Jan. 28, 1958 A. C. OLSEN 2,821,274

BUILDING STRUCTURES

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FIG. 1.

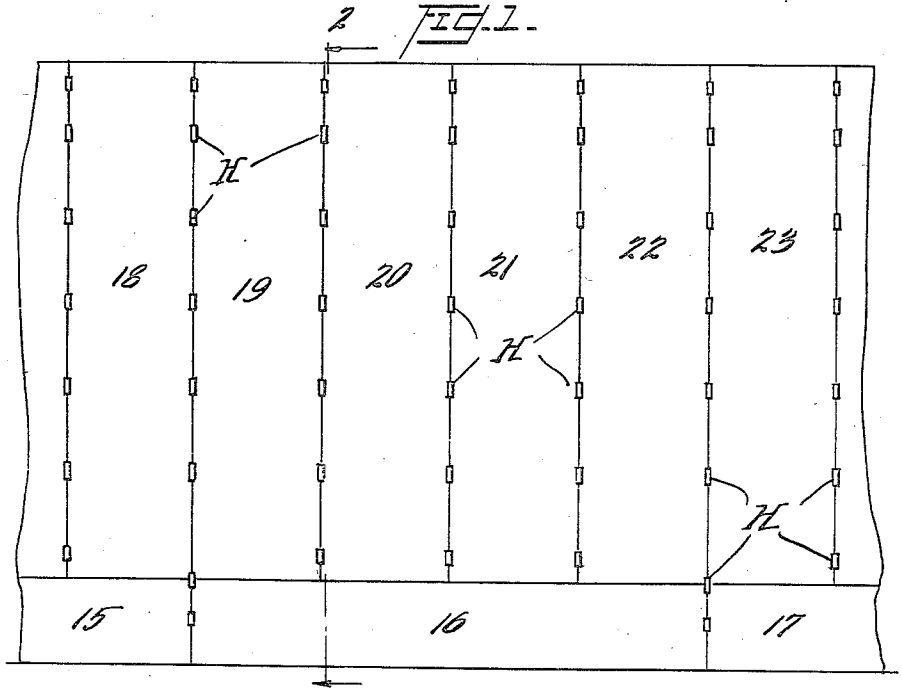


FIG. 2.

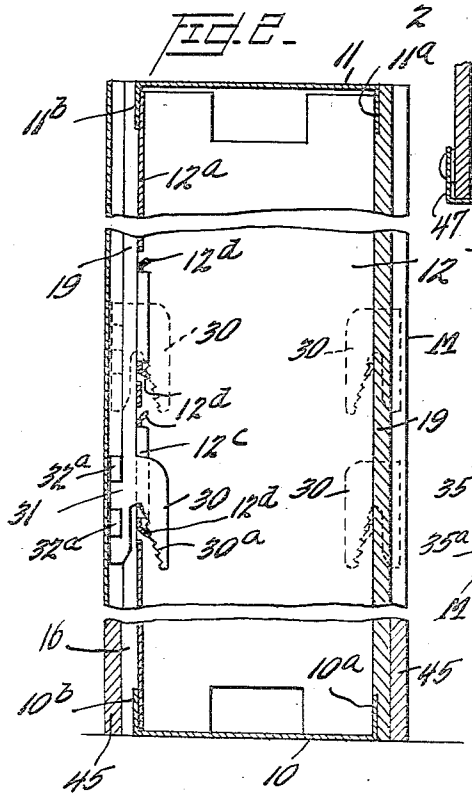


FIG. 3.

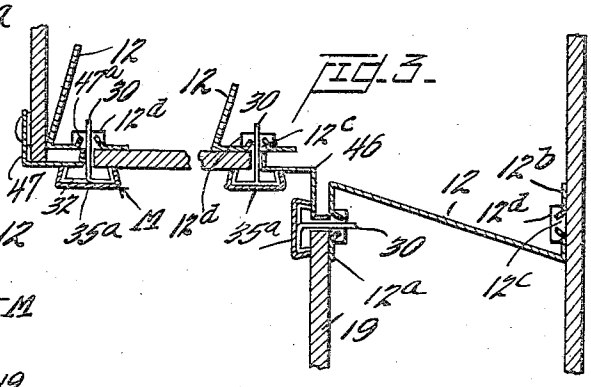
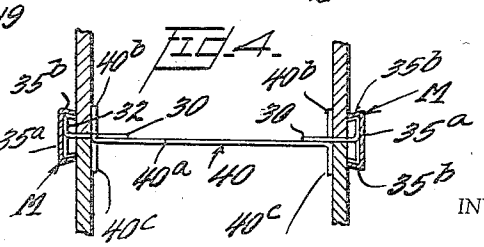


FIG. 4.



