

Aug. 11, 1942.

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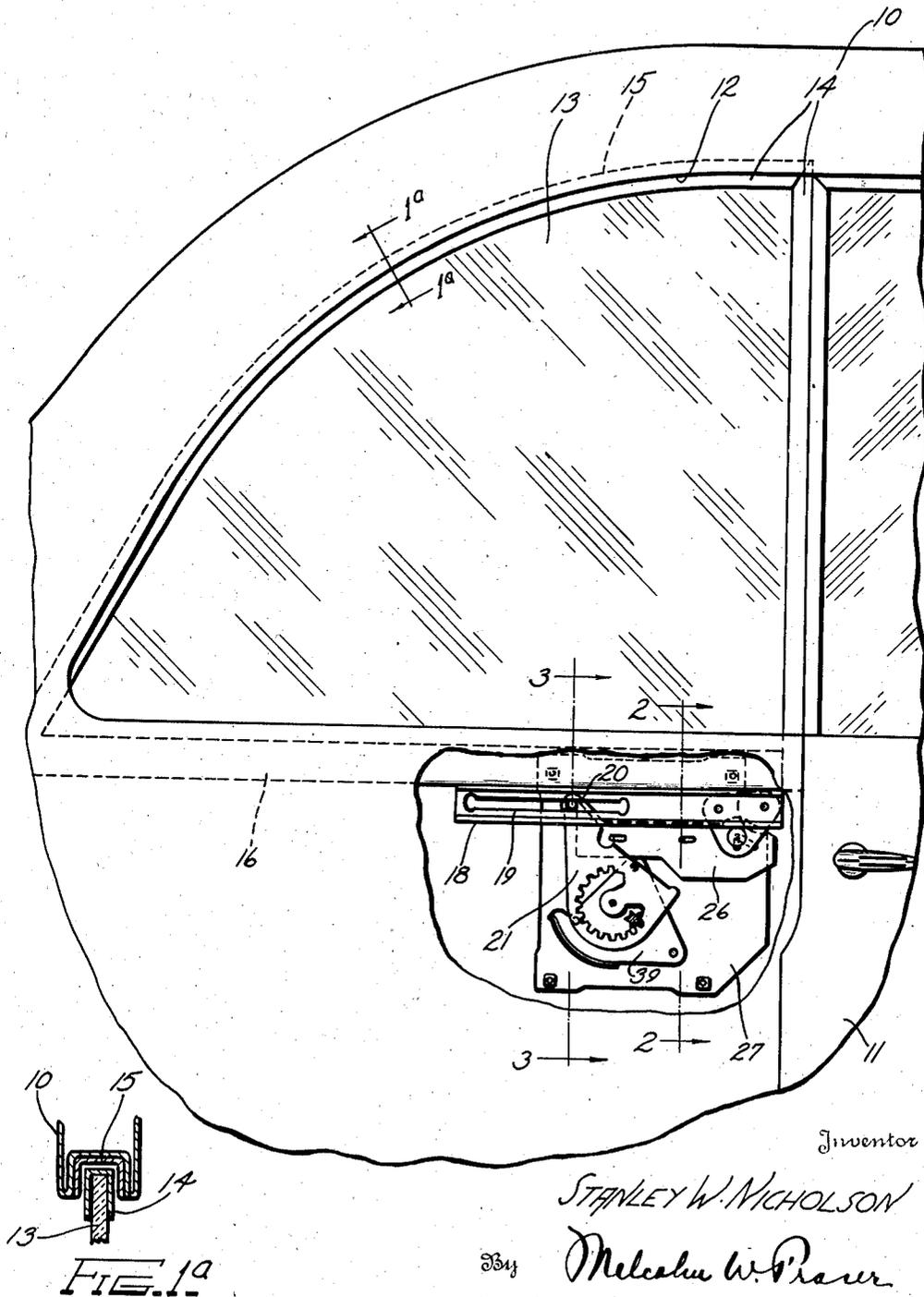
2,292,964

WINDOW REGULATOR

Filed Nov. 2, 1940

3 Sheets-Sheet 1

FIG. 1.



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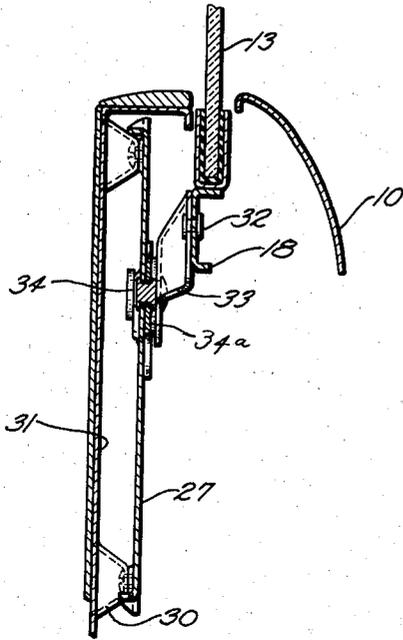


FIG. 2.

