

April 23, 1940.

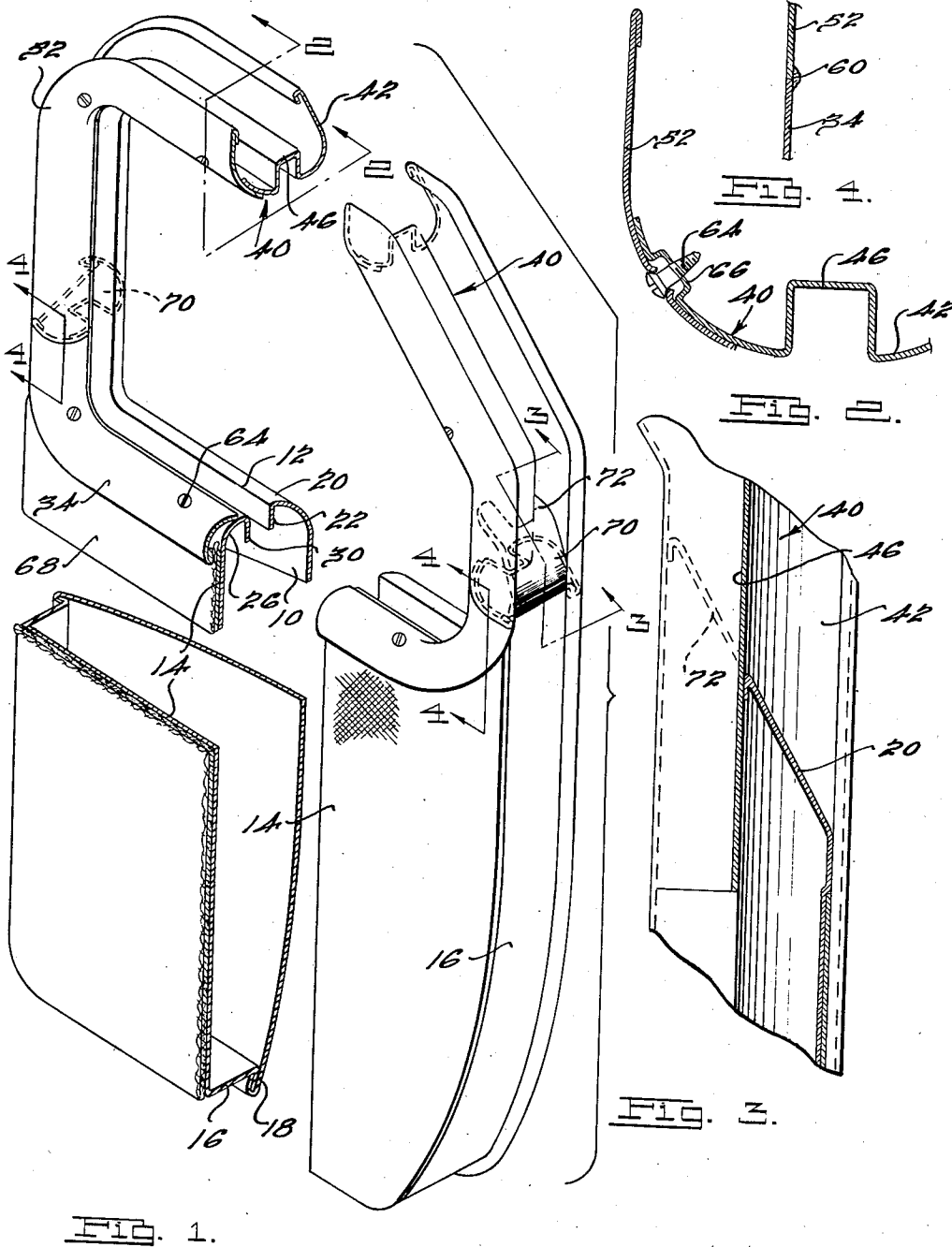
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2,198,069

