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## (54) Arrangement in a reinforcing insertion structure for wall studs.

(57) Arrangement in a wall stud, for providing a reinforcing insertion structure (14), said wall stud (5) having a generally U-shaped cross-section with a web (15) and two flanges (16, 17) projecting from the web in the same direction and at approximately right angles thereto. At their outer ends the flanges have edge portions (18, 19) bent inwardly towards each other so that an inner corner will be formed at the outer end of each flange (16, 17).

At least at the points where insertion is to take place the stud (5) is provided with mounting and rigidifying inserts (14) arranged in the longitudinal direction and including a first web or flange portion (20) applied along the web (15) of the stud and at least one second flange portion (21, 22) arranged at an angle to the first flange portion (20) and the longitudinal outer free edge of which is adapted to be accommodated in said inner corner of the stud. The second flange portion (21, 22) is disposed so as to form, together with part of the web and flange portions (15; 16, 17) of the stud (5), one or more longitudinal hollow spaces of triangular torsionally rigidifying section.

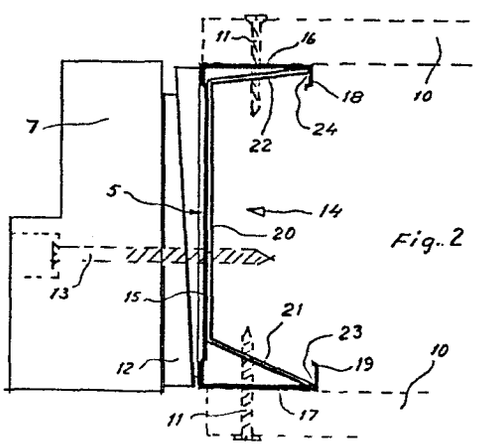


Fig. 2

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# ARRANGEMENT IN A REINFORCING INSERTION STRUCTURE FOR WALL STUDS

The present invention relates to an arrangement in a wall stud, for providing a reinforcing insertion structure, said wall stud having a generally U-shaped cross-section with a web and two flanges projecting from the web in the same direction and at approximately right angles thereto and having at their outer ends edge portions bent inwardly towards each other so that an internal corner will be formed at the outer end of each flange.

It is known to build walls by using wall studs of the type described above inserted between channels in floor and roof to support wall-boards, e.g. building or gypsum boards, or frames for windows and doors.

It is also known to arrange reinforced structures at the points where said building components - boards and frames - are joined with the stud, by using U-shaped, short insertion studs which are mounted with web and flanges between the outermost portions of the flanges of the wall stud or along the web of the wall stud in case the open side of the wall stud faces e.g. a door frame.

The construction described above has certain disadvantages, especially when the frame for heavy doors is to be fastened to the wall stud which, even in the reinforcement sections, has a rectangular cross-section of low torsional rigidity. The U-shaped stud pieces used in the known construction described above are made of thin standard sheet metal having a thickness of 0.56 mm. Such sheet metal does not provide sufficient hold for screws and for this reason it is necesssary to attach a reinforcement plate to the web of the stud piece. This involves additional costs for material as well as work in order to join the stud piece and the reinforcement plate. Moreover, the stud piece must be provided with several

bends in order to fit complementarily with the section of the steel stud with which it is to coact.

The above-mentioned disadvantages are eliminated by this invention and a simple and inexpensive but efficient reinforcing insertion structure is obtained. Such structures are fitted on the steel studs, at least at the points where insertion is to take place, and mounting and rigidifying inserts are provided with a first flange portion applied along the web of the stud and at least one second flange portion arranged at an angle relative to the first flange portion and the longitudinal outer free edge of which is adapted to be accommodated in said inner corner of the wall stud, and the second flange portion of the insert is disposed so as to form, together with part of the web and flange portions of the steel stud, a longitudinal hollow space of triangular cross-section.

Other advantages are apparent from the characteristic features stated in the appended claims.

The invention will be described more fully below with reference to the accompanying drawings in which:

Fig. 1 shows a steel stud structure for insertion in a door frame;

Fig. 2 shows a cross-section on line II-II in Fig.1;

Fig. 3 shows a cross-section through another steel stud with an insert for reinforced mounting on three sides;

Fig. 4 shows a cross-section with a very simple insert designed for reinforced mounting on one side;

Fig. 5 shows still another corresponding cross-section with a very simple insert designed for reinforced mounting on two sides; and

Fig. 6 shows a more rigid insert designed for reinforced mounting on three sides.

