Nov. 17, 1925. 1,561,573

H. C. SMITH

BUILDING CONSTRUCTION

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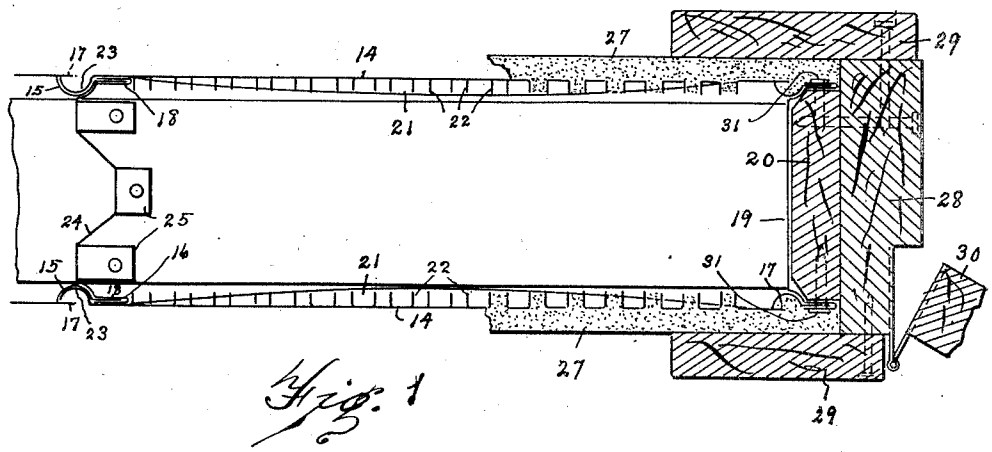


Fig. 1

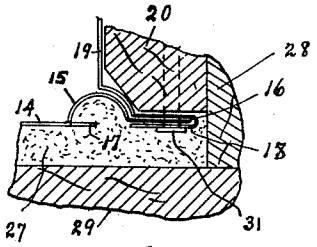


Fig. 2

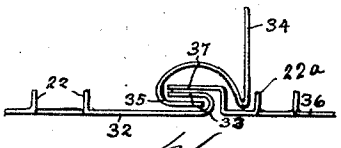


Fig. 3

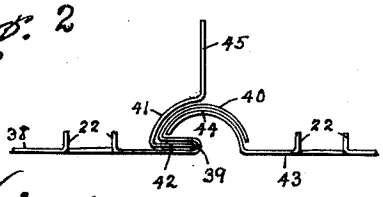


Fig. 4

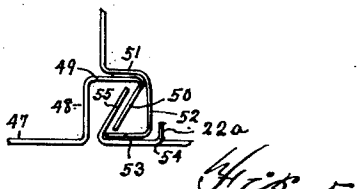


Fig. 5

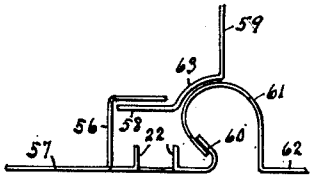


Fig. 6

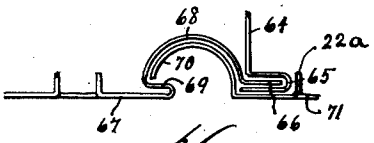


Fig. 7

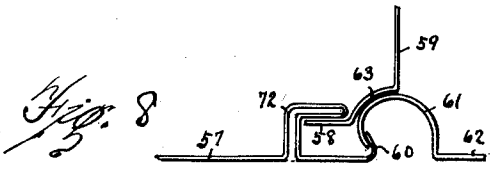


Fig. 8

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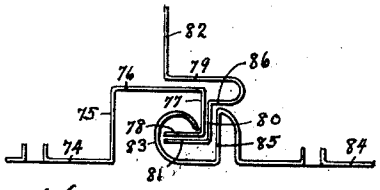


Fig. 9

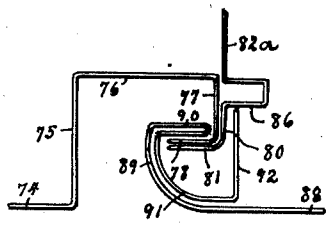


Fig. 10.

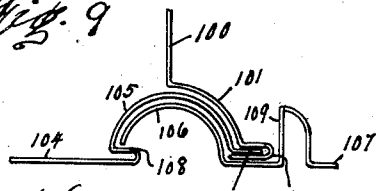


Fig. 11.

