

Sept. 3, 1935.

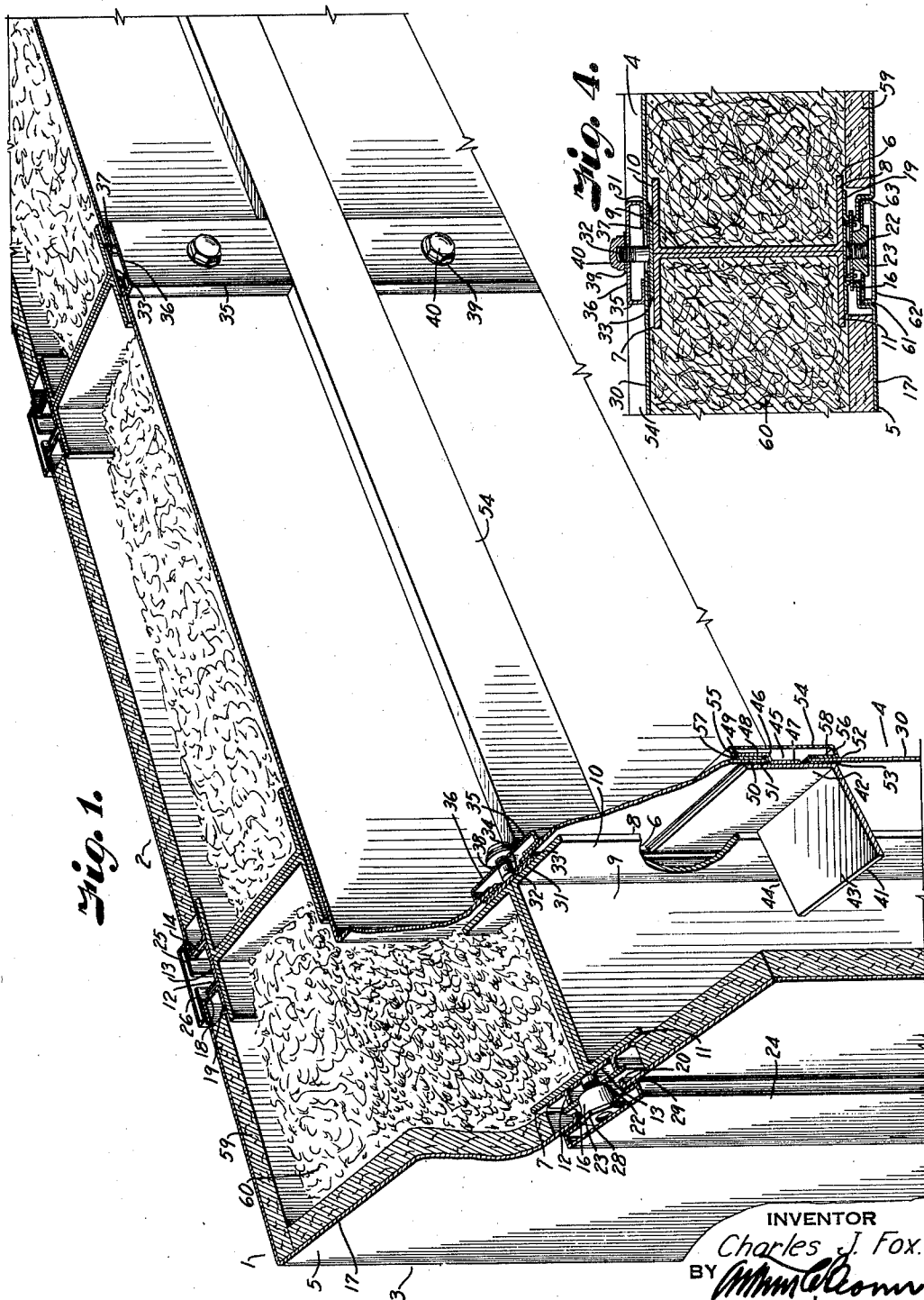
C. J. FOX

2,013,043

BUILDING CONSTRUCTION

Filed April 3, 1933

2 Sheets-Sheet 1



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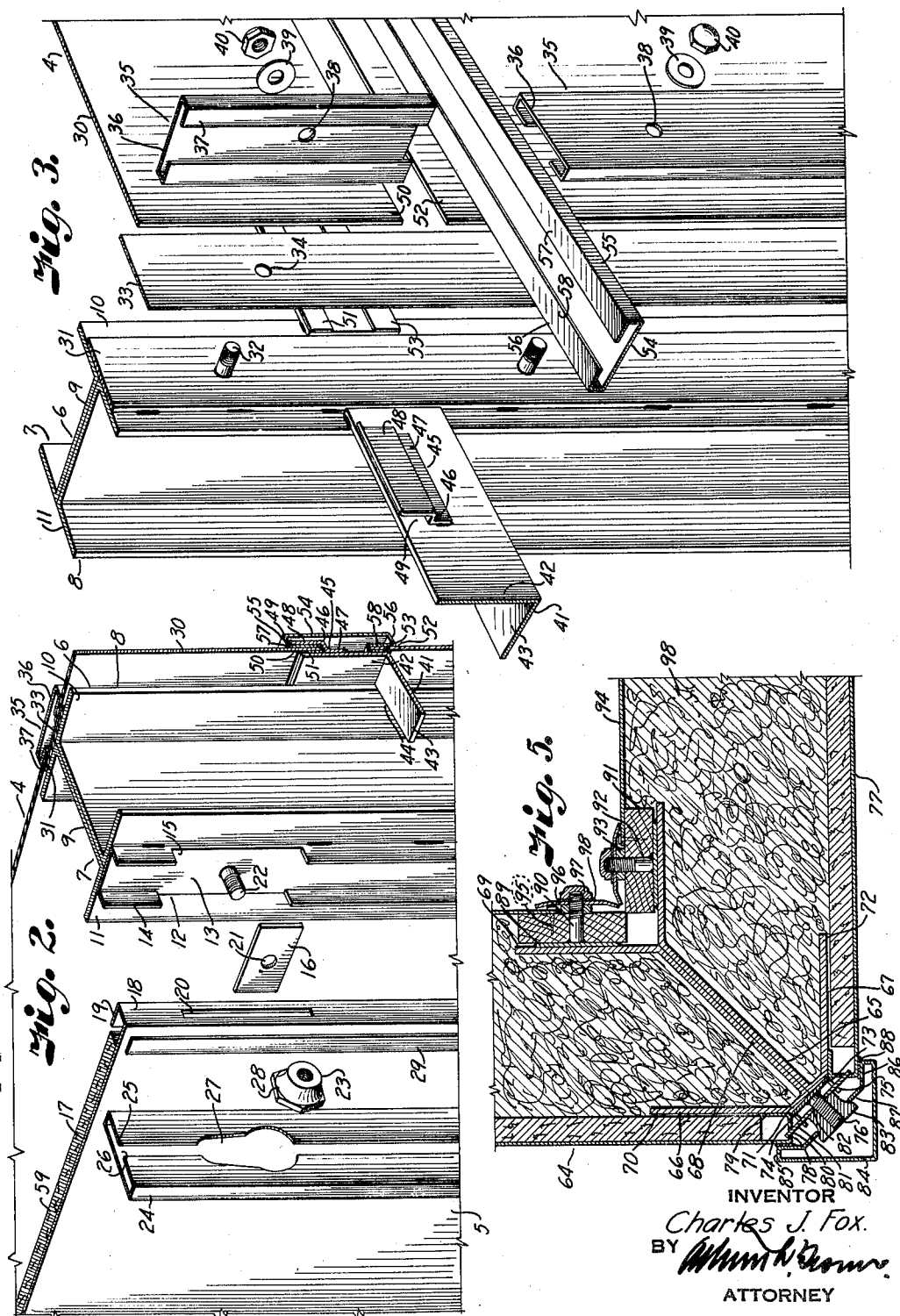
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE

2,013,043

BUILDING CONSTRUCTION

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9 Claims. (Cl. 189—34)

My invention relates to building construction and more particularly to a structure of that character wherein the walls are assembled of formed metallic material, the principal object of the invention being to provide a building structure of neat and finished appearance that is durable, rugged and readily assembled at its site from standard elements economically formed at their place of manufacture.

