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CONCRETE BUILDING CONSTRUCTION

Filed June 25, 1927

2 Sheets-Sheet 1

Fig. 1.

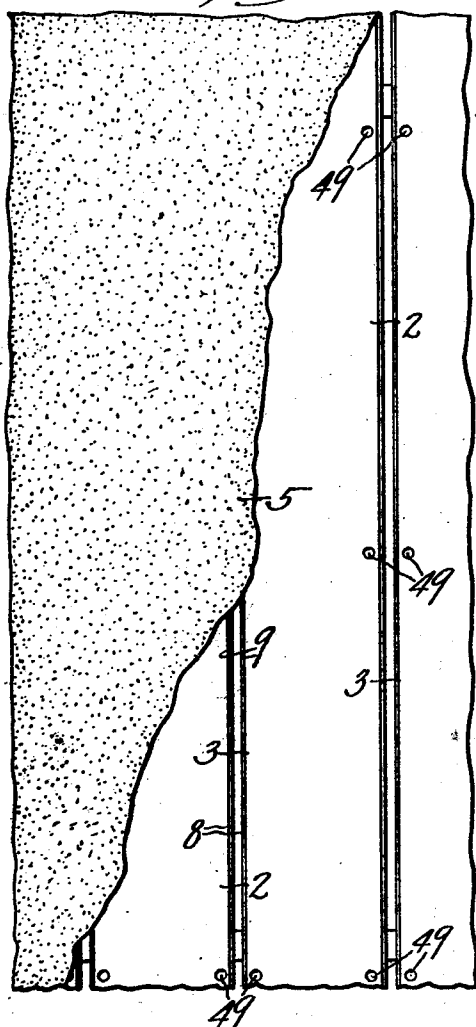


Fig. 2.

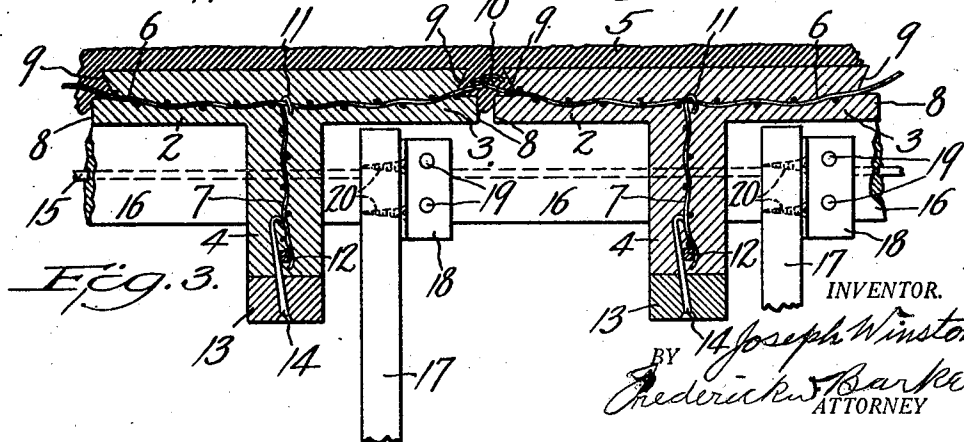
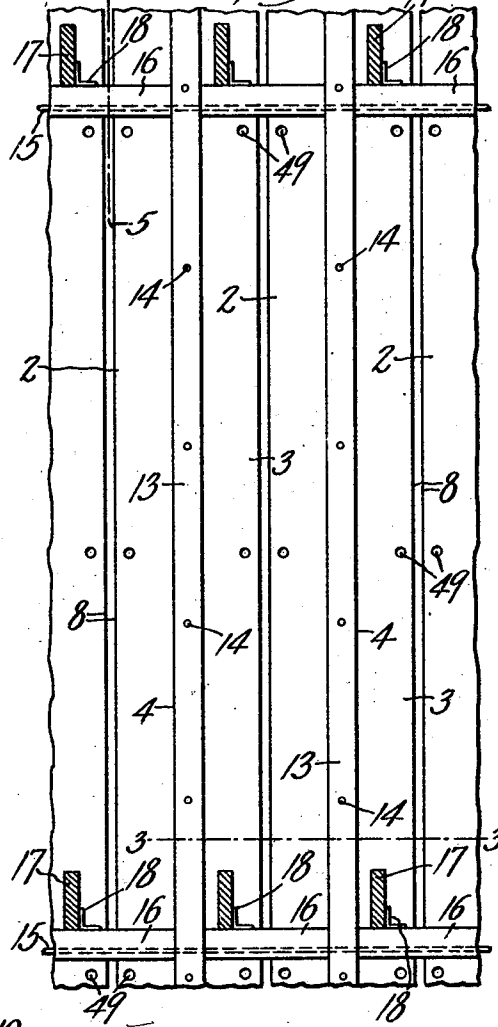


