

Nov. 2, 1937.

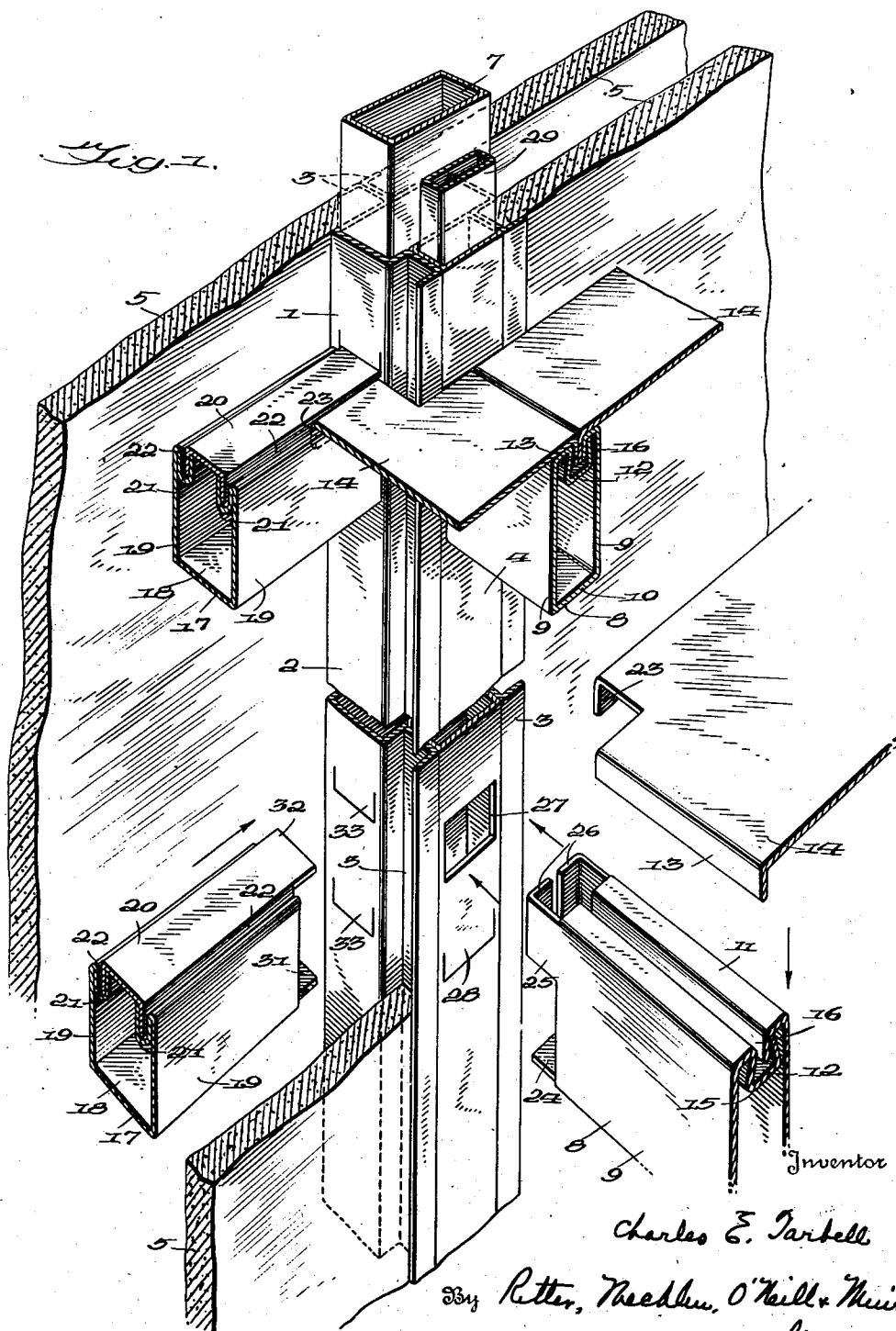
C. E. TARBELL

2,097,580

BUILDING CONSTRUCTION

Filed June 5, 1936

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 1.

