July 28, 1936. S. E. TOUSSAINT ET AL 2,049,278

BUILDING CONSTRUCTION

Filed Jan. 3, 1933 5 Sheets-Sheet 1

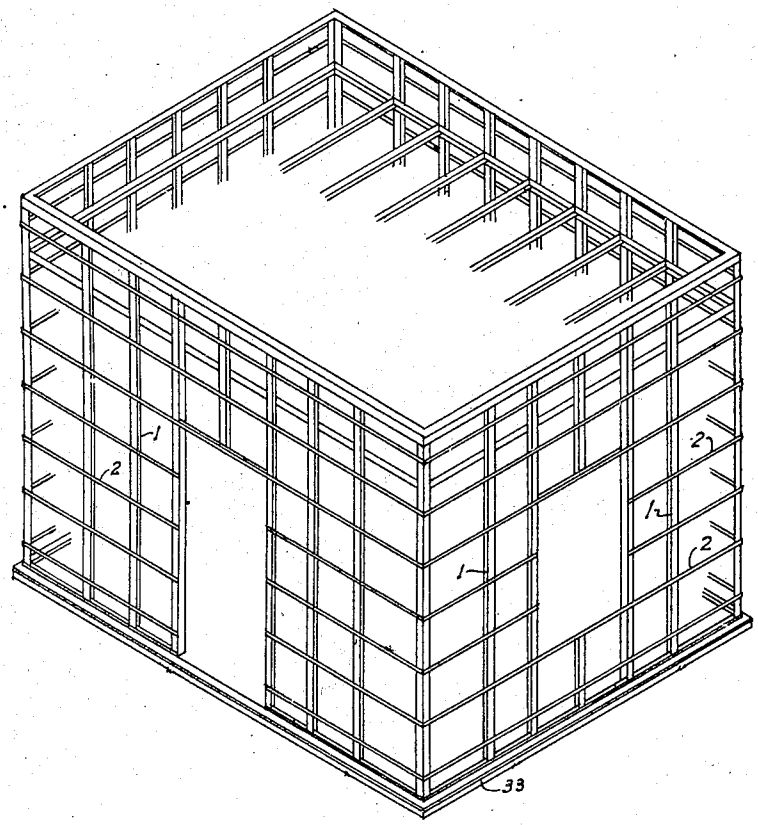

FIG. 1

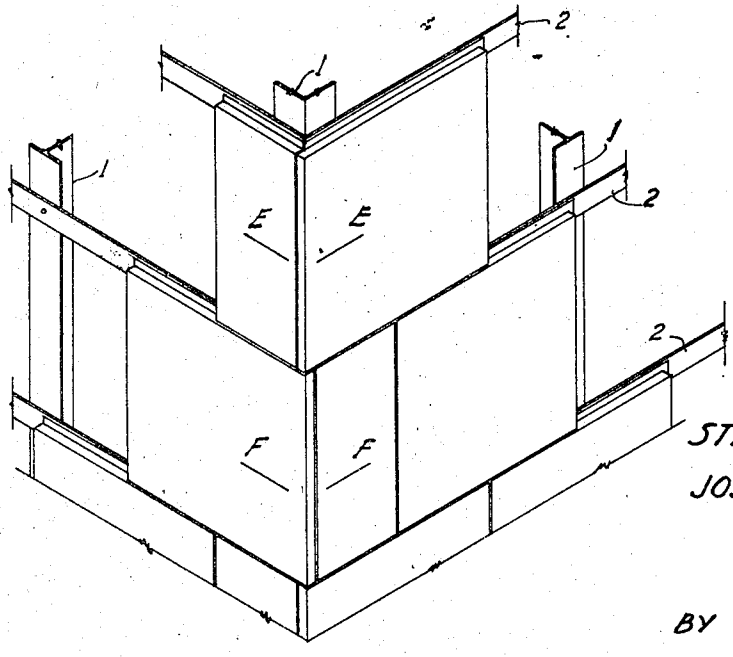

FIG. 2

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BUILDING CONSTRUCTION

Filed Jan. 3, 1933 5 Sheets-Sheet 2

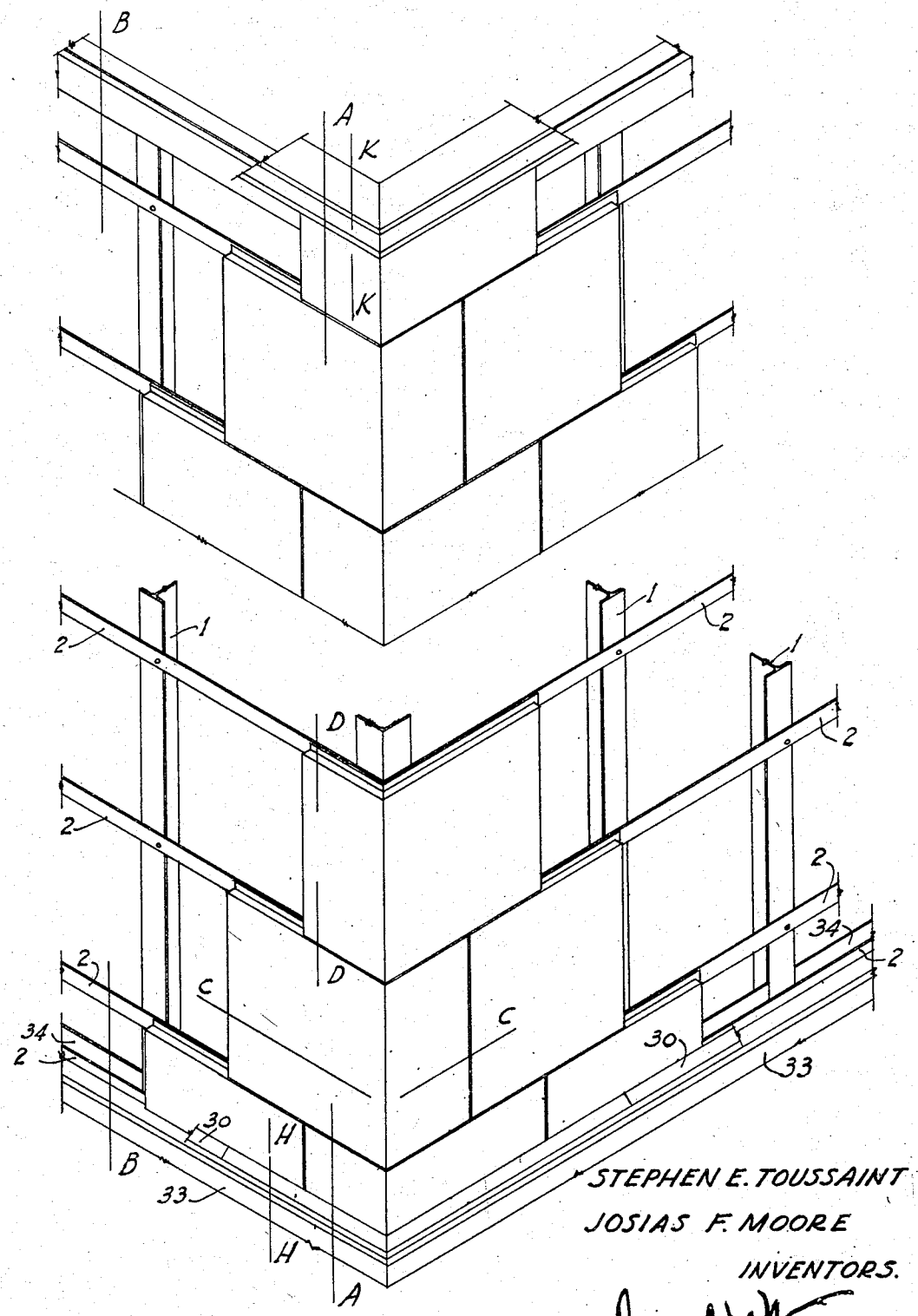

FIG. 3

