June 24, 1930. H. C. RUSCH 1,767,703

DOOR

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FIG. 1

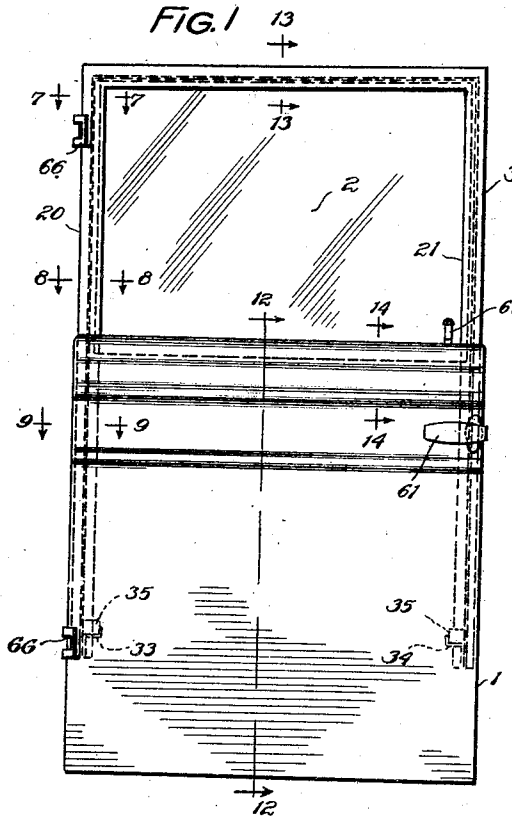


FIG. 2

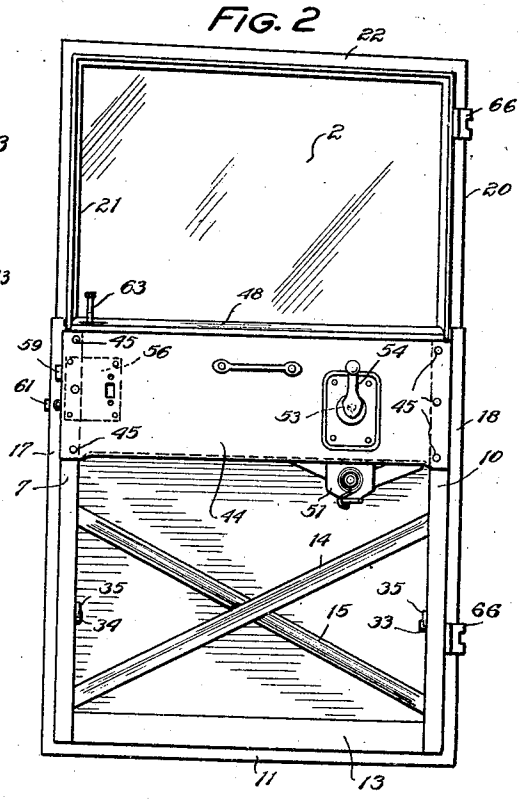


FIG. 3

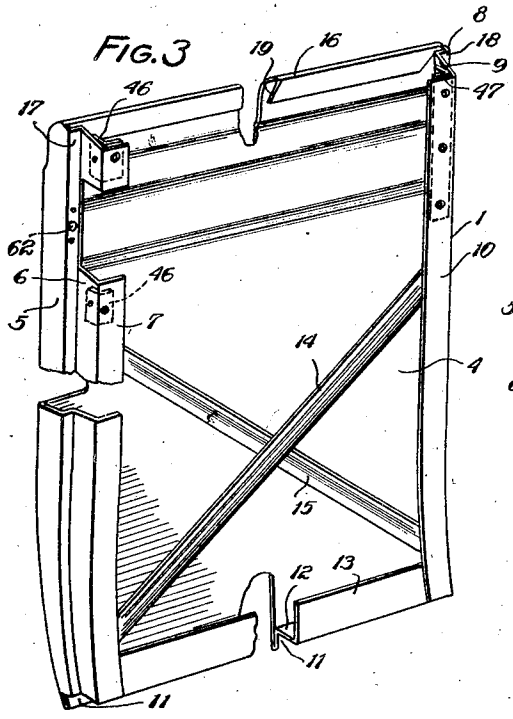


FIG. 4

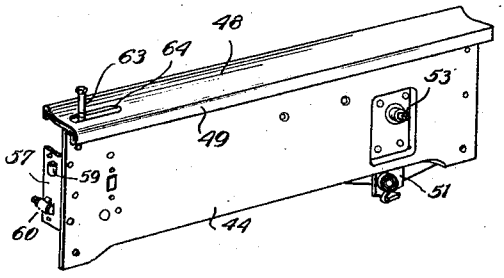
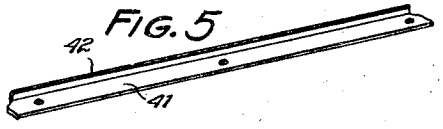


