Dec. 5, 1939. L. L. LEVENE 2,182,593

BUILDING CONSTRUCTION

Filed Feb. 3, 1938 5 Sheets-Sheet 1

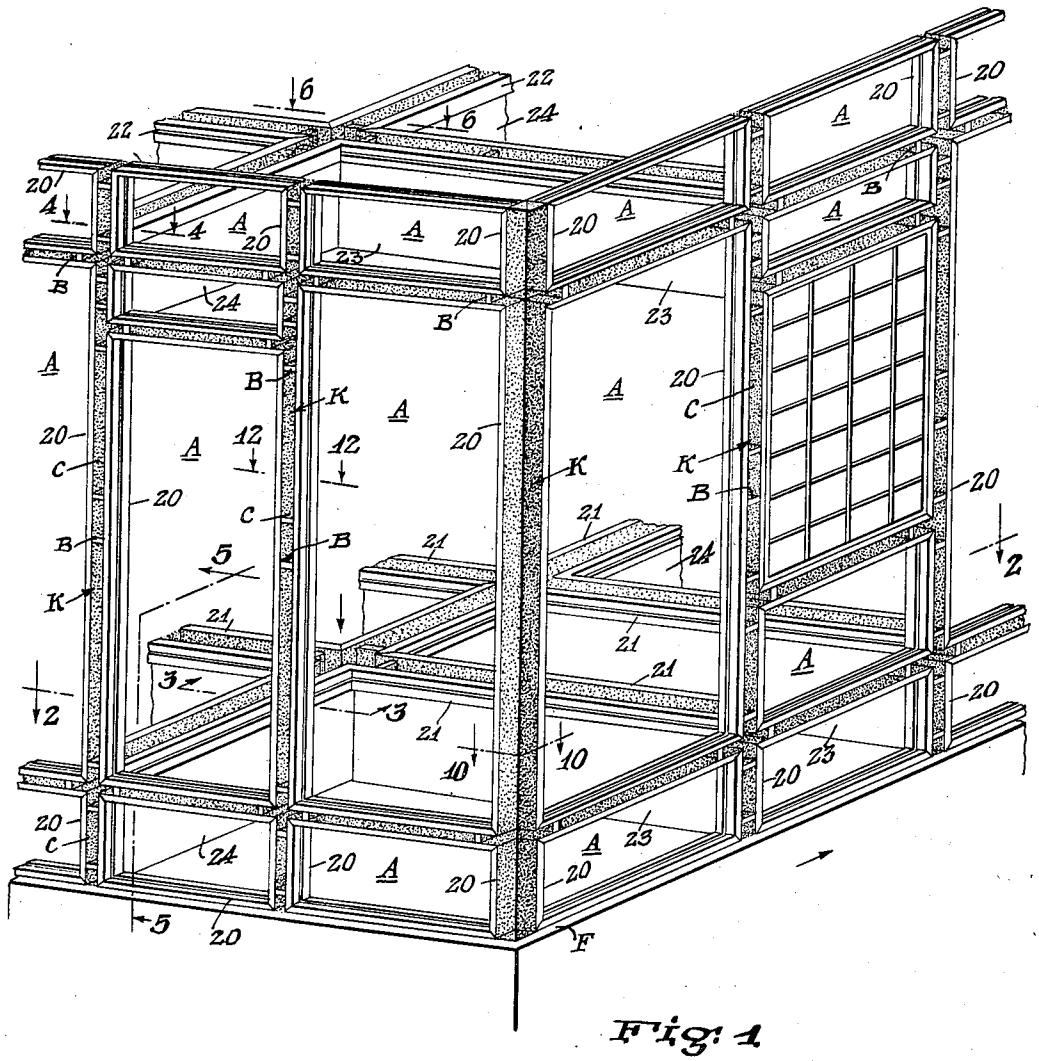


Fig. 1

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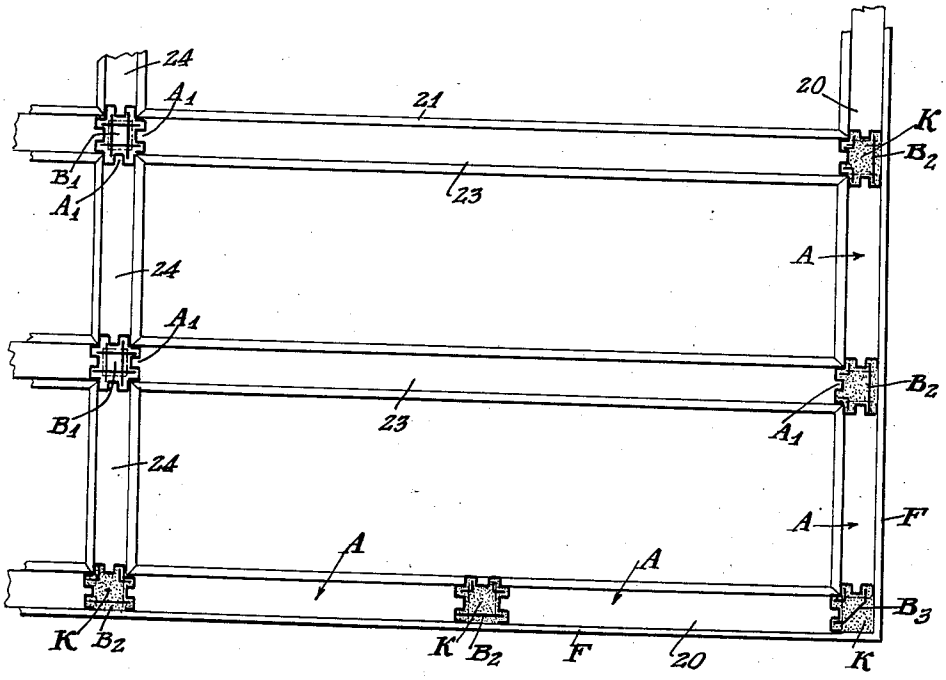