METHOD OF MAKING SHEET METAL VEHICLE DOORS

Filed Jan. 24, 1938

3 Sheets-Sheet 1



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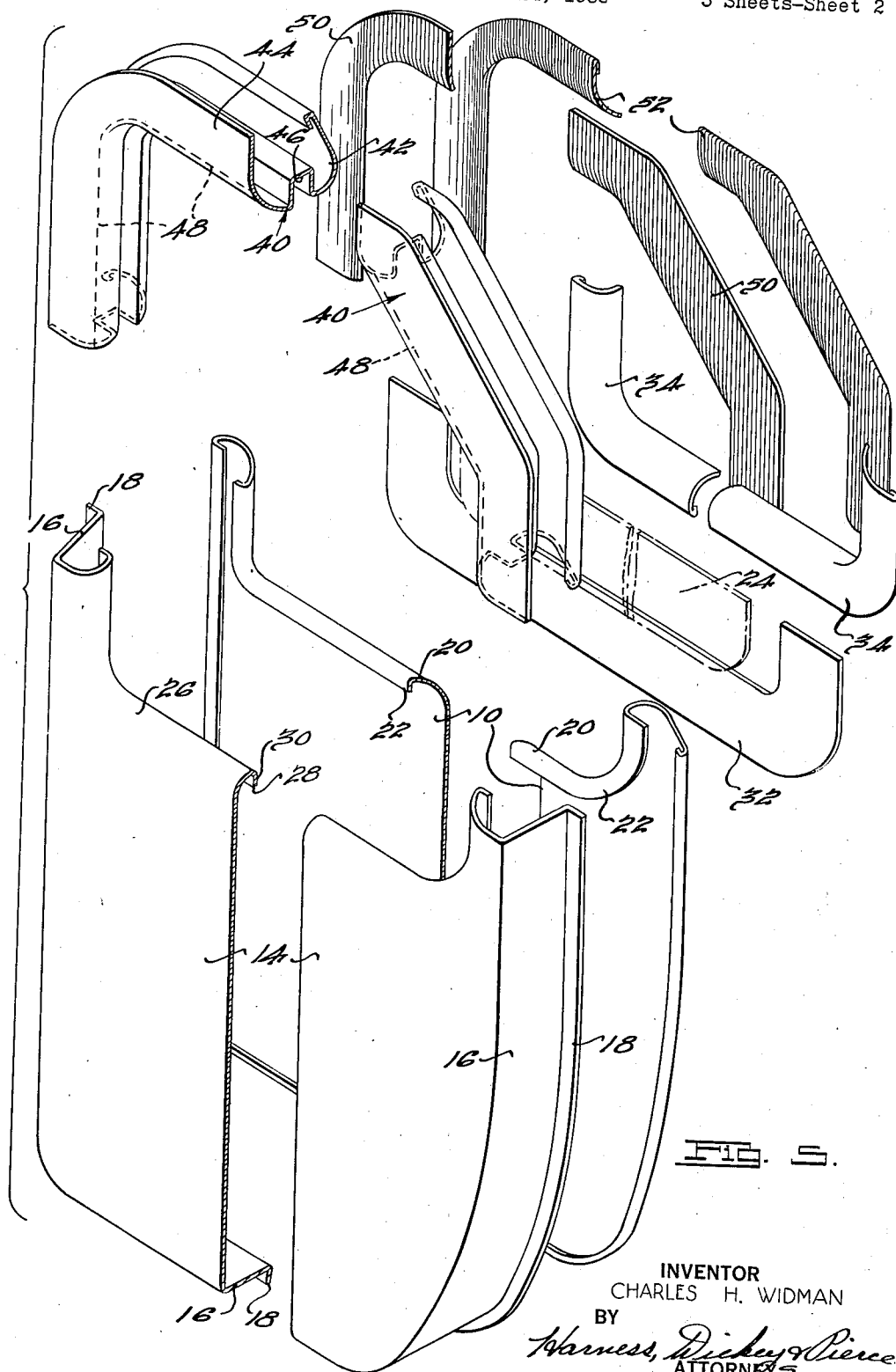
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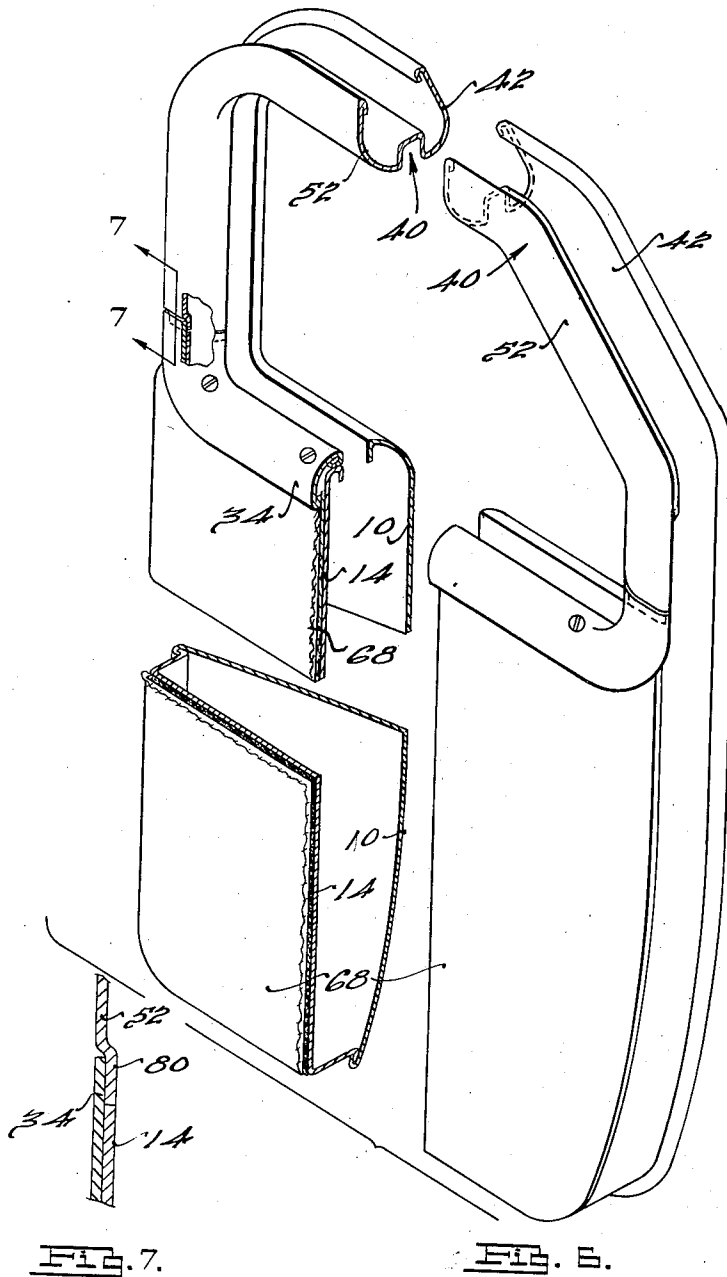


