June 18, 1940. W. S. RUGG ET AL 2,205,109

BUILDING

Original Filed May 8, 1937 2 Sheets-Sheet 1

Fig. 2.

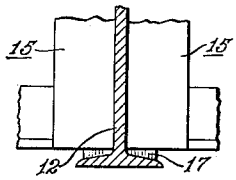


Fig. 1.

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Original Filed May 8, 1937 2 Sheets-Sheet 2

Fig. 3.

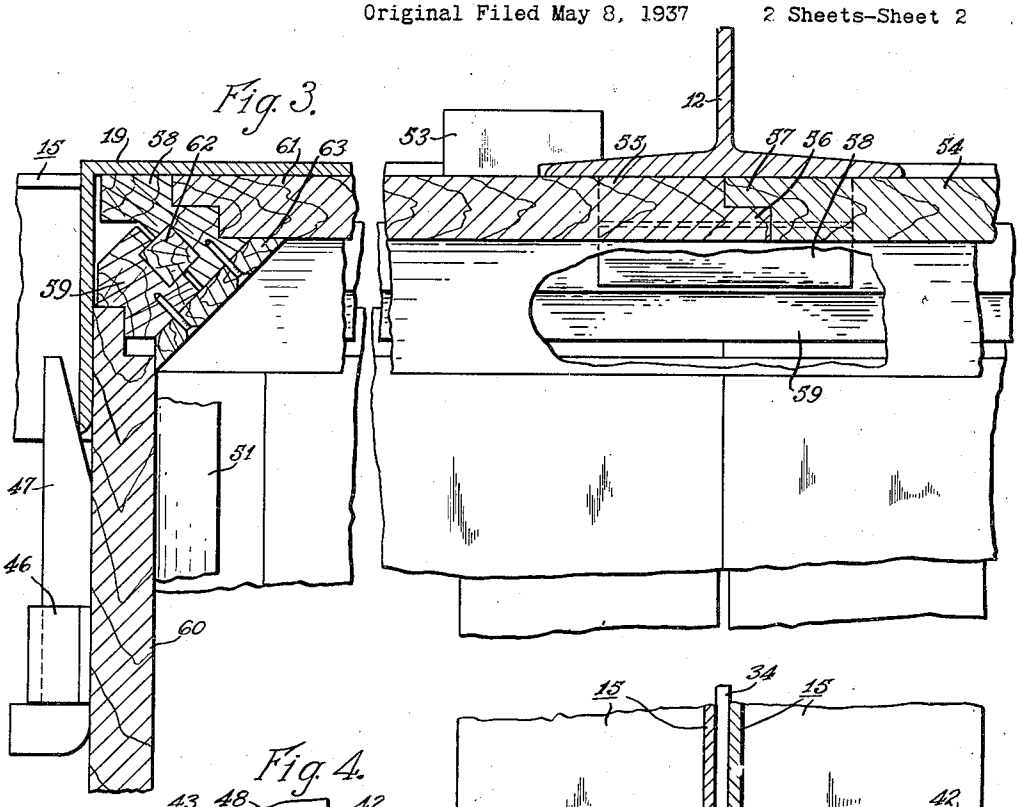


Fig. 4.

