

April 13, 1937.

S. P. BROWN

2,076,877

BUILDING CONSTRUCTION

Filed March 18, 1935

2 Sheets-Sheet 1

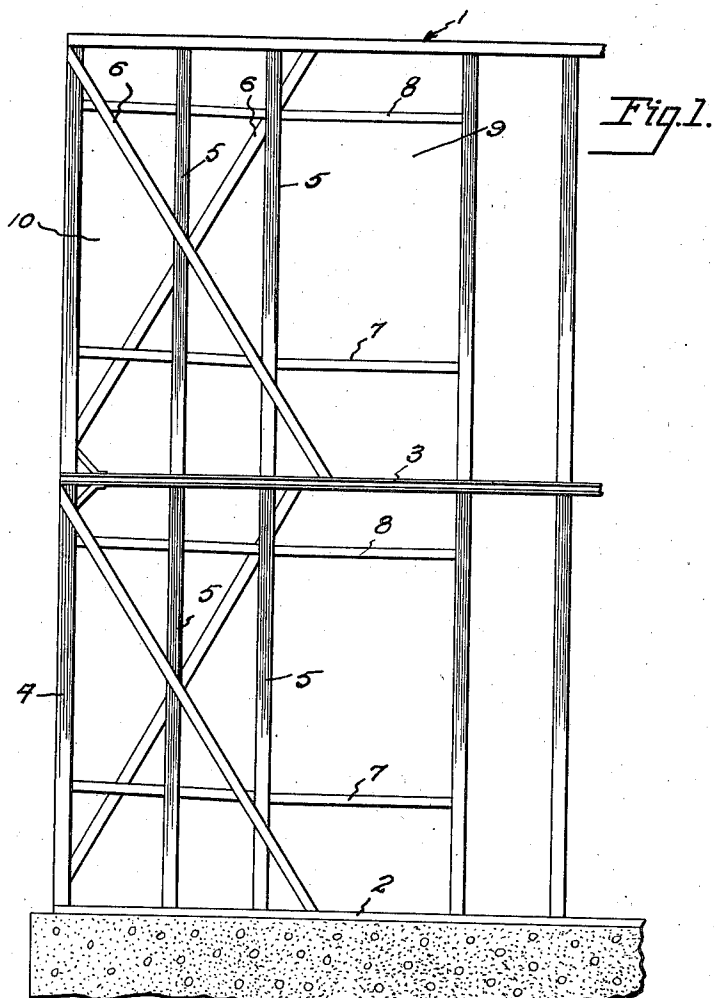


Fig. 2.

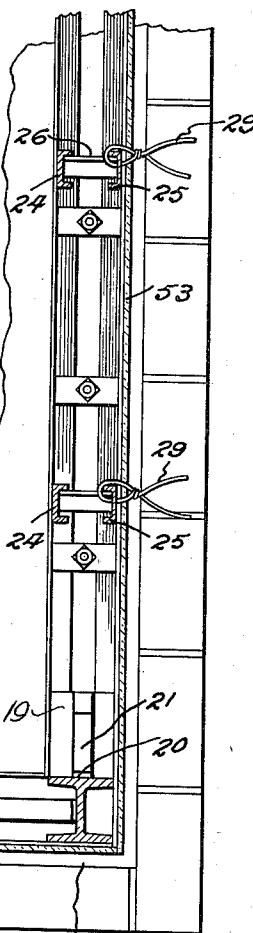
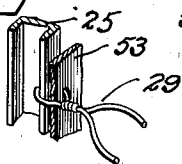


Fig. 6.



