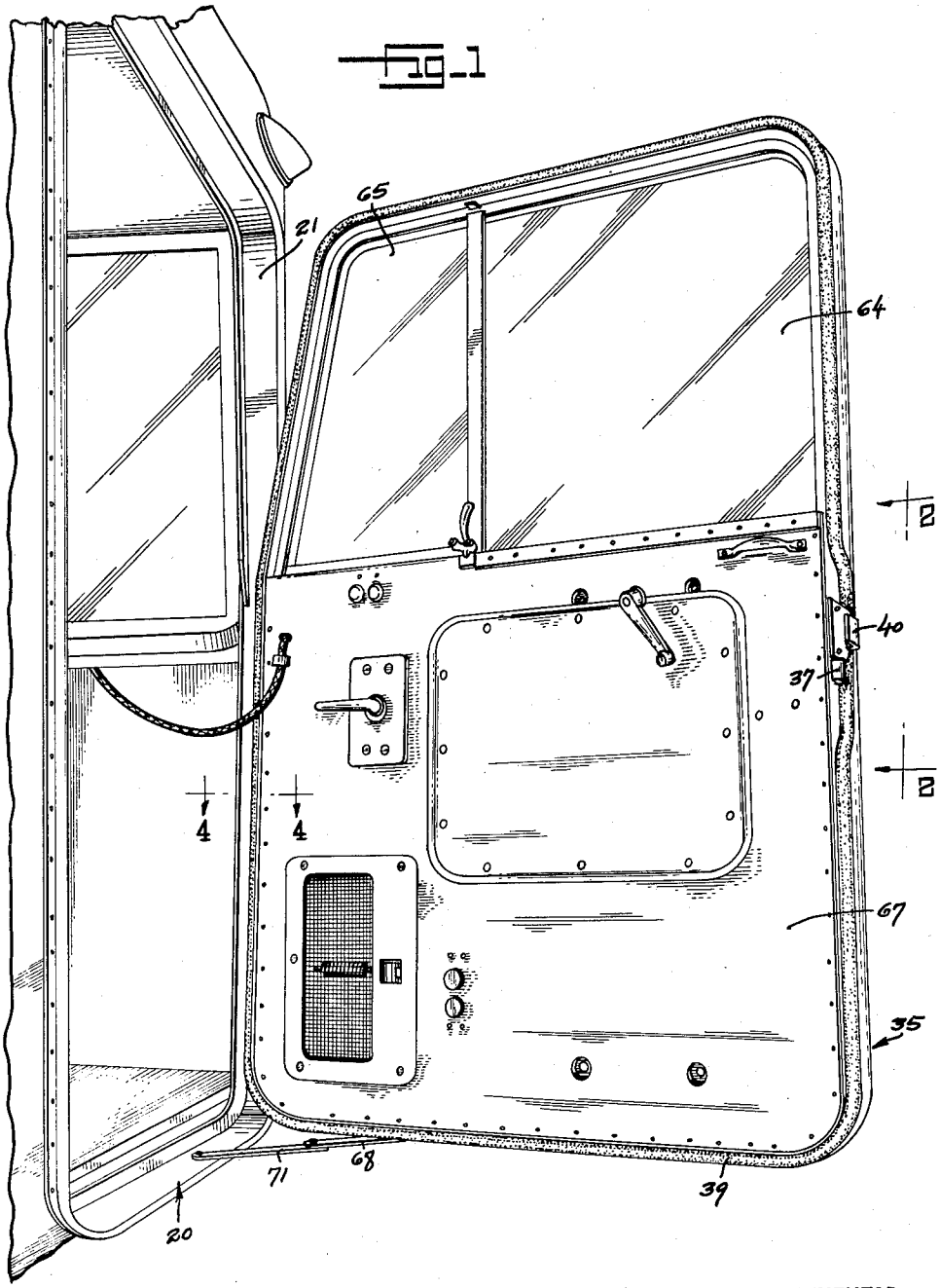
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BULKHEAD-TYPE DOOR CONSTRUCTION

