of its stud. The studs are moveable up and down in the channel space relative to both the clips and the upper channel member when subjected to a force that overcomes the frictional forces.

[0008] In preferred form, each stud comprises a web extending perpendicular to the side flanges of the upper channel and front and rear flanges connected to the web. The front and rear flanges extend parallel to the side flanges of the upper channel. The studs include lips that are connected to the flanges and extend inwardly towards each other, in coplanar parallelism. The lips are in spaced parallelism with the web. Also in preferred form, the clip has front and rear boundaries that are contiguous stud flanges.

[0009] In one embodiment, each clip comprises a web that is inwardly contiguous the web of its stud and front and rear flanges connected to the web of the clip that are inwardly contiguous front and rear flanges of its stud. The clip and

stud combination of this invention requires much less steel than the two-section stud disclosed by U.S. Pat. No. 5,685,121. More specifically, that system requires approximately fifty percent more steel than the clip and stud system provided by the present invention.

[0010] According to an aspect of the invention, screw fasteners extend through the side flanges of the upper channel and through the front and rear flanges of the upper portions of the clips. Upper portions of the front and rear flanges of each stud are sandwiched between the side flanges of the upper channel and lower portions of the front and rear flanges of the clip.

[0011] It is an object of the present invention to provide framing for internal walls, framing for external walls and framing that can be used in both internal and external walls. External building walls generally have larger side loads (e.g. wind loads) on them than interior walls.

[0012] According to an embodiment of the invention, the web of the clip, or the web of the stud includes at least one vertical slot. A screw fastener extends through the other web and through the slot and connects the clip to the stud. The slot is sized and positioned to allow up and down movement of the clip relative to the stud and the upper channel member.

[0013] In another embodiment of the invention, the clips included lips that are inwardly contiguous the lips on their stud. A vertical slot is provided in at least one lip on either the clip or the stud and for each slot a screw fastener extends through the other lip and the slot and connects the clip to the stud. The slot is of a length and is positioned to allow vertical movement of the clips relative to the studs and the upper channel member.

[0014] In still another embodiment, the clips are telescopically received within the studs and the clips include longitudinal channels in which the lips on the studs are received.

[0015] According to a further aspect of the invention, clips are provided that include at least one upper portion that extends perpendicular to the stud and parallel to the upper web of the upper channel member. At least one screw fastener connects said upper portion of the clip to the upper web of the upper channel member. Each clip may include two upper portions which extend perpendicular to its stud and parallel to the upper web of the upper channel member. In such case one of the upper portions extends along the upper channel member in a first direction from the clip. The other upper portion extends along the upper channel member in the opposite direction from the clip. At least one fastener is used to connect at least one of said upper portion of each clip to the upper web of the upper channel member. In one embodiment, each upper portion of the clip is connected to the upper web of the upper channel member by at least one fastener.

[0016] In a typical wall, the framing includes an upwardly opening lower channel member having a lower web and a pair of spaced apart flanges extending upwardly from the lower web to upper edges. The lower web and side flanges form a channel space above the lower web and between the side flanges. The studs include lower end portions that are received in the channel space. The studs have lower butt ends that contact the lower web.

[0017] A feature of the invention is that vertical studs are supported at their lower ends in an upwardly opening lower channel member and the studs include upper end portions that project upwardly into an upper channel space formed in a downwardly opening upper channel member. The upper end portions of the studs are contiguous side flanges of the upper channel member and include butt ends that are spaced downwardly from an upper web portion of the upper channel member. A clip is provided for each stud. Each clip includes an upper portion that is connected to an upper channel member and a lower portion that extends downwardly into its stud. This construction allows the upper end portions of the studs to be braced longitudinally and laterally of the upper channel member while at the same time permits the studs and the rest of the wall below the upper channel member to move up and down relative to the upper channel member, and also allows the upper channel member to move up and down relative to the studs and the rest of the wall.

[0018] According to an aspect of the invention, the upper end portions of the clips can be adapted to be connected to the web of the upper channel member or can be adapted to be connected to the side flanges of the upper channel member.

[0019] According to a further aspect of the invention, fasteners that secure sheeting to the studs enter into the studs but not into either the clips or the upper channel member.

[0020] The present invention includes providing a wall framing system in which there are yieldable connections between the studs and an overhead channel member. There is telescopic engagement of the studs with clips that are connected to the overhead channel member. This connection transfers longitudinal and lateral wall forces between the studs and the clips. The clips then transfer these forces to the upper channel member. In the connection, front and rear wall parts of the upper portions of the studs are sandwiched between lower end portions of the clips and side flange portions of the upper channel member.

[0021] The upper channel member forms what is sometimes referred to as an upper track. The essential parts of the upper track are the side panels that form a channel or track space between them. It is within the scope of the present invention to employ an upper track that is composed of two angle iron members. Each angle iron member includes a horizontal upper flange that is used to secure it to the overhead structure and a vertical flange that provides the side flange of the track.

[0022] Other objects, advantages and features of the invention will become apparent from the detailed description that is set forth below, from the drawings and from the claims.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0023] Like reference numerals are used to designate like parts throughout the several views of the drawing, and:

[0024] **FIG. 1** is a fragmentary pictorial view looking towards the assembly of an upper channel member, a lower channel member, a stud having an upper end portion, and a clip in said upper end portion, said clip being shown connected to the upper channel member, said view being taken from above, with the mid portion of the stud being broken away for purposes of indicating indeterminate length;

[0025] **FIG. 2** is an exploded pictorial view of the framing assembly shown by **FIG. 1**, such view including a fragmentary portion of some sheeting that is connected to the stud;

[0026] **FIG. 3** is a fragmentary side elevational view looking towards framing composed of an upper channel, a lower channel, a plurality of spaced apart, parallel studs extending between the two channels, and wallboard sheeting connected to the studs;

[0027] **FIG. 4** is a sectional view taken substantially along line **4-4** of **FIG. 3**;

[0028] **FIG. 5** is a sectional view taken substantially along line **5-5** of **FIG. 3**;

[0029] **FIG. 6** is a view like **FIG. 4** but showing additional layers of wallboard sheeting;

[0030] **FIG. 7** is a view like **FIG. 6** and also showing additional layers of wallboard sheeting;

[0031] **FIG. 8** is a pictorial view of the clip that is shown in **FIGS. 1, 2, 5** and **7**;

[0032] **FIG. 9** is a view like **FIG. 8** but of a modified form of clip;

[0033] **FIG. 10** is a view like **FIGS. 8 and 9** but of another form of clip;

[0034] **FIG. 11** is a view like FIGS. **8-10** but of yet another form of clip;