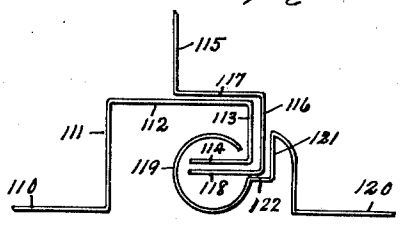


Fig. 13.

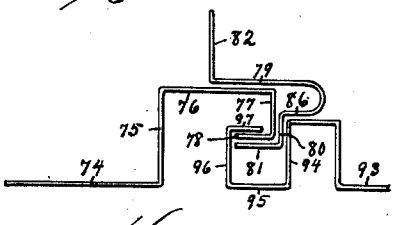


Fig. 12

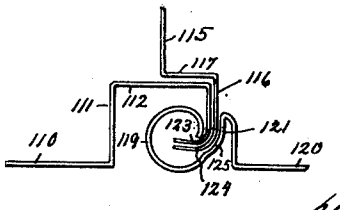


Fig. 15.

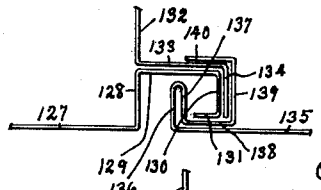


Fig. 14.

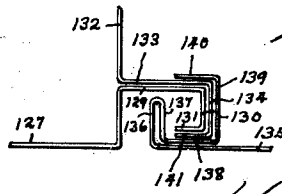


Fig. 17

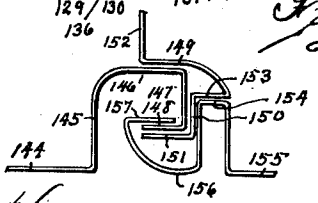


Fig. 16

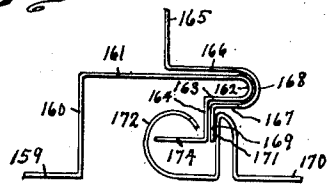


Fig. 18.

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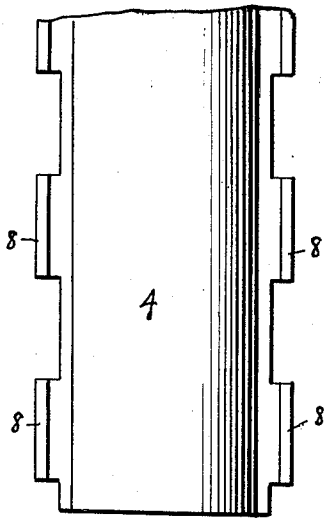


Fig. 20.

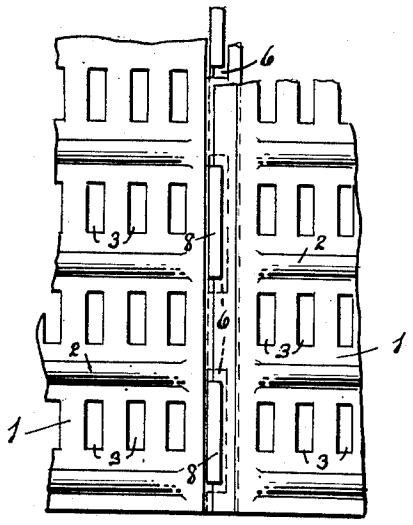


Fig. 22.

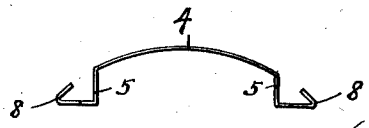


Fig. 21.

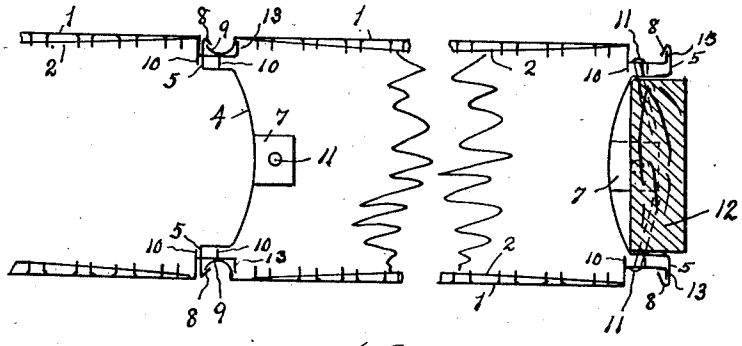


Fig. 19.

