C. M. JONES.

SHEET METAL CONSTRUCTION.

APPLICATION FILED AUG. 29, 1910.

**988,574.**

**Patented Apr. 4, 1911.**

3 SHEETS—SHEET 1.

Fig. 1.

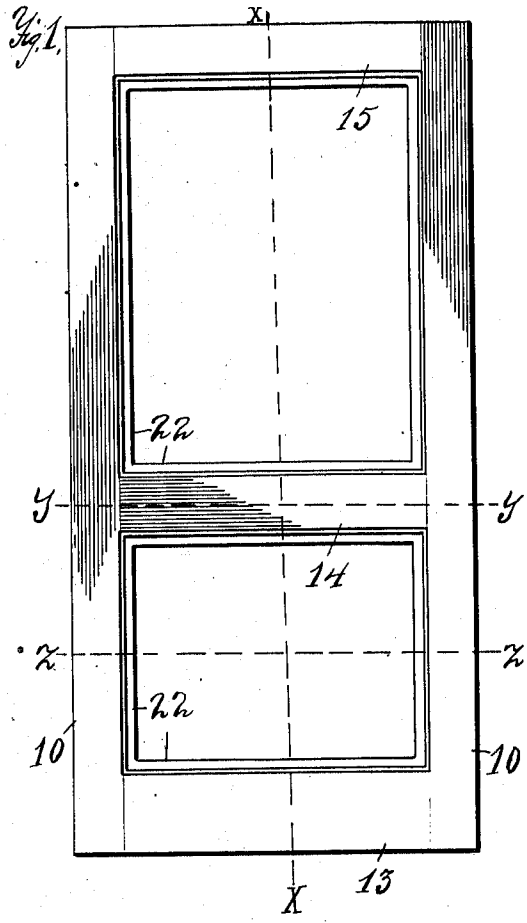



Fig. 3.

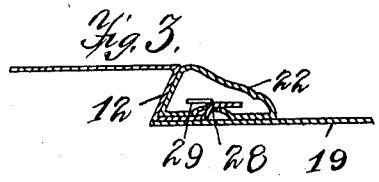



Fig. 4.

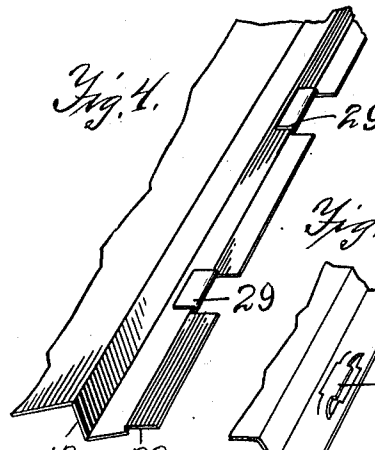
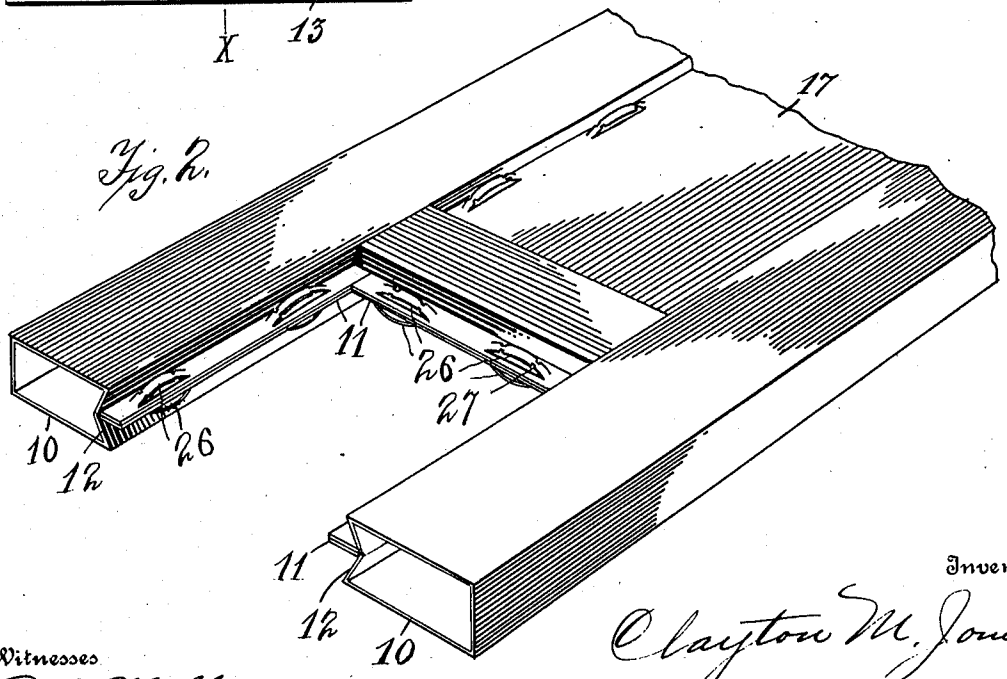



