A. W. ECKBERG.

METALLIC DOOR OR THE LIKE.

APPLICATION FILED DEC. 9, 1911.

1,174,401.

Patented Mar. 7, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

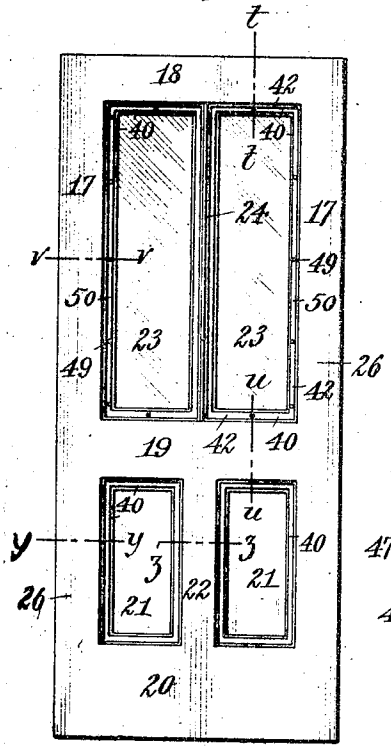


Fig. 2.

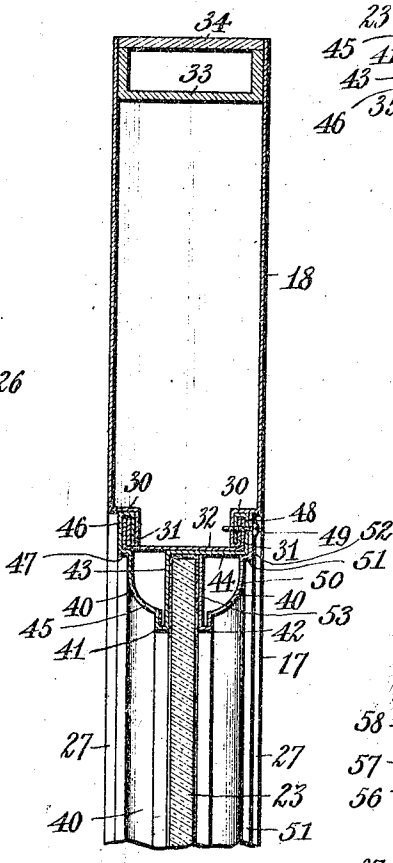


Fig. 3.

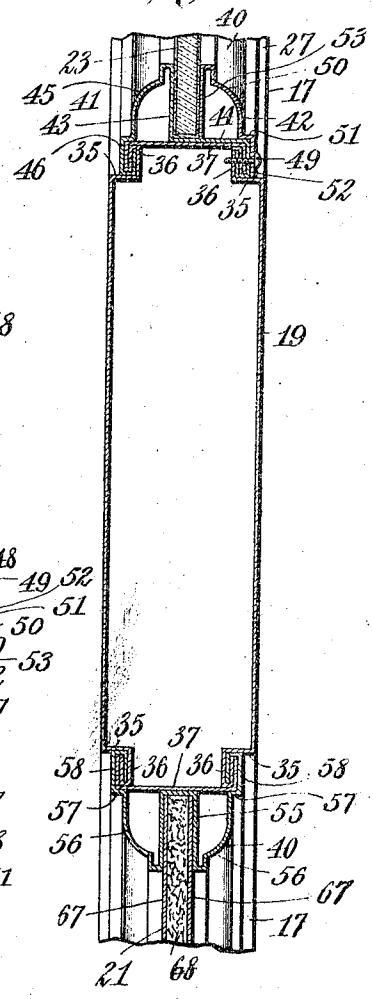
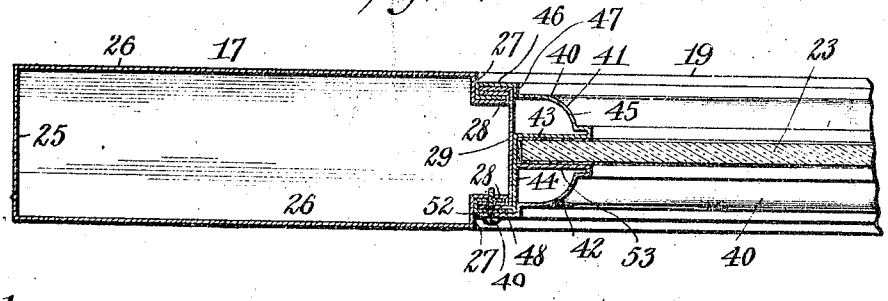