Fig. 2

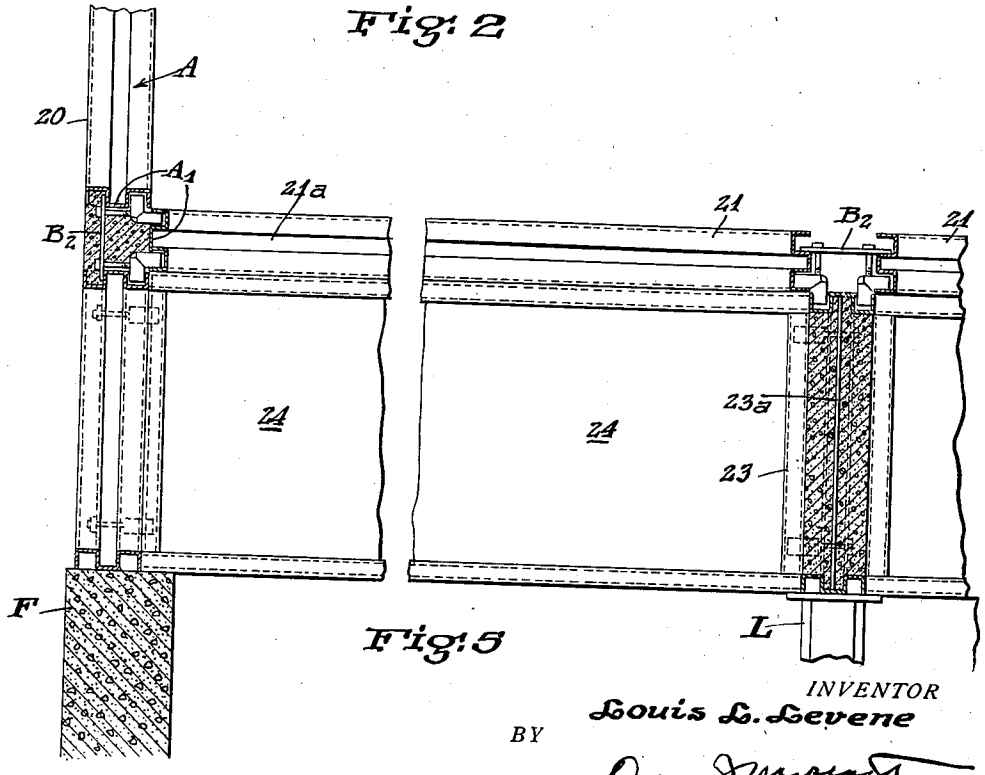


Fig. 3

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BUILDING CONSTRUCTION

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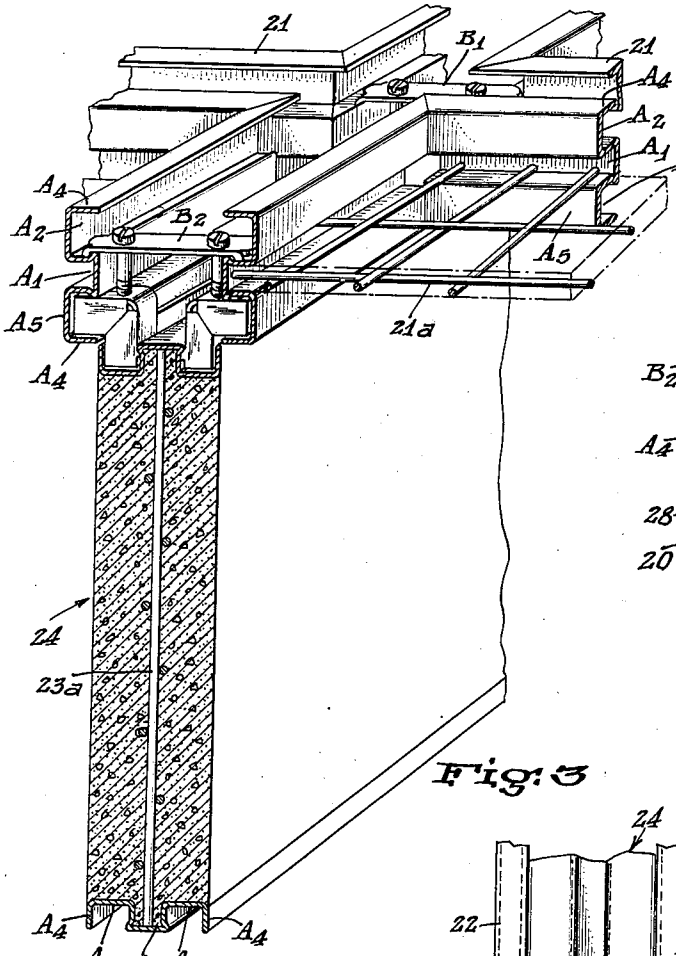


Fig: 3