Fig. 5.




Fig. 2.




Witnesses

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3 SHEETS—SHEET 2.

Fig. 6.

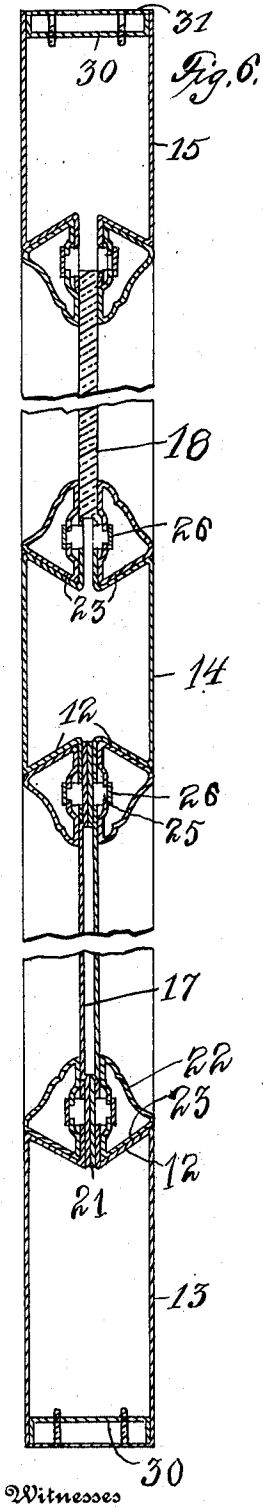
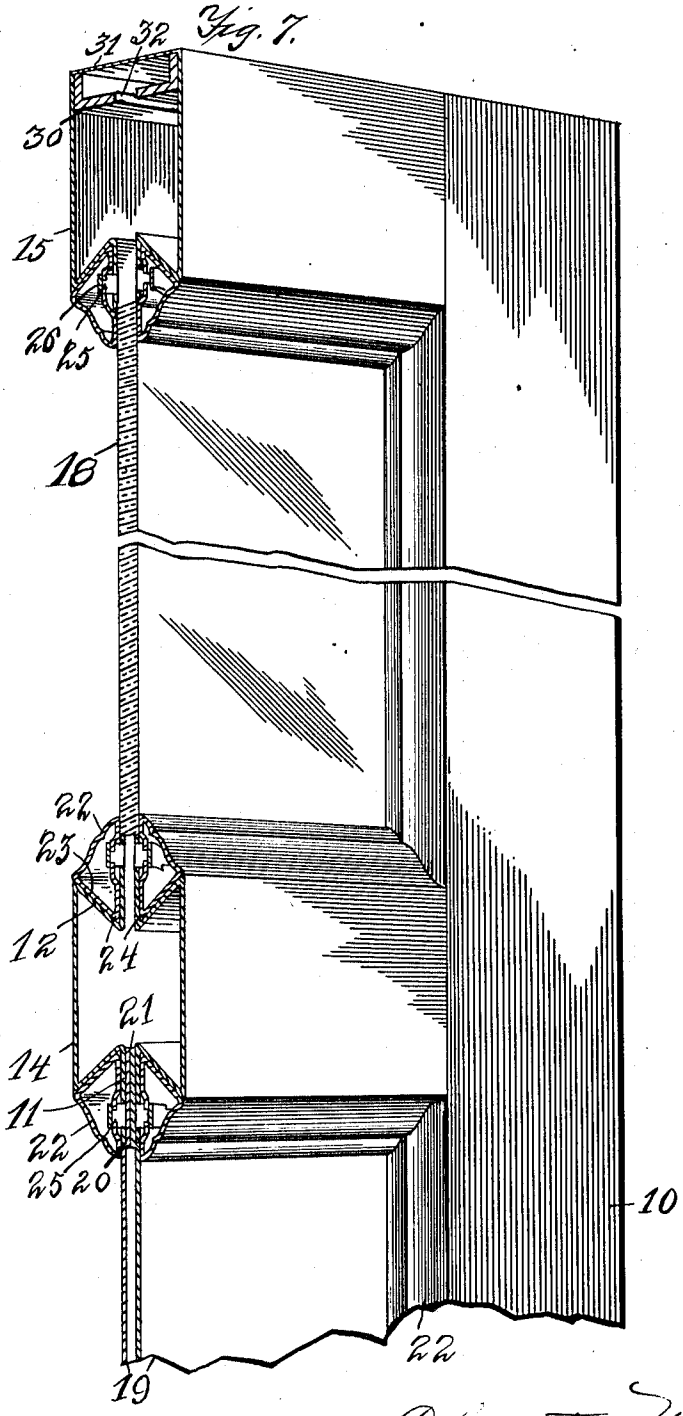



