

Aug. 11, 1936.

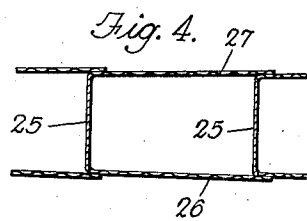
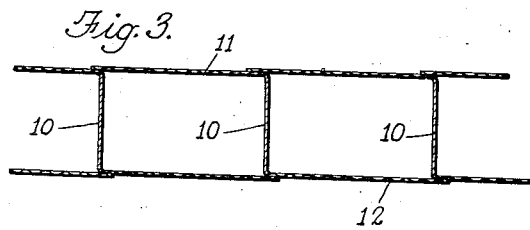
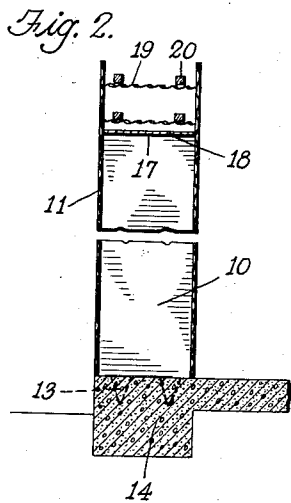
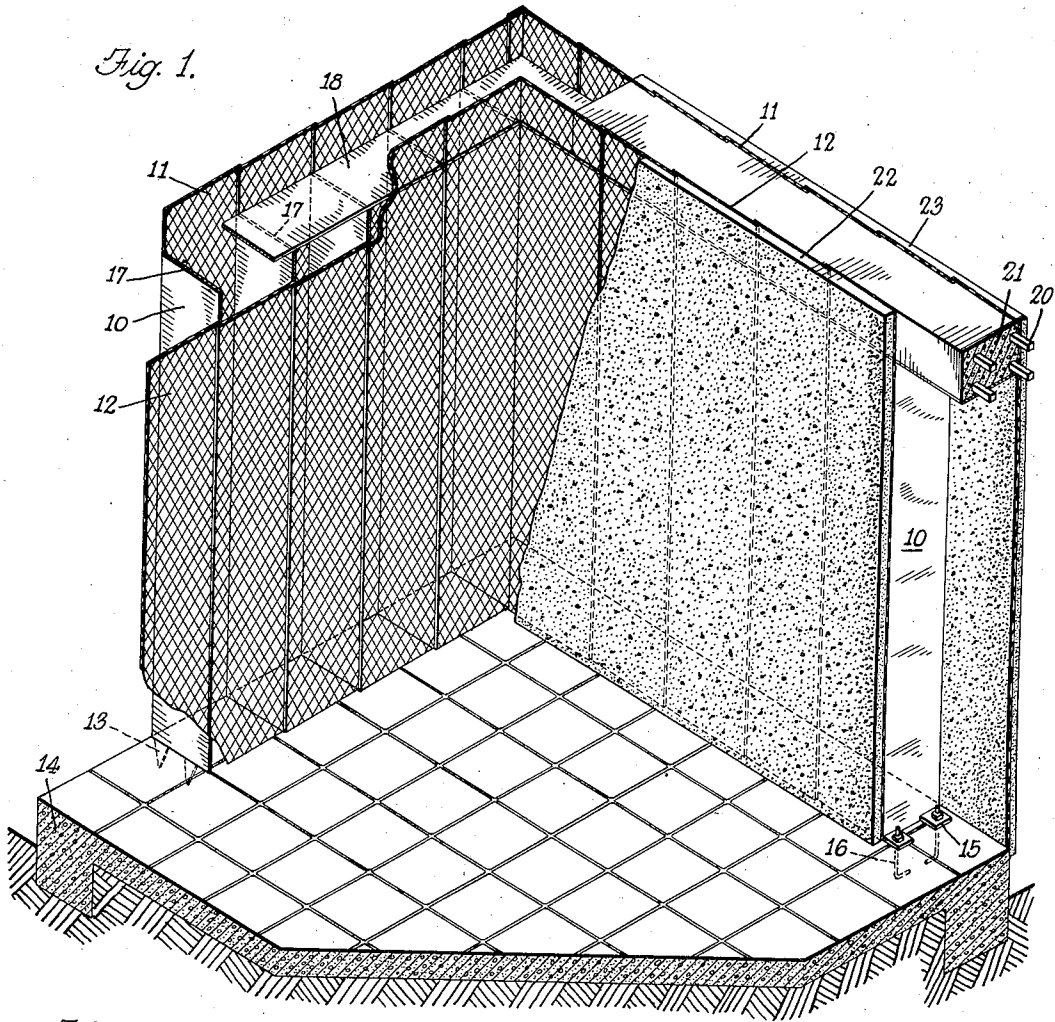
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2,050,609

