

Sept. 5, 1933.

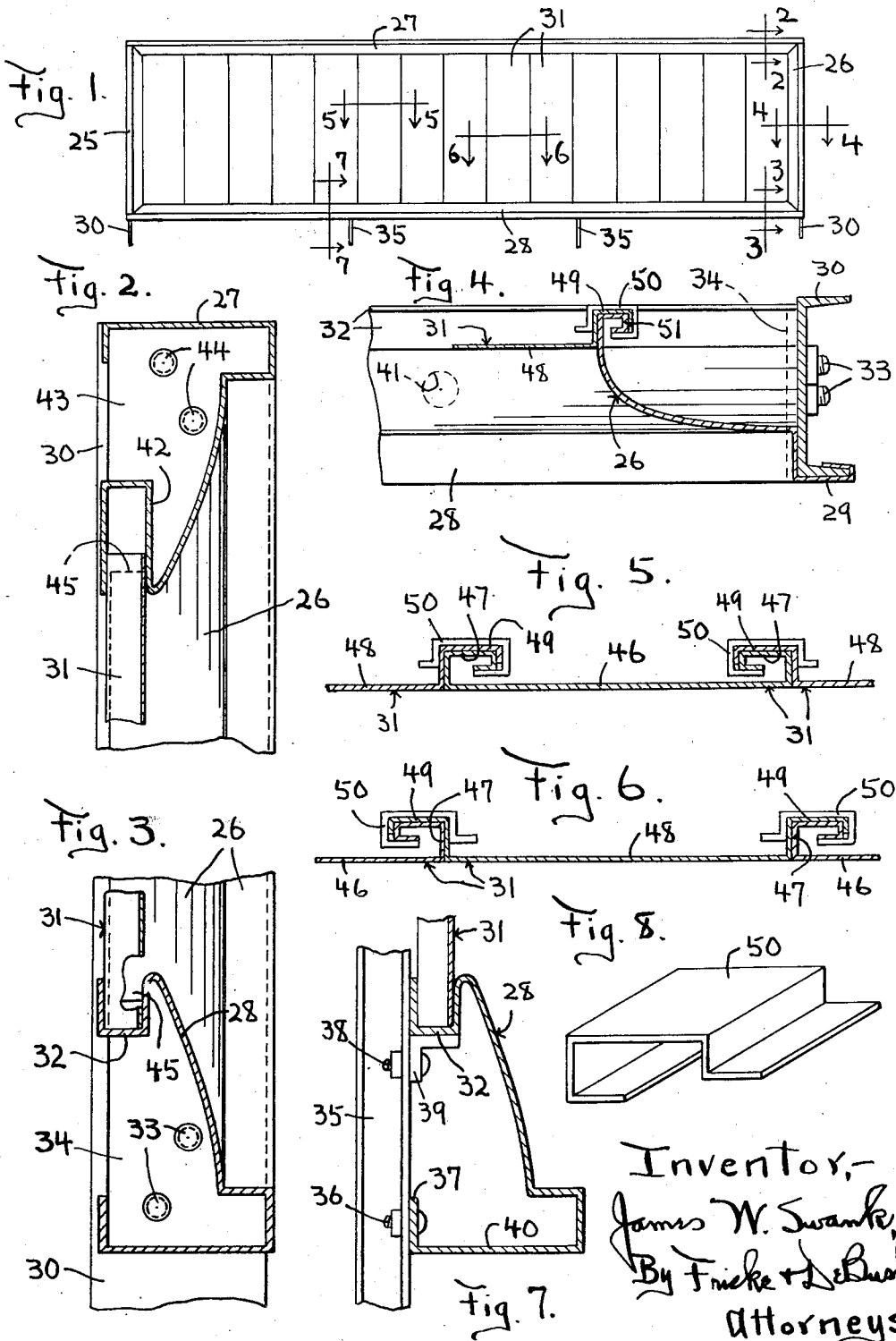
J. W. SWANK

1,925,418

BUILDING CONSTRUCTION

Filed Sept. 2, 1932

3 Sheets-Sheet 1



Sept. 5, 1933.

