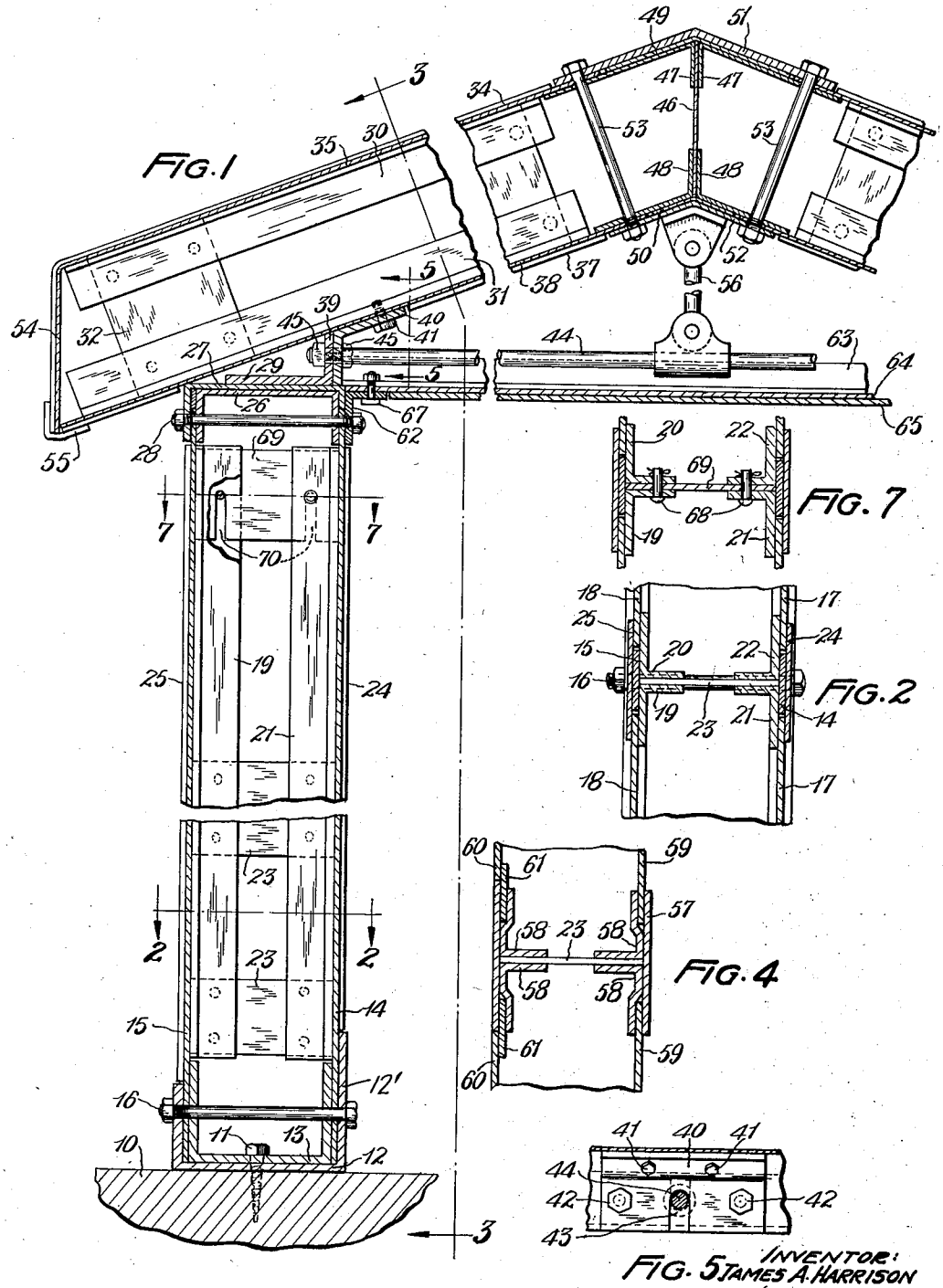
Aug. 18, 1936. J. A. HARRISON 2,051,707

BUILDING CONSTRUCTION

Filed May 16, 1933 2 Sheets-Sheet 1



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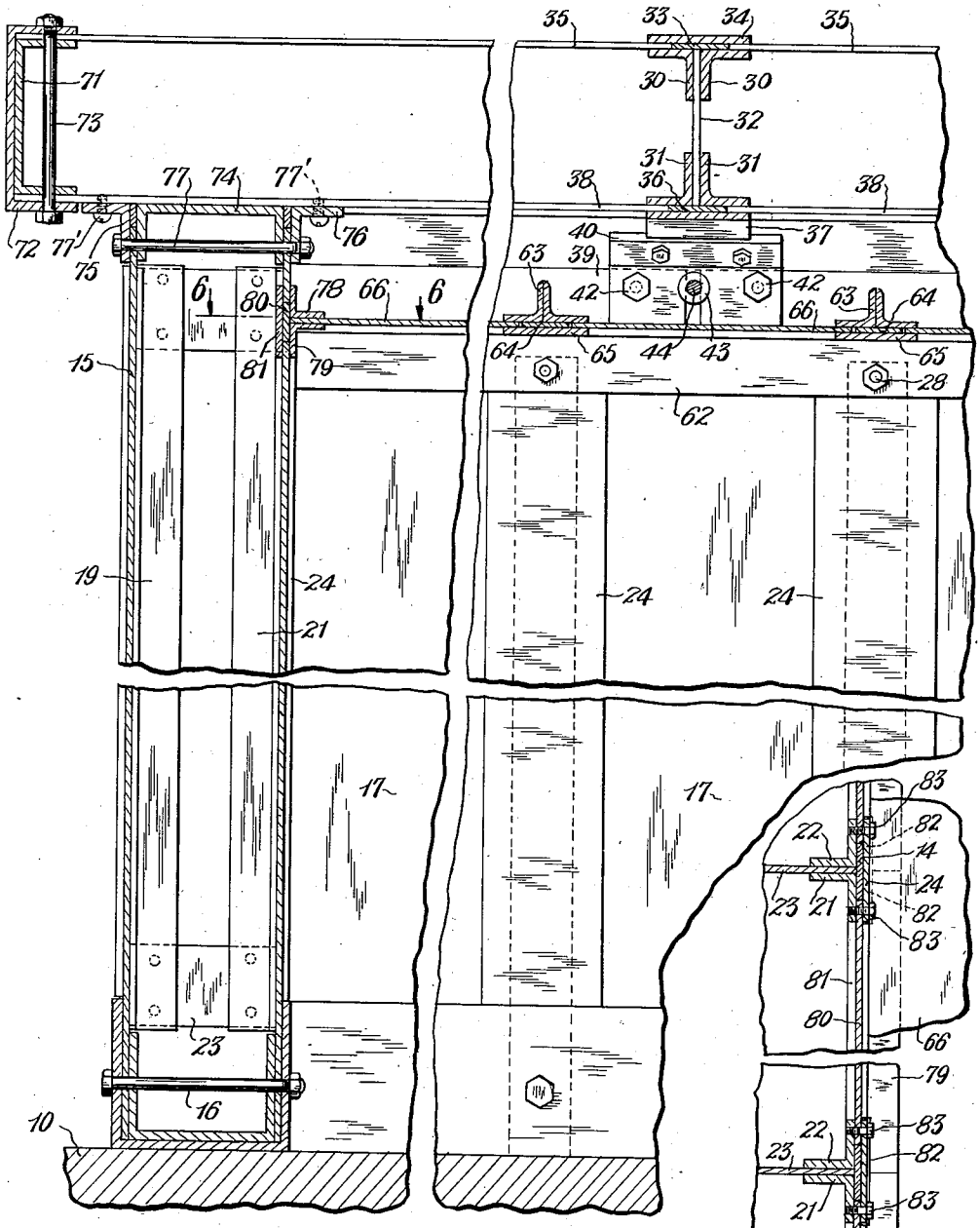


FIG. 3

FIG. 6

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Patented Aug. 18, 1936

2,051,707

UNITED STATES PATENT OFFICE

2,051,707

BUILDING CONSTRUCTION

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Application May 16, 1933, Serial No. 671,358

6 Claims. (Cl. 189—1)

This invention relates to building construction and, more particularly, to a type of construction that is made from steel and adapted for use in residences, garages, ovens, and other types of buildings.