WALL CONSTRUCTION

Filed Nov. 10, 1934

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

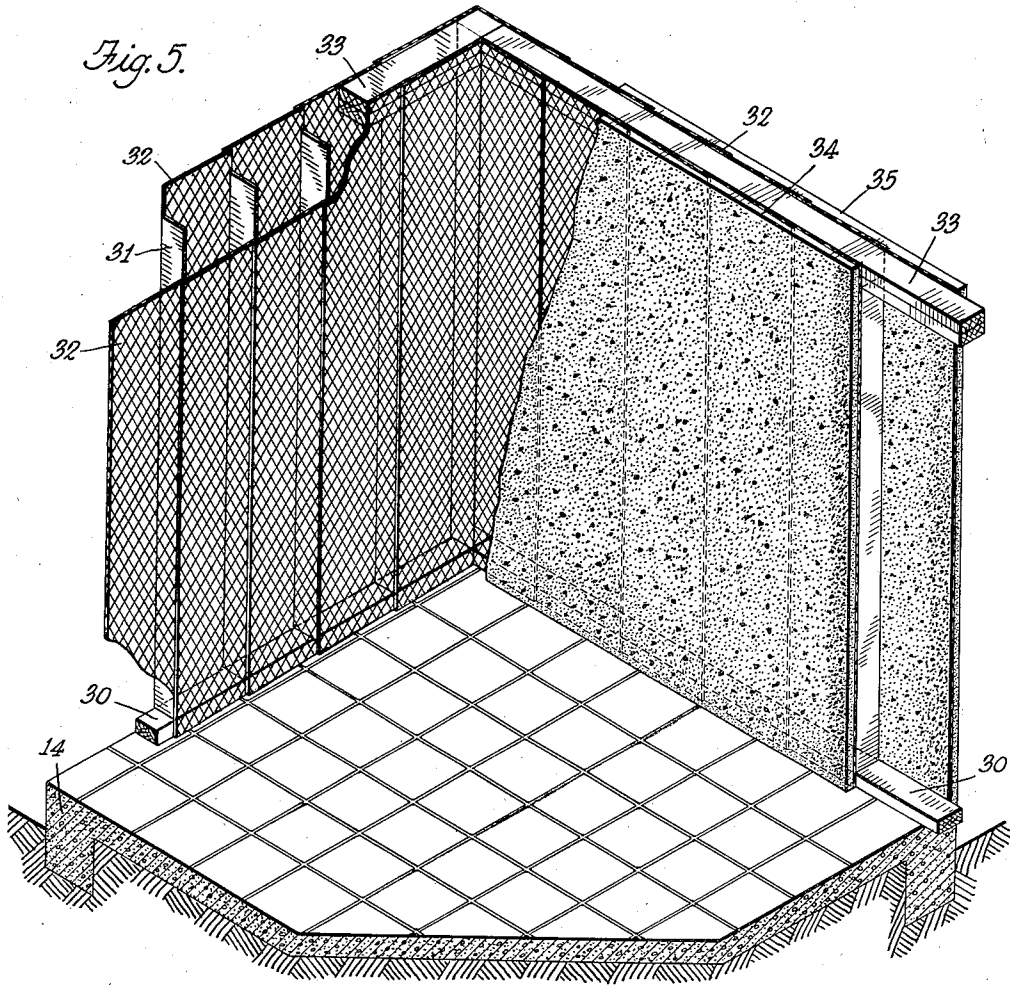


Fig. 6.