[0035] **FIG. 12** is a view like FIGS. **8-11** but of a further form of clip;

[0036] **FIG. 13** is a view like FIGS. **8-12** but of a yet another form of clip;

[0037] **FIG. 14** is a view like FIGS. **8-13** but of yet another form of clip;

[0038] **FIG. 15** is an end elevational view of the stud shown in **FIG. 14**;

[0039] **FIG. 16** is an end elevational view of the clip shown in **FIG. 14**;

[0040] **FIG. 17** is an end view of the clip shown by **FIG. 14** when telescopically received within the stud shown by **FIG. 14**;

[0041] **FIG. 18** is a pictorial view of an upper end portion of a stud and another form of clip;

[0042] **FIG. 19** is a view like **FIG. 18** showing still another form of clip;

[0043] **FIG. 20** is a side elevational view of a screw adapted to drill its way into metal, with it leading end spaced from two thicknesses of metal;

[0044] **FIG. 21** is an end view of the head end of the screw shown by **FIG. 20**;

[0045] **FIG. 22** is a view like **FIG. 20** but showing the screw extended through both thicknesses of metal;

[0046] **FIG. 23** is an end view at the forward end of the screw shown by FIGS. **20-22**;

[0047] **FIG. 24** is a view of a screw like the screw shown in **FIGS. 20 and 22**, shown spaced from two metal members, the nearest one of which has a preformed opening in it;

[0048] **FIG. 25** is a view similar to **FIG. 24**, but showing a screw that includes a shoulder adjacent the head, adapted to enter a slot and keep the head from clamping down on the metal member that includes the slot;

[0049] **FIG. 26** is a view like **FIG. 25**, but showing the screw installed;

[0050] **FIG. 27** is a pictorial view of a clip in telescopic engagement with the upper portion of a stud, such view showing a longitudinal slot in the web of the stud that is contiguous the web of the clip;

[0051] **FIG. 28** is a view like **FIG. 27**, but showing the clip spaced endwise outwardly from the stud, and showing a screw fastener in a spaced relationship with the slot in the stud and an opening in the clip;

[0052] **FIG. 29** is a view like **FIG. 27**, but showing two longitudinal slots in the web of the stud;

[0053] **FIG. 30** is a view like **FIG. 28**, but showing two longitudinal slots in the web of the stud and two screw fasteners used for connecting the stud to the clip;

[0054] **FIG. 31** is an end view of a clip inside of a stud, such view showing the clip having relatively wide lips and showing broken lines where screw fasteners extend through the lips of the clip and the web of the stud;

[0055] **FIG. 32** is a view like **FIG. 31**, but showing the stud having relatively wide lips and including broken lines indicating where screw fasteners extend through the stud lips and the web of the clip;

[0056] **FIG. 33** is a pictorial view of an embodiment of the invention in which the clip is positioned within the upper channel space on the outside of the web of the stud, such view showing slots in the web of the stud and screw fasteners extending through the slots and screwing into the web of the clip;

[0057] **FIG. 34** an elevational view looking towards the inside of the stud web and showing the heads of the screw fasteners;

[0058] **FIG. 35** is a fragmentary view showing an upper end portion of a stud, a portion of the upper channel member and a clip in the channel member positioned next to the upper end portion stud, such view including a broken line showing the location of a screw fastener that extends through a slot in the stud web and screws into the web of the clip; and

[0059] **FIG. 36** is a view like **FIG. 7**, but showing an upper track that is formed by a pair of angle members, arranged with their upper legs or flanges projecting laterally outwardly from their vertical legs or flanges which form the track space between them.

DETAILED DESCRIPTION OF THE INVENTION

[0060] FIGS. **1-7** show wall framing comprising an upper sheet metal channel member **10**, a lower sheet metal channel member **12** and a plurality of studs **14** that are supported at their lower ends in the lower sheet metal channel **12** and at their upper ends project into a channel space **16** formed below an upper web **18** and between a pair of side flanges **20, 22** that depend from the web **18**. The lower channel **12**

includes a channel space **24** that is defined above a lower web **26** and between a pair of side flanges **28, 30** that project upwardly from the lower web **26**. The upper flanges **20, 22** include lower edges **32, 34**. The lower flanges **28, 30** include upper edges **34, 36**. As shown by **FIG. 3, a** plurality of sheet metal studs **14** are spaced apart along the channels **10, 12**. The studs **14** are parallel to each other and are perpendicular to the channels **10, 12**.

[**0061**] Referring to **FIGS. 1 and 2**, in particular, each studs **14** preferably has a web **40**, front and rear (or first and second) flanges **42, 44** and a pair of lips **46, 48**. The flanges **42, 44** are parallel to each other and are perpendicular to the web **40**. The lips **46, 48** are in spaced, coplanar parallelism with and are perpendicular to the flanges **42, 44**. They are also parallel to the web **40**. The front to rear dimension of the studs substantially equals the distance between the side flanges **28, 30** of the lower channel member **12**. Web **40** and lips **46, 48** extend perpendicular to the upper side flanges **20, 22** and the lower side flanges **28, 30**.

[**0062**] Each stud **14** includes a lower butt end **50** and an upper butt end **52**. Butt end **50** preferably rests on the web **26**. Butt end **52** is spaced above the lower edges **32, 34** a distance x and below the upper web **18** a distance y. As will hereinafter be explained, the dimensions x, y are variable dimensions. This is because the framing permits relative vertical movement between the upper channel **10** and the rest of the wall structure that includes the studs **14** and the lower channel member **12**. **FIG. 1** shows an at rest position. When the wall structure is in this position, the dimension x is smaller than the dimension y but is large enough to provide substantial lateral bracing between the upper end portions of the studs **14** and the side flanges **20, 22** of the upper channel member **10**.

[**0063**] According to the invention, a separate clip **54** is provided for each stud **12**. Each clip **54** has an upper portion that extends upwardly into the channel space **16** and a lower portion that extends downwardly into the upper end of its stud **14**. As will hereinafter be described, the upper portions of the clips **54** are connected to the upper channel members **10** whereas the lower portions of the clips **54** extend downwardly into the upper end portions of the studs **14** and make a relatively snug fit with the interior surfaces of the stud **14**.

[**0064**] FIGS. **1-8** show a first embodiment of a clip **54**. It has an upper butt end **56**, a lower butt end **58**, a web **60**, a pair of flanges **62, 64** and a pair of lips **66, 68**. As can be readily seen, the cross sectional configuration of the clip **54** is like the cross sectional configuration of the studs **14** except that its dimensions are smaller so that its lower portion can snugly fit within the upper portion of the stud **14**. When this form of clip **54** is within the upper end portion of a stud **14**, its flanges **62, 64** are inwardly contiguous the flanges **42, 44** of the stud **14**. Its web **60** is inwardly contiguous the web **40** of the stud **14**. Its lips **66, 68** are inwardly contiguous the lips **46, 48** of the stud **14**.