In Fig. 1 a roof channel is designated 1 and two floor channels are designated 2, 3. Clamped between these channels are two vertical steel studs 4 and 5 between

which a steel bar 9 is mounted for providing an opening in which a door frame, consisting of two vertical frame parts 6 and 7 and a top part 8, is to be mounted.

Inserts 14 are arranged, as will be described in more detail below, at the fixing points between door frame and stud. The mounting will take place by means of screws extending through the vertical parts 6, 7 of the frame and screwed into the steel studs 4, 5 and inserts 14.

Fig. 2 shows the steel stud 5, the vertical door frame part 7, the inserts 14 and the mounting screws 13. The web of the steel stud is designated by 15 and its flanges 16 and 17 are provided at their outer ends with edge portions 18 and 19 respectively bent inwardly towards each other. The insert 14 has a web 20 bearing on the web 15 of the steel stud 5. The insert also has two flanges 21 and 22 which are bent up at an obtuse angle from the web 20 and the outer edges 23 and 24 of which lie pressed into the inner corners formed of the flange 16 and the edge portion 18 and the flange 17 and the edge portion 19. The dimensions of the insert are adjusted such that it will be pressed into the steel stud with press fitting so that it will be retained in position and can easily absorb the forces required for driving in the mounting screw 13 which, as can be seen, is anchored in the material of the steel stud 5 as well as the web 20 of the insert 14. Two wallboards 10 are secured to the flanges 16, 17 of the stud 5 by means of screws 11. Fitting wedges 12 are used for fitting of the frame parts 6, 7, 8 in the opening formed of the steel studs 4, 5, 9.

Fig. 3 shows an insert 34 with web 35 and bent-over flanges with portions 36 and 37 close to the web 35 and portions 38 and 39 extending along the flanges 16 and 17 of the steel stud 5. The reinforced mounting point for a screw for e.g. a door frame is designated by 13 while 11 stands for a reinforced mounting point

for a screw for fixing a wallboard to the steel stud.

Fig. 4 shows an insert 44 which only has two flanges one 45 of which lies applied along the web 15 of the stud 5 while the other flange 46 with its end edge 48 lies anchored in the inner corner at the outer portion of one flange of the steel stud.

Fig. 5 shows a steel stud and an insert 54 with a web 55 lying adjacent the web 15 of the steel stud 5 and providing a reinforced fixing point for a mounting screw 13 while the insert contains a single flange with two bent portions 56 and 57 and the latter portion 57 bears on the flange 16 of the steel stud 5 and forms together with this flange a reinforced insertion section for a screw 11 for a wallboard.

From Figs. 2 - 5 it is apparent that closed tubular sections of triangular cross-section are formed in one or more positions in the composite structure. This results in the composite structure having a greater section modulus as compared to the simple steel stud and, especially, increasing the section modulus in torsion of the construction.

Fig. 6 shows another embodiment of the invention where the insert 64 with the web 65 has two flanges including three sections bent angularly relative to each other, the intermediate section of which forms together with the steel stud reinforced insertion sections for screws 11 for wallboards while the edge of the outermost section cooperates with the edge portions 18 and 19 of the stud 5 which are bent inwards at an obtuse angle. In the embodiment shown no less than four sections of triangular cross-section are obtained, which give the stud great torsional rigidity. Also other embodiments of steel studs than those herein chosen by way of example can easily be made within the scope of the claims by anyone skilled in the art.

CLAIMS

1. Arrangement in a wall stud (5) for providing a reinforcing insertion structure (14), said wall stud (5) having a generally U-shaped cross-section with a web (15) and two flanges (16, 17) projecting from the web in the same direction and at approximately right angles thereto and having at their outer ends edge portions (18, 19) bent inwardly towards each other so that an inner corner will be formed at the outer end of each flange (16, 17), c h a r a c t e r i z e d in that the stud (5), at least at the points where insertion is to take place, is provided with mounting and rigidifying inserts (14, 34, 44, 54, 64) arranged in the longitudinal direction of the stud (5) and including a first web or flange portion (20, 35, 45, 55, 65) applied along the web (15) of the stud and at least one second flange portion (21, 22; 36, 38, 37, 39; 46; 56, 57) arranged at an angle relative to the first web or flange portion and the longitudinal outer free edge of which is adapted to be accommodated in said inner corner of the stud, and the second flange portion (21, 22; 36, 38, 37, 39; 46; 56, 57) is disposed so as to form, together with part of the web and flange portions (15; 16, 17) of the stud (5), one or more longitudinal hollow spaces of triangular torsionally rigidifying cross-section.