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Fig. 1



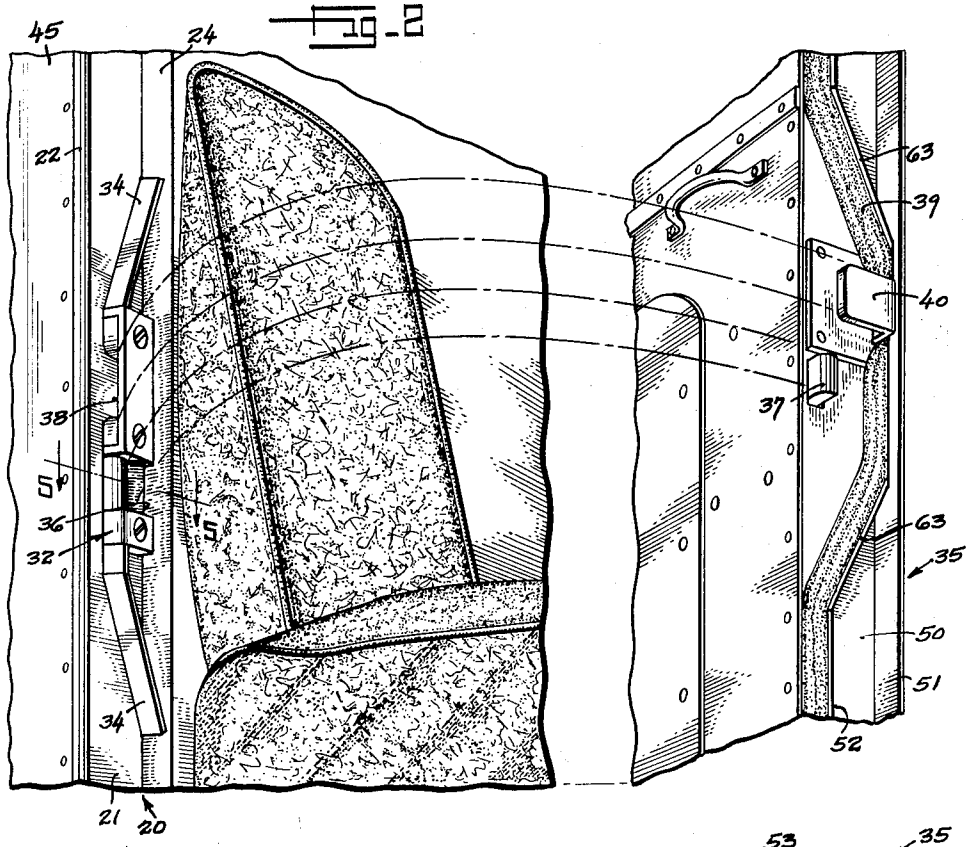

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Fig. 2



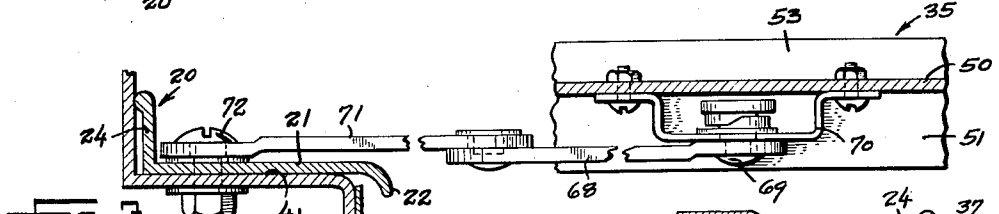




Fig. 3




Fig. 4

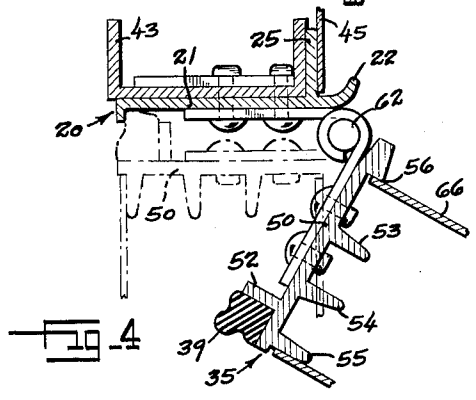
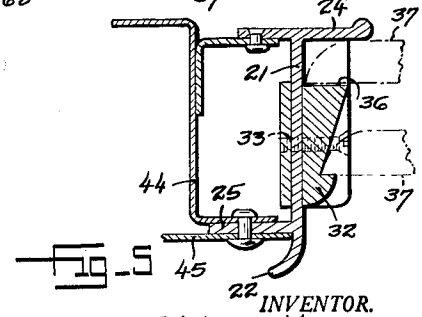



