E. GUSTAFSON.

SHEET METAL DOOR CONSTRUCTION.

APPLICATION FILED DEC. 26, 1911.

1,036,832.

Patented Aug. 27, 1912.

3 SHEETS—SHEET 1.

Fig. 1.

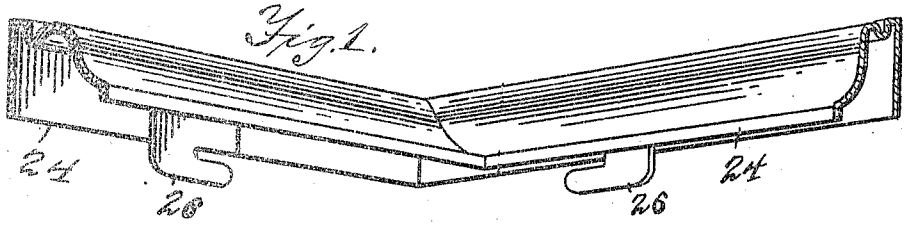



Fig. 2.

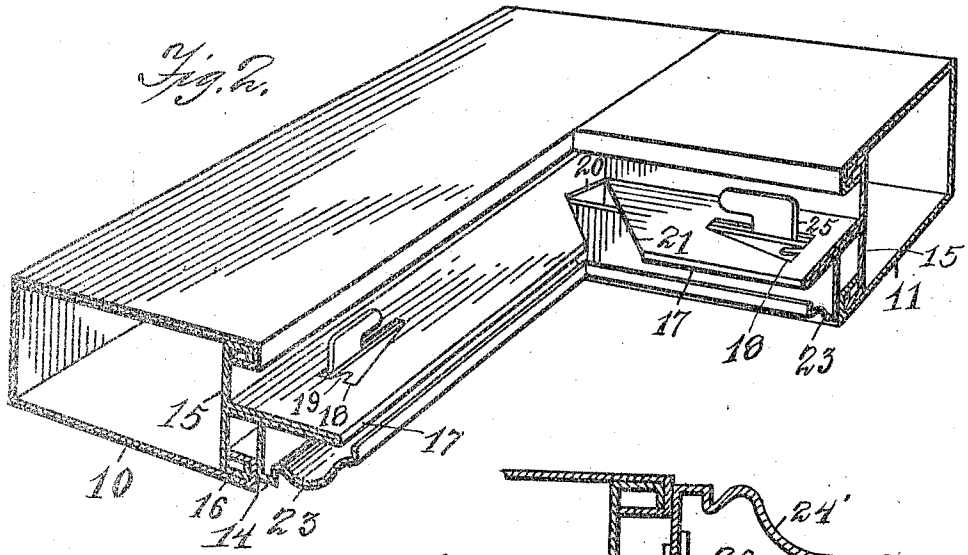



Fig. 3.

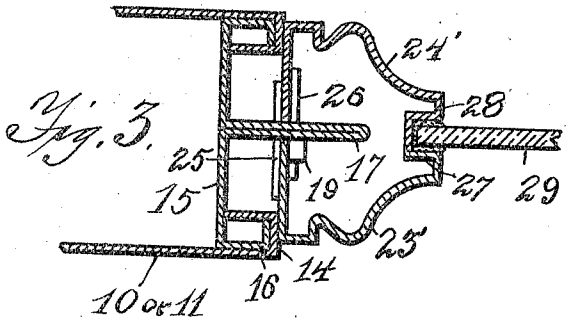
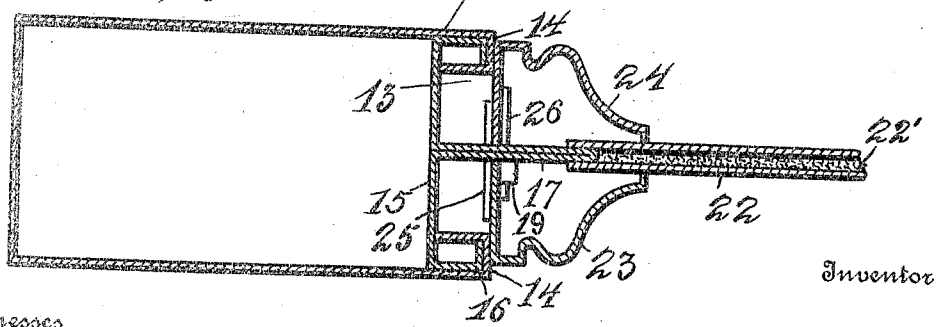



Fig. 4.