It is one of the objects of the invention to provide an improved form of construction that will embody factory-built units, of low cost, that may be readily assembled on the job with a minimum of labor and expense.

A further object of the invention is to provide a type of construction that may be made up of sheet metal into standardized units that will be capable of assembly in different arrangements for the purpose of providing structures which vary in size and shape.

Other objects of the invention and the features of novelty will be apparent from the following description, taken in connection with the accompanying drawings, of which—

Figure 1 is a fragmentary transverse section through a building structure embodying my invention;

Fig. 2 is a detail section on the line 2—2 of Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is a view similar to Fig. 2 but showing a modification;

Fig. 5 is a detailed section on the line 5—5 of Fig. 1;

Fig. 6 is a detailed section on the line 6—6 of Fig. 3; and

Fig. 7 is a section on line 7—7 of Fig. 1.

Referring to the drawings, 10 indicates any suitable form of foundation to which there is secured as by bolts 11, a sill member comprising the nested channels 12 and 13, the vertically extending flanges of which are spaced apart to receive the vertically extending strips 14 and 15 which constitute parts of studs or columns to be hereinafter described. The members just referred to may be secured together in any suitable manner, as by the bolts 16. The inner vertical flange 12' of the channel 12 is preferably of greater depth than the outer flange in order to more closely simulate the base board of a room.

Arranged at suitable intervals along the sill are the studs or columns which support the superstructure of the building and also carry the inner and outer wall panels 17 and 18, respectively. These studs or columns comprise, in the preferred form of my invention, two pairs of angle bars, the bars 19 and 20 constituting one pair and the bars 21 and 22 constituting the other pair. These pairs of angle bars are connected by a plate or plates 23 to which they may be spot-welded, riveted, or otherwise secured. The strip 14 is spot-welded or riveted or otherwise secured to the laterally projecting legs of the angle bars 21 and 22 and a batten strip 24 is secured in a similar manner on the strip 14, and thereby to the laterally projecting legs of the angle bars 21 and 22, but the lateral edges of the strip 24 project beyond the edges of the strip 14 to form, with the laterally projecting legs of the angle bars 21 and 22, longitudinally extending slots to receive the panels 17. These panels may be of sheet metal or any suitable form of wall board or other sheet material. The construction just described is employed in connection with the strip 15 and the batten strip 25 thereon and the lateral edges of the strip 25 form, with the laterally projecting legs of the angle bars 19 and 20, slots to receive the panels 18.

As will be seen from Fig. 1, the strips 24 and 25 extend to the upright flanges of the channel 12. At the upper ends of the studs or columns there is a channel 26 on which there is a channel 27 and the outer flanges of these channels are spaced apart to receive the upper end of the strip 15, these parts being secured together by bolts 28. Secured on the upper side of the channel 27 by welding, riveting, or otherwise, is an angle bar 29 which extends longitudinally of the wall of the building and carries the roof. The roof structure is made up substantially with the same form of construction as the side walls of the building, and comprises rafters which consist of two pairs of angle bars, of which the bars 30 constitute one pair and the bars 31 the other pair. These pairs are connected together by a plate or plates 32 similar to the plates 23. The laterally projecting arms of the angle bars 30 have secured thereon a spacing strip 33 on which there is a batten strip 34, this batten strip forming with the laterally projecting legs of the angle bars 30, slots to receive the edges of the roof panels 35. In a similar manner, the laterally projecting legs of the angle bars 31 carry a spacing strip 36 on which there is a batten strip 37 and the edge portions of this batten strip form, with the laterally projecting legs of the angle bars 31, slots to receive the panels 38.

