May 29, 1934. C. W. THOMAS 1,960,961

METAL CONSTRUCTION SECTION

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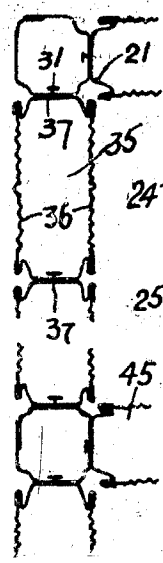



Fig. 1.

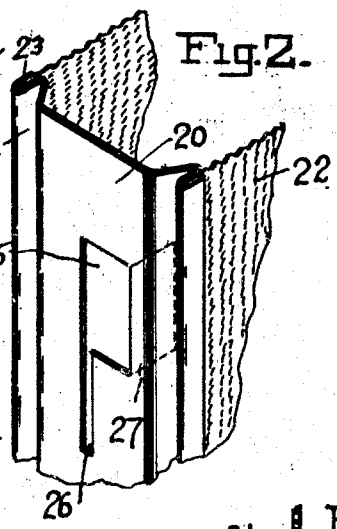



Fig. 2.

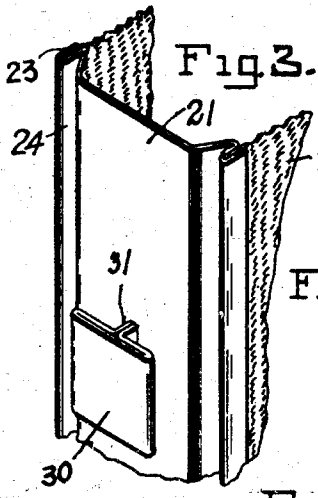



Fig. 3.

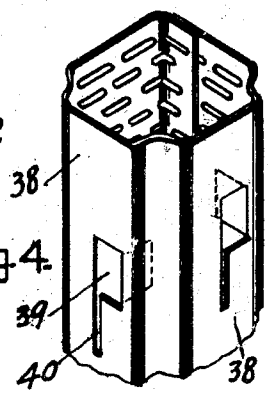



Fig. 4.

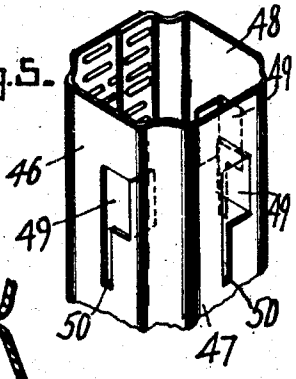



Fig. 5.

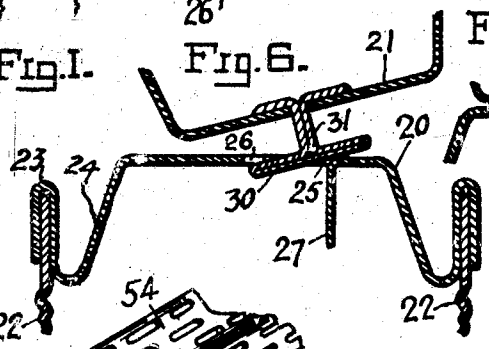



Fig. 6.

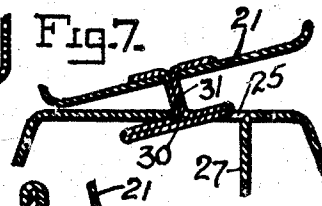



Fig. 7.

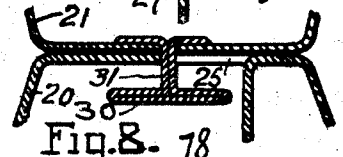



Fig. 8.

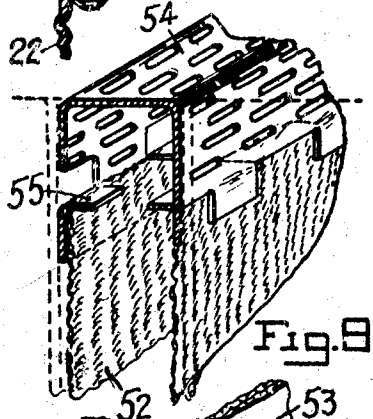



Fig. 9.

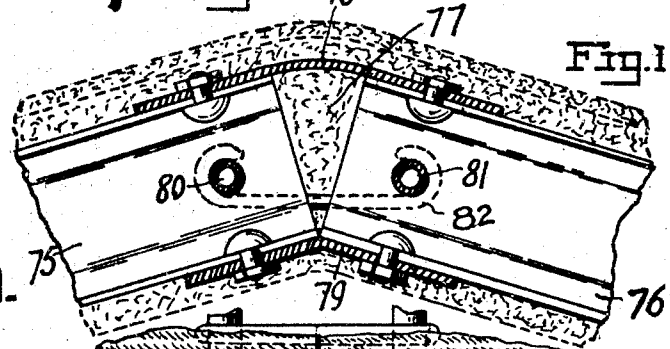



Fig. 10.