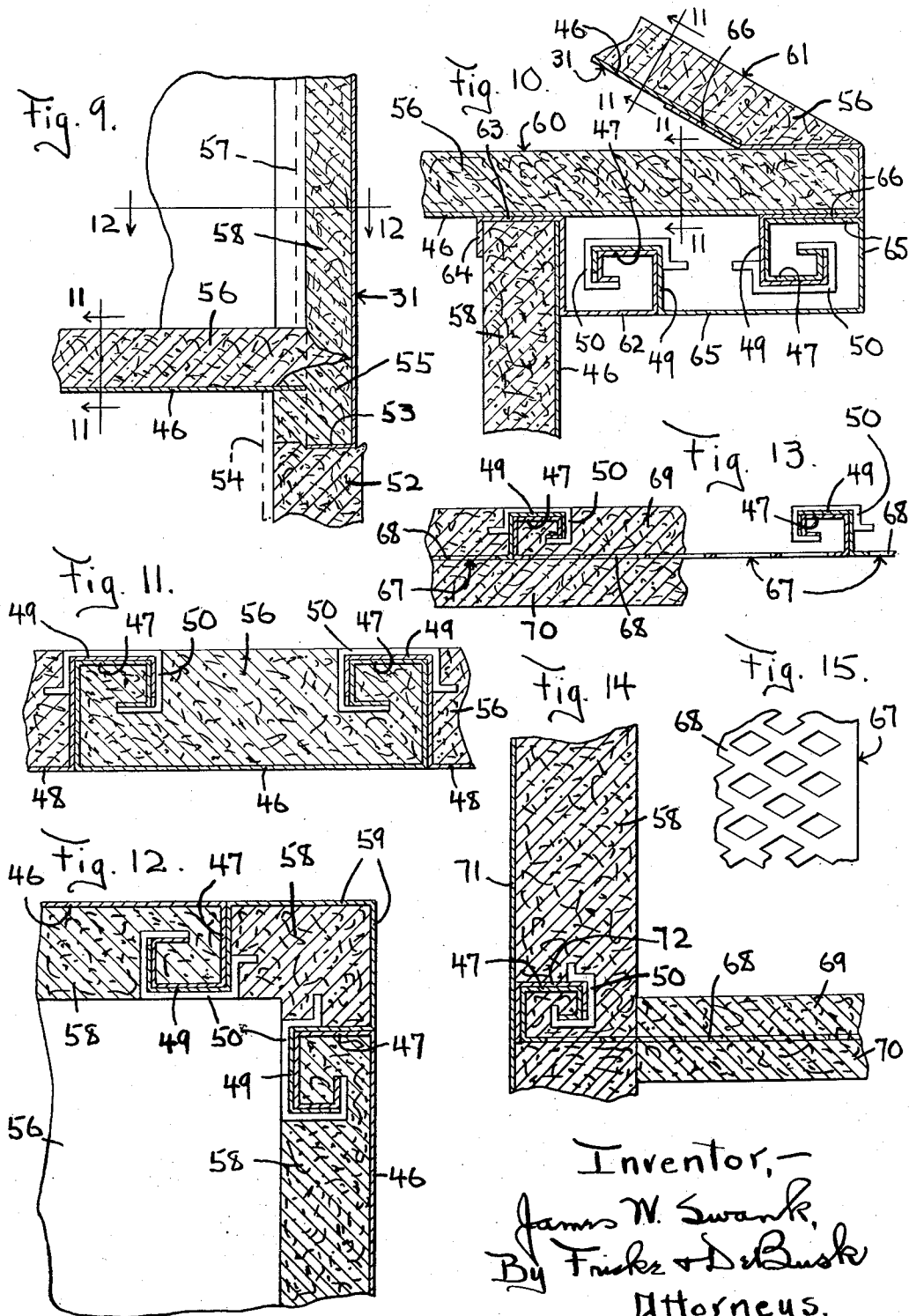
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3 Sheets-Sheet 2



Inventor, -
James W. Swank,
By Frick & DeBusk
Attorneys.