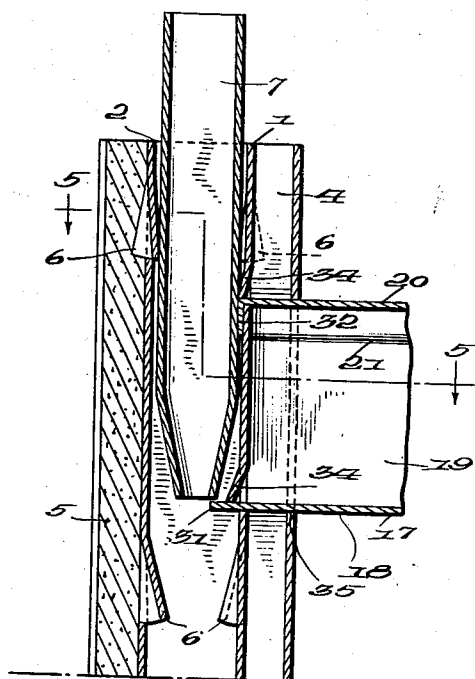


Fig. 2.

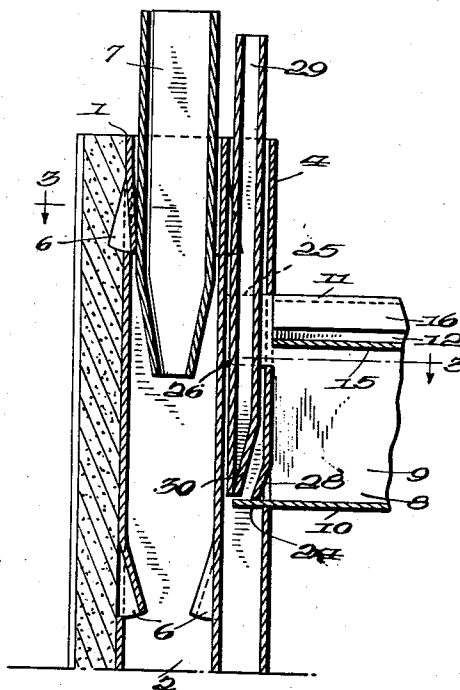


Fig. 5.

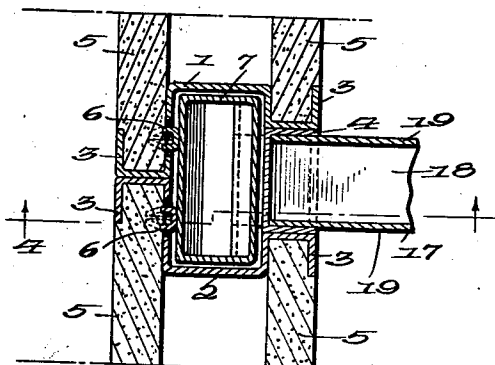
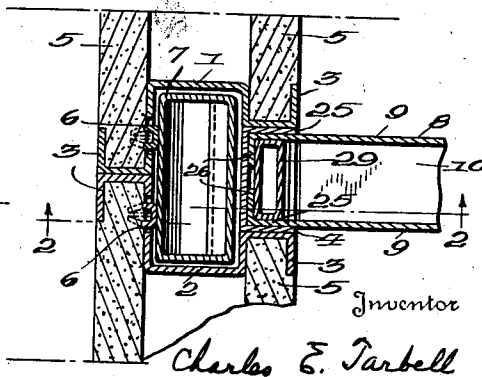


Fig. 3.



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UNITED STATES PATENT OFFICE

2,097,580

BUILDING CONSTRUCTION

Charles E. Tarbell, White Plains, N. Y.

Application June 5, 1936, Serial No. 83,753

7 Claims. (Cl. 189—36)

My invention relates to building constructions, more particularly to metallic building structures.

A principal object of the invention is to provide metallic frame members for building structures which may be readily and securely connected to each other as well as to boards, slabs, panels or other desirable wall forming material.

Another object of the invention is to provide metallic frame members possessing adequate strength to support a dwelling or other structure and which are light in weight and may be easily assembled in the field with other parts to form a complete structure.

Features of the invention residing in advantageous forms, combinations and relations of parts will hereinafter appear and be specifically pointed out in the claims.

In the drawings illustrating preferred embodiments of the invention,

Figure 1 is a composite perspective view illustrating one of the vertical frame members of a building structure, together with adjacent portions of the horizontal frame members, the wall boards and metal floor plates, the horizontal members and floor plate portions in the lower part of the figure being shown in positions preparatory to being assembled.

Figure 2 is a vertical sectional view through the vertical frame member and one of the horizontal members, the view being taken on a line corresponding to the line 2—2 of Figure 3.

Figure 3 is a horizontal sectional view on line 3—3 of Figure 2.

Figure 4 is a vertical sectional view similar to Figure 2, illustrating a modified form of the invention.

Figure 5 is a horizontal sectional view taken on line 5—5 of Figure 4.