[**0065**] Preferably, the lower end portion of each clip **54** is dimensioned such that it frictionally engages the inner surfaces of the upper end portions of its stud **14**. As best shown by **FIGS. 5 and 7**, when the lower end portion of each clip **54** is within the upper end portion of its stud **14**, the outer surfaces of the stud flanges **62, 64** are spaced inwardly from the side flanges **20, 22** of the upper channel member **10** a distance substantially equal to the thickness of a stud flange **62, 64**. Upper portions of the stud flanges **42, 44** are sandwiched between lower portions of the side flanges **20, 22** of the upper channel **10** and adjacent portions of the clip flanges **62, 64**.

[**0066**] As shown by **FIGS. 1 and 2**, screw fasteners are inserted at locations SF through the sidewalls **20, 22** of the upper channel member **10**. The screw fasteners and screw into the clip flanges **62, 64** at a location between the upper web **18** and the upper butt end **52** of the stud **14**. No fasteners are inserted through the upper side flanges **20, 22** and the stud flanges **42, 44**. When the screw fasteners are tightened, the side flanges **20, 22** of the upper flange **10** are drawn towards the clip flanges **62, 64**. This increases the frictional forces acting between the stud flanges **46, 48**, the clip flanges **62, 64** and the side flanges **20, 22** of the upper channel **10**.

[**0067**] The distance x is always sufficiently long that contact is made between the stud flanges **42, 44** and the side flanges **20, 22** of the upper channel **10**. This allows the use of a short clip **54**. Also, the clip **54** can have a cross sectional dimension that is smaller than the cross sectional dimension of the stud **14**.

[**0068**] The contact between the squared upper end **56** of the clip **54** and the web **18** will lock the clip **54** substantially perpendicular to the web **18** by the use of only two screw fasteners. This perpendicular orientation of the clip **54**, and the telescopic engagement of the lower portion of the clip **54** with the upper portion of the stud **14**, and the containment of the upper end portion of the stud **14** in the channel space **16** between the side flanges **20, 22**, will provide a connection that is substantially fixed (will carry a moment) in all directions except the vertical direction. Relative movement in the vertical direction is permitted because of the telescopic engagement of the clip **54** with the stud **14**. The contact between the squared lower end **50** of the stud **44** with the lower web **26** also helps maintain the stud **14** in a substantially vertical position.

[**0069**] In a typical installation, the upper channel members **10** are connected to an upper concrete structure **70**. This is usually done by inserting screw fasteners through the web **18** at a plurality of longitudinally and laterally spaced apart locations. In **FIG. 5**, two screw fastener locations are designated SF. In similar fashion, the lower channel member **12** is connected to a lower concrete structure (not shown). This is typically done by the use of laterally and longitudinally spaced apart screw fasteners (not shown) that extend between the lower web **24** and the lower concrete structure.

[**0070**] The upper and lower concrete structures are fixed relatively to each other most of the time. However, during earthquakes, and other times as well, there will be some vertical movement of the two concrete structures relative to each other. At times they may move relatively toward each other and at other times they may move relatively apart. As previously described, the studs **14** are connected to the lower channel member **12** and thus are in that manner connected to the lower concrete structure. However, they are not connected to either the upper channel member **10** or the upper concrete structure **70**. The upper channel member **10** is connected to the upper concrete structure and thus can and will move with the upper concrete structure whenever it moves.

[**0071**] As best shown by FIGS. **3-7**, the framing is covered (usually on both sides) by wallboard sheeting WS or

some other form of sheeting. Typically, the sheeting comes in sheets measuring four feet by eight feet, or four feet by ten feet or four feet by twelve feet, for example. The thickness varies, for example, from one-half inch to five eights of an inch to three-quarters of an inch. The wallboard sheeting WS is secured to the studs **14**, preferably by screw fasteners SF. Herein, "SF" is used to designate both the screw fasteners and openings which receive the screw fasteners. The screw fasteners SF extend through the wallboard sheeting WS and screw into the flanges **42**, **44** of the studs **14**.

[**0072**] **FIGS. 4 and 5** show a single thickness of wallboard sheeting WS. The sheeting may, for example, be five eights (⅝") GWB gypsum wallboard. A single thickness of wallboard sheeting WS (**FIGS. 4 and 5**) provides what is referred to as a one-hour wall system. This means that the wall will prevent fire from moving through it for about one hour. **FIGS. 6 and 7** show two thicknesses of wallboard sheeting WS. This provides a two-hour wall system. That is, the wall will prevent fire from passing through it for about two hours. In either system, the upper edges **76**, **78** are spaced below the lower edges **32**, **34** of the upper channel member **10**. In the illustrated embodiment, wallboard strips **80** are provided immediately outwardly of the side flanges **20**, **22** of the upper channel member **10**. Wider wallboard strips **82** are provided outwardly of the wallboard strips **80**. Screw fasteners are used to secure the wallboard strips **80**, **82** to the side flanges **20**, **22** of the upper channel member. The wider strips **82** extend downwardly and overlap edge portions of the wallboard sheeting WS.

[**0073**] Referring to FIGS. **4-7**, the wallboard sheeting WS is secured to the studs **10** and at its lower edge may be secured to the side flanges **28**, **30** of the lower channel member **12**. In any event, the studs **10** are connected to the side flanges **28**, **30** of the lower channel members **12** and the sheeting is connected to the studs **14**. This assembly by itself effectively unites the wallboard sheeting WS, the studs **14** and the lower channel members **12**.

