May 11, 1937. L. W. RAY 2,080,230

BUILDING STRUCTURE

Filed July 20, 1934 2 Sheets-Sheet 1

Fig 1

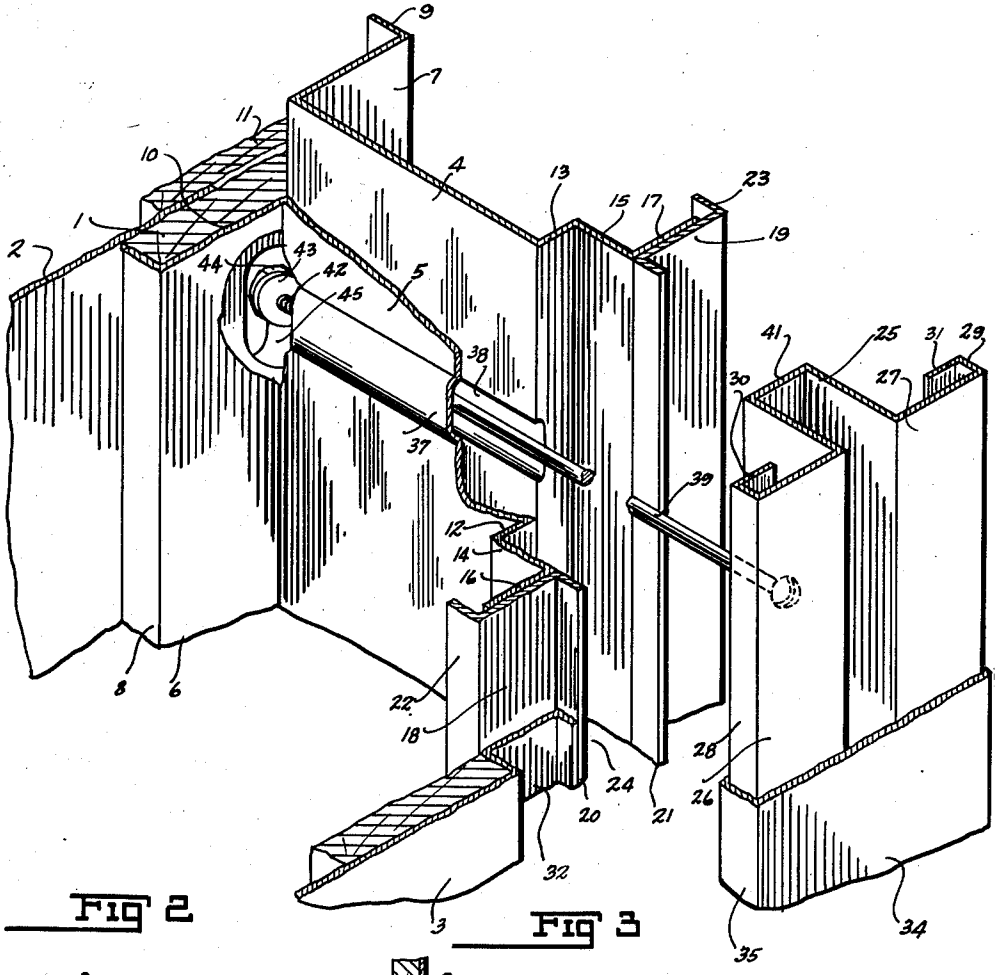


Fig 2

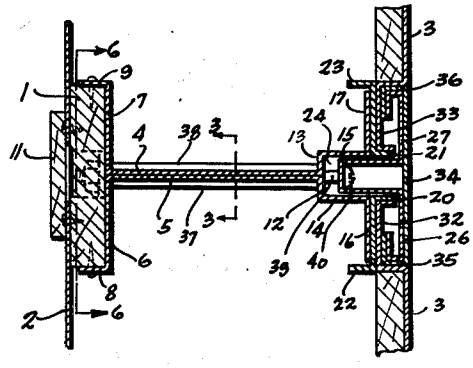
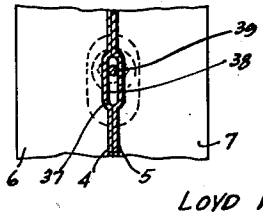


Fig 3



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Filed July 20, 1934 2 Sheets-Sheet 2