FIG. 5



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DOOR

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FIG. 6

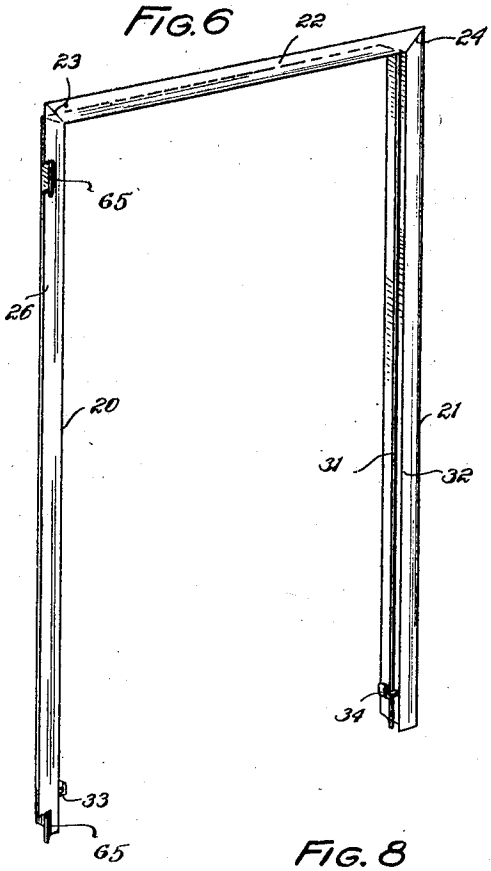


FIG. 7

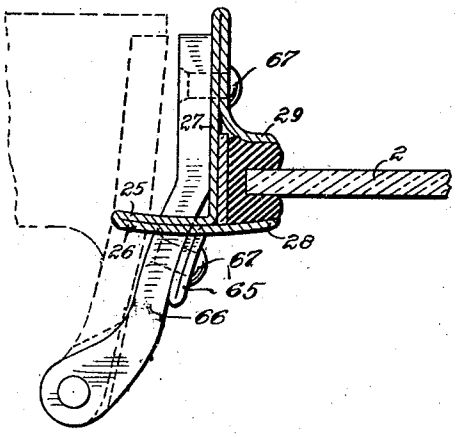


FIG. 9

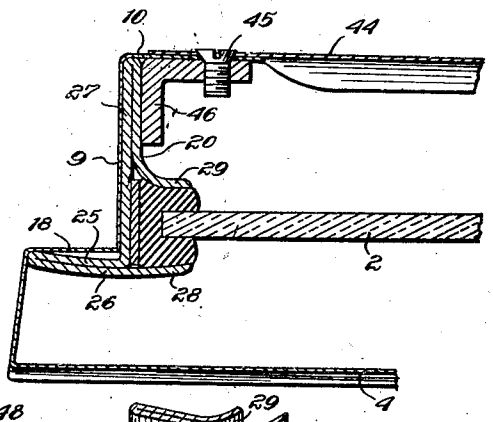


FIG. 8

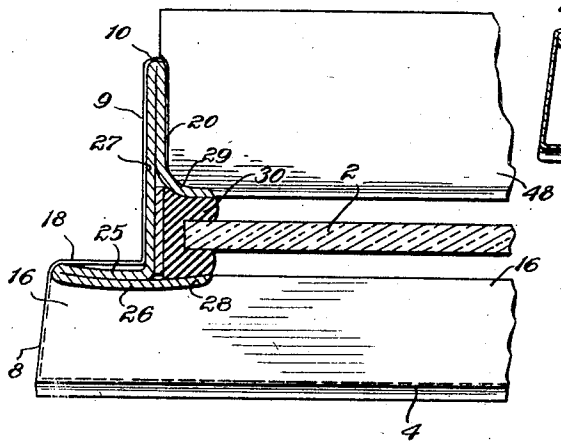
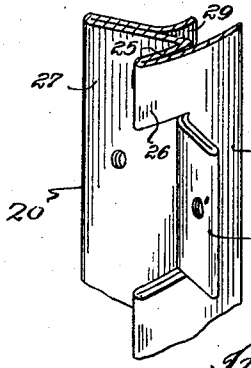