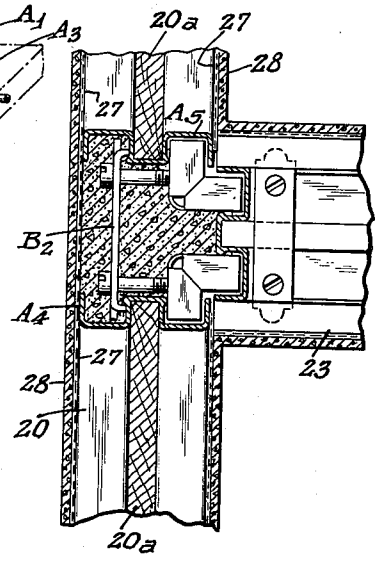


Fig: 4

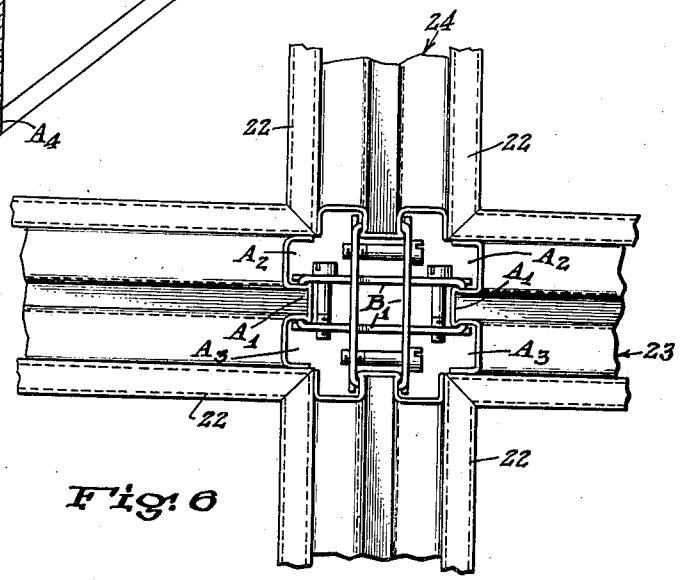


Fig: 6

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BUILDING CONSTRUCTION

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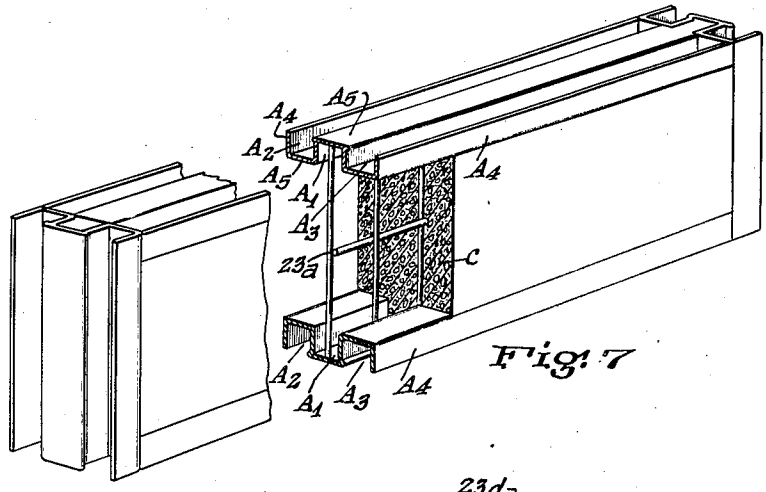


