(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 846 831 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
10.06.1998 Bulletin 1998/24

(51) Int Cl.[6]: **E06B 3/96**

(21) Application number: **97830641.3**

(22) Date of filing: **03.12.1997**

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **04.12.1996 IT RM960832**

(71) Applicant: **Mascioletti, Marco**
67100 L'Aquila (IT)

(72) Inventor: **Mascioletti, Ascanio**
67100 L'Aquila (IT)

(74) Representative: **Iannone, Carlo Luigi et al**
Ing. Barzanò & Zanardo Roma S.p.A.
Via Piemonte, 26
00187 Roma (IT)

(54) Fixing and/or coupling element

(57) The invention relates to a fixing and/or coupling element comprised of a first body (1) to be inserted within a first element (3) to be coupled, provided with a first through hole (4) for the insertion of a first screw (5) for fixing the same to said first element (3) to be coupled, and with a second threaded hole (6) for the coupling of a second screw (7) for the coupling of the first element (3) to be coupled with a second element (2) to be coupled.

The invention relates also to an element for the coupling of two angular elements, substantially placed at 90° each other.

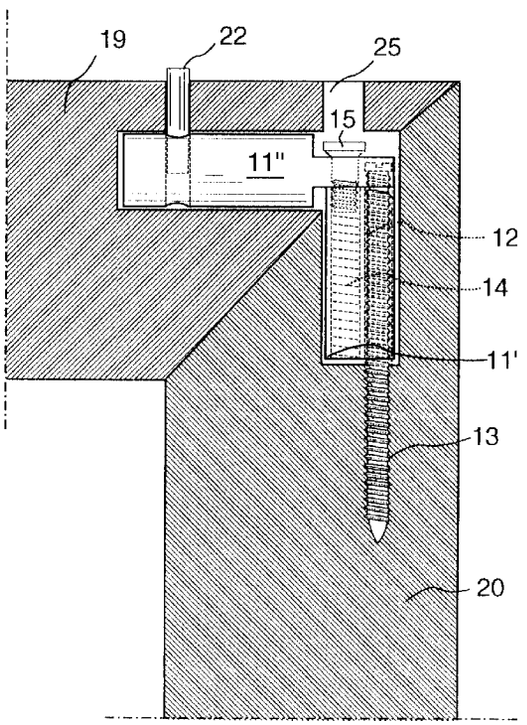

FIG. 8

EP 0 846 831 A1

Description

The present invention concerns a fixing an/or coupling element.

More specifically, the invention concerns a coupling element that can be used as fixing dowel for wood components or as 90°, or any other different angle, universal coupling element for two wood or aluminium or other material angular elements for frames.

In the frames field, but not only in this field, it has always existed the necessity of having at disposal a coupling and/or fixing element allowing to realise the coupling of two wood elements in a simple and fast way.

Furthermore, it is present the necessity of having a coupling element for wood frame elements, particularly 90° elements.

Moreover, recently, a remarkable development of the section bars, particularly aluminium sections.

Consequently, many solutions have been studied to try to improve and to simplify the mounting of the frames.

One of the points that have always created the main problems is the one connected with the coupling of the angular elements of the frame.

Particularly, the problems encountered are connected with the practical difficulties for the mounting and the necessities of obtaining a precise 90° coupling.

Furthermore, in view of the high number of different section bars, remarkable difficulties can be encountered to obtain the suitable coupling for any kind of section bar.

In view of the above, it is well evident the advantage of having at disposal an universal coupling element for frame 90° elements allowing to obtain a very precise and simple 90° coupling.

Furthermore, it is surely advantageous to have at disposal a solution allowing the mounting of the frames in a very fast, simple and cheap way.

The solution suggested according to the present invention allows to obtain these and other results.

The Applicant has studied and realised a technical solution able to satisfy the above needings.

It is therefore specific object of the present invention a fixing and/or coupling element comprised of a first body to be inserted within a first element to be coupled, provided with a first through hole for the insertion of a first screw for fixing the same to said first element to be coupled, and with a second threaded hole for the coupling of a second screw for the coupling of the first element to be coupled with a second element to be coupled.

Preferably, according to the invention, said first body is substantially cylindrical.

Always according to the invention, said second hole is blind.

Still according to the invention, at least a pin and seat coupling system between said first and said second elements to be coupled each other can be provided to prevent their reciprocal rotation.

Always according to the invention, said two elements to be coupled are wood elements.

In a first preferred embodiment of the element according to the invention, a second body is provided, said second body coupling to a first end of said first body and preferably having the end coupling with said first body substantially flat, said end being provided with a hole for the passage of a second screw, and close to the other end being provided with a transverse hole for the introduction of a pin for the fixing to one of said first and second element to be coupled, the two elements to be coupled being in this case angular elements.

Said end coupled with said first body is opened at its free part, on said first body reference means insertable within said opening being provided.

Always according to the invention, said first hole of said first body can be a blind hole, a transverse hole being provided on said first body for the introduction of a fixing pin on said first element to be coupled.

Particularly, said embodiment is employed to couple to angular elements substantially placed at 90° each other.

In a further embodiment of the element according to the invention, said first and second bodies have a substantially parallelepipedal shape, said first body being provided with a first transverse hole in a substantially central position, for the introduction of an adjustment and fixing screw, said screw coupling with a suitable seat realised on the first element to be coupled, with a central hole and with two lateral holes, in correspondence of the end coupled with said second body, respectively for a coupling and tightening screw and for two reference pins, and with a tongue, projecting with respect to said coupling end, abutting against a suitable seat obtained in said second element to be coupled, said second body having a transverse hole in a substantially central position, for a fixing and adjustment screw coupling with a seat obtained in said second element to be coupled, having a central hole and two lateral longitudinal holes, provided on the end coupled with said first body, respectively for the coupling and tightening screw and for the reference pins.

Preferably, according to the invention, said screws can be introduced into said transverse holes of said two bodies according to both directions.

Still according to the invention, both on said first and second bodies a second transverse hole can be provided for the insertion of a second fixing and adjustment screw, the seats obtained on said first and second element to be coupled being slotted to allow the sliding introduction of the second screws and the blocking by the first screws.

Still according to the invention, said two lateral holes can be extended for all the length of said first and second bodies.

Preferably, according to the invention, said fixing and adjustment screw can be comprised by a pin introduced within the suitable seat and bucked by suitable elastic means.

The present invention will be now described, for illustrative but not limitative purposes, according to its preferred embodiments, with particular reference to the figures of the enclosed drawings, wherein:

figure 1 is a plan view of a first fixing and/or coupling element according to the invention;
figure 2 is a lateral exploded view of the element of figure 1;
figure 3 is a partially broken-away, lateral view of the element of figure 1 employed to couple two wood parts;
figure 4 is an exploded lateral view of a second coupling element according to the invention;
figure 5 is a lateral view of the element of figure 4;
figure 6 is a perspective view of the element of figure 4;
figure 7 is an exploded section view of a use of the element of figure 4;
figure 8 is a section view of the element of figure 4 in position of use;
figure 9 is an exploded view of a third coupling element according to the invention;
figure 10 is a lateral view of the element of figure 9;
figure 11 is a perspective view of the element of figure 9;
figure 12 is an exploded section view of a use of the element of figure 9;
figure 13 is a section view of the element of figure 9 in position of use;
figure 14 is an exploded lateral view of a fourth coupling element according to the invention;
figure 15 is a lateral view of the element of figure 14;
figure 16 is a top view, exploded, of the element of figure 14;
figure 17 is a perspective view of the element of figure 14;
figure 18 shows two frame elements separated with the element of figure 14 partially applied;
figure 19 shows the two elements of figure 18 coupled;
figure 20 is a section view of the two frames elements according to figure 19 coupled;
figure 21 is an exploded lateral view of a fifth coupling element according to the invention;
figure 22 is a lateral view of the element of figure 21;
figure 23 is a top view, exploded, of the element of figure 21;
figure 24 is a perspective view of the element of figure 21;
figure 25 shows two frame elements separated with the element of figure 21 partially applied;
figure 26 shows the two elements of figure 25 coupled;
figure 27 is a section view of the two frames elements according to figure 26 coupled;
figure 28 is an exploded lateral view of a sixth coupling element according to the invention;
figure 29 is a lateral view of the element of figure 28;
figure 30 is a top view, exploded, of the element of figure 28;
figure 31 is a perspective view of the element of figure 28;
figure 32 shows two frame elements separated with the element of figure 28 partially applied;
figure 33 shows the two elements of figure 32 coupled;
figure 34 is a section view of the two frames elements according to figure 33 coupled;
figure 35 shows two aluminium frames separated with the element of figure 28 partially applied according a second arrangement;
figure 36 shows the two elements of figure 35 coupled; and
figure 37 is a section view of two frame elements coupled each other.

Referring first to figures 1 - 3, a fixing and coupling element 1 is shown, usable for the coupling of two wood elements 2 and 3 each other, as for the "Fisher" insert.

Element or insert 1 is comprised of a substantially cylindrical element to be introduced within a corresponding hole realised in the wood element 3 and provided with two threaded holes.

The first hole 4 is a through hole and extends all along the length of the element 1, in such a way to allow the introduction of a screw 5 for the fixing of the insert 1 into the wood element 3.

The second hole 6 instead is not a through hole and allow the coupling of the screw 7, serving for the fixing of the two wood elements 2 and 3 to be coupled and which is introduced within a suitable through hole 8 obtained in the wood element 2.

Depending on the wood elements to be coupled, it can be used only one insert 1 according to the invention, providing one or more reference pin 9 fixed to the wood element 3 and introduced in a suitable hole obtained on the wood element 2, to prevent the rotation of the wood elements, or more inserts 1 placed along the coupling zone.