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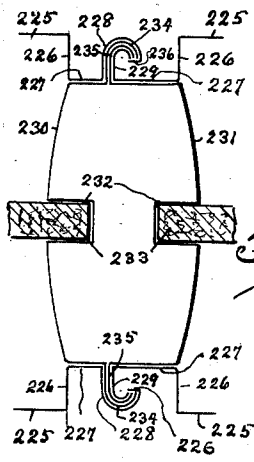


Fig. 27.

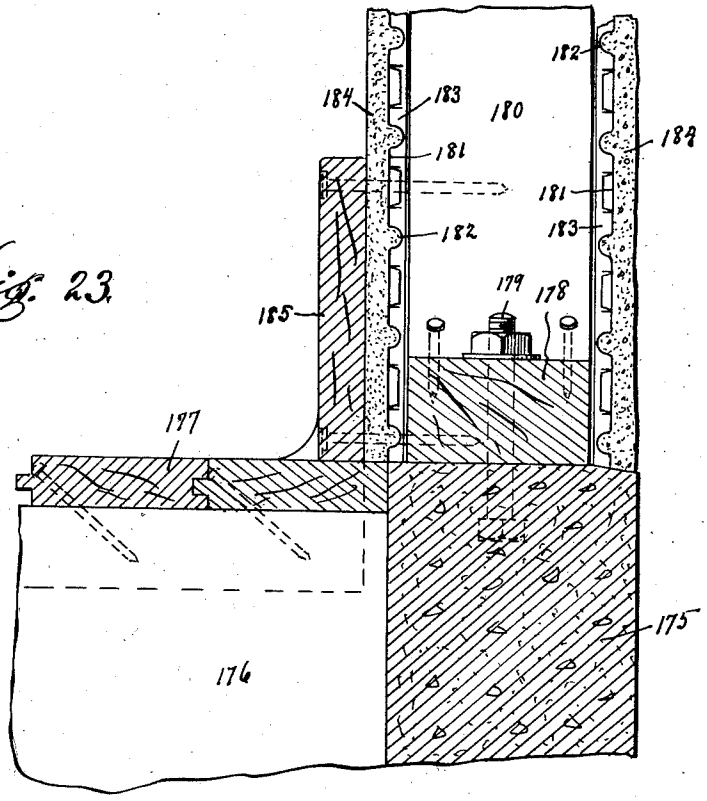


Fig. 23.

Fig. 24.

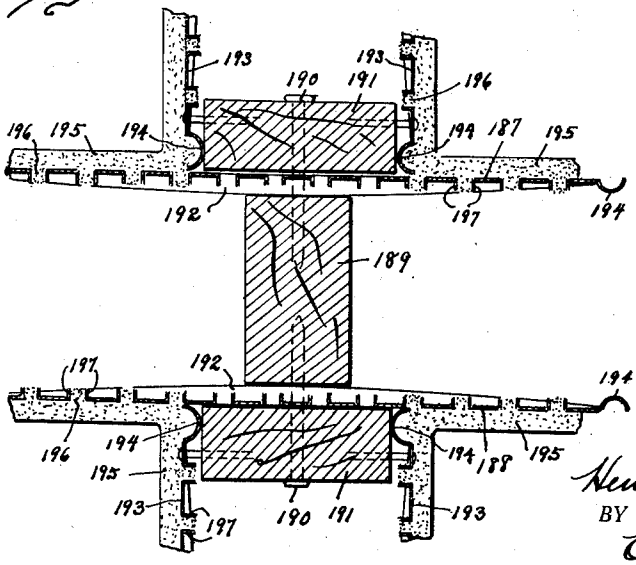
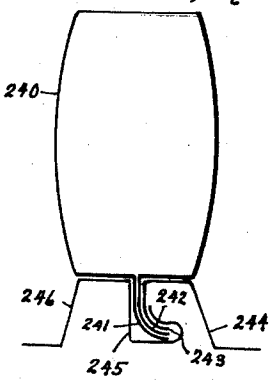


Fig. 28.



