To all whom it may concern:

Be it known that I, Georges Haarnagell, a citizen of the Republic of France, residing at Paris, 26 Rue Duret, France, have invented certain new and useful Improvements in Vehicle-Door Windows, of which the following is a specification.

My invention relates to means for opening and closing the windows of automobile doors particularly applicable to automobiles of the landau type in which the doors are unprovided with upper supports, in order to maintain the windows in the raised or closed position. The present means is based on an arrangement of window slides engaging one inside the other during the action of the window in combination with springs, which arrangement provides all the desired rigidity necessary to avoid accidental opening of the window due to vibrations or shocks during the running of the vehicle.

Reference is made to the accompanying drawings which show by way of example a constructional form in accordance with the present invention.

Figure 1 is a cross section of a construction in accordance with the present invention, the window and the window sides not being shown.

Figure 2 is a section of the door complete, the window being shown in the lowered position.

Figure 3 shows the door with the window raised.

Figure 4 is a detail elevation of the window slides.

Figure 5 is a similar view of the same at right angles to Figure 4.

Figure 6 is a similar view of the same at right angles to Figure 5.

Figure 7 is a detail sectional view on the plane indicated by the line 7—7 of Figure 4.

Figure 8 is a detail elevation of the window and its connections.

Figure 9 is a detail sectional view showing the cam i and the cooperating spring c, the view in this figure being in the opposite direction to that in Figures 1 to 3.

Referring first to Figures 1 to 3, it will be seen that the door has no upper frame or support to guide the window when the latter is raised. The door a, the subject of the present invention, is formed in such a manner as to present throughout its height and on the internal sides a large space M at one end of which is fixed a plate b.

The plate b is secured by screws to the upper part of the door and is shaped or provided with grooves and recesses to support a plate spring e which facilitates the action of the window slides e, e', e" secured at d by a pivot and a helical spring f, on a rod g assisting to maintain the immobility of the window when in the closed position.

The window slides e, e', e", Figures 4, 5 and 6 and Figure 7 are formed to slide one inside the other in order to follow the displacement of the window G, which is fixed to the head of each window slide e' by angle irons h secured to each side of the metallic framing of the window.

The development of the members e, e', and e" is obtained in the following way: The member e is fixed at d. The member e" is fixed on the glass. When the glass is lifted the member e" goes with the same and takes along by means of the projection s the member e', which has a projection n. Hence the member e" occupies the highest point for the development.

The fixed window slide e which is pivotally secured at d, carries a cam i which is disposed in the recess E and acts on the spring e permit of the window slides os oscillating about d in the recesses of the door, when the window is lowered or raised.

The oscillation in question takes place about the point d. It is a very slight oscillation just sufficient to avoid a collision in the development of the pieces e, e', e". This oscillation is caused by the action of the blade spring c against the cam i which is secured to the part e near the point d of pivot Fixation. When the stretchers e, e', e" are fixed at d on the carrier, the cam i is lodged in the groove E and against this cam the spring c acts. The structure is therefore a detail of mounting which renders the entire operation very smooth and which assures the glass to rest fixedly when it has been raised by causing the lower portion of the glass to engage the flange r of the carrier.

The window G is disposed between the sides of the door and slides against the edge R of the recesses M, being guided in such movement by the guides f provided at the lower ends of the window frame of the glass and extending downwardly therefrom.
When the window is lowered, as shown in Figure 2, if the strap S be pulled in order to raise the window to the position shown in Figure 3, the window in rising takes with it the window slides e1 and e2, which slide one in the other, by means of the catches k engaging in the slots f of the window frame and catches m acting on the stops n of the window slides e1, the catches k and m being both rigid with the window slides e1. Each of the stretcher members e2 has one of the catches k. Catches or paws k enter into the slots or grooves l of the frame for the glass. The glass is therefore united with the stretchers at the points h and k of the part e2. These paws k may leave, however, the groove f somewhat during the movements of lowering and raising the glass. The window slides being thus raised to the upper part of the door, the stops o of the window slide e1 come into contact with the rods g of the springs f compressing the latter, and the ledge of the window becomes engaged by the bearer p of the door. The immovability of the glass G is assured by the spring F when the glass is raised. (Figure 3). In this position of the glass the stretchers e, e1, e2, are developed and the stop o having entered in the lower gap of the plate b has compressed the spring f by acting on the rod g. As long as the stop o is engaged in this slot the spring is compressed. The opposite action which has a tendency to force the compressed spring against the stop o assures the immovability of the glass when it rests, by means of its flange r on the carriage b.

In order to open the window, it is only necessary to disengage the ledge r from the bearer p by acting on the strap S; the spring f expands, the window slides re-engage under the weight of the window and extend themselves to the lower part of the door so as to follow the displacements of the window.

In order to bring the window to an intermediate position the strap is provided as usual with button holes capable of engaging a button fixed at any convenient point on the inside face of the door.

What I claim is:

1. A door having recesses, a vertically movable window having guides at the lower end engaging in said recesses, telescopically related slides on one side of the window, one slide member being pivotally fixed at its upper end to the window to move therewith and said slide members having means to cause them to successively move with the window, a spring arranged in the door at one side of the path of movement of the slide, and a cam on one of the slide members to cooperate with said spring and prevent casual lateral movement of the window and slides.

2. A door having a recess therein open at the top of the door, a window movable vertically in said recess and through said opening, telescopically related slides one of which contacts with said window in the raising of the latter, said slides having means to cause successive movements thereof when the first is operated, means to secure the lower side of the window when same is raised, and yieldable means arranged to exert downward thrust on one of the slides when the window is raised to cushion the same and prevent casual upward movement of the window.

In testimony whereof I affix my signature.

GEORGES HAARNAGELL.