Fig. 7

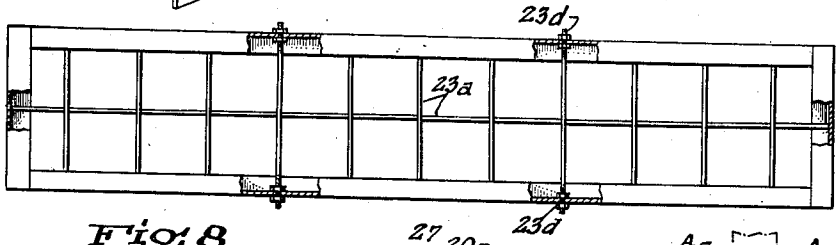


Fig. 8

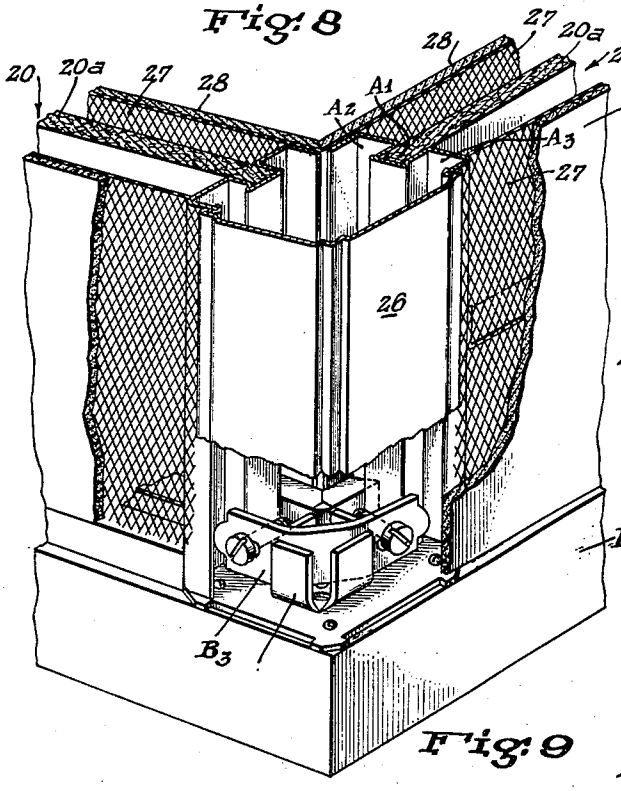


Fig. 9

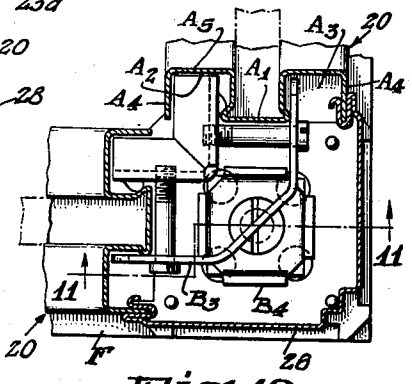


Fig. 10

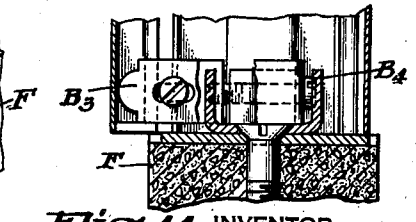


Fig. 11

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BUILDING CONSTRUCTION

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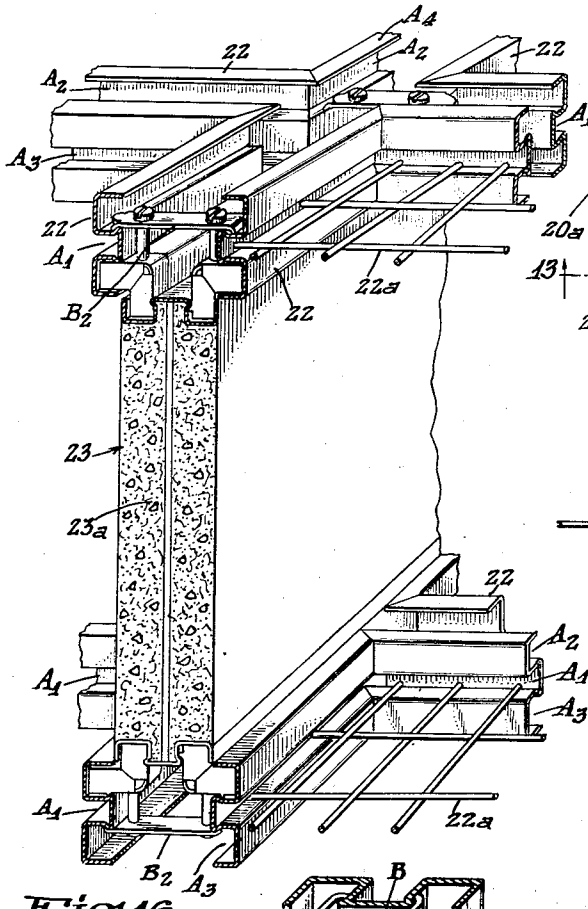


Fig: 16