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

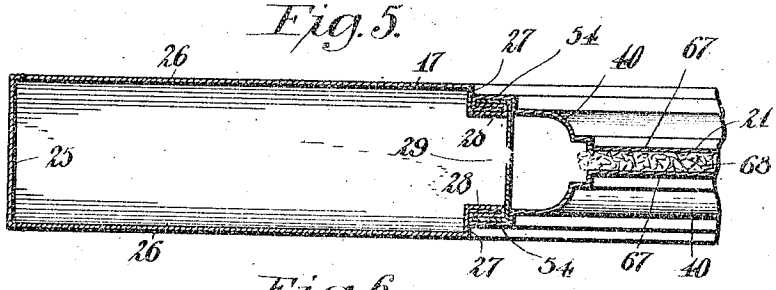


Fig. 6.

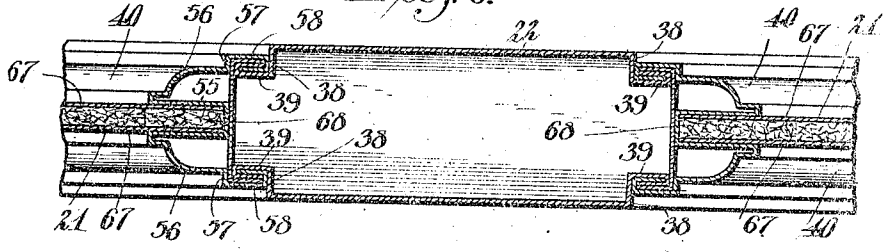


Fig. 7.

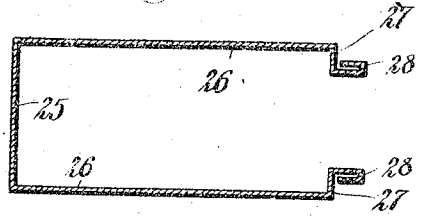


Fig. 8.

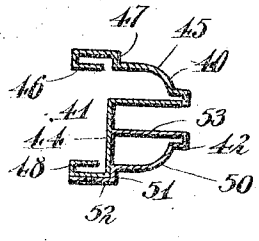


Fig. 9.

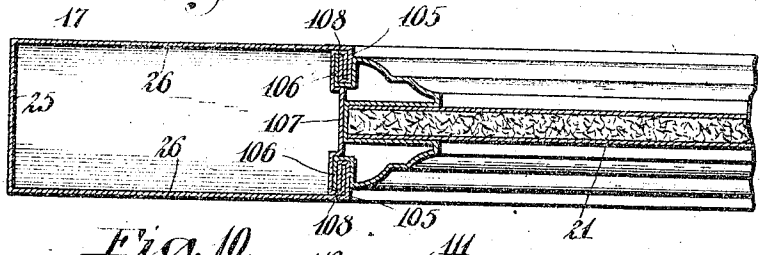
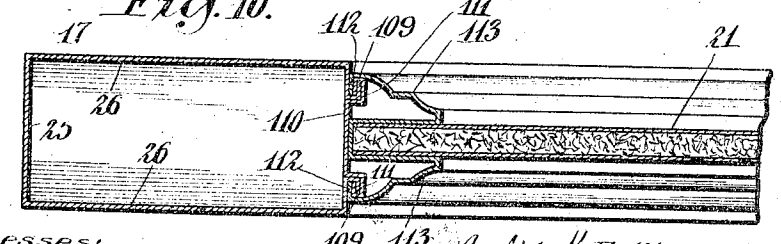


Fig. 10.