In figure 3 it is clearly shown how it is realised in a simple and easy way a coupling using an insert according to the invention.

Referring now to figures 4 - 8, it is shown a second embodiment of the element according to the invention.

Particularly, in this case, the element 11 according to the invention is comprised of two parts 11' and 11".

Part 11' is substantially similar to the insert 1 of the preceding embodiment, and it can also be used alone, according to what described in the above.

It provides a first through hole 12, wherein the screw 13 is screwed, and a second blind hole 14, wherein the screw 15 is screwed.

The second part 11" of the element 11 instead comprises a flat fork end 16, provided with a through hole 17, corresponding to the hole 14, for the introduction of

the screw 15 and thus the coupling each other, and a hole 18, the use of which will be described in the following.

As a whole, the element 11 is used to tighten the coupling between wood angular elements, particularly 90° elements.

Said step is illustrated in figures 7 and 8, wherein the coupling of two wood angular elements 19 and 20 is shown.

Part 11 of the element 11 is introduced into element 19, within a suitable seat 21. Then, a pin 22 is introduced within the hole 18 of the part 11", through a hole 23 realised in the wood element 19.

The part 11' of the coupling element 11 is introduced within a seat 24 of the wood element 20, blocking the same by the screw 13.

The wood elements 19 and 20 are approached and the screw 15 is introduced through a hole 25 on the wood element 19 and through the hole 17 and the hole 14, being it possible to tighten the 90° coupling between the wood elements 19 and 20 (see figure 8).

Making now reference to figures 9 - 13, a third embodiment of the element according to the invention is shown.

In this case, the element 31 according to the invention is structurally and functionally very similar to the element 11 of the former embodiment, being it comprised of two parts 31' and 31".

Part 31' is substantially similar to the part 11' of the preceding embodiment, but it is modified in such a way not to be possible to use the same alone as described in the above.

It provides a first through hole 32, wherein the screw 33 is screwed, and a second blind hole 34, wherein the screw 35 is screwed.

The second part 31" of the element 31 instead comprises a flat fork end 36, provided with a through hole 37, corresponding to the hole 34, for the introduction of the screw 35 and thus the coupling each other, and a hole 38, the use of which will be described in the following.

Toward the end of the part 31' not coupled with the part 31' a slot 46 is further provided, the use of which will be described later.

As a whole, the element 31 is used to tighten the coupling between wood angular elements, particularly 90° elements.

Said step is illustrated in figures 12 and 13, wherein the coupling of two wood angular elements 39 and 40 is shown.

Part 31" of the element 31 is introduced into element 39, within a suitable seat 41. Then, a pin 42 is introduced within the hole 38 of the part 31", through a hole 43 realised in the wood element 39.

The part 31' of the coupling element 31 is introduced within a seat 44 of the wood element 40, blocking the same by a pin 47 inserted within a hole 48 obtained in the wood element, and thus in the slot 46.

The wood elements 39 and 40 are approached and the screw 35 is introduced through a hole 45 on the wood element 39 and through the hole 37 and the hole 34, being it possible to tighten the 90° coupling between the wood elements 39 and 40 (see figure 13).

Making now reference to the enclosed figures 14 - 20, a fourth embodiment of the fixing and/or coupling element according to the invention is shown.

Said embodiment, which is directly derived from the preceding embodiments, has been suitably studied to tighten metallic angular elements, particularly elements placed at 90° each other.

The element 51 is comprised of two parts 51' and 51". Part 31' provides an end with reduced thickness wherein three holes are provided, two lateral holes 52 for the insertion of two reference pins 53 for the coupling with the part 51" and a threaded central hole 54 for the insertion of the traction screw 55.

On the end of the part 51' a projecting lug 56 is provided, the function of which will be clearer in the following.

Furthermore, always on part 51', two threaded holes 57 and 58 are provided, for the screwing of the screws 59 and 60.

The part 51" provides a front central hole 61 for the introduction of the screw 55 and two front lateral holes 62 for the introduction of the pins 53.

Furthermore, the par 51" of the element 51 provides two threaded holes 63 and 64 for the screwing of the screws 65 and 66.

Seats 69 and 70 and 71 are realised on two angular elements 67 and 68, respectively, of the frame for the introduction of the screws 60 and 59, 55 and 66 and 65.

At the beginning, the element 51 according to the invention is coupled with angular element 67, letting the screw 60 sliding into the shaped slot 69 in such a way that the head of the screw remains external with respect to the slot 69.

Screw 55 slides along the slot 70, which is open at the front part, with the head out of the same slot.

Then, the other angular element 68 is coupled, making the screw 65 sliding along the slot 71.

On the angular end of the angular element 68, a slit 72 is provided for the coupling of the projecting lug 56 of the part 51' of the coupling element 51.

Screws 59 and 60 and 65 and 66 are adjusted to properly couple the element 51 with the single angular elements, while screw 55 allows the tightening of the angular coupling in a fast, safe and efficient way.

This kind of element can be used for any kind of section bar, independently from its sizes and from the fact whether the coupling between fixing element and angular elements is an outer or an inner coupling.

Making now reference to the enclosed figures 21 - 27, a fifth embodiment of the fixing and/or coupling element according to the invention is shown, substantially identical to the one of the preceding embodiment, but in this case screws 59, 60 and 65, 66 are screwed from

inside into the corresponding holes, in order to be able to carry out a coupling between element 51 and angular element 67 and 68 from inside.

Therefore, the single parts of element 51 are indicated by the same references and are not further described.

In this case, inner seats 69' and 71', respectively, are provided on the two angular elements 67 and 68 of the frame, for the introduction of screws 60 and 59, and 66 and 65.

At the beginning, the element 51 according to the invention is coupled with angular element 67, making the screw 60 sliding along the shaped slot 69' in such a way that the head of the screw remains out of the slot 69'.

Then, the other angular element 68 is coupled, making the screw 65 sliding along the slot 71'.

Screws 59 and 60 and 65 and 66 are adjusted to properly couple the element 51 with the single angular elements, while screw 55 allows the tightening of the angular coupling in a fast, safe and efficient way.

Making finally reference to the enclosed figures 28 - 37, a fourth embodiment of the fixing and/or coupling element according to the invention is shown.

Said embodiment, which is directly derived from the preceding embodiments, has slight modifications for the use on more little section bars.

The element 81 is comprised of two parts 51' and 51". Part 81' provides an end with reduced thickness wherein three holes are provided, two lateral holes 82 for the insertion of two reference pins 83 for the coupling with the part 81" and a threaded central hole 84 for the insertion of the traction screw 85.

On the end of the part 81' a projecting lug 86 is provided, the function of which will be clearer in the following.

Furthermore, always on part 81', a threaded holes 87 is provided, for the screwing of the screw 88 both from inside and from outside.

The part 81" provides a front central hole 89 for the introduction of the screw 85 and two front lateral holes 90 for the introduction of the pins 83.

Furthermore, the part 81" of the element 81 provides a threaded hole 91 on its main surface for the screwing of the screws 92 both from inside and from outside.

For the application from outside of the element 81 on the angular elements, two holes 95, 96, are realised on each the angular elements 93 and 94, respectively, for the sliding introduction of the screw 85.

At the beginning, the element 81 according to the invention is coupled with angular element 67, introducing the screw 88 into the hole 95.

Screw 85 slides along the slot 97, which is open at the front part, with the head out of the same slot.

Then, the other angular element 94 is coupled, introducing the screw 92 within the hole 96.

On the angular end of the angular element 94, a slit 98 is provided for the coupling of the projecting lug 86 of the part 81' of the coupling element 81.

Screws 88 and 92 are adjusted to properly couple the element 81 with the single angular elements, while screw 85 allows the tightening of the angular coupling in a fast, safe and efficient way.

In case of coupling from inside of the element 81 with the angular elements 93' and 94', screws 88 and 92 are coupled into the respective holes 87 and 91 from inside.

The coupling is similar to the coupling of the preceding embodiment.

In this case the slit 98 for the lug 86 is not provided.

The present invention has been described for illustrative but not limitative purposes, according to its preferred embodiments, but it is to be understood that modifications and/or changes can be introduced by those skilled in the art without departing from the relevant scope as defined in the enclosed claims.

Claims

1. Fixing and/or coupling element characterised in that it is comprised of a first body to be inserted within a first element to be coupled, provided with a first through hole for the insertion of a first screw for fixing the same to said first element to be coupled, and with a second threaded hole for the coupling of a second screw for the coupling of the first element to be coupled with a second element to be coupled.

2. Element according to claim 1, characterised in that said first body is substantially cylindrical.

3. Element according to one of the preceding claims, characterised in that said second hole is blind.

4. Element according to one of the preceding claims, characterised in that Still at least a pin and seat coupling system between said first and said second elements to be coupled each other are provided to prevent their reciprocal rotation.

5. Element according to one of the preceding claims, characterised in that said two elements to be coupled are wood elements.

6. Element according to one of the preceding claims, characterised in that a second body is provided, said second body coupling to a first end of said first body and preferably having the end coupling with said first body substantially flat, said end being provided with a hole for the passage of a second screw, and close to the other end being provided with a transverse hole for the introduction of a pin for the fixing to one of said first and second element to be coupled, the two elements to be coupled being in

this case angular elements.

7. Element according to claim 6, characterised in that said end coupled with said first body is substantially flat.

8. Element according to claim 6 or 7, characterised in that said end coupled with said first body is opened at its free part, on said first body reference means insertable within said opening being provided.

9. Element according to claim 6, 7 or 8, characterised in that said first hole of said first body is a blind hole, a transverse hole being provided on said first body for the introduction of a fixing pin on said first element to be coupled.

10. Element according to claim 6, 7, 8 or 9, characterised in that it is employed to couple to angular elements substantially placed at 90° each other.