Fig. 7.

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3 SHEETS—SHEET 3.

Fig. 8.

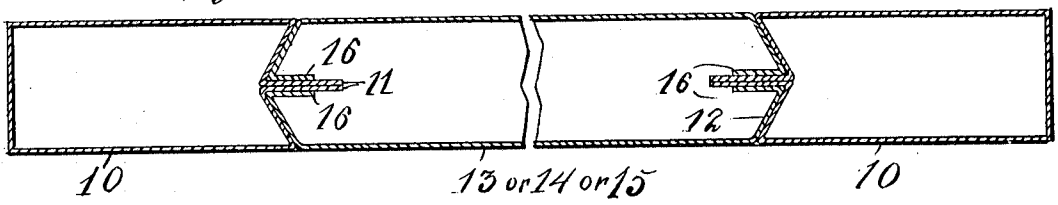


Fig. 9.

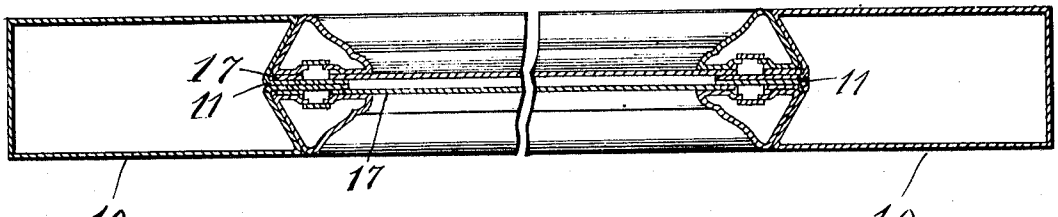


Fig. 10.