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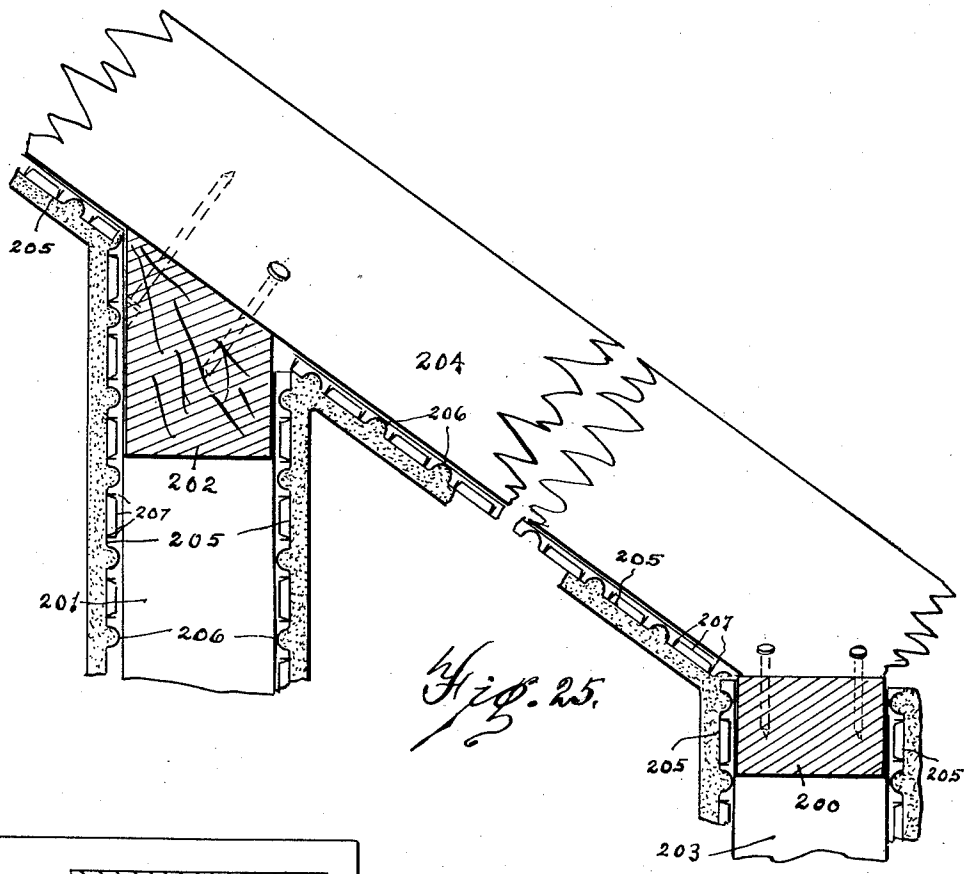


Fig. 25.

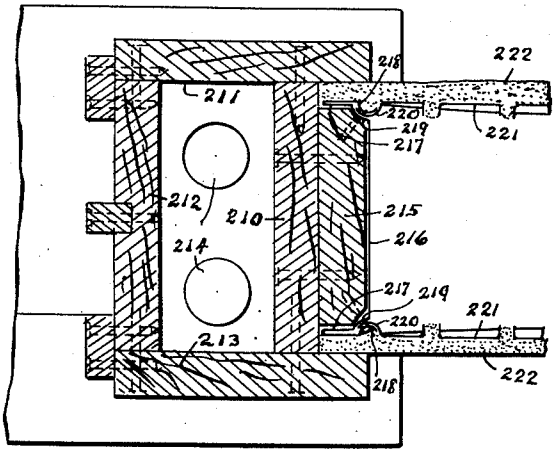


Fig. 26.

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UNITED STATES PATENT OFFICE.

HENRY COLLIER SMITH, OF ST. MARYS, OHIO.

BUILDING CONSTRUCTION.

Application filed March 29, 1924. Serial No. 702,739.

To all whom it may concern:

Be it known that I, HENRY COLLIER SMITH, a citizen of the United States, and residing at St. Marys, in the county of Auglaize and State of Ohio, have invented a new and Improved Building Construction, of which the following is a specification.

This invention consists of interchangeable interlocked wall face members and supporting members that are also interlocked with the interlocked edges of wall face members, all of such members being preferably made of sheet metal of gauges or thicknesses corresponding to the weights to be carried. The face or wall members can be transversely ribbed to give their surfaces greater stiffness, and they can be perforated to provide holes to receive the keys of a stuccoed or plastered covering or surface. It further consists in so forming the edges of the face and supporting members that they may be interlocked and be thereby kept in their respective and relative positions. It also consists in the details of construction illustrated in the accompanying drawings and particularly pointed out in the claims.