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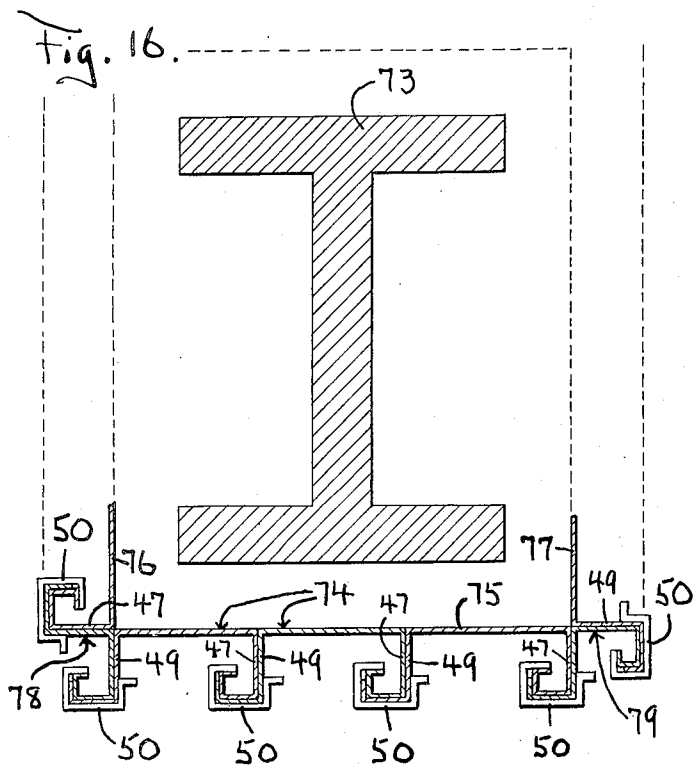
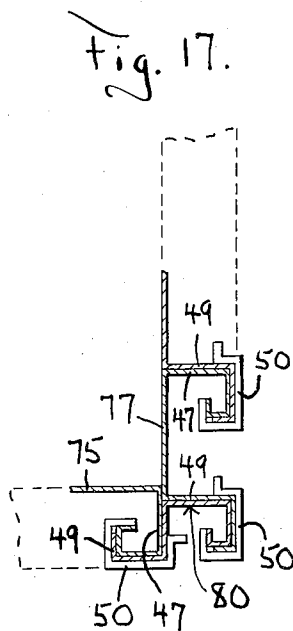
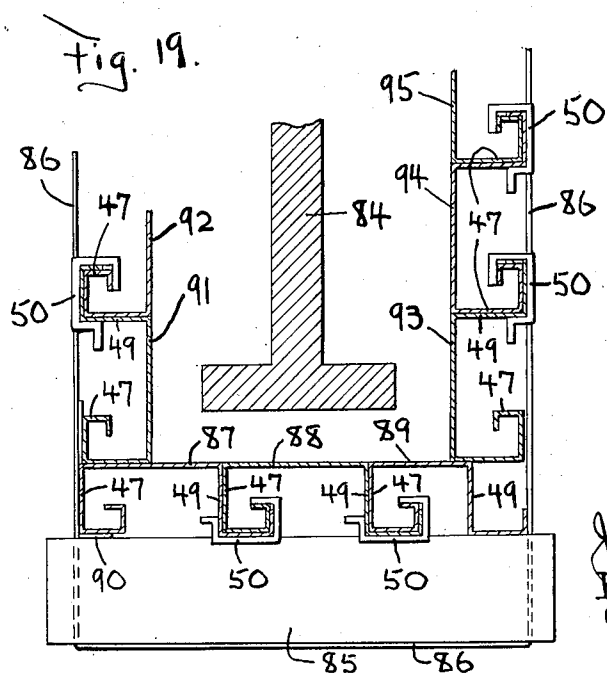
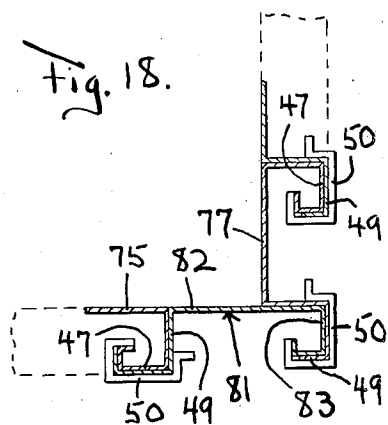
J. W. SWANK

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BUILDING CONSTRUCTION

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3 Sheets-Sheet 3



Inventor,—
James W. Swank,
By Fricker & DeBuck,
Attorneys.

UNITED STATES PATENT OFFICE

1,925,418

BUILDING CONSTRUCTION

James W. Swank, Chicago, Ill., assignor of one-half to Raymond M. Calkins, Deerfield, Ill.

Application September 2, 1932. Serial No. 631,471

20 Claims. (Cl. 72—16)

My invention relates to building construction and particularly to a form of panel of sheet metal or other suitable material for use as a substitute for lumber. The invention may be considered as an improvement upon, or a modification of, the construction disclosed in my co-pending application Serial No. 607,769, filed April 27, 1932.

It is of one of the objects of my invention to provide an improved form of construction comprising sheet material adapted to form the body of a wall and structural parts formed integrally with the body adapted to take the place of the frame work ordinarily required for supporting a wall. It is one of my objects to provide a construction of this type in which the sheet metal comprising the structural parts is so located and arranged as to have a maximum strength and reinforcing effect.

It is one of the objects of my invention to provide an improved form of panel construction and releasable securing means therefor in which the panels are secured to each other by means of an inside box-like arrangement of flanges on the edge of one panel fitting into an outside box-like arrangement of flanges on the edge of the adjacent panel, spring clip members being provided for holding the box-like structures strongly in engagement with each other in such manner as to hold the panels firmly in position so as to be immovable with respect to each other either angularly or otherwise.

It is one of the objects of my invention to provide an arrangement of this type comprising a set of panels each alternate one of which is provided with inside boxes along its edges and each other alternate panel of which is provided with outside boxes along its edges, the inside boxes being disposed toward each other opposite the body of the panel upon which they are mounted while the outside boxes are disposed away from each other beyond the side edges of the body portion. By this arrangement, each alternate panel is adapted to be moved straight forward out of engagement with the adjacent panels when the securing clips are removed, and each other alternate panel is adapted to be moved straight backwardly out of engagement. In this way any desired panel can be very readily removed from a series of panels without in any way disturbing any other panel and without any twisting or turning movement of the panel being removed.

It is one of the objects of my invention to provide a new and improved form of panel and as-

sociated parts for use particularly for building bill boards, and to provide such an arrangement as to enable the panels to be quickly and easily secured in position and as quickly and easily removed to accommodate frequent changes of the display.

It is one of the objects of my invention to provide an improved arrangement of top and bottom frame bars in which the panels are adapted to be mounted for bracing them strongly in position, such bracing means being arranged for facilitating easy assembly of the panels and easy removal of the panels when desired. It is another object of my invention to provide an improved frame for the reception of the panels making up a bill board together with an improved arrangement of means for supporting the frame in position.

