April 5, 1932. M. G. CLARK 1,852,002

METAL BUILDING STRUCTURE

Filed May 28, 1931

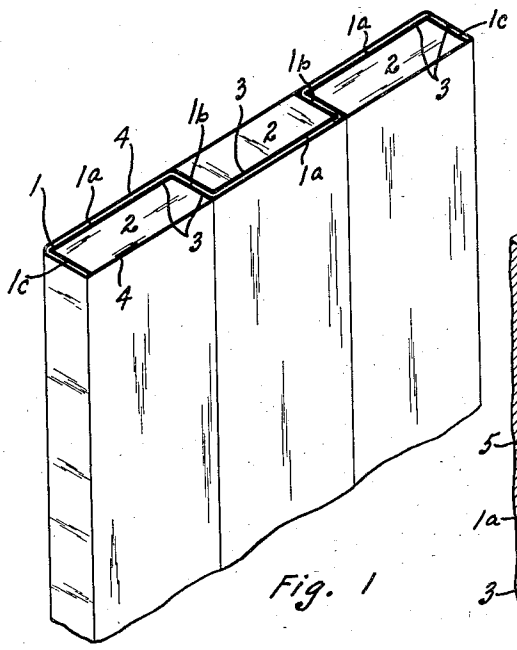

Fig. 1

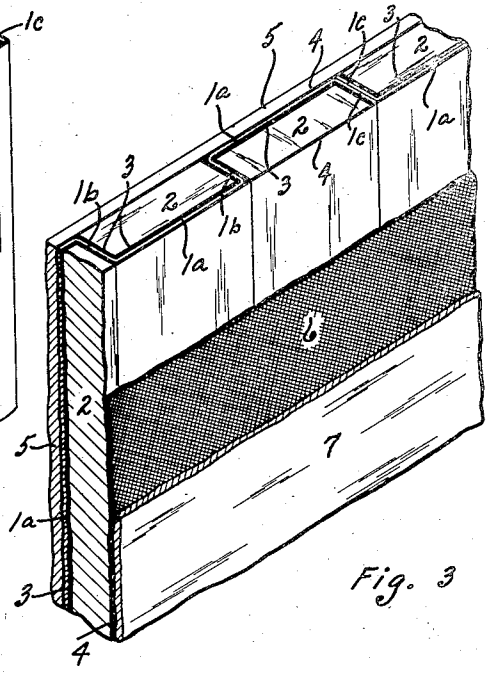

Fig. 3

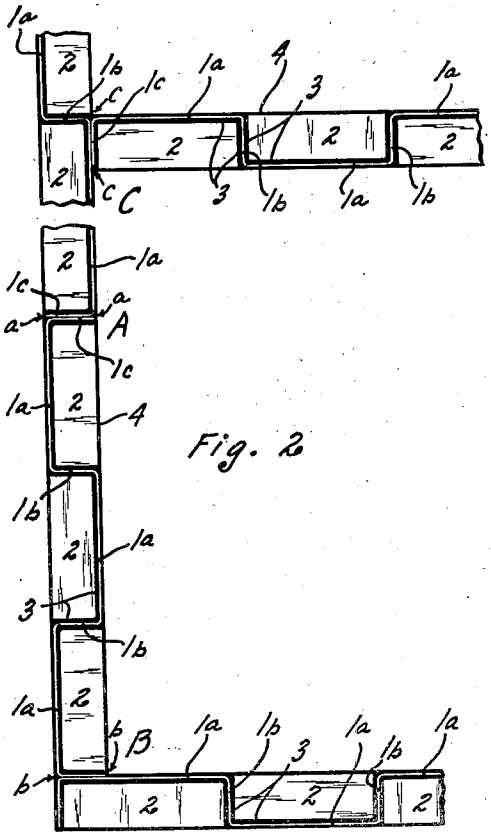

Fig. 2

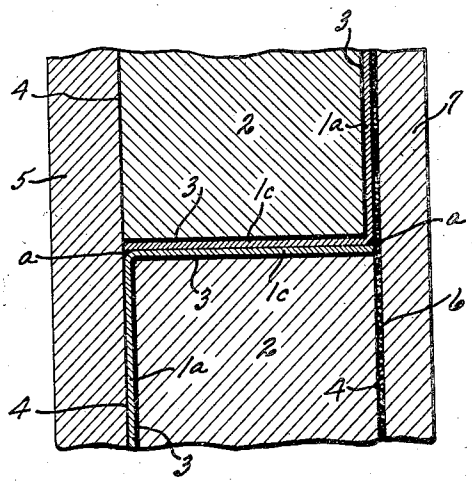

Fig. 4

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UNITED STATES PATENT OFFICE

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METAL BUILDING STRUCTURE

Application filed May 28, 1931. Serial No. 540,647.