FIG. 10



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DOOR

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FIG. 11

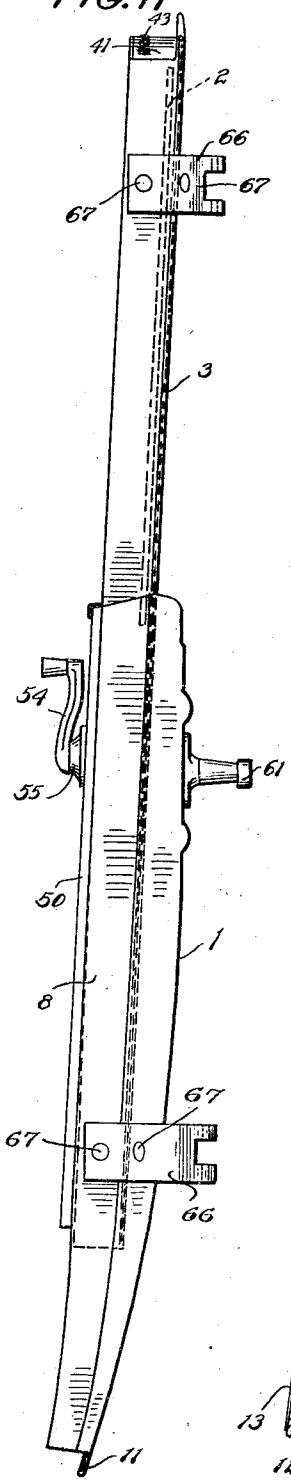


FIG. 12

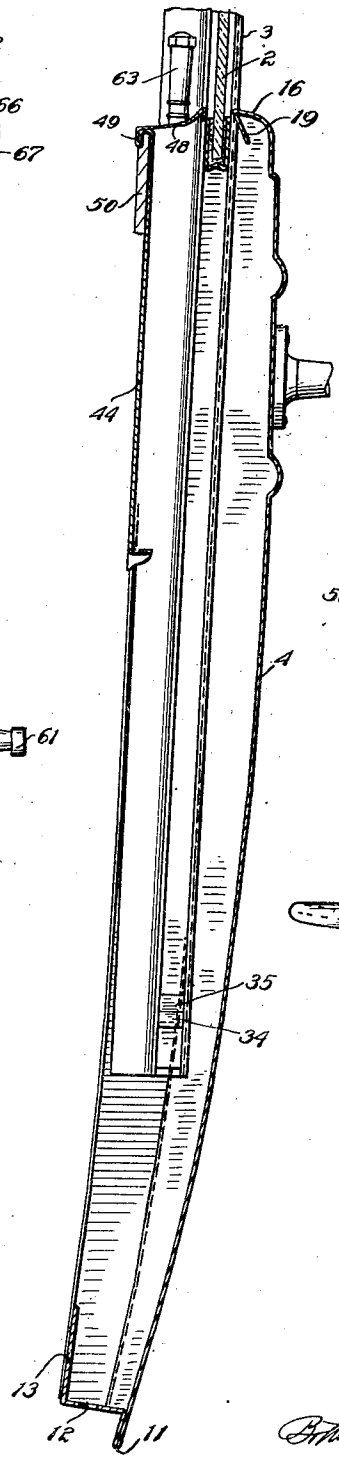


FIG. 13

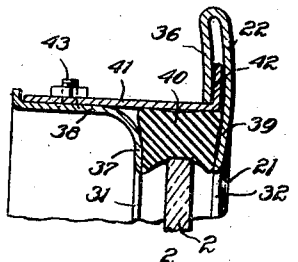


FIG. 14

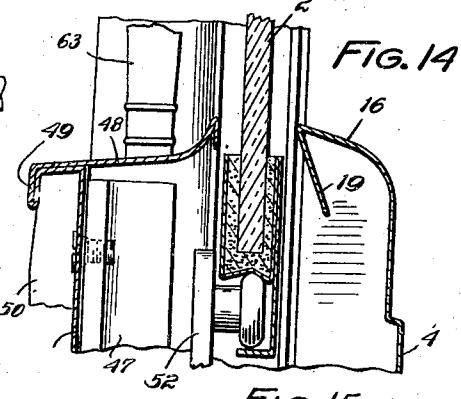


FIG. 15

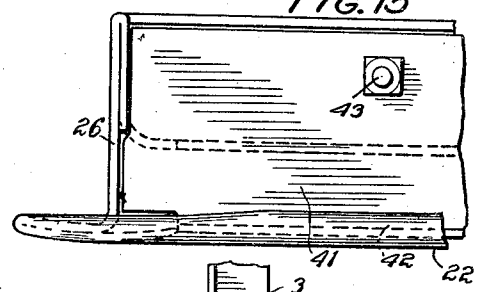
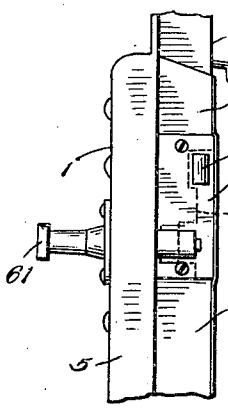


FIG. 16



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UNITED STATES PATENT OFFICE

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DOOR

Application filed June 20, 1925. Serial No. 38,398.

This invention relates to improvements in doors for motor vehicle bodies of the so-called all-metal type.

One object of the invention is to provide an improved door of the character referred to which has advantages over those constructed heretofore as regards clear vision possibilities, simplicity of construction, strength, and cost of manufacture.

Other objects and advantages will hereinafter appear.

For the purpose of illustrating the invention an embodiment thereof is shown in the drawings, in which:

Figure 1 is a front elevation;

Fig. 2 is a rear elevation;

Fig. 3 is a rear perspective view of the body portion of the door, some of the parts being removed;

Fig. 4 is a perspective view of the panel to which the door lock and actuating mechanism for the window are secured;

Fig. 5 is a perspective view of one of the parts;

Fig. 6 is a perspective view of the window frame;

Fig. 7 is an enlarged section taken on line 7—7 of Fig. 1;

Fig. 8 is an enlarged section taken on line 8—8 of Fig. 1;

Fig. 9 is an enlarged section taken on line 9—9 of Fig. 1;

Fig. 10 is an enlarged fragmentary view of one of the side members of the window frame shown in Fig. 6;

Fig. 11 is an end elevation, looking toward the left in Fig. 2;

Fig. 12 is a section taken on line 12—12 of Fig. 1;

Fig. 13 is an enlarged section taken on line 13—13 of Fig. 1:

Fig. 14 is an enlarged section taken on line 14—14 of Fig. 1;

Fig. 15 is an enlarged plan view of the upper left corner of the door as shown in Fig. 1; and

Fig. 16 is an end elevation, looking toward the left in Fig. 1.

