Sept. 24, 1935. R. L. CARR 2,015,547

CONVERTIBLE BODY

Filed June 15, 1929 4 Sheets-Sheet 1

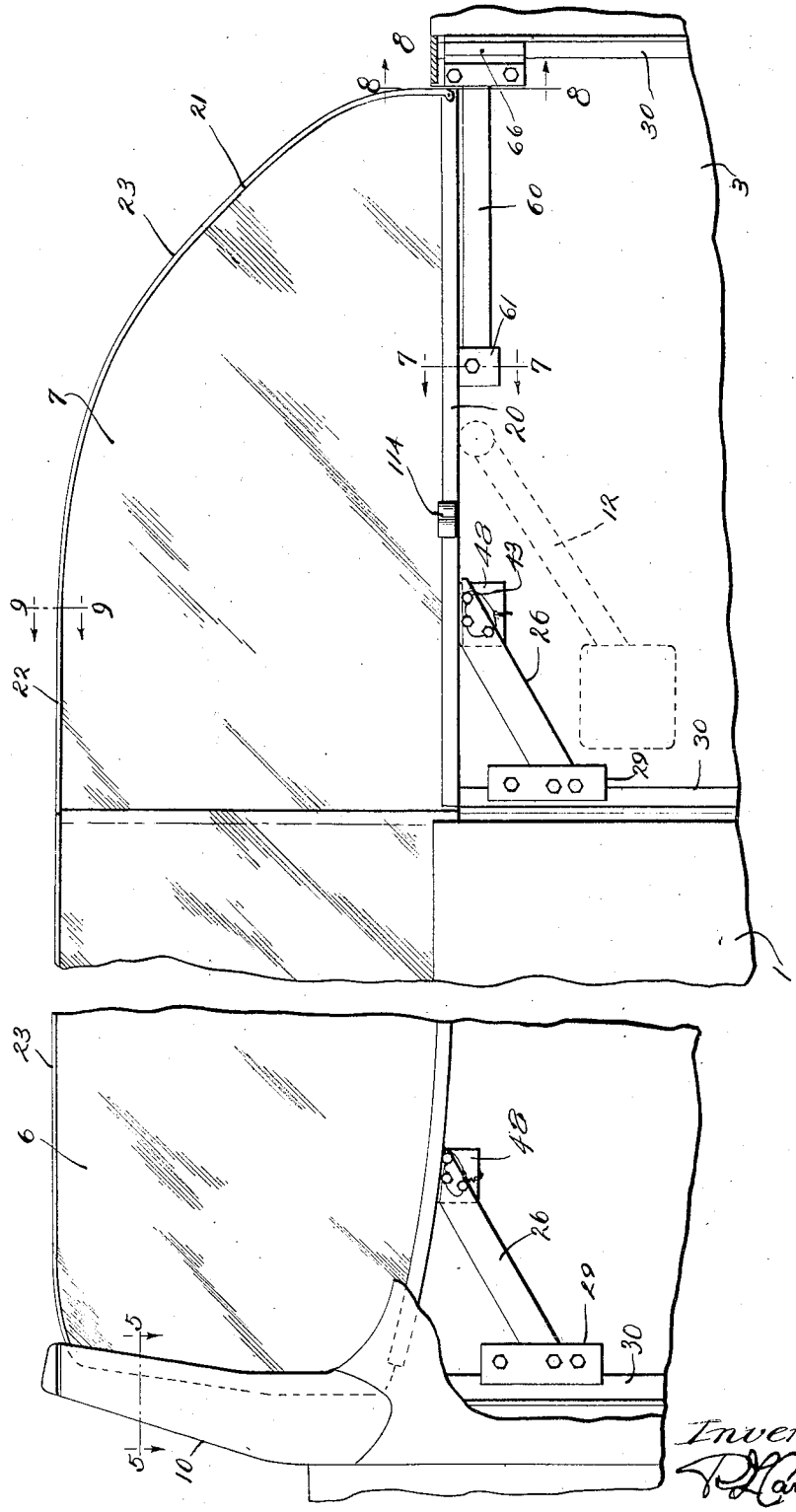


Fig. 1

Inventor:
R. L. Carr

Sept. 24, 1935. R. L. CARR 2,015,547

CONVERTIBLE BODY

Filed June 15, 1929 4 Sheets-Sheet 2

Fig. 2

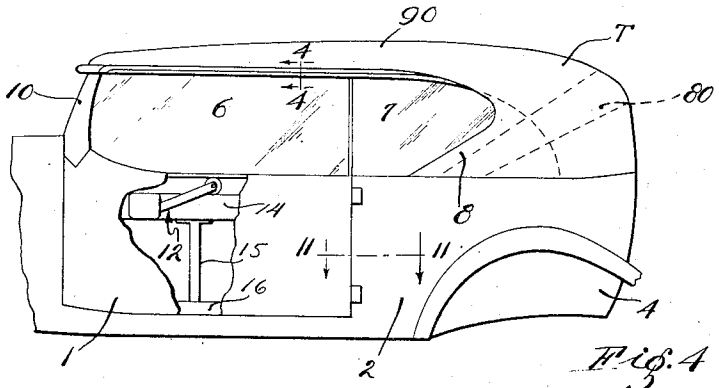


Fig. 3

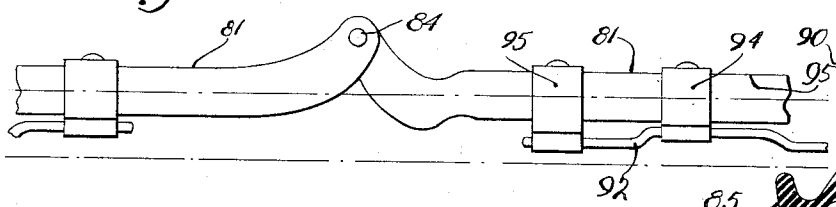


Fig. 4

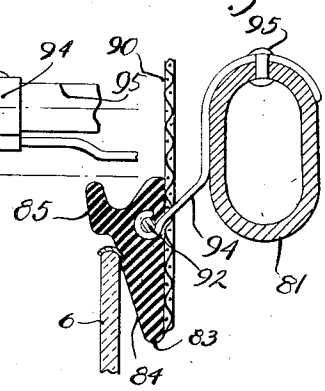


Fig. 5

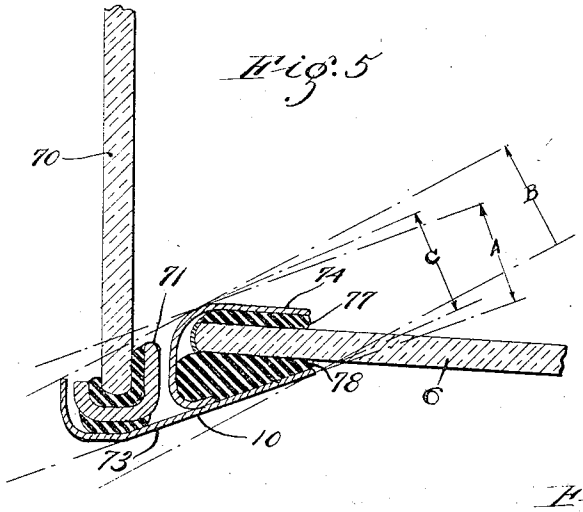


Fig. 6

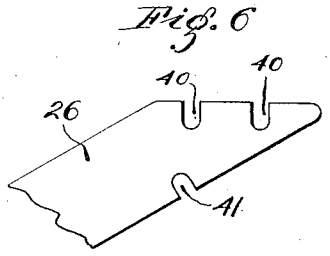


Fig. 7

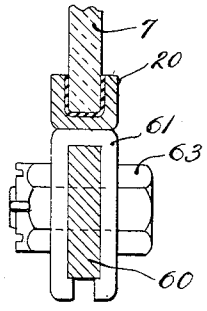


Fig. 8

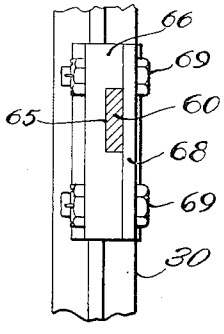


Fig. 9

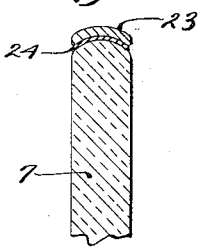
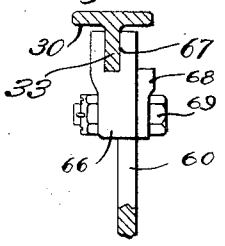


Fig. 10



Inventor:

