June 27, 1939. F. M. SMALL 2,164,261

BUILDING WALL CONSTRUCTION

Filed Nov. 7, 1936 3 Sheets-Sheet 1

Fig. 1.

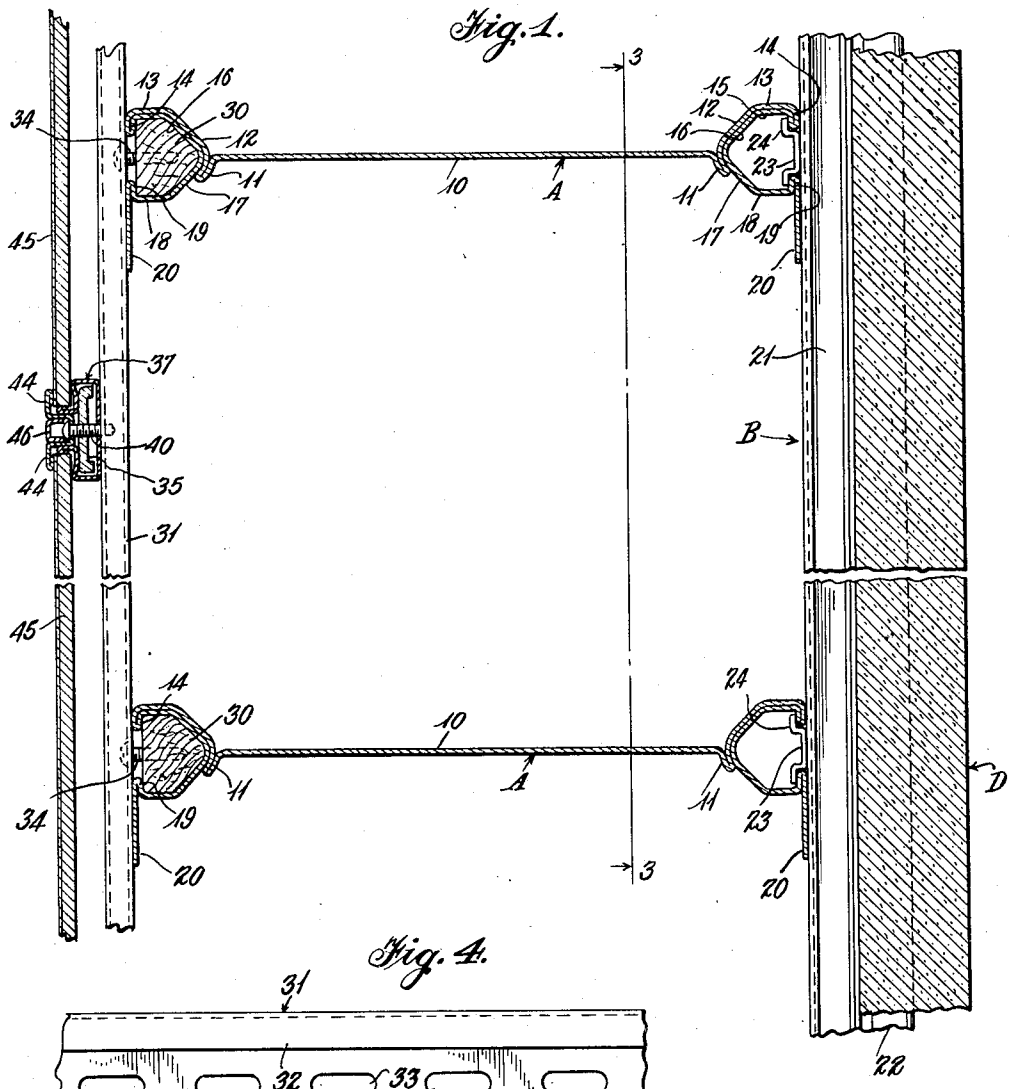
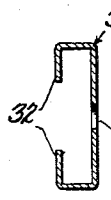


Fig. 4.

Fig. 5.



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Fig. 2.