[**0074**] As shown by FIGS. **4-7**, a vertical space exists between the upper edges **76**, **78** of the wallboard sheeting WS, WS'. This allows the upper edges **76**, **78** to move relatively upwardly into this space during relative upward movement of the channel members **10**, **12** and the concrete structures to which they are connected. The wallboard sheeting WS, WS' is connected to the studs **14** but is not connected to the clips **54**. The clips **54** have a substantially rigid configuration. When the lower portion of a clip is telescopically received in the upper portion of its stud **14**, the telescopic connection that is created resists most bending. The connection is reinforced by the cross sectional constructions of the stud **14** and the clips **54**. FIGS. **9-12**, **14-17** and **27-30** disclose telescopic connections between the clips and the studs **14** that are stiffened and further strengthened by additional structure. The clips shown by **FIGS. 9 and 10** have what may be referred to as a "box" shape. They include a lipped channel and a panel that is secured to the lips of the channel by either screws or weld beads. Clips **54***a*, **54***b* each comprise a web **90**, first and second flanges **92**, **94** that are connected to the web **90** and extend perpendicular from it, and lips **96**, **98**. The lips **96**, **98** are connected to the flanges **92**, **94** and extend perpendicular to them, and parallel to the web **90**. Lips **96**, **98** are in coplanar parallelism. Clip **54***a* includes a panel **100** that is fastened by screw fasteners SF to the lips **96**, **98**. In clip **54***b*, the panel **102** is connected to the lips **96** by welds W. The "box" shape of clips **54***a*, **54***b* provides a more rigid dowel than the lipped channel shown by **FIG. 8**. These clips **54***a*, **54***b* are particularly suited for use in exterior wall structures that are subjected to large side loads (e.g. high velocity wind loads).

[**0075**] **FIG. 11** shows providing the lips of the clip with longitudinal slots that are adapted to receive shank portions of screw fasteners that extend through openings in the stud web and then extend through the slots. Specifically, clip **54***c* includes a web **104**, flanges **106**, **108** connected to the web **104** and lips **110**, **112** connected to the flanges **106**, **108**. As in the earlier embodiments, the flanges **106**, **108** are parallel to each other and are perpendicular to the web **104** and the lips **110**, **112**. In this embodiment, the lips **110**, **112** may be wider than the lips **66**, **68** in the clip **54** shown by **FIG. 8**. This is so that the lips **110**, **112** can be provided with longitudinal slots **114**. The slots **114** receive the shank portions of screw fasteners that are screwed into the on the stud web **14**. In this embodiment, vertical movement of the clip **54***c* relative to the stud **14** is limited by the length of the slots **114**.

[**0076**] **FIG. 12** discloses providing elongated slots in the web of the clip **54***d*. Clip **54***d* comprises a web **16**, a pair of flanges **118**, **120** and a pair of lips **122**, **124**. Web **116** is parallel to lips **122**, **124** and is perpendicular to flanges **118**, **120**. At least one (but preferably two) slot **126** is formed in the web **116**. Slot(s) **126** receive shank portions of screw fasteners used to secure the clip **54***d* to a stud **14**. As in the last embodiment, the relative movement between the clip **54***d* and the stud **14** is limited by the length of the slot(s) **126**.

[**0077**] **FIG. 13** shows a simpler clip **54***e* comprising a web **128** and two flanges **130**, **132**. This clip **54***e* is not as rigid as the other clips and should only be used in internal wall systems that experience relatively low side loads. Clip **54***e* is telescopically received within the upper end portion of a stud **14**, in the manner shown by **FIG. 1**. The only difference is that in the system that includes a clip **54***e*, the free edges of the flanges **130**, **134** extend substantially to the inner surfaces of the lips **46**, **48** on the stud **14**.

[**0078**] FIGS. **14-17** show providing the clip **54***f* with longitudinal channels **134** outwardly of its lips **136**, **138**. The stud lips **46**, **48** are received in the channels **134**. This fit strengthens the telescopic connection. As illustrated, the clip **54***f* includes a web **140** flanges **142**, **144** and the channels **134**. As best shown by **FIGS. 16 and 17**, the channels **134** are formed by and between inner lips **146**, **148** and outer lips **150**, **152**. The lips **146**, **148** and **150**, **154** are substantially parallel to each other and the web **140** and are substantially perpendicular to the flanges **144**, **142**. **FIG. 17** is a cross sectional view through the stud **14** and the clip **54***f*. This view clearly shows the stud lips **46**, **48** received within the channels **134**. This provides an interlock between the two members and results in a stiffened connection, capable of withstanding substantial bending force at the connection.

[**0079**] **FIG. 18** shows a clip **150** that includes an upper portion **152** and a lower portion **154** that is telescopically received in the stud **14**. Upper portion **152** is a flat panel that is adapted to extend horizontally. It is connected to a vertical panel **156** that has a width substantially equal to the distance between the stud flanges **42**, **44**. At its lower end, panel **156** connects to a panel **158**. Another panel **160** is connected to panel **158**. Panel **152** is perpendicular to panels **156** and **160**.

It is parallel to panel **158**. Panels **156** and **160** have a common width that is equal to the width of panel **156**. The distance between the side of panel **156** that is contiguous the web **40** and the side of panel **160** that is contiguously webs **46**, **48** is substantially equal to the distance between the web **40** and the webs **46**,**48**. Panel **156** is substantially the length of the clips that have already been described e.g. clip **54** in **FIGS. 1 and 2**. In this embodiment, the panel **152** is moved upwardly against the upper web **18** of the upper channel member **10**. Then, screw fasteners are inserted through the openings designated as SF. The screws are inserted upwardly from below panel **152**, through the openings SF. They are then screwed into the upper web **18**. When the screws are tightened, they draw the panel **152** into tight engagement with the web **18**. This secures the clip **152** to the upper channel member **10**. The lower portion of the clip **152**, composed of panels **154**, **156**, and **160** are snuggly received within the stud **14**. The shape of the panels **154**, **158**, **160**, and their snug fit within the stud **14**, substantially restrains the stud **14** and clip **150** from movement relative to each other in all directions except for the vertical direction. The telescopic connection between the clip **150** and the stud **14** permits relative vertical movement between the two members **150**, **14**.

[**0080**] **FIG. 19** shows a modified clip **162**. In this embodiment, the panel **160'** extends upwardly from panel **158** on its side of panel **158** in the same manner that panel **156** extends up from the opposite side of panel **158**. The upper end of panel **160'** is connected to another panel **164**. Panels **152**, **164** are in coplanar parallelism. Both of these panels are connected to the upper web **18** of the upper channel member **10** by screw fasteners SF which are inserted upwardly through the openings SF. In this embodiment, the panels **156**, **158**, **1601** form the lower portion of the clip **150** that is telescopically received in the upper portion of the stud **14**. Preferably, the structure formed by panels **156**, **158**, **160'** is snuggly received within the stud **14**. It substantially restrains relative movement between clip **150** and stud **14** in all directions except the vertical direction. Relative movement is possible in the vertical direction because of the telescopic connection between the two members.