R. L. Carr

Sept. 24, 1935. R. L. CARR 2,015,547

CONVERTIBLE BODY

Filed June 15, 1929 4 Sheets-Sheet 3

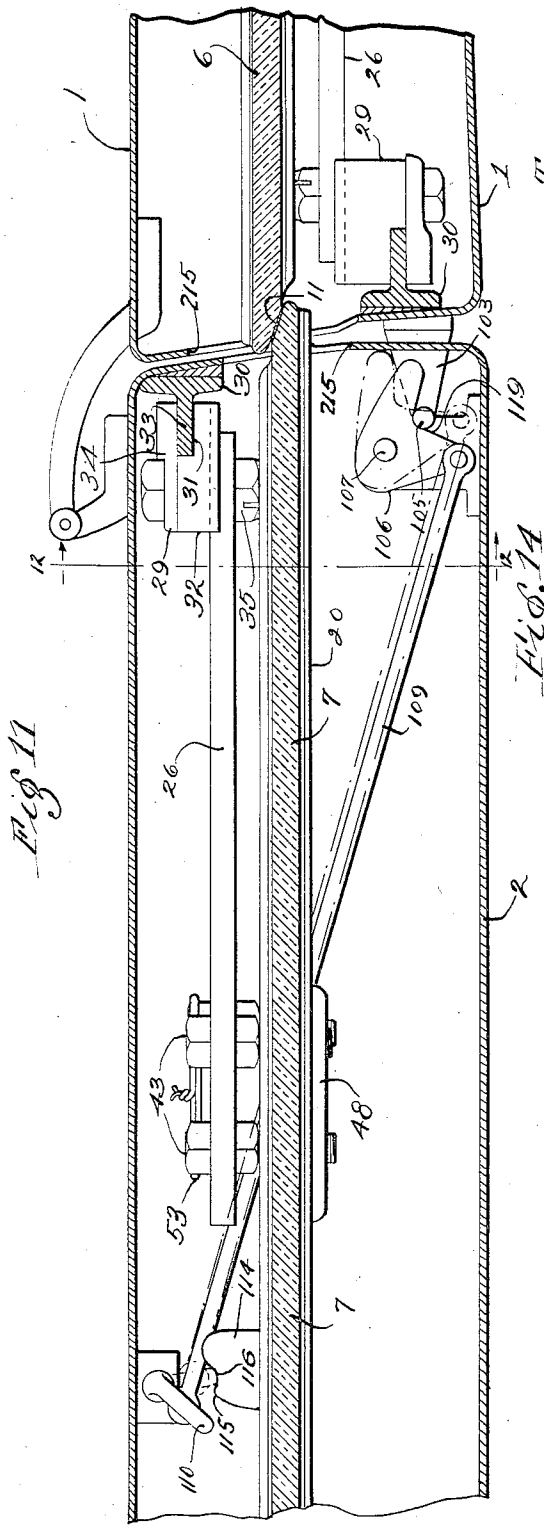


Fig. 11

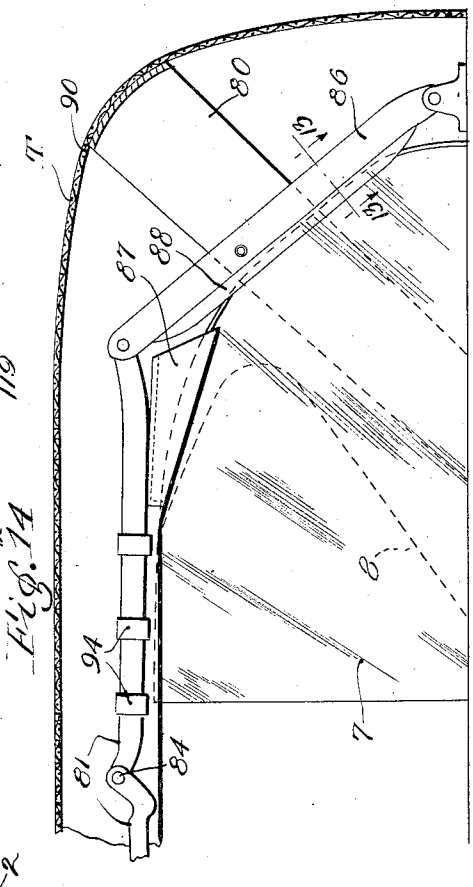


Fig. 14

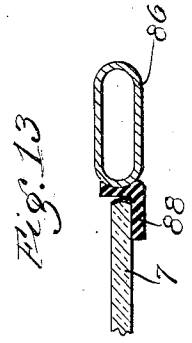


Fig. 13

Inventor:
R. L. Carr

Sept. 24, 1935. R. L. CARR 2,015,547

CONVERTIBLE BODY

Filed June 15, 1929 4 Sheets-Sheet 4

Fig. 12

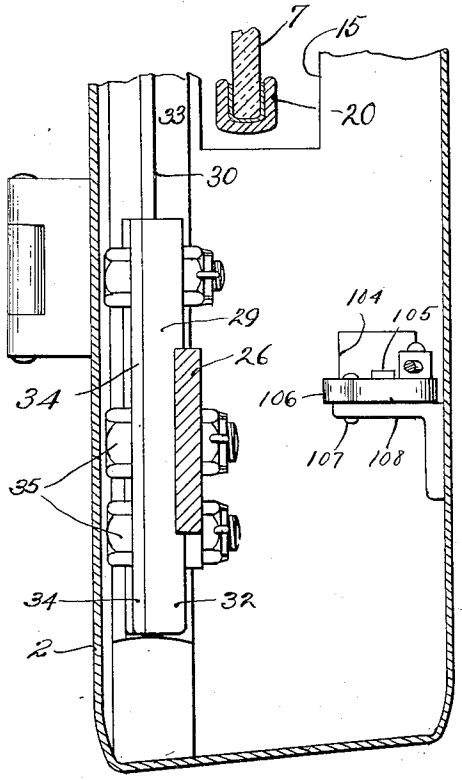


Fig. 15

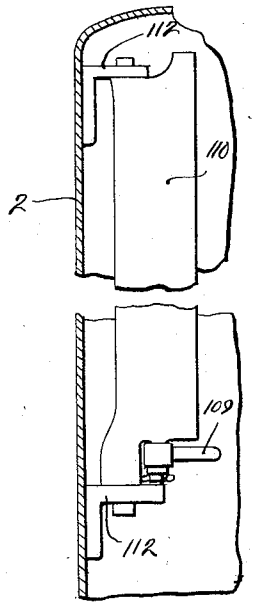


Fig. 16

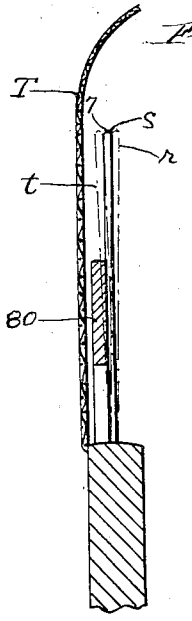
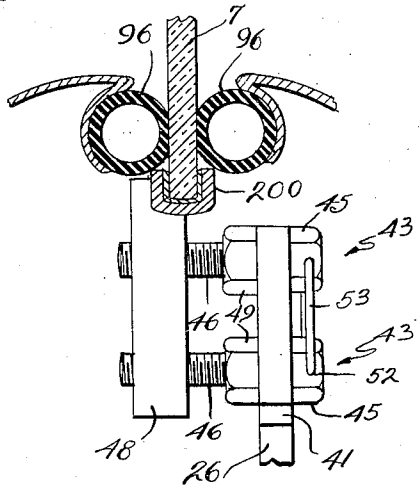


Fig. 17



Inventor:

Patented Sept. 24, 1935 2,015,547

UNITED STATES PATENT OFFICE

2,015,547

CONVERTIBLE BODY

Raymond L. Carr, Boston, Mass.

Application June 15, 1929, Serial No. 371,162

19 Claims. (Cl. 296—45)

This invention relates to improvements in vehicle bodies, and more particularly to an improved convertible body construction of the general character described in my copending application Serial No. 183,199, filed April 12, 1927. In that application resilient means were shown for supporting the lower edges of vertically movable closure panels so that the edges of the same might be held in resilient engagement with each other and/or with the valance of the top, thus assuring a weather-tight construction and freedom from rattles even under extreme conditions of body weaving or twisting, while not requiring particular accuracy in workmanship.

The present invention provides an improved construction of this character wherein the juxtaposed vertical edges of the panels preferably are substantially unframed, carrying, if desired, transparent cushioning material and being held in firm engagement with each other when the panel is fully raised. As disclosed in my copending application Serial No. 183,199, it is desirable not only to urge one of the panel edges bodily into engagement with the other edge, but it is also highly desirable, if not essential, to impart a planetary or secondary resilient force to a panel whereby its upper edge tends to be held more firmly in engagement with the corresponding portion of the adjoining panel. The present invention provides means facilitating the positioning of the panels under these conditions and more firmly supporting the same, particularly when one of the panels is raised and one of the same is lowered, and giving assurance of draft-proof joints between the panels and the valance or top as well as between the panels themselves.

In accordance with the present invention, parts are associated with the resilient supporting elements to guide the panels and position the same longitudinally of the vehicle, and practically any conventional lifter may be employed for controlling the position of the respective closure panels. Furthermore, the resilient supporting members are connected to the panels by means permitting relative adjustment, whereby initial positioning of the panels in relation to each other is greatly facilitated and whereby changes in this relationship, due for example to spring fatigue, may be readily compensated for.