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UNITED STATES PATENT OFFICE.

ARVID W. ECKBERG, OF JAMESTOWN, NEW YORK, ASSIGNOR TO DAHLSTROM METALLIC DOOR COMPANY, OF JAMESTOWN, NEW YORK, A CORPORATION OF NEW YORK.

METALLIC DOOR OR THE LIKE.

Specification of Letters Patent. Patented Mar. 7, 1916.

1,174,401.

Application filed December 9, 1911. Serial No. 664,791.

To all whom it may concern:

Be it known that I, ARVID W. ECKBERG, 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 Metallic Doors or the like, of which the following is a specification.

My invention relates to metallic doors or like articles of manufacture, and it has for its object the provision of a novel and convenient construction by means of which the inner edges of the stiles and rails are so interlocked with molded or formed edges of the door panel or the molding of the latter that the interlocking seam is held against opening up in all directions; to provide a stiffening channel at the inner edges of the stiles and rails so formed and interlocked with the seam connecting the panels or panel moldings with the stiles and rails that the side walls of the door are prevented from bulging out or becoming depressed at a point where this trouble is most likely to occur; and to otherwise improve on doors or similar articles, as will clearly appear hereinafter.

With these and other objects in view, the invention consists in the novel features of construction and in the arrangement, connection, and combination of the various parts to be hereinafter described and particularly pointed out in the subjoined claims.

In the drawings, Figure 1 is a side elevation of a door embodying my invention. Fig. 2 is an enlarged vertical section taken on line *t—t*, Fig. 1. Fig. 3 is an enlarged vertical section taken on line *u—u*, Fig. 1. Fig. 4 is an enlarged horizontal section taken on line *v—v*, Fig. 1. Fig. 5 is an enlarged horizontal section taken on line *y—y*, Fig. 1. Fig. 6 is an enlarged horizontal section taken on line *z—z*, Fig. 1. Fig. 7 is a broken cross section of one of the stiles. Fig. 8 is a cross section of the panel molding used to hold the glazed panel in place. Fig. 9 is a horizontal section taken through one of the edge walls and a portion to the panel connected thereto, the reinforcing bar being shown offset between its end with the offset portion positioned between the connections of the stiles and the panel moldings. Fig. 10 is a similar section showing my medially offset reinforcing bar applied to a modified construction.

Referring now to the drawings in detail, like numerals of reference refer to similar parts throughout the several figures.

The reference numeral 17 designates the edge stiles, 18 the upper rail, 19 the intermediate rail, and 20 the lower rail of the door. Between the edge stiles and the intermediate and lower rails two panels 21 are provided which are separated by a short center stile 22; and bounded by the edge stiles, and the upper and intermediate rails, is a glass panel comprising two panes of glass 23 separated by a mullion 24. The ends of the rails 18, 19 and 20 are secured to the stiles 17 in any parcticable manner, and each of said stiles is formed of a sheet of metal bent upon itself to provide an outer edge wall 25 and side walls 26, the inner marginal portions of which are bent inward in opposition to provide shoulders 27 and are thence bent at right-angles to the shoulders into hook-shape, as at 28, having their sides parallel with the sides of the stile. The hook-shaped edges of these side walls are embraced or connected by a reinforcing bar 29 in the form of a channel arranged transversely and bearing with its side walls against the outer walls of the hook-shaped inner marginal portions of the stiles.

