W. H. FRAZER.

BUILDING AND MEANS THEREFOR.

APPLICATION FILED FEB. 28, 1921.

1,433,998.

Patented Oct. 31, 1922.

3 SHEETS—SHEET 1.

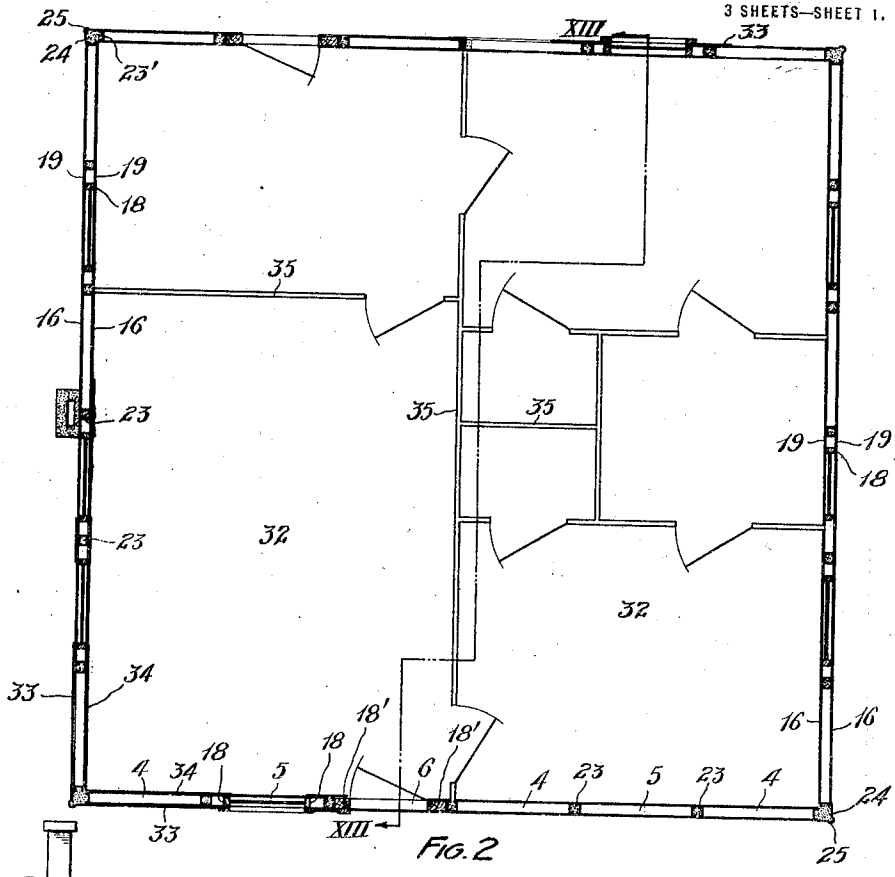


FIG. 2

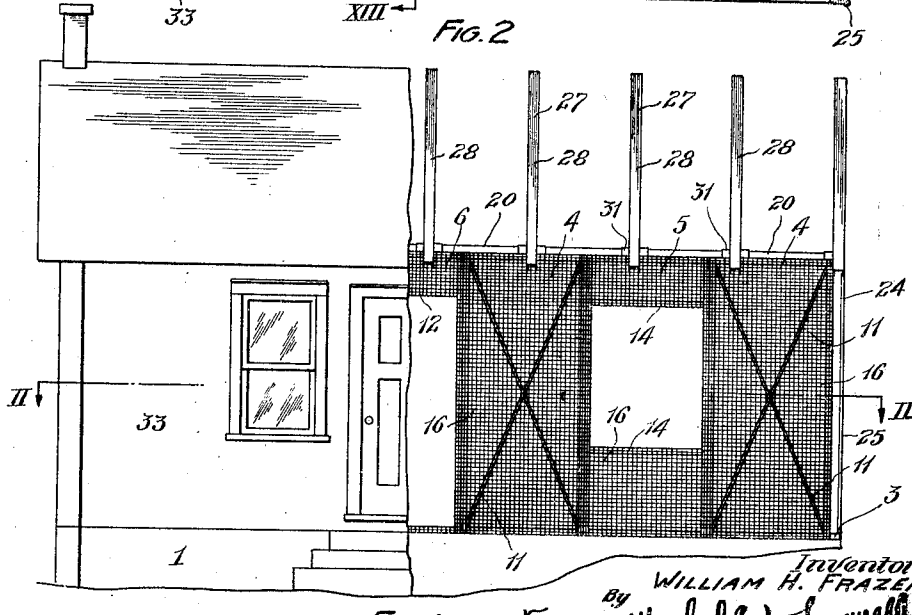


FIG. 1.