11. Element according to claim 1, characterised in that said first and second bodies have a substantially parallelepipedal shape, said first body being provided with a first transverse hole in a substantially central position, for the introduction of an adjustment and fixing screw, said screw coupling with a suitable seat realised on the first element to be coupled, with a central hole and with two lateral holes, in correspondence of the end coupled with said second body, respectively for a coupling and tightening screw and for two reference pins, and with a tongue, projecting with respect to said coupling end, abutting against a suitable seat obtained in said second element to be coupled, said second body having a transverse hole in a substantially central position, for a fixing and adjustment screw coupling with a seat obtained in said second element to be coupled, having a central hole and two lateral longitudinal holes, provided on the end coupled with said first body, respectively for the coupling and tightening screw and for the reference pins.

12. Element according to claim 11, characterised in that said screws are introduced into said transverse holes of said two bodies according to both directions.

13. Element according to claim 11 or 12, characterised in that both on said first and second bodies a second transverse hole is provided for the insertion of a second fixing and adjustment screw, the seats obtained on said first and second element to be coupled being slotted to allow the sliding introduction of the second screws and the blocking by the first screws.

14. Element according to claim 11, 12 or 13, characterised in that it is employed for the coupling of two metallic angular elements, substantially placed at 90° each other.

15. Element according to one of the preceding claims 11 - 14, characterised in that said two lateral holes are extended for all the length of said first and second bodies.

16. Element according to one of the preceding claims, characterised in that said fixing and adjustment screw is comprised by a pin introduced within the suitable seat and bucked by suitable elastic means.