Fig. 3.

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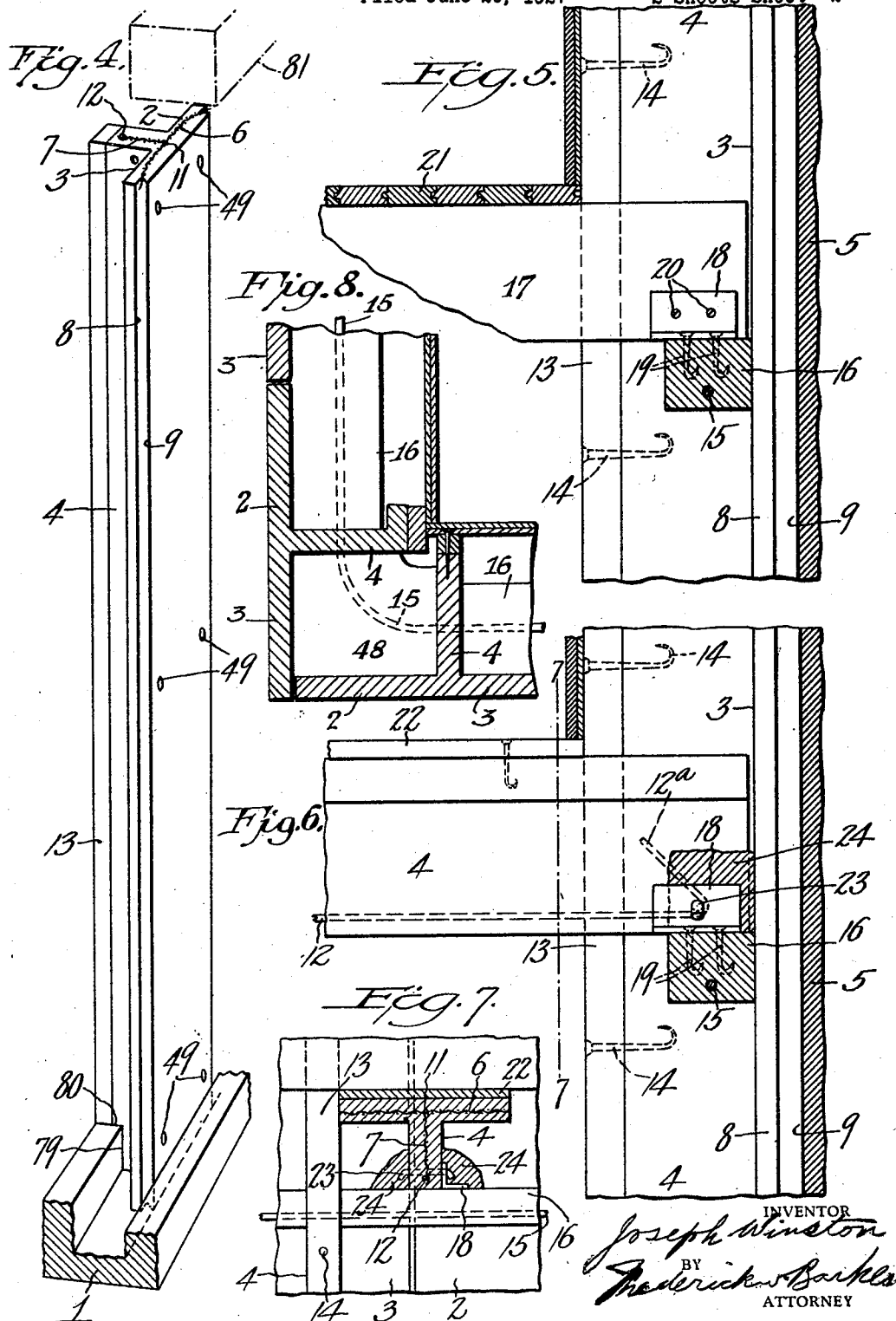
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2 Sheets-Sheet 2 2



UNITED STATES PATENT OFFICE.