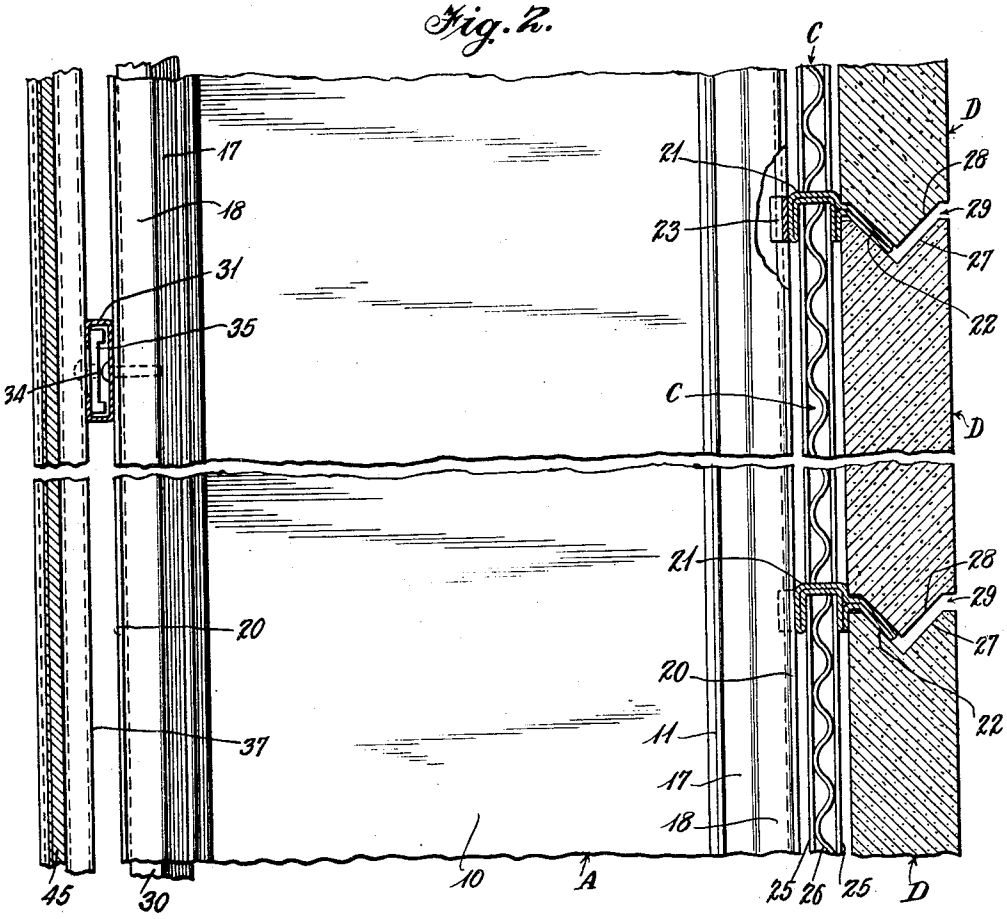


Fig. 6.

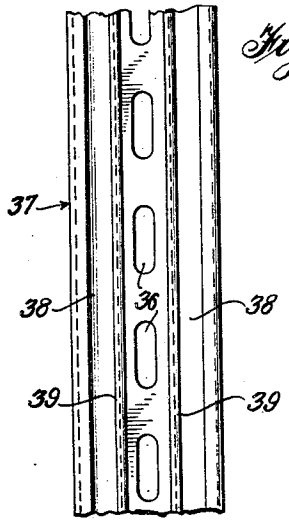
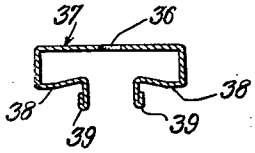


Fig. 7.



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Fig. 3.