[**0081**] FIGS. **27-30** show providing at least one longitudinal slot in the web of the stud. Screw fasteners SF extend through the slots and then screw into the webs of the clips. In FIGS. **27-30** the same reference numerals will be used that are used in FIGS. **1-2** except for where there is a difference. In **FIGS. 27 and 28** the difference is the existence of a single slot **180** in the stud web **40**. In **FIGS. 29 and 30**, the difference is the presence of two slots **180** in the stud web **40**. In these embodiments, a screw fastener **182** extends first through the slot **180** and then screws into the web **60** of clip **54** at location **184** (**FIG. 28**). In **FIGS. 29 and 30**, two screw fasteners **182** extend through the two slots **180** and then screw into the web **60** of the clip **54** at location **186**. In the two embodiments shown by FIGS. **27-30**, relative vertical movement can occur between the clip **54** and the stud **14** within limits set by the ends of the slots **180**.

[**0082**] FIGS. **20-24** show a screw fastener **190** (also SF) that includes a slotted head **192** adapted to receive a tip of a screwdriver in the slot **194** (**FIG. 21**). A threaded shank **196** is connected. No the head **192** and extends away from it on the side of the head **192** opposite the slots **194**. At its end opposite the head **192**, the shank **196** includes a tip **198** that is in the nature of a drill bit tip. It is adapted to drill a hole through one or more sheet metal members in response to rotation of the screw fastener **190**.

[**0083**] **FIG. 20** shows the screw fastener **190** with its tip **198** spaced from a pair of sheet metal members. By way of example, these members may be side flange **20** of the upper channel member **10** and flange **42** of the stud **14**. In a manner known per se, when the screw fastener **190** is moved to place its tip **198** against the first member **20**, and then a power driver is used to rotate the screw fastener **190**, the tip **190** drills a hole first through member **20** and then through member **42**. Then, upon further rotation of the screw fastener **190**, the threaded portion of the shank **196** moves the screw fastener **198** through the openings until its head **192** is against member **20**. This connects the two members **20**, **42** together with the head **192** bearing tight against the member **20**, as shown by **FIG. 22**.

[**0084**] **FIG. 24** shows the screw fastener tip **198** spaced from a pre-drilled opening **200** in the member **20**. In this embodiment, the tip **198** only has to drill through the metal member **42**. The provision of pre-drilled holes **200** in one of two members that are to be connected together substantially reduces the installation time of the screw fasteners. Again, this is because the tip **198** does not have to drill its way through two members. It only has to drill its way through one member.

[**0085**] When clips **54***c*, **54***d* are used, the screw fastener is used to form an opening in a stud panel at a location immediately outwardly from a slot **114**, **26**. When clip **54***c* is used, the lips **110**, **112** are preferably inwardly contiguous the stud web **40**. Thus, the screw fastener drills a hole for itself through the web **40** and then it moves through the slots **114**. The screw fastener **190** can be driven until its head **192** is tight against the web **40**. Each slot **114** is wider than the threaded shank of the screw fastener **190**. As a result, the threads of the screw fastener **190** do not engage the lips **110**, **112** of the clip **54***c*. As a result, the clip **54***c* is able to move up and down freely relative to the stud **14** between the two ends of the slots **114**.

[**0086**] In the embodiment of **FIG. 12**, the web **116** is inwardly contiguous the stud web **40**. Again, the screw fasteners **190** bite into the web **40** but not the web **116**. The threaded shanks of the screw fasteners **190** pass through the slots **196**, resulting in clip **54***d* being freely movable vertically relative to the stud **14**.

[**0087**] **FIGS. 25 and 26** show a modified screw fastener **204** that is for use with the embodiments shown by FIGS. **27-30**. Screw fastener **204** includes a threaded shank **206**, a drill tip **208** and a head **210**. It also includes a spacer member **212** between the head **210** and the threaded shank **206**. The diameter **214** of member **212** is smaller than the width dimension of the slot **180**. The axial dimension **216** of member **212** is greater than the thickness of web **40**. When this embodiment is used, the screw fastener is aligned with a slot **180**, with its tip at one of the locations **184**, **186**. Then the screw fastener is rotated and moved axially through the slot **180** and against the web **60**, causing tip **208** to drill its way through the web **60**. Following the making of an opening in web **60**, the threaded shank **206** engages the edges of the opening and pulls the threaded fastener **204** through web **60** until member **212** is within the slot **180**. In this embodiment, when the screw fastener **204** is tightened,

the surface **218** is moved tight against web **60** where it surrounds the opening. This is shown by **FIG. 26**. **FIG. 26** also shows that the spacer member **212** is narrower that the slot and when the surface **218** is against web **60**, the head **210** is spaces axially from the web **40**. Thus, the screw fastener **204** can be screwed in as far as it will go without web **40** being clamped between head **210** and web **60**. As a result, the clip **54** is free to move longitudinally relative to the stud **14**, within the limits of the end of the slots **180**.

[**0088**] The clips may be united with the studs in the factory or the clips and studs may be sent to the job site unassembled and assembled there. The lower end portion of each stud is inserted into the channel space of the lower channel member **12**. The stud **14** is put into a vertical position with its lower butt end resting on the lower web **24** of the lower channel member **12**. When the stud **14** is substantially vertical, its upper butt end **52** is spaced above the lower edges **32**, **34** of the side flanges **20**, **22** of the upper channel member **10** and below the upper web **18** of the upper channel member **10**. The upper portions of the web side flanges **42**, **44** are sandwiched between the side flanges **20**, **22** of the upper channel member **10** and contiguous portions of the clip. In most of the embodiments, this portion of the clip is a side flange of the clip. See flanges **18**, **20** in **FIG. 12**, for example. Next, the upper end portion of the clip is connected to the upper channel member. In most of the embodiments, a screw fastener SF is inserted through the side flanges **20**, **22** of the upper channel member **10** and then through the adjacent side flanges of the clip. In the other embodiments, the upper portion or portions of each clip is secured to the web **18** of the upper channel member **10**, by the use of screw fasteners. Next, the wallboard sheeting WS is connected to the studs **14** but not in the regions of the clips or the side flanges **20**, **22** of the upper channel member.

[**0089**] As previously stated, the lower channel member **12** is typically secured to a lower concrete structure, e.g. a concrete slab in the building. The upper channel member **10** is in a similar fashion secured to an upper concrete structure, e.g. another concrete slab that is positioned above the first slab. The connection of the upper channel member **10** to the upper concrete structure will result in the upper concrete structure and the channel member **10** moving together if there is any reason for either one of them to move. The same is true with respect to the lower concrete structure and the lower channel member **12**. Over time, buildings settle and their floor structures move relative to each other. Also, during an earthquake, there can be substantial movement of the concrete structures relative to each other. The use of the clips together with the shortened studs provides a telescopic connection between the clip and the stud that will accommodate the movement that will occur under most circumstances. At the same time, the stud is firmly connected to both the upper channel member **10** and the lower channel member **12** for movement normal to the plain of the wall and parallel to the plain of the wall. As has been described, there are a number of ways of constructing the clips so that they well strengthen the telescopic connection and resist any tendency of the assembly to bend at the connection. This is all accomplished without the use of slots in the side flanges **20**, **22** of the upper channel member, or the clip, that must be located by the installer so that he will avoid placing a screw fastener at a location where it will secure the stud to the upper channel member in such a way that relative vertical movement between them is prevented.