2. Arrangement as claimed in claim 1, c h a r a c t e r i z e d in that said second flange portions (21, 22) make both an obtuse angle to the first web portion (20).

3. Arrangement as claimed in claim 1, c h a r a c t e r i z e d in that at least one of the second flange portions has an inner flange section (36) lying adjacent the web portion (35) and forming an obtuse angle to the web, and an outer flange section (38)

adapted to bear against one flange (16) of the stud (5).

4. Arrangement as claimed in claim 1, c h a r a c t e r i z e d in that the first web portion (45) of the insert (44) extends from a corner between the web (15) and the flange (17) of the stud (5) past a mounting point (13) in the web (15) of the stud (5) and has a single second flange portion (46) making an obtuse angle with the web portion (45).

5. Arrangement as claimed in claim 1, c h a r a c t e r i z e d in that the web portion (55) of the insert (54) extends from a corner between the web (15) and the flange (17) of the stud (5) past a mounting point (13) while the second flange portion includes an inner section (56) making an obtuse angle to the web portion (55), and an outer section (57) disposed to bear against one flange (16) of the stud (5) for formation of a reinforced mounting point (11).

6. Arrangement as claimed in claim 1, c h a r a c t e r i z e d in that the insert (64) has at least one second flange portion with an inner flange section (66) lying adjacent the web portion (65) and making an obtuse angle to the web portion (65), an intermediate flange section (67) disposed to bear against one flange (16) of the stud (5), and an outer flange section (68) making an obtuse angle to the intermediate flange section (67) and the outer edge of which is situated in said inner corner in the flanges (16, 17) of the wall stud (5).