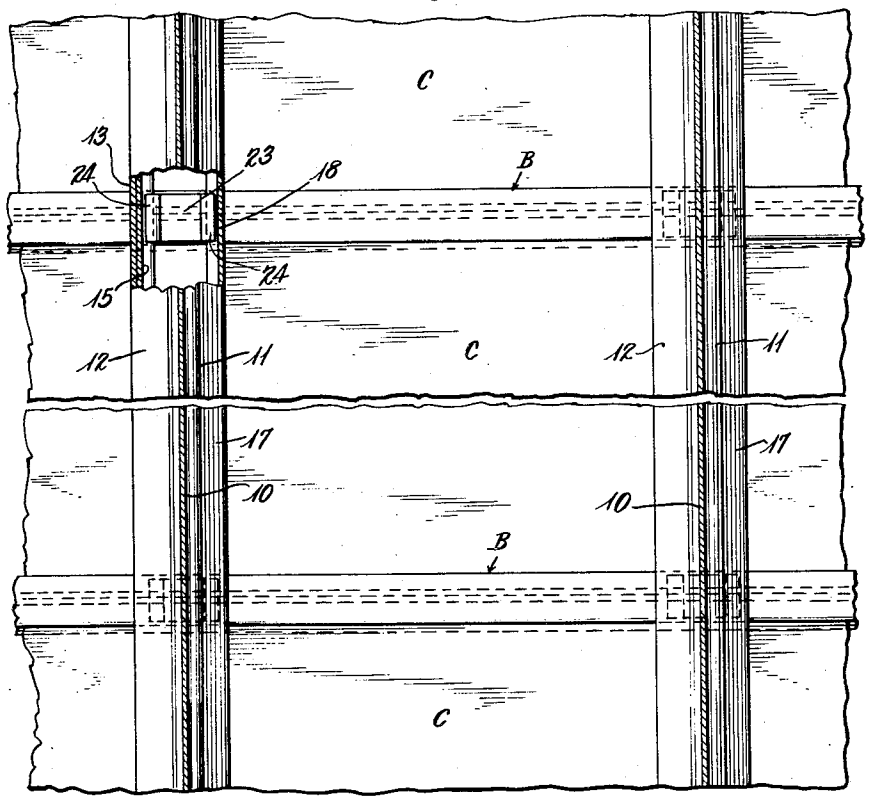


Fig. 8.

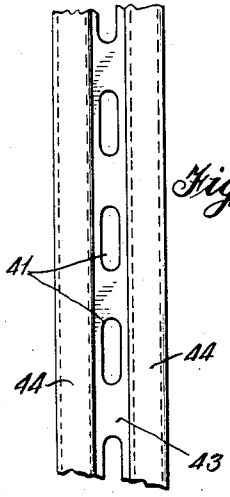
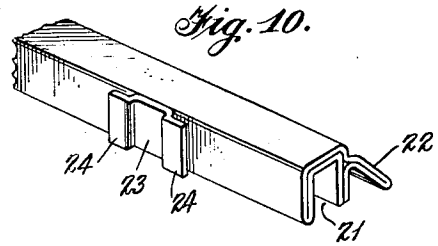


Fig. 9.



Fig. 10.



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2,164,261

UNITED STATES PATENT OFFICE

2,164,261

BUILDING WALL CONSTRUCTION

Frederick M. Small, York, Pa., assignor to Martin-Parry Corporation, York, Pa., a corporation of Delaware

Application November 7, 1936, Serial No. 109,767

18 Claims. (Cl. 72—16)

This invention relates to new and useful improvements in building wall constructions.

The primary object of the invention is to provide a wall structure adapted for use in any kind of building construction wherein there is desired a frame adapted to be finished on the exterior and interior surfaces and wherein finishing panel members may be employed for said surfaces.

A further important object of the invention is to provide a novel form of sheet metal studding which may be employed as a part of a wall frame construction.

Still another object of the invention is to provide a novel form of securing strip by means of which insulating and surface finishing panel members may be secured to a sheet metal studding member.

A still further object of the invention is to provide novel means for securing interior wall finishing panel members to sheet metal studding members.

Other objects and advantages of the invention will be apparent during the course of the following description:

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a horizontal sectional view taken through a section of a wall constructed in accordance with this invention,

Figure 2 is a fragmentary vertical sectional view of the wall structure shown in Figure 1 and disclosing a studding member in elevation with the balance of the wall structure in vertical section,

Figure 3 is a vertical sectional view taken on line 3—3 of Figure 1,

Figure 4 is a detail elevational view of a mounting rail employed as a part of a means for connecting interior paneling sheets or members to wall studding,

Figure 5 is a transverse sectional view of the mounting sheet shown in Figure 4,

Figure 6 is a detail elevational view of a molding base strip which is designed to cooperate with the mounting rail shown in Figures 4 and 5,

Figure 7 is a transverse sectional view of the molding base strip shown in Figure 6,

Figure 8 is a detail elevational view of a molding top strip which is adapted to be secured to the base strip shown in Figures 6 and 7,

Figure 9 is a transverse sectional view of the molding top strip disclosed in Figure 8, and

Figure 10 is a detail perspective view of the securing strip shown in Figure 2.