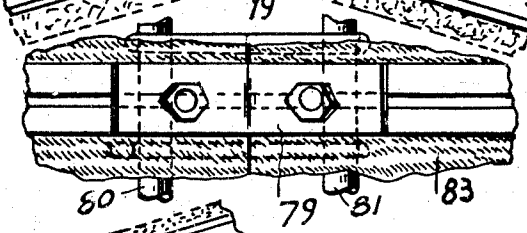
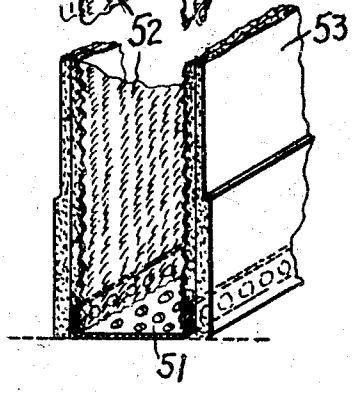



Fig. 11.



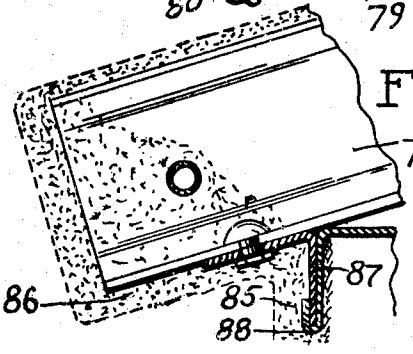




Fig. 12.

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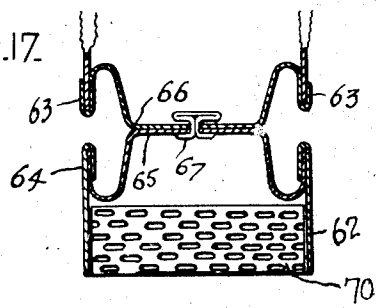
Fig. 17.



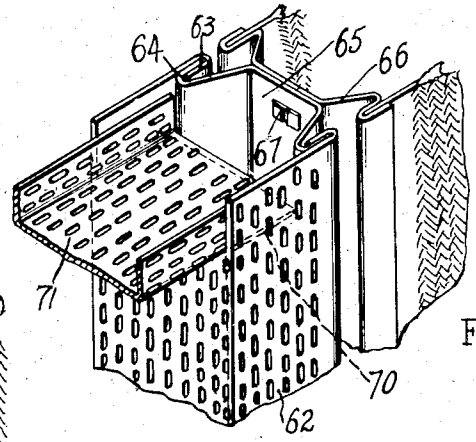




Fig. 14

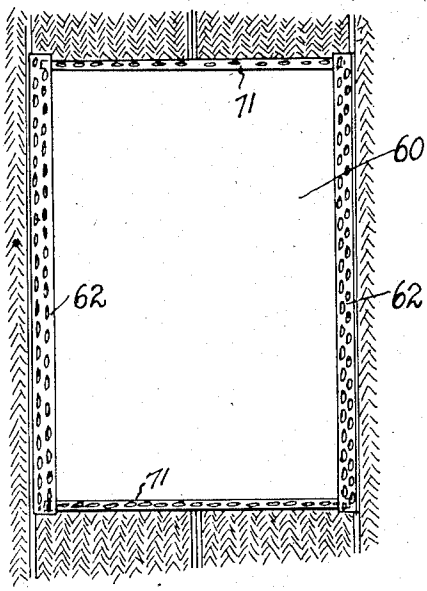
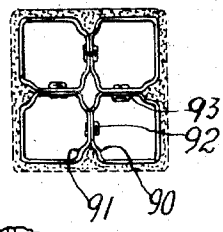



Fig. 15.

Fig. 18.



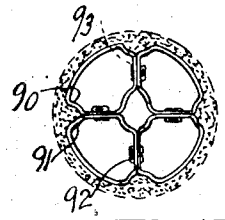




Fig. 19.