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BUILDING CONSTRUCTION

Filed Jan. 3, 1933 5 Sheets-Sheet 3

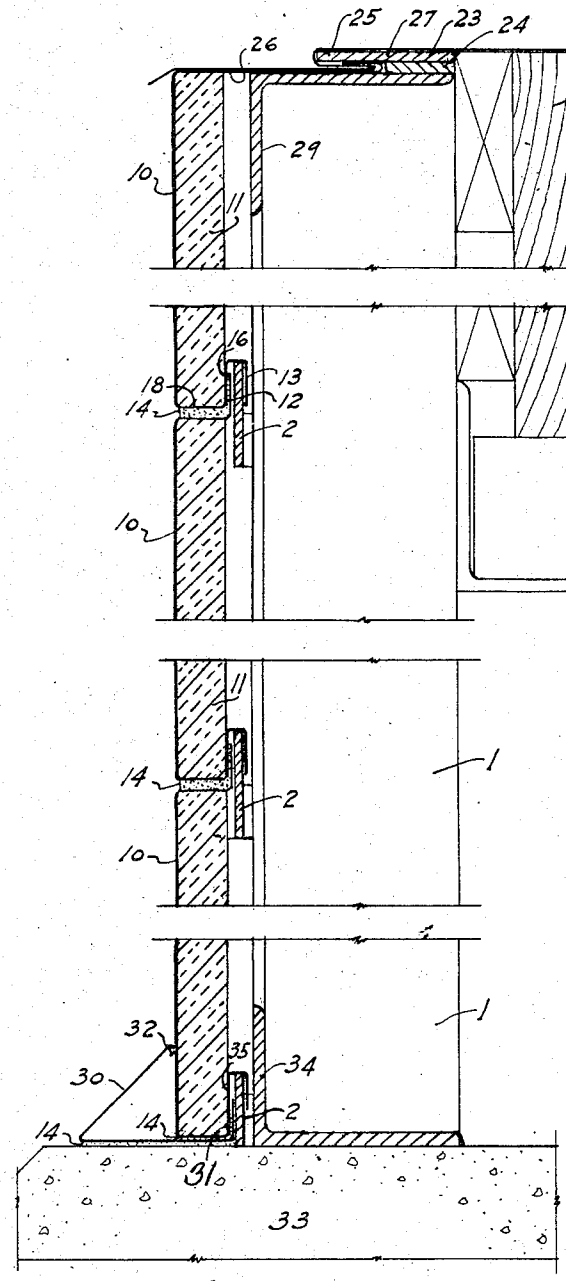

FIG. 4

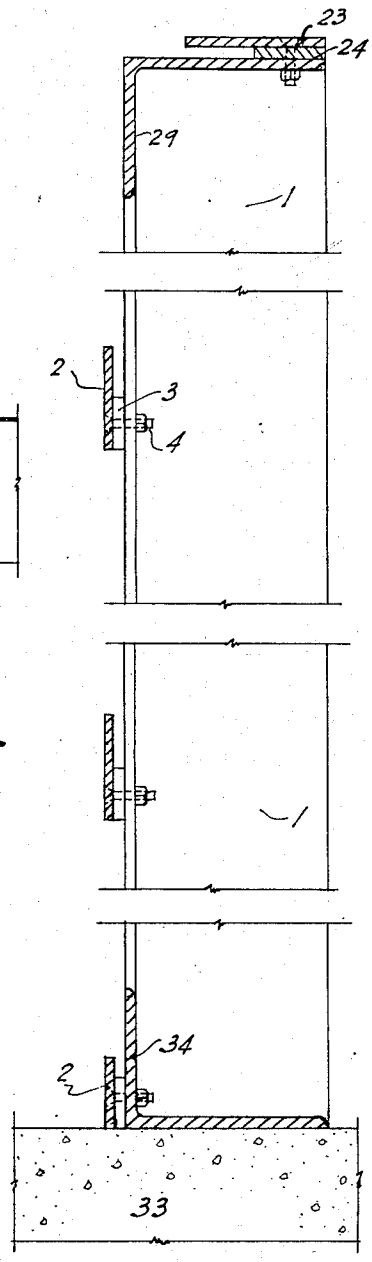

FIG. 5

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BUILDING CONSTRUCTION

Filed Jan. 3, 1933 5 Sheets-Sheet 4

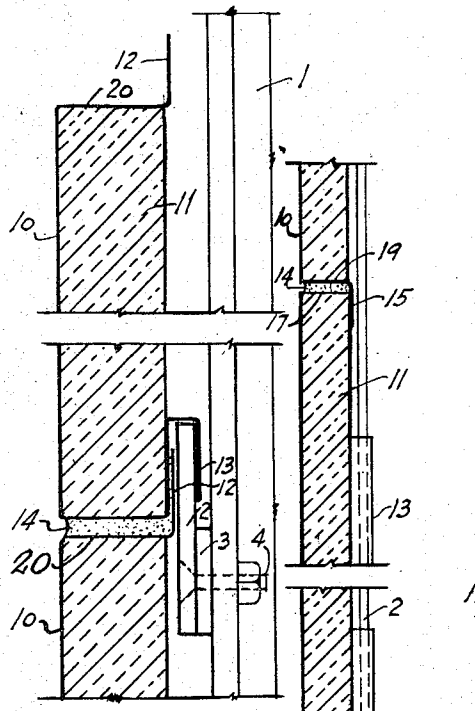

FIG. 10