Furthermore, the present invention provides an improved structural arrangement of the body wall to cooperate with the vertically movable panels and provides means to prevent shock between the edges of the panel when the door is closed, this means being associated with the hinged edge of the door and thus permitting the use of a door hinged at its rear end. The present invention is particularly suited to a body provided with front and rear seats and having a wide door affording access to both of these seats. In such a case but two transparent closure panels are necessary upon each side of the body, one being carried by the door and the other being arranged at the rear of the door to afford adequate vision to the occupants of the rear seat. With this arrangement the rear of the rear panel ordinarily is disposed between the back seat and wheel housing; accordingly, special supporting means may be arranged at this end of the panel so that the pocket receiving the same may be comparatively narrow to permit the maximum rear seat width.

The above and further objects and advantageous features of the present invention will be apparent to those skilled in the art upon a reading of the subjoined description and claims taken in conjunction with the drawings, in which:

Fig. 1 is a broken side elevational view of a portion of a body wall showing the closure panels in their raised position in relation to the same;

Fig. 2 is a side elevational view of the body with the top and closure panels raised, a portion of the outer wall of the door being broken away to show parts carried thereby;

Fig. 3 is an elevational detail of a portion of the foldable outrigger structure of the top and related parts, the position of the valance in relation to the same being indicated by dot and dash lines;

Fig. 4 is an enlarged section on line 4—4 of Fig. 2 showing the top framing and the valance and the upper edge of the closure panel;

Fig. 5 is an enlarged section on line 5—5 of Fig. 1 showing the windshield standard assembly;

Fig. 6 is an elevational detail of one of the resilient supports for a closure panel;

Figs. 7, 8, and 9 are sections on lines 7—7, 8—8, and 9—9 respectively of Fig. 1;

Fig. 10 is a top view of one of the rear spring connections showing the vertical guide for the same in section;

Fig. 11 is a section on line 11—11 of Fig. 2;

Fig. 12 is a section indicated by line 12—12 of Fig. 11;

Fig. 13 is a section on line 13—13 of Fig. 14;

Fig. 14 is a sectional view through the rear portion of the top, showing the relation of the same to the rear closure panel;

Fig. 15 is a broken sectional view of a portion of the body wall and related parts;

Fig. 16 is a diagrammatic view showing the relative position of the rear panel and the main top support when the rear panel is raised and the front panel is lowered, also indicating in dot and dash lines other positions of the rear panel corresponding to the lowered position of the top and the raised position of the front panel respectively; and

Fig. 17 is a sectional detail of the upper portion of the body wall and the adjoining portion of the closure panel and the supporting means therefor.

Referring to the accompanying drawings, and more particularly to Figs. 1 and 2 thereof which are illustrative of the preferred embodiment of my invention, the numeral 1 designates a swinging door which may form one section of a body wall having a suitable window receiving pocket therein; for example, this door may have an adequate width to afford access both to the front and to the rear seats of a two-seated vehicle. The adjoining body wall section 2 is provided with a pocket 3 which may extend back to the region of the wheel housing 4, thus permitting the window carried thereby to be in protective relation to the occupants of the rear seat.

In accordance with this invention, a closure panel 6 is movable from a lowered position within door 1 to a raised position thereabove wherein it is in juxtaposition to a rear panel 7 that is similarly movable out of pocket 3 in the rear body section 2. Preferably the adjoining edges of the panels 6 and 7 are brought into juxtaposition at least when the panels are fully raised, as fully described and disclosed in my prior copending applications referred to above, and they may be substantially transparent so that a continuous transparent closure wall is provided along the entire side of the body between the gypsy curtain 8 of the top T and the windshield standard assembly 10. If desired, for example, the juxtaposed edges of the panels 6 and 7 may be oppositely beveled as described in my copending application Serial No. 183,199 and disclosed in Fig. 11, being provided with a cellulosic cushioning strip 11 after the same general manner as described in that application, which permit the entire closure wall to be substantially continuously transparent.

As shown in Fig. 2 a suitable lifter mechanism 12 may be provided in the usual manner to move the panel 6 from its lowered to its raised position or to hold the panel in any desired intermediate position. A similar lifter 12 is also provided for the rear panel 7, such a lifter being indicated by dotted lines in Fig. 1. A strut 15 may extend from the lower horizontal frame member 16 of the door to the horizontal lifter supporting board 14, as shown in Fig. 2.

Preferably the adjoining edges of the closure panels are maintained in engagement with each other in all of their raised and/or lowered positions except when the door is opened. For this purpose, the edges of the panels extend downwardly below the upper edge of the body wall, as shown in Fig. 1, so that when one panel is lowered and the other panel raised, the upper portion of the edge of the former will engage the lower portion of the edge of the latter; as the panels are brought to substantially the same level a greater portion of their edge areas come into contact. For this purpose, the adjoining ends of the body sections 1 and 2 are provided with vertically disposed openings 215, Figs. 11 and 12, which have a suitable width to permit some movement of the panels laterally in relation to the body wall.

Rear panel 7 preferably is mounted in a channeled holder 20 and may be provided with an upwardly inclined or curved rear edge 21 which merges into the substantially horizontal edge 22. If desired a suitable transversely curved molding or reinforcing strip 23 may be secured to the upper and rear edges of the panel, being connected to the holder 20 in any suitable manner. Fig. 9, for example, illustrates such a reinforcing strip 23 which preferably may be formed of chromium- or nickel-plated sheet metal. A cushioning strip 24 is disposed between the edge of the glass and the strip 23. This strip 24 preferably is adhesively secured to the edge of the glass and to the molding 23, the curvature of the edge supplying a keying effect that opposes any tendency of the strip to be loosened from the glass. A similar molding 23 may extend along the top and, if desired, the front edge of panel 6; thus each panel is provided with framing or a marginal binding strip extending about substantially three sides, the juxtaposed fourth sides preferably remaining transparent and unframed.

The front of the panel 7 may be connected to a suitable resilient support or guide member 26. Preferably this member may be in the form of a leaf spring which may have one or more leaves, as desired, and which is inclined at an angle to the holder 20, having its lower end connected to a sliding shoe 29 that engages a substantially vertically disposed guideway 30 adjoining the end of the pocket 3. For example, as shown in Fig. 11, the guide 30 may be substantially a T-section, having two flanges welded or otherwise secured to the body wall and having another flange extending substantially in the direction of the plane of the body panel.