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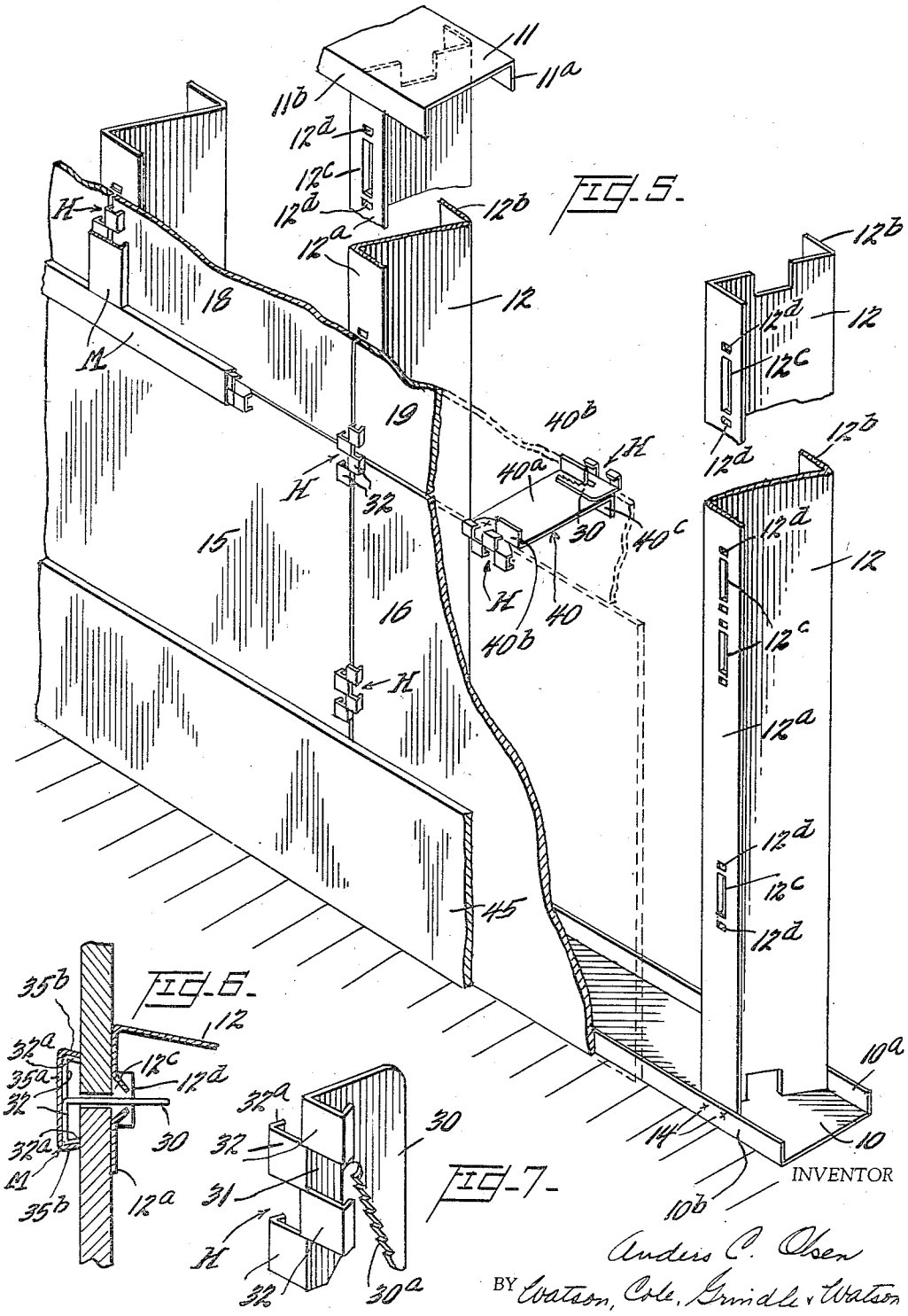

FIG. 5.