Fig. 5

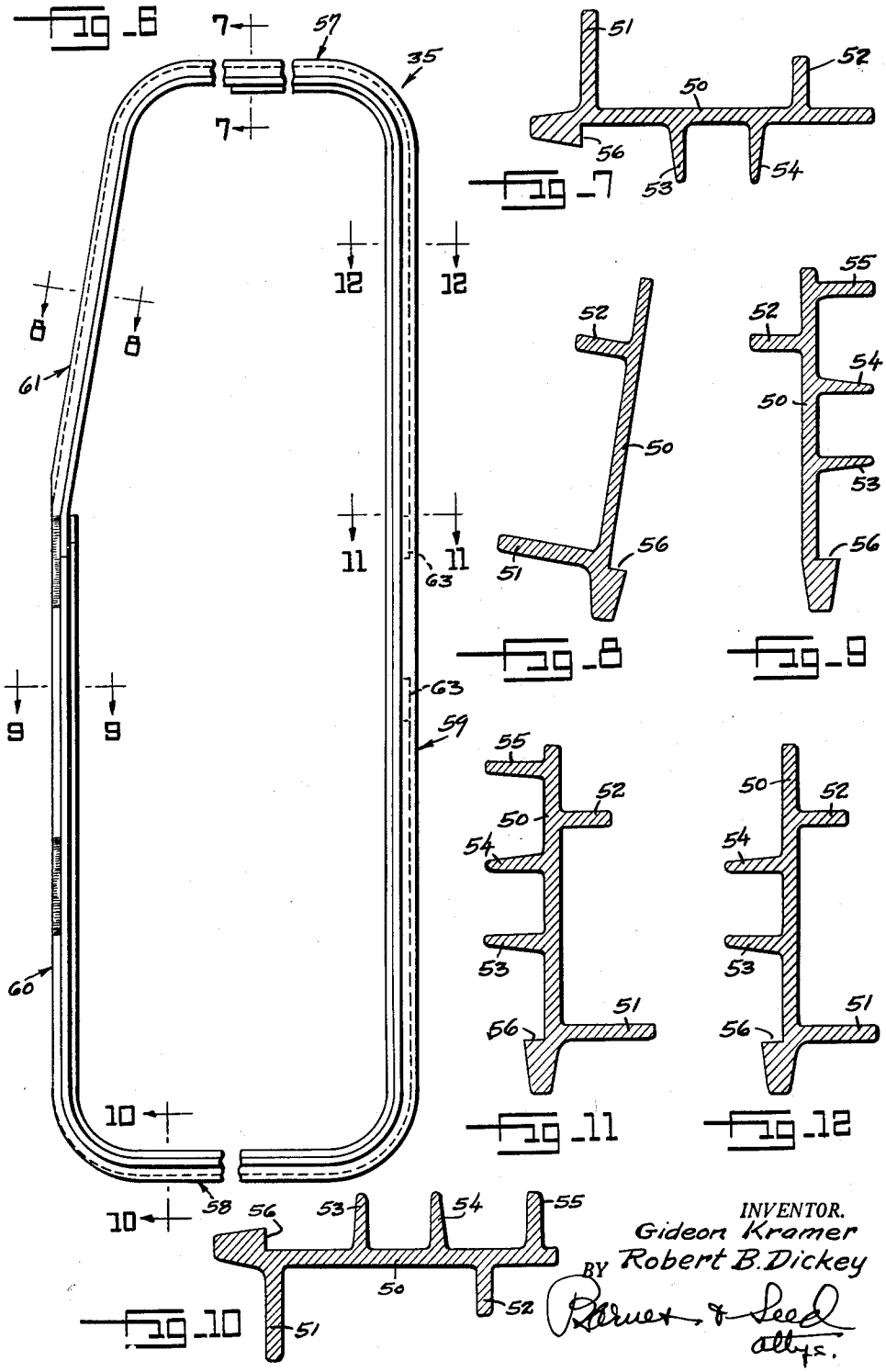



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Fig. 13

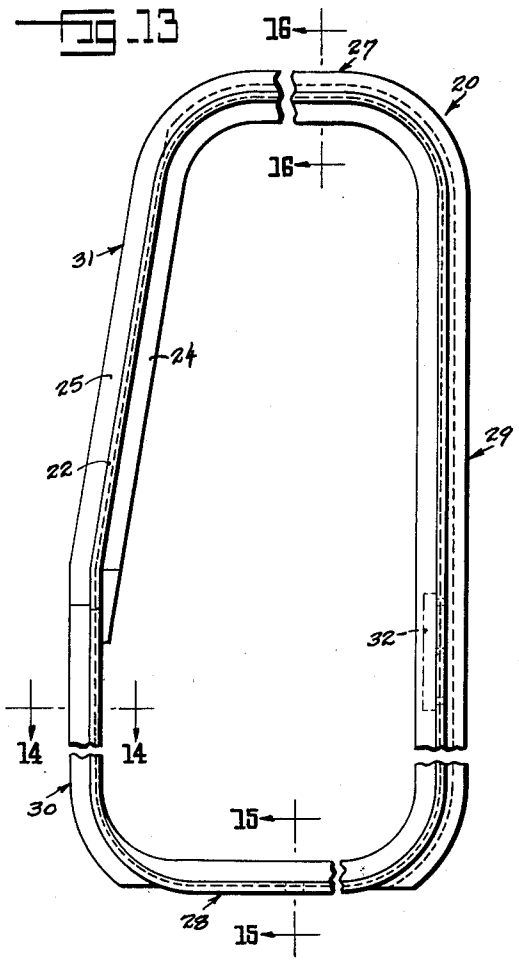
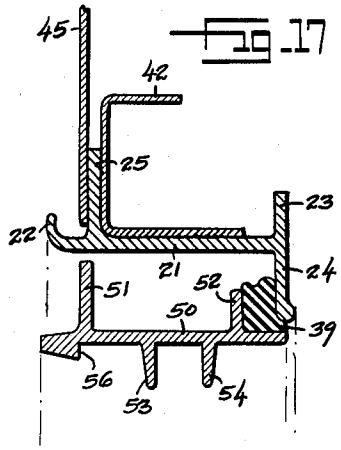
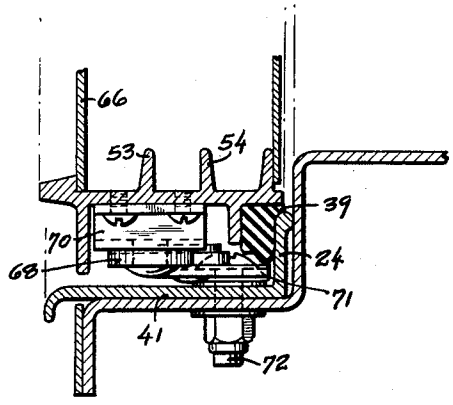



Fig. 17



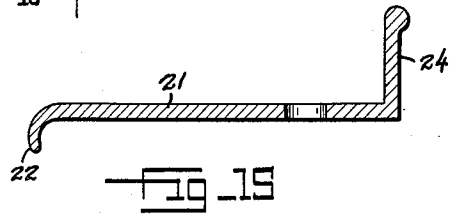
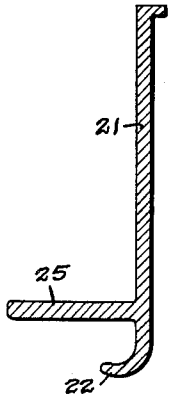




Fig. 15



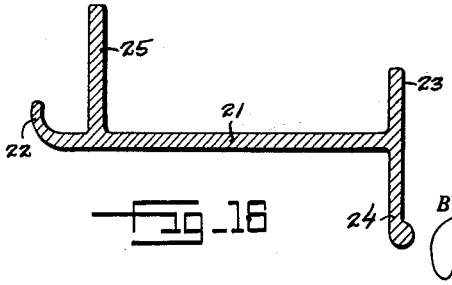




Fig. 16

Fig. 14

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2,926,040

# BULKHEAD-TYPE DOOR CONSTRUCTION

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Application February 8, 1957, Serial No. 639,043

4 Claims. (Cl. 296—44)

This invention relates to doors for the cabs of automotive trucks, and for its general object aims to improve cab doors by providing that which might be termed a "bulkhead" type of door characterized by the employment of aluminum extrusions as continuous framing members both for the door itself and for the opening in the cab which accommodates the door, thus producing a lightweight door structure of unusually rugged construction which can be easily and expeditiously produced at comparatively low cost.