The rails 18 and 20 are each formed of two sheets of metal, each sheet having its inner longitudinal marginal portion bent inward to provide a shoulder 30 from which the metal is bent at right-angles to the shoulder into hook-form 31, so that these edges are formed exactly like those of the edge stiles, the hook-shaped portion of the rail 18 being embraced by a reinforcing bar 32 in the form of a channel similar to the reinforcing bars connecting the walls of the stiles. Between the outer marginal portions of the walls of the upper and lower rails, outwardly opening channel bars 33 are interposed to which the walls of the rails are welded or otherwise secured, and bearing against the edges of the side walls of said channel bars are edge facing plates 34 arranged flush with the edges of the side walls forming the rails. These channel bars and plates extend into the opposite ends of the edge stiles and stiffen the stiles as well as the upper and lower rails while providing a finished upper and lower edge for the door. The walls of the intermediate rail, which latter is also formed of two sheets of metal, have their opposite longitudinal mar-

ginal portions bent to provide shoulders 35 and hook-shaped marginal portions 36 arranged at right-angles to said shoulders, said shoulders and hook-shaped marginal portions being similar to those at the inner edges of the stiles and the upper and lower rails. These hook-shaped portions are embraced or connected by reinforcing bars 37 in the form of a channel similar to the reinforcing bars 29 connecting the walls of the stiles. The short middle stile is also formed of two sheets of metal with the longitudinal marginal portions of each sheet fashioned similar to those of the intermediate rail so as to provide shoulders 38 and hook-shaped marginal portions 39. It is therefore seen that the stiles and rails are all reduced in thickness at the panel edges and that the panel edges of the walls of all stiles and rails are similarly formed so that they coöperate with panel moldings 40 formed with or separate from the panels, as may be desired, or as the style of the door demands.

By constructing the stiles and rails as described, the hook-shaped marginal portions lie within the area bounded by the exposed portions of said stiles and rails.

The panel molding surrounding the glazed panel preferably comprises two members 41, 42, which may be termed, respectively, a "backing-member" against which the panes of glass bear and a "fastening member" adapted to hold the glass in place. The backing-members are each formed of a sheet of metal bent medially to provide a backing wall 43 from one edge of which it is bent at right-angles to provide a supporting wall 44 resting against the reinforcing bars 29, 32, 37, respectively, and from its opposite edge it is bent in any suitable form to provide a facing wall 45, the marginal portion of the sheet adjacent said facing wall being bent into hook-shape, as at 46, reversely from the coöperating hook-shaped edges of the walls of said stiles and rails so as to interlock with the side walls of the channel-shaped reinforcing bars at one side of the door, thus forming an invisible interlocking seam. The facing walls 45 are off-set to provide shoulders 47 where they join said hook-shaped marginal portions. The opposite marginal portion of each sheet is also bent into hook-shape, as at 48, to be interlocked with the reversely-disposed hooked shaped edges of the stiles and rails and with the side walls of said reinforcing bars at the other side of the door.

The shoulders 27 formed on the stiles and the shoulders 47 and supporting walls 44 of the backing molding prevent opening of the interlocking seam in opposite directions in the width of the door, while the reversely shaped hooked portions of the backing molding and the stiles and rails prevent opening of the seams in opposite directions laterally, or in the direction of the thickness of the door. The reinforcing bars 29, 32, 37 guard against the walls of the stiles and rails separating and positively prevent their being forced inward or toward each other at this point.

It is to be noted that by interlocking the marginal portions of the sheets of metal forming the stiles and rails with the panel moldings in the manner described and with the flanges of the reinforcing bars interlocked therewith, five thicknesses of metal are interlocked, into which take securing screws 49 that are passed through the outer marginal portions of the fastening moldings. These fastening moldings are each formed of a strip of metal bent medially to provide an ornamental facing wall 50 having an off-set portion 51 to form a shoulder which bears against the supporting wall 44 of the backing-molding, and from this shoulder the metal is extended outward, as at 52, the shoulders 27 of the stiles and rails. From the inner edge of the facing wall the sheet of metal is rebent to provide a bearing wall 53 which bears against the panes of glass. The outwardly extending portion 52 of the strip of metal forms the outer marginal portion of the fastening molding through which the securing screws 49 are passed.