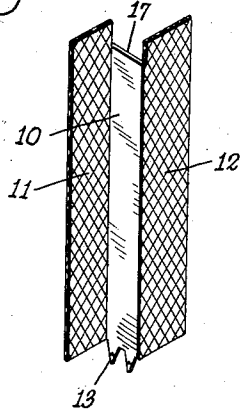
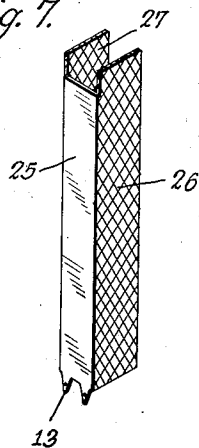


Fig. 7.



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UNITED STATES PATENT OFFICE

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WALL CONSTRUCTION

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9 Claims. (Cl. 72-48)

This invention relates to improvements in wall construction for light steel frame structures and to improvements in sections or units which may be assembled together in the construction of these walls.

An object of the present invention is to provide an improved and simplified cellular construction for walls and partitions of buildings in which the frame is built up of a plurality of assemblable standard units. A suitable plaster is applied to the faces of the frame, which plaster acts as one of the structural elements in this form of wall construction. In the forms of light steel frame wall construction now in use the steel frame must be erected as a separate operation, and all joints of the members must be bolted, riveted or welded, and the wall must have diagonal bracing, the joints of which must be bolted, riveted or welded. In my form of construction the units are so shaped and designed that the strength and rigidity may be accomplished without the necessity of bolting, riveting or welding the individual units together other than anchoring the units at the bottom. The necessary diagonal bracing is contained within the assembled units. In most forms of wall construction the plaster faces are applied as a finish only. In my form of wall construction the plaster faces act as structural elements in unison with the frame for resisting stresses.

In the preferred form of construction each side of the wall there is a reinforced plaster face, which may be considered as two reinforced plaster walls connected at frequent intervals by transverse webs which are adequately tied to the walls along each edge, so that the walls will mutually cooperate with each other and the webs when under stress, instead of acting as two independent walls. To this end the object of this invention is to provide an assemblable unit of standard construction which is so designed that it may be easily, quickly and cheaply manufactured in such a way that the connection between the two walls by means of the web is assured.

While some attempts have been made to develop a wall construction consisting of two plaster walls connected by transversely extending webs the connection between each wall and the web has heretofore usually been established on the assembly such as by wiring, wire lacing, and the like. When the connection is postponed until the time of assembly it is difficult to form an adequate connection between the webs and

the two plaster walls without going to a great deal of expense and trouble. The present invention in assuring a proper connection between the two walls and the webs overcomes this difficulty.

Another object of the invention is to provide an improved wall construction made up of assemblable frame units and to provide a novel and advantageous means for forming a bondstone, which bondstone is means of securing the units in place and eliminates the necessity of bolting the frame together.

With the foregoing and other objects in view, which will be made manifest in the following detailed description, and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Fig. 1 is an isometric view of a corner formed by a wall made in accordance with the present invention.

Fig. 2 is a vertical, transverse section through one of the walls shown in Fig. 1.

Fig. 3 is a horizontal section through one of the walls shown in Fig. 1.

Fig. 4 is a horizontal section illustrating a modified form of construction.

Fig. 5 is an isometric view similar to Fig. 1 illustrating the manner in which interior partitions may be built employing the present invention.

Fig. 6 is a perspective view of one of the assemblable units that may be assembled in forming the wall embodying the invention.

Fig. 7 is a perspective view of an alternative form of unit that may be employed.

Referring to the accompanying drawings, wherein similar reference characters designate similar parts throughout, the improved wall construction is made up of a plurality of assemblable units.

In the preferred form of construction each unit consists of a transverse sheet metal web having at its side edges longitudinally extending sections 11 and 12 of expanded metal or like material suitable for the application of plaster.

The web 10 may be imperforate as shown or it may be perforated but if perforated the perforations should be such as not to materially weaken the sheet metal web. The sections of expanded metal indicated at 11 and 12 may be formed integral with web 10 by cutting the slits in the sides of the web and then expanding the slitted metal in accordance with the well known practice of forming expanded metal. If separate

expanded metal sections are to be attached to the side edges of web 10 these should be welded along their edges to the web in the course of construction of these individual units, thus rendering the expanded metal sections integral with the web.