[**0090**] The use of slots such as shown by **FIGS. 11,12** and **27-30** does not present a problem because these slots are used in the connection of the clip to the stud. This connection does not have to be done through wallboard sheeting. It is done at a time when the location of the slot is clearly visible and care can be taken to see that the screw fastener is properly positioned in the slot. Also, if a screw fastener should be installed in a position where it screws the clip to the stud, the workman see this and can remove the screw fastener and replace it with a properly located screw fastener before sheeting is place on the wall. Also, when it is elected to pre-assemble the clips and the studs in the factory, jigs can be developed that will make the drilling operation exact and substantially automatic.

[**0091**] **FIG. 31** is an end view of a clip **54***c* where it is telescopically received within a stud **14**. This system can be compared with the system shown by **FIGS. 29 and 30**. The difference is, in this system the clip **54***c* is turned around before it is inserted into the stud **14**. Its lips **110**, **112** are contiguous the stud web **40**. Screw fasteners are provided at SF. These screw fasteners can either screw into one of the metal members and then extend through a slot in the other, or they can first extend through a slot in one member and then screw into the other member. For example, the screw fasteners SF may screw through the stud web **40** and then extend through the slots **114** in the lips **110**, **112** of the clip **54***c*.

[**0092**] The system shown by **FIG. 32** comprises a stud **14'** having relatively wide lips **46'**, **48'**. Either the lips **46'**,**48'** include slots or the slots are formed in the clip web **60**. In any event, the screw fasteners SF either extend through a slot in a first member and then screw into the second member, or screw into the first member and then extend through a slot in the second member. When the screw fastener SF passes through the slot first, a screw fastener like screw fastener **204** (**FIGS. 25 and 26**) is used. When the screw fastener first screws into a metal member and then extends through a slot in the other member, a screw fastener like the screw fastener **196** (FIGS. **20-24**) is used.

[**0093**] It is to be understood that in all of the embodiments that have been shown and described, the screw fastener may first screw into a first metal member and then extend through a slot in the second metal member. Or, it may first extend through a slot in a first metal member and then screw into the second metal member. In each case, the appropriate screw fastener **196**, **204** is used.

[**0094**] FIGS. **33-35** show another embodiment of the invention. In this embodiment, a clip is used that is positioned within the channel space **16** adjacent to but outside of the upper end portion of the stud **14**. The clip may be like any of the clips that have been illustrated and described. In FIGS. **33-35**, by way of an example, a clip **54***e'* is used. The difference between clip **54***e'* and clip **54***e* is that in clip **54***e'* the distance between the outer sides of the flanges **130**, **132** is substantially equal to the distance between the inner sides of the flanges **20**, **22** of the upper channel member **10**. As illustrated, screw fasteners SF are used to secure the flanges **20**, **22** to the flanges **132**, **130**, respectively. This is done when the upper butt end of the clip **54***e'* is up against the lower surface of the web **18**. This abutting relationship of the end of the clip **54***e'* and the use of the two screw fasteners SF keeps the clip **54***e'* from rotating in position inside the

channel space **16**. In this embodiment, slots are either provided in the stud web **40** or in the clip web **128**. Screw fasteners are used at the locations of these slots to secure the upper end portion of the stud **14** to the clip **54***e*'. As previously described, the screw fasteners may extend either first through the slots and then into the other web member. Or they may first screw through a web member and then extend through the slots in the other web member. A screw fastener like screw fastener **196** is used when the screw fastener is first screwed into a web. A fastener like fastener **204** is used when the screw fastener first extends through a slot and then screws into the adjacent web. When the parts are assembled, relatively vertical movement is permitted between the upper channel member **10** and the stud **14** and the wall of which the stud **14** is a part. The screw fasteners extending through the two webs **40**, **128**, acting with the slots, provide a rigid connection in a direction normal to the wall. This connection also results in the upper end portion of the stud **14** being restrained against all kinds of movement except vertical movement relative to the upper channel member **10** and the clip **54***e*'.

[**0095**] Herein, unless otherwise specified, the screw fasteners may be nut and bolt assemblies rather than screw members. Thus, bolts may be provided that have shoulder portions adjacent the bolt heads that are adapted to extend into slots formed in one of the metal members. The shoulder has an end portion that bears against the metal member that does not include the slot. The shoulder is long enough so that when the end of the shoulder is against the metal, the head of the fastener is spaced away from the slotted member a small amount, so that the fastener head will not clamp the slotted member to the other member when it is tightened.

[**0096**] **FIG. 36** is similar to **FIG. 7** except that the upper track member **10** that is in **FIG. 7** has in **FIG. 36** been replaced by a pair of angle iron members **200**, **202**. Angle iron member **200** includes a horizontal flange **204** and a vertical flange **206**. Channel member **202** includes a horizontal upper flange **208** and a vertical flange **210**. Flange **206** makes a right angle connection with flange **204**. In similar fashion, flange **210** makes a right angle connection with flange **208**. Flanges **200**, **202** are secured to the overhead structure **212** by suitable fasteners **214**. The vertical flanges **206**, **210** are spaced apart substantially the same distance as the side flanges **20**, **22** in the previously described upper channel member **10**. When the channel member **10** is used, the side flanges **20**, **22** form a channel or "track" space between them. In like fashion, in the embodiment of **FIG. 36**, the vertical flanges **206**, **210** form a channel or "track" space between them. The clip **54** is telescopically received in the upper end portion of the stud **14**. Screw fasteners **216** are used to connect the side flanges **206**, **210** to the upper portion of the clip **54**.

[**0097**] In the embodiment of **FIG. 36**, the angle iron members **200**, **206** may be separately attached to the structure **212**, and then the clips **54** may be inserted and connected to the side flanges **206**, **210**. Or, a plurality of the clips may be connected to the side flanges **206**, **210** of the angle iron members **200**, **202**, to form an assembly composed of the angle iron members **200**, **202** and the clips **54**. Then, this assembly can be lifted up and set in place and then secured to the structure **212** by the fasteners **214** that first pass through the horizontal legs or flanges **204**, **208** of the angle iron members **200**, **202**.