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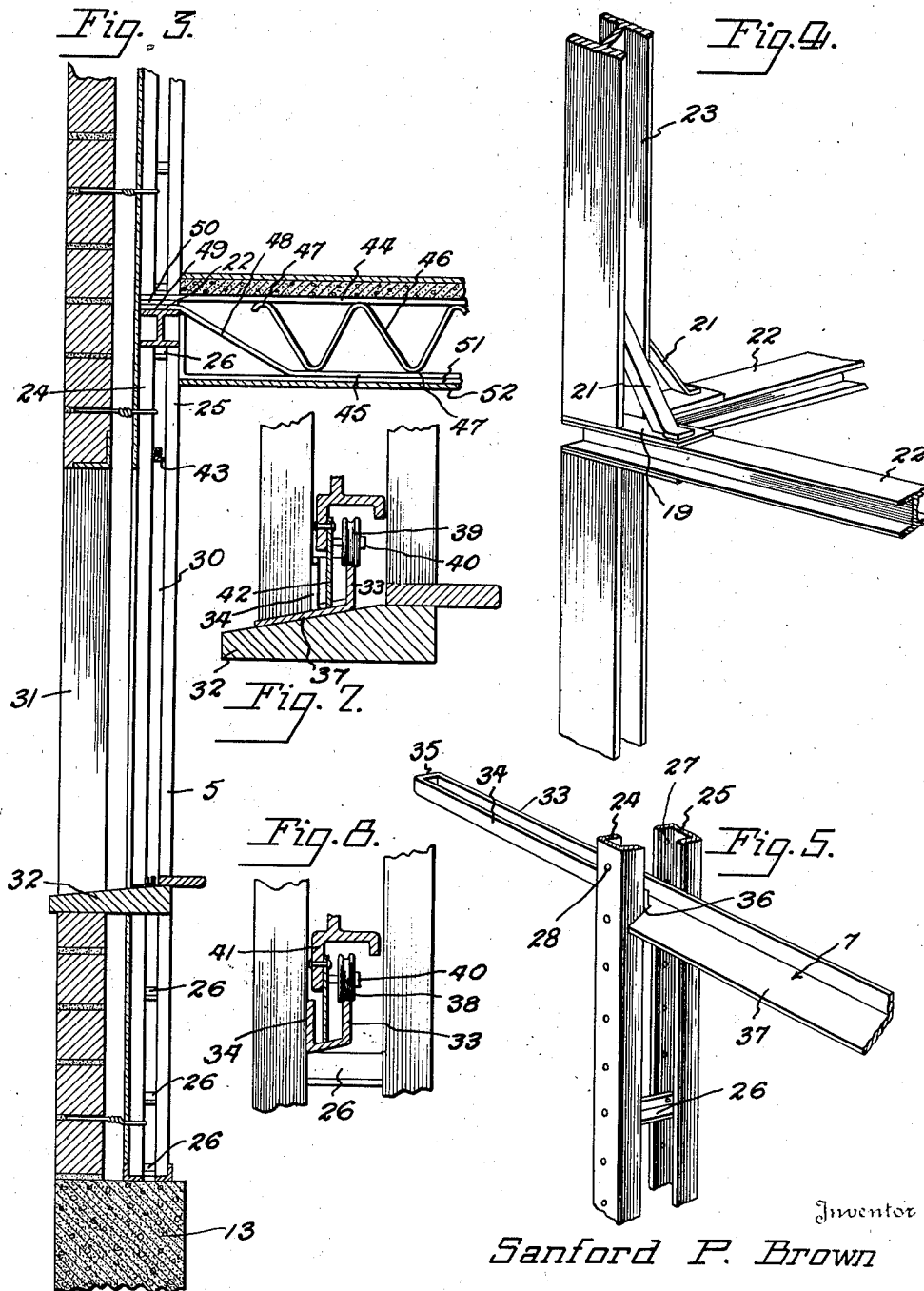
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2 Sheets-Sheet 2



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BUILDING CONSTRUCTION

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Application March 18, 1935, Serial No. 11,717

5 Claims. (Cl. 189—64)

This invention relates to building construction. It has for its general purpose the provision of fireproof structural elements adapted to be fabricated into a framework, simplified in the interest of facility in assembling, and economy of cost, but amply rigid for smaller building units such as residences.

One of the objects of the invention is to provide a simple braced construction between the vertical and horizontal steel members at the corners of the framework.

Another object of the invention is to provide light, strong and novel fabricated studding;

A further object of the invention is the provision of window and door construction in which the sash or door frame slides into the adjacent wall spaces between the inner and outer members of such studs as may intervene.

Still another object of the invention is to provide a water shedding wheel and track system in connection with the sliding sashes, extending back the requisite distance into the wall spaces.

Another object of the invention relates to a heated insulating construction in which the fabricated metallic framework of the building is sheathed with insulation sheets tied at suitable intervals direct to the studding.

A still further object of the invention is to provide a wall construction in which a brick or stucco veneer is erected in spaced relation to the heat insulated metallic frame construction and tied to the frame construction by the same means which secures the heat insulation to the frame.

Other objects of the invention will appear as the following description of a preferred and practical embodiment thereof proceeds.

In the drawings which accompany and form a part of the following specification and throughout the several figures of which the same characters of reference have been employed to designate identical parts:

Figure 1 is a view in elevation illustrating frame construction including window spaces and the wall spaces within which the sashes slide;

Figure 2 is a cross section through one corner of the frame construction;

Figure 3 is a vertical section showing details of construction;

Figure 4 is a perspective view of the corner construction above the first floor;

Figure 5 is a perspective view showing the track construction for the sliding sash and its relation to the studs in the wall space;

Figure 6 is a detail in perspective showing the

means for tying the sheets of heat insulation material to the metallic framework;

Figure 7 is a cross section through the track and lower sash frame taken along the exposed portion of the track; and

Figure 8 is a similar view taken along the concealed portion of the track.