Shoe 29 may comprise a metal block 32 having a rabbet 31 engaging the outstanding flange 33 of the member 30 and having a plate 34 secured thereto by suitable fastening means 35 so that the members 32 and 34 together cooperate to provide a groove having a close sliding fit upon the edge and side faces of flange 33 of guide 30. Preferably one or more of the fastening members 35 pass through the end of the spring 26, the block 32 being grooved if desired to permit more firm engagement with the spring end and to oppose angular movement in a vertical plane.

Preferably the upper end of spring 26 is connected to the holder 20 by means permitting the adjustment of the relative position of the spring end and the panel, not only so that the distance between the panel and the spring may be varied to cause the entire panel edge to be brought more or less firmly against the edge of the adjoining panel, but so that the panel may be suitably tipped or its angular position changed in relation to the spring whereby its upper edge is even more firmly urged into engagement with the corresponding portion of the other panel when both panels are fully raised. For this purpose the upper end of spring 26 may be formed as shown in Fig. 6 with two slots 40 in its upper edge and with a slot 41 in its inclined lower edge, these slots being adapted to receive fastening elements 43 which are inserted laterally into the same. These elements preferably are provided with non-circular, for example hexagonal, heads 45 and with threaded body portions 46, thus corresponding to conventional cap screws; moreover, suitable members 49 which may resemble nuts in shape and dimensions are secured to the

body portion of the members so that they are integral therewith. Members 49 and 45 are spaced from each other at a distance substantially equal to the thickness of the spring 26 which is inserted therebetween. A suitable block 48 is welded or otherwise secured to the holder 20, preferably being offset laterally in relation to the same, as shown in Fig. 17, and this block is provided with suitable threaded openings to receive the threaded ends 46 of the fastening members. It is thus evident that adjustment of the position of the panel in relation to the spring may be effected by the use of a single tool applied in turn, for example, to the head 45 of each fastening element. Openings 52 preferably are provided in the fastening members for a wire 53 which may extend through these openings and is effective in preventing the accidental turning of the adjustable supporting elements. It is thus evident that means are provided which permit the ready adjustment of the panel in relation to the spring when the same is necessary and which, however, will not loosen from its adjusted position.

At the rear of the pocket 3 a guide 30 of T-section, for example similar to the guide 30 at the front of the pocket, may be arranged. However, the flange 33 of this member is disposed substantially in the plane of the panel to permit the rear of the pocket to be comparatively narrow, especially adjoining the seat portion, so that the width of the latter may be ample. A substantially horizontal leaf spring 60 may be arranged to connect the rear of the panel to the rear guide member 30. For this purpose the end of the spring 60, as shown more particularly in Fig. 7, may be engaged in a box-like retaining member 61 which is welded or otherwise secured to the lower face of the holder 20, a suitable retaining bolt 63 extending through registering openings in the spring and the opposite legs of the member 61. The opposite end of the spring preferably is engaged in a groove 65 in a shoe member 66 having a vertical groove 67 in sliding engagement with the sides and outer edge of flange 33 of member 30. A retaining plate 68 preferably extends across the groove 65 and holds the spring 60 in place, suitable bolts 69 passing through plate 68 and block 66 for this purpose.

As shown, the spring 60 is somewhat longer and has less depth vertically than the front spring 26 and, due to its position in relation to the panel and guideway, the rear spring is mainly subjected to torsional stresses while the front spring is subjected, due to its angular position, to combine bending and torsional stresses. Thus the heavier front spring primarily is effective in positioning the panel, particularly the portion adjoining the upper horizontal edge thereof which is arranged only over the front part of the panel, while the greater flexibility of the rear spring will permit it to conform somewhat to the stress imposed thereon by the adjustment of the front spring in relation to the panel. It is evident that the angular positioning of the front spring in relation to the panel and the disposition of the rear spring in relation to the same permit the springs to cooperate with the members 30 in positioning the panel 7 longitudinally in relation to the vehicle and in preventing any substantial movement of the same about an axis intersecting its plane. On the other hand, since the limited dimensions of the springs 26 and 60 transversely of the vehicle pocket permit their ready flexing in this direction, the panel is adapted to have some freedom of lateral movement.

Front panel 6 preferably is mounted upon springs 26 which engage guideways 30 similar to the arrangement described with reference to the front end of the rear panel. Preferably the front edge of the panel 6 is disposed in a cushioned guideway in the windshield standard assembly 10. Fig. 5 illustrates in detail the arrangement of this assembly which is more particularly disclosed and claimed in my copending application Serial No. 360,105, filed May 3, 1929. As shown in Fig. 6 the windshield panel 70 has an edge engaged in a suitable channel-like standard 71 and the door post 73 has a sheet metal portion extending around the outside and front of the standard, which sheet metal portion is connected to another portion 74 that cooperates therewith in providing the channel for the front edge of panel 6. Preferably the panel engaging portions of the assembly are disposed substantially in alignment with each other in the driver's line of sight so that, as viewed by the driver, one of the same is behind the other in order to permit the windshield standard assembly to afford the minimum obstruction to vision. The dimension marked A designates the effective cross section of the upper part of windshield standard assembly, and the dimensions marked B and C respectively show that a considerable variation in the lateral position of the driver with a corresponding variation in the angle of the line of sight toward the windshield standard does not materially increase the obstruction to vision. The cushioning members 77 and 78 within the door post are adapted to protect the margin of the panel 6 from shock and to permit some change in the angular position of the panel in relation to the door post.