Each of the rafters, above described, is secured to the upstanding leg 39, of the angle bar 29, by means of an angle clip 40 which may be secured to the laterally projecting legs of the bars 31 by the bolts 41, as shown in Figs. 1 and 2. The vertically extending portion of the clip 40 is secured to the leg 39 of the angle bar 29, by bolts 42, and is slotted, as indicated in Fig. 5, at 43 to span

the bolt 44 which ties the opposite walls of the building together. The ends of the bolt 44 are threaded to receive the nuts 45, as shown in Fig. 1.

The ridge of the roof structure is constructed on the same principle as the studs and rafters and comprises the plate or plates 46 and the pairs of angles 47 and 48 which are welded or otherwise secured thereto and have their laterally projecting legs deflected downwardly in accordance with the pitch of the roof. A spacing strip 49 is arranged on the angles 47 and a similar strip 50 is secured to the angles 48, and these strips have secured thereon the strips 51 and 52, respectively which are analogous to the batten strips 24 and 25 and which form, with the laterally projecting legs of the angles 47 and 48, slots to receive the edges of the panels 35 and 38 and also the ends of the strips 33 and 36 by which the rafters are secured to the ridge structure. These parts may be secured together by bolts 53 arranged at intervals longitudinally of the roof.

One method of closing the lower end of the roof structure is illustrated in Fig. 1, wherein the panels 35 are bent downwardly as indicated at 54, so that their lower edges will meet the lower edges of the panels 38. These edges may be secured together by the clips 55 or in any other suitable manner.

Where the size of the structure requires it the bolts 44 may be supported, at the middle thereof, by hangers 56, as shown in Fig. 1.

A modification of the above described constructions of the studs and rafters, is shown in Fig. 4, wherein a relatively wide strip 57 is secured to the laterally projecting legs of the angle bars 58 by welding or riveting or otherwise and has its ends extended beyond the ends of the legs and into the spaces between the flanges of the channel members 12 and 13 and 26 and 27, as do the strips 14 and 15 in Fig. 1. These legs have their edge portions bent, as shown, to form slots for the panels 59. When it is desired to provide a smooth wall surface, either on the interior or exterior of the building, the construction illustrated on the left-hand side of Fig. 4 may be employed and, in this construction, the panels 60 have spot welded to the edges thereof the strips 61 which enter the slots between the angles 58 and the strip 57 so that the panels 60 will be flush with the strip 57, as shown.

In order to provide for a ceiling construction, a horizontally extending angle 62 may be secured to the upper ends of the studs, by means of the bolts 28, as shown in Fig. 1, or otherwise. It will be understood that angle bars similar to the bar 62 will extend around the room and serve as supports for the spaced pairs of angle bars 63 shown in Fig. 3. A spacing strip 64 is secured on the horizontally extending legs of the angle bars 63 and another strip 65 is secured thereon so that the edge portions thereof will form with the laterally projecting legs of the angles 63, slots to receive the ceiling panels 66. The angle bars 63 may be secured to the angle bars 62 by bolts 67, as shown in Fig. 1.

A modification of the above described construction of the studs for the side walls is illustrated in Fig. 7, wherein the angles 19, 20, 21 and 22 carry pins 68 and the tie plate 69 for these pairs of angles has slots 70 therein which will permit the plate to be dropped into position and lock the parts together, as will be clear from Figs. 1 and 7. This, of course, will be done before the channels 26 and 27 are connected to the studding.

A preferred method of closing the ends of the roof structure is shown in Fig. 3, and consists of the pairs of channels 71 and 72 which have their horizontally extending flanges spaced apart to receive the panels 35 and 38, and the strips 49 and 50 of the ridge structure. The channels 71 and 72 may be secured in position by bolts 73. The studding of the end wall of a building having a hip roof, such as shown in Fig. 1, will, of course, vary in length, and a convenient method for securing this studding to the roof structure is illustrated in Fig. 3 and consists of a channel 74 which is secured to the upper end of the spacing strip 15. An angle bar 75 is arranged in the exterior corner between the end wall of the building and overhanging portion of the roof structure, and another angle bar 76 is similarly arranged on the inner side of the wall and all of these parts are secured together by bolts 77 and screws 77'.