It is one of the objects of my invention to provide an improved arrangement of parts by which a building can be constructed from panels of this type, being used preferably for the side walls, the floors, the ceilings, the roof, and the trim, the panels being used either alone or in connection with a suitable filling and reinforcing material such as concrete or the like.

It is one of the objects of my invention to provide an improved form of panel adapted for use in connection with partitions and adapted for use under certain circumstances in connection with the outside walls of a house, comprising a piece of expanded metal having my improved flange connecting means along its side edges, constituting an improved combination metal lath and structural supporting parts.

It is one of the objects of my invention to provide an improved construction for use in connection with forms for concreting a steel frame work of a building under construction or for forms for concreting at any other desired point. To this end, it is one of the objects of my invention to provide an improved arrangement of parts by which a built up panel construction of any desired width can be quickly and easily provided for forming the sides and bottom of a form of the required dimensions for concreting a horizontal beam.

It is another object of my invention to improve arrangements of this type in sundry details hereinafter pointed out. The preferred means by which I have accomplished my several objects are illustrated in the drawings and are hereinafter specifically described. That which I believe to be new and desire to cover by Letters Patent is set forth in the claims.

In the drawings,—

Fig. 1 is a front face view of a bill board embodying my improved construction;

Figs. 2 and 3 are vertical cross sectional views taken on an enlarged scale at line 2—2 and line 3—3 respectively of Fig. 1;

Figs. 4, 5 and 6 are horizontal cross sectional views taken on an enlarged scale at line 4—4, line 5—5, and line 6—6, respectively of Fig. 1;

Fig. 7 is a vertical cross sectional view taken on an enlarged scale at line 7—7 of Fig. 1;

Fig. 8 is a perspective view of my improved spring clip member by which the panels of the Fig. 1 construction are secured together;

Fig. 9 is a vertical cross sectional view showing a part of a building structure comprising the foundation, the floor, and the side walls, all of such parts being broken away;

Fig. 10 is a vertical cross sectional view through the upper portion of the wall shown in Fig. 9 and showing a portion of the ceiling and roof in position thereon;

Fig. 11 is a sectional view taken at any one of the three lines 11—11 of Figs. 9 and 10;

Fig. 12 is a horizontal sectional view taken at lines 12—12 of Fig. 9;

Fig. 13 is a cross sectional view showing the use of my improved panel formation in a metal lath arrangement, in which the body portion of each panel is in the form of expanded sheet metal, the panels at the left in the figure being provided with layers of plaster on opposite faces of the lath;

Fig. 14 is a cross sectional view of a fragmentary portion of a wall having a partition connected thereto comprising my improved metal lath panel formation;

Fig. 15 is a front face view of a fragmentary portion of one of the panels shown in Fig. 13;

Fig. 16 is a horizontal sectional view showing the preferred arrangement of panels involving my invention as used for the facings for concreting a column;

Fig. 17 is a fragmentary view similar to the lower right hand corner of the part shown in Fig. 16 but showing a slightly modified construction;

Fig. 18 is a view similar to Fig. 17 but showing a second modification; and

Fig. 19 is a vertical cross sectional view showing the use of my improved panels in connection with the form for concreting a horizontal beam.

Referring now particularly to Figs. 1 to 8, in which corresponding parts are indicated by the same reference characters, 25 and 26 indicate the end frame bars, and 27 and 28 indicate the top and bottom frame members of a bill board as shown in Fig. 1. As is best shown in Fig. 4, each of the end frame bars is in the form of a strip of sheet metal bent along longitudinal lines to provide flanges arranged in box formation at each side edge of the bar. As is shown in said Fig. 4, the box 29 at one edge of the end bar embraces one of the flanges of a supporting post 30 of channel formation so as to be held against movement with respect to said supporting post except as the end bar may be slid longitudinally along the post. The box arrangement of flanges at the inner edge of each of the end bars has releasable engagement with the adjacent edges of the adjacent intermediate panels 31 as herein-after described. The lower frame bar 28 is also formed of sheet metal as is clearly shown in Fig. 3, the bar being bent along longitudinal lines into the form of an elongated box, the flange portions provided by the bending providing a channel 32 along the upper edge of the bar. The bar 28

is secured in position between the end posts 30 by means of bolts 33 extending through the posts and through filler plates 34 secured in position in the ends of the bar, in the construction shown the plates being secured in position by welding. As is best shown in Fig. 7, the lower frame bar 28 is supported at one or more intermediate points by intermediate posts 35 preferably in the form of I-beams, such beams 35 being secured to the bar by means of bolts 36 engaging an upwardly extending flange 37 on the bar and bolts 38 engaging metal angles 39 welded to the bottom face of the channel 32. The horizontally disposed flange 40 forming the bottom face of the bar 28 is provided with one or more drainage openings 41 therethrough, as is clearly shown in dotted lines in Fig. 4.