Fig 4

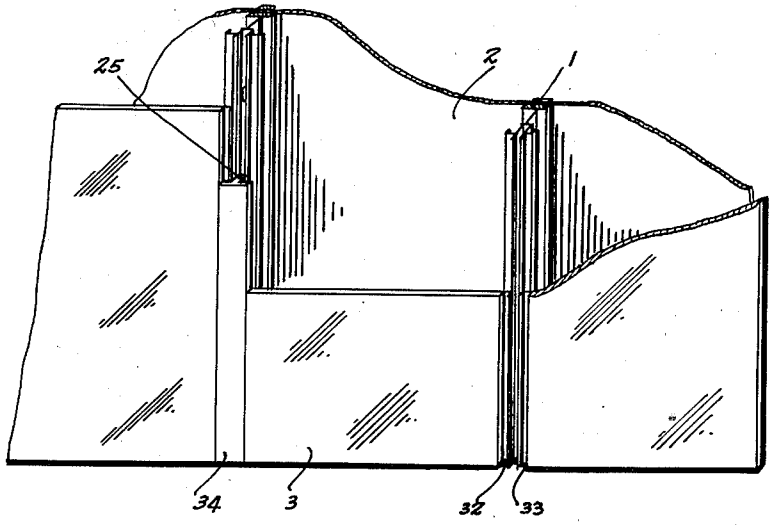


Fig 5

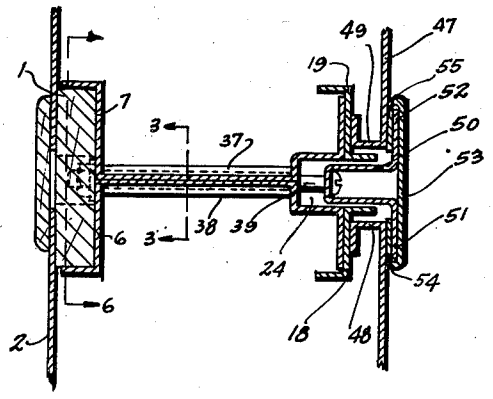
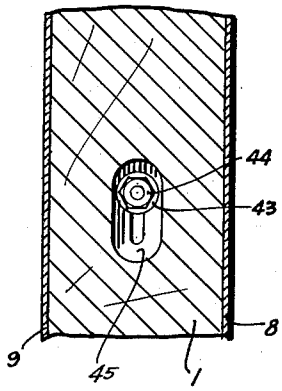


Fig 6



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Patented May 11, 1937 2,080,230

UNITED STATES PATENT OFFICE

2,080,230

BUILDING STRUCTURE

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Application July 20, 1934, Serial No. 736,169

5 Claims. (Cl. 189—34)

This invention relates to building structures and has special reference to metallic building structures characterized by a facility and rapidity of erection and dismantling, the construction being of the sectional panel type and the various parts thereof being standardized and interchangeable.

More particularly, this invention has reference to a building structure comprising a metallic frame including vertical members having webs with flanges at the edges thereof to provide wall clamp receiving portions for receiving outer wall panels and to provide channels for receiving nailing strips for receiving inside wall panels, the nailing strips being thicker than the depth of the channels to prevent direct contact of said inside wall panels and said support. Further, the present invention contemplates the provision of longitudinally elongated slots extending the width of the vertical members to provide bolt receiving slots to accommodate adjustments, expansion and contraction and settling, if any, of the elements of the construction and to facilitate manufacturing, assembly and disassembly thereof.

It has been further desirable in metal building structures to provide means for fastening the outside wall panels and the inside wall panels so that the structure may be fabricated at a central plant and can be conveniently set up whenever desired without the necessity of cutting and fitting at the place of installation. The present invention contemplates the above provision as well as the provision of means whereby the building can be dismantled and reassembled whenever desired. For example, in very valuable property where buildings have been torn down it has been found desirable to utilize the space pending the building of a permanent structure as parking lots for automobiles and for like purposes. Permanent buildings cannot be installed for the convenience of attendants at these parking areas and it is desirable to install a building of more or less permanent character, yet which may be dismantled when desired and moved to a new location.

Further, it is necessary and desirable at times in the instance where the building structure of this invention is used as a permanent structure to remove outside wall sections for inspection or repair or to substitute new sections. The present invention contemplates the provision of means whereby the outside wall panels or sections can be removed and new ones substituted without materially disturbing the inner wall structure.

The construction herein described has the advantage of permanence in character, yet has likewise the advantages flowing from structures of the knock-down type. Since the buildings may be of permanent character and used throughout the year under all weather conditions, it is further desirable because of the elements being formed of metal to break the frost line which in the usual type of construction appears on the inner wall panels. A nailing strip is provided in the channel formed by the flanges of one end of the webs, the nailing strip being preferably of wood or plastic or fibrous materials for securing the panels nailed thereto and being thicker than the depth of the channels to prevent direct contact of the inside wall panels and the upright supports. The outside wall panel and the intermediate vertical metallic wall support therefor does not contact with the inside wall panel excepting through the wooden nailing strip and in such a construction the frost line is broken thereat.

