A. F. KLEINSCHMIDT.

EXTENSIBLE AUTOMOBILE DOOR.

APPLICATION FILED MAY 17, 1918.

1,325,790. Patented Dec. 23, 1919.

Fig. 1.

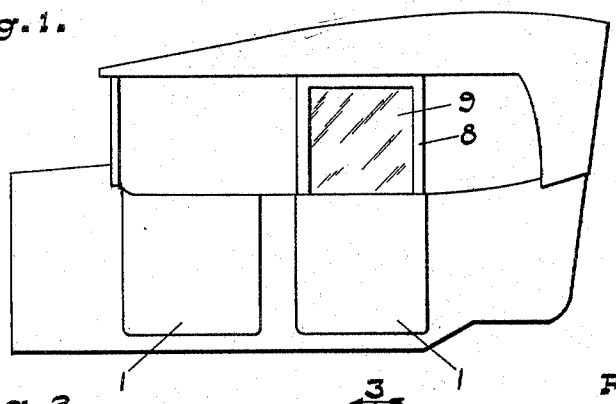


Fig. 2.

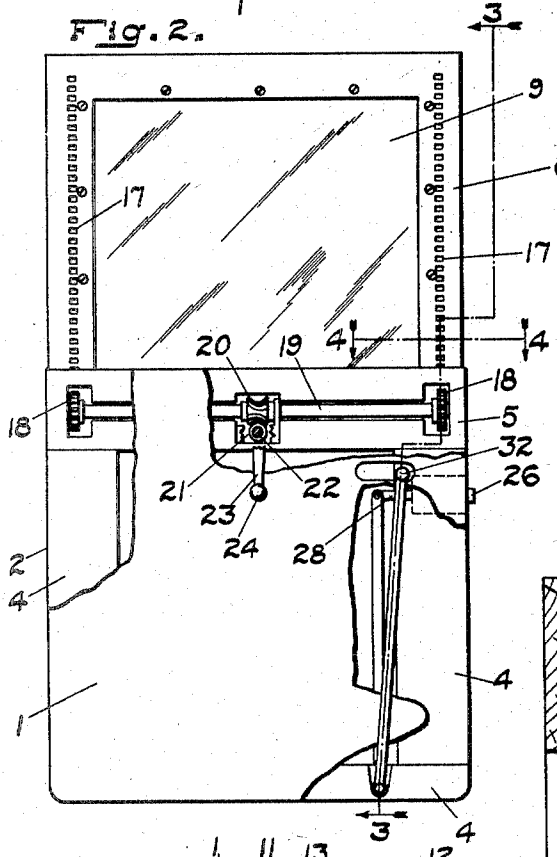


Fig. 3.

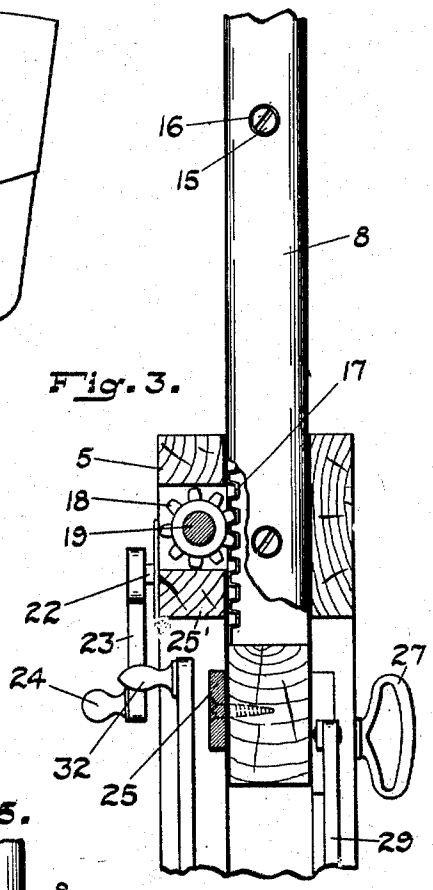
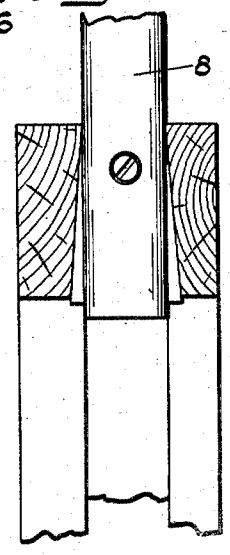


Fig. 5.