As is clearly shown in Fig. 2, the upper frame bar 27 is similar to the frame bar 28, except that a channel 42 is provided thereon of considerably greater depth than that of the channel 32. As is clearly shown in Fig. 2, the bar 27 is normally used in inverted position as compared with the bar 28. The bar 27 is secured in position between the posts 30 by means of filler plates 43 welded in position and secured to the posts by means of bolts 44. The bar 27 is secured to the intermediate posts 35 by means of bolts 36 and 38 and angles 39 in the same manner as is illustrated in Fig. 7 in connection with the bar 28.

The end portions of the end bars 25 and 26 are coped to fit between the upper and the lower frame bars 27 and 28 and are held in position against vertical movement by their engagement with the longitudinally extending bars. Each of the end bars is provided at each end with a vertically extending lug 45 extending into the adjacent channel 32 or 42 for holding the bars rigidly in position with respect to each other.

As is clearly shown in Figs. 5 and 6, each of the panels 31 is formed of sheet metal bent along longitudinal lines for providing flanges in box formation along each side edge of the body portion of the panel. In the form of construction shown in Fig. 5, the body portion is indicated by the numeral 46. Four flanges are provided along each side edge of the body portion 46 providing an inside box arrangement 47, such inside boxes being disposed opposite the body portion 46. In the arrangement of panel shown in full in Fig. 6, the body portion 48 is provided with three flanges along each side edge providing an outside box arrangement 49 along each edge. Throughout the sign as shown in Fig. 1, the panels having body portions 46 and 48 are alternated with each other, each alternate panel having inside boxes on both sides extending toward each other and each other alternate panel having outside boxes 49 extending outwardly away from each other. Each of the inside box arrangements 47 is located within the outside box arrangement 49 of the adjacent panel, the arrangement being such that the inside boxes have an easy working fit within the outside boxes. The panels are held rigidly and securely in position with respect to each other by means of spring clips 50 also made of sheet metal and bent along longitudinal lines for providing a box-like arrangement adapted to fit about the boxes 47 and 49 for holding such boxes in rigid engagement with each other. In the arrangement shown the clips 50 are made of spring steel sheet material so as to enable an operator to press the clip into position about the interfitting boxes 47 and 49, the clips being adapted when pressed into position to snap into

engagement so as to be held by a strong spring grip in position upon the boxes. As is clearly shown in Figs. 5 and 6, each of the clips 50 engages snugly the three flanges of each of the outside boxes and the final flange of the inside box in each instance, being adapted to hold the parts in such manner as to prevent movement of the body portion of one panel with respect to the body portion of the adjacent panel. The clips 50 are preferably of such formation as to be capable of being pressed into snap engagement with the boxes by the application of a fairly heavy pressure thereon.

It will be understood that a plurality of the clips will usually be employed in connection with each box, the number used depending largely on the length of the panels or boxes. The clips may be spaced as desired. In a sign construction as shown in Fig. 1, I have obtained good results by spacing the clips three feet apart.

As is clearly shown in Fig. 4, the end panels 31 are of the type having outside boxes 49 thereon such outside boxes 49 being adapted to engage inside boxes 51 on the inner edges of the end frame bars 26. Clips 50 of the type above described serve to hold the boxes 49 and 51 in engagement with each other.

As is clearly shown in Figs. 2, 3 and 7, each of the panels 31 rests at its lower end within the channel 32, the upper end of each of the panels being located within the channel 42. By reason of the greater depth of the channel 42 than that of the bottom channel 32, a panel can be inserted at its upper end within the inverted channel 42 and raised to such position therein that its lower end stands clear of the channel 32 whereupon the lower end can be moved slightly into position above the lower channel ready to be lowered into operative position as shown in Figs. 2 and 3.

When the parts are in the position as shown in Fig. 1, with all of the panels securely held in position by means of clips 50, whenever it is desired to remove one or more of the panels, this can be accomplished very readily. The clips 50 are first removed, and the panel is raised out of engagement with the bottom channel 32, whereupon the channel can be moved directly forward out of engagement with the outside boxes of the adjacent panels or directly backward out of engagement with the inside boxes of the adjacent panels. The panel can then as readily be replaced, or a substitute panel of similar formation can be substituted, all without disturbing any of the panels except the one in question.

Referring now to the construction as shown in Figs. 9 to 15, in which certain of the parts are indicated by the same reference characters as those above designated, 52 indicates the foundation of any suitable type for a dwelling house. Resting upon their lower ends upon the foundation 52, there are a series of panels of sheet metal of the type shown in Fig. 11, formed of sheet metal bent along longitudinal lines for providing flanges arranged in box formation such as that indicated by the numeral 47 as shown in Fig. 5. Each of such panels has its lower margin bent at right angles to provide a base flange 53 as shown in Fig. 9. Inasmuch as the panels forming the walls, the floor, the ceiling, and the roof as shown in Figs. 9 to 12 are of the same type as those shown in Figs. 1 to 8, the corresponding parts are indicated by the same reference characters. In the assembly of the parts constituting the building as shown in Fig. 9, the upright panels 31 forming the wall portions are first placed in position, being secured

in position by means of clips 50 as above described. A form 54 is then placed in position at the inner face of the foundation 52, after which the floor panels are placed in position and concrete is poured for providing an upward extension 55 for the foundation serving to hold the floor panels securely in position. Filling material 56 is then placed on top of the floor panels, such filling material being preferably of the type known in the trade as Insulex, which is adapted to set and harden in cellular form of comparatively small weight. After the filling material 56 has hardened sufficiently, a form 57 is placed in position along the inner face of the wall panels and a filler 58 of any approved type is poured between the form and the panels, such filler 58 being preferably of the same type as that used in the floor but being preferably of lighter weight.