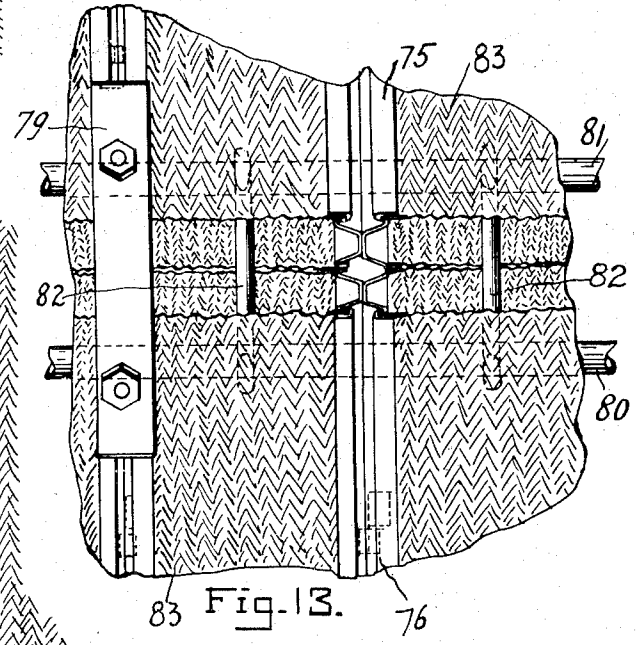



Fig. 13.

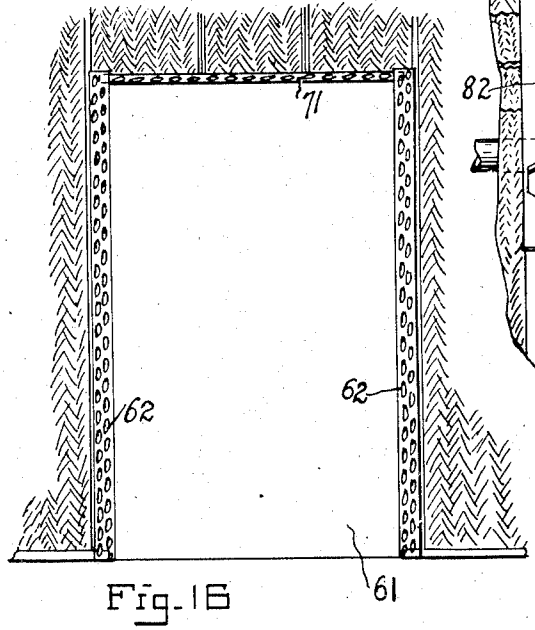



Fig. 16

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# UNITED STATES PATENT OFFICE

1,960,961

## METAL CONSTRUCTION SECTION

Charles W. Thomas, Tenafly, N. J.

Application April 1, 1932, Serial No. 602,455

5 Claims. (Cl. 72—115)

The invention relates to metal construction sections suitable for the building up of buildings, conduits, etc., and of a nature adapted to secure in position lengths of wire mesh, metal lath or expanded metal to afford panels, floors, beams, columns, etc., over which, as well as over the sections themselves is to be applied a cement or plaster wall material.

The invention has for an object the provision of a metal section or unit composed of two sheet metal elements which may readily be keyed together, after fabrication in standard dimensions, for assembly in the desired structure at the place of erection. A further object of the invention is to provide the units in such design that they are capable of application to variations in architecture and admit of a reasonable variety of building constructions therewith with a minimum number of variations of the shapes.

In carrying out the invention, it is to be understood that the novel sections or units may be constructed of different predetermined lengths and widths to accommodate the usual more or less standardized building operations. Each unit comprises two sheet metal, more or less channel-shaped, elements whose sides each are so constructed, as in having bent-over extensions folded upon themselves, to retain the edge of a holding mesh or expanded metal member for receiving a finishing material which is adapted to be spread thereover, as well as over the units themselves. One of the coacting elements, furthermore, is provided with longitudinally disposed openings, each opening along its lower edge having a slotted extension as a continuation of a side edge and of substantially the same length as the adjacent opening, while the other element is provided with longitudinally disposed, integral key members extending outwardly at right angles to its base and each key member being adapted to pass through a said opening of the other element and to slide in the slotted extension thereof to key the two elements to each other.

Various combinations of these units are possible in structural design, the same being suitable for providing walls, floors, roofs, beams, columns, etc. Modifications in the shape, for example in the element having the opening and slot, may be made as in the provision of a unit element for connecting in a partition at right angles, or in providing a corner unit.

The nature of the invention, however, will best be understood when described in connection with the accompanying drawings, in which:

Fig. 1 is a fragmentary plan view illustrating several of the units assembled with the metal lath or the like, said figure showing also the arrangement of a corner element and a partition element connected in.

Figs. 2 and 3 are fragmentary perspective views, on an enlarged scale, respectively of the slotted element and the keying element composing a unit.