This invention relates to wall units for building construction, and contemplates such a unit which shall be of sufficient strength and rigidity and have proper weather-proofing and heat and sound insulating properties to serve in itself without a supporting frame-work, as a complete wall panel; so that a building may be constructed of walls comprising solely a plurality of such units, to which, on the inside, may be directly applied a finish coat as a plaster or the like, and on the outside weatherproofing and decorative material.

The principal object of this invention then is to provide a building wall unit of the class described and more particularly one comprising a sheet metal bent to form adjacent channels opening on opposite sides, and non-metallic members filling said channels and secured therein, whereby said wall unit has a non-metallic body, with a metallic reinforcing having portions at the opposite faces of the unit and portions extending therebetween.

Another object is to employ for the purpose of securing together members of the unit, a material which is both adhesive and protective; and to apply this material to all sizes of all members before their assembly into the unit, whereby in the assembled unit all exposed sides are protected by a single thickness of protective coating, and all abutting sides of adjacent members are secured by double thicknesses of adhesive coating therebetween.

A further object of the invention is to so arrange the metal member of the unit that a plurality of the units each comprising a wall panel, may be rigidly and permanently secured together as by welding, to provide a substantially continuous complete wall.

Another object is to make the metal portion of the wall of such form that units may be joined with equal facility either end to end or in angular relation as at corners.

And still another object is to provide novel means for joining units where the desired building dimensions are not such as to be provided by a mere plurality of complete units.

The exact nature of this invention together with further objects and advantages thereof will be apparent from the following description taken in connection with the accompanying drawings, in which Fig. 1 is a top end view in perspective illustrative of a unit embodying the invention; Fig. 2 is a plan view illustrative of the manner of joining together such units in building construction; Fig. 3 is a view similar to that of Fig. 1 showing a completed wall section to which the finish materials have been applied; and Fig. 4 is an enlarged view of a typical section Fig. 3.

With reference now to the drawings and particularly to Fig. 1 thereof, the principal parts of the unit shown are a sheet metal member 1 and three non-metallic members 2. The member 1 is bent preferably rectangularly as indicated, to form adjacent channels opening on opposite sides of the general plane of the unit. In the unit illustrated Fig. 1 there are provided three channels of rectangular section, a central one opening from the observer, and on either side thereof a channel opening in the opposite direction or toward the observer. The locations of the bends are such that these channels are of equal width and depth, so that the outer edges of the metal member define a rectangular solid of thickness equal to approximately that of the depth of the channels, of width approximately three times the width of one of the channels, and of relatively greater length. The dimensions of this figure may thus be 2″ thickness, 18″ width and 10′ in length.

For each of the channels I provide a non-metallic filler which may be of any of the numerous so-called wall-bored materials, having relatively light fibrous or cellular structure and usually representing a by-product of an industry. Such by-products of the lumber, sugar, turpentine, peanut, cork, asbestos, and other industries, are to be found on the market. These filler members are each of sectional dimension to fit into one of the channels and preferably of length corresponding to that of the metal member, so that when the assembly is made as in Fig. 1, a rectangular solid will be formed having outside di-

mensions as described above. In order that the assembly be weatherproof, with all of the members protected against moisture, and that the filler members may be firmly secured in the assembly, I employ in the following manner a coating material which has adhesive and protective properties such as emulsified asphalt.

Before assembly of the parts all are dipped in such material so as to receive a coating thereof, so that each of the four members has its own coating on all of its sides. The filler members 2 are then pressed into the metallic member 1. It will be apparent that in the assembled unit, all exposed sides are protected by a single thickness of preservative coating, and all abutting sides of adjacent members are secured together by double thicknesses of adhesive coating therebetween. The double thickness of the coating is indicated Fig. 1 as at 3 wherein the coating acts as a binder, and by a thinner line as at 4 wherein the coating acts merely as a preservative or protection for the outer wall of the assembled unit.

It will be noticed that in the assembled unit the bulk of the unit is composed of the relatively light material of the fillers 2 but the metallic member 1 acts as a reinforcing so that the unit has the rigidity and strength of structural metal.

It will also be observed that, neglecting the coating material, the reinforcing has portions as at 1*a* in the opposite faces of the unit and transverse portions as at 1*b* extending directly therebetween. Also metal portions 1*c* are disposed at the side faces of the unit.