Referring more particularly to the drawings, 1 indicates one of the vertical frame members of a building structure constructed in accordance with the present invention. The vertical frame members are each preferably made of a plurality of rigidly connected metal sheets or plates to provide a main body portion 2 of substantially rectangular shape in cross section, two pairs of channels 3 respectively disposed on opposite sides of the main body portion and a tubular member 4, also of substantially rectangular shape in cross section, which is interposed between the channels 3 of one of said pairs. The channels of each pair are oppositely disposed to receive adjoining edges of neighboring boards, slabs, panels or the like 5 which form the walls of the building structure.

While the boards or the like may be secured within the channels 3 in any convenient manner, it is preferred to form the main body portion 2 of the vertical frame member with a plurality of struck up portions 6 which normally extend inwardly into the body portion so as to be engaged by an elongated member 7 movable longitudinally within the body portion and thus be forced outwardly to securely lock the boards within the channels. While the member 7 may be of any suitable shape in cross section, it is preferable that it be of substantially the same cross sectional shape as the body portion 2 and of a size so as to fit rather snugly within the latter.

The horizontal frame members of the building structure may be of a variety of forms or shapes, although it is preferable that they be of generally rectangular shape in cross section. One form of horizontal member, which is advantageous, is indicated at 8 in Figures 1, 2, and 3. This member, which may be easily formed from a single sheet of metal, has side walls 9, a bottom wall 10 and a top wall 11 provided with a longitudinally extending groove or the like 12 for receiving down-turned flanges 13 which may be conveniently formed along the marginal edges of suitable floor plates 14. The groove 12 is preferably formed by providing one of the marginal edges of the sheet from which the member is made with a channel 15, the opposite edge of the sheet having a flange 16 which extends downwardly into the channel and is secured thereto in any suitable manner, such, for example, as by welding.

Another advantageous form of horizontal member is indicated at 17 in Figures 1, 4, and 5. This member is made of two rigidly connected parts, one of which forms a bottom wall 18 and side walls 19 and the other of which forms a top wall 20. The upper ends of the side walls 19 are formed with grooves 21 for receiving down-turned flanges 22 formed along the side edges of the top plate 20 and also for receiving the adjacent downwardly extending marginal flanges 23 of neighboring floor plates 14.

To rigidly connect the horizontal frame members to the vertical frame members 1, they are each provided with a plurality of portions which respectively project beyond their ends so as to extend within the vertical frame member. The character of the end projections of the horizontal frame members depends, in a measure, upon the particular construction of the member.

As shown in Figures 1, 2, and 3, the horizontal frame members 8 are provided with a projection

24 constituting a continuation of the bottom wall 10 and with a pair of projections 25 constituting continuations of the side walls 9, the outer ends of the projections 25 terminating in offset elements 26 respectively extending toward each other. To receive the projections 25, the outer wall of the tubular member 4 of the vertical frame member is provided with an opening 27 and, to receive the projection 24, the outer wall of the tubular member is slit to provide a bendable portion 28.

The offset elements 26 of the projections 25 are spaced a sufficient distance beyond the adjacent end of the frame member so that, when that end is in abutting engagement with the vertical frame member, the offset elements engage the inner face of the inner wall of the tubular member 4. During assembly of the horizontal frame member with the vertical frame member, it will be perceived that the projection 24 forces the bendable portion inwardly and the lower end of the latter frictionally engages the upper surface of the projection 24 and thereby assists in temporarily supporting the horizontal member.

To firmly lock or connect the horizontal and vertical frame members, an elongated locking member 29 is movably mounted in the tubular member 4, the locking member being of substantially the same cross sectional shape as the tubular member and being of only slightly less size. The locking member which is preferably formed with a tapered lower end, as indicated at 30, is adapted to move downwardly within the tubular member to overlappingsly engage the inner faces of the offset elements 26 of the projections 25 and to force the projection 24 downwardly into overlapping engagement with the inner face of the outer wall of the tubular member. It will thus be perceived that the horizontal frame members 8 will be firmly connected to the vertical frame member. However, if desired, the parts may be additionally secured by welding neighboring portions.

To connect the horizontal frame members 17 to the vertical frame members, each is provided with a plurality of projections 31 and 32 respectively forming continuations of the bottom and top walls 18 and 20. To receive these projections, the adjacent walls of the main body portion 2 of the vertical frame member is slit so as to provide bendable portions 33 which, when the projections are forced into the vertical frame member, cooperate with them in the same manner as the bendable portions 28 cooperate with the projections 24 of the frame members 8. The portions of the projections 31 and 32 which extend into the main body portion when the adjacent end of the frame member 17 is in abutting relation with the vertical frame member, are adapted to be bent downwardly into engagement with the inner face of the adjacent wall of the body portion 2 by the elongated member 7, as it is moved downwardly to force the struck up portions 6 into locking engagement with the wall boards 5.