The method of connecting the ceiling structure to the end wall of the building is illustrated in Figs. 3 and 6, and consists of the angle bars 78 and 79 which are arranged above and below the ceiling panels 66 and spaced apart to receive the edges of these panels. The angle bars 78 and 79 have the strips 80 and 81 secured thereto but the spacing strips 14 and the battens 24 extend upward past the angle bars 78 and 79 for connection to the roof structure and, in order to permit the battens 24 to pass the angle bars 78 and 79, the vertical flanges of these angle bars are cut out, as shown in Fig. 6 at 82. The angle bars 78 and 79 and the strips 80 and 81 are made up in units of sufficient length to extend from one stud to the next and these units are secured to the angle bars 21 and 22 by bolts 83.

The various elements of the structure above described may be made up at a factory and, as a matter of economy, the various angle bars may, in many instances, be made from sheet metal and the members of the different units may be permanently secured together by spot-welding, riveting, or otherwise. These units may then be readily assembled, on the job, and secured together by bolts, as shown. In erecting the side walls, a progressive method of assembly may be used and, according to this method, when each stud is placed in position, the panels, such as 17 and 18, are inserted in the slots provided therefor in the lateral edges of the studs, and then the next stud is placed in position, and so on. A similar method of assembling the roof structure may be employed. In order to insulate the walls of a structure of this kind they may be filled with any suitable insulating material as they are erected and before the top closure elements of the walls are placed in position.

While I have illustrated and described what I now consider to be the preferred details of construction, it will be evident that various changes may be made in these details without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, I claim:

1. A structural unit for building structure comprising two pairs of angle members and a connecting plate therefor, the members of each of said pairs being positioned on opposite sides of said plate and secured thereto with legs projecting laterally in opposite directions, a spacing strip secured on the laterally projecting legs of one of said pairs and extending longitudinally thereof and beyond the ends of said legs, and a strip overlying and secured on the first men-

tioned strip and projecting beyond the edges of the latter so as to form, with said laterally projecting legs, longitudinally extending slots therebetween.

2. A structural unit for building structures comprising two pairs of angle members and a connecting plate therefor, the members of each of said pairs being positioned on opposite sides of said plate and secured thereto with legs projecting laterally in opposite directions, spacing strips secured on the laterally projecting legs of each of said pairs and extending longitudinally thereof and beyond the ends of said legs, and strips overlying and secured on the first mentioned strips and projecting beyond the edges of the latter so as to form, with said laterally projecting legs, longitudinally extending slots therebetween.

3. A structural unit for building structures comprising two pairs of angle members and a connecting plate therefor, the members of each of said pairs being positioned on opposite sides of said plate and secured thereto with legs projecting laterally in opposite directions, a strip abutting against and secured to the laterally projecting legs of one of said pairs and extending longitudinally thereof and beyond the ends of said legs, the edge portions of said strip being spaced from the longitudinal edge portions of said legs to form longitudinally extending slots therebetween.

4. A structural unit for building structures comprising two pairs of angle members and a connecting plate therefor, the members of each of said pairs being positioned on opposite sides of said plate and secured thereto with legs projecting laterally in opposite directions, strips abutting against and secured to the laterally projecting legs of said pairs of angle members and extending longitudinally thereof and beyond the ends of said legs, the edge portions of said strips being spaced from the longitudinal edge portions of said legs to form longitudinally extending slots therebetween.

5. A structural unit for building structures comprising a pair of angle members arranged back-to-back and secured together with legs thereof projecting in opposite directions, a spacing strip secured to said legs and extending longitudinally thereof and beyond the ends of said legs, and a strip overlying and secured on the first mentioned strip and projecting beyond the edges of the latter to form with said legs longitudinally extending slots in the lateral edges of the unit.

6. In building construction, a plurality of members each comprising a plate, two pairs of angle bars secured to said plate so that the bars of each pair are arranged back-to-back and have legs projecting laterally in opposite directions, longitudinally extending strips secured on said legs and extending beyond the ends of said angle members and having their lateral edges spaced inwardly from the lateral edges of said legs, a strip wider than the first mentioned strip and secured thereon and forming, with the lateral edge portions of said legs, longitudinal slots, and plates between said members having their lateral edges positioned in said slots.

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