In the drawings, Fig. 1 is a horizontal section of a hollow or double surface wall. Fig. 2 is a detail of a joint between the side or wall plates of this partition and the spacing member between them. Figs. 3 to 18 inclusive are details of other types of joints embodying the present invention. Fig. 19 is a plan of the metal-work of a partition. Fig. 20 is an elevation and Fig. 21 an end view of a spacing member adapted to be used in walls embodying the present invention. Fig. 22 is a side elevation of the joint between two side plates and a spacing member. Fig. 23 is a vertical section of a building structure at the line where a partition rests on a wall. Fig. 24 is a horizontal section showing the connection between two walls crossing each other. Fig. 25 is a vertical section of a roof. Fig. 26 is a horizontal section through a window casing. Fig. 27 is a similar section across a modified form of spacing member, and Fig. 28 is a horizontal section showing a single surfaced wall and one of the supporting members.

Similar reference characters refer to like parts throughout the several views.

The present invention relates to walls and partitions and the constructions shown as embodying the invention can be used in comparatively light gauges of metal without reinforcement for single story buildings having light roof construction. For two story buildings or single story buildings with heavy roof construction, heavier gauges of metal can be used, and if necessary reinforced. The reinforcement referred to consists of filling certain spaces in the wall with concrete or the use of cylindrical, rectangular or other shaped metal columns placed inside of the wall spaces in order to afford the necessary weight carrying strength for the support of floors and roofs. Where the weight to be carried is not excessive, heavier gauges of sheet metal can be used in the construction of the wall plates and supports, thus affording the necessary strength. The building members shown comprise wall plates interlocked together and transverse supporting or spacing members which interlock with the vertical edges of the wall plates. The wall plates can be perforated to receive plaster or they can be left unperforated to form the completed face of the wall. The wall plates may be transversely beaded to afford stiffness or they can be left unbeaded. The joints between adjacent edges of the wall plates and of the spacing members are so designed that the parts can be interlocked without the use of tools, and the spacing or supporting members may be provided with perforated flanges at their upper and lower ends whereby they may be attached to floors and ceilings or to wood strips or metal bars which are secured to foundations or floors and roofs or ceilings.

The sheet metal wall or face plates are of any desired thickness and widths, and their lengths are preferably the distances between the bottom and top of the spaces where the walls or partitions are to be erected. These plates 1 can be formed with or without transverse stiffening ribs 2 as shown in Figs. 19 and 22 and with or without holes 3, to permit the keys of plaster to extend through. A spacing member 4, Fig. 21, and 230 and 231, Fig. 27, is shown to be curved transversely in order to give it columnar stiffness, and, as shown in Fig. 19, can have a flange at each end whereby it may be attached to the floor and ceiling of the building where it is used.

In Fig. 22 I have shown an edge of one of the plates 1 formed with longitudinal slots

6 to receive the curved tongues 8 on the flanges 5 of the spacing member 4, which tongues 8 extend through and are engaged by the edge 9, Fig. 19, of the adjacent plate. This edge is shown substantially semi-cylindrical so that it may be easily slid in below the tongues 8. The metal of the side plates which is struck up to form the slots 6 remains attached to the plates in the form of the tongues 10 which position the plates relative to the spacing members. The nails or screws 11 through the flanges 7 secure the ends of these spacing members and therefore locate the partition. As these plates and spacing members can be quickly and easily positioned by one man, a partition can be erected with minimum labor. If desired, a vertical strip 12 of wood may be secured at the end of such a wall to constitute a base for a door casing.

The partition shown in Fig. 19 will be built from the left, each spacing member 4 being secured at both ends when in position and then the flanges 9 of the next plates are hooked into the hooks 8 of the spacing members and these plates swung into position parallel to those already in place, after which another spacing member has its hooks 8 inserted through the slots 6. If necessary, the hooks 8 of the spacing member may be hooked over the small edge flanges 13 at the edges of these plates 1 at the end of a partition.

In Figs. 1 and 2, the side plate 14 is formed with a longitudinal grooved portion 15 beyond which is a flat flange 16. Tongues 17 extend partly across the cylindrically grooved portion 15. The flange 16 is adapted to extend into the reversely folded edge 18 of the spacing member which may be flat like the member 19 shown in Fig. 1 so as to fit against the flat wood spacing member 20. These plates 14 also have ribs 21 and holes formed by striking up the tongues 22. The edges 23 of the plates opposite the flanges 16 are also cylindrical so that they may be inserted in the grooved portions 15 with their outer edges back of the tongues 17. The intermediate spacing members 24 may be in the form of troughs to secure columnar stiffness and provided with footing flanges 25 whereby these spacing members may be secured in position.