It is a further object of my invention to provide a building of the portable type having walls adapted to be insulated, and to be readily knocked down and reassembled on a new site at small cost.

In accomplishing these and other objects of the invention, I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a corner of a building constructed in accordance with my invention, the building wall being broken away to better illustrate the assembled relation of its exterior and interior members.

Fig. 2 is a perspective view showing an exterior wall sheet, a stud and clamping members in disassembled relation.

Fig. 3 is a perspective view wherein the interior wall sheets, stud and clamping members are shown in disassembled relation.

Fig. 4 is a cross sectional view through a modified form of wall joint.

Fig. 5 is a cross sectional view through a corner of a building illustrating a modified form of corner joint and also a modified form of anchorage for the interior wall sheets.

Referring more in detail to the drawings:

1 designates a corner of a building formed by adjacent walls 2 and 3, each consisting of interior and exterior wall portions 4 and 5 secured to and supported by vertical columns 6 of the building frame in the manner presently described.

The columns may be of any suitable construction, but preferably comprise pairs of channels 7 and 8 having webs 9 welded or otherwise secured together in facing relation to form columns of I-shaped cross section provided with interior and exterior flanges 10 and 11 for respectively supporting the interior and exterior wall portions 4 and 5.

In order to provide for anchoring the exterior wall portion to the columns a channel-shaped member 12 having a web 13 is preferably employed and secured by welding or the like to each

flange 11, and outwardly directed flanges 14 of the member 12 are provided with transversely aligned notches 15 to receive a clamping bar 16 for a purpose presently disclosed.

The exterior wall portion 5 includes metal sheets 17 having side edges extending inwardly to provide shoulders 18 for abutment against the outer edges of the channel flanges 14, and terminating in back bent portions 19 adapted to seat against the flanges 11 of the columns. As will be apparent from Fig. 1, the sheets 17 are of a width corresponding substantially to the spacing between the columns, some of the sheets being bent at right angles for closing the corners of the building.

The shoulders 18 of the metal sheets are provided with elongated slots 20 arranged to align with the notches 15 of the channels 12 so that a clamping bar 16, provided with a central aperture 21 for receiving an anchoring member such as a stud 22 welded or otherwise fixed to the web 13, may have its opposite ends inserted through the slots of adjacent sheets for anchoring the sheets firmly to the column upon threading of a nut 23 on the stud.

It is apparent that with this structure the exterior wall sheets may be clamped securely to the columns but it is desirable to close the joints of the wall to give them a finished appearance. I have, therefore, provided a sheet metal key or batten strip 24, having side edges bent inwardly and retractively to produce a form substantially rectangular in cross section, the retractively bent portions, designated 25, being preferably spaced to provide a gap or longitudinal slot 26. The portions 25 are notched as at 27, the lower part of each notch being of sufficient diameter to receive an enlarged flange 28 on the nut 23, and tapering upwardly to an opening of less width so that when the larger opening receives the flange of the nut and the key is moved downwardly it will be automatically locked to the flange of the nut.

The joint is preferably made waterproof by inserting strips 29 of waterproofing material such as tar paper between the flanges of the key and the wall sheet adjacent the shoulders.

The interior wall portion 4 includes flat metal sheets 30 having side edge portions adapted to seat against plates 31 welded to the flanges 10 of the columns, the flanges being substantially wider than the plates for a purpose presently described. The plates are further provided at vertically spaced intervals with anchoring members or studs 32 welded or otherwise secured

thereto and strips of insulating material 33, such as felt, are preferably interposed between the edges of the wall sheets and the plates with the studs extending through apertures 34 provided in said insulating strips.

In order to clamp the sheets into functional position against the columns, clamping keys 35 are provided having webs 36 terminating in inwardly and retractively bent side portions to form shoulders 37 for abutment against the wall sheets. The studs 32 are extended through openings 38 in the web 36 and washers 39 of non-abrasive material such as fibre are sleeved on the studs and are followed by nuts 40 to securely fasten the wall sheets to the columns and produce a rigid structure. It will be noted, however, that the construction of the joints permits sufficient expansion of the walls to prevent buckling there-of under temperature changes.