In the drawings, wherein, for the purpose of illustration is shown the preferred embodiment of this invention, the reference character A designates in its entirety a one-piece sheet metal studding member. It is to be understood that a wall constructed in accordance with this invention is to be formed from a skeleton frame which includes a suitable number of vertically arranged, parallel studding members A. These studding members are adapted to be secured at their opposite ends in any desired manner to sills, floor joists, or the like, not shown. Each studding member is of similar construction and the description of one will be sufficient for all.

As previously stated, the studding member is to be formed from a single sheet or blank of steel of any desired gauge and dimensions. The studding member comprises a central web portion 10 of single thickness. Each longitudinal edge of the web portion is folded upon itself and bent at an angle of approximately 45 degrees with respect to the plane of the web 10 to form a seat portion 11. After forming the seat portion, the blank is bent, outwardly of each seat portion, to provide one ply 12 of a wall of a channel shaped enlargement. Beyond the wall ply 12, the sheet is bent to form a second wall ply 13 which is arranged at an angle to the ply 12.

The blank is then folded upon itself to form a mouth restricting flange 14 of double ply and to form the inner wall plys 15 and 16, which flushly engage the outer wall plys 13 and 12, respectively. The blank is then bent to form a wall ply 17 which bears against the seat 11 and is arranged at approximately an angle of 90 degrees with respect to the wall plys 12 and 16. The blank is then further folded to provide a wall ply 18 which is arranged in parallelism with the wall plys 13 and 15. The blank is then folded upon itself and bent at an angle to form a second mouth restricting flange 19 and a laterally projecting bearing flange 20. This bearing flange is arranged at one edge of the channel shaped enlargement formed by the various plys 12 to 18, inclusive. It will be seen by inspecting Figures 1 to 3, inclusive, that each longitudinal edge of the studding member is similarly constructed to provide the channel shaped edge enlargements and that these channel shaped enlargements are provided with mouths which open in opposite directions and in the plane of the web portion 10.

After the frame of the wall is constructed, a

suitable number of horizontally extending securing strips, designated in their entirety by the reference character B, are connected to the outer edge enlargements of the studding members A. These securing strips B are adapted to suitably engage and receive associated edge portions of adjacent panel members C and D.

The panel members C are formed of insulating material of any desired construction, while the panel members D preferably are blocks or slabs which may be constructed of any desired material. These panel members C and D will be described in their preferred form at a later point.

Each securing strip B best shown in Fig. 10 is formed for the most part of a blank of sheet metal of suitable gauge which is properly bent or folded to form all portions of the same of two plys of material. The securing strip includes a channel shaped portion **21** which has integrally formed with one wall a flange **22** which is arranged at an angle of approximately 45 degrees with respect to the wall portion of the channel **21** with which the flange is associated. Secured to the opposite wall portion of the channel **21** is a connecting lug **23**. This lug is of substantially U-shape with laterally outwardly projecting edge flanges **24**. These securing lugs **23** are adapted to be received within the outer, channel shaped edge enlargements of the studding members, in the manner best illustrated in Figure 1.

As a preferred construction for the insulating panel members C, I may employ exterior surface layers **25** of asbestos paper which are spaced and reinforced by a central ply **26** formed of corrugated Kraft paper. This combination of sheets of asbestos paper which are spaced and interconnected by a corrugated piece of Kraft paper will produce an insulating panel member which will effectively retard the passage of hot or cold air through the wall construction and will constitute a very efficient protection against fire. This insulating panel construction also will absorb and deaden sound.

The channel shaped portion **21** of each securing strip B is adapted to receive one edge of an insulating channel member C. The associated edge of the adjacent insulating panel member C will bear upon the outer base wall of the channel portion **21**, in the manner best illustrated in Figure 2.

As a preferred construction for the exterior finishing panel members D, I may form the same into blocks or slabs of desired thickness and from a composition composed of crushed, ground, or powdered stone bound together by a suitable binding material. Figure 2 discloses the fact that one longitudinal edge of each of the panel members D is provided with a longitudinally extending, substantially V-shaped groove **27**. The associated edge of the adjacent exterior panel member D is formed with a substantially V-shaped rib **28** which corresponds in cross section with the V-shaped recess or groove **27** previously described. When the surface finishing panel members D are associated with a securing strip B, the angularly arranged flange **22** of the securing strip is received within the recess or groove **27** of one of the panel members D. The next adjacent panel member D is then arranged with its rib **28** received within the recess or groove **27** and to rest upon a surface of the securing strip flange **22**. A suitable plastic filling material **29** then may be forced into the space or crack provided between associated edges of the panel members D.