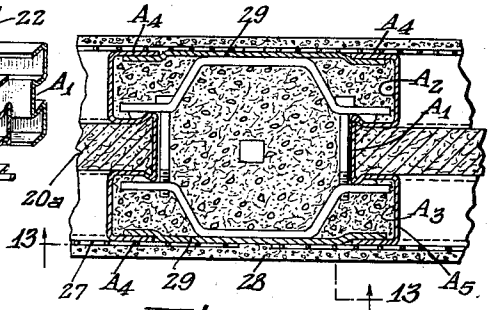


Fig: 12

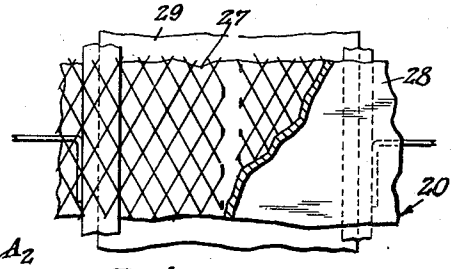


Fig: 13

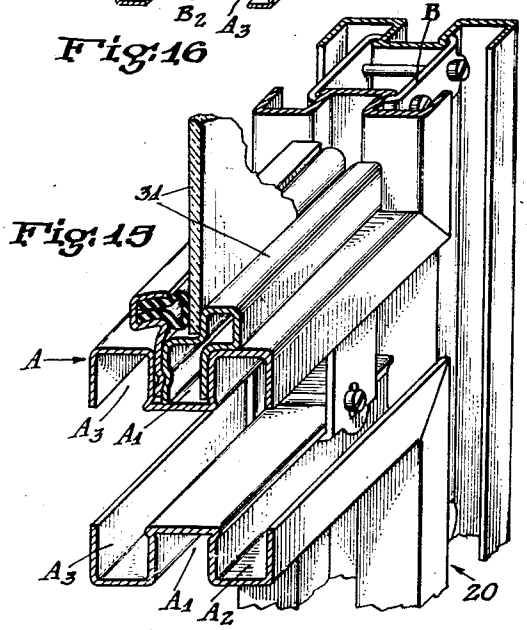


Fig: 15

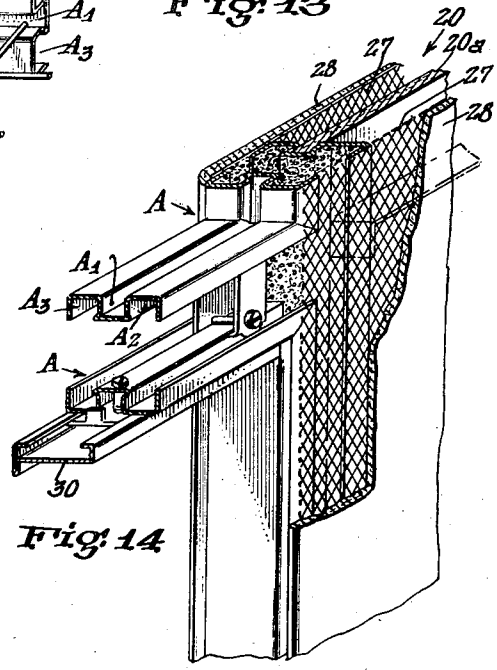


Fig: 14

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Patented Dec. 5, 1939 2,182,593

UNITED STATES PATENT OFFICE

2,182,593

BUILDING CONSTRUCTION

Louis L. Levene, Merrick, N. Y.