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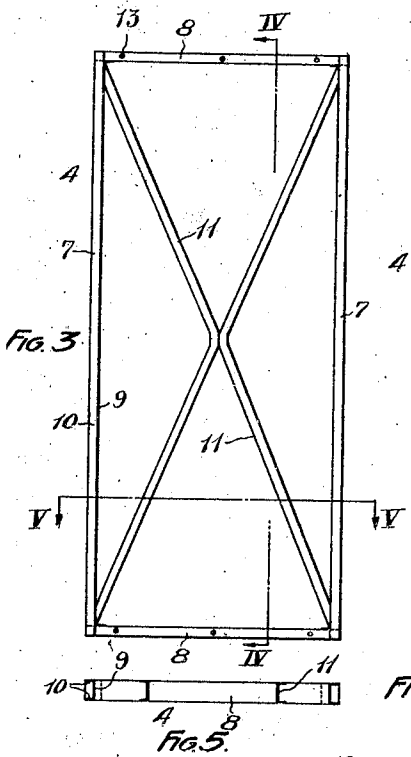


Fig. 3

Fig. 5.

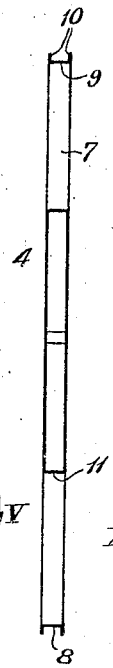


Fig. 4

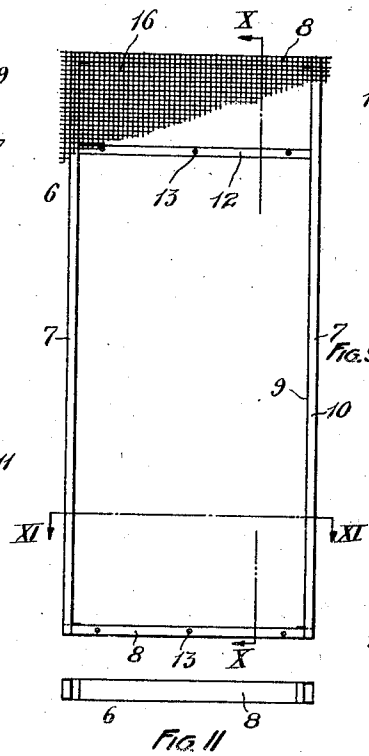


Fig. 11

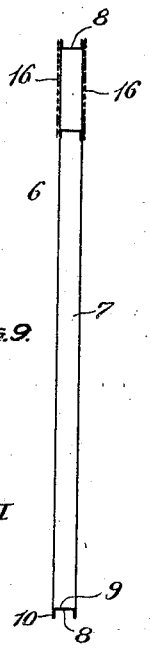


Fig. 9.

Fig. 10.

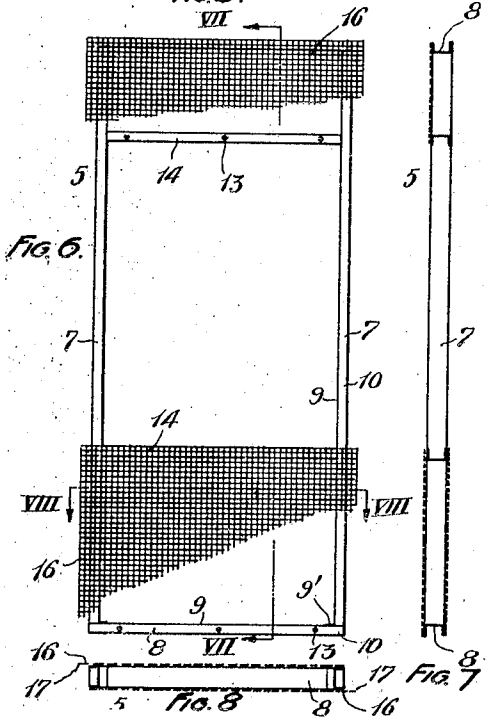


Fig. 6.

