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PRESSED METAL VEHICLE DOOR

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2 Sheets-Sheet 1

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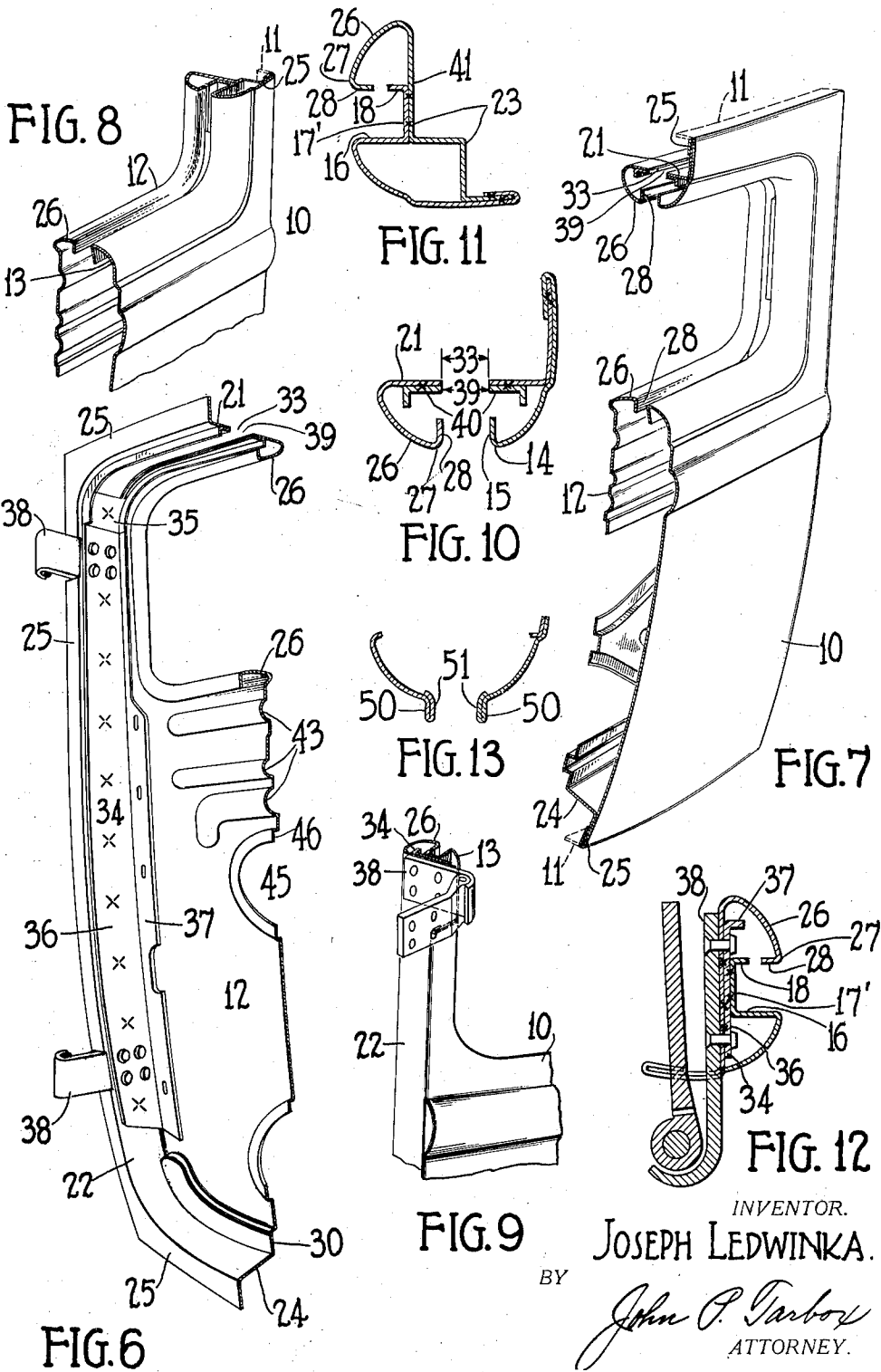
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2 Sheets-Sheet 2



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PRESSED METAL VEHICLE DOOR

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The invention relates to pressed metal doors and particularly to such doors adapted for use in motor vehicles, such as automobiles of the pleasure car type.