Witnesses

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3 SHEETS—SHEET 2.

Fig. 5.

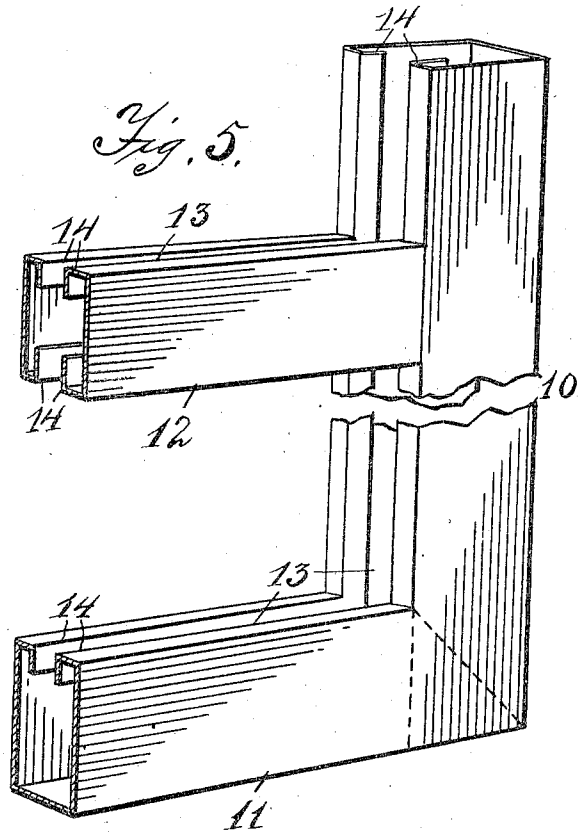



Fig. 6.

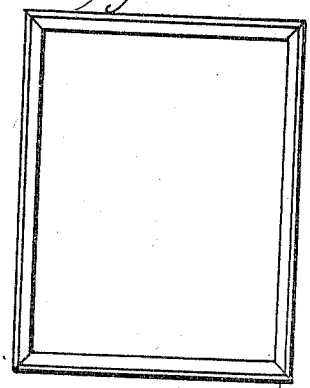


Fig. 7.

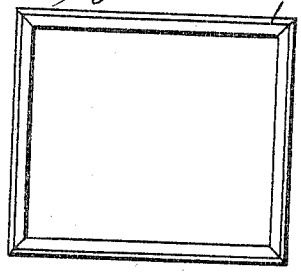



Fig. 8.

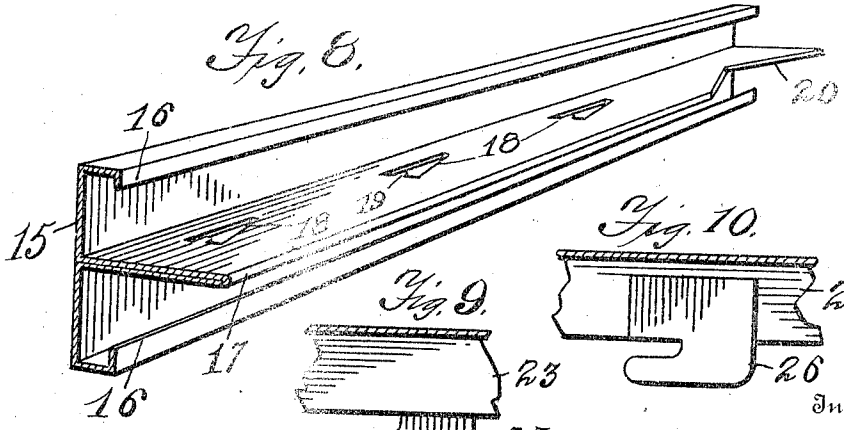



Fig. 9.




Fig. 10.




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3 SHEETS—SHEET 3.

Fig. 11.