A special panel is employed at the corners for joining the wall portions, such special wall panel being shown in Fig. 12. This panel comprises a strip of sheet material bent along an intermediate line to provide an angularly formed body portion 59, each part of which in the arrangement shown is provided with an outside box arrangement 49. The inside box arrangements 47 of the adjacent panels are secured within the boxes 49 of the corner panel by means of clips 50 as above described.

As is shown in Fig. 10, the side walls support a ceiling structure 60 extending thereacross, and a roof structure 61 rises in oblique position from the edge of the ceiling structure, both the ceiling structure and the roof structure being of the same form as that above described in connection with the floor.

In the arrangement shown, a special panel 62 is employed at the upper edge of the wall having an inside box arrangement 47 on one edge and being bent inwardly and downwardly about the upper edge of the wall by means of integrally formed flange portions 63 and 64. A second special panel 65 is provided equipped with an outside box arrangement 49 at its inner edge and with an inside box arrangement 47 at its outer edge, such outside box 49 being firmly connected with the inside box 47 of the panel 62 by means of one of the clips 50. A third special panel 66 provided with an outside box 49 at its lower edge is connected with the inside box 47 of the member 65 by means of one of the clips 50, such member 66 extending upwardly about the outer edge of the ceiling structure 60, and thence inwardly along the top face of the ceiling and diagonally upwardly and inwardly along the bottom face of the roof structure 61. The diagonally disposed flange portion of the member 66 is connected in any suitable manner with the lower ends of the panels 31 of the roof.

In the arrangement shown in Fig. 13, panels 67 of sheet metal are provided, bent along longitudinal lines to provide inside boxes 47 and outside boxes 49 in the manner above described in connection with the forms above described, the body portions 68 of such panels 67 being formed of expanded metal of any approved type. Clips 50 are employed for securing the boxes together. Upon opposite faces of the body portions 68 and extending between and within the boxes 47 and 49 and about the clips 50 there are provided layers 69 and 70 of plaster which are keyed to the panels and keyed to each other through the openings in the expanded metal.

In Fig. 14 I have illustrated an improved form

of means for securing a metal lath arrangement such as that shown in Figs. 13 and 15 to a wall, such arrangement being adapted for the provision of partitions in a building having outer walls of the type shown in said Fig. 14. In this arrangement, the body portion of the wall panel is indicated by the numeral 71, such panel having a special securing device 72 of sheet metal secured thereto preferably by welding, such member 72 being bent along longitudinal lines to provide an arrangement similar to the arrangement of the outside boxes of the panels as above described. The inside box 47 of a panel 67 is held in position within the box-like arrangement of the member 72 by means of a clip 50 in the manner already described.

In the arrangement shown in Fig. 16, by which a form is provided for concreting a beam or column 73, I have provided a plurality of panels of considerably smaller width than those employed for the wall of a building, the panels being preferably formed of a plurality of different widths so as to enable them to be combined to advantage for providing facing members of different widths suitable for use in connection with beams of different sizes. In the arrangement shown, I have provided two panels 74 and a slightly wider panel 75 for forming one side of the enclosure for receiving the concrete. Other panels 76 and 77 are arranged at right angles to the facing member comprising the panels 74 and 75, such panels 76 and 77 being of any desired width, preferably of about the same type as panels 74 and 75. Each of the panels 74, 75, 76 and 77 is provided with flanges in box-like arrangement upon both edges, in the arrangement shown each panel being provided with an inside box at one edge arranged opposite the body portion and an outside box at the opposite edge extending beyond the body portion. Each inside box is positioned within the outside box of the adjacent panel, except for the arrangement at the corners of the enclosure, where special panels 78 and 79 are provided. Each of the panels 78 and 79 is made up of an outside box and an inside box formed integrally with each other, such boxes of the corner panels engaging the adjacent boxes of the adjacent panels. Clips 50 are employed serving to hold the various panels in operative relation to each other.

In Fig. 17 I have provided an arrangement similar to that shown in Fig. 16, except that a corner panel 80 of slightly different form is employed in which a slight variation is made in the width of the inside flange portions of the boxes so as to provide for the panels 75 and 77 having a slightly overlapping relationship in lieu of the direct corner engagement as shown in Fig. 16.

Still another form of corner panel 81 is shown in Fig. 18 for connecting the panels 75 and 77 in slightly different relationship. In the form shown in said Fig. 18, the special panel 81 comprises a body portion 82 having an outside box 49 at one edge and an inside box 83 at the opposite edge, such inside box 83 differing from the inside boxes 47 as above described in that said box 83 comprises only three flange portions in angular position with respect to each other in lieu of the four flange portions as heretofore described. The arrangement is such that such inside box 83 is adapted to engage the outside box 49 of the panel 77 in such manner as to be held firmly in engagement therewith by one of the clips 50.