5 It is a main object of the invention to make such doors as light as possible consistent with adequate strength, to reduce the cost of production of such doors, and yet to provide a door of this class which is rigid and durable.

10 Other and further objects and advantages and the means through which they are attained will be evident from the following detailed description when read in connection with the accompanying drawings, in which,

15 Fig. 1 is a perspective view of the outer panel stamping, according to the preferred form of the invention, looking at it from the inside, as it appears prior to assembly.

20 Figs. 2 and 3 are detail perspective views of the outer panel stamping, looking at it from the outer sides, and showing the various sections around the window opening.

25 Fig. 4 is a perspective view of the inner panel stamping, with minor parts assembled therewith, looking at it from the outer side, as respects the door as a whole, and toward the jamb rail portion.

30 Fig. 5 is a partial perspective view of the inner panel stamping, looking at it from the inner side, and showing a central longitudinal section thereof.

35 Fig. 6 is a perspective view of the inner panel stamping and attached reinforcing means, looking at the outer side thereof and toward the hinge rail, and showing a longitudinal section thereof.

40 Figs. 7, 8 and 9 are fragmentary perspective views, of the assembled door, showing in Fig. 7, a longitudinal section thereof, in Fig. 8, a section below and at the side of the window opening at the lock side of the door, and in Fig. 9, a section at the side of the window opening at the hinge side.

45 Figs. 10, 11 and 12 are enlarged sectional views of the tops and side rails corresponding to the rail sections shown in Figs. 7, 8 and 9, respectively.

50 Fig. 13 is a fragmentary detail sectional view showing a modified form of finish at the edge of the window opening.

Fig. 14 is a fragmentary enlarged detail view of the buffer block supporting offset on the inner panel stamping as shown in Fig. 4.

According to the preferred form of the invention the outer panel stamping 10 forming the outer face of the door has its body portion curved to conform to the body curvature and is formed, as usual, with a peripheral flange 11, extending substantially at right angles to the body of the panel, as shown in dotted lines in Fig. 7 and in full lines in Fig. 1, prior to its assembly with the inner panel stamping, designated as a whole by numeral 12.

65 Around the window opening the outer panel stamping 10 is formed with an inwardly extending flange 13 which may be given a curved contour as shown, or be otherwise formed to provide the desired finish contour at the outside of the window opening. 70 This flange 13 is extended entirely around the window opening, and extends inwardly to substantially the plane of the vertically sliding glass. To provide a smooth finish at this point, it is bent reversely by a relatively sharp 75 curve at 14 extending entirely around the window opening, and a reversely extending flange extending toward the periphery of the panel. At the top this flange is designated 15, the sides, 16 and the bottom 17. At the 80 top and sides the edge flanges 15 and 16 extend substantially in the plane of the door according to the preferred form of the invention and at the bottom the flange 17 is inclined toward the body of the panel. At the sides, 85 the flanges 16 are formed along their edges into channel formation, the bottom of the channel being designated 17' and the inner side of the channel, by 18. These channel portions of the outer panel stampings are 90 adapted to seat against the side rail portions of the inner stamping and be secured thereto in a manner to be presently described.

It will be noted that the inner side wall 18 of the channels is of less height than the outer 95 side wall 16, and in the assembled door, it is adapted to be in aligned relation to a portion of the inner panel stamping.

The outer panel stamping may be formed with suitable beading, as 19, and an offset, as 100

20, extending entirely around the window opening, this beading and offsetting adding to the stiffness and strength of the panel, but varying with the design of the body in which the door is to be used.

The inner panel stamping 12 has its body portion curved corresponding to interior contour of the body and is provided with transverse jamb rail portions at sides, top and bottom. The transverse jamb rail portions merge into each other at the corners by well-rounded curved portions, but for convenience of description, the top portion is designated by 21, the side portion at the hinge side, by 22, the side portion at the lock side by 23, and, the bottom portion, by 24. A continuous peripheral flange 25 having square corners extends entirely around the inner paneling, this flange extending in the plane of the the door, and being adapted to be secured to the outer peripheral portion of the outer panel stamping 10, as shown in Figs. 7, 8, 9, 10, 11 and 12, by crimping the edge of flange 11, of the outer panel stamping over the edge flange 25 of the inner panel stamping, thus forming a reinforced door overlap. Addition securely of joinder is assured by spot welding in the crimped joint.