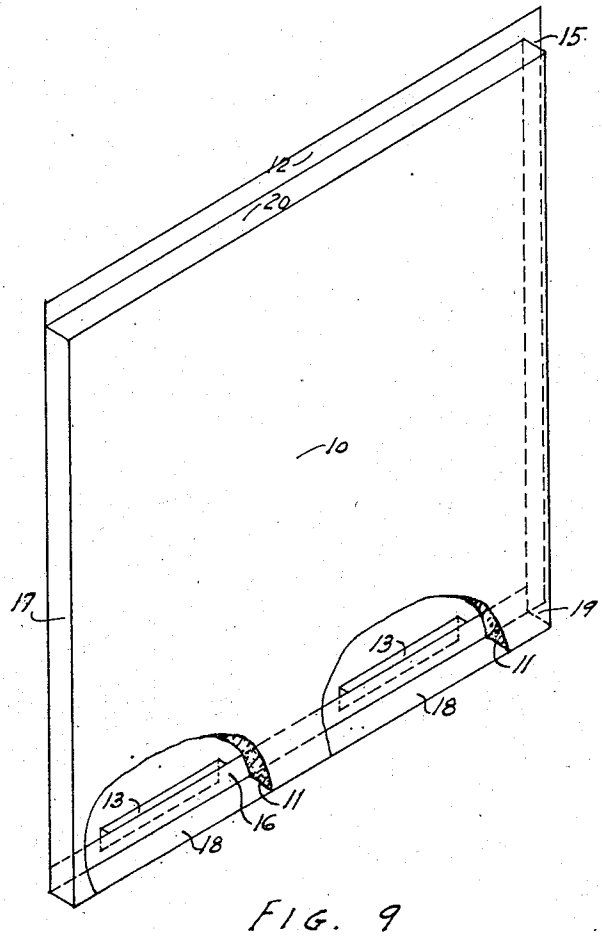

FIG. 9

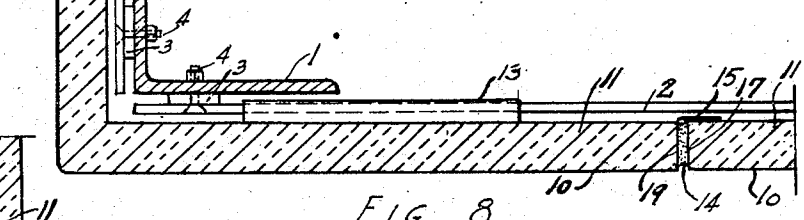

FIG. 8

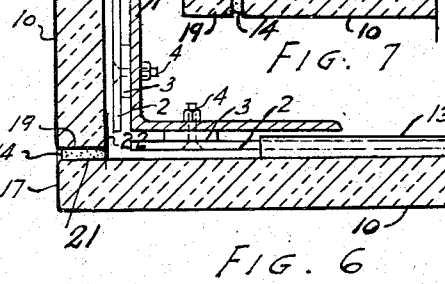

FIG. 7

FIG. 6

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BUILDING CONSTRUCTION

Filed Jan. 3, 1933 5 Sheets-Sheet 5

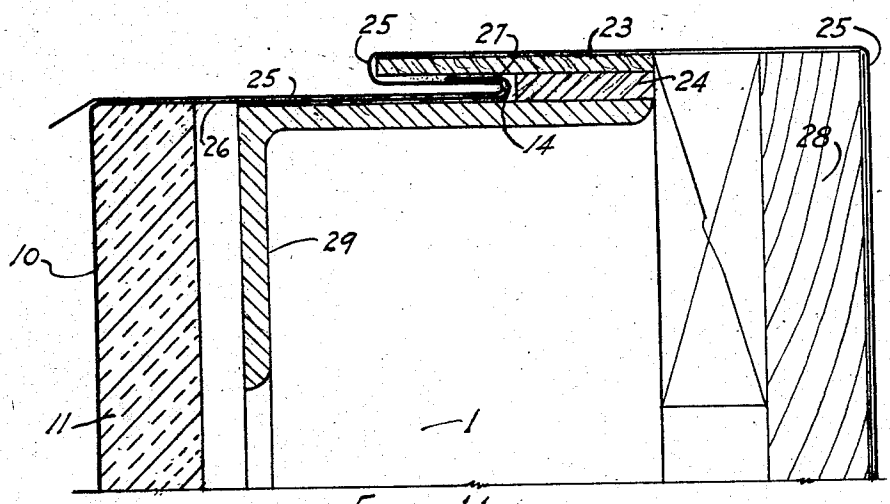

FIG. 11

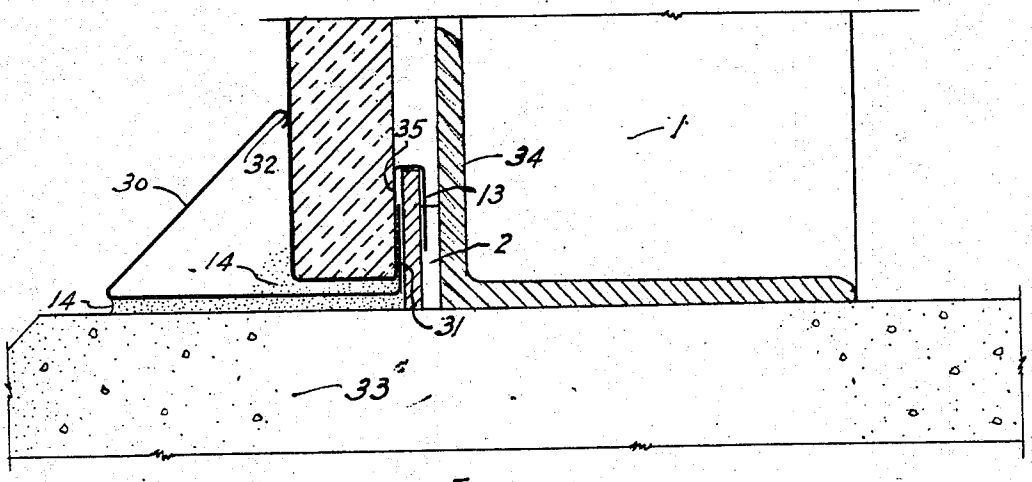

FIG. 12

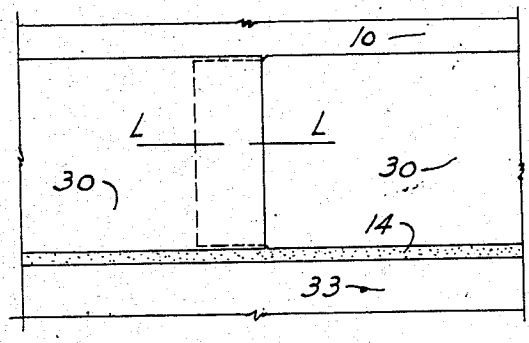

FIG. 13

FIG. 14

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Patented July 28, 1936

2,049,278

UNITED STATES PATENT OFFICE

2,049,278

BUILDING CONSTRUCTION

Stephen E. Toussaint and Josias F. Moore,
Chicago, Ill.

Application January 3, 1933, Serial No. 649,834

15 Claims. (Cl. 72—16)

Our invention relates to a method of constructing exterior and interior walls, roofs and ceilings of buildings and is applicable primarily to walls surfaced with sheet metal coated either with porcelain enamel or other suitable paint, varnish, lacquer or resin, although we do not confine ourselves to such material, for the surface units may be made of phenolic or asphaltum pastics, or similar plastic material, laminated with a suitable insulation board.