Preferably a body of this character may be provided with a folded top T which may have a main rear shell 80 pivotally connected to main supports 86 which may support any suitable outrigger mechanism; for example, the outrigger assembly may be provided with the plurality of frame members 81 shown in Fig. 3 which are pivotally connected to each other, as designated by numeral 84, to permit the folding of the top. A suitable valance 83, which may be formed of flexible rubber, preferably is carried by the frame members 81 and positioned to engage the raised panel edges. For this purpose the valance may have an inwardly inclined outer face 84 which is so positioned in relation to the panel that the latter will engage the same despite some variation in the position of its upper edge. Preferably the valance carries an integral gutter portion 85 that extends outwardly from the inclined portion 84 so that it may overhang the edge of the raised panel to protect the same from the intrusion of moisture. The valance may be cementitiously secured to the lower portion of the fabric 90 along the side of the top and has suitable supports 92 embedded therein adjoining the intermediate portions of each of the outrigger members 81. Preferably the members 92 may be formed of comparatively heavy wire or a light rod with sections offset in relation to each other to oppose any tendency of the valance to rotate about the longitudinally disposed wire. A plurality of resilient sheet metal supporting elements 94 connected to the offset sections of the wire 92 may be secured to the members 81 by rivets 95 or in any suitable manner. It is thus evident that the valance is so supported that it provides a suitable cushioning

abutment to engage the panel upper edge which is held in resilient engagement with the same by the members 94, while the flexible portions of the valance which are free from reinforcement adjoining the pivots 84 permit the top to be folded if desired.

At the back of the top the overhanging side wall curves downwardly to merge into the gypsy curtain 8; and the valance here passes behind the curtain, having its rear end secured to a depending flap 87 that is stitched to the inside of the curtain and forms a weatherstrip for the upper portion of panel 7. The inclined main support 86 parallels the slanting rear edge of this panel and carries a strip 88 of flexible material cementitiously or otherwise secured thereto, which overlaps the panel edge to provide further protection. Since the gypsy curtain overlaps the lower portion of the panel for a considerable distance and since the side of shell 80 may be disposed adjoining the same, the construction is substantially draft-proof.

Preferably the adjustable connections between springs 26 and the panels are so arranged that the panels are positioned after the general manner disclosed and described in my copending application Serial No. 183,199. In other words, the edges of the panels 6 and 7 are urged into engagement with each other, while the upper edges of both of the panels are pressed inwardly against the valance at least when the front panel is raised. As shown in Fig. 17, suitable resilient members 96 may be disposed in the body wall at each side of the panel yieldably to engage the same. Accordingly the guides 30, if desired, may be so shaped that when the panels are in their lowered position the stress upon the springs is somewhat relieved, the cushioning elements 96 being partially depended upon to hold the panel edges in engagement. However, in any case, when the panels are fully raised, their upper portions tend to be urged more firmly into engagement with each other than the remainder thereof. In other words, there is a tendency to tip the upper portion of each panel toward the adjoining panel.

Due to the arrangement of the front edge of panel 6 in the door post, however, the normal tendency of the panel 6 under the action of springs 26 to be inclined inwardly from its normal position, particularly when both the top and the rear panel are lowered, is opposed by the inner cushioning member 77. Thus the springs 26 supporting the panel are held under stress so that upon raising of the rear panel an appreciable force will be required to impart a slightly greater stress to the springs, whereby a comparatively firm engagement may be provided between the panel edges with a comparatively restrained movement of the edge of the front panel. It is of course evident that the resiliency of the panel 6 and the yieldability of the cushioning members within the door post permit some freedom of movement of its rear edge under the action of the supporting springs but that this action is considerably restrained by the engagement of the panel edge within the channel guideway carried by the door post. Accordingly the movement of the front panel edge is so limited under all conditions that it may readily engage the inclined surface of the valance when raised.

The rear panel may be so disposed in relation to the member 80 of the top, as shown in Fig. 16, that a similar effect occurs. In this figure the full-line showing of the panel designated *s* is that which the panel occupies when the front panel is lowered and the top raised, the springs supporting the rear panel tending to urge it outwardly, but the bow or top support 80 engaging the same and restraining its movement so that as soon as the front panel is raised a comparatively firm engagement is assured between the panel edges, although there is but a limited movement of the rear panel. The position shown in dot and dash lines and designated *r* corresponds to the position of the rear panel when the front panel is raised, it being evident that in this position the upper edge of the panel is pressed firmly against the valance and that in the position marked *s* it is closely juxtaposed to the valance, it being understood, of course, that the angular positions of the panels, as illustrated in Fig. 16, are somewhat exaggerated for clarity of illustration. The dot and dash line position indicated by the symbol *t* in Fig. 16 shows the position of the rear panel when both the top and the front panel are lowered and the springs 26 and 60 are substantially free to act upon the raised panels. Obviously when the top is thus lowered the position of the upper edge of the panel is not material, and when it is raised the panel edge is juxtaposed to the valance so that a substantially wind-tight construction is provided and the awkward appearance that would result from the panel edge being spaced from the valance is positively avoided. It is further evident that when the top is lowered and both of the panels are raised that the panel edges are held in engagement with each other at the position determined by the supporting springs and by the restraint upon the front panel movement imparted by the door post, the exact positioning of the panels under these conditions not being important as long as they are held in mutual engagement.

Due to the possible variation in angular positioning of the panels and in order to avoid undesirable shock to the panel edges, I preferably provide means automatically operable upon opening of the vehicle door whereby one of the panels is so positioned that it may properly reengage the other panel when the door is closed. For this purpose I may provide, as shown in Figs. 11 and 12 for example, an arm 103 upon the end of door 1 extending through an opening 104, Fig. 12, in the body section 2. Preferably this arm carries an actuator 105 that is adapted to engage a cam 106 pivotally connected by a pintle 107 to a bracket 108 carried by the inner wall of the body section. Preferably cam 106 is so shaped that it will be swung to the dotted line position shown in Fig. 11 as soon as the door is opened slightly. A link 109 is connected to the swinging arm and to a pivotally mounted member 110 between the outer wall of the body section and the panel 7. Fig. 15 illustrates the arrangement of this member, which may be pivotally mounted upon brackets 112 secured to the door wall and be arranged to swing about a substantially vertical axis.