Application February 3, 1938, Serial No. 188,409

7 Claims. (Cl. 72—16)

This invention relates to improvements in building construction, being particularly directed to an assembly of units mounted in spaced relationship with respect to one another and bonded to form a volumnar enclosure, and a method of erecting such assembly.

Up to the present time, in low cost housing construction, the greatest difficulties encountered have been in the attempt to develop unit or section formations either in the structural or the enclosing members; no attempt has been made to apply multiple units forming structural and enclosing members having common properties and assembly characteristics.

Broadly, it is an object of this invention to provide a building construction for low cost housing involving an assembly of cooperating elements, all of which are of the same structural formation and type mounted in spaced relationship with respect to one another to form a volumnar assembly, with the bonding medium disposed in the zone between such elements serving to provide a firm structure.

Specifically, it is an object of this invention to provide a series of sections incorporating elements bounded by a common edge formation and mounted in spaced relationship with respect to one another to provide a volumnar enclosed construction, there being disposed between the elements forming the sections a bonding medium to form a continuous volumnar structure incorporating continuous walled formations.

Specifically, it is an object of this invention to provide a building construction incorporating sections to provide the various elements in a building, the edges defining the enclosing boundaries thereof being of a common predetermined contour to permit assembly of the same to form a volumnar framework and to provide for ready application of a bonding medium therebetween to form a continuous volumnar shell incorporating sections mounted in spaced relationship; all sections, whether serving as part of wall, floor or ceiling, or as supporting elements therefor, being maintained in the spaced relationship and bonded as indicated aforesaid.

Further, it is an object of this invention to provide a building construction for low cost housing, wherein all enclosing elements defining the volumnar contour of the construction are formed of unit sections spacedly mounted with respect to one another, and having a predetermined common peripheral surface formation on all sides, to permit simplicity in erection and assembly in spaced relationship to define the volumnar formation of the construction, and to provide zones of channel-like formation between the spaced sections in which is distributed bonding medium serving as a filler or reenforcing formation, as the case may require; the enclosed area defined by the units having material distributed therein and/or on the surfaces thereof serving as a filler or reenforcing medium, to provide for the functioning of such sections as an enclosing element, involving application under relatively low pressures, to that of a beam or girder unit, wherein the pressures are of great magnitude.

These and other advantages, capabilities and features of the invention will appear from the subjoined detailed description of one specific embodiment thereof illustrated in the accompanying drawings, in which

Figure 1 is a perspective view of a construction erected according to my method.

Figure 2 is a plan view partly in section taken along lines 2—2 of Figure 1.

Figure 3 is a side elevation partly in section taken along lines 3—3 of Figure 1.

Figure 4 is a plan view partially in section taken along lines 4—4 of Figure 1.

Figure 5 is a front elevation partially in section taken along lines 5—5 of Figure 1.

Figure 6 is a plan view taken looking downwardly along lines 6—6 of Figure 1.

Figure 7 is a perspective view partially in section of a beam unit.

Figure 8 is a side elevation of the structural assembly of a beam unit prior to casting.

Figure 9 is a perspective view partially in section of a corner of the structure showing the wall mounting.

Figure 10 is an end elevation partially in section taken along lines 10—10 of Figure 1.

Figure 11 is a front elevation in section taken along lines 11—11 of Figure 10.

Figure 12 is a plan view in section taken along lines 12—12 of Figure 1.

Figure 13 is a cut out section of one form of covering for the wall elements, taken along lines 13—13 of Figure 12.

Figure 14 is a perspective view partially in section of a window assembly.

Figure 15 is a perspective view partially in section of a door assembly.

Figure 16 is a perspective view partially in section of a ceiling element-beam assembly.

Referring to the figures and reference characters of the drawing, the volumnar structure involved is formed through the assembly in spaced

relationship of panel units of varying area and having a common peripheral contour, the respective panel units being rigidly erected and reenforced in spaced relationship through clamping and bonding media, to provide a common volume defining structure including wall, ceiling and floor formations and supports for the same in the nature of beams, girders and columns.

The frames of panel units A are in the nature of rectangular members formed, as for example, of rolled steel, the peripheral contour of which in section comprises a series of channel formations, the intermediate channel A1 being inverted with respect to the exterior channels A2 and A3, the wall A4 and base formations A5 of the channels respectively being parallel, with the provision of a slight flare at the jointure of base and wall of the intermediate channel.