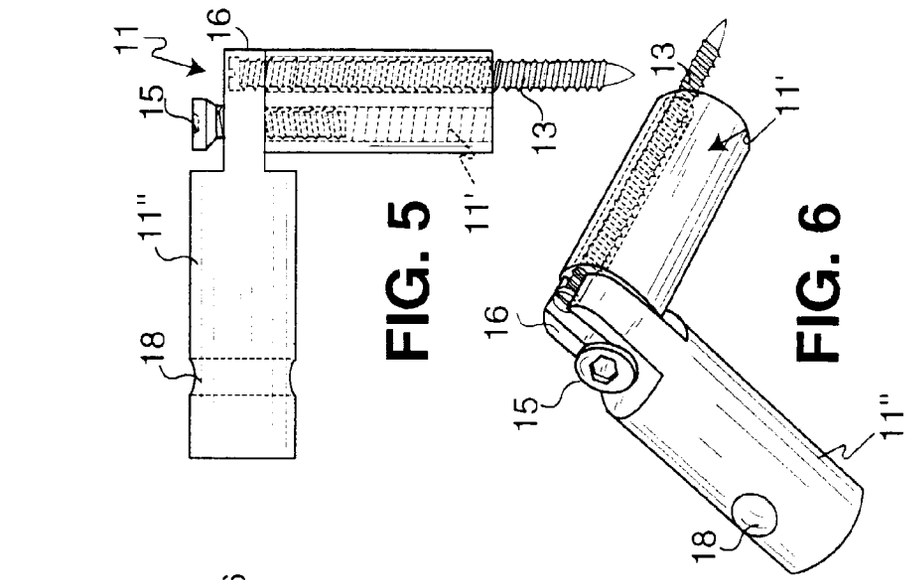

FIG. 5

FIG. 6

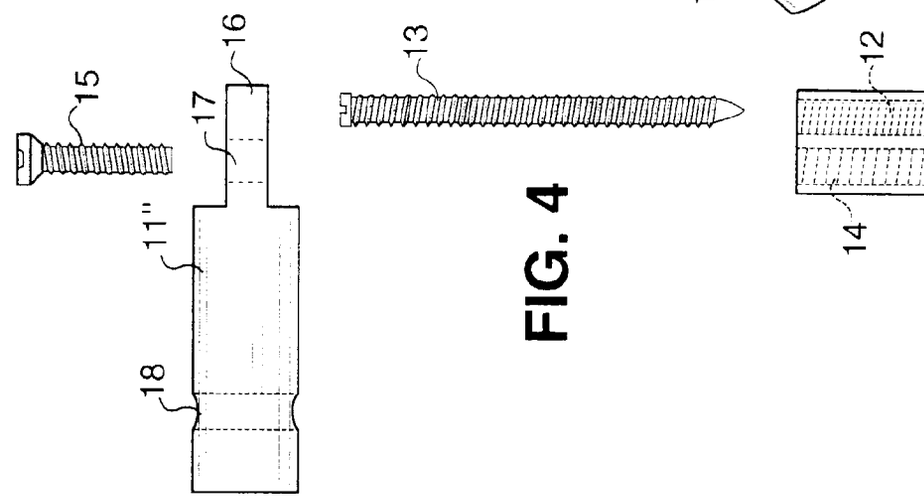

FIG. 4

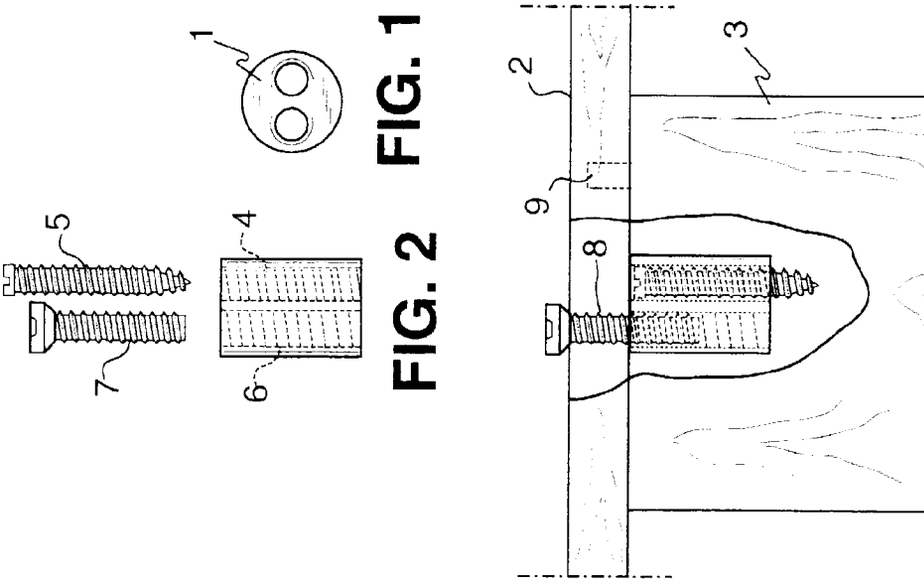

FIG. 1

FIG. 2

FIG. 3

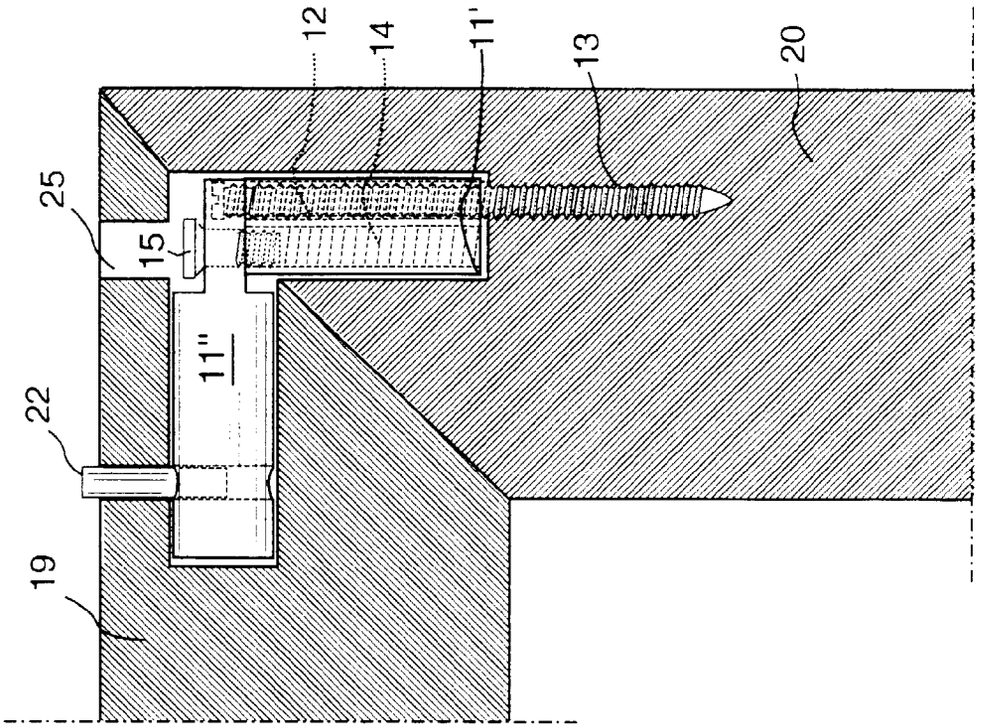

FIG. 8

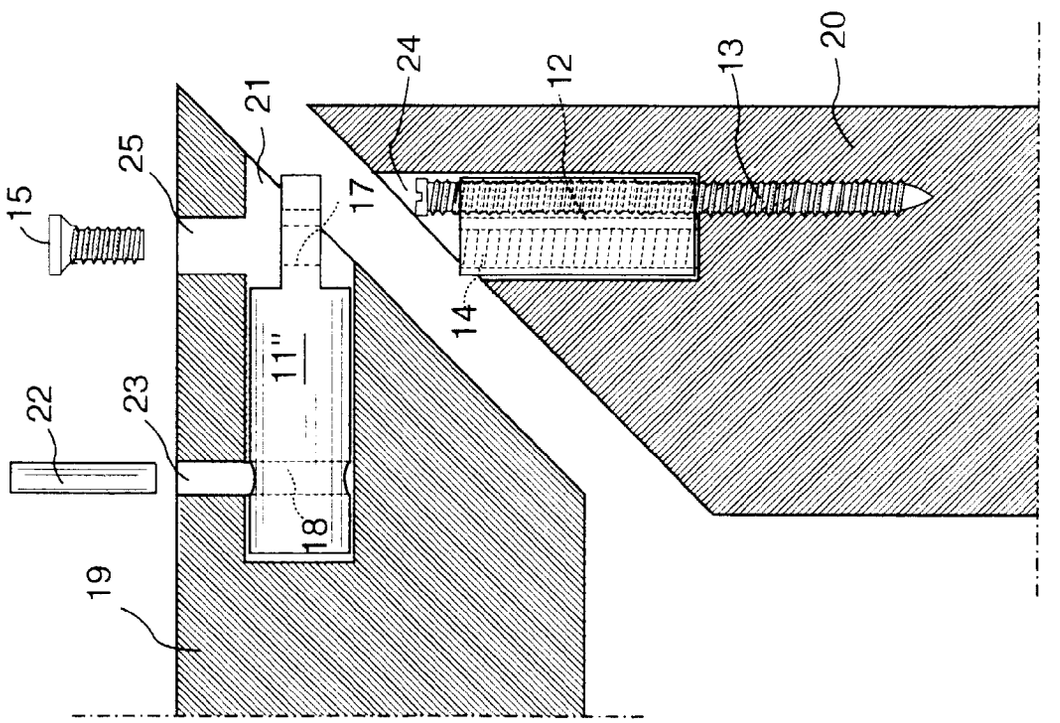

FIG. 7

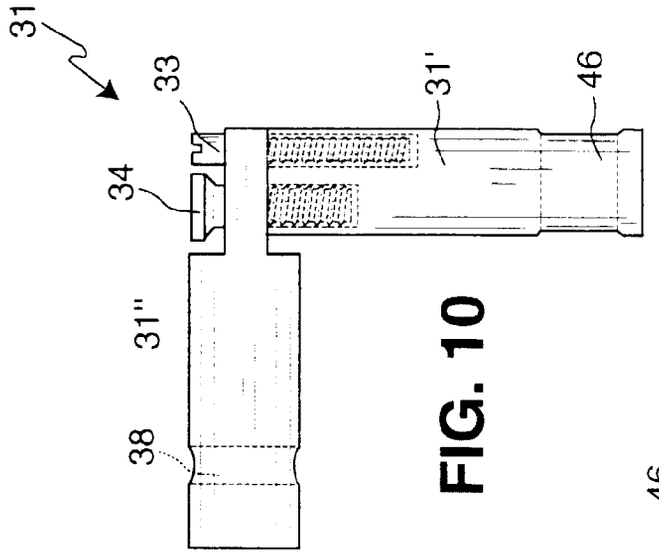