The door comprises, in general, a body portion 1 adapted to contain the window 2, and a window frame 3 secured to the door and arranged to guide the window for vertical reciprocatory movement into and beyond the body portion of the door.

Referring more particularly to Fig. 3, one of the side edges of the piece of sheet metal forming the outer face member 4 of body portion 1 is bent rearwardly and inwardly to form the lap portion 5 designed to overlap and interfit with the front pillar or the center post of the vehicle body depending on whether the door is used as a front or rear door, this edge being then bent to provide the rearwardly extending portion 6 and inwardly extending flange 7. The opposite side edge of body portion 1 is bent in a similar manner to form the lap portion 8, the rearwardly extending portion 9 and the inwardly extending flange 10, as shown. The bottom edge of face member 4 is bent back upon itself to form the bead 11, and is then bent rearwardly to form the horizontal portion 12 and then bent upwardly to form the vertical flange 13, the ends of flange 13 extending back of flanges 7 and 10 and being secured thereto in any suitable manner such as by electric welding. Diagonal bracing members 14 and 15 are crossed and arranged as shown, the respective ends of these members also extending back of flanges 7 and 10 and being electrically welded or otherwise secured thereto. Members 14 and 15 may also be electrically welded together at the point where they cross if desired. The top edge 16 of face member 4 is bent rearwardly to a point slightly forward of the inwardly extending portions 17 and 18 of lap portions 5 and 8, respectively, and is then bent downwardly at an acute angle to form the reinforcing flange 19, as shown in Figs. 3 and 14.

The window frame 3 comprises side members 20 and 21 and a top member 22, the ends of member 22 being welded at 23 and 24 to the upper ends of side members 20 and 21. Referring more particularly to Figs. 7 to 10, portion 25 of side members 20 is bent back upon portion 26 thereof and then bent at right angles to itself to form portion 27, portion 27 then being bent back

upon itself as shown, whereby the respective flanges 28 and 29 of the side member are arranged in parallel spaced relation on the inner side thereof to form a channel for receiving and guiding one edge of window 2, a felt strip 30 or other suitable means being inserted and held between flanges 28 and 29 to engage and protect the edge of the window. Side member 21 of the window frame is formed similarly to member 20 whereby flanges 31 and 32 are provided and arranged in parallel spaced relation to receive and guide the opposite side edge of window 2. Suitable brackets 33 and 34 may be arranged between the flanges of side members 20 and 21 to hold rubber or felt pads 35 in position at the bottom of the window frame to engage the bottom corners of the window and support the latter when the same is in its lowermost position within body portion 1 of the door. In securing window frame 3 to body portion 1 of the door, the overlapped portions 25 and 26 of side member 20 are inserted between the top edge 16 of face member 4 and inwardly extending portion 18 of lap portion 8, as more clearly shown in Figs. 8 and 9, portion 27 of member 20 resting against rearwardly extending flange 9 and being secured thereto in any suitable manner, such as by spot or electric welding. Side member 21 of the window frame is secured to body portion 1 of the door in the same manner, the overlapping portions of member 21 corresponding to portions 25 and 26 of member 20 being inserted between top edge 16 of face member 4 and the inwardly extending portion 17 of lap portion 5. The upper edge portion 36 of top member 22 of the window frame is reversely bent, as more clearly shown in Fig. 13. The flange 37 of a second top member 38 is bent downwardly, as shown in Fig. 13, to form with the lower edge or flange 39 of member 22 a channel for holding a felt strip 40 or other suitable means in position to receive the top edge of the window when the latter is raised beyond body portion 1 of the door to its uppermost position in the window frame. A second member 41 having its edge 42 bent upwardly and arranged between member 22 and edge portion 36 thereof is provided with apertures registering with similar apertures in member 38 for receiving suitable means such as bolts 43 for holding members 38 and 41 in assembled relation, flange 37 of member 38 being in line with flanges 29 and 31 of side members 20 and 21 of the window frame, as shown. Parts 65 of side member 20 of the window frame are struck therefrom and bent at an angle with respect thereto, as shown in Figs. 7 and 10, to provide brackets for the hinge members 66, the latter being secured to member 20 and parts or brackets 65 by means of rivets or the like 67.