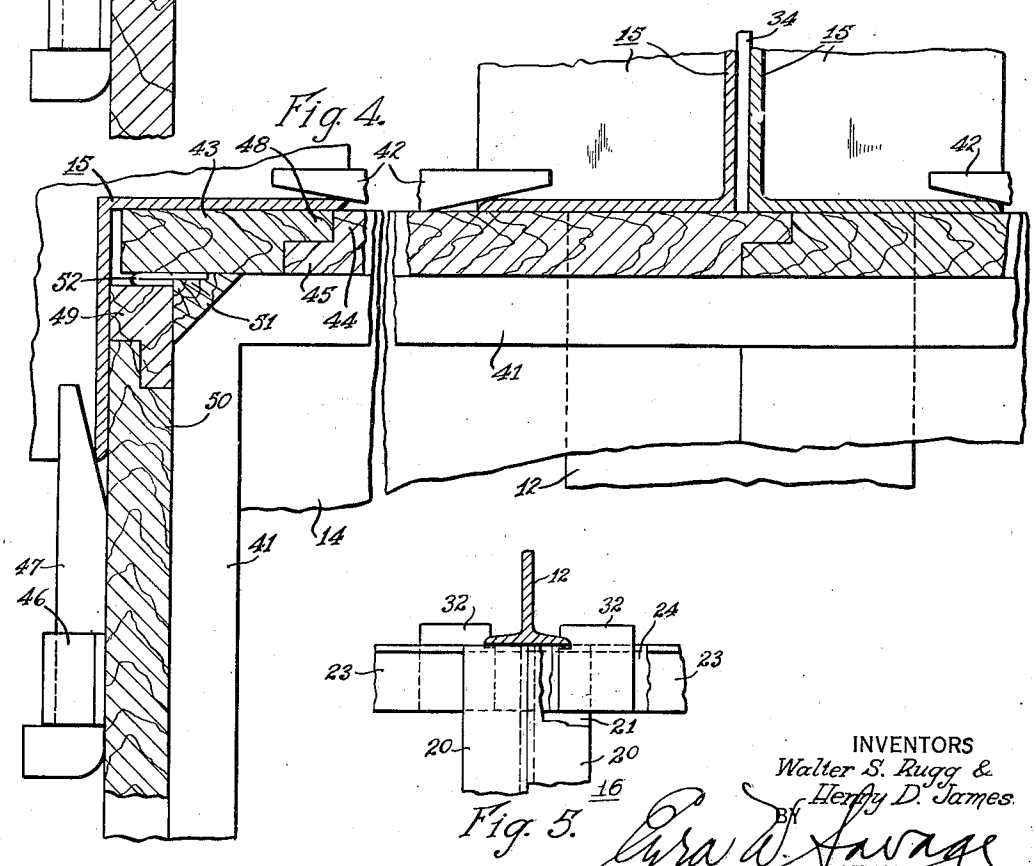


Fig. 5.

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UNITED STATES PATENT OFFICE

2,205,109

BUILDING

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Original application May 8, 1937, Serial No. 141,438. Divided and this application November 30, 1937, Serial No. 177,262

7 Claims. (Cl. 20—1)

This application is a division of application Serial No. 141,438, filed May 8, 1937 for Building units and buildings.

The invention relates to standardized building units and buildings erected by an assembly of such building units.

Heretofore many proposals have been made for speeding the erection of buildings, but usually the result has been a factory made frame to which the well known building materials are attached in the usual manner. The buildings erected in this way were permanent until their purpose had been served and the wreckers arrived.

The object of the invention is to provide standardized building units that may be utilized in erecting a building of substantially any predetermined rectangular shape and size.

A further object of the invention is to provide standardized building units that may be utilized with great facility in erecting a building and which may be removed from the building with equal facility without damage to the members, making it possible to use them in the same structure on another site or in another structure.

Other objects of the invention will, in part, be obvious and, in part, appear hereinafter.

The invention accordingly is disclosed in the accompanying drawings and comprises the features of construction, combination of elements, and arrangement of parts which will be exemplified in the structure hereinafter set forth and the scope of which will be indicated in the claims.

For a fuller understanding of the objects of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a view, partly in elevation and partly in perspective, showing a portion of a building embodying the features of this invention.

Fig. 2 is a view, partly in section and partly in side elevation, showing how the frames for the side walls are mounted on the cross beams of any floor.

Fig. 3 is a view in vertical section through a portion of a room showing how the inside finish wall and ceiling are held in position and how the corners are finished.

Fig. 4 is a view in transverse section of a portion of a room showing how the walls are held in position and how the corners are finished.

Fig. 5 is a view, partly in section and partly in side elevation, with portions broken away to show how a partition may be run transversely of the beams for the making of a room.

Referring now to the drawings and Fig. 1 in particular, a plurality of girts 10 are provided for carrying a floor and wall structure. The girts 10 may be mounted on any suitable foundation (not shown) since this is common practice in the art. The girts in this particular embodiment of the invention are I-beams, the size of which will depend on the conditions to be met in the building to be erected.

The floor structure 11 is carried by the girts. As illustrated, the floor structure 11 comprises a plurality of I-beams 12 which extend from girt to girt and a plurality of short I-beams 13 extending from a side girt to a beam. In this particular floor structure the beams 12 and 13 are I-beams with a portion of the upper flange cut away at the ends forming a T-part, the function of which will appear hereinafter. The beams 12 and 13 will be designed especially for the conditions under which they are to be utilized as in the case of the girts.

A plurality of floor sections 14 are disposed on the beams 12 and 13 as shown in Fig. 1. The construction of the floor section may vary greatly depending upon the conditions to be met. The particular floor sections illustrated comprise bottom and top layers with insulation between the layers. One type of floor unit that has been found to be quite satisfactory embodies top and bottom layers of Masonite with a suitable insulating material such as cork interposed between the Masonite layers and the whole glued into a solid mass. However, many other different types of floors may be used successfully.

In the design of a building, standard outside wall frames 15 of any predetermined size and standard partition frames 16 of some suitable size selected to meet the requirements for strength are utilized. The size of the partition frames 16 and the outside wall frames will be so related to one another as to facilitate erection. A standard of measurement for relating the frames can readily be determined by an architect or fabricator of such frames.