Figs. 4 and 5 are fragmentary perspective views, respectively, of a modified form of a slotted element suitable for making a right-angled turn, as at a corner, and of a slotted element suitable for use in attaching a partition to a wall composed of the novel section units.

Figs. 6, 7 and 8 are horizontal sectional views through coacting elements forming a unit, and illustrate the manner of locking the elements together in forming the unit.

Fig. 9 is a fragmentary perspective view illustrating the construction of a partition with the novel units.

Fig. 10 is a fragmentary vertical section and Fig. 11 is a similar underneath view illustrating the arrangement of the novel units as embodied in the construction of a roof; and Fig. 12 is a fragmentary vertical section of a unit constituting the eaves of a roof.

Fig. 13 is a fragmentary plan of a roof construction, with one of the tie-bars removed.

Fig. 14 is a fragmentary perspective view of a finishing panel attached to a unit and as employed in the construction of window and door openings.

Figs. 15 and 16 are fragmentary vertical sections showing the construction indicated in Fig. 14 as applied respectively to a window and door opening.

Fig. 17 is a fragmentary horizontal section through the upper portion of a finishing panel and connected unit.

Figs. 18 and 19 are horizontal sections respectively of different forms of columns constructed of sections locked together in the novel manner.

Referring to the drawings, more particularly Figs. 2, 3 and 6 to 8, the novel unit is illustrated as composed of two sectional members in the form of channel elements 20 and 21, respectively, of sheet metal and provided with means for retaining a metal lath member 22. Such lath member may consist of wire mesh or expanded metal and the like and is adapted to be held, for example, by the bent or folded over portions 23 of a side 24 of an element.

In accordance with the invention, one of the

elements composing a unit is provided with a succession of longitudinal openings 25 which are provided, for example, along one edge of an opening with a slotted extension 26 and of a length substantially equal to the length of an opening. The openings 25 may conveniently be provided by striking out a spur or tab 27 from the bottom or web of the channel, the same then extending upwardly therefrom substantially at right angles from the base of the channel and serving as an additional holding member for plaster or concrete utilized as a finishing material over the structure formed by the units.

The other element 21 is provided with a corresponding succession of key members 30 extending outwardly from the bottom of a channel 21 and having the web 31 to displace the same somewhat from the said bottom of the channel. This key member may be in the nature of a grommet or the like which can be suitably secured to the bottom of the channel as by welding thereto or in any convenient manner, and serves as a locking member for uniting the two elements 20 and 21 into a single structural unit. This is conveniently effected in the manner more particularly shown in Figs. 6–8 in which the key 30 is shown as being introduced into an opening 25 by inclining the element 21. After the same has been fully inserted, the bases of the two elements are located substantially parallel to each other and the web 31 of the key member is caused to drop through the slot 26 into a locked position. By this expedient, the different section elements may be shipped in disassembled state, and can readily be united and locked together as hereinbefore described for use in erecting walls, floors, roofs and the like.

This is indicated in Fig. 1 of the drawings which shows a wall 35 formed by securing expanded metal or the like 36 between a succession of units 37, the latter being of the required height. Over this expanded metal is designed to be plastered or attached in the usual manner the finishing surface which may be of cement, plaster and the like.

In order to provide a corner connection, the special corner elements shown more particularly in Fig. 4 may be utilized, the same consisting of a square piece of sheet metal whose two inner faces 38 are not roughened or expanded and are provided with a succession of longitudinally disposed openings 39 with slots 40, as in the case of the elements 20, and are adapted to receive a locking key 31 of an element 21 for attachment thereto.

To attach a partition 45 to the wall 35, the element shown in Fig. 4 is further modified, as is indicated in Fig. 5 of the drawings, three faces 46, 47 and 48 in this embodiment being left smooth and provided with corresponding longitudinally disposed openings 49 and associated slots 50 for receiving the locking keys 31 of the elements 21.

In this manner, a structure may very readily be constructed from the section units and expanded metal. For example, reference being had to Fig. 9 of the drawings, in erecting a wall, a channel piece 51 is first laid down as a finishing and aligning member to receive the various supporting uprights constituted by the interlocked elements 20 and 21, as hereinbefore set forth, with intermediate expanded metal 52 over which is secured the coatings 53 of the finished wall. At the top a further finishing element in the nature of an inverted channel 54 is set over the upper ends of the interlocked elements 21 and 22, being secured over the upper edges of the expanded metal lengths 52 by inwardly turned tabs 55 cut from the channel piece 54.