One of the objects of this invention is to provide a building structure of the type indicated above in which the frost line from the outer wall panels is broken and therefore is not conducted to the inner wall panels.

Another object of this invention is to provide a studding for buildings of the character noted above in which registering offset elongated portions extending the width of the webs of the studding cooperate to provide bolt receiving slots to accommodate expansion and contraction of the elements of the building and to facilitate assembly and disassembly thereof.

A still further object of this invention is to provide a building structure as hereinbefore described in which the wall clamp may be removed by releasing the nut from the bolt securing the inner and outer wall panels together to permit the wall clamp for the outer wall to be detached without disturbing the inner panels of the building.

Other objects and advantages will hereinafter be more particularly pointed out and for a more complete understanding of the characteristic features of this invention, reference may now be had to the following description when taken together with the accompanying drawings, in which latter:

Figure 1 is a fragmentary perspective view partially in section of a construction embodying

the feature of this invention, a portion of the structure being detached;

Fig. 2 is a plan sectional view of the construction shown in Figure 1 with the portions in an assembled relation;

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary front elevational view of the assembled construction of Fig. 1 as embodied in this invention;

Fig. 5 is a plan sectional view similar to Fig. 2 of a modified form of this invention; and

Fig. 6 is a vertical sectional view taken on the line 6—6 of Fig. 2.

Referring now to the drawings and more particularly to Figs. 1 to 4 and 6, inclusive, thereof, the device of this invention is shown as comprising an anchor or nailing strip 1 preferably formed of wood or some composition or fibrous material to which may be nailed or otherwise secured inside wall panels 2. The wall panels 2 are preferably of metal or tile and may be provided in the form of sheets of standardized size and shape. The same is true of the outside panels 3 which may likewise be formed in sheets of various sizes and configurations, although standardized as to form so that they may be interchangeable to facilitate erection and dismantling.

The inside and outside panels 2 and 3 are secured to studding disposed therebetween, the studding being formed by two channel-shaped members, the intermediate web portions 4 and 5 of which may be preferably secured together by spot welding or other suitable means. The two web portions are bent outwardly at their outer edges as indicated at 6 and 7 to provide flanges, the flanges having right-angularly projecting lips 8 and 9 to embrace the anchor or nailing strip 1 in the recess or channel 10 formed by the lips. The thickness of the nailing strip 1 is preferably greater than the depth of the channel 10 in order that there may be space between the projecting lips 8 and 9 and the inside panels 2 so that the frost line from the outside panel and the intermediate metallic studding may terminate at the nailing strip.

The anchor strip is held in the channel by any suitable means and the side wall panels 2 may be fastened thereto as likewise may an inner wall finishing strip 11 by any suitable fastening devices such as screws or nails. The inside wall panels 2 are preferably separated a substantial distance and the finishing strip overlaps the edges of the wall panels.

The outer edges of the webs 4 and 5 are bent outwardly as at 12 and 13 and then forwardly as at 14 and 15 and again outwardly as indicated at 16 and 17. Z-shaped angle strips 18 and 19 of the usual commercial form are fastened preferably to the flanges 16 and 17. Flanges 20 and 21 of the members 18 and 19 project outwardly and are preferably in alignment with the webs 14 and 15 and the flanges 22 and 23 project rearwardly.

A space 24 is formed by the outer portion of the studding and the Z-angle strips for receiving a clamping strip constituting an elongated sheet 25 bent in substantial U-shape in cross-section to have outwardly projecting flanges 26 and 27 with rearwardly extending webs 28 and 29 terminating in inturned lips 30 and 31 extending substantially parallel with the flanges 26 and 27. The clamping strip carries a finishing strip 34, the latter having ends 35 and 36 or overlapping the edges of the clamping strip as shown in Figs. 1 and 2 so that the ends may clamp the parts 32 and 33 of the outside panels 3 against the Z-angle strips.

It will be noted that the clamping strips are located between the vertical edges of the panels 3 so that the strips extend the height of the wall to permit a tight joint to be made between the edges of the outer panels.

The webs 4 and 5 are provided preferably with offset portions 37 and 38 which register with each other to provide a relatively wide elongated slot between the web portions. The slot thus provided receives an elongated bolt 39, the head of which rests against the wall 41 of the U-shaped member 25 and the threaded end 42 of which passes through a washer 43 which latter bears against the edge of the web. The threaded end receives a nut 44 in an elongated recess 45 of the nailing strip 1. Any number of slots or channels may be formed in the studding and a corresponding number of bolts may be used to draw the clamping strip into clamping position before the finishing strip 11 is secured in place.