Referring now in detail to the several figures and first adverting to Figure 1, the numeral 1 represents in general the fabricated metallic framework of a two-story building in which the numerals 2 and 3 represent horizontally positioned girders, 4 vertical corner beams, 5 metallic fabricated studs, 6 a system of diagonal bracing, the employment of which is optional, 7 and 8 lower and upper sash tracks, 9 being the window space and 10 the wall space within which the sash slides when the windows are open. It will be observed that by this construction the entire window opening is available for ventilation in contrast to the customary arrangement in which the lower sash slides over the upper sash, only one-half of the window space being open.

It will be observed that that part of the upper and lower sash tracks which are concealed within the wall spaces, are slightly inclined to facilitate the closing of the window as well as to provide drainage toward the window opening.

The details of construction will be explained by referring to the other figures of the drawings.

Referring now to Figures 2 and 3, it will be understood that the girder 2 which forms the sill of the framework is preferably composed of a pair of angle irons 11 and 12 facing one another having their horizontal flanges resting upon a concrete footing 13. The vertical flanges 14 and 15 extend upwardly. The angle irons are preferably anchored to the footing by means of clips 16 of such length as to fit width-wise within the channels formed by the pairs of angle irons which clips are apertured to extend over the ends of bolts 17 embedded in the footing and are secured by nuts 18 screwed on said bolts and bearing against said clips.

At the corners where two of the outer walls of the building construction meet, metallic plates 19 preferably L-shaped are fitted down into the channels resting upon the horizontal flanges of the angle irons and being spot welded thereto or secured in any suitable manner. These plates serve to bind the sills together at the corners and function as flat supports to receive the lower ends of the vertical corner beams 20 which as shown are preferably of H cross section. To facilitate the fabrication of the framework as

well as to simplify and cheapen the construction the H beams may be secured solely to the wings of the L plates 19 by diagonal braces 21 secured at their lower ends to said wings and at their upper ends to the web and face of the H beam respectively. The means of securing the braces in place is unimportant. It may be by means of spot welding as is indicated in the drawings or by any equivalent means.

The corners at the second floor are quite similar to the base corners excepting that the girder formed by two angle irons is substituted by a single beam of commercial cross section such for example as the I beam 22 shown in Figure 4. An L-shaped plate 19 is secured to the corner I beams 22 by spot welding or otherwise and a vertical H beam 23 stands upon this plate, being braced by the braces 21 in the same manner as at the corners on the first floor.

Figures 5 and 6 show that the vertical studs each consist of channel bars 24 and 25 having their open sides confronting one another and spaced apart, the spacing being accomplished by means of angular clips 26 bridging the space between said channel bars and being preferably bolted to the flanges of said channel bars in such manner that any one or more can be readily removed should the presence of such clips be an obstruction to the space between said channel bars. Preferably the sides of the channel bars to which the clips 26 are bolted are provided with series of perforations 27 so that the clips can be adjustably shifted higher or lower relative to the channel bars if desired.

At least one channel bar of a pair forming a stud has its web perforated by series of holes 28 through which a tie wire 29, see Figure 6 and Figure 2, may be passed for a purpose which will presently appear. The studs 5 on the first floor are secured to the angle irons 11 and 12 by means of the lowermost angle clip 26 which may be spot welded or otherwise secured to the horizontal flanges of the angle irons. The studs 5 on the second floor may be secured in the same or in an equivalent manner to the top faces of the I beams 22.

In Figure 3, the stud 5 which extends from the footing 13 to the I beam 22 which supports the second floor has the channel bars 24 and 25 bound together by a clip 26 at the top and by similar clips 26 at intervals along the lower portion, but the clips have been removed from the intermediate portion forming an unobstructed slide-way 30 communicating with the wall space 10 shown in Figure 1. So many studs are thus modified as may be necessary to make available sufficient wall space for the reception of an entire sash. The stud 5 shown in Figure 3 is adjacent the window opening 31 which opening is bounded on the bottom by a sill 32 which may be of wood, metal or concrete as may be desired. The metallic track member 7 rests upon this sill which track member was originally preferably of channel construction having inner and outer flanges 33 and 34 and an inner closed end 35. The outer flange is vertically cut adjacent the side of the window opening as shown at 36 in Figure 5, and bent out into planar relation to the bottom of the channel and in the slightly downwardly inclined position forming a ledge 37 adapted to shed water toward the outside of the sill 32. The remaining portion of the channel is left intact and is introduced into the wall space 10 and through the slide-ways 30 of the modified studs. It may be slightly bent upward as is indicated in

Figure 1 to further facilitate drainage. The inner flange 33 of the lower sash track 7 serves as a rail on which a pair of grooved wheels 38 and 39 roll, said wheels being journaled on pins 40 made integral with the downwardly extending flange 41 which forms the lower member of the sash. A piece of weather strip 42 of any suitable construction may be secured to the flange 41 and extend downwardly into contact with the bottom of the sash track 7. The upper sash track 8 is formed throughout its length as a channel extending across the upper end of the window opening and extending back into the wall space for a distance equal at least to the width of the sash. The part which extends into the wall space is angularly bent to correspond with the angular deflection of the lower sash track, so that the two sash tracks everywhere are parallel.