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CONCRETE BUILDING CONSTRUCTION.

Application filed June 25, 1927. Serial No. 201,304.

This invention relates to building construction and my improvements are directed to certain novel formations, reinforcement, and interconnections of monolithic elements employed by me in the production of a concrete building, for the economical erection thereof with a minimum amount of labor. While aware that others before me have contributed to the art of concrete building construction, the innovations comprised in this application have been devised for the purpose of simplifying the form of the individual structural elements used, besides adapting them to be conveniently and expeditiously assembled, and further in connecting and securing said elements together in such manner that they may unitedly constitute a homogeneous fabrication, possessing the characteristics of great strength and durability.

Other features and advantages of my invention will hereinafter appear.

In the drawings:

Figure 1 is a front elevation showing some of my improved monolithic elements in assembled relation, the stucco surfacing thereon being partly broken away.

Fig. 2 is a rear view thereof, showing the rods, compression members and flooring supports carried by said compression members.

Fig. 3 is an enlarged horizontal section taken on the line 3—3 of Fig. 2, this view also illustrating the dove-tail grooving established between adjacent flange edges of monolithic elements, with the stucco bonding therein; the metallic reinforcement; the nailing strips for lathing on the webs of the monolithic elements, and the anchorage means therefor.

Fig. 4 is a perspective elevation of one of my improved monolithic elements.

Fig. 5 is an enlarged partial view of a monolithic element taken on the line 5—5 of Fig. 2 showing a compression member and a flooring beam or joist secured thereon.

Fig. 6 is a similar view showing a modification wherein a horizontally disposed monolithic element is supported on the compression members with its flanged portion

uppermost and provided thereon with a nailing strip for the flooring.

Fig. 7 is a section on the line 7—7 of Fig. 6.

Fig. 8 is a horizontal section taken through a corner of a building to show the tie rod curved through angularly disposed monolithic elements.

Under my improved system of concrete construction the walls of a building are composed of a number of monolithic elements such as that shown in Fig. 4, their lower ends being placed upon a concrete foundation, of which the channel 1 is an example. These monolithic elements consist each of the flange portions 2, 3 and the web portion 4, the flanges and web being co-extensive in length. The outer surfaces of the flange portions form the wall exterior, to which stucco 5 or other suitable covering material may be applied, and the monolithic elements are placed side by side with their adjacent flange edges in abutting relation.

The monolithic elements can be of sufficient length to extend to the height of one or more stories of the building, whose walls, thus constituted, are suitably provided with metallic reinforcement, and when placed in position said monolithic elements are tied together by suitable initial connecting means.

In considering the production of the monolithic elements, which are conveniently formed by moulding in wooden moulds or otherwise, it will be noted from the example thereof shown by Fig. 4 that metallic mesh reinforcement 6 is embedded in the flange portions 2, 3 and that metallic mesh reinforcement 7, is embedded in the web portion 4, the meshings 6 and 7 being connected; also that the lateral edges of flange portions 2, 3 are each provided with a longitudinal groove to receive some of the stucco or other plastic material serving as the wall covering. The grooves are so formed that they have a base 8 parallel with the flange surfaces and an angular undercut side 9, so that a groove in one flange may co-act with a similar groove at the opposed flange edge of an adjacent monolithic element, to thus provide a dove-tail recess for the reception of the stucco or

the like, which material thereby forms an interlocked bond between succeeding monolithic elements.

It will be noted that strands of the meshing 6 extended from adjacent flanges 2, 3 enter the dove-tail recess (see Fig. 3) and are interengaged as at joint 10 to thus unite the metallic reinforcements in a wall composed of monolithic elements.

When the plastic material 5 is subsequently filled into said dove-tail recesses the joint 10 thereby becomes embedded in said material, thus serving the twofold purpose of cementing the mesh engagement, and increasing the strength of the bond between adjacent monolithic elements.