FIG. 6.

FIG. 7.

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BUILDING STRUCTURES

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Application December 20, 1951, Serial No. 262,555
2 Claims. (Cl. 189—34)

This invention relates to a building structure and particularly to a partition construction of the type embodying a plurality of vertically extending studs arranged in a rectilinear series and having a covering for one or both sides of the structure formed by this series of studs which comprises a plurality of wall boards or panels grouped together.

It has heretofore been proposed that inexpensive but nevertheless strong, durable and fireproof or fire-resistant partitions might be erected with the aid of floor and ceiling runners, vertical metallic studs the upper and lower ends of which are received and retained within the runners respectively, and wall board panel coverings for the series of studs, each such covering comprising a plurality of wall boards and means for conveniently but firmly attaching each wall board to several of the supporting studs. A partition structure of this type, in which the studs are in the form of elongated metallic members Z-shaped in cross section, is illustrated, described and claimed in application Serial 45,595, filed August 23, 1948 and now abandoned, of which this application is a continuation-in-part. This partition structure has proven eminently satisfactory in use, meeting all of the rigid requirements imposed upon structures intended to be fireproof while at the same time providing means for completely partitioning one space from another at small cost. A further advantage consists in the ability of the user of the novel partition structure to quickly and easily assemble its various elements and, if at a later time the partition is to be removed, to disassemble such elements and transport them to a further locality for re-use. Nails, screws and bolts are not used and the securing devices which are employed to fasten the panels to the studs are of such character as to be readily placed by an unskilled attendant. Disassembly may be as readily effected.

The present invention comprises an improved wall structure of the type disclosed in the aforementioned application and includes as one of its novel features an improved means for the attachment of molding to cover the gaps between the adjacent edges of adjacent panels, the molding strips being readily attached to the securing devices which function to secure the panels to the studs. A new and improved stiffener or cross brace is utilized whereby the panels of one wall covering may be rigidly connected to the panels of the parallel wall covering at a point intermediate two studs, so that each panel structure strengthens the opposite panel structure and a greater degree of rigidity is imparted to the entire wall. These cross bracing or stiffening members are readily assembled as the wall panels are positioned and may be as readily disassembled when the wall or partition structure is to be

dismantled. Other novel features of the improved wall partition construction will be apparent.

In the accompanying drawings one embodiment of the invention is illustrated by way of example.

Figure 1 is a side elevation of a partition embodying the invention, the partition being partially completed only, the molding members not having been assembled;

Figure 2 is a transverse vertical section, partly broken away, through the partition, taken on line 2—2 of Figure 1;

Figure 3 is a horizontal section through portion of a partition structure embodying the invention, disclosing also special fittings to be employed at the corners, where adjacent wall panels are angularly disposed;

Figure 4 is a vertical section taken through portion of the wall or partition structure and showing one of the panel bracing or spacing members in side elevation;

Figure 5 is a perspective view of portion of a wall structure embodying the invention, broken away in order that the elements which together comprise the novel wall structure may be more clearly perceived;

Figure 6 is a horizontal section through portion of one of the supporting studs, the associated panels and molding strip, one of the securing devices being disclosed in plan; and

Figure 7 is a perspective view of one of the securing devices for attachment of the panels to the studs and upon which the molding strips are in turn mounted.