In forming the frame for the panel unit A a length of material is rolled to the contour above specified and after bending to required angular shape, preferably rectangular, the free ends are welded to provide a rigid assembly, the frames having reenforcing or other media mounted across and within the intermediate channel, or throughout the interior of the frame, as will be later described, to provide different enclosing units for wall, floor, ceiling members, or to provide supporting units, as beams or girders, as the case may require.

Referring particularly to Figure 1, in which is shown a perspective view indicating a volumnar assembly, there are provided panel units serving as wall elements, indicated at 20, as floor elements indicated at 21, as ceiling elements indicated at 22, as beam elements indicated at 23, and as girder elements indicated at 24, each of the same being mounted in spaced relationship through clamping as by connecting clips B and rigidly maintaining in position to form a continuous volumnar assembly through the disposition of concrete or other bonding material C in the zones defined by the spacing therebetween.

As shown in Figure 2, beams 23 extend across the structure from left to right in a regular spaced arrangement, being supported at at least one of their ends upon foundation F, their other ends resting on "lally" or foundation columns L (see Figure 5) at the connection section with cross-girders 24, spaced at right angles to the beams and extending across the structure to form a wall or column supported at spaced intervals therein; the beams and girders being interconnected at their peripheral central channel formations A1, by series of cross-lock-clips B1, of the type shown in Figure 6, and after interconnection being rigidly bounded by the distribution of concrete within the zone defined by the peripheral walls of the beams and girders at the interconnection. The beams 23 are clamped to the plural wall elements 20 disposed across the ends thereof along the foundation F, at the respective central peripheral channels A1 of the beam and the plural wall elements 20 by tri-lock-clips; the vertical zone between the beam end and the two wall elements and defined by the peripheral walls of the frames of the same, is filled with concrete or like material to form a column K, which although herein shown as being a solid section of concrete or the like, may have embodied centrally thereof rods or steel forms or the like, to provide rigidity thereto. The horizontal zones between the beams, girders and wall sections are filled with concrete to provide in conjunction with the vertical columns a cross or transverse reenforcement.

As shown in Figure 3, which is partly in section, the beam unit 23 comprises of the frame A having the channel configuration previously described, across the central channel A1 of which there extends a reenforcing grid 23*a* formed of cross steel bars, and enclosing concrete or like filler to impart strength and rigidity thereto. The panel units supported thereon comprise floor elements 21 and are mounted at right angles thereto by means of the spaced tri-lock-clips, the floor sections having grids 21*a* embedded in gypsum or like material of block form fitting into the central channels A1 thereof, to provide sufficient rigidity thereto and to permit the use of the mounting of wooden or like flooring across one of the walls A4 of the floor element; it being, however, within the province of the invention to provide for a solid body of gypsum, cast into the floor element 21 as a floor block.

As shown in Figure 4, beam 23 has connected at its extremity by tri-lock-clips B2, wall sections 20, within the central channel of which there is mounted Celotex or like insulation blocks 20*a* and across the exterior channel walls A4 of which there is applied wire lathe or the like over which stucco or plastering material may be applied to provide a desired air insulated wall, the zone defined by the channeled peripheries of the wall and beam elements being here shown prior to the distribution therein of concrete or like material, for bonding the same and forming the column at such zone.

Referring to Figures 5 and 6, there is disclosed in the latter the cross-lock-clip formation connecting beam and girder prior to distribution of concrete or aggregate for reenforcing the zone to define a jointure therebetween, while the view in Figure 5 discloses the support for the girder 24 on the foundation wall F, at one end and the support for the interconnected beam 23 and girder 24 by the "lally" column L, with floor sections 21 supported on the beam with the girder providing lateral support at a right-angular plane and the wall elements 20 as interlocked with the floor elements by means of a tri-lock-clip above the beam, the zone defined by the peripheries thereof having concrete or the like disposed therein.

Figures 7 and 8 show details of the beam formation with locking means 23*d* for the reenforcing grid 23*a* disposed in the central channel thereof.

Referring to Figures 9 to 11 inclusive, a corner construction involving angularly disposed wall elements 20 is disclosed, the same being erected in the angular relation indicated by the application of a radial-lock-clip B3 in conjunction with the U-shaped base clip B4, embedded in and extending upwardly from the foundation; the outer contour of the corner being decoratively mounted in the illustration herein with a facing member 26 which may be clamped or sprung into shape as indicated, the zone defined by the pilaster 26 and the adjoining peripheries of the wall elements having concrete applied therein to form a bonding medium in the nature of a column therebetween. Although a facing member is here applied, the corner may be in the nature of a smooth-faced bonding medium, the contour of which may be determined by a mold applied at such corner. The wall elements 20 have the usual Celotex or similar insulation across their central channels and have carried the wire lathe 27 and stucco layers 28 to define the outer walls thereof, although there may be substituted for the wire lathe or stucco, any other finish carried across

the outer channel walls forming the transverse peripheries of the elements.