Should it be desired to use the horizontal frame members 17 in place of the horizontal frame members 8, the locking member 29 may be dispensed with and the elongated member 7 utilized for bending the end projections downwardly. This may be accomplished, as shown in Figures 4 and 5 of the drawings, by forming the outer wall of the tubular member 4 with an opening sufficiently large to receive the entire end portion of the horizontal member 8 and by providing the inner wall of the tubular member with bendable portions 34 of the same character as the portions 33 to per-

mit the end projections 31 and 32 to extend within the main body portion 2 of the vertical frame member. Thus it will be perceived that the elongated member 7, as it is moved downwardly within the main body portion of the vertical member, will bend the portions 31 and 32 downwardly as shown in Figures 4 and 5.

The form of connection between the horizontal and vertical frame members illustrated in Figures 4 and 5 is particularly advantageous because the portion 35 of the outer wall of the tubular member 4 bounding the lower edge of the opening for receiving the frame member 8 affords a support or abutment for the frame member which is spaced inwardly from the adjacent end of the latter.

From the foregoing, it will be readily appreciated that the structural members may be fabricated in a variety of ways and that the metal shapes which form the structural members may be bent and stamped from sheet metal or drawn or rolled. Moreover, the separate metal shapes may be permanently joined where that is desired by means of welding, seaming, riveting, etc., and the various structural units may be welded together when it is desired to obtain additional rigidity.

This application is a continuation in part of my pending application Serial No. 634,089, filed September 21, 1932.

What I claim is:

1. A metallic building structure including two angularly disposed hollow structural members, one of said members having an end portion disposed in abutting relation with the other of said members and being provided with laterally spaced portions projecting beyond said end portion into the interior of the latter, said last named member having means adapted to frictionally engage at least one of said laterally spaced portions, and means movable longitudinally of and within said last named member engageable with said laterally spaced portions for rigidly connecting said members.

2. A metallic building structure including two angularly disposed structural members each having spaced walls, one of said members having an end portion disposed in abutting relation with one of said walls of the other of said members and being provided with spaced portions respectively constituting continuations of the spaced walls thereof projecting beyond said end portion through one of the walls of the latter member, said last named member having bendable means for frictionally gripping at least one of said spaced portions, and means movable longitudinally of said last named member within the space between the walls thereof engageable with said continuations of the walls of the other member for rigidly connecting said members.

3. A metallic building structure including substantially vertical and horizontal hollow structural members, said horizontal member having an end portion disposed in abutting relation with the vertical member and also having top and bottom walls respectively provided with portions projecting beyond said end portion into the interior of the vertical member, said vertical member having bendable portions for frictionally gripping said projecting portions, and means movable within said vertical member for bending said projecting portions of the horizontal member downwardly to thereby rigidly connect said members.

4. A metallic building structure including sub-

stantially vertical and horizontal hollow structural members, said horizontal member having an end portion disposed in abutting relation with the vertical member and also having side walls respectively provided with portions projecting beyond said end portion into the interior of the vertical member, said projecting portions terminating in elements projecting toward each other, and means movable within the vertical member and cooperable with said offset elements for rigidly connecting said members.

5. A metallic building structure including substantially vertical and horizontal structural members, said horizontal member having an end portion disposed in abutting relation with the vertical member and also having side walls and a bottom wall respectively provided with portions projecting beyond said end portion into the interior of the vertical member, said portions of the side walls terminating in offset elements projecting toward each other, and means movable within said vertical member for overlappingly engaging the inner faces of said offset elements and

for bending downwardly the projecting portion of the bottom wall of said horizontal member.

6. A metallic building structure including two angularly disposed structural members each having spaced walls, one of said members extending through one of the walls of the other of said members and having an end portion disposed in abutting relation with the inner face of the other wall of said member and also having bendable portions projecting beyond said end portion through the last named wall of said latter member whereby said members may be rigidly connected.

7. A metallic building structure including substantially vertical and horizontal structural members, said vertical member having spaced walls and one of said walls having an opening, said horizontal member extending through said opening into abutting relation with the inner face of the other wall of the vertical member and having portions extending through said last named wall, said portions being adapted to be bent so as to connect the members together.

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