Also in Fig. 3 it will be seen that the meshings 6 and 7 are interconnected at 11 to unify the metallic reinforcement throughout the flanges and web of each monolithic element.

As further means of strengthening the web portions 4 of the monolithic elements a metallic rod 12 is embedded lengthwise in each web, preferably being positioned near the outer edge thereof, where said rod most suitably serves to strengthen the web and act as a braced connection for the free edge of meshing 7, whose strands are engaged therewith. Walls composed of the monolithic elements aforesaid, having as stated their outer surfaces provided by the flanges 2, 3 are given support for their interior finish of lath and plaster by the webs 4, whose free ends have nailing strips 13 attached thereto. As convenient means for such attachment the nailing strips are penetrated with nails 14 that project a suitable distance beyond the surfaces of said strips which are opposed to the webs, said nails having their ends bent into a hook-like formation and being embedded in the material of the web in the operation of moulding the monolithic elements. In this manner the nailing strips become securely anchored to the webs.

For the purpose of rigidly connecting together all the monolithic elements constituting the walls of a building the webs 4 of said elements are all penetrated by stout tie rods 15, which latter (see Fig. 8) are curved at the building corners to engage the webs of monolithic elements disposed in right angular relation to provide said corners. The tie rods 15 occur in horizontal planes and extend between the webs 4 where compression members 16 of concrete are provided, said tie rods serving as metallic cores for said members, which latter are produced by moulding in suitable forms after erection of the monolithic elements.

Inspection of Fig. 3 will show that the compression members are moulded against the inner surfaces of flanges 2, 3 and against opposed surfaces of succeeding webs 4, whose intervening spaces they bridge, thereby constituting powerful bracing means for the

wall construction. Further said compression members fulfill another important function in that they comprise sturdy supporting seats or bearings for the flooring beams or joists 17, which latter are superimposed thereon.

This feature of my invention wherein the metallic tie-rod-cored compression members included in the homogeneous wall fabrication described serve to support the flooring joists is regarded by me as of particular importance both on account of the strong structural arrangement involved, and the elimination of adjuncts which heretofore have required the employment of costly labor.

In Figs. 2, 3 and 5 the joists 17 are shown as secured to the compression members by means of angle plates 18, anchorage bolts 19 fastening one flange of a plate 18 to a compression member and a joist being attached to the other flange by screws 20.

In Fig. 5 flooring 21 is shown supported by a joist 17.

A modification appears in Figs. 6 and 7 wherein one of the monolithic elements is disposed horizontally to take the place of a floor joist. In this relation the flange portions 2, 3 are uppermost and provided with a nailing strip 22 for flooring (not shown), while the lower edge of web 4 is supported upon compression members 16, of which one example only is illustrated in these fragmentary views. Also in this modification the angle plates 18 connect the web 4 to its supporting compression member by a pin 23 that extends through said web and the flange of an angle plate lying thereagainst, the joint thus created being embedded in a mass 24 of concrete moulded thereover and upon the compression member. The strengthening rod 12 lying in web 4 in this example has one end 12^a bent around the pin 23 within mass 24.

The example of Fig. 8 is intended to represent the means whereby adjacent monolithic elements are related right-angularly for the formation of a building corner, and to show how the tie rods connect said elements. Thus, as will appear, the flanges 2 and 3 of adjacent monolithic elements are placed in contacting right-angular relation while their respective webs 4, 4 approach each other in similar relation, thereby forming a rectangular enclosure. A tie rod 15 that connects these angularly relates webs 4, 4 and the adjacent compression members 16, 16 is embedded in a mass 48 of concrete that is moulded within the rectangular space aforesaid, thereby adding substantial strength and rigidity to the building corners.

It will be noted in Fig. 4 that the flange portions 2 and 3 of the monolithic element are pierced transversely with apertures 49. These apertures, which occur in like planes in elements placed together for a wall formation, are intended for the initial tying to-

gether of said elements by wires passed there-through before bonding by the outside plastic material which is applied to the dove-tail recesses intermediate adjacent flange edges.

5 In Fig. 4 I have shown a portion of a foundation channel or trough 1 into which the lower ends of the monolithic elements are fitted in the erection of a wall composed of said elements.