In Fig. 19, I have shown the preferred form

of my improved arrangement for concreting a horizontal beam 84. In this arrangement, a cross bar 85 is supported in position below the beam 84 by means of a metal strap 86 as is usual or in any other suitable manner. Upon the cross bar 85 I have provided a series of panels 87, 88 and 89 secured together by means of clips 50 engaging inner and outer boxes on the edges of said panels. A spacing block 90 is preferably provided beneath the inside box 47 at the outer edge of the panel 87. Upon the top face of the series of panels 87, 88 and 89, I have provided panels 91 and 92 at one side and panels 93, 94 and 95 at the opposite side, such panels engaging the oppositely disposed plies of the strap 86 at the outer faces of the panels. The panels at each side are connected together by means of clips 50 engaging the inner and outer boxes thereon.

By the use of my invention, I have provided a construction in the form of metal lumber in which the means for connecting the adjacent panels together comprises also the framework for supporting the panels. By reason of my improved construction the several panels can be very quickly and easily assembled in their cooperative relation, and when occasion requires one or more panels can be very quickly and easily withdrawn for the substitution of other panels therefor. At the same time, the parts in operative position are held very strongly in position braced with respect to each other for affording great strength in the structure as a whole.

While I prefer to employ the form of structure as shown in my drawings and as above described, it is to be understood that my invention is not limited to the form shown except so far as the claims may be so limited by the prior art.

I claim:—

1. In a panel construction, the combination of two panels of sheet material each bent along longitudinal lines for providing a body portion and a series of flange portions along one edge of the body portion with said flange portions arranged in effect in the form of interfitting boxes, and a clip fitting about the outer one of said boxes for holding said boxes firmly in engagement and serving to lock said panels securely against movement with respect to each other.

2. In a panel construction, the combination of two panels of sheet material each bent along longitudinal lines for providing a body portion and a series of flange portions along one edge of the body portion with said flange portions arranged in effect in the form of interfitting boxes, and a clip conforming to the shape of said boxes and fitted snugly thereabout for holding the boxes firmly in engagement and serving to hold said panels securely against movement with respect to each other.

3. In a panel construction, the combination of two panels of sheet material each bent along longitudinal lines for providing a body portion and a series of flange portions along one edge of the body portion with said flange portions arranged in effect in the form of interfitting boxes, and a spring clip of sheet metal extending partially about said boxes and serving to hold the boxes firmly in engagement for maintaining the panels in alignment with each other and for preventing movement of one panel transversely with respect to the other.

4. In a panel construction, the combination of two panels of sheet material each bent along longitudinal lines for providing a body portion and a series of flange portions along one edge of the

body portion with said flange portions arranged in effect in the form of inter-fitting boxes, and a spring clip adapted to be pressed into snap engagement about said boxes for holding the boxes 5 firmly in engagement with each other and serving to lock the panels securely against movement with respect to each other.

5. In a panel construction, the combination of two panels of sheet material each bent along 10 longitudinal lines for providing a body portion and a series of flange portions along one edge of the body portion with said flange portions arranged in effect in the form of inter-fitting boxes, and a clip of spring steel also in the form of a 15 box in effect adapted to be pressed into snap engagement about said boxes adapted by engagement with the several flanges of the outside box and the terminal flange of the inside box to hold the boxes firmly in engagement with each other 20 and serving to lock the panels securely against movement with respect to each other.

6. In a panel construction, the combination of a panel of sheet material bent along longitudinal 25 lines for providing a body portion and a series of three flange portions along one edge providing in effect a box, a second panel of sheet material bent along longitudinal lines for providing a body portion and a series of four flange 30 portions along one edge providing in effect a box adapted to be fitted snugly within the box on said first named panel, and a clip also formed of sheet material bent to form a box adapted to receive said first named boxes and adapted when in position 35 thereon to hold said first named boxes against movement with respect to each other.

7. In a panel construction, the combination of a panel of sheet material provided along one 40 edge with a series of three flange portions each in substantially right angular position with respect to the adjacent portions to provide in effect a box, a second panel of sheet material provided along one edge with a series of four flange 45 portions each in substantially right angular position with respect to the adjacent portions to provide in effect a box adapted to be fitted snugly within said first named box, and a clip in the 50 form of a box and adapted to receive said first named box and adapted when in position thereon to hold said first named boxes against movement with respect to each other.

8. In a panel construction, the combination of a series of panels (46-48) of sheet material each 55 provided along two opposite edges with a series of flange portions arranged to provide in effect a box on each of said edges, the boxes on each alternate panel (46) being adapted to be fitted from one side within the boxes on the adjacent 60 other alternate panels (48) and the boxes on said other alternate panels (48) being adapted to be fitted from the opposite side over the boxes on the alternate panels (46), and means fitted about each of the outer boxes for holding such box and the box fitted within it against movement with 65 respect to each other.