Figure 12 discloses a section defining the zone bounded by adjacent wall units, the clamping means for the same being a two-lock-clip joining the central channel formations A1, the zone defined by the peripheries of the adjoining wall elements having concrete applied therein to form a column, there being disposed centrally within the zone reenforcing element, here indicated as a square bar to impart rigidity to the column formed at the zone indicated. A facing member 29 is set across and interiorly of the end walls A4 of adjacent wall elements to provide the exterior for the column L; this member 29 not only serves as a decorative medium but also provides a mold wall in conjunction with the adjoining channel frames defining the zones in which the bonding and reenforcing medium is distributed.

Figure 13 shows generally the wire lathe and stucco or plaster assembly for interiors or exteriors of the walls.

In Figure 14 there are disclosed the elements to provide the assembly of the door construction, particularly the frame 30 thereof with respect to the wall sections, the same being applicable to permit the use of standard door elements to the channel wall assembly for the door frame shown in Figure 1 by means of a two-way clip between wall channel peripheries.

Figure 15 dicloses the frame 31 and accessories to provide the window construction shown at the right of Figure 1, in conjunction with the wall formation, the frame being interconnected with the peripheral channel formation of the walls by the two-lock-clip.

In Figure 16 there is shown in detail the construction capable of application for a ceiling support on the beam defining either the roof support or the support for the second floor, in the event that it is not desired to expose beams in the ceilings of the respective floors. The ceiling section 22, which is identical with the floor elements, is attached to such ceiling beams by tri-lock clips B2, at the lower face of the beams, whereas at the upper face of the beams there are mounted as by tri-lock-clips the sections forming either the second floor elements or, if desired, the roof proper, in the event a flat roof is desired, with requisite air insulation.

Although the disclosure herein has been more or less specific to a definite type of structural formation involving the exterior frame sections, it is within the province of this invention to provide for the erection and assembly of volumnar structures of varying size, shape and contour, so long as there is applied the series of panel units having a common peripheral formation capable of erection in spaced arrangement to form the exterior and interior framework or assembly of a structure and within the zones defining the spacing between the respective sections as interlocked, there is disposed reenforcing medium serving not only to bond the respective panels, but to impart rigidity to the framework.

It is also within the province of this invention to provide for the application of reenforcing or filling material at the job or to pre-cast the same to provide the various shapes and functions assumed by the panel frames as indicated herein, the essence of this invention being the application of the panel units in any of the above defined conditions wherein such panel units having the common peripheral formations are mounted and maintained in spaced relation to produce the volumnar assembly and construction herein.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit of the invention as set forth in the appended claims.

I claim:

1. In a building construction, a series of unit sections, some forming enclosing, some bearing and others supporting elements, assembled in multiple planes to form a volumnar skeleton, all unit sections having common peripheral edge formations, adjacent unit sections being spacedly mounted with respect to their peripheral edges to provide spacing zones therebetween, and means clamping adjacent unit sections at their peripheral edges to form a rigid structure.

2. In a building construction, a series of unit sections, some forming enclosing, some bearing and others supporting elements, assembled in multiple planes to form a volumnar skeleton, all unit sections having common peripheral edge formations, adjacent unit sections being spacedly mounted with respect to their peripheral edges to provide spacing zones therebetween, and means clamping adjacent unit sections at their peripheral edges to form a rigid structure, and a bonding medium distributable within the spacing zones between the peripheral edges of adjacent unit sections.

3. A building construction as set forth in claim 1, wherein the common peripheral edge formations of the unit sections comprise a continuous metal frame.

4. A building construction as set forth in claim 1, wherein the common peripheral edge formations of the unit sections comprise continuous channeled frames.

5. A building construction as set forth in claim 1, wherein the common peripheral edge formations of the unit sections comprise a continuous channeled frame between the walls of which are disposed surfaces cooperating with the clamping means.

6. A building construction as set forth in claim 2, wherein the common peripheral edge formations of the unit sections comprise continuous multi-channeled frame, the internal walls of which provide surfaces cooperating with the clamping means and the external walls of which provide bounding surfaces for the bonding medium distributable in this spacing zone.

7. A building construction as set forth in claim 1, wherein the common peripheral edge formation of the unit sections consists of a multi-channeled frame substantially W-shaped in cross section, the walls defining the central channel providing a surface cooperating with the clamping means.

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