In utilizing the aforesaid structural sections in the provision of a window opening 60 or a door opening 61, Figs. 15 and 16, respectively, longitudinal perforated channel elements 62 are utilized in upright position for the respective sides. In addition, these elements have their side edges 63 bent over and located within the doubled-over side portion 64 of an element 65 which is locked to the coacting element 66 by the keys 67, similarly to the arrangement hereinbefore described in connection with the securing of two elements to each other to form a unit.

However, at the top of a channel member 62 in the case of a door opening, and also at the bottom in the case of a window opening, the bottom of the channel is cut along its sides and bent inwardly, as indicated more clearly in Figs. 14 and 17 so as to afford a shelf or support 70 for a further finishing perforated channel or the like 71, the inner end of the base of which then rests upon the support 70. In this manner a smooth finishing surface is afforded for the sides and top and bottom of the openings and the wall is continued from the portions both laterally and in a vertical plane.

The novel section element affords also a convenient means for constituting a roof, reference being had particularly to Figs. 10–13, inclusive.

In this embodiment, a pair of sheet metal units 75 and 76 are formed of the two interlocked channel elements, as hereinbefore set forth, to form the rafters, the same being juxtaposed at their inner ends, as indicated in Fig. 10 of the drawings, with an open spacing 77 therebetween corresponding to the desired angle of inclination of the roof. Upper and lower tie-bars 78 and 79, respectively, are bolted to the flanges or sides of the respective units to securely hold the same in the desired angular relationship; and, furthermore, ridge poles as the pipes 80 and 81 are arranged to extend longitudinally of the roof and substantially parallel to each other through the bottoms of the channel elements forming the units and substantially at the inner end of a unit, straps or clips 82 being provided over the same to further prevent separation of the units. After the expanded metal 83 has been secured between the units as hereinbefore described, the finishing material may be applied over the entire structure, sealing in the various means for maintaining the adjacent units at the desired angle and affording a substantial and satisfactory roof structure.

Where the rafters extend beyond the side wall 85 of a structure to provide the eaves 86 thereof, it is desirable to further reinforce and secure the roof units as by means of angle pieces 87, one side of which is bolted, as shown, to the side of a unit, while the other may rest and be held within an upturned folded-back portion 88 of the structure wall.

Where columns are desired, these may be conveniently constructed of section elements 90 and 91 which are joined together by key members 92 fitting in corresponding slots 93 after the manner disclosed in connection with the uniting of the elements 20 and 21, each element in this instance being in the nature of a square, more or less, or of a sector, as shown in Figs. 17 and 18, respectively.

I claim:

1. An interlocking section or unit for building

construction, comprising two sheet metal channel elements having means for retaining a metal lath member, one of the elements having longitudinally disposed openings, each of which is provided with a slotted extension along one of its side edges, and the other element being provided with key members extending outwardly at right angles to the base of a width greater than the openings of the other element and adapted to pass through said openings and having a shank to slide in the slots thereof to key the two elements to each other.

2. An interlocking section or unit for building construction, comprising two sheet metal channel elements, the sides of each having bent-over extensions folded upon themselves to retain the edge of a metal lath member, one of the elements having longitudinally disposed openings, each of which is provided with a slotted extension along one of its side edges, and the other element being provided with key members extending outwardly at right angles to the base of a width greater than the openings of the other element and adapted to pass through said openings and having a shank to slide in the slots thereof to key the two elements to each other.

3. An interlocking section or unit for building construction, comprising two sheet metal channel elements having means for retaining a metal lath member, one of the elements having longitudinally disposed openings, each of which is provided with a slotted extension along one of its side edges and of a length substantially equal to an opening, and the other element being provided with key members extending outwardly at right angles to the base of a width greater than the openings of the other element and adapted to pass through said openings and having a shank to slide in the slots thereof to key the two elements to each other.

4. An interlocking section or unit for building construction, comprising two sheet metal channel elements having means for retaining a metal lath member, one of the elements having longitudinally disposed openings, each of which is provided with a slotted extension along one of its side edges, and the other element being provided with T-shaped key members to secure the elements to each other, a key member extending from the base of its element of a width greater than the openings of the other element and adapted to pass through said openings and its web to slide in the slot thereof.

5. An interlocking section or unit for building construction, comprising two sheet metal channel elements, one of the elements having longitudinally disposed openings, each of which is provided with a slotted extension along one of its side edges and with a spur extending inwardly from the opposite side edge of the opening, and the other element being provided with key members extending outwardly at right angles to the base of a width greater than the openings of the other element and adapted to pass through said openings and having a shank adapted to slide in the slots thereof to key the two elements to each other.

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