In the erection of porcelain enamel buildings, practice has shown that it is impractical to use bolts, nuts, rivets or nails or the like where the same may touch the porcelain enamel because of chippage of the enamel during erection. Where the wall surface is an exterior, such chippage permits water to reach the metal sheet with consequent rust and destruction of the wall surface.

One object of our invention is to construct a building surface of sheet metal or a smooth plastic material, permitting a continuous smooth surface without the use of bolts, nuts or rivets, except in the construction of the framework upon which the surface units are supported. Another object of our invention is to construct a building surface, each unit of which is seated separately from each other unit on a framework so that expansion and contraction of the unit under the normal fluctuations of temperature will in no wise affect any other unit, and by the use of plastic material between the units each unit is cushioned against each other unit.

This application is a continuation in part of applicants' co-pending application Serial Number 586,160 filed January 12, 1932.

In porcelain enamel building, occasional chippage of a surface unit is inevitable, and our invention permits the removal of damaged surface units after the building is finished and in use without demolition of the wall surface; they can be replaced by removing only the units between the damaged unit and the nearest opening in the wall by sliding the units between the damaged unit and the opening horizontally or upward as the case may require until the damaged unit is reached.

Other objects of our invention will appear and be described in the specification.

The novelty of our invention will be hereinafter more fully set forth and specifically pointed out in the claims.

In the accompanying drawings:

Fig. 1 is an isometric view of the frame work for a building.

Fig. 2 is an isometric view of a portion of a frame work with a portion of the surface units in place, and an alternate type of corner.

Fig. 3 is an isometric view of the preferred type of corner construction.

Fig. 4 is a vertical cross-section along the line A—A of Fig. 3.

Fig. 5 is a vertical cross-section along the line B—B of Fig. 3.

Fig. 6 is a horizontal cross-section along the line E—E of Fig. 2.

Fig. 7 is a horizontal cross-section along the line F—F of Fig. 2.

Fig. 8 is a horizontal cross-section along the line C—C of Fig. 3.

Fig. 9 is an isometric view of a surface unit, with a cut out section showing the insulation, and the clip flanges 13.

Fig. 10 is an enlarged cross-section of a horizontal joint.

Fig. 11 is a vertical cross-section along the line K—K of Fig. 3.

Fig. 12 is a vertical cross-section along the line H—H of Fig. 3.

Fig. 13 is a detail drawing of the base joint.

Fig. 14 is a horizontal cross-section along the line L—L of Fig. 13.

The same numerals of reference are used to indicate identical parts in all the figures.

In employing our invention using steel T columns as the columns of the frame work a structure such as is shown in Fig. 1 is erected. The columns 1 are tied together by cross bars or girts 2 of about ⅛" iron straps, the cross bars being set out from the faces of the studs at least $\frac{1}{16}$ inch by washers 3, or other suitable means, and being fastened to the studs by screws or bolts 4, Fig. 5. The function performed by the washers permits the removal of damaged surface units as hereinafter described; the washers may be omitted in construction if the removal feature is not desired.

The surface units have a face, 10, as shown in the drawings, and in the preferred metal type are made of 20-gage sheets, preferably coated with porcelain enamel, forming a pan with four flanges, 17, 18, 19, 20, Fig. 9, within which is placed an insulating material 11 of about ¾ inch thickness; the insulation is held firmly in place without the use of plastic or other adhesive by the flange 16 at the butt of the pan as shown in Figs. 4, 9 and 10; at the top of the pan is horizontal underlapping flange 12, while on the right side of the pan is vertical underlapping flange

15; clip flanges 13, being an extension of the flange 16, complete the standard surface unit.

It is to be understood that in practice, the standard surface unit may have the vertical underlapping flange 15 at the left of the pan 10, instead of at the right, as in Fig. 9, the position of this flange depending on the design and method of building erection. In each tier of surface units forming a wall with the alternative type of corner as shown in Figs. 6 and 7, one unit must omit vertical overlapping flange 15 to permit a fit with the corner unit. This is not necessary in the corner type shown in Fig. 8. In all standard surface units, the position and length of the clip flanges 13, Fig. 10, is so spaced that each clip flange is equal in length to the distance between them, while each clip flange is spaced a distance equal to half its length from the edge of the surface unit, for the reason that when surface units are positioned on girts which are not offset from the columns, the clip flanges 13 will never conflict with the columns.