Fig. 8

Fig. 7

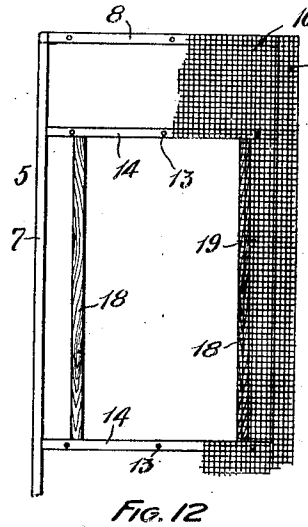


Fig. 12

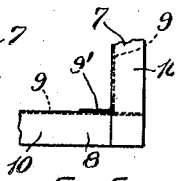


Fig. 5a

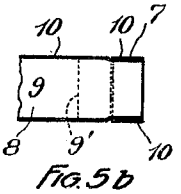


Fig. 5b

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3 SHEETS—SHEET 3.

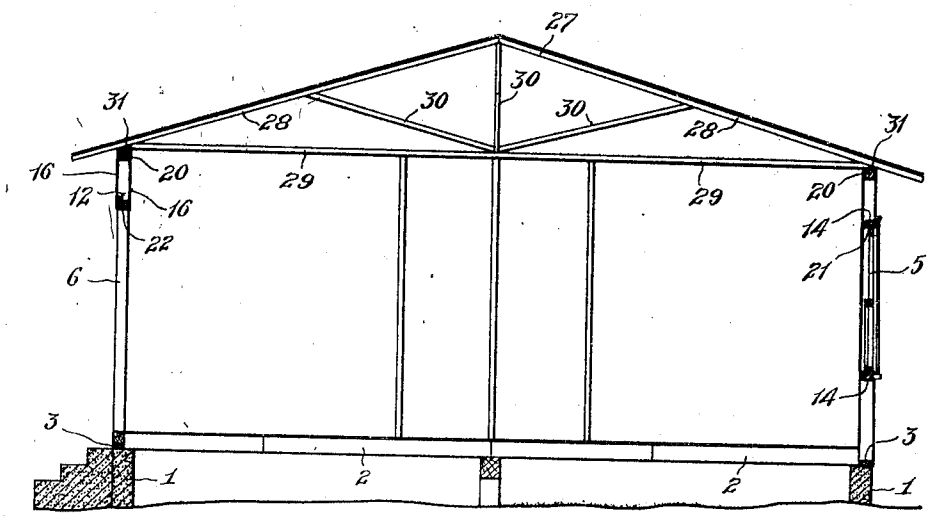


FIG. 13.

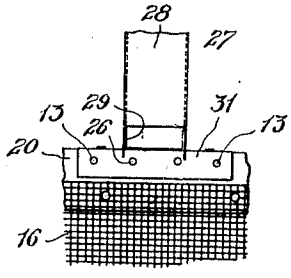


FIG. 15.

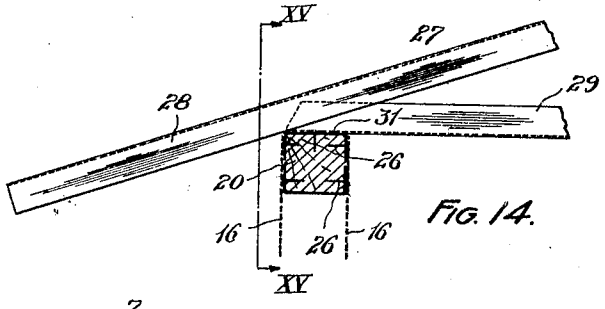


FIG. 14.

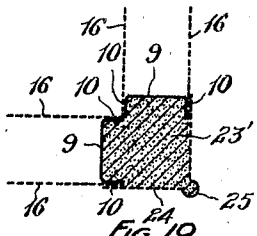


FIG. 19.

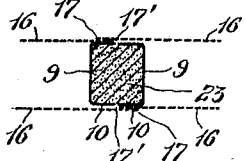


FIG. 17.

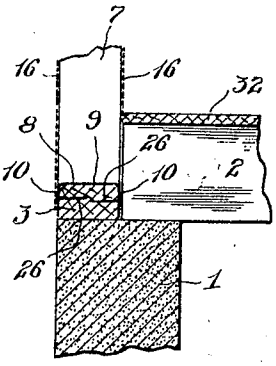


FIG. 16.