The invention consists in the novel construction and in the adaptation and combination of parts hereinafter described and claimed.

In the accompanying drawings:

Figure 1 is a persepective view of a door and a door-opening each having a frame constructed in accordance with the preferred teachings of the present invention.

Fig. 2 is a fragmentary enlarged-scale view thereof to detail the lock mechanism, this view, for purposes of correlation, including a fragmentary showing of one of the two front seats of the cab to which the door is applied. The vantage point of this view is shown at 2—2 in Fig. 1.

Fig. 3 is a fragmentary vertical sectional view detailing the jointed stay-arm for the door structure and showing the same in an extended condition.

Fig. 4 is a fragmentary horizontal sectional view on line 4—4 of Fig. 1.

Fig. 5 is a fragmentary horizontal sectional view on line 5—5 of Fig. 2.

Fig. 6 is a fragmentary plan view of the frame for the door, employing a scale approximately the same as that of Fig. 1. The frame is here viewed from the outboard side and it is to be noted that the frame shown, as with the companion member illustrated in Fig. 13, is for the left-hand door as distinguished from the right-hand structure illustrated in Figs. 1 and 2.

Figs. 7 through 12, inclusive, are cross-sectional views drawn to an enlarged scale on lines 7—7, 8—8, 9—9, 10—10, 11—11, and 12—12, respectively, of Fig. 6.

Fig. 13 is a fragmentary plan view of the frame for the door-opening, using a somewhat larger scale than that of Fig. 6 and, like the latter, viewing the frame from the outboard side.

Figs. 14, 15 and 16 are cross-sectional views drawn to an enlarged scale on lines 14—14, 15—15, and 16—16, respectively, of Fig. 13; and

Fig. 17 is a fragmentary vertical sectional view, using a scale the same as that of Figs. 3, 4 and 5, taken on substantially the longitudinal median line of the door structure with the door in closed position.

Before proceeding with a detailed description of the invention, and with a view toward avoiding confusion in terminology, it is here stated that the edge of the frame which faces toward the center of the opening surrounded by said frame shall be considered the "inside" edge, the edge which is in distal relation to said center shall be considered the "outside" edge, the edge which



faces toward the interior of the cab shall be considered the "inboard" edge, and the edge which faces in an outward direction shall be considered the "outboard" edge.

First describing the frame for the cab-door opening, and which is designated generally by the number 20, the same is constituted of a single length of an aluminum extrusion having the basic shape, in cross-section, portrayed in Fig. 16, and namely a shape presenting a central web 21 presenting a 90° curl 22 at one end, having at the other end of this web oppositely projecting short and long legs 23 and 24, respectively, disposed in a common plane disposed normal to the plane occupied by the web, and proximate to but spaced from said terminal curl 22 presenting a leg 25, this leg 25 being parallel to the legs 23 and 24 and projecting in the same direction as the curl 22 from the web. Leg 24, this being the long leg, projects in a direction opposite to said curl and presents a thickened free end which is rounded smooth. The length of the leg 25 approximates that of the leg 24, and is or may be in the approximate ratio of 1 to 3 as compared with the length of the web.

The procedure, in producing the frame, is to bend the extrusion to shape by wrapping the extrusion about a shaping templet or templets into the plan configuration indicated by the fragmentary disclosure of Fig. 13, wherein it will be seen that there is provided a generally convex pentagonal figure approaching a rectangle, and this is to say that the sections which border the top 27, the bottom 28, and one side 29 of the produced figure are generally rectilineal other than for curved corners, and lie substantially at right angles to one another. The lower section 30 of the remaining border of the figure lies at right angles to the bottom section 28, while the upper section 31 of said remaining border is moderately inclined with respect to such section 30.