FIG. 7.

FIG. 8.

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METHOD OF MAKING SHEET METAL
VEHICLE DOORS

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Application January 24, 1938, Serial No. 186,560

5 Claims. (Cl. 113—116)

This invention relates to a method of making sheet metal vehicle doors.

One of the primary objects of the present invention is to provide a novel sheet metal door construction by a novel method of manufacture which results in a substantial saving of material over methods heretofore known.

A further object of the invention is to provide a novel method of manufacturing vehicle door constructions by which certain expensive die operations are dispensed with, thereby materially reducing the cost of the door construction.

A further object of the present invention is to provide a novel garnish molding construction in which the complete garnish molding is formed in separate parts with the lower part serving to retain the inner trim panel in position.

A further object of the present invention is to provide a door construction of independent upper and lower portions in which the upper portion is formed of a generally U-shaped rolled element, which has a section severed therefrom to form a portion of the garnish molding, and in which the lower portion has a section thereof severed therefrom to form the remaining portion of the garnish molding thereby providing a simplified construction as well as effecting a saving in operation and material.

Other objects of the invention will become apparent from the following specification, the drawings relating thereto, and from the claims hereinafter set forth.

In the drawings, in which like numerals are used to designate like parts in the several views throughout:

Figure 1 is a parted, perspective view of a vehicle door embodying features of the present invention;

Fig. 2 is a fragmentary cross-sectional view taken substantially along the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary cross-sectional view taken substantially along the line 3—3 of Fig. 1;

Fig. 4 is a fragmentary cross-sectional view taken substantially along the line 4—4 of Fig. 1;

Fig. 5 is an exploded perspective view of the structure illustrated in Fig. 1 showing the various elements of the structure in their various stages of fabrication;

Fig. 6 is a view similar to Fig. 1 illustrating a modified embodiment of the present invention; and

Fig. 7 is a fragmentary cross-sectional view taken substantially along the line 7—7 of Fig. 6.

In general, the structure of the present invention relates generally to the type of door illus-

trated in the patent to Charles H. Widman No. 1,996,601 issued April 2, 1935, and assigned to the present assignee. The patent discloses a door constructed of independent upper and lower portions in which the lower portion is in the form of a box section with the top edge forming the ledge of a window opening. The upper portion comprises a rolled strip in the form of an inverted U which is secured to the lower portion to form the upper sides and top of the door and to define the window opening.