A plate 44 is arranged transversely of body portion 1 of the door and secured to flanges 7 and 10 thereof by any suitable means such as screws 45, angle members 46 and 47 being welded to said flanges and spaced from the rearwardly extending portions 6 and 9 to permit insertion of side members 20 and 21 between portions 6 and 9 and the angle members, as shown in Fig. 9, members 46 and 47 being threaded to receive screws 45. The upper edge 48 of plate 44 is bent at substantially a right angle with respect thereto and arranged in spaced relation with respect to the top edge 16 of body portion 1 to permit movement of window 2 between these edges, as shown in Fig. 8. A portion 49 of edge 48 is bent back upon itself and extends beyond the plane of plate 44 to receive the upper edge of a finishing panel 50, as shown in Fig. 14.

Suitable actuating mechanism for the window, indicated generally by the reference number 51, is secured to and supported by plate 44, this mechanism being of any well-known type and including a lever 52 operatively connected to the lower edge of window 2, as shown in Fig. 14, and a shaft 53 extending through the plate and operated by a suitable crank 54 journaled in a bearing member 55 projecting beyond panel 50.

The locking device for the door may be of any suitable type and is mounted upon a plate 56 secured to plate 44, one edge 57 of plate 56 being bent transversely with respect thereto and fitting flush with portion 6 when plate 44 is secured in position, portion 6 being cut away, as shown in Fig. 3, to receive plate 56 and edge 57 thereof. Side member 20 of window frame 3 is cut away, as shown by the dotted line 58 in Fig. 16, to receive the latch 59 and operating shaft 60 of the locking device, shaft 60 being connected to a second shaft provided with a suitable handle 61 and extending through opening 62 in lap portion 5. An actuating lever 63 for effecting movement of the locking device from the inside of the vehicle body extends upwardly through a slot 64 in the edge 48 of plate 44. The locking device and actuating shaft 60 therefor and the manner in which the latter is arranged and connected to handle 61 form the subject matter of copending application Serial No. 36,359, filed June 11, 1925, and are only shown and described in sufficient detail to show the manner in which they may be embodied in a door made in accordance with the present invention.

From the foregoing it will be seen that an improved door of the character referred to has been provided in which the side members of the window frame are bent so that their respective edges or flanges form chan-

nels for receiving and guiding the side edges of window 2, and that by the construction shown and described a door has been provided which has advantages over those constructed heretofore as regards simplicity of construction, strength, and cost of manufacture. By forming or bending side members 20 and 21 of the window frame in the manner shown and described above, these members are given the same strength as the boxlike girders used heretofore but are relatively thinner than the latter, thus making possible use of windows of maximum width and providing for maximum clear vision.

In the drawings one embodiment of the invention has been shown, but of course various changes in the size, shape and arrangement of the parts may be adopted without departing from the spirit of the invention or the scope of the claims.

The invention claimed is:

1. A window frame having a side frame member formed with flanges to define a channel adapted for guiding an edge of a window, said side frame member also having attaching portions at least one of which is positioned and adapted to engage the lap portion of the automobile door whereby to serve also as a reinforcement for the lap portion.

2. A window frame having a side frame member adapted for attachment to an automobile door and consisting of a single piece of metal having its intermediate portions doubled and bent to provide attaching portions and having its edges shaped to provide spaced flanges defining a channel for receiving and guiding a window.