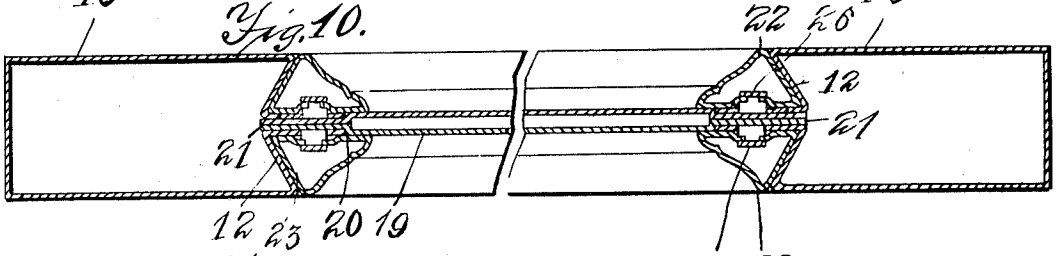


Fig 11

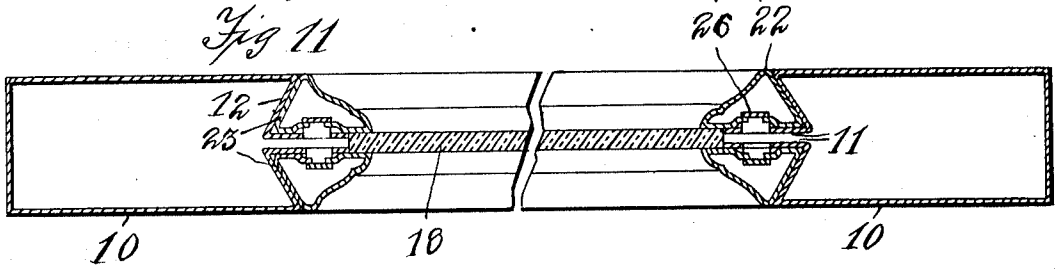


Fig. 12.

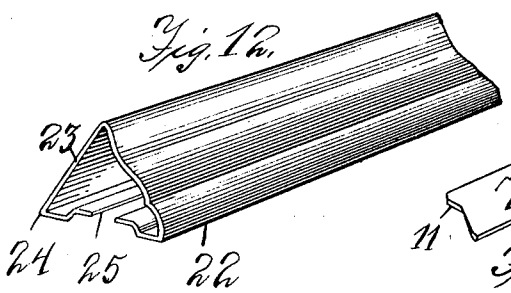


Fig. 13

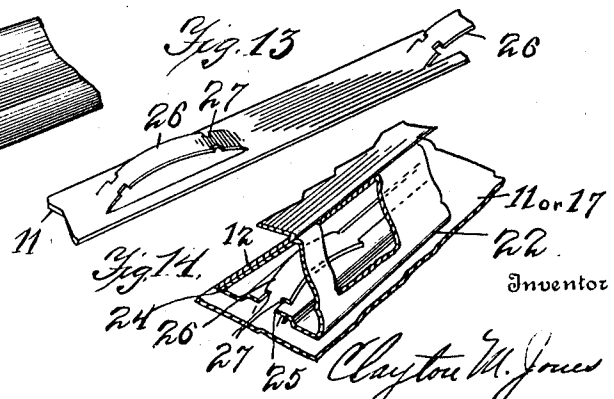


Fig. 14.

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# UNITED STATES PATENT OFFICE.

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## SHEET-METAL CONSTRUCTION.

988,574. Specification of Letters Patent. Patented Apr. 4, 1911.

Application filed August 29, 1910. Serial No. 579,530.

*To all whom it may concern:*

Be it known that I, CLAYTON M. JONES, a citizen of the United States, and resident of Jamestown, in the county of Chautauqua and State of New York, have invented new and useful Improvements in Sheet-Metal Construction, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to sheet metal doors and windows; and the object of my improvement is to provide a strong sheet metal construction by means of which doors and windows may be quickly and easily made and assembled without the need of rivets or bolts for holding the stiles, rails, panels or glass and molding together; and the invention consists in the construction and arrangement of the parts as described in this specification and shown in the accompanying drawings and pointed out in the claims.

In the drawings, Figure 1 is an elevation of a sheet metal door. Fig. 2 is a perspective view of a portion of the door, the molding and one of the panels being removed to show the construction of the parts. Fig. 3 is a crosswise sectional view of the molding and stile or cross rail showing a modification of the preferred form for holding the molding in place; and Fig. 4 is a perspective view of a single piece of the stile or cross rail showing the modification set forth in Fig. 3 for holding the molding in place. Fig. 5 is a perspective view of a portion of the stile or cross rail showing another modification of the holding means for the molding. Fig. 6 is a lengthwise sectional view of the door at line X X in Fig. 1 showing the construction and arrangement of the parts in a door having a glass panel. Fig. 7 is a perspective view of a portion of the door, the edge being shown in section. Fig. 8 is a sectional view of an all metal door at line Y Y in Fig. 1. Fig. 9 is a crosswise sectional view at line Z Z in Fig. 1, showing the manner of attaching a sheet metal panel to the stiles in an all sheet metal door; and Fig. 10 is a similar view showing the manner of attaching a sheet metal panel to the stiles in a door having a glass upper panel; and Fig. 11 is a similar view showing the manner of attaching the molding to the stiles and thereby holding the glass panel. Fig. 12 is a perspective view of a piece of the molding. Fig. 13 is a perspective view showing a detail of the preferred form of the offset struck from the sheet metal stile or panel to hold the molding; and Fig. 14 shows the same with the molding held in place thereon, portions of the molding being broken away to show the offset holding construction.