It is important to have a good connection between the expanded metal sections and the web assured and, consequently, if the expanded metal sections are not formed truly integral with the web they should be rendered integral therewith by welding prior to the assembly of the units in making a wall.

On the bottom of the web 10 there may be formed one or more anchoring lugs 13 which may be embedded in a concrete footing 14 at the time it is poured. Instead of these lugs, an alternative method of anchoring the bottom of each unit may be employed wherein the lugs are bent horizontally, as indicated at 15, and suitable anchoring bolts 16 pass therethrough into the footing. Any other suitable means for anchoring the webs to the footing may be employed.

In constructing the wall a plurality of these units are assembled together with the free edges of the sections 11 and 12 overlapping slightly the expanded metal sections of adjacent units, as shown on Fig. 3. These overlapped portions may be secured together in any preferred manner, such as wiring, lacing, or spot welding. When the units are assembled they form the frame of the wall, the expanded metal sections running from the floor to the ceiling. The webs 10, however, do not extend quite as high as the expanded metal sections and their top edges 17 are disposed a sufficient distance below the top edges of the expanded metal sections to accommodate a bondstone. A sheet metal aligner 18 is positioned on top of the webs 10 forming the bottom of a channel defined by the tops of the extended expanded metal sections. At the corners these aligners overlap. Tie wires 19 are passed through the opposed expanded metal sections above the aligner and tied. These wires prevent the spreading of the expanded metal sections when the concrete is poured; also act as support for the longitudinal reinforcing bars 20 in the channel, also as anchors for the expanded metal to the faces of the bondstone. Concrete 21 is then poured into the channel thus formed on the aligner 18 and embeds the tie wires and reinforcing bars, thus forming a reinforced concrete bondstone the entire length of the wall, which securely anchors the units together and unifies the entire structure. The concrete when poured will work into the interstices of the expanded metal and thus anchor the expanded metal over the entire face of the bondstone.

Thereafter, coatings of plaster 22 and 23, respectively, are then applied to the two faces of the wall frame. These plaster faces act as finish for the wall faces, also as structural elements of the wall. As structural elements they act as continuous flanges or stiffeners integrally bonded to webs 10 at each edge to prevent load carrying metal webs from buckling under vertical load.

To resist horizontal stresses parallel to the wall the entire wall acts as a boxed cantilever beam with the metal webs acting as stiffeners for the plaster faces at frequent intervals, which webs are an integral part of the expanded metal plaster reinforcement.

When the wall is thus completed it will be noted that the units have been assembled and substantially unified by the bondstone without the necessity of bolting, riveting or welding the individual units together other than making secure the overlapping expanded metal sections on the adjacent units; also that the wall consists of two spaced reinforced plaster walls 22 and 23 in combination with a plurality of vertical, transversely extending webs 10. The structural strength of the wall is dependent upon the firm connection of the edges of these webs to the opposed walls, which connections are established in the original manufacture of the unit. In other words, the separation of the opposed walls is not dependent upon any field-made connections.

In Figs. 4 and 7 I have illustrated an alternative form of construction wherein the unit is of U-shaped cross section as distinguished from the general Z-shaped cross section in Fig. 7. The web is indicated at 25 having integral expanded metal sections 26 and 27 which either may be made truly integral with the web or rendered integral therewith by welding. These sections may be assembled as shown in Fig. 4 in the construction of the wall, gaining the same advantages as above described.

In Fig. 5 I have illustrated the application of the invention to non-bearing partitions. In this form of construction units of either the shape shown in Fig. 6 or the shape shown in Fig. 7 may be assembled together over wood foot plates 30. The webs 31 having the adjacent integral expanded metal sections 32 may be shortened at their bottoms to accommodate the foot plates. Wood top plates 33 take the place of the bondstone, being supported upon the tops of the webs 31. The tops and bottoms of the expanded metal sections may be nailed to the sides of these top and foot plates, respectively, after which the plaster coats 34 and 35 are applied.