Around the window opening the inner panel stamping is formed with an inwardly extending flange 26, which may be curved complementally to the contour of the outer panel, to form a garnish or finish on the inside of the window opening similar to that on the outer side. The inwardly extending flange 26 has its edge spaced from the curved edge 14 of the outer panel to permit the vertical movement of the window glass therebetween. The edge portion of flange 26 is reversely bent on a relatively sharp curve at 27 to provide a smooth finish and, in my preferred form, it is extended by a flange 28 directed toward the transverse jamb rail portions at the outer periphery of the door. This flange 28 may be formed at the top and bottom similar to the top and bottom flanges 15 and 17, respectively, of the outer panel, and at the sides by a relatively narrow flange which is aligned, in the final assembly of the door with the inner side wall 18 of the channel at the edge of the outer panel stamping to form therewith the complete inner side wall of the glass run channels.

At the bottom, the inner panel stamping is formed with an offset portion 30 at the juncture of the main body of the panel and the transverse jamb rail portion 24, this offset extending around the curved corner portions, and thus additionally stiffening the lower portion of the door, and, at the same time, providing a seat adapted to receive within the offset, the edge of a weather strip and the means for securing it in position, not shown.

At the top the transverse rail portion 21 of the inner panel stamping is slotted at 33 to

permit the insertion and removal of the window glass panel.

Reinforcing means forming a feature of this invention are provided to strengthen the top and hinge side rail portions of the door where greater strength is desirable to form a suitably secure anchorage for the hinges and, at the top, to reinforce the edges of the slot 33 in the inner panel stamping. This reinforcing means comprises two strips of metal 34 and 35 of heavier gauge than the panels, the one, 34, being an angle having its arms 36 and 37 nested at the bottom in the angle between the body of the inner panel stamping and the transverse rail portion 22 and welded to the rail portion. The flange or arm 37 is wider at the bottom than at the top and serves as means for securing a channel (not shown) forming the lower portion of the glass run. This strip 34 extends from adjacent the bottom of the door to adjacent the top thereof, and the glass run channel 16, 17', 18 on the outer panel stamping is secured thereto, as by welding the bottom of the channel to the strip.

The hinge straps 38 are secured to the outside face of the transverse hinge rail portion 22 by means extending through the said portion and the arm 36 of the angular reinforcing strip.

The reinforcing strip 35 for the top is of channel form in section and is extended around both the top rounded corners of the transverse jamb rail portion of the door, the end adjacent the hinge rail being extended to the top of the strip 34 and welded thereto, so that a continuous reinforcing means extends from the bottom of the hinge rail to and across the top and around the top corner of the door at the lock side. The channel of the top reinforce 35 is cut out or slotted at 39 to correspond with the slot in inner panel rail portion 21, and the angular portions 40 bordering the slot are welded to and reinforce the edges of the slot in panel rail portion 21.

At the lock side, the side rail portion of the inner panel is transversely stepped throughout the greater portion of its length in a usual manner, and the bottom 17' of the channel 16, 17' and 18 of the outer panel is welded at the side of the window opening to the inwardly offset portion 41 of the stepped rail portion. See Fig. 8.

A channel member 42 secured to the lower portion of the lock side rail portion 23, forms a downward extension of the glass run channel adapted to guide the window panel in its lowered position. A similar channel, not shown, is provided at the hinge side.

The inner panel may be formed with strengthening beads as 43, and offset portions as 44, to receive portion of the lock and window regulator mechanism, and also with openings, as 45, provided with flanged mar-

gins 46, these openings decreasing the weight of the door, without materially detracting from its strength, and also permitting ready access to the regulator or lock mechanism arranged between the panels, when desired. An outward offset, as 47, in the lower margin of one of the openings 45 is adapted to extend into the path of movement of an arm, not shown, on the window regulator mechanism, and is slotted as at 48 to receive a resilient buffer block adapted to frictionally engage the side of the slot, and to be thus held in place without other means. This block, being arranged in the path of the arm of the regulator mechanism buffers the descent of said arm.