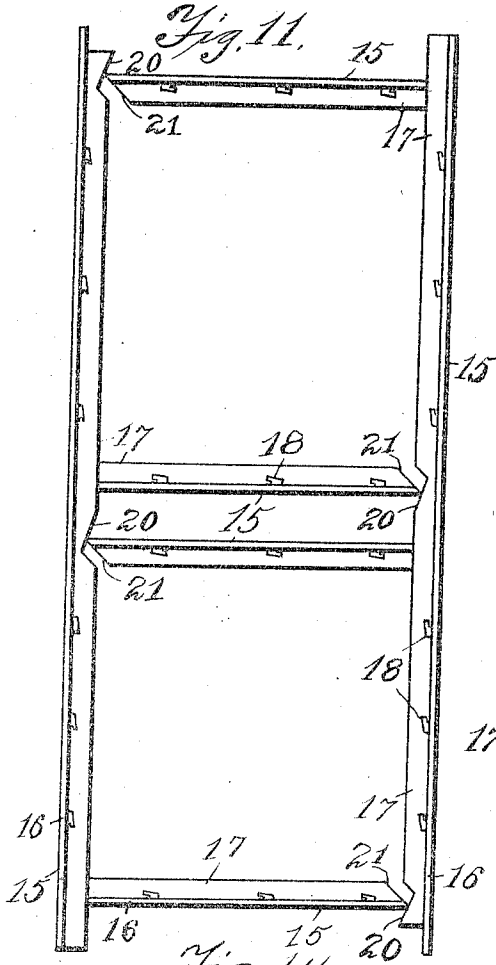



Fig. 12.

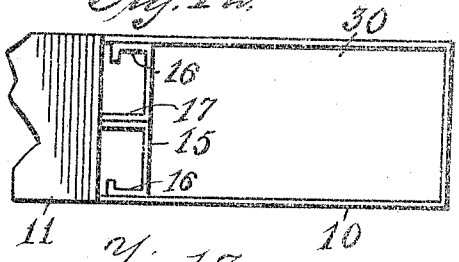



Fig. 13.

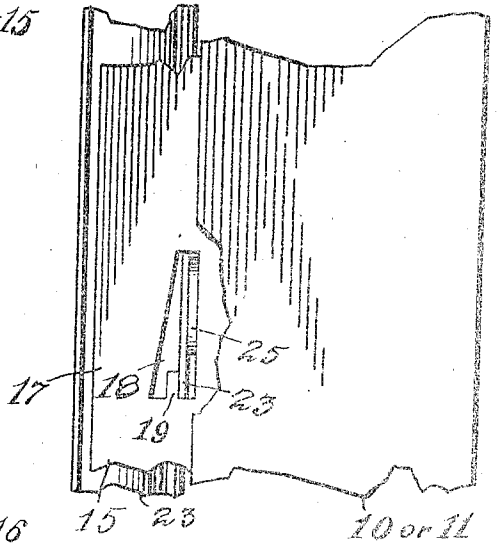
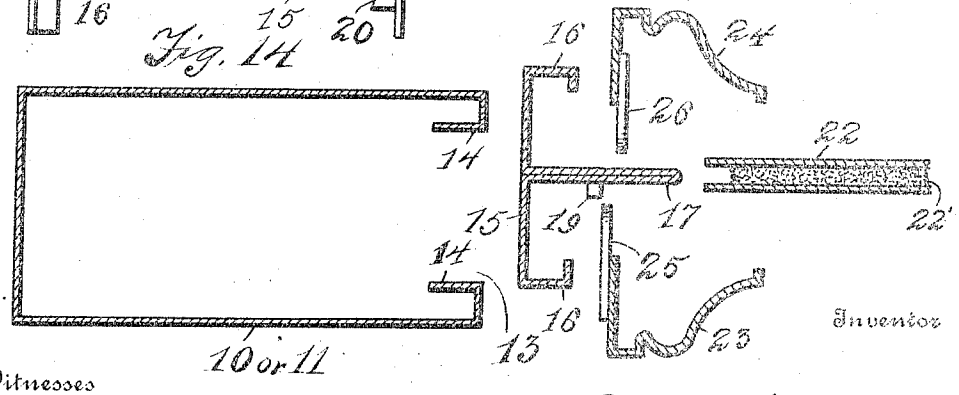



Fig. 14




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# UNITED STATES PATENT OFFICE.

EDWIN GUSTAFSON, OF JAMESTOWN, NEW YORK, ASSIGNOR OF ONE-HALF TO LEVI OLSON, OF JAMESTOWN, NEW YORK.

## SHEET-METAL DOOR CONSTRUCTION.

1,036,832. Specification of Letters Patent. Patented Aug. 27, 1912.

Application filed December 26, 1911. Serial No. 667,796.