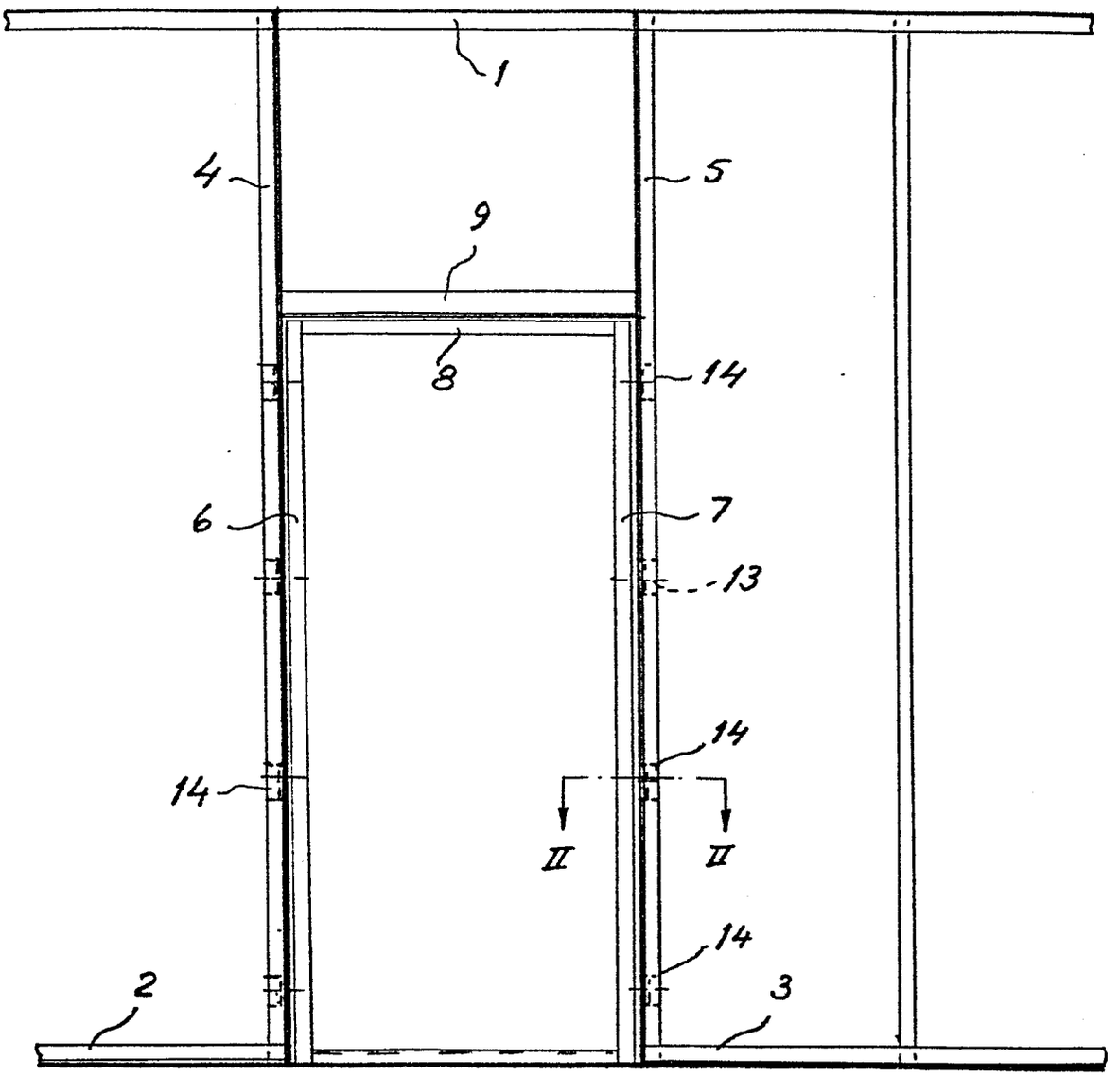
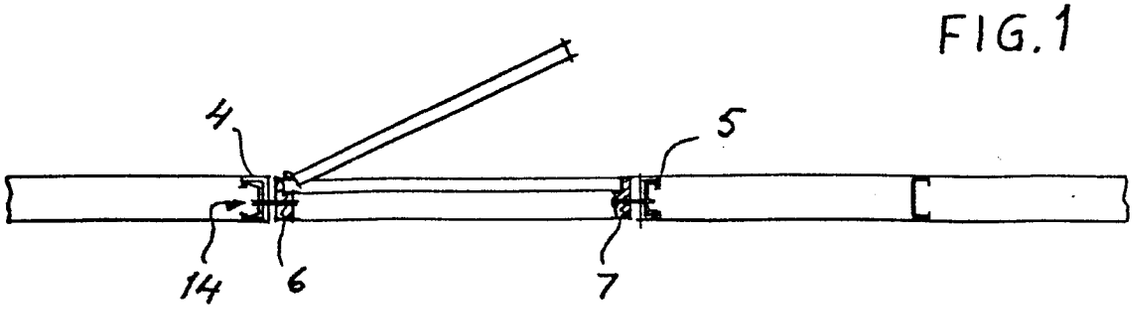