The manner of mounting the frames 15 on the I-beams 12 is best shown in Fig. 2. As illustrated, the lower flange of I-beams 12 slopes downwardly as it extends outwardly from the web 12. In order to give the lower edges of the frames a proper bearing surface, wedges 17, lower faces of which conform in shape generally to the web of the I-beam, are disposed below the frames. These wedges are preferably made of steel.

The outside wall frames may be fabricated in any suitable manner well known in the steel in-

dustry. Frames found to be satisfactory have been fabricated from two-inch angle bars which are welded together at the joints. A detailed description of the frame is not necessary, since it is clearly illustrated in Fig. 1 and may be made of suitable dimensions in accordance with the well-known practice of the art. The partition frames may be fabricated in the same manner.

Referring now to Fig. 5, the partitions 16 are made in complementary halves, that is, the half 20 is the complement of the half 21, and when the two are tied together as illustrated they make up a partition of predetermined thickness. For most purposes, the partitions will be made about four inches thick. The complementary halves of the partition frame are made from angle members in any well known manner such as by welding the angle members together to give a frame structure of any predetermined size.

As shown in Fig. 5, the portion 20 of the partition frame 16 is provided with inwardly extending angle plates 23, disposed at the top and bottom. The portion 21 of the frame is provided with top and bottom angle plates 24 similar in shape to the angle plates 23 carried by the portion 20. When the partition frames are constructed in this manner, they may be readily secured to any I-beams such as 12.

The material employed for the finishing of the inside of the building will be selected to meet the purposes for which the building has been erected. For houses a very satisfactory finish is the well known plywood. In preparing the plywood for mounting, it will be made in sections 40 which will be predetermined to fit the frame structure. In the frame structure described as an embodiment of this invention, the room height will be about 8 feet. This necessitates the making of the inside-wall finish-sections 40 somewhat shorter than the building units 33. Further, the overall height of the three wall sections applied to the inside of one wall frame will be reduced by the depth of the baseboard 41. The width of the inside finish section 40 will be designed to give a symmetrical appearance.

In order to provide for mounting the wall finish sections with facility, they are provided with cleats 42 which engage the angle members of the wall frames 15 as best shown in Fig. 4. These cleats 42 may be of any suitable material and are wedge shaped so that, if they do not fit exactly, they may be forced a short distance to give a tight fit. By the proper locating of the cleats 42, provision may be made for mounting the finish sections 40 even if they do not conform in width to the frames 15.

The keys 47 may be inserted into the stirrups 46 as the finish sections 50 are applied from the bottom upwardly. The last key may be inserted by gaining access through the open top of the frame as will readily be seen by reference to Fig. 1.

Referring now to Fig. 4, assuming that the wall section 43 is placed in position in the first corner, then when the finish section 44 is placed in position the tongue 45 overlaps the tongue 48 of the unit 43. The cleat 42 carried by the wall finish section 44 engages the angle member of the wall frame 15 and locks the outer edge of the finish section 43 in position. The next finish section mounted will engage the outer edge of the finish section 44 and the cleat carried by it will engage the angle member of the frame 15, and thus the finish unit 44 will be retained in position. In this manner all the finish units except the last one may be held in position. At the next corner the finish sections 50 may be provided with stirrups 46 and keys 47 for attaching the sections to the wall frames.

At the corner a strip such as 49 is provided which is a width slightly less than the space to be filled. It is pressed into position to engage the tongue provided on the finish section 50. Then a corner finish strip 51 carrying a spring member 52 is pressed into position.

As shown, the spring member 52 is attached to the corner finish strip 51 by countersinking and nailing. When the corner finish strip is mounted, it fits tightly against the finish strips of the meeting walls. It therefore gives a finished appearance.

It will be readily appreciated that if desired beading may be mounted over the joints of the finish sections. However, this will be a matter of choice and is not a part of this invention. When plywood is employed, the finish may be improved by staining or painting.

The problem of mounting the ceiling is much the same as the mounting of the side walls. The ceiling finish is prepared in sections and will be designed to conform to the frame structure. The ceiling sections are provided with cleats 53 shaped to engage the flanges of the I-beams. Assuming that the section 54 has been mounted by hooking its cleat 53 to a flange of an I-beam, then a ceiling section 55 having a tongue 56 which engages the tongue 57 provided on the section 54 is pressed into position as illustrated, the cleats 53 engaging the flange of the I-beam 12. Thus one edge of the finish section is held in position by means of its cleat 53 while the other edge is engaged by the next adjacent ceiling section and so all the units are locked to the ceiling frame structure.