Besides the standard surface unit, in the construction of a wall, interior wainscoting or the like, special units must be used at the top and bottom, and to form the corners. The preferred design for a surface unit for the first tier of a wall or wainscoting is that shown in Fig. 12 in which the flange 35 at the butt of the pan is proportionately larger than flange 16 shown in Figs. 4, 9, and 10, to permit the use of standard horizontal girts 2 and yet seat the surface unit on plastic 14, Fig. 12, on the concrete foundation 33, Fig. 12. The surface units forming the topmost tier have no horizontal underlapping flange 12, Figs. 9 and 10, but have the flange 20 of Fig. 9 extending back from the face of the pan 10 as is seen in flange 26 of Fig. 11, the flange being curved back upon itself as at 27 in Fig. 11.

The preferred types of corners in our method of building are shown in Figs. 6, 7, and 8, while an isometric view of the corner type of Figs. 6 and 7 is shown in Fig. 2 and an isometric view of the corner type of Fig. 8 is shown in Fig. 3. In the first type, referred to herein as the "fitted corner", special units are used having additional flanges 21 and 22 appended to vertical flanges 17 or 19 as the case may be. Where vertical flange 17 forms the corner, as in Fig. 6, the unit contiguous to it around the corner, on which vertical underlapping flange 15 is omitted, fits into flanges 21 and 22 of the corner unit, flange 22 forming a wind break; in the next tier of units, vertical flange 19 forms the corner, and flange 17 of a standard unit fits into flanges 21 and 22 of the corner unit, as in Fig. 7. In the second type of corner, referred to herein as the "formed corner", special units as shown in Fig. 8 are used, the method of construction being shown in Fig. 3.

In constructing the outer surface of a building by our method, after the frame work is erected on the foundation 33, as shown in Fig. 1, a water table 30, Figs. 12 and 13, butting against the lowest girt 2, Fig. 12, and cushioned on a plastic 14, is first put in place. The water table, which should be of copper, is designed with a base, a butt flange 31, a face 30, the face being at an acute angle to the base in the preferred type of construction and having a curved edge 32 to form a continuous contact with the face of the lowest tier of surface units. The water table is formed at the corners of the building and is joined as shown in Figs. 13 and 14 by a male and female joint. The first tier of surface units is then placed in position, flange 35 and clip flange 13 clamping butt flange 31 of the water table firmly to the base girt 2, Fig. 12. Succeeding tiers of surface units are placed one on top of another in each tier, the clip flange 13, clamping the horizontal underlapping flange 12 of the lower unit to the girt 2; clip flange 13 is so designed with relation to the width of the horizontal girts and horizontal underlapping flange 12 that the lower surface unit is firmly locked in place by spring action in the clip flange 13; a loose contact between flanges 12 and 13 and the girt 2 is shown in the drawings, Figs. 4, 10, and 12, simply for the purpose of clarifying construction, but in practice the contact should be such that the lower surface unit is firmly locked by the upper.

When the top of the wall is reached, special top units as shown in Fig. 11 are used. The columns 1 are topped with a top angle 29, at the rear of which a continuous bar or plate 24 sets off a top plate 23 from the top angle. Flange 26 of the top surface unit fits into the space formed by plate 24, curving back on itself at 27. A copper flashing formed as in Fig. 11 is then placed over the parapet fitting in to the interstice 27, the space between the flashing and the flange of the top unit being filled with plastic 14 to make the joint water tight. The flashing is fastened at the rear of the parapet as in Fig. 4.

The foregoing describes the method used for constructing the exterior surface of a building, and the interior, ceiling or roof is treated in substantially the same way.

It will be seen that since each surface unit is seated independently of each other surface unit, that a damaged unit may be removed without disturbing any other units than those between it and the nearest wall opening; since in the preferred type of construction, the girts on which the surface units are seated are offset from the columns, any unit next a wall opening may be slid out along the girt, which permits the removal of the unit immediately below simply by lifting the unit. By sliding or lifting units as the case may require, any unit may be reached and replaced with another.