From the above described constructions it will be appreciated that the units which are assembled to build a wall may be completely preformed at a suitable factory and easily and quickly erected at the building where they are assembled. Although tie wires, lacings, or the equivalent, may be employed in tying adjacent units together at the time of assembly, these connections are in no way relied upon to form connections between the opposed walls through the webs. Instead, this connection is formed by the integral connection between the expanded metal and the web, rendering the wall a monolithic structure wherein the two opposed plaster walls, which are important structural elements, cooperate together in withstanding loads as distinguished from acting independently, which is apt to be the case where lacings and wirings are used and relied upon to connect the walls with the webs.

Various changes may be made in the details of construction without departing from the spirit or scope of the invention as defined in the appended claims.

I claim:

1. An assemblable unit for wall constructions comprising a transversely arranged web of sheet metal, and longitudinally extending sections of expanded metal or the like integral with the side edges of the web, the top of the web being disposed below the tops of the sections so as to receive a bondstone thereon.

2. An assemblable unit for wall constructions

comprising a transversely arranged web of sheet metal, and longitudinally extending sections of expanded metal or the like integral with the side edges of the web and extending thereabove, the bottom of the web being coterminous with the bottom of said sections with the exception of integral extensions forming anchoring means.

3. A wall comprising a plurality of assembled units, each unit comprising a transverse sheet metal web having at its side edges longitudinally extending sections of expanded metal integral therewith, the free edges of the sections being secured to the sections of adjacent units, and a strong plaster applied to the sections of the assembled units, the bottoms of the webs being coterminous with the bottom of said sections with the exception of integral extensions by which the webs may be anchored to a footing.

4. A wall comprising a plurality of assembled units, each unit comprising a transverse sheet metal web having at its side edges longitudinally extending sections of expanded metal integral therewith, the free edges of the sections being secured to the sections of adjacent units, and a strong plaster applied to the sections of the assembled units, the tops of the webs being disposed below the tops of the sections, and means forming a bondstone disposed thereon bonded with the plaster through the expanded metal.

5. A wall comprising a plurality of assembled units, each unit comprising a transverse sheet metal web having at its side edges longitudinally extending sections of expanded metal integral therewith, the free edges of the sections being secured to the sections of adjacent units, and a strong plaster applied to the sections of the assembled units, the tops of the webs being disposed below the tops of the sections, a sheet metal aligner supported on top of the webs, means connecting the tops of opposed sections over the aligner, reinforcing bars on the connecting means, and concrete on the aligner imbedding the connecting means and reinforcing bars thus forming a bondstone at the top of the wall.

6. A wall comprising a plurality of assembled units, each unit comprising a transverse sheet

metal web having at its side edges longitudinally extending sections of expanded metal or the like extending above the top of the web, a concrete bondstone poured between the longitudinal sections adjacent the top thereof, and a strong plaster applied to the outer sides of said sections and over the sides of the bondstone.

7. A wall comprising a plurality of assembled units, each unit comprising a transverse sheet metal web having at its side edges longitudinally extending sections of expanded metal or the like, a concrete bondstone poured between the longitudinal sections adjacent the top thereof, and a strong plaster applied to the outer sides of said sections and over the sides of the bondstone, said webs having their tops terminating adjacent the bottom of the bondstone and serving to partially separate the bondstone and superposed loads.

8. A wall comprising a plurality of assembled units, each unit comprising a transverse sheet metal web having at its side edges longitudinally extending sections of expanded metal or the like extending above the top of the web, a sheet metal alignment resting upon the tops of the webs and disposed below the tops of the sections, a concrete bondstone poured on the alignment and disposed between the tops of the sections, and a strong plaster applied to the outer sides of the sections and over the sides of the bondstone.

9. A wall comprising a plurality of assembled units, each unit comprising a transverse sheet metal web having at its side edges longitudinally extending sections of expanded metal or the like extending above the top of the web, a sheet metal alignment resting upon the tops of the webs and disposed below the tops of the sections, reinforcing means extending longitudinally and transversely across the space over the alignment, a concrete bondstone poured on the alignment and disposed between the tops of the sections, and a strong plaster applied to the outer sides of the sections and over the sides of the bondstone.

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