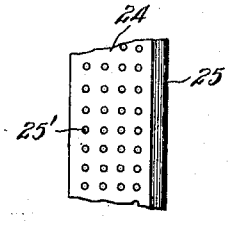


FIG. 18.

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UNITED STATES PATENT OFFICE.

WILLIAM H. FRAZER, OF RAVENNA, OHIO, ASSIGNOR TO THE STUKO-STEEL COMPANY, OF YOUNGSTOWN, OHIO, A CORPORATION OF OHIO.

BUILDING AND MEANS THEREFOR.

Application filed February 28, 1921. Serial No. 448,431.

To all whom it may concern:

Be it known that I, WILLIAM H. FRAZER, a citizen of the United States, resident of Ravenna, county of Portage, and State of Ohio, have invented new and useful Improvements in Buildings and Means Therefor, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to reinforced concrete buildings, and particularly to means of this character having a supporting side structure comprised of fabricated steel units. More particularly, my invention relates to buildings of this character suitable for dwelling purposes, the object of the invention being to provide dwelling means which shall be adaptable as to size and interior arrangement, fireproof, and which can be economically built and constructed on the site by means of common labor for the most part. The invention further relates to a unit skeleton frame comprised of reinforcing steel channel members and, preferably, metal laths secured thereto, which unit frames are fabricated at the steel plant and shipped in sufficient quantities to the dwelling site where, without any further fabrication thereof, they are readily set into position to form the side supporting structure of the dwelling.

The annexed drawings and the following description set forth in detail certain means embodying my invention, such means disclosing, however, but one of the various ways in which the principle of the invention may be embodied.

In said annexed drawings:

Figure 1 represents a fragmentary side elevation of a dwelling illustrating and embodying my invention, a part of the view being broken away to disclose an assembly of the unit panels and also a plurality of roof trusses, of standard construction, having secured thereto channel members presenting downwardly extending flanges, all as hereinafter fully described:

Figure 2 represents a plan section taken in the plane indicated by the line II—II, Figure 1;

Figures 3, 4 and 5, represent, respectively, an elevation, a vertical section in the plane IV—IV, and a horizontal section in the plane V—V, Figure 3, of a fabricated unit skeleton frame of my improved dwelling forming a wall panel, which will be hereinafter described in detail, the metal lath which may or may not form a part of said unit not being shown in said figures;

Figures 5^a and 5^b represent, on an enlarged scale, a side elevation and a bottom plan, respectively, of a corner of the unit skeleton frame shown in Figures 3, 4 and 5.

Figures 6, 7 and 8 represent views similar to Figures 3, 4 and 5, respectively, of a modified form of unit member forming a window panel, the metal lath being shown in these figures.

Figures 9, 10 and 11 represent views similar to Figures 6, 7 and 8, respectively, of a still further modified form of unit member forming a door panel;

Figure 12 represents an elevation of a modification of the window panel adapted to serve for a smaller outlook;

Figure 13 represents a vertical section taken in the planes indicated by the lines XIII—XIII, Figure 2;

Figure 14 represents, upon an enlarged scale, a view of fragmentary elements shown in Figure 13, illustrating the tying together of the side supporting structure and the roof trusses;

Figure 15 is a fragmentary elevation, taken from the plane indicated by the line XV—XV, Figure 14, of elements shown in said Figure 14;

Figure 16 is a vertical section, upon an enlarged scale, of fragmentary elements shown in Figure 13, illustrating the foundation construction;

Figure 17 is a horizontal section, upon an enlarged scale, illustrating the method of joining adjacent unit members or panels;

Figure 18 is an elevation of a fragmentary portion of a building corner plate; and

Figure 19 is a horizontal section illustrating the building corner construction.

Referring to the annexed drawings, in which similar elements are designated by the same ordinals, respectively, in the several views, an artificial stone foundation, of any desired character, is illustrated by the ordinal 1, upon which are supported, at any suitable distance apart, 16″ centers, for instance, joists 2. The illustrated embodiment of my invention is a substantially square dwelling, but the same can be, of

course, within the spirit of the invention, a rectangular or any other suitably shaped building. It is intended, however, that the several dimensions of the dwelling, inside measurement, shall be multiples of a width given to certain unit members or wall panels, hereinafter fully described, so that a definite number of said panels may be set up to provide the side supporting structure of the size of dwelling desired, such size being, as before stated, on each side, a multiple of the standard width of such unit members. For instance, I have shown in the accompanying drawing, and shall hereinafter fully describe, a unit member 4 feet wide, the illustrated dwelling being twenty-four feet on a side, so that an equivalent of six unit members is required upon each side.