Preferably member 110 has a vertical edge extending for substantially the full height of the path of the holder 29 for panel 7 and is adapted to engage a cam 114 which is welded or otherwise secured to the outer face of the holder. Preferably cam 114 is shaped as shown in Fig. 11, having an inclined face 115 which is adapted to permit the panel 7 to move outwardly toward the member 110 when the latter is in its inoperative position, shown in full lines in Fig. 11, while movement of the member 110 to its opera-

tive position, indicated by dotted lines, causes the cam to be engaged to press the panel inwardly away from the adjoining edge of the front panel, thereby putting the springs 26 and 60 under a somewhat greater stress and tilting the front edge of the rear panel to a position which is substantially in parallelism with the rear edge of the front panel so that when the door is closed the edges of the panels are substantially parallel to each other. The surface of cam 114 preferably is provided with a depressed or notched portion 116 which is adapted to engage the edge of member 110 to prevent the latter from returning to its inoperative position as the movement of the door is continued. When the door is closed actuator 103 engages the surface 119 of cam 106 to return the latter to its inoperative position and to snap the member 110 out of engagement with the cam 114, this action taking place substantially as the movement of the door is completed and after the panel edges are in juxtaposition so that these edges are held out of engagement with each other until the movement of the front panel is substantially completed, and thereupon they are positioned in substantial parallelism with each other, having a very limited movement in response to the action of the supporting springs to return them into proper engagement with each other.

It is evident that I have provided means for firmly supporting the closure panels; for example, three sides of the same may be suitably framed or protected by structural parts of the body so that, if desired, only the juxtaposed vertical edges are left unframed to provide a continuous transparent closure wall, and means are provided for properly and accurately positioning the panel edges in relation to the valance so that the panels readily are brought to their proper raised positions under all conditions, and further that means are provided properly to assure the firm engagement of the panels with each other or to vary this engagement, if desired.

I claim:

1. In a vehicle, a body wall comprising two body wall sections each of which provides a pocket, a closure panel movable out of each pocket to a raised position thereabove, said panels having edge portions in mutual engagement, the pockets having openings to permit the engagement of these edge portions when the panels are lowered, resilient means supporting one of the panels and holding its edge in yieldable engagement with that of the other panel, said resilient means comprising a spring connected to the bottom of the corresponding panel, a guide element in the pocket with which the spring is slidably associated, said spring and element being arranged to prevent any substantial longitudinal movement of the panel through the opening.

2. In a vehicle, a body wall comprising two body wall sections each of which provides a pocket, a closure panel movable out of each pocket to a raised position thereabove, said panels having edge portions in mutual engagement, the pockets having openings to permit the engagement of these edge portions when the panels are lowered, resilient means supporting one of the panels and holding its edge in yieldable engagement with that of the other panel, said resilient means comprising a spring connected to the bottom of the corresponding panel, a guide element in the pocket with which the spring is slidably associated, one of said body sections being a door hingedly connected to the other section, and means automatically operable upon opening of the door to impose stress upon the resilient means as the panel edges are separated by the door movement.

3. In a vehicle, a body wall comprising two body wall sections each of which provides a pocket, a closure panel movable out of each pocket to a raised position thereabove, said panels having edge portions in mutual engagement, the pockets having openings to permit the engagement of these edge portions when the panels are lowered, resilient means supporting one of the panels and holding its edge in yieldable engagement with that of the other panel, said resilient means comprising a spring connected to the bottom of the corresponding panel, a guide element in the pocket with which the spring is slidably associated, one of said body sections being a door hingedly connected to the other section, means automatically operable upon opening of the door to impose stress upon the resilient means as the panel edges are separated by the door movement, and locking means to retain the resilient means under stress until the panel edges are returned to juxtaposition upon closing of the door.

4. In a vehicle body, a body wall comprising a door and an adjoining wall section, said door and said wall section each having a pocket therein, a closure panel movable upwardly out of each pocket, a windshield standard assembly adjoining the front of the panel carried by the door, a top having a rear portion adjoining the rear of the panel carried by the other body wall section, the adjoining vertical edges of the closure panels being substantially unframed and in overlapping juxtaposition when the panels are raised, and framing reinforcing substantially all of the remaining perimetric portions of each of the panels.

5. In a vehicle body, a body wall comprising a door and an adjoining wall section, said door and said wall section each having a pocket therein, a closure panel movable upwardly out of each pocket, a windshield standard assembly adjoining the front of the panel carried by the door, the adjoining vertical edges of the closure panels being substantially unframed and in overlapping juxtaposition when the panels are raised, the front portion of the front panel being disposed in engagement with the windshield standard assembly, and resilient means supporting the lower portion of the front panel and urging juxtaposed panel edge portions into firm engagement with each other when both the panels are raised, the engagement of the front panel with the windshield standard assembly being effective in maintaining this resilient means under stress when the front panel is raised and the rear panel is lowered.

6. In a vehicle body, a body wall comprising a door and an adjoining wall section, said door and said wall section each having a pocket therein, a closure panel movable upwardly out of each pocket, a windshield standard assembly adjoining the front of the panel carried by the door, a top having a rear portion adjoining the rear of the panel carried by the other body wall section, the adjoining vertical edges of the closure panels being substantially unframed and in overlapping juxtaposition when the panels are raised, the front portion of the front panel being disposed in engagement with the windshield standard assembly and the rear of the other closure panel being engageable with the side of the top, and resilient means supporting the rear panel and urging the juxtaposed panel edges into firm engagement with each other when both of the panels are

raised, the rear panel engaging the side of the top and thus holding the resilient means under stress when the rear panel is raised and the front panel is lowered.

7. In a vehicle body, a body wall comprising a door and an adjoining wall section, said door and said wall section each having a pocket therein, a closure panel movable upwardly out of each pocket, a windshield standard assembly adjoining the front of the panel carried by the door, a top having a rear portion adjoining the rear of the panel carried by the other body wall section, the adjoining vertical edges of the closure panels being substantially unframed and in overlapping juxtaposition when the panels are raised, resilient means supporting one of said panels and urging its edge, when raised, into firm engagement with the edge of the other raised panel, a valance extending along the side of the top and engageable by the panels when both of the same are raised, and means maintaining the resilient means under stress when the other panel is lowered in order to hold the raised panel in substantially the same relation to the valance.

8. In a vehicle body, a plurality of body wall sections, each of said sections providing a pocket, a closure panel movable out of a concealed position within each pocket to a raised position thereabove wherein the closure panels form a closure wall, a top comprising jointed outrigger portions, a valance carried by the top, said valance being formed of flexible material whereby it permits the folding of the outrigger section of the top, and stiff reinforcing means for the valance adjoining the intermediate parts of each of the outrigger portions and connected thereto, the valance between these portions being free from rigid reinforcement whereby it may flex upon the folding of the top.