The units are obviously adapted to be employed in a wall structure, with their members running vertically, as indicated in the plan view Fig. 2. Since metal 1*c* is disposed at the end edges of each unit, a pair of units, arranged edge to edge as at A, Fig. 2, may be secured as by welding up and down the seams thus made, as at *a*. The coating material may be scraped or burned off to permit the welding. A wall corner may be formed by disposing adjacent units as at B, Fig. 2, and welding as at *b*. A partition wall may be had by disposing the parts as at C and welding as at *c*. It will be appreciated that in any or all of these cases the metal reinforcing members of the several units are made in effect continuous so that a rigid wall structure of great strength is had.

It is usually desirable that a finish be applied to the walls. Thus as indicated Fig. 3, on the outside a thin coat 5 of stucco or the like may be applied as through compressed air guns directly to the outer faces of the assembled units; or indeed clapboards may be applied as it will be obvious that nails can be nicely driven into the filler members 2 between the facing reinforcing metal portions 1*a*.

On the inside the finish will largely depend upon the decorative effect desired. In some instances it is desirable that a sheet 6 of burlap or other coarse textile material be applied to the inner wall face, to overlie the portions 1*a* of the metallic reinforcing in this face, and the non-metallic face portions therebetween. The sheet 6 may be secured by an additional thin coat of emulsified asphalt or the like. In many cases such a covering as a suitable textile 6 may suffice for finish. In other instances it may be desired to overlay upon the covering 6 a thin finish coat 7 of plaster or the like.

Fig. 4 thus illustrates a complete exterior wall section as at the joint A, Fig. 2, wherein the reference characters correspond with those in the other figures so that the parts are already identified. It may be here noted, however, that outside of the finish material the wall has at every section therethrough, a principal thickness of the material of the members 2 which is of excellent soundproof qualities and highly resistant to heat transfer. The section also includes a thickness of the metal reinforcing member 1. Overlaid upon either side is a finish material concealing and protecting the joint between units.

What I claim is:

1. A building wall unit of the class described comprising a sheet metal member bent to form adjacent channels opening on opposite sides, and non-metallic material filling said channels and secured therein, whereby said wall unit has a non-metallic body, with a metallic reinforcing having portions at the opposite faces of the unit and portions extending therebetween.

2. A building wall unit of the class described comprising a sheet metal member having rectangular bends to form adjacent channels of rectangular section opening on opposite sides, and non-metallic material filling said channels and secured therein, whereby said wall unit has a non-metallic body, with a metallic reinforcing having portions in the opposite faces of the unit and transverse portions extending directly therebetween.

3. A building wall unit of the class described comprising a sheet metal member bent to form adjacent channels opening on opposite sides, said channels being lined with adhesive material, and non-metallic members fitting said channels and secured therein by said adhesive material.

4. A building wall unit of the class described comprising a sheet metal member bent to form adjacent channels of rectangular section opening on opposite sides, said channels being lined with adhesive material, and non-metallic members fitting said channels and secured therein by said adhesive material.

5. A building wall unit of the class described comprising a sheet metal member bent to form adjacent channels opening on opposite sides, and non-metallic members fitting in said channels, each of said members having a coating of adhesive and preservative material on all sides before assembly, whereby in the assembled unit all exposed sides are protected by a single thickness of preservative coating, and all abutting sides of adjacent members are secured together by double thicknesses of adhesive coating therebetween.

6. A building wall unit of the class described comprising a sheet metal member bent to form a plurality of adjacent channels opening on opposite sides, with parallel end panels at the outer extremities of the end channels, and non-metallic members filling said channels and secured therein, whereby a plurality of said units may be secured edge to edge in a plane, by welding at the edges of their adjacent end panels.

7. A building wall structure of the class described comprising a sheet metal member bent to form adjacent channels opening on opposite sides, non-metallic members filling said channels and secured therein, whereby a wall unit is provided having a non-metallic body, with metallic reinforcing having portions in the opposite faces of said unit and portions extending therebetween, and finish material applied to a face of said unit to overlie the portion of the reinforcing in said face.

8. A building wall structure of the class described comprising a sheet metal member bent to form adjacent channels opening on opposite sides, non-metallic members filling said channels and secured therein, whereby a wall unit is provided having a non-metallic body, with metallic reinforcing having portions in the opposite faces of said unit and portions extending therebetween, and finish material overlying said faces and those reinforcing portions which would otherwise be exposed.

In testimony whereof I hereby affix my signature.

MILLS G. CLARK.