After the plaster 27 has been applied to the perforated plates, the door casing may be attached to the strip 20, the casing consisting of the parts 28 and 29 as usual, the door 30 being hinged thereto. Nails 31 may be used to secure the plates 14 to the strip 20.

The side plates and spacing members may connect in many different ways, as indicated in Figs. 3 to 18 inclusive, but in each of these embodiments, one of the plates is first hooked or joined onto the spacing member, after which the other side plate is hooked into place and swung into position.

The side plate 32 of Fig. 3 has a reversely bent edge 33 and the spacing member 34 has a hooked edge 35 which extends between the plate 32 and its edge 33. The plate 36 has an edge 37 which extends into the loop at the edge of the spacing member. When plaster is applied to these plates and enters the groove between their ends, the three members are practically locked together.

The plate 38 of Fig. 4 is reversely bent at 39 and has a substantially cylindrical edge 40. The spacing member 45 has a cylindrical portion 41 and a right angled edge 42 which closely interlocks with the plate 38. The plate 43 has a cylindrical edge 44 which fits the part 40 and will be secured there when the plaster is applied. These plates also have struck up tongues 22 made when the apertures to receive the plaster are formed.

Fig. 5 shows the plate 47 bent three times to constitute the parts 48, 49 and 50, the spacing member having the right angled parts 51, 52 and 53, and the plate 54 with the edge 55 at an angle to its plane. This simple construction is easily produced and securely interlocks the several members when plastered.

Fig. 6 shows a tongue 56 struck up from the plate 57 to lap over the edge 58 of the spacing member 59. The edge 60 of the plate 57 is bent back and engages the edge of the cylindrical roll 61 on the plate 62. The cylindrical portion 63 of the spacing member engages this roll 61 and thus prevents the parts from disengaging except when the plate 62 is unhooked.

In Fig. 7 the spacing member 64 has a reversely bent edge 65 at about right angles to the member 64 to receive the edge 66 of the plate 67. This plate is formed with a cylindrical portion 68 and with a shoulder 69 to stop the edge of the cylindrical portion 70 of the plate 71. This plate 71 cannot be detached from the plate 67 except by swinging it to roll the portion 70 within the portion 68 to pass the shoulder 69.

In Fig. 8 the structure is similar to that of Fig. 6 but instead of the tongues 56 being struck up from the plate 57, this plate is bent to constitute the arm 72.

In the structures shown in Figs. 9 to 18 inclusive, the spacing member is so interlocked with the side plates that it cannot be removed when the two side plates are in alinement. In each of them the edge of the spacing member closely fits the edge of one of the plates and the other plate is hooked in and then swung around into alinement to interlock the three members.

In Fig. 9 the plate 74 has parts 75, 76, 77 and 78 which form a channel, the sides 76, 77 and 78 being substantially parallel to the

parts 79, 80 and 81 of the spacing member 82. The edge 83 of the plate 84 hooks over the parts 78 and 81, and the part 85 of this plate extends parallel to the parts 77 and 80 to the shoulder 86 on the spacing member. These parts are locked rigidly together when plaster fills the channel thus formed.

In Fig. 10 the plate 74 and spacing member 82ª are about the same as in Fig. 9, but the plate 88 is folded upon itself to constitute the parts 89, 90 and 91, and then bent toward the shoulder 86 to constitute the flange 92.

In Fig. 12 the plate 74 and the spacing member 82 are again as in Fig. 9, but the plate 93 has its parts 94, 95, 96 and 97 connecting at right angles to each other. The effect is the same as in Fig. 9.

In Fig. 11, the spacing member 100 has a cylindrical portion 101 and a reversely curved edge 102 which receives the edge 103 of the side plate 104 which also has a cylindrical portion 105 to fit the part 101 of the spacing member. After these two are assembled, the cylindrical portion 106 of the second side plate 107 is hooked into the joint made by the other two members, the shoulder 108 on the plate 104 and the shoulder 109 on the plate 107 preventing the disengagement of these members.

The structures shown in Figs. 13 and 15 are quite similar. The plate 110 has the flat portions 111, 112, 113 and 114 at right angles to each other and the spacing member 115 has flat portions 117, 116 and 118 parallel to the parts 112, 113 and 114. The cylindrical portion 119 of the plate 120 is hooked around the parts 114 and 118 while the shoulder 121 is parallel to the parts 113 and 116. A portion 122 of the plate 120 is parallel to and adapted to engage the portion 118.