Having fully described our invention, we claim:

1. In a wall, vertical structural columns and a series of substantially parallel girts for supporting surface units on said columns, means in said surface units for applying said surface units to said girts, said means permitting the seating of each surface unit upon said girts independently of each other surface unit in said wall.

2. In a wall, the combination of vertical structural columns and girts spaced horizontally to said columns for supporting surface units, and surface units supported independently of one another on said girts, being cushioned vertically and horizontally against one another by the use of plastic material in the interstices between said surface units.

3. In a wall, the combination of vertical structural columns and spaced horizontal cross bars on said columns fastened by suitable means, and surface units for said wall, said surface units being seated at the bottom on said cross bars independently of each other.

4. In a building, vertical structural columns, spaced horizontal cross bars, metal surface units provided with clips engaging said cross bars, and with butt flanges, insulation in said surface units, said insulation being held in place in said surface units by said butt flanges in the units, and by

engagement of said clips in contiguous units with said cross bars.

5. In a building surface composed of multiple units, each supported independently of the others upon horizontal cross bars, units adapted cooperatively to form a corner of said building, said corner units consisting of a primary unit forming the corner and having at its corner two vertical flanges forming a seat for a subsidiary corner unit seated against the said vertical flanges to complete the said corner.

6. In a corner for a building composed of tiers of corner units, a corner column with horizontal cross bars acting as support for said corner units, said corner being formed by primary and subsidiary corner units, the primary units furnishing seats for the subsidiary units.

7. In a corner for a building consisting of multiple surface units each independently supported on a frame work, a surface unit formed as a corner having clip flanges at the base thereof, which said clip flanges support the said corner unit on a frame work and hold lower corner units in position on said frame work to form the corner.

8. A formed corner unit for a building consisting of two contiguous faces set at an angle to form the corner vertical and horizontal flanges at right angles to the said faces, butt flanges at the base of and parallel to the said faces, said butt flanges being provided with clip flanges to seat the said corner.

9. A building having a surface composed of a multiplicity of units, a water table at the base of said building, having a vertical inner flange butted against a horizontal base girt on the frame work of said building, said water table being held in position by clip flanges on the lowest tier of surface units interlocking the said vertical inner flange of the water table with the base girt on the frame work.

10. A water table for a building, said water table being held in operative position by the surface units of said building, butting the same against base girts affixed to the columns of said building, said units clipping said water table to said girts.

11. A building composed of vertical structural columns and spaced horizontal cross bars, surfaced with multiple surface units, a parapet on said building, composed of a top angle and continuous top plate, said top plate being set off from said top angle, a series of top surface units seated at their bases on girts, said top units having horizontal top flanges bent back upon themselves to fit the interstice between the top angle and the top plate and a flashing, protruding over the face of the top surface unit, formed to fit the said interstice, being suitably fastened at the inner base of the parapet.

12. A surface unit for the parapet of a sheet metal building, said unit being composed of a face, vertical side flanges, and a horizontal base flange, a butt flange at the base provided with clip flanges to seat the said unit, and a top horizontal flange, forming the top of the parapet, said top horizontal flange being bent upon itself at the end farthest from the face of the unit.

13. In a wall vertical structural columns, and girts for supporting a multiplicity of surface units on said columns, surface units having rectangular faces, vertical and horizontal flanges at right angles to said faces, and means in the base horizontal flanges for supporting said surface units on said girts independently of one another, said means permitting the unit to move independently on said girt, said units being so spaced on said girts that the horizontal and vertical flanges of one unit at no place touch the horizontal or vertical flanges of another unit, and plastic in the interstices between said units to cushion one unit against another.

14. In a wall, the combination of vertical structural columns, spaced horizontal cross bars fastened on said columns being set off therefrom, said cross bars forming an independent seating means for surface units, surface units provided with horizontal and vertical flanges parallel to the face of said units and with means for interlocking one surface unit with another on said cross bars, said interlocking means permitting the sliding of individual surface units on said cross bars.

15. In a wall, the combination of vertical structural columns, horizontal cross bars fastened on said columns being set off therefrom, surface units independently seated on said cross bars said surface units having means for individually seating insulation, means in said surface units for interlocking one surface unit with another on said cross bars, said interlocking means permitting the sliding of individual surface units on said cross bars.

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