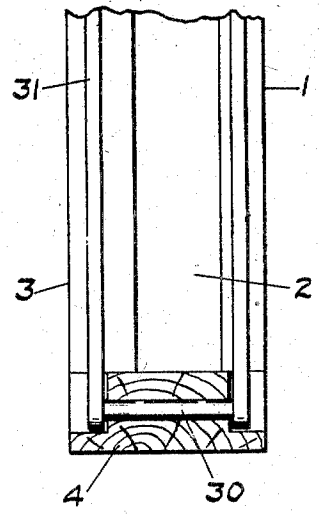
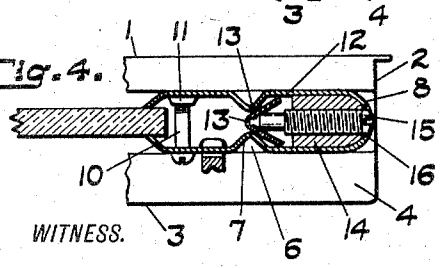


Fig. 4.



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EXTENSIBLE AUTOMOBILE-DOOR.

1,325,790. Specification of Letters Patent. Patented Dec. 23, 1919.

Application filed May 17, 1918. Serial No. 235,121.

To all whom it may concern:

Be it known that I, ANTHONY F. KLEINSCHMIDT, a citizen of the United States, residing at Indianapolis, Marion county, and State of Indiana, have invented and discovered certain new and useful Improvements in Extensible Automobile-Doors, of which the following is a specification.

My invention relates to automobile doors. The object of the invention is to provide a door having a sliding section therein. The door is particularly adapted for use in connection with automobiles having touring bodies in which a sash is adapted to take the place of the usual curtain employed therein, although the invention is also applicable to cars having convertible tops or closed bodies. Other objects are to provide a door of this character in which the smooth exterior surface of the door body shall be preserved and in which the sash is effectively concealed and protected when lowered; to provide a door, which, when the sash is elevated to closing position, will present the appearance of being formed in one piece; to provide effective means for raising and lowering the sash and for holding it fixed at any desired height by means of the operating mechanism therefor, and without the use of auxiliary catches; to provide an effective and easily operated latch handle cooperating with the hollow door and the sliding sash therein, and to provide means whereby the sash frame may be effectively engaged with the sash and at the same time said frame may be adjusted to fit the guiding surfaces of the door between which it travels, thereby enabling proper compensation to be obtained for the wear and looseness occasioned by the shocks and jars to which an automobile door is subjected in usage.

With these objects in view, my invention is embodied in preferable form in the arrangement and construction hereinafter described and illustrated in the accompanying drawings.

In these drawings, Figure 1 is a side view in elevation of an automobile door partly broken away; Fig. 2, a vertical section at right angles to Fig. 1; Fig. 3, an enlarged vertical section of the latch operating handle; Fig. 4, a detail horizontal section on the line 4—4 of Fig. 1, and Fig. 5, a detail cross section showing a modified construction of stop means for the sash.

Referring to the drawings, 1 indicates the front panel of the body of the door which body is made hollow to receive the vertically sliding window sash. Secured to this panel along each vertical side edge, or formed integral therewith, if desired, are rearwardly extending side flanges 2, to which is removably secured a panel 3 constituting the rear wall of the door. This rear wall is spaced from the front wall of the door to provide the chamber in which the sash moves. The walls are provided with border strips 4, projecting inwardly from the outer panel along the bottom and two vertical sides thereof, and a similar border strip 5, extending along the upper edge of the panel, which latter border strip provides also a housing and journal bearing for the operating shaft of the door raising and lowering mechanism.

Secured on the opposing inner faces of the front and rear panels of the doors and along the border strips of said panels are vertical guide rails 6, preferably V-shaped with which are adapted to engage complementarily shaped grooves 7 formed in the sheet metal frame 8 which is adapted to carry the glass window pane, 9. The sash moves up and down on these guide rails and at its outer edges is held between and guided by the inwardly projecting side flanges 2 of the panel 1.

The sash frame is preferably formed of a single sheet of metal, U-shape in cross section, and its inner edges are engaged with the pane by a clamping pressure exerted against the same through screws 10 which pass through one section of the frame and into screw-threaded holes in bosses 11 formed on the other section whereby the same is clamped within the frame by the compression of the latter against the glass. The V-shaped grooves of the frame serve to divide the latter into an inner compressible or clamping section as above described and an inner expansion section 12. This outer section of the hollow frame is adapted to be expanded or contracted to cause it to properly fit the guide rails carried by the inner and outer panels so as to both provide such a free engagement as will enable the sash to move readily and at the same time

prevent rattling of the sash. The extent of such expansion or contraction of the frame may be determined by adjusting means consisting in the embodiment herein illustrated of V-shaped wedging members 13 mounted within the frame and extending along the vertical and horizontal portions thereof. These wedges are adapted to bear against the inwardly inclined inner walls 13 formed by the depressed grooves in the frame and are mounted in the chambers 12. In said chambers are also mounted in such manner as to be held fixedly by the walls of the chamber, longitudinal blocks or pressure member carriers 14, the inner edges of which enter the V-shaped wedges. Through these blocks or strips are adapted to extend screws 15 the inner ends of which are adapted to bear against wedges 13 and the heads of which screws are exposed along the outer borders of the frame by means of openings 16 adapted to permit the insertion of a screw driver to engage the screw. When these screws are screwed inwardly their ends will bear against the V-shaped wedges 13, and force the latter against the inclined inner walls of the chamber 12, thus expanding the wall of said chamber and increasing the cross sectional projection thereof so as to cause the frame to more closely approach the opposing walls of the inner and outer panels of the door and carry the grooves into closer contact with the rails. The pressure is correspondingly reduced by retracting the adjusting screws.