In the structure of the present invention the lower portion of the door is formed of mating, inner and outer sheet metal stampings. A plane section of the inner door panel is separated therefrom adjacent the upper edge of this panel and the top edge of the panel is then shaped to define the ledge of the window opening. The plane section which has been removed is elongated and shaped to form a portion of a garnish molding complementary in shape to the ledge of the window opening, thereby effecting a substantial saving in material which would otherwise be wasted. This section of the garnish molding is reattached to the inner panel and serves to secure the door trim panel in place.

Also, according to the present invention the upper door portion is in the form of an inverted U of rolled section which forms the upper sides and top of the door and defines the window opening. According to one embodiment, the rolled section is first formed with a reveal portion and an integral inner portion having a glass run channel therebetween. The integral inner portion is of greater depth than the reveal portion and is severed from the rolled section to provide the upper section of a garnish molding. This severed portion is butt welded, or otherwise attached to the lower section of garnish molding mentioned above, to provide the complete garnish molding around the window. The section of garnish molding severed from the rolled section is thereafter reattached to the rolled section in overlapping relation to the edge from which the garnish molding was severed.

Referring to the drawings, and referring more particularly to Figs. 1 to 5 thereof, a vehicle door is illustrated including an outer panel 10 which extends from the bottom 12 of the window opening to the bottom of the door, and an inner panel 14 which also extends from the bottom 12 of the window opening to the bottom of the door. The inner and outer panels are sheet metal stampings; and the inner panel 14 is preferably formed to provide a jamb face portion 16 extending

therearound. The jamb face portion 16 is further preformed to provide an overlap flange 18 lying substantially in the plane of the door as a whole and projecting outwardly from the portion 16.

The peripheral edge portion of the outer panel section 10 is preferably bent around this outwardly projecting flange 18 to form a door overlap of substantial thickness and to provide positive means for permanently securing the mating sections 10 and 14 together. The outer stamping 10 is preformed to provide the bottom or lower ledge 12 of the window opening formed from a suitable integral molding 20 which extends inwardly from the general plane of the outer panel 20 substantially to the plane of the window opening. The inner marginal edge of the molding 20 is bent downwardly to lie substantially in the plane of the window opening, thus providing a flange 22 which serves to support and guide the window glass.

In forming the inner panel 14, the top edge of the panel was originally straight and a section 24 of the shape indicated by the broken lines in Fig. 5 was removed during the shearing operation leaving a recess in the upper edge of the panel 14 which is stamped to form a curved portion 26 similar to the curved portion 20 in the outer panel 10. The marginal edge 28, which is complementary in shape to the sides and lower marginal edges of the removed section 24, is then bent to lie substantially in the plane of the window opening thus providing a flange 30 which serves to support and guide the window glass.

The removed section 24 is then elongated and formed to the shape indicated at 32 in Fig. 5 and thereafter the member 32 is stamped to provide the lower section of a garnish molding 34, also indicated in Fig. 5. It is thus seen that the garnish molding section 34 is formed from the removed section 24 thereby further effecting a substantial saving in material.

In final form the upwardly projecting corners of the inner and outer panels 10 and 14 extend a slight distance above the lower ledge of the window opening. The top member generally indicated at 40, which forms the sides and top of the door around the window opening, is in the shape of an inverted U and is formed from a single piece of sheet metal either rolled or stamped, or both. The cross-sectional configuration of this top member conforms in general to the cross-sectional configuration of the inner and outer panel members at the points of juncture when assembled, so that the upper member 40 appears to be formed, around the window opening, of the same piece of metal as the inner and outer lower panel members. In cross-sectional shape, the upper member 40 has a reveal portion 42 and an inner curved portion 44 having a glass run channel 46 therebetween. The portion 44 is of greater depth than the reveal portion 42 and is severed from the member 40 along the dotted line indicated at 48 (Fig. 5) to provide the severed section indicated at 50. The section 50 is thereafter stamped to provide the upper portion of the garnish molding indicated at 52 in Fig. 5.