The partition structure includes parallel lower and upper runners **10** and **11** which are oppositely facing channel members, the member **10** being secured to a floor structure by suitable means and the member **11** to a ceiling structure, as by screws or nails. The metal studs are indicated at **12** and each will be seen to comprise a sheet metal member Z-shaped in transverse or horizontal section. The studs are transversely deformable, the metal being resilient and sufficiently light to permit transverse compression to facilitate assembly with the runners **10** and **11**. When finally positioned the flanges **12***a* and **12***b* of each stud will be pressed firmly against the lateral flanges **10***a* and **10***b* of the channel member **10** and the uppermost areas of the outer surfaces of these flanges will likewise tightly engage the inner surfaces of the flanges **11***a* and **11***b* of the upper runner **11**. In the event that extreme rigidity is desired the stud flanges may be welded to the runner flanges, two such spot welds being indicated at **14** in Figure 5, but it will be understood that the wall structure, when fully assembled, possesses great inherent stability and rigidity without welding, such stability being quite sufficient for all ordinary purposes.

After assembly of the spaced vertically extending studs **12** with the upper and lower runners the panels are positioned and it is preferred to employ rectangular panels disposed somewhat as indicated in Figure 1, panels **15**, **16** and **17** being relatively long and narrow and disposed with their longer axes horizontal and their lower edges at the floor level. Panels **18**, **19**, **20**, **21**, **22** and **23** are of equal size and are disposed with their longer axes vertical. The studs are so spaced that the adjacent vertically extending edges of each pair of adjacent panels overlie one flange of a stud, the adjacent margins of the panels **18** and **19** overlapping the flange **12***a* of stud **12**, as may be clearly perceived from an inspection of Figure 5, and the vertical edges of the marginal portions of adjacent lower panels **15** and **16** likewise overlapping flange **12***a* of this stud. The adjacent vertical edges

of panels 18 and 19 are, however, slightly spaced apart, likewise the vertical edges of the horizontally extending panels 15 and 16, a vertical gap of appreciable width being thus defined, which gap extends from the floor to the ceiling, as may be observed in Figure 1. Furthermore, the horizontal upper edges of panels 15 and 16 respectively are slightly spaced from the horizontal lower edges of panels 18 and 19, and the other vertically extending panels of the ceiling structure, so that a horizontal gap between the series of vertically disposed panels and the series of horizontally disposed panels extends from one end of the wall covering to the other.

The wall panel securing means associated with each stud comprises a plurality of fastening devices such as that indicated in Figure 7. Each of these devices includes a stud engaging portion 30 having an inclined serrated edge 30*a*, this portion merging with an intermediate portion or web 31 which terminates in a panel engaging portion or head generally indicated at H and comprising a plurality of flanges 32, alternate flanges extending in opposite direction from the web 31, as shown in Figure 7, and being disposed substantially at right angles to this web. The terminal ends 32*a* of the flanges 32, respectively, are inturned in the same general direction and the outer or oppositely facing surfaces of the terminal flanges 32*a* are disposed, respectively, in two relatively inclined planes, as may be seen most clearly in Figure 6, so that the head H as a whole may be said to be outwardly flaring.

The molding strip such as indicated at M in Figure 6 comprises a flat web 35*a* and marginal flanges 35*b* which converge, the molding M being of resilient metal so that the flanges 35*b* may be drawn apart slightly passed over the head H of a securing device, and then released to tightly engage the head H, all after assembly of the securing device with the other elements of the wall structure, the purpose being to provide molding strips which will wholly conceal the securing devices and also close and conceal the gaps between adjacent panels of the structure.

As will be observed in Figures 1 and 5, the margins of adjacent panels are held in position by means of a plurality of securing devices, each being disposed with its head overlapping and contacting two panels, the web thereof extending through the gap between the adjacent edges of the slightly spaced apart panels, and the stud engaging portion 30 thereof having interlocking engagement with the associated stud. It will also be seen that the flange of each stud is provided with a plurality of slots 12*c* through which the stud engaging portions 30 of the attachment devices may be passed and with struck-up tongues or flanges portions 12*d* the edges of which may be engaged by one or the other of the teeth 30*a* of the stud engaging portion 30. These securing devices may be readily assembled by hand and without special tools, each being passed between the adjacent edges of adjacent panels after those panels have been properly positioned, passed through the slot in the stud designed to receive it and caused to interlock with the adjacent flange 12*d* of that stud, the edge surfaces of the terminal flanges 35*b* of the head portion of each such securing device being firmly seated against the outwardly facing surfaces of the adjacent margins of two contiguous panels. Slight force only is necessary to cause the proper tooth of the securing device to engage the appropriate flange 12*d* of the associated stud and, after a series of such securing devices have been positioned, the molding strip may be readily applied in the manner already described.