In wrapping the extrusion about the templets, the web occupies a plane normal to the plane of the frame, with the leg 24 lying inboard. We find that the relative softness of an aluminum extrusion permits the material to follow a curve of moderate magnitude, $3\frac{5}{16}$"R for example, with no buckling. Some minor wrinkling does occur and these are hammered smooth by hand labor. The two ends of the extrusion meet by a scarf joint at the substantial juncture of the two sections 30 and 31, being weld-connected, and the final procedure is to grind down the legs 23 and 25 flush with the web 21 along the entire bottom section of the frame, and additionally grind off very nearly the entire leg 24 along the length of the section 30, leaving only the stub shown in Fig. 14. Also, at a point intermediate the height of the side section 29, a striker 32 is secured as by screws 33 to the inside face of the web, and strips 34 are welded as cheek-fillets to extend from the front edge of the striker to the leg 24 of the extrusion, producing diagonal faces against which a weather-seal strip 39 carried by the companion door frame 35, is adapted to press. The construction of the striker is one providing the usual catch 36 for a retractable bolt 37 carried by the door, and having a stay-pocket 38 alongside said catch to accommodate a door-carried hooking finger 40.

In securing the described frame in place on the cab (see Fig. 17), the bottom section 28 seats upon a ledge 41 made integral with the floor of the cab, such ledge being depressed below the floor a distance somewhat greater than the length of the leg 24. Along the top section and each side section, the frame is riveted and welded to channels or other like members such as 42, 43 and 44, (see Figs. 17, 4 and 5) which are made a part of the framework of the cab. The face panel 45 for the cab seats against and is secured to the outer face of the leg 25.

The door frame 35, like said door-opening frame, is constituted of a single length of an aluminum extrusion, in this instance having the basic shape, in cross-section, portrayed in Figs. 10 and 11, and namely a shape presenting a central web 50 with a long and a short leg 51 and 52, respectively, projecting from one face thereof in positions well spaced from the opposite ends. From the other face, approximately intermediate the ends, the extrusion has a pair of spaced legs 53 and 54 whose inner walls are substantially parallel and located normal to the web, at one of the ends provides an additional leg 55 disposed normal to the web, and at the other end has an inwardly facing shoulder 56, likewise disposed normal to the web. The shoulder 56 and the long leg 51 occur upon the same end of the extrusion, this end occupying an inboard position on the completed frame with the long and short legs 51 and 52 lying to the outside. Like the described frame for the door-opening, the frame for the door is produced by bending the concerned extrusion about shaping templets and connecting the meeting ends by a weld joint, producing a convex pentagonal figure which is in substantial mating correspondence with that of the frame 20. The sections of this figure corresponding to the sections 27, 28, 29, 30 and 31 will be denoted by 57, 58, 59, 60 and 61, respectively. After such welding, the two legs 53 and 54 are ground off throughout the length of the section 61 and an adjacent portion of the section 57, and the leg 55 is removed along both of such sections 61 and 57 as well as that portion of the section 59 which lies above a horizontal plane defining the lower limit of the section 61. Along the lower portion of the section 60 the long leg 51 is ground down to a length approximating that of the short leg 52, and in the remaining upper portion of such section 60 such long leg is completely removed. Accommodated in the space thus provided is the hinge 62 for the door. Along a portion of the section 59 immediately below a horizontal plane defining the lower limit of the section 61 the short leg 52 is ground off. The space here provided accommodates the afore-described bolt 37 and its complementing hooking finger 40, diagonal strips 63 being applied above and below these fittings as a backing for the weather-seal 39.

An inspection of Figs. 1 through 4 and 17 will indicate the manner in which the sliding wndow 64, the pivoted ventilation window 65, the exterior panel 66, interior panel 67, and the usual hardware are applied to the door frame, it being apparent that the edges of said sliding window track in the channel described between the legs 53 and 54. Also apparent from an inspection of these views is the mounting of the usual jointed stay-arm with one joint 68 having its free end pivoted, as at 69, to a bracket 70 attached to the underside of the door frame and with the other joint 71 having its free end pivoted, as at 72, to the bottom section 28 of the door-opening frame 20.