3. In a door of the character described, a body portion having a window associated therewith, means associated with said body portion for effecting vertical reciprocatory movement of said window into and beyond the latter, a window frame including side members secured to said body portion and adapted to receive and guide the side edges of said window, part of one of said members being struck therefrom and bent at an angle with respect thereto, and a hinge secured to said part.

4. An automobile door comprising a body portion having a front panel section and rearwardly extending side flanges, a reinforcing plate secured across said flanges in spaced relation to said panel, said plate being provided with oppositely directed flanges along its upper edge, one terminating short of said panel and forming therewith a window slot, and the other serving for the attachment of a finishing panel to the rear of said body portion.

5. A door of the character described comprising a face member having its integral side edges thereof bent rearwardly and inwardly to form inwardly extending flanges, and a diagonal bracing member having its ends overlapping and secured to said flanges.

6. In a door of the character described, a body portion having a window associated therewith, means associated with said body portion for guiding and effecting vertical reciprocatory movement of said window into and beyond the latter, and a window frame secured to said body portion and including side members and a plurality of interlocking top members secured to said side members and arranged with their respective adjacent edges in parallel spaced relation to form a channel for receiving the top edge of said window.

7. In a door of the character described, an all metal body portion having a window associated therewith, means associated with said body portion for effecting vertical reciprocatory movement of said window into and beyond the latter, and a window frame including side members secured to said body portion and a top member secured to said side members, one edge of said body portion being bent rearwardly and inwardly to form an inwardly extending flange having its upper end arranged in spaced relation with respect to the top edge of said body portion, a portion of one of said side members extending between said top edge of said body portion and said upper end of said inwardly extending flange.

8. In a door of the character described, a body portion having a vertically slidable window associated therewith, a window-guiding frame including side members secured to said body portion, each of said members being formed of a single piece of sheet metal bent upon itself and shaped to provide oppositely projecting flanges along one edge thereof, and a flange adjacent the other edge thereof complemental to one of said first-mentioned flanges and arranged in parallel spaced relation with respect thereto to provide a window-receiving channel, the other of said oppositely projecting flanges engaging the body portion of the door to reinforce the same and to provide a means of attachment.

9. In a door of the character described, a one piece metal body portion having the side edges thereof bent to form inwardly extending flanges and the bottom edge of the same bent to form an upwardly extending flange, the ends of said upwardly extending flange overlapping and being secured to said inwardly extending flanges, and crossed diagonal bracing members having their respective ends secured to said inwardly extending flanges.

10. A door of the character described comprising a body portion adapted to receive a window, an inverted U-shaped window frame including side members, each

side member being formed of a single piece of sheet metal folded upon itself and shaped to provide an outwardly extending flange secured to the respective side edge of said body portion and with a plurality of inwardly extending flanges arranged in parallel spaced relation to form a channel, a window having its side edges fitted in said channels, and means for raising and lowering said window.

11. A door of the character described comprising a body portion provided along one of its side edges with a laterally extending lap portion, an inverted U-shaped window frame including side members secured to the respective side edges of said body portion, the side member adjacent said lap portion being provided with a flange extending into and reinforcing said lap portion and with other flanges arranged in parallel spaced relation to form a channel for receiving and guiding one edge of a window.

12. In combination, a sheet metal automobile door having its side edges channeled to form laterally projecting lap portions, an inverted U-shaped window frame secured to the side edges of said door interiorly thereof and extending above the same, the side members of said frame being provided with outwardly extending flanges engaging within and reinforcing said lap portions and with inwardly directed flanges forming opposed channels for receiving and guiding a window.

13. In combination, a sheet metal automobile door having its side edges channeled to form laterally projecting lap portions, an inverted U-shaped window frame secured to the side edges of said door interiorly thereof and extending above the same, the side members of said frame being provided with outwardly extending flanges engaging within and reinforcing said lap portions and with inwardly directed flanges forming opposed channels for receiving and guiding a window, and a hinge-supporting bracket struck out from one of said first-mentioned flanges.