9. A panel formed of sheet material bent along 70 longitudinal lines to provide a body portion and a series of four flange portions along each of its side edges each in substantially right angular position with respect to the adjacent portions and arranged in box formation at one side of the 75 panel and opposite the body portion, with the face of each box adjacent to the body portion at least partially open.

10. A panel formed of sheet material bent along longitudinal lines to provide a body por-

tion and a series of flange portions along each of its side edges arranged in box formation with the boxes located beyond the body portion of the panel and with the front faces of the boxes entirely open.

11. A panel construction comprising in combination a series of panels of sheet material 80 joined together by flanges in box arrangement on the adjoining edges of the several panels, and means for supporting said panels comprising 85 end frame members of sheet material having flanges in box arrangement inter-fitted with the adjacent box-arranged flanges on the adjacent panels, and longitudinally extending frame bars of sheet material connected with said end frame 90 members and provided with oppositely located channel portions into which said panels extend at their upper and lower ends respectively, said end frame members being provided with lug 95 portions also extending into said channel portions for holding the parts rigidly in position with respect to each other.

12. A panel construction comprising in combination a series of panels of sheet material joined 100 together by flanges in box arrangement on the adjoining edges of the several panels, means for supporting said panels comprising end frame members of sheet material having flanges in box 105 arrangement inter-fitted with the adjacent box-arranged flanges on the adjacent panels, and longitudinally extending frame members of sheet material connected with said end frame members and provided with oppositely located channel 110 portions in which said panels extend at their upper and lower ends respectively, and spring clips pressed into snap engagement about each 115 two inter-fitted flange box arrangements for holding the panels against movement with respect to each other and against movement with respect to the end frame members.

13. A construction for walls, ceilings, floors, roofs, and the like, comprising in combination a series of panels of sheet material each bent along 120 longitudinal lines for providing a series of flange portions along each edge in the form of boxes with the boxes of each panel inter-fitted with the adjacent boxes of the adjacent panels, and spring clips pressed into snap engagement about said inter-fitted boxes for holding the panels 125 firmly in position with respect to each other.

14. A construction for walls, ceilings, floors, roofs, and the like, comprising in combination a series of panels of sheet material each bent along 130 longitudinal lines for providing a series of flange portions along each edge in the form of boxes with the boxes of each panel inter-fitted with the adjacent boxes of the adjacent panels, spring clips pressed into snap engagement about said inter-fitted boxes for holding the panels firmly 135 in position with respect to each other, and a layer of filling material between and within said boxes serving to stiffen the structure and to hold the boxes strongly in interengaging position.

15. In a panel construction, the combination of a series of pieces of sheet metal formed to serve 140 as a plaster base each constituting the body portion of a panel, a plurality of flange portions provided on each body portion along its side edges and arranged in substantially box formation 145 thereon with the boxes of each panel inter-fitted with the adjacent boxes of the adjacent panels, and clips fitted about said inter-fitted boxes for holding the panels firmly in position with respect to each other.

16. In a panel construction, the combination

- of a series of pieces of sheet metal formed to serve as a plaster base each constituting the body portion of a panel, a plurality of flange portions provided on each body portion along its side edges and arranged in substantially box formation thereon with the boxes of each panel inter-fitted with the adjacent boxes of the adjacent panels, the boxes being open at one side, clips fitted about said inter-fitted boxes for holding the panels firmly in position with respect to each other, and a layer of plaster extending over one face of said body portions and into said inter-fitted boxes. 80
17. In a panel construction, the combination of a series of pieces of expanded sheet metal each constituting the body portion of a panel, a plurality of flange portions formed integrally with each body portion along each side edge in substantially a box formation thereon with the boxes of each panel interfitted with the adjacent boxes of the adjacent panels, and spring clips pressed into snap engagement about said inter-fitted boxes for holding the panels firmly in position with respect to each other. 85
18. In a panel construction, the combination of a series of pieces of expanded sheet metal each constituting the body portion of a panel, a plurality of non-expanded flange portions formed integrally with each body portion along each side edge in substantially a box formation thereon with the boxes of each panel inter-fitted with the adjacent boxes of the adjacent panels, spring clips pressed into snap engagement about said inter-fitted boxes for holding the panels firmly in position with respect to each other, and layers of plaster on opposite faces of the panels keyed to the body portions and to each other through the openings in the expanded metal. 90
19. In a panel construction, the combination of two facings positioned at right angles to each other and each made up of a plurality of panels having body portions of sheet material with a series of flange portions formed integrally in box formation along their side edges, a corner member of sheet material comprising two box-like arrangements of flanges engaging the boxes of said facings respectively, and a clip also of box formation fitting about each two inter-engaging boxes for holding said boxes firmly in engagement with each other. 95
20. In a panel construction, the combination of two facings positioned at right angles to each other and each made up of a plurality of panels having body portions of sheet material with a series of flange portions formed integrally in box formation along their side edges, a corner member of sheet material comprising two box-like arrangements of flanges engaging the boxes of said facings respectively, and a clip of spring steel sheet also bent into the form of a box adapted to be pressed into snap engagement about each two inter-engaging boxes for holding said boxes firmly in engagement with each other. 100
- JAMES W. SWANK. 105

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