It is desirable to have the slot in the web relatively wide, that is, longitudinally of the vertically extending studding to provide for manufacturing ease, speed and cheapness, and facilitating erection. By this means exactness of manufacture in the spacing or length of the offset portions which register to form the bolt slots is not required, nor their exact registration in assembling the two halves to form the complete studding. It is not necessary exactly to space the bolt holes in the anchor strips when such elongated slots are provided in the studding, and the bolts may be placed in position in such strips in the plan ready for use on the erection job. All of this materially reduces the cost of manufacture and speeds up production. In erecting the building it is often necessary to set the anchor strips on top of a porcelain base panel and/or end the same against a coping panel, and if, as frequently happens, there is some inaccuracy in the edge of either the base panel or the coping, the anchor strip must be adjusted longitudinally to take care of these inaccuracies. The elongated holes readily permit this to be done. The slots also provide for such expansion, contraction and settling as may occur so that the bolt may be easily inserted and so that the assembly and disassembly of the building may be facilitated.

When the parts are assembled as described and as illlustrated in Fig. 2 and it is desired to remove an outside panel or panels, it is only necessary to remove the finishing strip 11, unscrew the nut 44, take out the clamping strip and remove the outer panel or panels. This facilitates the inspection and repair of the outside wall as well as assists in the ease and operation of disassembling the building after it has been once set up.

Referring now more particularly to Fig. 5, a modified form of this invention is shown in which the outside wall sections 46 and 47 have channel-shaped ends 48 and 49, which latter are clamped against the edge of the Z-shaped members 18 and 19 by a slightly modified form of anchor strip. In this form the anchor strip 50 is provided with right angular flanges 51 and 52 corresponding with the flanges 26 and 27 in Fig. 1, but the edges are not turned back. The outside finishing strip 53 has its edges 54 and 55 bent around the flanges 51 and 52 as indicated, so that when the parts are assembled the finishing strip 53 is offset slightly from the outer wall of the building to provide a vertical bead. In other respects the

construction in Fig. 5 conforms to the construction shown in Figs. 1, 2 and 3.

While but two forms of this invention are herein shown and described, it is to be understood that various modifications thereof may be apparent to those skilled in the art without departing from the spirit and scope of this invention and, therefore, the same are only to be limited by the scope of the prior art and the appended claims.

I claim:

1. A studding for buildings comprising vertical members including webs with flanges at the edges thereof, said webs being secured together and said flanges cooperating to provide nailing strip engaging portions and wall clamp receiving portions, and registering offset portions extending the width of said webs and cooperating to provide bolt receiving slots, said offset portions being of substantially greater depth longitudinally of the channel than the width to facilitate manufacture, assembly and erection.

2. A building structure comprising a frame including an intermediate portion having a transverse opening therethrough, a recessed nailing strip on the inner edge of said intermediate portion for supporting inner wall panels, a wall clamp engaging means on the outer edge of said intermediate portion for supporting outer wall panels, a bolt in said opening securing said wall clamp engaging means and extending beyond the end of said opening into said nailing strip, and a nut for the nailing strip end of said bolt receivable in one of said recesses of said nailing strip the adjacent side edge portions of the inner wall panels being laterally spaced from the nut, whereby said wall clamp may be removed by releasing said nut from said bolt to permit said wall clamp to be detached without disturbing the inner panels of said building.

3. A metallic building structure comprising studding including webs with flanges at the edges thereof co-operating to provide nailing strip engaging portions and wall panel clamping or anchor strip receiving portions, clamping or anchor strips in the latter, clamping bolts longitudinally spaced throughout the clamping or anchor strips and passing through longitudinal slots in the studding members and from edge to edge of the webs of said members to secure said strips in clamping or anchoring positions, said slots providing for longitudinal adjustments of said clamping or anchor strips.

4. A building structure comprising a frame including intermediate portions having transverse openings therethrough, recessed nailing strips on the inner edges of said intermediate portions for supporting inner wall panels, wall clamp engaging means on the outer edges of said intermediate portions for supporting outer wall panels, bolts in said openings securing said wall clamp engaging means and extending beyond the ends of said openings into said nailing strips, and nuts for the nailing strip ends of said bolts receivable in the said recesses of said nailing strips and accessible through the said inner wall panels, whereby said wall clamps may be removed by releasing said nuts from said bolts to permit said wall clamps to be released without disturbing the inner panels of said building.

5. A building structure comprising inner and outer wall panels, a metallic stud between said inner and outer panels, means for clamping the outer panels to said stud, a non-metallic member for supporting the inner panels spaced from said metallic stud, and means accessible between the adjacent edges of said inner panels to operate said clamping means.

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