FIG. 10

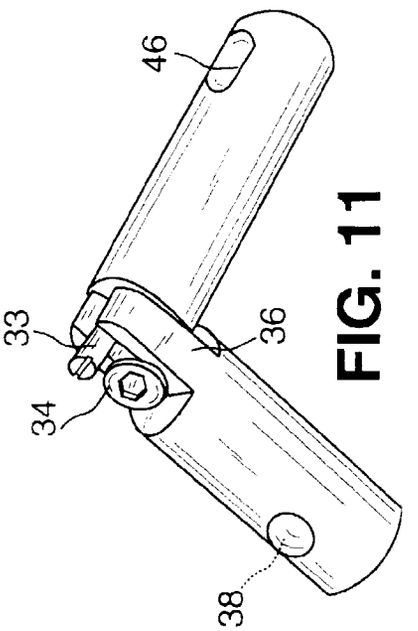

FIG. 11

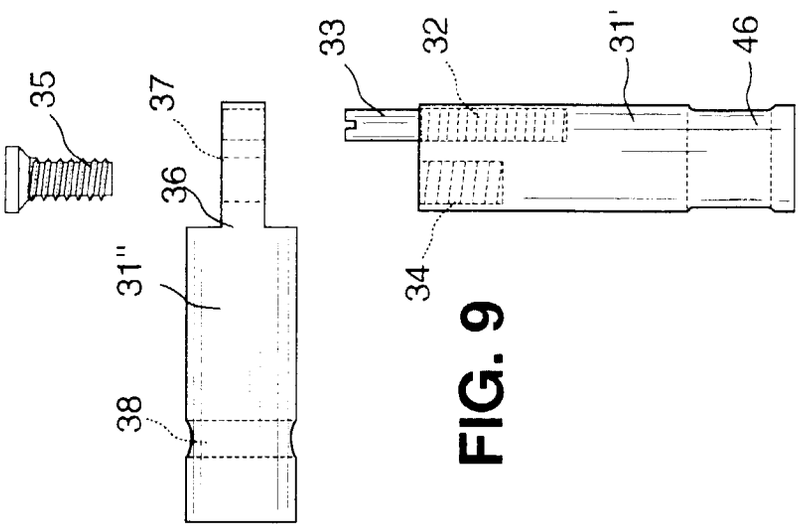

FIG. 9

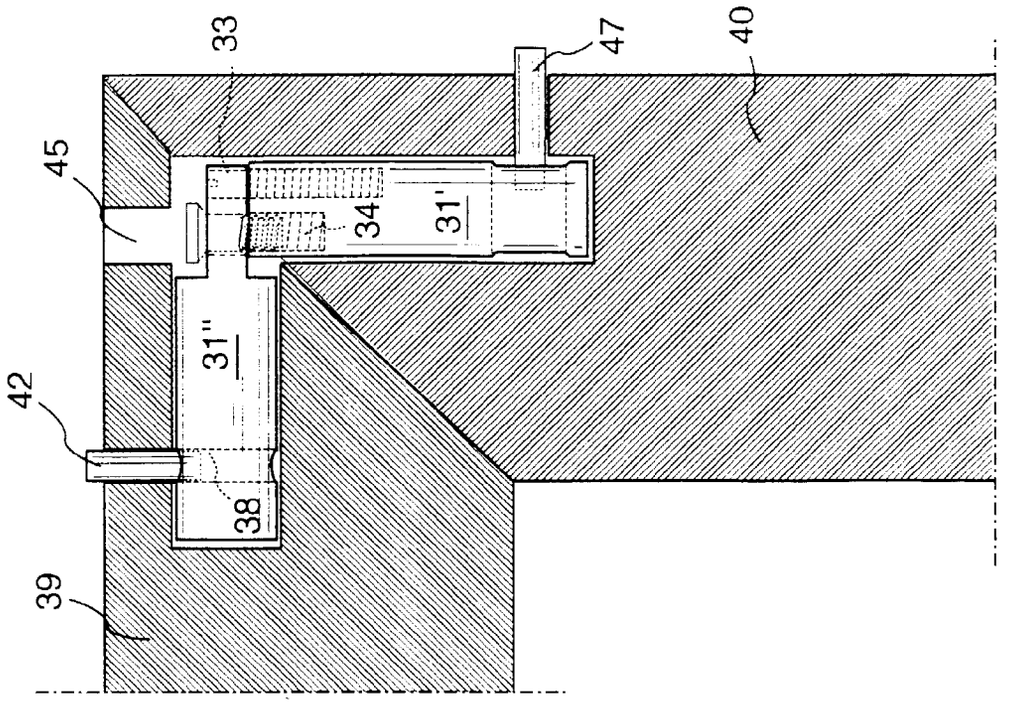
33
47
40
45
34
31'
31''
42
38
39

FIG. 13

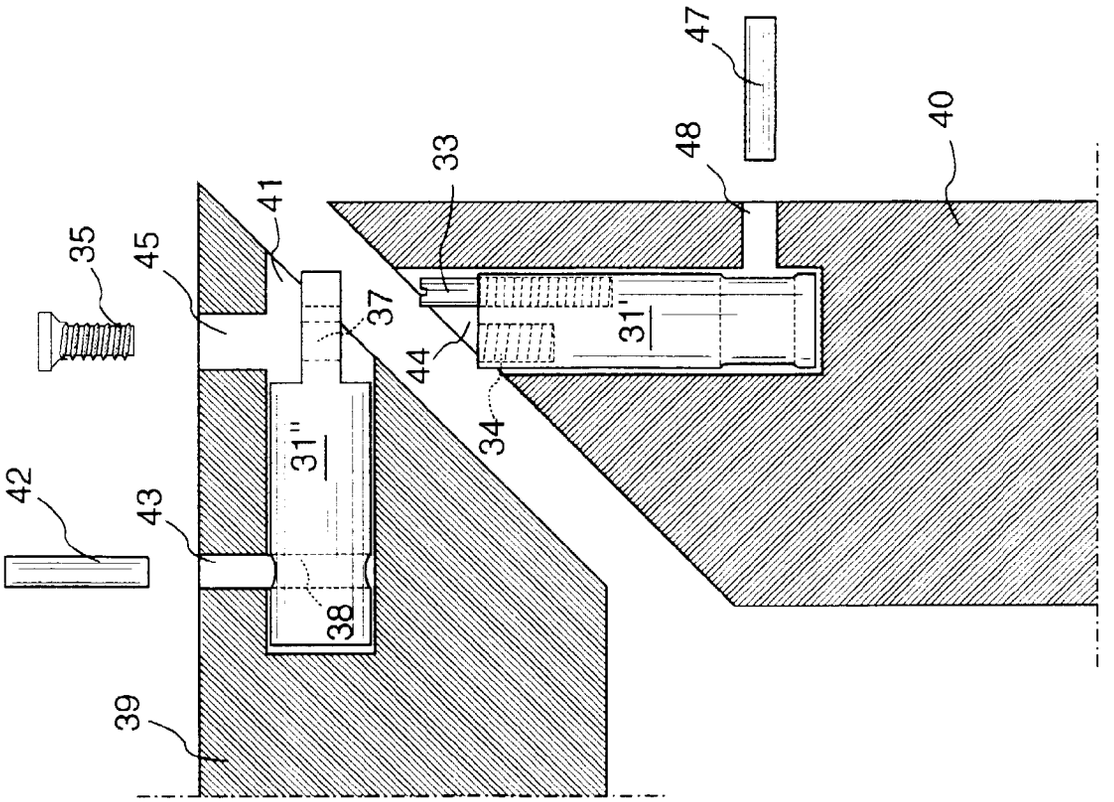
47
48
40
33
41
35
45
37
31'
44
34
31''
42
43
38
39