[**0098**] The remainder of the assembly shown by **FIG. 36** is like the previously described assembly shown by **FIG. 7**. Therefore, it will not be separately described in more detail. In this embodiment, each of the previously described clips, and also later developed clips, can be used with the angle iron members **200**, **202**.

[**0099**] The studs, the channels, the angle iron members and the clips are all formed from between twelve and twenty-six gauge sheet metal. Bend radiuses are formed between the flanges and the webs of the channel members, between the lips and the flanges of the lip channel members and between the two legs or flanges of the angle iron members. Preferably, the clips measure about four inches in length. Preferably, the side flanges of the channel members **10**, **12** and the vertical flanges of the angle iron members **200**, **202** are about 2.5 inches in the vertical direction. The static distance between the lower edges of the side flanges **20**, **22** and the upper butt ends of the studs **14** is preferably about one and one-half inches. The slots may be about three-sixteenths inches in width and about two inches in length.

[**0100**] The illustrated embodiments are only examples of the present invention and, therefore, are non-limitive. It is to be understood that many changes in the particular structure, materials and features of the invention may be made without departing from the spirit and scope of the invention. Therefore, it is my intention that my patent rights not be limited by the particular embodiments illustrated and described herein, but rather are to be determined by the following claims, interpreted according to accepted doctrines of patent claim interpretation, including use of the doctrine of equivalents and reversal of parts.

What is claimed is:

1. A wall structure, comprising:

a downwardly opening upper channel member including an upper web and a pair of spaced apart side flanges depending from the upper web to lower edges, said upper web and side flanges forming a channel space below the upper web and between the side flanges;

a plurality of horizontally spaced apart, vertically extending studs that are each said stud including an upper end portion and an upper butt end;

said upper end portions of said studs being received in the channel space, with the butt ends of the studs being positioned above the lower edges of the side flanges of the upper channel member;

a clip for each said stud, each said clip comprising an upper portion secured to the upper channel member and a lower portion that extends downwardly from the upper portion into the upper end portion of its stud, said lower end portions of the clips being snugly received within, and frictionally engaging, the upper end portions of the studs; and

said studs being movable up and down in the channel space relative to both the clips and the upper channel member upon being subjected to forces that overcome the frictional forces.

2. The wall construction of claim 1, wherein each stud comprises a web extending perpendicular to the side flanges of the upper channel, front and rear flanges connected to the

web and extending parallel to the side flanges of the upper channel, and lips connected to the flanges and extending towards each other, in coplanar parallelism, said lips being in spaced parallelism with the web.

3. The wall construction of claim 2, wherein the clip has front and rear boundaries that are contiguous the stud flanges.

4. The wall construction of claim 1, wherein each stud comprises a web extending perpendicular to the side flanges of the upper channel, and front and rear flanges connected to the web and extending parallel to the side flanges of the upper channel, said front and rear flanges of the stud having upper end portions which are contiguous the side flanges of the upper channel member, and wherein each said clip comprises a web that is inwardly contiguous the web of its stud, and front and rear flanges connected to the web of the clip that are inwardly contiguous the front and rear flanges of the stud.

5. The wall construction of claim 4, comprising screw fasteners extending through the side flanges of the upper channel and through the front and rear flanges in the upper portions of the clips, wherein upper portions of the front and rear flanges of the stud are sandwiched between the side flanges of the upper channel and lower portions of the front and rear flanges of the clip.

6. The wall construction of claim 5, wherein the web and the front and rear flanges of the clip are vertically straight and the web and the front and rear flanges of the stud are vertically straight.

7. The wall construction of claim 2, wherein the clip has front and rear panels that are inwardly contiguous the front and rear flanges of the stud, and perpendicular panels that extend between and interconnect the front and rear panels.

8. The wall construction of claim 1, wherein each stud includes a web extending perpendicular to the side flanges of the upper channel member, and the clip includes a web that is inwardly contiguous the web of the stud, wherein one of said webs includes at least one vertical slot and a screw fastener extends through the slot and the other web, and connects the clip to the stud, with the slot being positioned to allow up and down movement of the clip relative to the stud and the upper channel member.

9. The wall construction of claim 2, wherein the clip includes lips that are inwardly contiguous the lips on the stud, wherein at least one of the contiguous lips includes a vertical slot, and wherein a screw fastener extends through the slot and connects the clip to the stud, for vertical movement of the clip relative to the stud and the upper channel member.

10. The wall construction of claim 2, wherein the clips are telescopically received within the studs and the clips include longitudinal channels in which the lips on the studs are received.

11. The wall construction of claim 1, wherein each clip includes at least one upper portion that extends perpendicular to the stud and parallel to the upper web of the upper channel member, and wherein at least one screw fastener connects said upper portion of the clip to the upper web of the upper channel member.

12. The wall construction of claim 11, wherein the clip includes two upper portions which extend perpendicular to the stud and parallel to the upper web of the upper channel member, wherein one said upper portion extends along the upper channel member in a first direction from the clip, and the other upper portion extends along the upper channel member in the opposition direction from the clip, and wherein at least one fastener is used to connect at least one of said upper portions of the clip to the upper web of the upper channel member.

13. The wall construction of claim 12, wherein each upper portion of the clip is connected to the upper web of the upper channel member by at least one fastener.

14. A wall structure, comprising:

a downwardly opening upper channel member including an upper web and a pair of spaced apart side flanges depending from the upper web to lower edges, said upper web and side flanges forming a channel space below the upper web and between the side flanges;

an upwardly opening lower channel member including a lower web and a pair of spaced apart side flanges extending upwardly from the lower web to upper edges, said lower web and side flanges forming a channel space above the lower web and between the side flanges;

said upper web being spaced above the lower web a predetermined distance;

a plurality of horizontally spaced apart, vertically extending studs, each said stud including an upper end portion with an upper butt end and a lower end portion with a lower butt end;

said lower end portions of said studs being received in the lower channel space, above the lower web and between the side flanges of the lower channel member;

said lower butt ends of the studs being supported by the lower web of the lower channel member;

said upper end portions of the studs being received in the upper channel space with the upper butt ends spaced below the upper web of the upper channel member a predetermined distance, said upper butt ends being positioned above the lower edges of the side flanges of the upper channel member;

a clip for each said stud, each said clip comprising an upper portion secured to the upper channel member and a lower portion that extends downwardly from the upper portion into the upper end portion of its stud, said lower end portions of the clips being snugly received within, and frictionally engaging, the upper end portions of the studs; and

said upper butt ends of the studs being movable up and down in the upper channel space relative to both the clips and the upper channel member.