In Fig. 15, the ends 123 and 124 of the plate 110 and spacing member 115 and the part 125 of the plate 120 are curved in order to improve the interlock.

The structure in Fig. 14 has all its parts at right angles to each other. The plate 127 has the flat portions 128, 129, 130 and 131, while the spacing member 132 has the portions 133 and 134. The plate 135 has the reversely bent portions 136 and 137, and the flat portions 138, 139 and 140 parallel to the adjacent portions of the other plate and the spacing member. In the structure shown in Fig. 17, the spacing member 132 has an additional portion 141 between the portion 138 of the plate 135 and the end 131 of the plate 127.

The structures shown in Figs. 16 and 18 are of the same general type as that of Fig. 9. The plate 144 has the sections 145, 146, 147 and 148, the last three being parallel to the parts 149, 150 and 151 of the spacing member 152. The parts 149 and 150 connect by means of the portion 153 which extends parallel to the part 154 of the plate 155. This plate terminates in the curved portion 156 and in the edge 157.

The side plate 159 shown in Fig. 18 has the flat portions 160 and 161, the latter terminating in the semi-cylindrical portion 162 which connects it to the parts 163, 164 and 174. The spacing member 165 has flat portions 166 and 167 connected by a similar semi-cylindrical portion 168 and terminates in a flat edge 169. The plate 170 is struck up to form a shoulder 171 and terminates in a cylindrical portion 172.

In Fig. 23 I have shown an outer wall constructed to embody my invention. A foundation wall 175 of any desired construction supports the joists 176, floor 177 and the wall plate 178 which may be secured to the foundation wall by means of bolts 179. Studs 180 rest on this wall plate in the usual manner and the perforated plates 181 are attached to these studs, preferably at their edges, but this is immaterial as the vertical edges of these plates 181 may be connected by the spacing members heretofore described. These plates are again formed with transverse ribs 182 and one edge of each plate is preferably in the form of a cylindrical flange 183. After the plaster 184 is applied, the base board 185 may be positioned.

In Fig. 24 I have shown four partition walls meeting at a common point. A central stud 189 is first secured in position, after which the plates 187 and 188 are attached thereto, preferably by means of the lateral studs 191 and the nails 190. These plates have the transverse ribs 192. The side plates 193 are then attached to the lateral studs 191, being formed with cylindrical bearing members 194. The plaster 195, when applied, extends into the slots 196 which are formed by striking up the tongues 197.

Fig. 25 illustrates the use of these plates in roof constructions. The wall plate 200 rests on studs 203 while a second plate 202 rests on studs 201 of a partition wall. The rafters 204 rest on these wall plates. Perforated plates 205 are secured to these rafters, plates and studs, these plates being formed with the transverse ribs 206, and the tongues 207 are struck up to form slots to receive the plaster.

Fig. 26 illustrates the connection between my improved wall and a window casing, the casing comprising the four members 210, 211, 212 and 213 constituting the box for the sash weights 214. A spacing strip 215 is secured to the member 210 and the metal spacing member 216 is attached to this strip 215. The member 216 has reversely bent edge portions 217 terminating in cylindrical edges 218, between which and the cylindrical parts 219 parallel thereto extend the cy-

lindrical edges 220 of the plates 221 which receive the plaster 222.

In many cases the struck up tongues 22 may be used to assist in securing the side plates and the spacing members together, as indicated in Figs. 3, 5 and 7, where the tongues 22ª are so located that the spacing member cannot unhook. These tongues can be formed at proper points on all the other side plates.

The wall units may be divided into two sections by means of sheets of metal or boards of asbestos or other earthen compounds by forming the spacing members with vertical grooves to position these sheets or boards.

In Fig. 27 I have shown side plates 225 provided with inwardly extending flanges 226, longitudinal flanges 227, and outwardly extending hooks 228 and 229. The spacing member is formed of two parts 230 and 231, each having a vertical socket 232 to receive the boards 233, and with hooks 234 and 235 respectively.