FIG.1



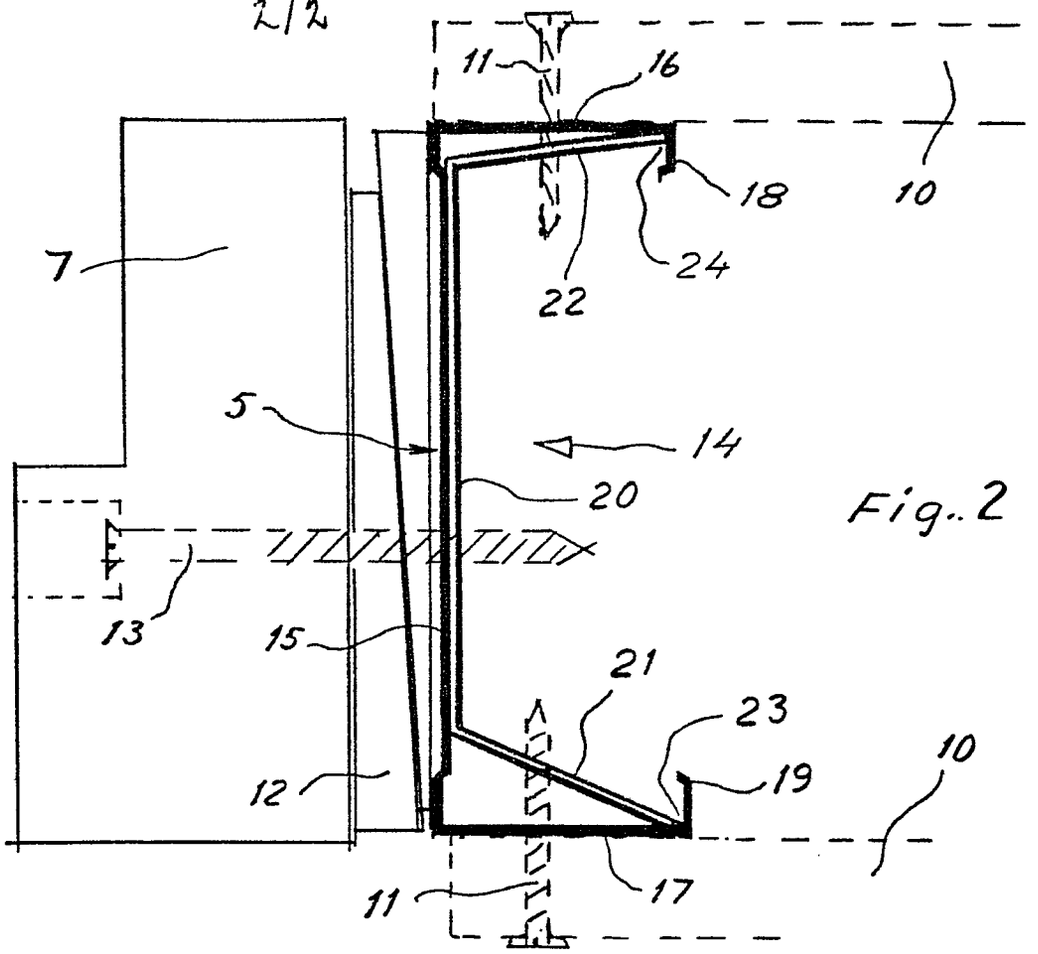



Fig. 2

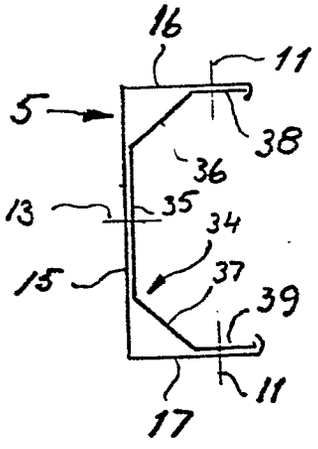



Fig. 3

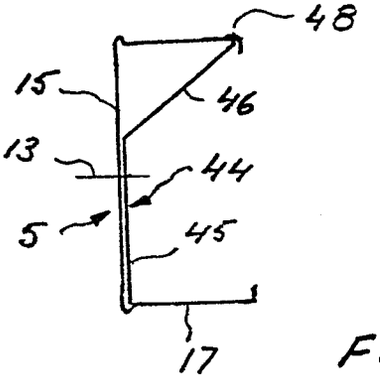



Fig. 4

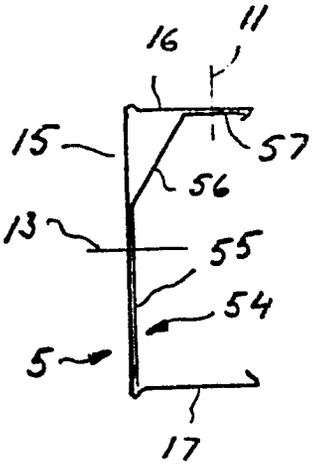



Fig. 5

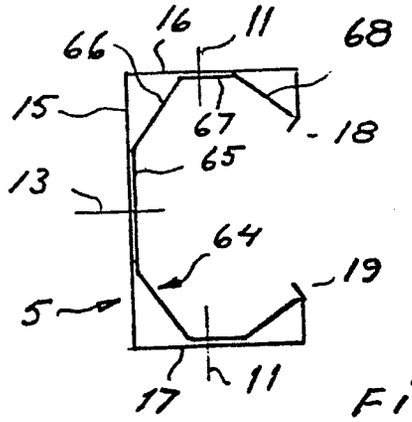



Fig. 6