FIG. 12

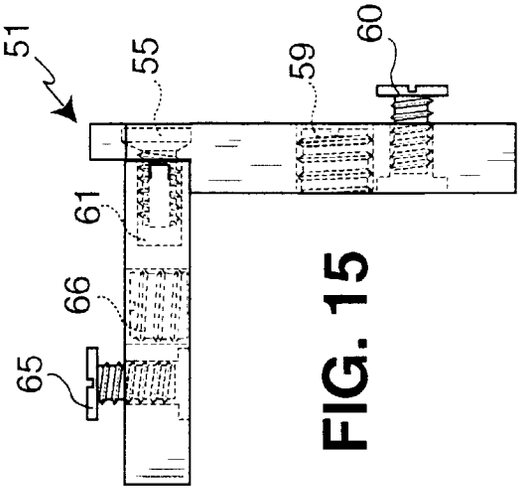

FIG. 15

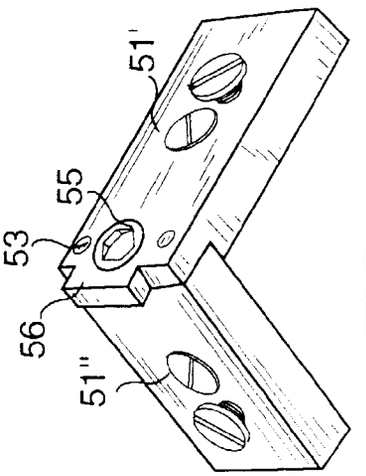

FIG. 17

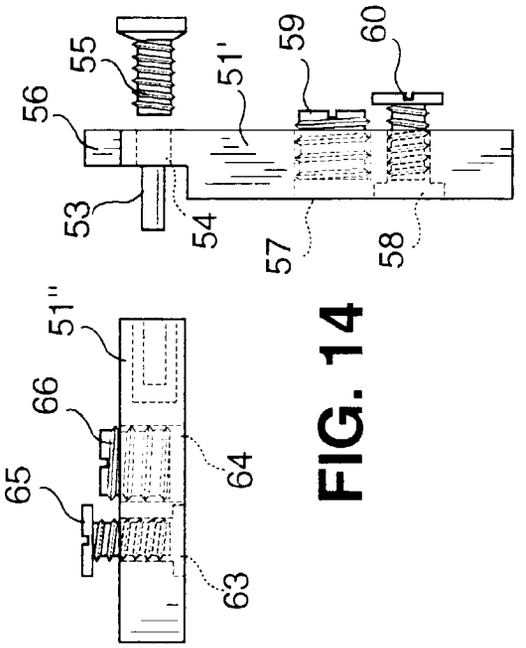

FIG. 14

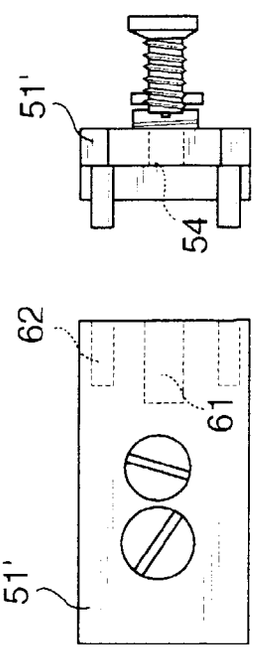

FIG. 16

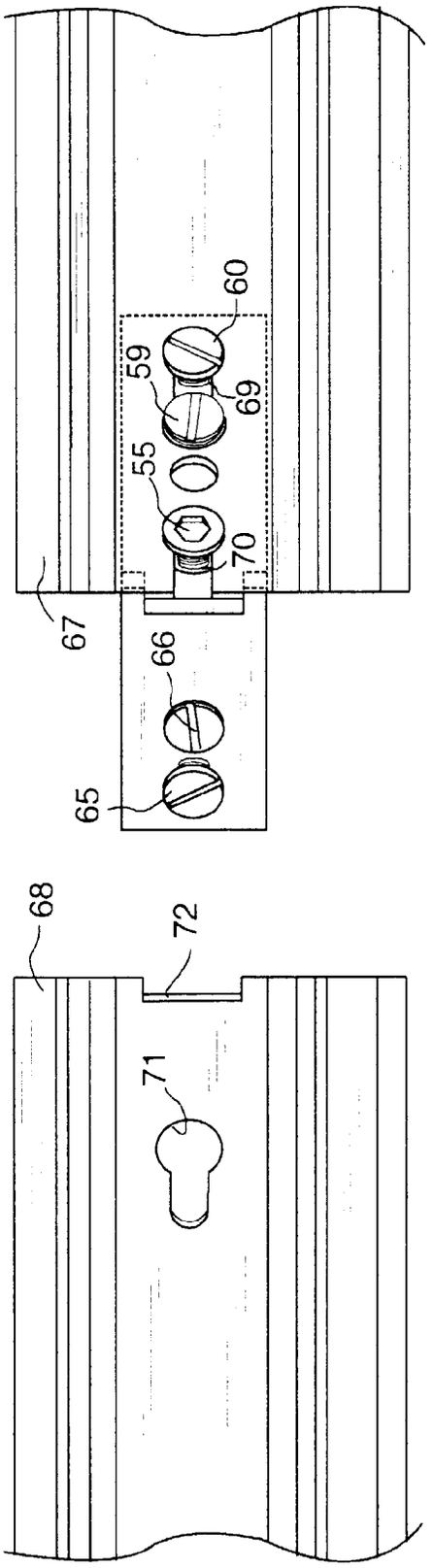

FIG. 18

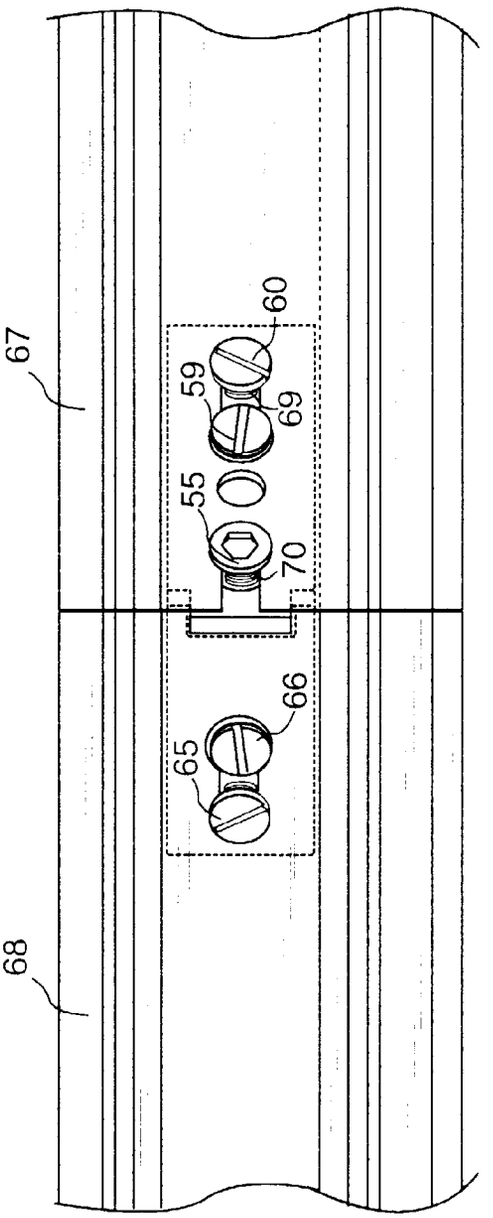

FIG. 19

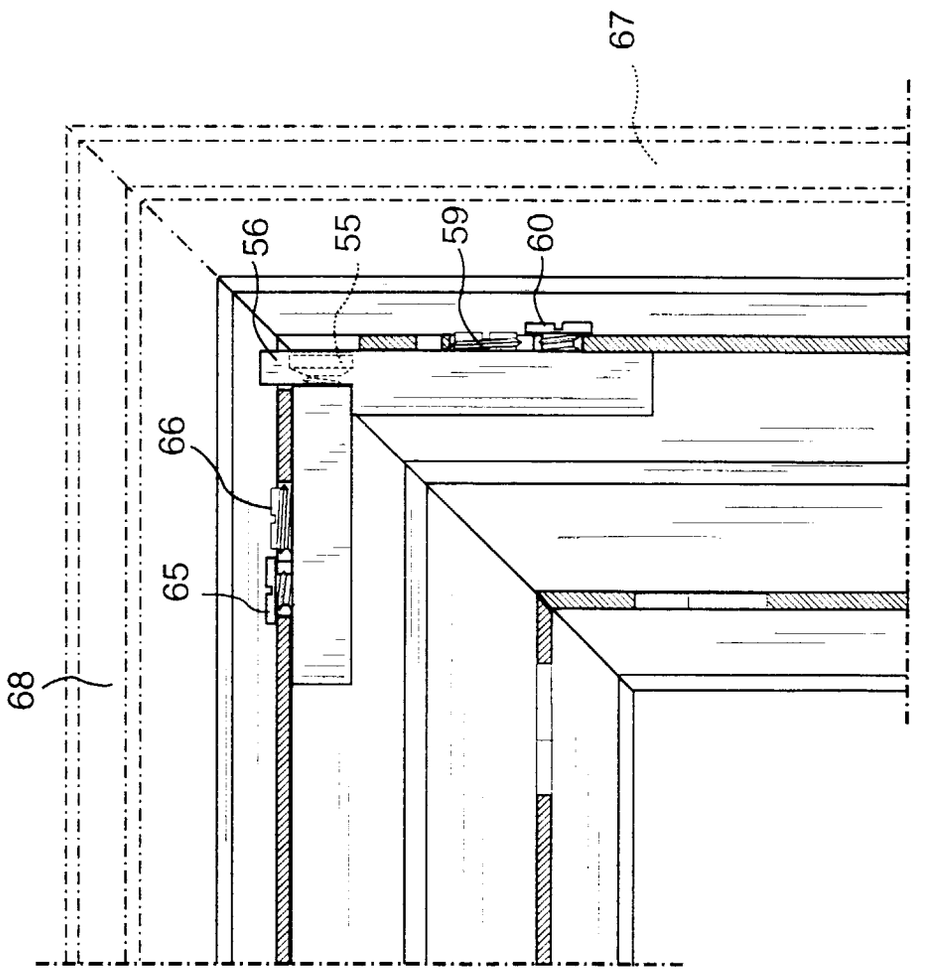

FIG. 20

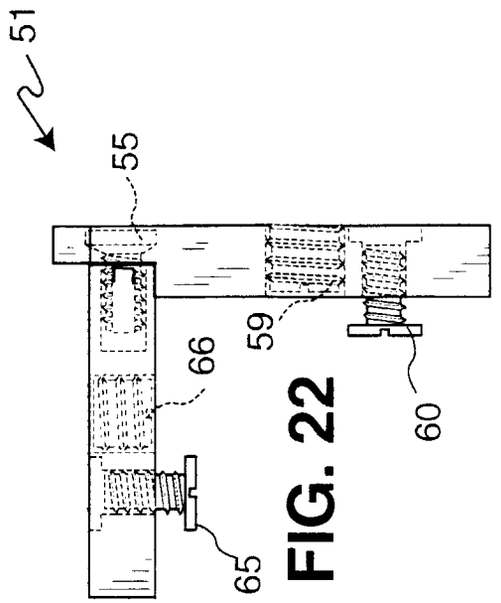

FIG. 22

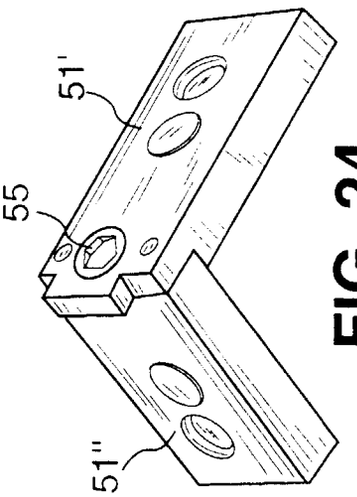

FIG. 24

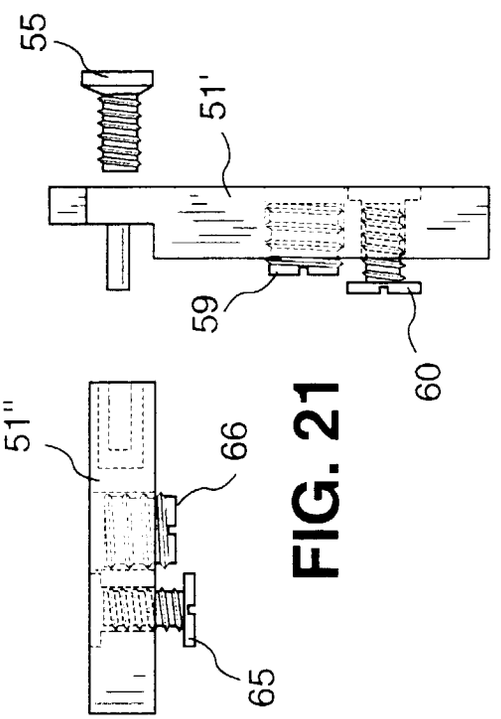

FIG. 21

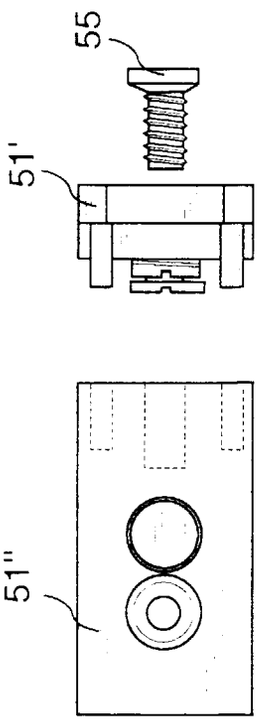

FIG. 23

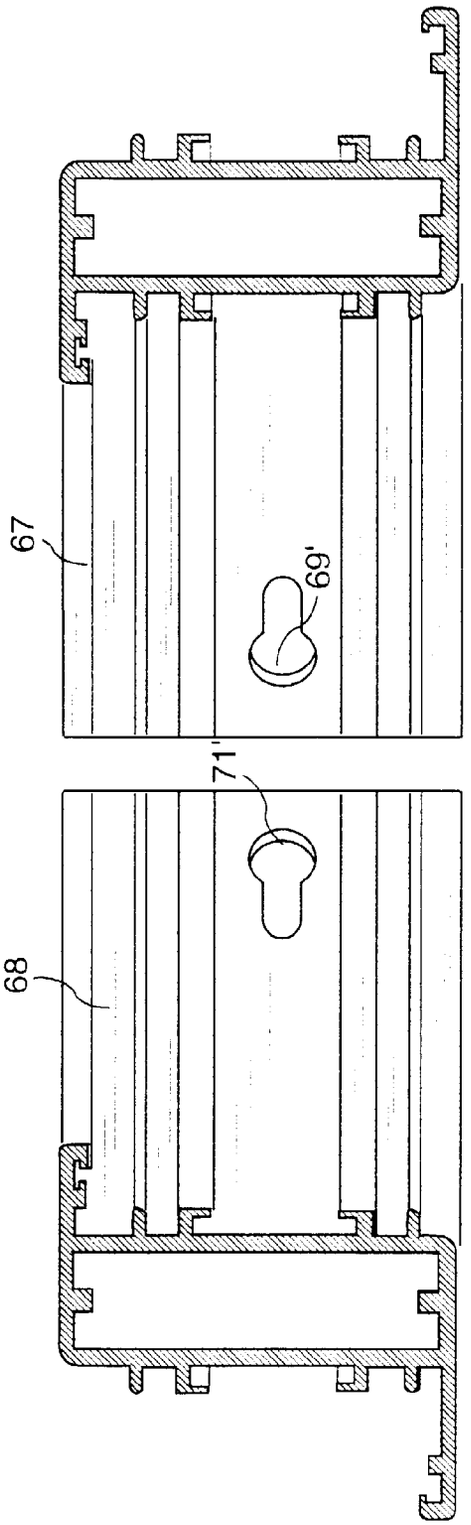

FIG. 25

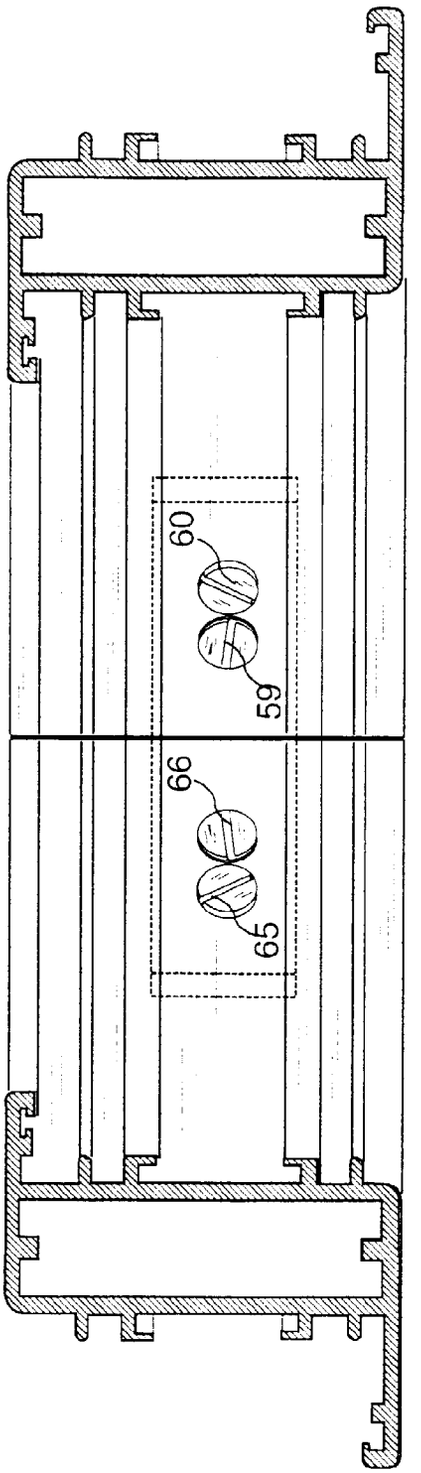

FIG. 26

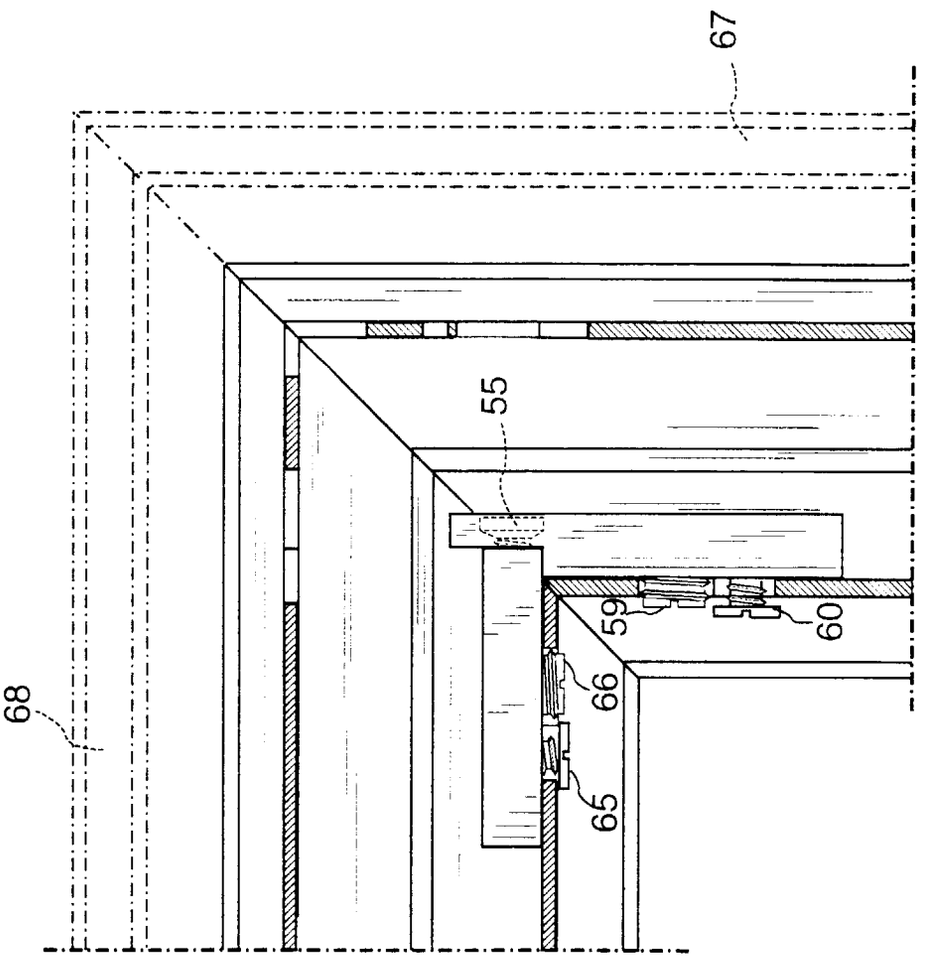