If the height of the room necessitates the use of two or more sheets in vertical series, horizontal joints such as illustrated in Figs. 1, 2 and 3, may be used.

Each horizontal joint preferably includes a bar 41 in the form of an angle, having a vertical flange 42 and a horizontal flange 43 extending toward the exterior of the building and notched at its ends as at 44 for engagement of the vertical flange 42 with the flange 10 of adjacent columns. It will be clear from Fig. 3 that because of the relatively narrow plates 31, a sufficient portion of the flanges 10 is available for welding the angles directly to the flanges.

Clips or brackets 45, each formed with an offset bend 46 to produce a lower leg 47 fixed as by welding to the vertical flange of the angle, further include upwardly extending legs 48 spaced from the flanges to form pockets 49 for seating the lower edges 50 of an upper series of wall sheets, strips of insulating material 51 being inserted between the wall sheets and the angle to produce a tighter joint. Upper edges 52 of a lower series of wall sheets engage the angles below the legs 46 and insulating strips are preferably inserted between the wall sheet and legs, as indicated at 53.

A horizontally extending clamping key or strip 54 of channel shape is further provided having upper and lower flanges 55 and 56 extending inwardly in back lap to form clamping flanges 57 and 58 for respective abutment against lower and upper edges of the upper and lower series of wall sheets. The flange 57 is inserted into the pocket 49 between the upper wall sheet and the legs 48 of the clips and the lower flange 58 engages the other wall sheet, thereby clamping the sheets rigidly against the angle by reason of the relatively tight fit of the flange 57 in the pocket.

The wall, constructed as above described, is particularly adapted to receive insulation. If desired, an insulating board 59 of porous material pressed into shape may be cemented to the inner faces of the exterior wall sheets before these sheets are assembled in place. After both interior and exterior wall sheets have been anchored into functional position to form a hollow wall, the space is filled with insulation 60 such as rock wool to complete a waterproof insulated wall which is durable and rugged but retains its portable qualities.

Fig. 4 illustrates a modified form of joint wherein the side edges of the wall sheets are depressed as at 61 to form a seat for a key 62 corresponding in thickness to the depth of the

depressions, thus producing a finished joint having an exposed surface flush with the exterior wall surface. Waterproofing strips 63 can likewise be inserted in this type of joint if desired.

In some buildings it is necessary to provide columns at their corners and to join the wall sheets at these corners. It may further be found desirable to nail the interior wall sheets in place. These results can be accomplished with the structure illustrated in Fig. 5, wherein 64 designates a corner of a building including a column 65 fabricated from channels 66 and 67 having abutting webs 68 and individual flanges cooperating to form interior and exterior flanges 69 and 70 of the column. The flange 70 has a central portion 71 at right angles to the column web and free edge portions 72 bent back to parallelism with the walls.

Secured to the central portion 71 of the outer flange is a channel-shaped member 73 having a web 74 connecting outwardly extending flanges 75 and carrying outwardly directed studs 76 secured by welding in a vertical median line on the web.

Exterior wall sheets 77 are provided with inwardly extending side edges to form shoulders 78 terminating in retractively bent flanges 79 adapted to seat against the edge portions 72. Formed in the shoulders of the wall sheets are slots 80 adapted to receive a clamping plate 81 having an aperture 82 for admitting one of the studs 76, a flanged nut 83 being threaded on the stud to secure the wall sheet to the column.

In order to close and seal the joint and to also provide an ornamental corner piece, a key strip 84 of triangular shape is formed of sheet metal and its outer edges are bent inwardly to provide flanges 85 terminating in retractively and angularly directed portions forming seating flanges 86. The free ends 87 of the flanges are bent parallel to the clamping bar and adapted to engage the flanged nut for securing the key in position, strips of waterproofing 88 being inserted between the seating flanges 86 and the wall sheets.

The interior flanges 69 extend from the web in alignment with their respective walls and carry flat plates 89 provided with laterally directed studs 90. Nailing strips 91 having openings 92 for receiving the studs are clamped against the plates 89 by nuts 93 threaded on the studs.