9. In a vehicle body, a swinging door section, an adjoining body section, a pocket in each of said sections, a closure panel movable upwardly out of each pocket into juxtaposition to the adjoining panel, resilient means supporting the lower portion of at least one of said panels and holding the the juxtaposed edges of the panels in firm engagement when raised, said resilient means tending to cause the inclination of the panel edge from the position occupied in engagement with the adjoining panel when the door is open, and means operable upon the opening of the door to restrain the panel edge from assuming such an inclined position whereby upon closing the panel edges may be brought into proper juxtaposition to each other.

10. In a vehicle body, a swinging door section, an adjoining body section, a pocket in each of said sections, a closure panel movable upwardly out of each pocket into juxtaposition to the adjoining panel, resilient means supporting the lower portion of at least one of said panels to hold the juxtaposed edges of the panels in firm engagement when raised, said resilient means tending to cause the inclination of the panel edge from the position occupied in engagement with the adjoining panel when the door is open, means operable upon the opening of the door to prevent the panel edge from assuming such an inclined position whereby upon closing the panel edges may be brought into proper juxtaposition to each other, said means comprising a member extending from one of the body sections into the pocket in the other body section, cam means, said means being operable upon the relative movement between said member and the body section into which it extends, linkage operable by the cam means, and a movable member operatively connected to the linkage, said member engaging an element carried by the panel to restrain the effect of the resilient means thereon while the door is open.

11. In a vehicle body, a body wall, a closure panel movable from a concealed position within the body wall to a raised position thereabove, and means to support the panel in a plurality of intermediate positions, the body portion of the panel being formed of glass, the upper edge of the glass having a transverse curvature, and a sheet metal reinforcing strip transversely curved and secured to the upper edge of the panel, whereby when the panel is in an intermediate position the reinforcement affords little obstruction to the vision of the occupants of the vehicle.

12. In a vehicle body, a body wall having a pocket therein, a closure panel, resilient means supporting the lower end of the panel, said resilient means comprising a leaf spring, guide means engaging one end of the spring, the other end of the spring being connected to the panel, said spring being inclined at a substantial angle whereby lateral movement of the panel causes a combined bending and twisting stress upon the spring.

13. In a vehicle body, a body wall having a pocket therein, a closure panel, resilient means supporting the lower end of the panel, said resilient means comprising a leaf spring, guide means engaging one end of the spring, the other end of the spring being connected to the panel, said spring being inclined at a substantial angle, whereby lateral movement of the panel causes a combined bending and twisting stress upon the spring, the guide means at the end of the pocket being associated with the spring to prevent movement of the spring toward the end of the pocket, whereby the stiffness of the spring in a longitudinal direction and its association with the supporting means serves to prevent substantial longitudinal movement of the panel in one direction.

14. In a vehicle body, a door, a closure panel movable out of a substantially concealed position within the door to a raised position thereabove, an opening in one end of the door permitting the engagement of the panel with the edge of an adjoining panel, said opening having a vertical depth substantially equal to that of the panel, a lifter to move the panel from its lowered to its raised position, a door frame member extending longitudinally of the door upon which the lifter is mounted, a longitudinal frame member extending along the lower part of the door, and a strut connecting said longitudinal members between the lifter and the end of the door provided with the aforesaid opening.

15. In a vehicle body, two body wall sections providing pockets, a closure panel movable out of each of said pockets to a raised position wherein it engages the adjoining raised panel to form a substantially continuous closure wall, structural portions of the body extending upwardly adjoining the remote ends of said panels, resilient means urging each panel transversely into firm engagement with the edge of the other panel when both are raised, the aforesaid structural parts of the body being arranged to hold the resilient means under stress when one panel is raised and the other panel is not raised.

16. A vehicle body comprising a body wall including a plurality of sections, one of said sections being a door, said door and an adjacent section each providing a pocket, a closure panel

movable out of each of said pockets to a raised position thereabove the panels in their raised positions having their edges in direct overlapping juxtaposition, a spring, means connecting said spring to a panel, means connecting said spring to the body wall section, said spring tending to urge the panel with which it is connected in a lateral direction against the overlapping edge of the adjoining panel, one of said means being adjustable to vary the force with which the spring holds the panel edges together.

17. A vehicle body comprising a body wall including a plurality of sections, one of said sections being a door, said door and an adjacent section each providing a pocket, a closure panel movable out of each of said pockets to a raised position thereabove, the panels in their raised positions having their edges in direct overlapping juxtaposition, a spring, means connecting said spring to a panel, means connecting said spring to the body wall section, said spring tending to urge the panel with which it is connected in a lateral direction against the overlapping edge of the adjoining panel, one of said means being adjustable to vary the pressures between the upper and the lower parts of the overlapping panel edges.

18. A vehicle body comprising a body wall including a plurality of sections, one of said sections being a door, said door and an adjacent section each providing a pocket, a closure panel movable out of each of said pockets to a raised position thereabove, the panels in their raised positions having their edges in direct overlapping juxtaposition, a spring means connecting said spring to a panel, means connecting said spring to the body wall section, said spring tending to urge the panel with which it is connected in a lateral direction against the overlapping edge of the adjoining panel, said last-named means being slidably engageable with a fixed part mounted within the pocket, said first-named means including an adjustable part for varying the position of the panel laterally in relation to the body wall.

19. A vehicle body comprising a body wall including a plurality of sections, one of said sections being a door, said door and an adjacent section each providing a pocket, a closure panel movable out of each of said pockets to a raised position thereabove, the panels in their raised positions having their edges in direct overlapping juxtaposition, a spring, means connecting said spring to a panel, means connecting said spring to the body wall section, said spring tending to urge the panel with which it is connected in a lateral direction against the overlapping edge of the adjoining panel, said last-named means being slidably engageable with a fixed part mounted within the pocket, said first-named means including cooperating parts at least one of which is adjustable to vary the angle to the vehicle wall to which the spring tends to urge the panel.

R. L. CARR.