Similar numerals refer to corresponding parts in the several views.

The numeral 10 indicates the stiles which are each made out of a single sheet metal plate bent in tubular form with the lengthwise edges brought together in the double lengthwise central flange 11 on the inner edge. The sides 12 of the tubular stile adjacent the flanges 11 are given an acute angle to the said flange so as to project the sides into tubular stile 10, the two sides forming a V-shaped angle.

The rails 13, 14 and 15 have their ends formed at a corresponding outward angle, as shown in Fig. 8, to fit within the angle of sides 12 and flange 11, the opposite ends of the rails forming a dove-tail shaped joint with the stiles. An inturned flange 16 is provided on each end of the rail to hold against flange 11. The rail ends are preferably spot welded on to side 12. When the rail is slipped into place, the dovetail shaped joint braces all parts firmly and the spot welding holds the rails from slipping sidewise, thereby making a very strong and rigid construction. The inner sides of cross rails 13 and 15 and both sides of the middle cross rail 14 are formed at the inturned or V-shaped angles 12, the same as the stile and also as to the double flange 11. The middle cross rail 14 is made in two pieces which are preferably joined together by spot welding, after being slipped into place within the stiles 10. It is apparent that rails 13 and 15 may be made in either one or two pieces.

In an all sheet metal door the edges of the panels 17 fit closely within the acute angle formed by sides 12 and flange 11 on the stiles and cross rails. This is sufficient to hold the panels quite firmly in place, but they may also be spot welded if desired. In a door having an upper glass panel 18, the lower sheet metal panel 19 is formed with a shoulder 20 along each side, so that each edge of flange 11 abuts against a shoulder 20, and the contacting edges 21 of the panel 19 extend through between the double flanged edges 11. This arrangement of the

lower panel and stiles and cross rails permits the holding of the glass panel 18 in practically the same way. The edges of each part of the double flange 11 abutting against the edge of the glass and holding it firmly in place against edgewise movement, and the molding 22 on each side fastens the glass tightly in place.

The molding 22 is formed with its rear side 23 at the angle of the side 12 of the stile so that the inner corner 24 of the molding fits within the acute angle formed by flange 11 and side 12, both on the stile and cross rail. The side of the molding adjacent the panel 19 or flange 11 is formed with a lengthwise slot 25. Molding 22 is securely attached contiguous to the stile or cross rail by means of a lug or offset 26 which is struck from the flange 11 or the panel 19 according to the two forms of construction used, as shown in Figs. 9 and 10. Offset 26 is preferably made with the two pairs of notches 27 on opposite sides through which the edges of the molding 22 adjacent slot 25 are slipped, as shown in Fig. 10 and in the sectional views. A sufficient number of offsets 26 are provided to hold the molding in place on each side of the panel, usually two to each side. The parts are preferably made so as to fit tightly and the spring of the sheet metal holds them all firmly in place. The angular side 12 holds the molding so that it can not be displaced on the offsets 26, and the molding braces all the parts rendering them exceedingly rigid and strong.

In the modifications shown in Figs. 3 and 4 the panel 19 is made straight and yet passes within the flanged edge 28 of the stile or cross rail. The offset flanged edge 28 has the lugs 29 turned back therefrom so as to form a holding means in both directions for the slotted molding 22. This modified form of attachment for the molding 22 may be used in certain forms of doors, but is not applicable to all forms.

A simple modification of offset 26 is shown at 33 in Fig. 5 and its application would seem to be obvious.