The wall is built from the right to the left in Fig. 27, the spacing member 231, and the board 233 to the right being positioned as the last side plates are swung into alinement. The second spacing member 230 is then placed in position, after which the left hand side plates 225 are hooked in and swung around into alinement. The small flanges 236 at the ends of the hooks 228 prevent these last positioned plates from disengaging and thus hold all the members in proper position. It is evident that the wall may be constructed with only one finished face. In Fig. 28, the metal supporting member 240 is folded up from sheet metal, the edges 241 and 242 being engaged by hook 243 on the side plate 244 and hook 245 on the side plate 246. The side plate 244 is secured in position by the plate 246. It is evident that such supporting members as are shown in Figs. 27 and 28 can be filled with concrete and then constitute strong and rigid posts to carry floors and other structures. Such posts may be employed in connection with any of the other wall plates previously described.

These boards may be of any desired material to divide the wall into air spaces so as to reduce the heat and sound conducting properties of the wall. If of non-combustible material, it will prevent the passage of flame even after the plaster has fallen from both sides of the wall.

These several embodiments of my ideas show to some extent the scope of my invention, but many other modifications may be produced by those skilled in the art without departing from the spirit of my invention as set forth in the following claims, all of such modifications embodying the face or side plates provided with transverse ridges to stiffen them between their longitudinal edges.

I claim:—

1. In a building construction, a wall embodying two parallel vertical sets of sheet metal plates to form vertical surfaces, the plates of each set extending the height of the wall and having its vertical edges bent to constitute hooks, and upright spacing members extending across between the two sets of sheets and having their vertical edges in the form of hooks which inter-engage with the hooks of two adjacent sheets of each surface.

2. In a building structure, the combination of vertical sheet metal plates joined edge to edge to form two parallel surfaces, and vertical sheet metal spacing members extending across between said parallel surfaces and connecting therewith at the joints between said plates, said spacing members having flanges at their ends whereby they may be secured in position.

3. In a building structure, the combination of vertical sheet metal plates joined edge to edge to form two parallel surfaces, and vertical sheet metal spacing members extending across between said parallel surfaces and connecting therewith at the joints between said plates, said spacing members having flanges at their ends whereby they may be secured in position, the edges of the plates and of the spacing members being formed with interlocking flanges.

4. In a building structure, the combination of vertical sheet metal plates joined edge to edge to form two parallel surfaces, and vertical sheet metal spacing members extending across between said parallel surfaces and connecting therewith at the joints between said plates, said spacing members having flanges at their ends whereby they may be secured in position, the edges of the plates and of the spacing members being formed with interlocking flanges so that when a spacing member is interlocked with the edges of two parallel plates, an additional plate can be hooked onto the edge of each of said interlocked plates and be swung into the plane thereof.

5. In a building structure, the combination of sheet metal plates joined edge to edge to form two parallel surfaces, and sheet metal spacing members extending across between said parallel surfaces and connecting therewith at the joints between said plates, said plates being formed with transverse stiffening ribs and with perforations to admit keys of plaster.

6. In a building structure, the combination of vertical sheet metal plates joined edge to edge to form two parallel surfaces, and vertical sheet metal spacing members extending across between said parallel surfaces and connecting therewith at the joints

between said plates, said spacing members having flanges at their ends whereby they may be secured in position, the edges of the plates and of the spacing members being formed into hooked interlocking edge portions.

7. In a building structure, the combination of vertical sheet metal plates joined edge to edge to form two parallel surfaces, and vertical sheet metal spacing members extending across between said parallel surfaces and connecting therewith at the joints between said plates, said spacing members having flanges at their ends whereby they may be secured in position, one edge of each of said plates being cylindrical so that it may be hooked into spaces between the interlocking edges of the spacing member and the next adjacent plate.

8. In a building structure, the combination of sheet metal plates joined edge to edge to form two parallel surfaces, and sheet metal spacing members extending across between said parallel surfaces and connecting therewith at the joints between the plates.

9. In a building construction, a wall embodying two parallel vertical sets of sheet metal plates to form vertical surfaces, the plates of each set extending the height of the wall and having its vertical edges bent to constitute hooks, and upright spacing members extending across between the two sets of sheets and having their vertical edges in the form of hooks which inter-engage with the hooks of two adjacent sheets of each surface, the hook at one edge of each plate being substantially semi-cylindrical and adapted to be rolled into the hook on the edge of an adjacent sheet to engage therewith to secure the edge of the spacing member thereto.

10. In a building structure, the combination of sheet metal plates joined edge to edge to form two parallel surfaces, and sheet metal spacing members extending across between said parallel surfaces and connecting therewith at the joints between said plates, said plates being formed with transverse stiffening ribs.

HENRY COLLIER SMITH.