It is of course not essential that there be wheels sliding in the upper sash track. The upper sash member is preferably provided with a rib or flange 43 which extends within the channel of the upper sash track. It is obvious that when the sash is closed, rain impinging upon it and running down the lower sash track is readily shed by the ledge 37, and if the sash should be slid into the wall space while it is wet and dripping, the water will be collected in the inclined channel within the wall space and drained outwardly on to the external ledge 37.

Figure 3 shows a cheap and efficient joist construction which may be employed for the support of the floors of the building. It includes upper and lower metal plates 44 and 45 spaced depthwise and being joined by a sinuous metal sheet 46 spot welded or otherwise united to the upper and lower plates along its apices 47. According to the physical laws which control the binding stresses in a horizontal member, it is unnecessary that the joist be as deep toward the ends as it is at the center, consequently, the lower plate 47 is preferably bent upwardly as at 48 and having its terminal portion 49 brought into parallel relation with the terminal portion of the upper plate 44, a reinforcing plate 50 intervening. The shallow ends of the joist are supported upon the I beams 22.

In Figure 3, the reference characters 51 and 52 represent a lath and plaster ceiling applied beneath the joist and which does not constitute an essential part of the invention.

The fabricated steel structure illustrated in Figure 1 and in detail in the other figures may be heat insulated in both directions by the provision of heat insulation 53. This may be of any known character, but is preferably bright aluminum or cardboard plated on its opposite sides with aluminum foil. The sheets are placed directly against the frame as shown and tied thereto by wires 29 passed through one of the apertures 28 in the outer channel member of the studs and through a hole in the insulation sheet, the wire being twisted together.

The building structure may be finished by a brick veneer 54 spaced from the sheet insulation to form a dead air space 55, and the brick veneer is bonded to the steel skeletal structure by embedding the free ends 56 of the tie wires 29 in the mortar joints.

It will appear to those skilled in the art that in the construction as above described, I have disclosed metallic framework units which can be fabricated at the factory and installed on the job with less cost and greater facility than structural

steel units as heretofore known and described; that I have provided studding capable of adjustment and modification to suit conditions arising on the job, that I have disclosed novel window and door construction and means capable of standardization for adapting the sliding sash principle to any building with hollow walls; that I have disclosed a cheap and efficient means for erecting a heat insulated metallic building of light construction such as is especially adapted for residences; and that I have shown means for employing a common tie for binding the brick or stucco veneer and the heat insulation to the framework of the building, all of which features and such variations and modifications as may be regarded as equivalent thereto are to be considered within the scope of my invention as claimed.

What I claim is:

1. Building construction comprising a framework having inner and outer surfaces adapted to be covered defining a wall space, studding comprising channel members arranged in pairs with the channels facing and spaced apart, positioned in said wall space having the unobstructed space between their channel bar elements adjusted to a length sufficient to permit a sash to pass between said elements, and a sash adapted to slide within said wall space between the channel bar elements of said studding.

2. Building construction comprising a framework having inner and outer surfaces adapted to be covered defining a wall space, having a window opening communicating with said wall space, studding vertically positioned in said wall space comprising spaced channel members having the space between the channel members adjusted as to length so as to receive a sash, a sill in said window opening, a track seated on the sill and extending through said space between the channel bars of said studding, the portion of said track

within said wall space being in the form of an upwardly open channel with closed inner end, the portion of said track on the sill being in the form of an angle bar with a water shedding lower flange, said track having a vertical flange, and a sash element having a roller adapted to ride on said vertical flange to facilitate sliding said sash through the space between the channel bar elements of said studding.

3. Track device for laterally sliding sashes of that type which when open are adapted to be concealed in an adjacent wall space, said track device including an upwardly open channel having a closed inner end and having the flange on one side bent down to form a water shedding incline through that portion of said track device which will be exposed outside of the wall space, the opposite flange remaining intact and vertical affording a rail for a sash roller.

4. Track device as claimed in claim 3, in combination with a sash element having a roller cooperating with said intact flange, and a weather strip depending from said sash element into contact with the bottom of said channel.

5. In wall structure, metallic studding comprising a pair of parallel channel bars with their open sides confronting and spaced apart, plates having bolt holes, bridging the spaces between said channel bars contacting the adjacent flanges of said bars, said flanges being provided with correspondingly placed perforations at longitudinal intervals into alignment with which the holes in said plates are adapted to be brought by selective shifting of said plates longitudinally, for determining the length of the unobstructed space between said channel bars and means for securing said plates in an adjusted position for bonding said channel bars together, in combination with a sash adapted to slide in said wall space.

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