In assembling the door the two stiles 10 are placed a spaced distance apart corresponding to the length of the rails. The parts of the middle rail 14 are then slipped into place and attached to the stiles and to one another. The panels on the opposite sides are then inserted. The molding is then slipped endwise into place on offsets 26, after which the top and bottom cross rails are attached, channel irons 30 being provided in the cross rails. When the glass panel 18 is inserted, the upper edge of the top cross rail 15 is left open for the insertion of the glass panel and is closed by means of a channel iron 30 and a strip 31 is attached thereto by means of suitable screws. The channel iron 30 for the upper edge of the top cross rail 15 is preferably formed with a lengthwise slot 32 therein, as shown in Fig. 7. This arrangement allows of the removal of the glass after the assemblage of the door and the insertion of new glass, it only being necessary to remove the top plate 31, after which the glass may be inserted through slot 32.

It is obvious that the construction around glass 18 shown in Figs. 7 and 11, is applicable to sheet metal windows. The cross rails and stiles around glass 18 show a simple frame construction applicable to sheet metal windows and the slotted molding and offsets form a strong and convenient method of holding the glass.

It is apparent that the exterior and interior angles of the sheet metal in the stiles are substantially equal. It is also obvious that the offsets for receiving the slotted molding have extensions in opposite directions so that the molding is held on the inner sides adjacent the slot, which slot is placed adjacent the angled sheet metal.

I claim as new:

1. In sheet metal construction, a sheet of metal having substantially equal exterior and interior angles, offsets on said sheet of metal near said angles having extensions in opposite directions, and tubular molding having a slot therein in order that said molding may slide under said extension.

2. In sheet metal construction, a tubular frame having inturned flanged edges, offsets on said frame, and slotted tubular molding to fit said flanged edges and have a holding engagement with said offsets.

3. In sheet metal construction, a tubular frame having inturned flanged edges, offsets on said flanged edges, tubular molding to fit said flanged edges having a lengthwise slot therein to engage said offsets, and a panel between the molding on the opposite sides of said flanged edges.

4. In sheet metal construction, a tubular frame, a flange on the inner side of said frame the inner sides of said tubular frame formed at an inward angle to form an acute angle between said side and flange, offsets on said flange, and tubular molding having an angled side to fit said angle in said frame side, said molding having a slot to engage said offsets.

5. In sheet metal construction, a tubular frame, a panel in said tubular frame, slotted molding to fit between said tubular frame and panel, said molding having a lengthwise slot therein, and offsets on said tubular frame to engage and hold said molding within the sides of said slot.

6. In sheet metal construction, a tubular frame formed of sheet metal plates, the inner sides of said tube formed in a V-shape, the edges of said plates projected in a central lengthwise flange from said V-shaped

side, offsets on said flanges, tubular molding to fit said inner sides each side of said flange, said molding having a lengthwise slot to engage said offsets.

7. In sheet metal construction, a sheet metal plate formed in a tube having a V-shaped inner side, the edges of said plate forming a central lengthwise flange in said V-shaped inner side, sheet metal panel pieces attached to said flange, tubular molding to fit said V-shaped inner side each side of said flange and panel, said molding having a lengthwise slot, and offsets on said flange and panel engaged by said molding through said slot.

8. In sheet metal construction, a door comprising tubular frame composed of stiles and cross rails having contiguous V-shaped edges, flanges lengthwise of the center of said V-shaped edges, offsets on said flanges, panels held by said flanges, tubular molding to fit said tubular frame each side of said flanges, said molding having a lengthwise slot to receive said offsets therethrough in holding engagement.

9. A sheet metal door comprising tubular stiles having V-shaped inner edges, cross rails having ends to fit within said V-shaped inner edges on said stiles, said cross rails having V-shaped edges, flanges lengthwise of the center of said V-shaped edges of said stiles and cross rails, means for attaching said rails to said stiles, panels attached to said flanges, offsets on said flanges, tubular molding to fit each side of said V-shaped edges each side of said flanges, said molding having a lengthwise slot to receive said offsets in holding engagement.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CLAYTON M. JONES.

Witnesses:
A. W. KETTLE,
I. A. ELLSWORTH.