On the outer walls of the foundation 1, adjacent the ends of the joist 2, are positioned sills 3, the same being, in the means illustrated, standard 2″ x 4″ timbers. Upon and around these sills I mount unit members such as wall members 4, Figure 3, window panels 5, Figure 6, and door panels 6, Figure 9. These members or panels may be of any suitable length, but I have illustrated the same as having an overall length of nine feet three inches. These members or panels are the unit members hereinbefore mentioned, and are fabricated at the steel works, either complete, with metal lath, hereinafter described, or without said lath. They are comparatively flat so that they can be conveniently shipped in quantities, and, no additional work being required upon them at the installation, can be set up on the job by common labor. These unit members are rectangular, and consist of two end channels 8, of four foot lengths, and two side channels 7, of nine feet three inches length. These channels are welded or riveted together so that the flanges 10 of each of the four channels extend outwardly, thus forming an area-inclosing unit member 4 of a U-shaped cross-section through its boundary wall. The flanges 10 are 2″ in depth, in the form of the unit member illustrated. The web 9 of the channels is 4″ wide, except possibly in the case of the bottom rail 8 which covers the sill 3 and the top rail 8 which is secured to the tie-plate 20 hereinafter fully described. These bottom and top rails may have webs 3½ inches wide which will simplify the process of welding together the side and end rails of the unit skeleton frames during the fabricating of the same at the steel plant. Otherwise, after the side rails 7 have been slit and a piece turned back as illustrated by 9′, Figures 5ª and 5ᵇ for welding to the web of the end rail 8, the latter will be slightly buckled, as illustrated in Figures 5ª and 5ᵇ, due to its being confined between the flanges of the side rail. The rectangular unit frame is reinforced by other channels 11 welded thereto, and to each other, as plainly shown in Figure 3. This bracing is for withstanding a wind load, and may or may not be used, within the spirit of this invention.

Referring to the door panel, Figure 9, a horizontal spacing and bracing channel 12 is secured to the side channels a suitable distance below the top channel, according to the requirements of the door. Referring to the window panel, Figure 6, two auxiliary horizontal channels 14 are secured to the side channels at different distances from the top and bottom channels, respectively, so that, for different requirements, the window panel may be reversed end to end to present the outlook at different heights.

Spot-welded to the supporting steel frame thus fabricated from the channels, is any suitable form of lath 16, preferably expanded metal, of substantially the character and mesh shown in Figures 1, 6 and 9. Preferably, this metal lath 16 which serves to key the stucco or the plaster is secured to the skeleton frames at the steel works and is an integral part of the fabricated unit of the side supporting structure of the building. This metal lath 16 is secured upon both faces of the unit frame members, as plainly shown at 17 in Figure 17, if plaster surfacing is later to be applied; otherwise, if only the outside stucco surfacing is to be applied, the metal lath 16 is secured to the outer face only of the unit frame members. The metal lath 16 extends about two inches beyond the edge of the members 7, the extra two inches being arranged in staggered relation, as plainly shown in Figure 17, so that they form one two-inch overlap over the members at the vertical line of contact of adjacent unit members, if the opposed flanges 10 of said unit members substantially contact. If there is a material spacing greater than the distance 17′, Figure 17, between the opposed flanges of the laterally adjacent unit members, the overlap will be decreased by the amount of said spacing, as will be readily understood. Of course, the spacing 17′ will not amount to any considerable distance, because the side of the building should be substantially a multiple in length of the width of the unit panel. In the event that the unit window panel is too large for the desired window, an inner wood frame 18 is formed and secured thereto, and the intervening space is covered by metal lath 19, as plainly shown in Figure 12. As regards the door panel 6, the same contingency is met in a similar manner, as is evidenced by the auxiliary door frame 18′, Figure 2. In the event that it is possible and preferable to secure the metal lath 16 to the side supporting structure, on the job, the same is welded or tied thereto in any practicable

unit lengths and widths, after the side supporting structure has been placed and tied in position in the manner hereinafter described.