The edges of interior wall sheets 94 overlie portions of the nailing strips and are attached thereto by nails 95 which are preferably concealed by keys or strips 96 engaged by nuts 97 threaded on the studs, fibre washers 98 being interposed between the key and the nuts. The hollow wall formed by this construction may likewise be filled with insulation material, as indicated at 98.

From the foregoing the manner of assembling a wall of elements formed in accordance with my invention is believed to be clear, it being obvious that the order of assembly may be varied to suit individual conditions.

It will thus be evident that I have provided a wall structure of neat appearance that can be readily assembled at the building site from pre-formed members economically fabricated, and that the resulting wall is not only tight, durable and rugged, but is particularly adapted for receiving insulating material.

What I claim and desire to secure by Letters Patent is:

1. In a building wall, a column, an anchoring member fixed to the column and extended later-

ally therefrom, wall sheets having inturned side edge portions provided with slots, a clamping bar having opposite ends extended through the slots of adjacent wall sheets, clamping means on the anchoring member and engaging said bar for clamping the sheet edge portions against the column, and a key strip secured to the column for covering the joint between said wall sheets.

2. In a building wall, a column, a channel member fixed to the column, anchoring members fixed to the channel member and extended laterally therefrom, wall sheets having adjacent edge portions seated against the column and abutting the channel member, clamping bars engaging the anchoring members and said adjacent edge portions of the wall, and means engageable with the anchoring members and bars for clamping the wall sheets against said column.

3. In a building wall, a column, a channel member fixed to the column having side flanges directed outwardly from the column, studs fixed to said channel, wall sheets having inwardly bent edge portions provided with slots and adapted to abut said flanges of the channel member, clamping bars provided with openings for receiving said studs and having opposite ends inserted in the slots of adjacent wall sheets, and nuts threaded on the studs for moving the clamping bars toward the column to clamp the wall sheets to the column.

4. In a building wall, a column, a channel member fixed to the column having side flanges directed outwardly from the column and provided with transversely aligned notches, a stud fixed to said channel in line with the notches, wall sheets having inwardly bent edge portions provided with slots in registry with said notches, a clamping bar seatable in the notches of the channel members having opposite ends inserted in the slots of adjacent wall sheets and having an opening for receiving said stud, and a nut threaded on the stud for moving the clamping bar toward the column to clamp the wall sheets to the column.

5. In a building wall, a column, a stud fixed to said column, wall sheets having inturned edge portions provided with slots, a clamping bar having opposite ends inserted in the slots of adjacent wall sheets and having an opening for receiving the stud, a flanged nut threaded on the stud for moving the clamping bar toward the column to clamp the wall sheets against said column, and a key strip having an opening for engaging said

flanged nut to cover the joint between the adjacent wall sheets.

6. In a building wall, a column, wall sheets having adjacent slotted edge portions seated against said column, a clamp member overlying said column and having ends engaging in the slots of said edge portions, means anchoring the clamp member to the column for securing the edge portions, and a batten member covering said edge portions and secured to the anchoring means.

7. In a building wall, a column, an anchoring member carried by the column and extended therefrom, wall sheets having inturned side edge portions provided with clamp engaging portions, means on the column spacing said edge portions of the wall sheets to accommodate said anchoring member therebetween, a sheet engaging member having portions engaging said portions on said inturned side edge portions of the sheets, means located in said space and engaging the anchoring member for securing said sheet engaging member, and a batten member having support on the column independent of said sheet engaging member and covering said space.

8. In a building wall, a column, a channel member having a web portion secured to the column and flanges extending laterally of the column, anchoring members extending from the channel member in parallel relation to said flanges, wall sheets having adjacent edge portions seated against the column and abutting the flanges of the channel member to space said wall sheet, sheet engaging means on the anchoring members and engaging said adjacent edge portions of the wall sheets, means on the anchoring members to clamp said sheet engaging means, and a batten member having support on the column independent of said sheet engaging means for covering said space.

9. In a building wall, a column, a channel member secured to the column, anchoring members extending from the channel member, wall sheets having adjacent edge portions seated against the column and abutting the channel member, clamping members on the anchoring members and engaging said adjacent edge portions of the wall sheets, means engageable with the anchoring and clamping members for clamping the wall sheets to the column, and a batten strip secured over the joint formed between the wall sheets.

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