It should perhaps be here pointed out that the outboard curl 22 of the door-opening frame, in addition to producing a trim about the entire perimeter of the door-opening frame, serves as a drip moulding along the top of the door and as a windshield for the hinge 62 at the front of the door. The flanges 51 and 52 of the door frame 35, across the top of the door, produce a trough to carry away rain or moisture which otherwise might get to the rubber sealing strip 39 and freeze.

It is thought that the invention will have been clearly understood from the foregoing description of our now-preferred illustrated embodiment. Minor changes in the details of construction can self-evidently be resorted to without departing from the spirit of the invention and it is therefore our intention that no limitations be implied and that the hereto annexed claims be given the broadest interpretation to which the employed language fairly admits.

What we claim is:

1. In a bulkhead-type door for a vehicle cab, a frame having a generally rectangular plan configuration with the corners rounded on a gradual curve and comprised of a single length of an extrusion having the ends connected by a weld joint, the basic shape of said extrusion, considered in cross-section, being one providing a web with flange-forming legs extending both inwardly and outwardly from the web in planes approximately parallel to the general plane of the frame, the web being disposed to occupy a plane at cross-angles to said general plane of the frame, there being two of said outwardly directed legs spaced one from the other transversely of the web and each having substantial length from the root to the tip thereof so as to produce between the two, across the top of the door, a comparatively deep trough to carry away rain or moisture, the said outwardly directed leg which lies at the inboard side of the door frame being spaced from the inboard edge of the extrusion so as to produce, in conjunction with the web, a sectionally triangular recess facing inboard from the door frame about the entire perimeter thereof, said outwardly directed leg which lies at the inboard side of the door frame isolating from the trough a weather-seal strip received in said triangular recess.

2. In a bulkhead-type door for a vehicle cab, a frame having a generally rectangular plan configuration with the corners rounded and comprised of a single length of an aluminum extrusion having the ends connected by a weld joint, the basic shape of said extrusion, in cross-section, being one providing a web with flange-forming legs projecting from opposite sides, and which is to say both inwardly and outwardly from the web in planes approximately parallel to the general plane in which the frame lies, the web being disposed to occupy a plane at cross-angles to said general plane of the frame, two of said legs occurring on the inside face so as to project inwardly from the web and occupying closely spaced parallel positions at opposite sides of the approximate transverse median line of the extrusion, said two legs producing a channel serving as a guide-way for the vertical movement of a sliding window.

3. The frame of claim 2 in which said two legs are ground off along an upper corner portion of the rectangular figure to accommodate a pivoted ventilation window.

4. In vehicle cab construction, a door-opening frame having a generally rectangular plan configuration and comprised of a single length of an aluminum extrusion having the ends connected by a weld joint, the basic shape of said extrusion, in cross-section, being one providing a web with flange-forming legs projecting from opposite sides, the web being disposed to occupy a plane at right angles to the general plane of the frame, framing pieces for the cab generally outlining an opening for the door-opening frame and welded to the door-opening frame to integrate the door-opening frame with the cab, said opening for the door-opening frame being defined along the bottom by a ledge depressed below the floor of the cab and made integral with the latter, the frame for the door opening having the legs which occur upon the outer face thereof ground off along the bottom section of the frame so that the web of the door-opening frame will lie flat against said ledge, a door for the door opening hinged to the door-opening frame and likewise framed by a single length of an aluminum extrusion having the ends connected by a weld joint, the basic shape of the extrusion for the door frame, in cross-section, being one providing a web disposed to lie in spaced parallelism with the web of the door-opening frame and with flange-forming legs projecting as substantial appendages of the web from opposite sides thereof so as to extend both inwardly and outwardly from the parent web at substantial right angles to the web, one of said outwardly extending legs of the door frame being disposed to lie in close proximity of the outboard edge of the parent web, and a jointed stay-arm for the door frame occupying a position at the bottom of

the door frame in the space between the web of the door frame and the web of the door-opening frame with one joint pivoted at its free end to the one web and the other joint pivoted at its free end to the other web, the outwardly projecting leg of said door frame shielding the stay-arm.

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