The interior surface of the wall structure embodying this invention preferably is formed of veneer panel members and the devices employed for securing these panel sheets or members to the inner edge enlargements of the studding members are, with the exception of one element, described in detail as a portion of my previously filed application for Interior paneling, Serial No. 718,064, filed March 29, 1934.

To enable the securing devices for the interior panel members to be connected to the inner edge enlargement of the studding members A, I intend to employ strips **30** which are adapted to be received within the channeled portions of the inner edge enlargements. These strips **30** will be made of desired cross sectional shape and produced by compressing Kraft paper into proper form. These strips **30** have been found to be especially adapted for having embedded therein nails or screws by means of which elongated mounting rails, shown in detail in Figures 4 and 5, are secured to the studding. Each mounting rail is of channel formation, as shown in Figure 5, and the side walls of the channel are provided with inwardly directed flanges **32**. The base wall of the mounting rail **31** is provided with elongated apertures **33** suitably spaced to accommodate any desired spacing or arrangement of the studding members A. These elongated apertures are adapted to permit the securing screws **34** to be passed through the mounting rail to be embedded in the strip **30**. It is to be understood, of course, that nails may be substituted for the screws **34**. Preferably, the mounting rails **31** should be arranged to extend horizontally or at right angles to the vertical studding members A. A desired number of rails **31** may be provided to permit interior finishing panel sheets of any desired size to be secured to the studding members. If desired, however, the mounting rails may be arranged to extend vertically so as to extend longitudinally of a studding member.

At suitably spaced intervals, mounting rail **31** is adapted to have arranged therein blocks or nuts of the form shown at **35** in Figure 1. These blocks or nuts **35** are centrally apertured and interiorly screw threaded to receive bolts which are passed through suitable ones of the elongated apertures **36** formed in the base wall of a molding base strip **37**. This base strip is disclosed in detail in Figures 6 and 7, as comprising the channel shaped body portion with inwardly directed edge flanges **38** and upstanding beads **39** at the inner edges of the flanges **38**. Any desired number of molding base strips may be secured to the mounting rails **31** in suitable spaced relation. The base strips also are designed to receive a suitable number of blocks or nuts **35** for having threaded therein bolts **40** which are passed through the elongated apertures **41** formed in the base wall of a molding top strip **42** which is shown in detail in Figures 8 and 9. This molding top strip **41** is of channel formation throughout its mid section **43** and is provided with outwardly projecting edge flanges **44**. In assembling the molding top and base strips, the channel shaped mid section **44** of the top strip is arranged within the trough formed between the edge beads **39** of the base strip, as illustrated in section in Figure 1. The edge flanges **44** of the molding strip and the edge flanges **38** of the molding base strip are maintained in spaced parallelism by the beads **39** of the base strip and these flanges **44**

and 38 receive therebetween the edges of the interior finishing panel sheets or members 45. To finish the molding device formed by the top and base strips 37 and 42, respectively, and to conceal the heads of the bolts 40, a filler strip 46 is driven into the channel of the mid section 43 of the molding top strip.

To assemble the interior finish of the wall construction, the mounting rails 31 first are connected to the inner edge enlargements of the studding members A. The base molding strips then are secured to the mounting rails to extend at right angles to the same. The panel members 45 then may be arranged to engage the flanges 38 of the molding base strips and the molding top strips then should be connected to the base strips to securely bind and clamp the panel sheets 45 in place. The filler strips 46 then should be driven into the channel shaped mid sections of the molding top strips.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:

1. In a wall construction, a one piece studding comprising a web portion and a channel shaped portion at each longitudinal edge which has its mouth opening outwardly in the plane of the web portion, and means received in each channel shaped portion for securing surfacing material to said studding.

2. In a wall construction, a one piece studding comprising a web portion and a similarly shaped channel portion at each longitudinal edge of the web portion, said channel portions having their mouths opening in opposite directions, and means received in each channel portion for securing surfacing material to an edge of the studding.

3. In a wall construction, a one piece studding comprising a web portion and a channel shaped portion at its longitudinal edge which has its mouth opening outwardly in the plane of the web portion, a securing member receiving strip positioned in one channel portion, a panel securing strip having a connecting lug received in the other channel portion and a panel edge engaging portion connected to the said lug.