*To all whom it may concern:*

Be it known that I, EDWIN GUSTAFSON, a subject of the King of Sweden, residing at Jamestown, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Sheet-Metal Door Construction, of which the following, taken in connection with the accompanying drawings, is a specification.

The invention relates to doors and windows made of sheet metal and the objects of my improvement are to provide a hollow tubular frame which is rigid yet open and easy of access for the attachment of the hinges, latch, lock and other hardware, and for the straightening of the sheet metal, and to which the molding and panels may be attached and all the parts securely drawn together by means of suitable locking strips and interlocking lugs on the molding; and the invention consists in the combination and arrangement of the parts as shown in this specification and the accompanying drawings and pointed out in the claims.

In the drawings, Figure 1 is a perspective view of a corner of the molding showing the attaching hooks thereon. Fig. 2 is a perspective view of a corner of a door or window sash frame with the molding attached to one side, showing the manner of attaching the molding for holding either the sheet metal panel or the glass. Fig. 3 is a sectional view of a sash frame with the moldings arranged to hold the glass. Fig. 4 is a similar sectional view of a door frame with the molding arranged to hold the sheet metal panel. Fig. 5 is a perspective view of a portion of a door or sash frame with the stiles and cross rails in section. Figs. 6 and 7 show elevations of the molding frames ready for insertion in the door or sash frame. Fig. 8 is a perspective view of the wedge or locking strip for holding the parts together. Fig. 9 is an elevation of a portion of the side of the molding, the front portion being broken away, as shown in section, with the hooked lug on the rear side of the plate; and Fig. 10 is a similar view with the hooked lug on the front side of the plate or within the molding. Fig. 11 is an elevation of the wedge or locking strips arranged as in a door frame, showing the openings for the hooked lugs on the molding. Fig. 12 is an elevation of the open end of the stile. Fig. 13 is a detail plan view of a portion of the locking strip and stile with the molding attached to one side of the wedge strip. Fig. 14 is a detail sectional view of the stile, panel, molding and locking strip in the position which they assume to one another when assembled.

Like numerals of reference refer to corresponding parts in the several views.

The numeral 10 designates the stiles, the numeral 11 the top or bottom cross rails; and the numeral 12 the middle cross rail of a door or window frame.

The stiles and cross rails are preferably attached by welding either with a mitered joint as shown in dotted line in Fig. 5 or with a straight joint across the end of the cross rail 11 along the side of the stile 10 as shown in dotted line. The two parts of the cross rail 12 are also preferably attached by welding so as to form a rigid door or sash frame, the open construction on the inner edges permitting of the straightening of all buckling or other bends in the sheet metal from welding or bending the stiles and cross rails and also for attaching the hardware.

Each of the stiles 10 and cross rails 11 are arranged on their inner edges with the open space 13 formed by the two inwardly angular flanges 14 on the edges of the sheet metal. Similar flanges 14 are provided on the upper and lower edges of the two parts of the middle cross rail 12 with a similar space 13 therebetween. The slot 13 admits to the door or sash frame so that latches, locks, hinges and similar hardware can be attached to a door frame before the insertion of the panels, and this construction also permits the coating of the interior of the tubular door frame to prevent rust and deterioration of the sheet metal. The angular flanges 14 also stiffen the frame and hold the parts of the door together by means of a locking strip 15.

The locking strip 15 is preferably formed of a single sheet of metal with angularly flanged edges 16 bent the opposite of the angular flanged edges 14 and spaced to fit within them. A central flange 17 is formed by a return bend in the sheet metal plate, which flange 17 extends out through the slot 13 when the parts are assembled. The flange 17 has the slots 18 cut therethrough with a tongue 19 at one end. The flange 17 also has the angular notch 20 opposite the mitered ends 21 of the cross locking strips,

said mitered ends resting preferably against the longer side of the notch 20 to form a wedge when the locking strip 15 is moved endwise as it bears against the ends of said cross locking strips. A sheet metal panel 22 is preferably made of two sheet metal plates separated by suitable fire proof cement or asbestos packing 22′ and fitting closely each side of the central flange or tongue 17 on locking strip 15, as shown in Fig. 4.