The upper section of garnish molding 52 and the lower section of garnish molding 34 are thereafter placed in abutting relationship and welded together as indicated at 60 in Fig. 4 to form a complete garnish molding of the size

and shape of the window opening. The parts are then assembled to complete the door, the rolled member 40 is placed in position above the box section formed by the inner and outer panel members 14 and 10, respectively, and butt welded 5 or otherwise secured thereto. The garnish molding formed by the members 34 and 52 is then positioned and removably secured to the inner panel member 14 and the rolled member 40 by suitable screws 64. The portion of the garnish molding 52 is placed in overlapping relationship to the remaining section of the inner curve portion 44 of the rolled strip 40, as best indicated in Fig. 2, and is secured thereto by screws 64 which engage the recessed bosses 66 formed in the member 40 at spaced intervals therearound. The portion of the garnish molding 34 is attached by similar screws to the curve portion 26 on the inner panel 14. The garnish molding serves to secure the inner door trim panel 68 in position along the upper edge thereof.

To close the space between the outer and inner panels 10 and 14, at the juncture of the rolled section 40 and to add further strength thereto, I have secured a member 70 at each side of the door. The member 70 has a forked inwardly projecting portion 72 which is of the contour of the inner section of the member 40 spanning the sides of the glass run channel 46 and engaging the inner sides of the member 40. The members 70 are then welded or otherwise secured to the member 40 and the panels 10 and 14.

In the embodiment illustrated in Figs. 6 and 7, the outer panel 10 and inner panel 14 and the lower section of garnish molding 34 are formed as in the embodiment previously described. The rolled member 40 in this embodiment is formed to have the upper section of garnish molding 52 integral therewith. That is, the portion 44 previously described is not severed from the member 40 as in the embodiment previously described but is completely formed into the upper garnish molding section 52. The member 40 is inwardly offset as indicated at 80 in Fig. 7, to receive the lower garnish molding section 34 which will lie substantially in the plane of the upper garnish molding portion of the member 40 when the parts are in their assembled positions. In this embodiment, the garnish molding section 34 is removably attached to the inner panel 14 and serves to support the upper edge of the door trim panel 68 in position on the inner face of the door. A structure is thereby provided in which a portion only of the garnish molding is removable which removable portion serves to support the door trim panel. Thus in assembly, the door may be completed with the exception of the lower garnish molding section 34 which may be attached in position after the door trim panel has been applied to the door and when in its attached position serves to retain the upper edge of the trim panel in place.

In both embodiments of the invention described, the window glass which is relatively narrow in depth may be inserted by moving the glass through a substantially 90° angle from its normal position, projecting the lower end thereof through the open slot between the flanges 22 and 30, and finally turning the glass within the slot to its normal position. The glass may then be engaged by the usual elevating mechanism (not shown).

Formal changes may be made in the specific

embodiments of the invention described without departing from the spirit and substance of the invention, the scope of which is commensurate with the appended claims.

5 What is claimed is:

10 1. In a method of forming a vehicle door construction, the steps which consist of forming a sheet of metal to provide a door panel, severing a substantially plane section therefrom to provide the lower portion of a window opening in said panel, shaping said severed section to form the lower portion of a garnish molding, and thereafter attaching said portion of the garnish molding in position on said door panel.

15 2. In a method of forming a vehicle door construction, the steps which consist of preforming a generally U-shaped member having a reveal portion, an inner curved portion and a glass run channel therebetween, severing the inner curved portion from said member, thereafter shaping said severed portion to form a portion of a garnish molding, and thereafter attaching said portion of the garnish molding in overlapping relationship along the severed edge of said U-shaped member.

20 3. In a method of forming a vehicle door construction, the steps which consist of forming a sheet of metal to provide a door panel, severing a substantially plane section therefrom to provide the lower portion of a window opening in said panel, shaping said severed section to form the lower portion of a garnish molding, forming a generally U-shaped member having a reveal por-

tion, an inner curved portion and a glass run channel therebetween, severing said inner curve portion from said U-shaped member, shaping said last named severed portion to form the upper portion of a garnish molding, attaching said last named shaped portion to said first named shaped severed section to form a complete garnish molding, and thereafter attaching said complete garnish molding to said door panel and to said U-shaped member.

10 4. In a method of forming a vehicle door construction, the steps which consist of forming a sheet of metal into a generally U-shaped member having a reveal portion, an inner curve portion, a glass run channel therebetween, said inner curve portion being of greater depth than the depth of the reveal portion, thereafter severing said inner curve portion from said member, shaping said severed portion to form a portion of a garnish molding, and thereafter attaching said portion of the garnish molding in position on said member in overlapping relationship to the edge of said member along which said portion was severed.

15 5. In a method of forming a vehicle door construction, the steps which consist of severing a substantially plane section from a sheet metal panel to provide the lower portion of a window opening in said panel, shaping said severed section to form a portion of a garnish molding, and thereafter attaching said portion of the garnish molding in position on said panel.

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