4. In a wall construction, a one piece studding comprising a web portion and a channel shaped enlargement at each longitudinal edge of the web portion, said channel shaped enlargements having their mouths opening in opposite directions, a nail or screw embedding strip positioned in one channel shaped enlargement, and a panel securing strip having a connecting lug received in a channel enlargement of the studding and a panel edge engaging portion carried by the lug.

5. In a wall construction, a sheet metal studding member, an insulating layer formed of panel sheets arranged in edge to edge relation outwardly of the studding members, a surfacing layer formed of panel sheets arranged in edge to edge relation outwardly of the insulating layer, and securing strips connected to the studding members and cooperating with adjacent edges of the said panel sheets forming the insulating and surfacing layers to retain said panel sheets in place.

6. In a wall construction, a one piece studding comprising a web portion and a channel shaped portion at each longitudinal edge of the web portion which has its mouth opening outwardly in the plane of the web, each of said channel portions having inwardly directed flanges formed on its longitudinal edges to provide a channel mouth of reduced width, and means received in each channel portion for securing surfacing material to said studding.

7. In a wall construction, a one piece studding comprising a web portion and a similarly shaped channel portion at each longitudinal edge of the web portion, said channel portions having their mouths opening in opposite directions, each of said channel portions having inwardly directed flanges formed on its longitudinal edges to provide a channel mouth of reduced width, and means received in each channel portion for securing surfacing material to an edge of the studding.

8. In a wall construction, a studding member having a channel shaped edge enlargement, a securing strip having a channel shaped portion formed with an angularly arranged flange projecting from one wall and a mounting lug secured to another wall, said mounting lug being adapted to be received in the edge enlargement of the studding member for connecting the securing strip to said member, an insulating panel having an edge received in the channel shaped portion of the securing strip, and a surface finishing panel having a recessed edge to receive the angularly arranged flange of said securing strip.

9. In a wall construction, a studding member formed of sheet metal and having a web portion, the opposed ends of said metal sheet at each longitudinal edge of the web portion being reversely bent to provide a seat portion and a channel portion bearing in each seat portion.

10. In a wall construction, a studding member formed of sheet metal and having a web portion, the opposed ends of said metal sheet at each longitudinal edge of the web portion being reversely bent to provide a seat portion and a channel portion bearing in each said portion, each channel portion having a mouth of less width than the width of said channel portion.

11. In a wall construction, a metal studding member formed of sheet metal and having a web portion, the opposed ends of said metal sheet at each longitudinal edge of the web portion being reversely bent to provide a seat portion, a channel portion bearing in each seat portion, and a bearing flange extending laterally from one side of each channel portion.

12. In a wall construction, a sheet metal studding comprising a web portion, said metal sheet being reversely bent at each longitudinal edge of the web portion to provide a channel shaped portion having its mouth opening outwardly in the plane of the web portion, and means received in said channel portion for securing surfacing material to said studding.

13. In a wall construction, a sheet metal studding comprising a web portion, said metal sheet being reversely bent at each longitudinal edge of the web portion to provide a channel shaped portion having a restricted mouth opening outwardly, and means received in said channel portion for securing surfacing material to said studding.

14. In a wall construction, a studding member comprising, a web portion having a channel shaped portion at each longitudinal edge which has its mouth opening outwardly in the plane of

the web portion, and a securing strip adapted to support surfacing material, said securing strip having a mounting lug adapted to be received in said channel shaped portion.

15. A securing strip for insulating and surface paneling members in a wall construction comprising, a laterally opening channel shaped portion adapted to receive an edge of a paneling member, an angularly arranged flange carried by one wall of the channel shaped portion, and a mounting lug secured to another wall of the channel shaped portion.

16. A studding member comprising, a web portion, a seat portion at a longitudinal edge of said web portion, and a channel portion bearing in said seat portion.

17. A studding member comprising, a web portion, a seat portion at a longitudinal edge of said web portion, and a channel portion bearing in said seat portion, said channel portion having a mouth of less width than the width of said channel portion.

18. A studding member comprising, a web portion, a seat portion at a longitudinal edge of said web portion, a channel portion bearing in said seat portion, and a bearing flange extending laterally from one side of said channel portion.

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