At the corners blocks 58 and 59 which loosely fit between the wall section 60 and the ceiling section 61 are provided. These blocks are stepped to engage the tongues provided on the wall and ceiling finish sections 60 and 61. A wedge 62 is driven between the blocks 58 and 59 spreading them to tightly press the wall and ceiling sections 60 and 61 into position.

After all the blocks have been mounted and wedged apart as illustrated, a finish strip 63 is nailed to the blocks. In this particular illustration of the invention a plain strip nailed to the blocks with finish nails is provided. If desired, the ornamental finish strip may be employed.

Since certain changes may be made in the above construction, and different embodiments of the invention may be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim as our invention:

1. In a building structure, in combination, a foundation, a frame carried by the foundation, a beam structure carried by the frame, a ceiling finish suspended from the beam structure, a wall finish carried by the frame, the ceiling finish extending within a predetermined distance of the wall and the wall finish extending within a predetermined distance of the ceiling, blocks disposed between the wall and ceiling, tightening means disposed between the blocks for spreading them to firmly retain the engaged edges of the

ceiling finish and the wall finish in position, and a trim disposed between the ceiling and wall, said trim serving to unite the wall and ceiling to present a good appearance.

2. In a building structure, in combination, a foundation, a frame carried by the foundation, a wall finish disposed on the frame, the wall finish comprising panels, means provided on the panels for attaching them to the frame, the last panel on one wall extending within a predetermined distance of the other wall, a strip of finish material having a horizontal dimension less than the distance between the panel and the wall disposed in position, the horizontal dimension being less than the distance between the last panel and the wall to facilitate mounting of the strip, a second strip disposed between the last panel on the other wall and the first strip, this second strip having a horizontal dimension less than the distance between the panel and the first strip, and means disposed between the strips for forcing them into engagement with the wall panels whereby they are retained in position and a vertical trim strip disposed over the other strips, and means extending between said first strips for retaining the vertical trim strip in position.

3. In a building structure, in combination, a foundation, a frame carried by the foundation, the frame comprising a plurality of standard frame units, wall panels for mounting on the frame, the wall panels having a horizontal dimension having a predetermined relation to the horizontal dimension of the standard frame units whereby the panels mounted on one wall extend within a predetermined distance of the meeting wall, a vertical strip having a running horizontal dimension slightly less than the distance between the panel and the meeting wall disposed between the meeting wall and the edge of the panel, means for pressing the strip into tight engagement with the panel, a second strip disposed between the first strip and the panel on the other wall, the strip having a running horizontal dimension slightly less than the distance between the panel and the first mounted strip, a vertical trim member, and a fastening member carried by the vertical trim strip.

4. In a building structure, in combination, a frame provided with vertical members and beams, ceiling panels suspended from the beams, cleats provided on one side of each ceiling panel for engaging a beam, the side of the ceiling panel on which the cleats are provided being shaped to receive and carry the next adjacent panel, wall panels, means provided on the wall panels for mounting them on the vertical members, a block structure shaped to receive the ceiling panel and to engage the wall panel disposed between said panels, and means for actuating the block structure to force the wall and ceiling panels into position and a finish strip mounted on the block structure extending between the wall and ceiling panels.

5. In a building structure, in combination, a foundation, a frame carried by the foundation, beams carried by the frame, ceiling panels, cleats provided on the ceiling panels, the cleats being shaped to engage the beams, the side of the ceiling panel carrying the cleat being shaped to receive the next adjacent panel to carry it, and a movable block for supporting the outer edge of the last ceiling panel, and means for forcing the block and panel into position.

6. In a building structure, in combination, a foundation, a frame carried by the foundation, beams carried by the frame, wall panels carried by the frame structure, ceiling panels, cleats provided on the ceiling panels, said cleats being shaped to engage the beams, the side of the ceiling panel carrying the cleats being shaped to receive and carry the next adjacent panel, blocks supported by the wall panels for carrying the outer edge of the last ceiling panel, means for utilizing the blocks for forcing the panel into a predetermined position, and finish strips attached to the blocks cooperative with the ceiling and wall panels to give a finished appearance.

7. In a building structure, in combination, a foundation, a frame carried by the foundation, a beam structure carried by the frame, wall panels, stirrups provided on the wall panels, keys for mounting in the stirrups to engage the frame to draw the panels tightly into position, ceiling panels, cleats provided on the ceiling panels, the cleats being shaped to engage the beams, the edge of the ceiling panel to which the cleats are attached being shaped to receive the next adjacent panel to support it, blocks disposed between the wall panels and ceiling panels for supporting the last ceiling panel, means provided in conjunction with said blocks for wedging said ceiling panels and wall panels into position, and a finish strip carried by the blocks cooperative with the wall and ceiling panels to give a finished appearance.

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