The suitable number of wall panels, door panels and window panels is set in place on the sills 3, secured by nails 26, and suitably temporarily braced, if desired, and a tie-plate 20 set in the flanges of the upper rails 8, nails 26 also securing the rails 8 to the tie-plate 20. These tie-plates are preferably standard 4″ x 4″ timber members. Roof trusses 27, preferably of standard construction, are then mounted on the side supporting structure. The standard features of the roof truss consist of lower horizontal channel members 29, upper inclined members 28, and braces consisting of members 30, all as plainly shown in Figures 13 and 14. These members are severally welded together, and the flanges of the channels 29 extend upwardly so that the web thereof is on the bottom. To this web, and before mounting the roof trusses, I weld channel sections 31, preferably channel scrap, these channel sections 31 presenting downwardly extending flanges registering closely with the upwardly extending flanges of the upper channel members of the unit panels 4, 5 and 6. Disposed within the space formed by the flanges of the channel sections 31 and the upwardly extending flanges of the wall panels, are the tie-plates 20. All of the channel members are formed with nail holes 13, as necessary, and through these holes and into the several tie members 3 and 20, heretofore mentioned, are driven nails 26. Within the flanges of the auxiliary channel members 12 and 14 of the door and window panels, respectively, and also secured by nails 26 are wood frame members 22 and 21, respectively, the same being standard 2″ x 4″ timber members.

If desired, and to the extent desired, any suitable artificial stone material is poured into the spaces formed by and between the opposed flanges of adjacent side rails of the unit panels, to form vertical tie members and artificial stone supporting columns 23, Figure 17. It will be apparent from the foregoing description, that the right angular corners of the building structure, formed by the described wall panels, will be of the form shown in full lines in Figure 19. I cap the corner with a building corner plate 24 having a corner bead 25 and, if desired, perforations 25′, plainly shown in Figure 18, and fill the space with artificial stone material so as to form vertical, artificial stone corner columns 23′.

Upon the supporting structure fabricated and set up as hereinbefore described, and specifically to the exterior metal lath 16 thereof, I form any suitable artificial stone surfacing 33, such as cement plaster, commonly called stucco. A flooring for the interior of the house is indicated by the ordinal 32. If an inside wall is desired, a surfacing 34 is formed upon interior metal lath 16, such surfacing being the usual inside plaster.

The structure fabricated and set up, as before described, may be subdivided by partitions 35, in any desired or suitable manner, and the interior arrangement of rooms perfected as required.

What I claim is:

1. A skeleton unit for building construction consisting of, an area-enclosing frame formed of a steel channel member of U-shaped cross-section whose flanges are outturned; and expanded metal extending across said frame and integrally secured to said flanges.

2. A skeleton unit for building construction consisting of, an area-inclosing frame formed of a steel channel member of U-shaped cross-section whose flanges are outturned; and expanded metal integrally secured to both faces of said member.

3. A skeleton wall construction for buildings comprising, a plurality of units each characterized as in claim one, the flanges of each unit being opposed to the flanges of adjacent units; and tie members for the respectively adjacent units disposed within the spaces formed by the opposed flanges.

4. A skeleton wall construction for buildings comprising, a plurality of units each characterized as in claim one, the flanges of each unit extending outwardly at right angles to the web; and tie members for the respectively adjacent units disposed within and between the opposed flanges.

5. A stucco-steel building comprising, in combination with a suitable foundation and a roof; sills associated with the foundation and roof, a wall structure consisting of a plurality of connected area-inclosing metal channel units of U-shaped cross-section whose flanges are outturned, said wall structure being united by channel flanges to said sills, a stucco-surfacing for said wall structure, and means keying said surfacing to said wall structure.

6. A stucco-steel building comprising, in combination with a suitable foundation and a roof; metal channel members secured to the under side of the roof members and having downwardly extended flanges, a wall structure consisting of a plurality of connected area-inclosing metal channel units of U-shaped cross-section whose flanges are outturned, sills to which said roof channels and the upper channels of said wall structure are secured, sills associated with the foundation and to which the lower channels of said wall structure are secured, a stucco-surfacing for said wall structure, and means keying said surfacing to said wall structure.

Signed by me this 23 day of October, 1920.

WILLIAM H. FRAZER.