From the foregoing description, it will be apparent that applicant has produced a sheet metal door, requiring a minimum number of forming and assembling operations, one which is exceedingly light in weight, yet because of the formation of its inner and outer panel stampings and their manner of joinder, one which is strong enough to meet all the demands of service, and one which involves the use of a minimum number of separate parts, and may be almost wholly built up of light gauge sheet metal. It is an improvement over prior doors of this class using inner and outer panel stampings extending entirely around the window opening and forming the jamb rails of the door in that it eliminates entirely the necessity of using a separate stamping or stampings, in addition to the panel stampings, to form the glass run channel frame around the window openings.

The formations around the window opening and elsewhere may be varied within the scope of the appended claims. In Fig. 13, in which one such modification is shown, both outer and inner panels stampings are first extended toward the center of the window opening as at 50, and then bent back upon themselves as at 51, to provide an inwardly extending bead at both sides of the window glass.

This is but one example of the numerous modifications in which the invention may be embodied, and applicant does not wish to be limited, except as required by the language and spirit of the claims appended hereto.

What I claim is:

1. A hinged sheet metal door comprising inner and outer light gauge stampings forming the inner and outer faces of the door and the garnish around the window opening as well as transversely extending jamb face portions of the door, the upper portion of said transversely extending portion having a slot therein to permit insertion or removal of a window glass, and an angular metal reinforcing strip extending continuously around the hinge side and top of said transversely extending portion.

2. A sheet metal door comprising an inner stamping extending entirely around the window opening and forming the window moulding at the edges of said opening and extended transversely in its outer portion to form the jamb faces of the door, the upper transverse portion merging by well rounded corners into the side transverse portions and being slotted to permit insertion and removal of the window glass from the top, and a channel section reinforcing member secured to the inner surface of said upper transverse portion and extended around the rounded corners through which said upper portion merges into the side transverse portions, said member being slotted correspondingly to said transverse portion of the panel, thereby forming angular reinforcements on each side of the slot in the panel.

3. An inner panel stamping for sheet metal doors having transversely extending lower and side jamb face portions merging into each other through well-rounded corner formations, and an offset formed in the lower edge of said panel adjacent the junction of its body with the transverse jamb face portion, said offset extending around the corners and providing a recess to receive a weather strip and securing means therefor.

4. A sheet metal door comprised of inner and outer stampings forming the inner and outer faces of the door and the moulding around the window opening as well as transversely extending jamb face portions of the door having well rounded corners, and a reinforcing strip extending from the lower end of the hinge rail portion across the top, and around the corner at the top of the lock rail side of the door, said reinforce being of angular section along the hinge rail side, the angle nesting with the angle formed by the body of the stamping and its transverse jamb rail portion, and of channel section across the top and throughout the rounded corners of the door, said top transverse portion of the panel and the channel portion of the reinforce being slotted to permit insertion and removal of the window glass.

5. An inner panel stamping for sheet metal doors having its body portion arranged in the plane of the door and its edges extended transversely to form the jamb portion of the door, and an angular reinforcement arranged within the angle formed by the body portion of the door and its transverse jamb rail portion and extending along a horizontal and vertical edge of the door.

6. An inner panel stamping for sheet metal doors having its body portion arranged in the plane of the door and its edges extended transversely to form the jamb portion of the door, and an angular reinforcement arranged within the angle formed by the body portion of the door and its transverse jamb rail portion, the inner arm of said angle mem-

ber being of substantially greater width below than above the lower edge of the window opening.

7. A sheet metal door having an inner
5 transversely extending panel connecting the side rails of the door and adapted to mount the window regulator mechanism, said panel having an inwardly offset portion provided with a slot, adapted to mount a limit stop
10 for said regulator mechanism.

In testimony whereof I hereunto affix my signature.

JOSEPH LEDWINKA.

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