The panel molding coöperating with the panels 21 at the inner edges of the edge stiles are formed in piece with said panels and the outer edges of the sheets of metal forming these panels are bent into hook shape, as at 54, reversely from the hook-shaped inner edges of the stile walls with which they interlock, while the molding at the lower edge of the intermediate rails is preferably formed of a single strip of sheet metal bent medially into channel shape, as at 55, thence reversely from the side walls of the channel to provide ornamental facing walls 56, each having an off-set portion at its outer edge to form a shoulder 57 which bears against the channel shaped reinforcing bar 37 and, from said shoulders it is continued and terminates in two hook-shaped portions, as at 58, to interlock with the adjacent hook-shaped marginal portions 36 of the walls forming the intermediate rail. The panel moldings at the longitudinal edges of the middle stile are also each formed of a single sheet of metal fashioned and applied similar to the panel molding at the lower edge of the intermediate rail, while the panel moldings at the upper edge of the lower rail may, if desired, be formed like those at the lower edge of the upper rail, or in any other practicable manner.

In the previous figures the channel and angle reinforcing bars were locked in position by the panel moldings and the margi-

nal portions of the stiles and rails; but this may be modified by providing the stiles or rails with hook-shaped marginal portions 105 and the panel moldings with hook-shaped marginal portions 106 and also providing the reinforcing bars 107 with hook-shaped marginal portions 108, all of which are suitably interlocked with each other, as shown in Fig. 13, with the terminal webs of the three hook-shaped portions arranged side by side, one in contact with another. In this instance the reinforcing bar is shown provided with an offset portion between its ends, said offset portion forming two oppositely-disposed shoulders which lie in contact with the inner walls of the joints formed by the hook-shaped terminals of the stile, panel moldings and said reinforcing bar. As shown, the interlocking seam is wholly within the area of the stile, whereas in the figures previously described, the interlocking seams lie outside of the main body portions of the stiles and rails.

In Fig. 14 I have shown the inner marginal portions of the walls of the stile bent into hook shape, as at 109, and the reinforcing bar 110 provided at its edges with hook-shaped portions 111, both hook-shaped portions being interlocked and clamping in place the bent marginal portions 112 of the panel molding 113.

Having thus described my invention, what I claim is,—

1. A metallic door or the like having hollow stiles and rails and a panel bounded by said stiles and rails, said stiles being formed of sheet metal bent to provide opposite flat side walls having their inner marginal portions bent laterally in opposition from said flat side wall to provide shoulders and thence bent into hook shape, a panel molding comprising two parts lying on opposite sides of the marginal portions of said panel, one of said parts being formed of a sheet of metal fashioned to provide hook-shaped marginal portions interlocked with the hook shaped portions of said stiles and the other part of said panel molding bearing with its outer marginal portion against the exterior surface of the hook-shaped marginal portion of the first-mentioned part of said molding on one side of the door, and screws passing through the marginal portion of the second-mentioned part of said molding and taking into the interlocking seam formed by the interlocked hook-shaped portions of said stiles and the first-mentioned part of said panel molding.

2. A metallic door or the like comprising hollow stiles and rails and a panel bounded by said stiles and rails, a panel molding comprising two parts, one of which faces the marginal portions of said panel on one side of the door and is formed of a strip of metal having its opposite marginal portions connected with the inner marginal portions of said stiles and rails by interlocking seams and the other part facing the marginal portions of the panel on the other side of the door and being formed of a strip of metal having its outer marginal portions facing the interlocking seam on said other side of the door, and screws passing through the outer marginal portion of said other part and taking into the different thicknesses of metal forming said last-mentioned interlocking seam.

3. A metallic door or the like having hollow stiles and rails reduced in thickness at their inner marginal portions and having hook-shaped inner edges at said reduced portions, a panel bounded by said stiles and rails, a panel molding comprising a backing molding and a fastening molding, said backing molding being formed of a strip of metal having opposite hook-shaped marginal portions interlocked with the hook-shaped portions of said stiles and rails to provide interlocking seams and said fastening molding facing the interlocking seam on one side of the door, and fastening screws passing through said fastening molding and taking into the interlocking seam faced thereby.

In testimony whereof, I have affixed my signature in the presence of two subscribing witnesses.

A. W. ECKBERG.

Witnesses:
H. F. JOHNSON,
J. A. BERGWALL.