FIG. 27

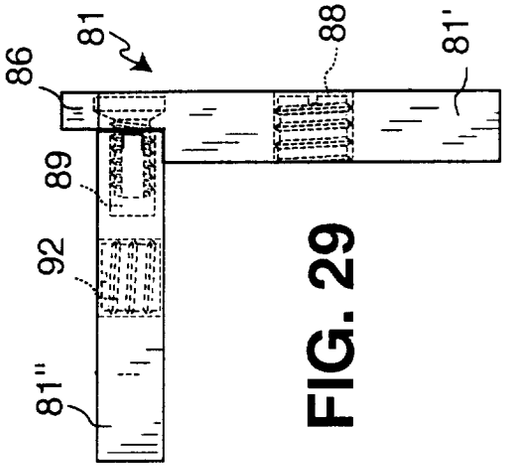

FIG. 29

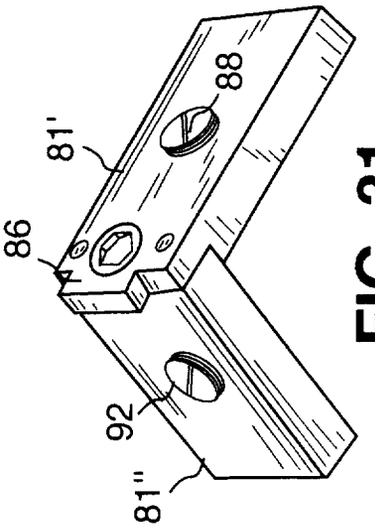

FIG. 31

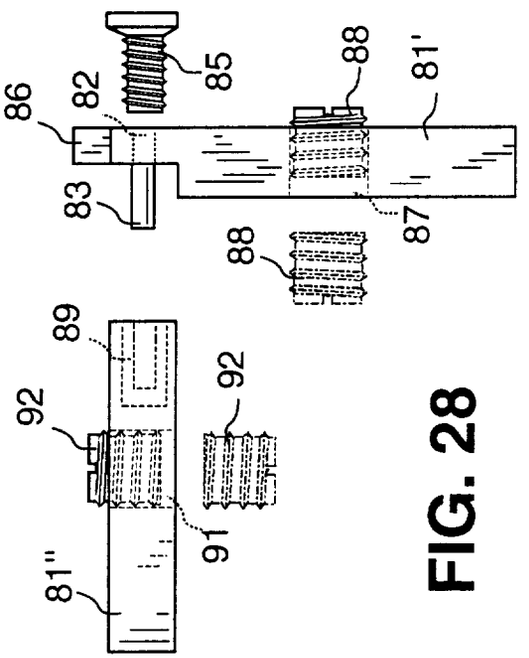

FIG. 28

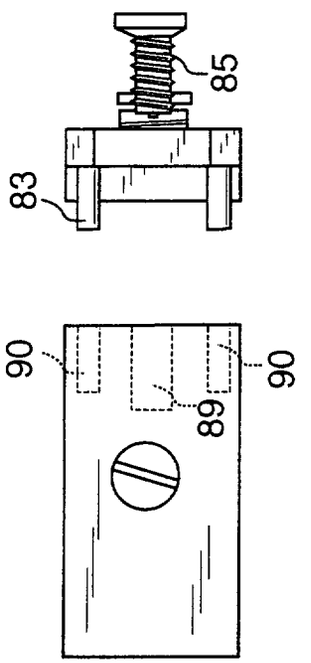

FIG. 30

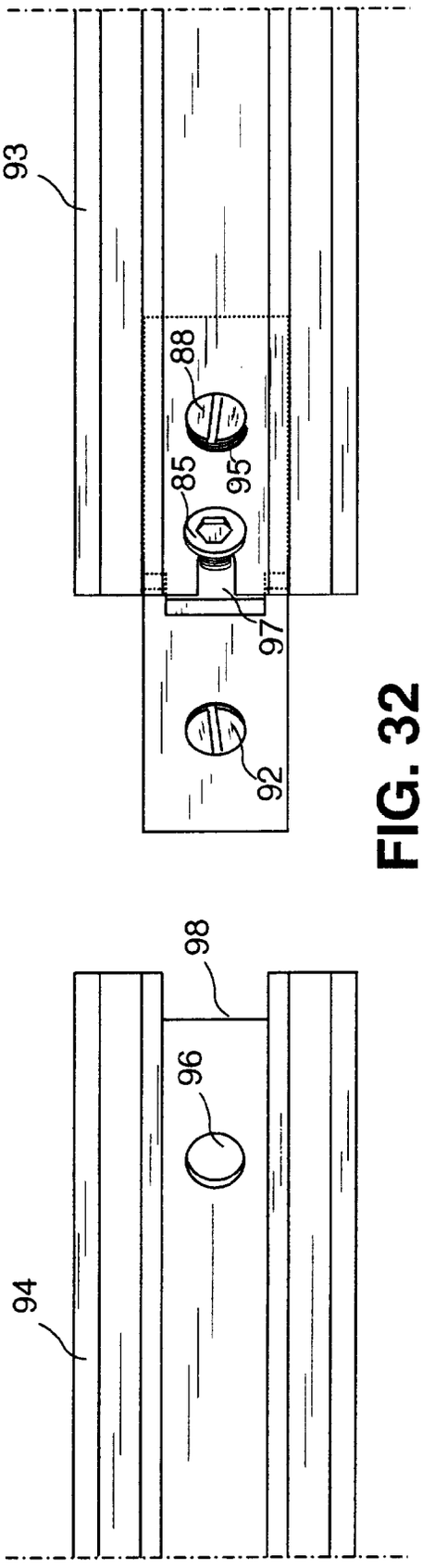

FIG. 32

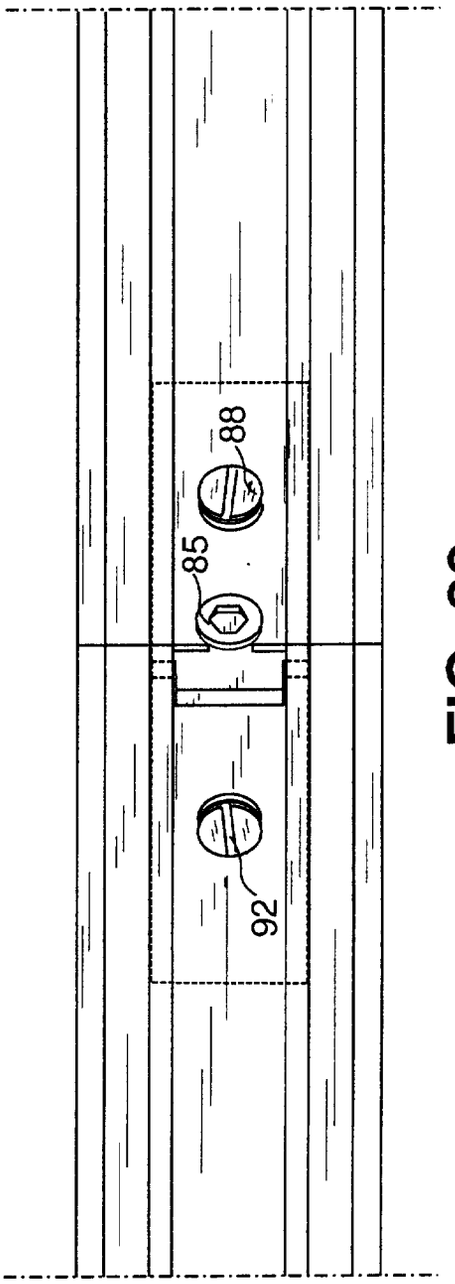

FIG. 33

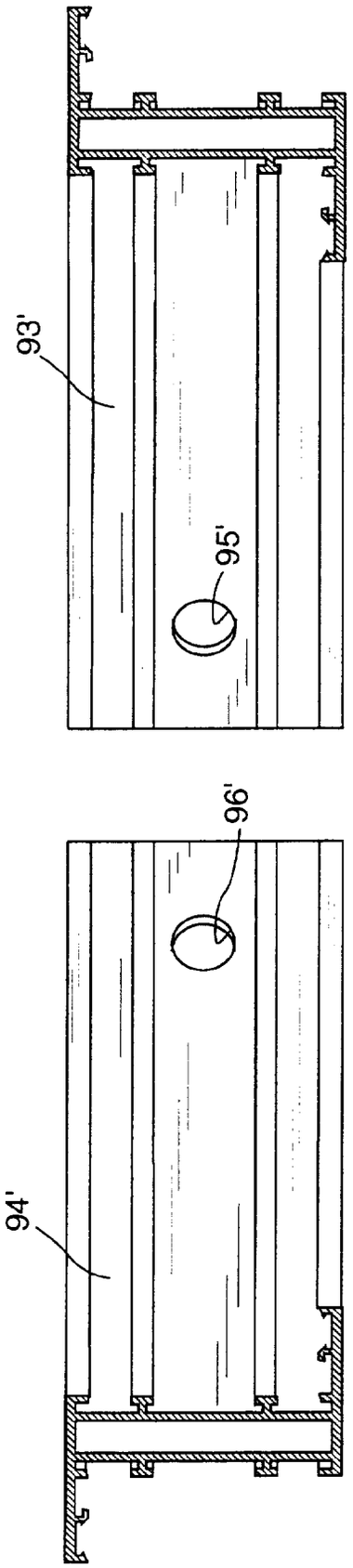

FIG. 35

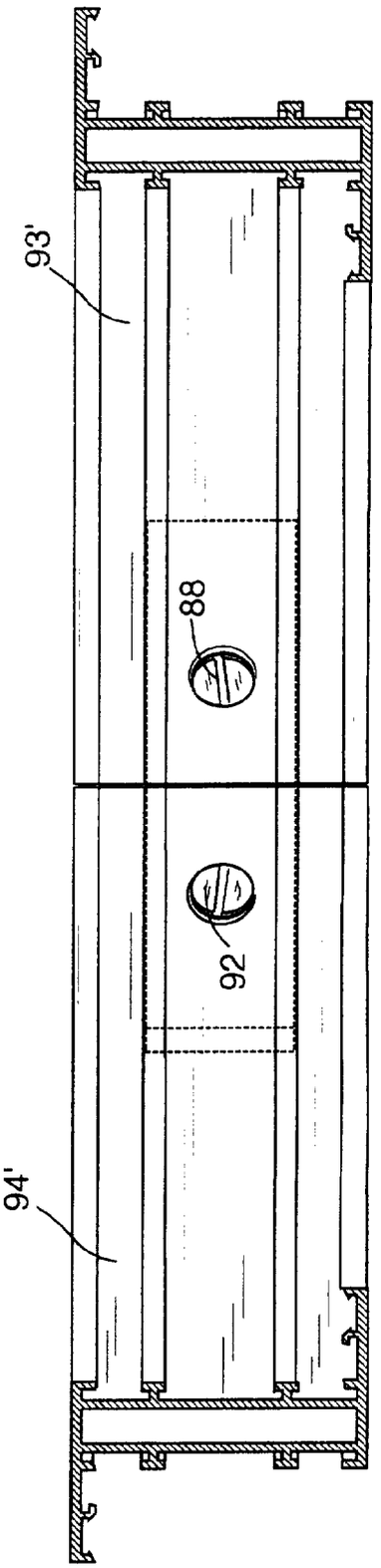

FIG. 36

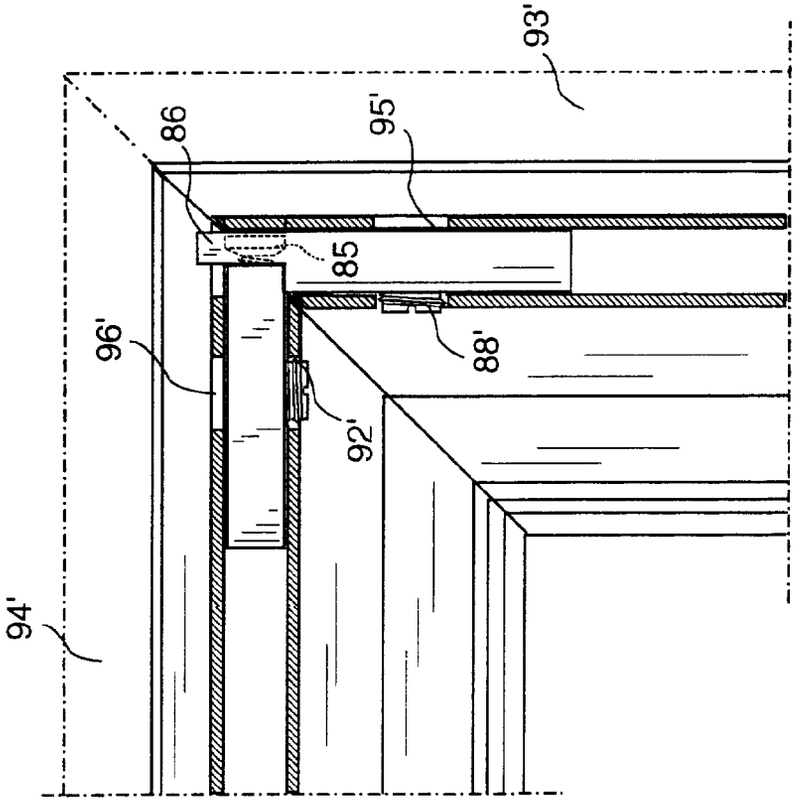

FIG. 37

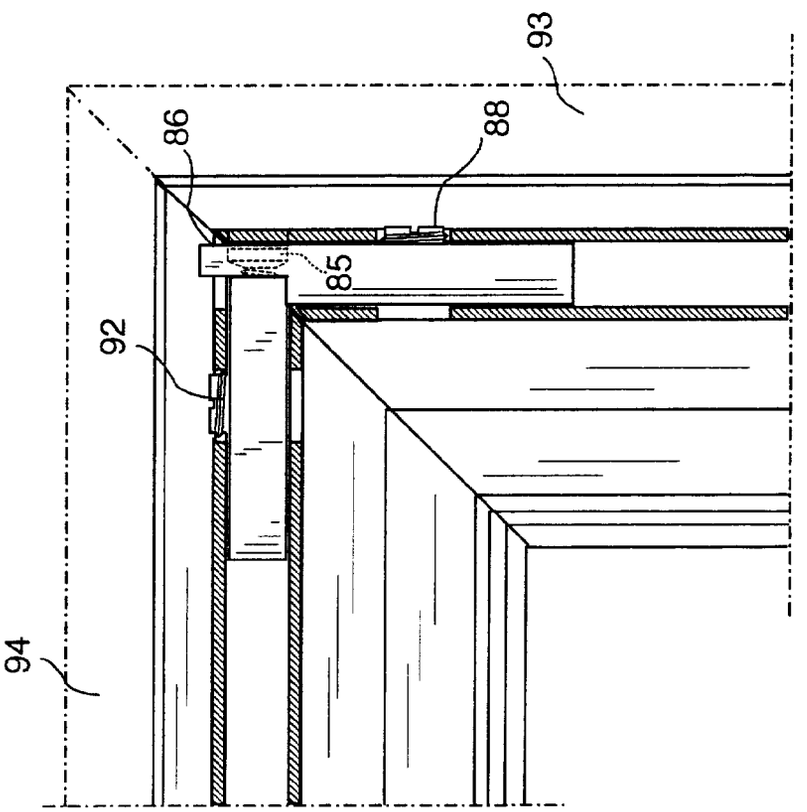

FIG. 34

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 83 0641

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X A	EP 0 517 330 A (DUERRE SAS DI POLLARA GUISEPPE) * column 3, line 4 - column 6, line 35; figures *	1-3,5,9, 10 4,6	E06B3/96
X	GB 114 938 A (STEWARD) * page 2, line 3 - line 40; figures *	1,5,10	
A	CH 671 805 A (DI GIUSTO) * the whole document *	1-3,5,6, 9,10	
A	US 2 717 061 A (KATZ) * column 4, line 71 - column 5; figures *	1,6,14	
A	DE 24 20 688 A (BIFFAR) * claims; figures *	1,2,4,5, 9-11	
A	US 2 700 441 A (CUDINI) * column 1, line 64 - column 2, line 52; figures *	1,11,14	TECHNICAL FIELDS SEARCHED (Int.Cl.6) E06B
A	GB 2 022 757 A (BRIGGS)		
A	US 3 772 837 A (HUNT)		
A	FR 1 459 944 A (MARX)		
A	DE 871 507 C (LIPP)		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13 March 1998	Vijverman, W

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)