15. The wall construction of claim 14, wherein each stud comprises a web extending perpendicular to the side flanges of the upper channel, front and rear flanges connected to the web and extending parallel to the side flanges of the upper channel, and lips connected to the flanges and extending towards each other, in coplanar parallelism, said lips being in spaced parallelism with the web.

16. The wall construction of claim 15, wherein the clip has front and rear boundaries that are contiguous the stud flanges.

17. The wall construction of claim 14, wherein each stud comprises a web extending perpendicular to the side flanges of the upper channel, and front and rear flanges connected to

the web and extending parallel to the side flanges of the upper channel, said front and rear flanges of the stud having upper end portions which are contiguous the side flanges of the other channel member, and wherein each said clip comprises a web that is contiguous the web of its stud, and front and rear flanges connected to the web of the clip that are inwardly contiguous the front and rear flanges of the stud.

18. The wall construction of claim 17, comprising screw fasteners extending through the side flanges of the upper channel and through the front and rear flanges of the upper portions of the clips, wherein upper portions of the front and rear flanges of the stud are sandwiched between the side flanges of the upper channel and lower portions of the front and rear flanges of the clip.

19. The wall construction of claim 18, wherein the web and the front and rear flanges of the clip are vertically straight and web and the front and rear flanges of the stud are vertically straight.

20. The wall construction of claim 15, wherein the clip has front and rear panels that are inwardly contiguous the front and rear flanges of the stud, and perpendicular panels that extend between and interconnect the front and rear panels.

21. The wall construction of claim 14, wherein each stud includes a web extending perpendicular to the side flanges of the upper channel member, and the clip includes a web that is inwardly contiguous the web of the stud, wherein one of said webs includes at least one vertical slot and a screw fastener extends through the slot and the other web, and connects the clip to the stud, with the slot being positioned to allow up and down movement of the clip relative to the stud and the upper channel member.

22. The wall construction of claim 15, wherein the clip includes lips that are inwardly contiguous the lips on the stud, wherein at least one of the contiguous lips includes a vertical slot, and wherein a screw fastener extends through the slot and connects the clip to the stud, for vertical movement of the clip relative to the stud and the upper channel member.

23. The wall construction of claim 15, wherein the clip is telescopically received within the stud and the clip includes longitudinal channels in which the lips on the stud are received.

24. The wall construction of claim 14, wherein the clip includes at least one upper portion that extends perpendicular to the stud and parallel to the upper web of the upper channel member, and wherein at least one fastener connects said at least one upper portion of the clip to the upper web of the upper channel member.

25. The wall construction of claim 14, wherein the clip includes two upper portions that extend perpendicular to the stud and parallel to the upper web of the upper channel member, one of said upper portions extending along the upper channel member in a first direction from the clip and the other said upper portion extending along the upper channel member in the opposite direction from the clip, and wherein at least one fastener connects at least one of said upper portions of the clip to the upper web of the upper channel member.

26. The wall construction of claim 25, wherein at least one screw fastener extends through each one of the upper portions of the clip and connects it to the upper web of the upper channel member.

27. A wall structure, comprising:

a downwardly opening upper channel member including an upper web and a pair of spaced apart side flanges depending from the upper web to lower edges, said upper web and side flanges forming a channel space below the upper web and between the side flanges;

a plurality of horizontally spaced apart, vertically extending studs that are each said stud including an upper end portion and an upper butt end;

said upper end portions of said studs being received in the channel space, with the butt ends of the studs being positioned above the lower edges of the side flanges of the upper channel member and below the upper web;

a clip for each said stud, each said clip, being secured to the upper channel member, contiguous the upper end portion of its stud;

wherein one of said clip and said upper end portion of the stud includes a first panel including at least one elongated vertical slot and the other includes a second panel;

wherein a screw fastener extends through the slot and connects the two panels together; and

said studs being movable up and sown in the channel space relative to both the clips and the upper channel member.

28. The wall structure of claim 27, wherein the screw fastener extends through the slot in the first panel and then screws into the second panel.

29. The wall structure of claim 28, wherein the screw includes a head and a shoulder at the base of the head that fits within the slot, said shoulder having an end surface that bears against the second panel, said shoulder being of sufficient length to keep the head of the screw fastener away from clamping the first panel to the second panel.

30. A wall structure, comprising:

an upper track including a pair of spaced apart side flanges depending from the upper edges to lower edges, said side flanges forming a track space between the side flanges;

a plurality of horizontally spaced apart, vertically extending studs that are each said stud including an upper end portion and an upper butt end;

said upper end portions of said studs being received in the track space, with the butt ends of the studs being positioned above the lower edges of the side flanges;

a clip for each said stud, each said clip comprising an upper portion secured to the side flanges and a lower portion that extends downwardly from the upper portion into the upper end portion of its stud, said lower end portions of the clips being snugly received within, and frictionally engaging, the upper end portions of the studs; and

said studs being movable up and down in the track space relative to both the clips and the upper channel member upon being subjected to forces that overcome the frictional forces.

31. The wall construction of claim 30, wherein each stud comprises a web extending perpendicular to the side flanges

of the upper track, front and rear flanges connected to the web and extending parallel to the side flanges of the upper channel, and lips connected to the flanges and extending towards each other, in coplanar parallelism, said lips being in spaced parallelism with the web.

32. The wall construction of claim 31, wherein the clip has front and rear boundaries that are contiguous the stud flanges.

33. The wall construction of claim 30, wherein each stud comprises a web extending perpendicular to the side flanges of the upper track, and front and rear flanges connected to the web and extending parallel to the side flanges of the upper track, said front and rear flanges of the stud having upper end portions which are contiguous the side flanges of the upper track, and wherein each said clip comprises a web that is inwardly contiguous the web of its stud, and front and rear flanges connected to the web of the clip that are inwardly contiguous the front and rear flanges of the stud.

34. The wall construction of claim 33, comprising screw fasteners extending through the side flanges of the upper track and through the front and rear flanges in the upper portions of the clips, wherein upper portions of the front and rear flanges of the stud are sandwiched between the side flanges of the upper channel and lower portions of the front and rear flanges of the clip.

35. The wall construction of claim 34, wherein the web and the front and rear flanges of the clip are vertically straight and the web and the front and rear flanges of the stud are vertically straight.

36. The wall construction of claim 30, wherein each stud includes a web extending perpendicular to the side flanges of the upper track, and the clip includes a web that is inwardly contiguous the web of the stud, wherein one of said webs includes at least one vertical slot and a screw fastener extends through the slot and the other web, and connects the clip to the stud, with the slot being positioned to allow up and down movement of the clip relative to the stud and the upper track.

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