10 It will be noted that a recess 79 is formed at the lower end of web 4, to reduce its width, and as thus reduced the transverse width of the element from said recess to the outer surface of the flange portions 2, 3 permits said
15 element to fit snugly within channel 1. The shoulder 80 of recess 79 lies against the top of channel 1 when the monolithic element is seated upon the trough base, and the element by these means is held upright during the
20 process of binding the assembled monolithic elements together in wall fabrication.

It is of course to be understood that a cap member such as that indicated at 81 in Fig. 4 can be put in place upon the upper ends of the
25 monolithic elements, and that the building roof will be supported thereon.

Variations within the spirit and scope of my invention are equally comprehended by the foregoing disclosure.

30 I claim:

1. A building wall composed of monolithic elements in spaced relation, succeeding elements being separated by an interspace, and reinforce meshing embedded in said elements,
35 the respective meshings extending out into the interspace and interengaging.

2. A building wall composed of monolithic elements in spaced relation, succeeding elements being separated by an interspace, reinforce meshing embedded in said elements,
40 the respective meshings extending out into the interspace and interengaging, and bonding plastic material filling said interspace.

3. A building wall composed of monolithic elements each including flange portions, succeeding elements having their adjacent flange portions separated by an interspace, reinforce meshing imbedded in said flange portions, the
45 respective meshings extending out into the interspace and interengaging.

4. A building wall composed of monolithic elements each including flange portions, succeeding elements having their adjacent flange portions separated by an interspace, reinforce meshing embedded in said flange portions,
50 the respective meshings extending out into the interspace and interengaging, and bonding plastic material filling said interspace.

5. A building wall composed of monolithic elements each including opposite flange portions and an intermediate web portion, the side edges of said flange portions having grooves formed therein, the grooves in juxtaposed flange portions of adjacent elements

constituting dove-tail recesses, reinforce 65 meshings embedded in said flange portions, the respective meshings extending out into said recesses and interengaging, and bonding plastic material filling said recesses.

6. A monolithic element for use in building 70 construction including opposite flange portions and an intermediate web portion, reinforce meshing embedded in said flange portions, other reinforce meshing in said web portion, and a strengthening rod embedded
75 longitudinally in said web portion, said other meshing having brace connection both with the meshing in the flange portions and with said rod.

7. A monolithic element for use in building 80 construction including opposite flange portions and an intermediate web portion, said flange portions intended for wall exterior finish support, reinforce meshing in said element and a nailing strip anchored to the inwardly presented end of said web portions,
85 with its anchorage engaging said meshing to carry the wall interior finish.

8. The combination in building construction of monolithic elements each having flange 90 portions and an intermediate web portion, the flange portions of adjacent elements having side abutting relation, horizontal concrete compression members between the web portions of succeeding elements, and metallic reinforcement uniting said compression members and web portions. 95

9. The combination in building construction of monolithic elements each having flange portions and an intermediate web portion, the flange portions of adjacent elements having side abutting relation, to constitute a wall, a tie rod extended through said web portions, and horizontal concrete compression members moulded about said tie rod between
100 the web portions of succeeding elements.

10. The combination in building construction of monolithic elements each having flange portions and an intermediate web portion, the flange portions of adjacent elements having side abutting relation, horizontal concrete compression members moulded between the web portions of succeeding elements, metallic reinforcement uniting said compression members and web portions and joists supported on said compression members. 115

11. A building wall composed of monolithic elements having flanges and a web, the flanges each provided near their edges with transverse apertures for the reception of tie strands, whereby adjacent elements may be united. 120

12. A building whose walls are formed of monolithic elements, each composed of flange portions and an intermediate web portion, a corner of said building comprising a rectangular enclosure bounded by angularly opposed flange and web portions, a tie rod 125

curved through said enclosure, connecting said webs, and a concrete mass moulded in said enclosure about said tie rod.

13. A building whose walls are formed of
5 monolithic elements, each composed of flange portions and an intermediate web portion and a foundation channel to supportingly receive

the lower ends of said elements, said web portions being recessed at their lower ends to provide a shoulder that contacts with the 10 channel top.

New York, June 17th, 1927.

JOSEPH WINSTON.