The moldings 23 and 24 for the opposite sides of the door may be made in any desired pattern and rest against the inturned flanges 14 and the panel 22 on each side. The moldings are made in the form of a frame as shown in Figs. 6 and 7 by being welded at the corners, which frames fit within the stiles and crossrails and are attached to the central flange 17 of locking strips 15 by means of hooked lugs 25 and 26, hook 25 being attached to the back of the molding 23 and hook 26 being attached within the molding 24, for a purpose in assembling which will be hereinafter set forth.

When it is desired to place a glass panel in the upper part of a door or to use my construction for a window sash, the moldings are modified slightly on their inner edges, the molding 23′ being given a return bend 27 alongside the glass 29 and the molding 24′ being given an angular bend 28 along the side and edge of the glass 29. These two flanges 27 and 28 abutting on one another form a closed groove which fits the edge of the glass, allowing for suitable packing.

In assembling the door the frame is welded together, and the hardware is attached within the frame and the frame is duly coated to prevent deterioration from condensation within the tubular metal construction. The lengthwise and crosswise wedge strips 15 are then inserted within the flanges 14 so that the flanges 16 fit closely within the flanges 14 on all sides of a panel opening. The entire strip 15 supports the sides of the stiles and cross rails as they extend crosswise within the same, and the central flange 17 extends lengthwise through spaces 13 on the stiles and cross rails.

In a door, the wedge strips 15 would take the form shown in Fig. 11, the bevel end of the cross locking strips resting loosely against the lengthwise locking strips in notches 20. The hooked lugs 25 on molding frames 23 or 23′ are then inserted through the slots 18 and the lugs 19 are pressed downward as shown in Figs. 2, 3, 4 and 14, thereby pressing the hooked lugs 25 firmly against the inner side of the slot 18 and holding the molding 23 or 23′ firmly in place. When the panel 22 is to be inserted with molding 23, said panel is placed with the edge of the flange 17 inserted between the plates of the panel. The frame of molding 24 is then placed with its hooks 26 extending through the slots 18 from the opposite side of the flange 17 from hooks 25 but with the hooked ends extending in the same direction. The lengthwise locking strips are then driven endwise thereby tightening all the parts and locking the molding, panel, stiles and cross rails firmly together.

The ends of the stiles 10 are preferably left open as shown at 30 in Fig. 12, for the insertion of locking strips 15 through a hole opposite the end of the locking strip 15 in the door frame would serve the purpose since locking strip 15 may be inserted through space 13 and a tool is inserted through said hole to drive the wedge or locking strip into place. The opening 30 is closed in finishing the door. The lengthwise wedge or locking strips on the opposite sides of a door or window sash are preferably arranged to drive in opposite directions so that they will draw more evenly upon the frame.

It is apparent that this construction can be used interchangeably for either a door or window sash and that the door or sash can be taken apart for the insertion of new glass or the attachment of fresh hardware or any other purpose for which it may be desired since the locking strips can simply be driven back permitting the removal of the molding 24 or 24′ and allowing the removal of the molding 23 and the locking strips 15.

I claim as new:

1. A device of the class described comprising a hollow sheet metal frame, oppositely placed molding for the two sides of said frame around the panels, intercrossing lugs on said oppositely placed molding to draw from both sides of said door, and locking strips engaging said lugs and frame to lock said parts together by endwise movement from both ends of said door.

2. A device of the class described comprising a hollow sheet metal frame, oppositely placed molding for each side of the door around the panels, oppositely movable lengthwise locking strips along the inner edges of the stiles having engagement with said lugs to interlock the same, and crosswise locking strips along the inner edges of the cross rails engaging said intercrossing lugs on the molding and connecting to said lengthwise locking strips.

3. A device of the class described comprising a hollow sheet metal frame, inturned spaced flanges on the opposite edges of said hollow frame, a locking strip attached to said inturned edges, a tongue on said locking strip extending out between said spaced flanges, a panel, molding for each side of said panel, and intercrossing lugs on said molding engaging said tongue and holding said parts.

4. A device of the class described comprising a hollow sheet metal frame, inturned return bend flanges on the inner edges of said hollow frame around the panel openings, locking strips engaging said return bend flanges, a central tongue on said locking strips extending out lengthwise between said return bend flanges and having openings therein, a panel fitting onto said tongue, molding for the opposite sides of said panel adjacent said frame, and lugs on said molding engaging said tongue through said openings and locked by the movement of said locking strip.

In testimony whereof I affix my signature in the presence of two witnesses.

EDWIN GUSTAFSON.

Witnesses:
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ARTHUR O. MORSE.