14. An automobile door comprising a body portion having channeled side edges, vertical window guides secured to said edges and projecting above said body portion, said guides being provided with inwardly directed flanges forming opposed channels for receiving and guiding a window and with outwardly directed flanges engaging within and reinforcing the channels in the side edges of said body portion.

15. An automobile door comprising a body portion having channeled side edges, vertical window guides secured to said edges and projecting above said body portion, said guides being provided with inwardly directed flanges forming opposed channels for receiving and guiding a window and with outwardly directed flanges engaging within and reinforcing the channels in the side edges of said body portion, the last-mentioned flange of one of said guides having hinge-supporting brackets struck up therefrom, one above the upper edge of said body portion and the other below the same.

16. An automobile door comprising a body portion constructed of a single piece of metal shaped to provide a front panel and angular flanges around its margin, means coacting with the angular flanges to give a substantially box-like section to the door, the angular flanges also presenting lap portions, and a window frame member of inverted U-shape and having side members formed with flanges presenting channels for receiving and guiding a window and also formed with attaching portions coacting with certain of the marginal flanges of the body portion whereby to maintain the window frame in position and to reinforce the body portion.

17. An all metal automobile door comprising a body portion constructed of a single piece of metal and having integral marginal flanges providing lap portions on the door, means extending across and connected to the flanges to complete the mechanical structure of the door body and an inverted U-shaped window frame having side members secured to the flanges of the door body.

18. An all metal automobile door comprising a body portion constructed of a single piece of metal and having integral marginal flanges providing lap portions on the door, means extending across and connected to the flanges to complete the mechanical structure of the door body and an inverted U-shaped window frame having side members constructed of a single piece of metal folded upon itself and shaped to provide a pair of flanges presenting a channel for receiving and guiding one edge of a window and also presenting doubled attaching portions cooperable with the flanges of the door body for maintaining the window frame in position and for strengthening and reinforcing the door body.

19. In combination, an all metal automobile door, a metal window frame having side members secured to the door and a cross member rigidly and permanently connected to the side members, said cross member having a removable plate adapted to permit of the insertion and removal of a window pane while the window frame remains mechanically and structurally complete.

20. A vehicle door having a metal window frame including side members rigid with the door and a cross member rigidly and permanently connected to the side members, said cross member having a removable plate

adapted to permit of the insertion and removal of a window pane through the cross member while the window frame remains mechanically and structurally complete.

21. A vehicle door having a metal window frame including side members rigid with the door and a cross member rigidly and permanently connected to the side members and provided with a channel for receiving an edge of a window pane, said cross member having a removable plate adapted to permit of the insertion and removal of a window pane through the cross member while the window frame remains mechanically and structurally complete.

22. A vehicle door having a metal window frame including side members rigid with the door and a cross member rigidly and permanently connected to the side members and provided with a channel for receiving an edge of a window pane, a buffer for a window pane carried by said channel, said cross member having a removable plate adapted to permit of the insertion and removal of a window pane through the cross member while the window frame remains mechanically and structurally complete.

23. In a device of the character described, a frame supporting a slidable window, a metallic lockboard extending across said frame and carrying a window raising and lowering device thereon, and a covering for said lockboard and a member integral with said lockboard and extending across said frame to form a garnish strip and having a portion thereof closely engaging said covering to hold it in position.

24. In a vehicle door construction of the type having a frame provided with a front panel and supporting a slidable window and a metallic lock board extending across said frame, a member integral with said lock board and extending across said frame and carrying a garnish strip having one edge cooperable with the front panel to form a window slot and having means along its other edge adapted to engage and aid in securing a finishing panel to the rear of the door.

In witness whereof I hereto affix my signature.

HERMAN C. RUSCH.