Formed in the outer face of each inner vertical section of the sash frame are rack teeth 17 with which are adapted to engage respectively pinions 18 carried at the opposite ends of a rotatable shaft 19 which is journaled in the housing member 5 of the front panel. This shaft is adapted to be operated by mechanism capable of automatically retaining the sash in any position of elevation to which it may be adjusted. The mechanism here illustrated, and preferably employed, consists of a worm gear 20 fixed on the shaft and adapted to be engaged by a worm 21 carried on the end of a stud shaft 22 extending through the front panel and having on the outer end thereof outside of said panel a crank 23 carrying a handle 24 whereby the worm may be turned so as to rotate the shaft and thus through the engagement of the rack and pinion elevate or lower the sash with respect to the door. A stop 25 is provided to limit the upward movement of the sash and is adapted to engage the bottom rail 25′ of the frame. In touring bodies, the sides of the sash frame have no support when the latter is in elevated position, but the support obtained from the engagement of the frame with the walls of the door and the guide rail is sufficient to hold the sash in an elevated position. When used with a closed body or convertible top the sides of the sash may engage the usual posts or rigid frame of the body. Owing to the fact that the borders of the sash frame are in substantial continuation of the vertical borders of the door the construction presents the appearance of a one piece door when the sash is elevated. The sash is held automatically in any desired position by the worm and worm gear thus avoiding the necessity of using additional catch means.

The door is provided with a latch 26 adapted to be operated from the outside by a handle 27 of ordinary construction and from the interior by a U-shaped handle which passes down within the door under the space adapted to be occupied by the sash. This inner handle comprises a latch bolt connected member 28, an outer vertical lever 29, a horizontal rocking shaft 30 below the level of the sash, and an inner vertical lever 31 fixed on the rocking shaft and carrying at its upper end a handle 32. By this arrangement the latch may be operated from the inside without interference with the sash.

In Fig. 5, a construction is shown in which the lower sash rail and the upper door body rails are wedge shaped, thus providing means for limiting the upward movement of the sash and also increasing the firmness of support of the sash frame by the door.

Having thus described my invention, what I claim is:

1. An extensible automobile door having a hollow body, a window therein comprising glass and a metal sash mounted therein and adapted to be projected above said hollow body, said body being provided with guiding surfaces for the frame of said sash, and means for adjusting the sides of said sash toward and from the guiding surfaces to regulate the sliding fit thereof, substantially as set forth.

2. An extensible automobile door having a hollow body, a vertically slidable sash therein, a frame for said sash, guiding surfaces in said body between which said frame is adapted to slide, and means for contracting or expanding said frame to adjust it to said guiding surfaces.

3. An extensible automobile door having a hollow body, a sash movable vertically therein and formed expansible and contractible at both edges, wedge within said frame adapted to adjust the same in relation to the walls of the body, means for operating the wedge, and means for adjustably clamping the inner edge of the sash to the glass, substantially as set forth.

4. In an extensible automobile door, in combination with a hollow body, a sash vertically slidable therein, a frame for said sash having means for clamping the pane of the sash by pressure, means for exerting the

clamping pressure, said frame having body fitting border portions expansible and contractible, and separate means for expanding said portion toward the opposite parts of the said body.

5. An extensible automobile door having a hollow body, a sash movable therein having a frame provided with vertical slide grooves, vertical rails on said body shaped to engage said grooves, said frame being provided with pressure means to clamp the glass, and separate means for expanding or contracting said frame to adapt it for a close fit within said body to prevent rattling of the sash.

6. An automobile door comprising a hollow body, a sash mounted to slide vertically in said body, and consisting of a pair of vertically disposed members adapted to clamp the window pane in one edge and be expanded and contracted to fit the slideway in the body at its other edge, means for adjusting the parts of said sash at its pane clamping edge, and separate means for expanding and contracting its other edge, substantially as set forth.

7. In an automobile door, the combination of a hollow door body, a sliding window in said body, said window comprising a pane and a sash, the sash being formed of a pair of members adapted to clamp the pane at their inner edges and fit the slideways in the body at their outer edges, each member being formed with a vertical V-shaped ridge intermediate its edges, a wedge adapted to operate between said ridges, and means for operating said wedge, substantially as set forth.

In witness whereof I have hereunto set my hand and seal at San Francisco, California, this 30th day of April, A. D. nineteen hundred and eighteen.

ANTHONY F. KLEINSCHMIDT. [L. S.]

Witnesses:

D. M. HANSEN,

GERTRUDE C. LYTHGOE.