At a point intermediate two studs a cross bracing member, such as that indicated generally at 40 in Figures 4 and 5, may be employed. This member comprises essentially a web 40*a*, two end flanges 40*b* turned at right angles to the web in one direction and two oppositely directed end flanges 40*c*, the outer faces of the flanges 40*b* and 40*c* at each end of the member being disposed in a common plane and adapted to engage the inner faces, respectively, of the adjacent margins of two of the panels, such as panels 16 and 19 of Figure 5. Two securing devices such as that illustrated in Figure 7 and previously described are utilized to secure the spacing member 40 in the position shown, each portion 30 thereof engaging one or the other of the flanges of the spacing member but being firmly attached to the bracing member after having been inserted through the gap between panels and then given a horizontal sliding motion longitudinally of the partition structure. After such assembly the spacer is held firmly in position and comprises a rigid connection between two panels of the wall covering for one side of the partition and two panels of the wall covering for the other side of the partition. If desired the securing devices 30 may be spot welded to the web 40*a*. Rigidity of the structure as a whole is thus provided.

A relatively narrow strip of board 45 may be provided along the lower edge of the partition, this wall board being preferably secured in position by means of an adhesive and being of a material well adapted to withstand impact and to remain unmarred under such impact. Various special fittings may be employed at corners, as shown in Figure 3, a novel corner piece 46 comprising a metallic strip, bent during fabrication into the cross sectional form shown in that figure, being conveniently employed to avoid cutting and fitting together two wall panels at that point. An exterior corner fitting is indicated at 47 and likewise comprises an elongated strip having two flange-like portions disposed at right angles to each other and a terminal flange 47*a* the edge surface of which will be slightly spaced from the edge surface of the adjacent panel, thus defining a slot for the reception of attachment devices such as illustrated in Figure 7.

Other ways and means for facilitating rapid erection of the wall structure may be provided, being generally in the nature of special fittings which minimize the necessity for cutting or otherwise altering any of the panels, which are generally of gypsum board or non-metallic fireproof materials.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A wall structure comprising a rectilinear series of vertically disposed studs having a plurality of slots therein, a plurality of tongues adjacent an extremity of each of said slots and each directed away from the adjacent slot, wall board panels together covering the studs, means for securing said panels in position against said studs, comprising spaced securing devices each having a panel engaging portion, a stud engaging portion, and a web portion connecting said two first mentioned portions, said web portion extending through the gap between the edges of two closely spaced panels and said stud engaging portion passing through one of said slots on the adjacent stud and having an inclined serrated edge in locking engagement with one of said tongues on said stud, the panel engaging portion of each such securing means having surfaces engaging the marginal faces of two such adjacent panels, respectively, and oppositely facing outwardly flaring surfaces, and a vertically extending molding member covering said gap and resiliently gripping the panel engaging portions of the fastening devices extending therethrough.

2. A wall structure comprising a rectilinear series of vertically disposed studs having a plurality of tongues extending therefrom in pairs adjacent the extremities of said slots, one of each of said pairs of tongues extending in an upward direction, the other of each of said pairs of tongues extending in a downward direction, wall board panels covering the studs, means for securing said panels in position against said studs, comprising spaced securing devices each having a panel engaging portion, a stud engaging portion, and a web portion extending through

the gap between the edges of two closely spaced panels, said panel engaging portion comprising a plurality of aligned flanges bent at substantially right angles to said web portion with alternate flanges extending in opposite directions from the web, the terminal ends of said flanges being turned in two oppositely facing planes inclined relative to each other, and a molding member having mutually facing relatively inclined marginal flanges engaging the terminal end surfaces of the panel engaging portion and an intermediate portion with which said marginal flanges merge and which resiliently oppose their separation, said stud engaging portion having an inclined serrated edge in locking engagement with a selected one of said tongues depending on whether said slot engaging portion extends upwardly or downwardly.

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