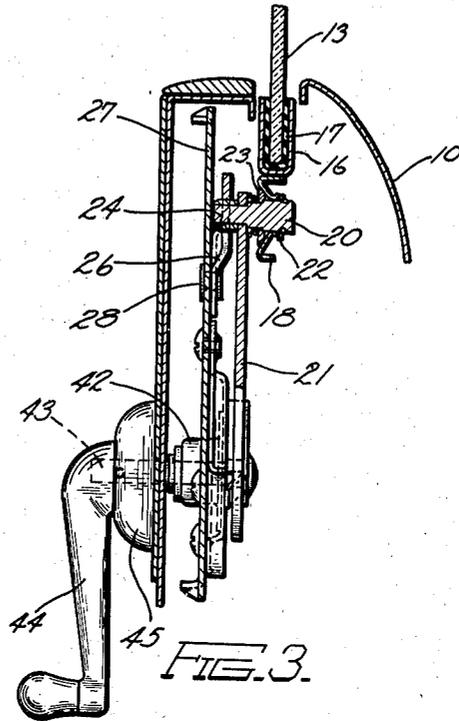


FIG. 3.

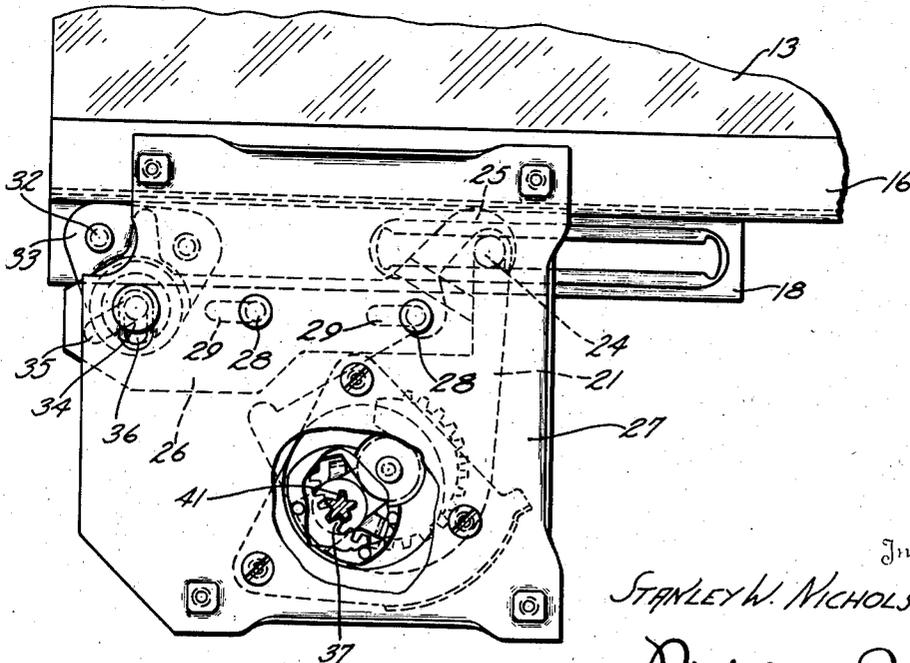


FIG. 4.

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3 Sheets-Sheet 3

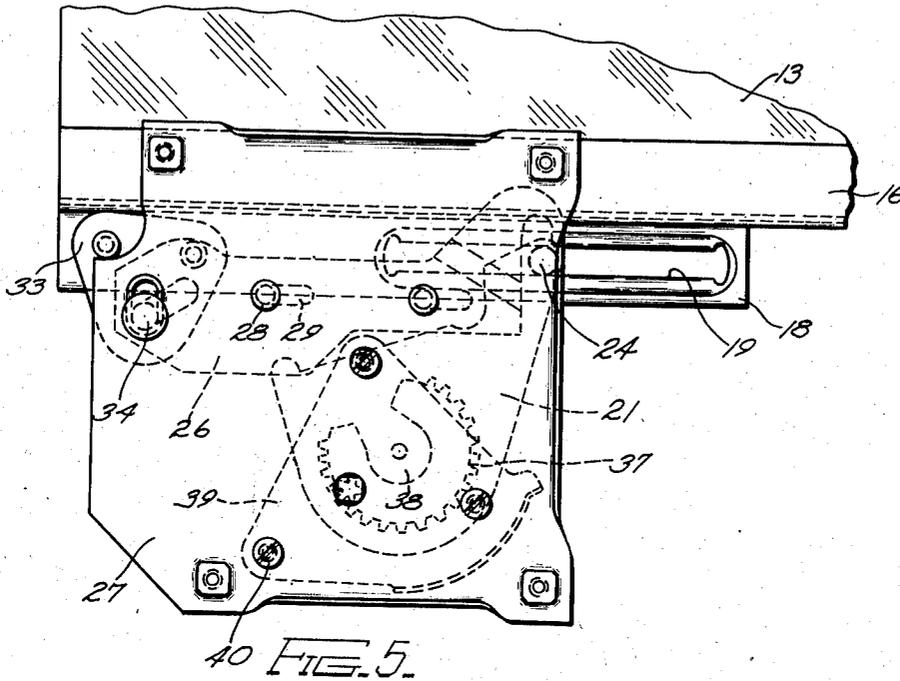


FIG. 5.

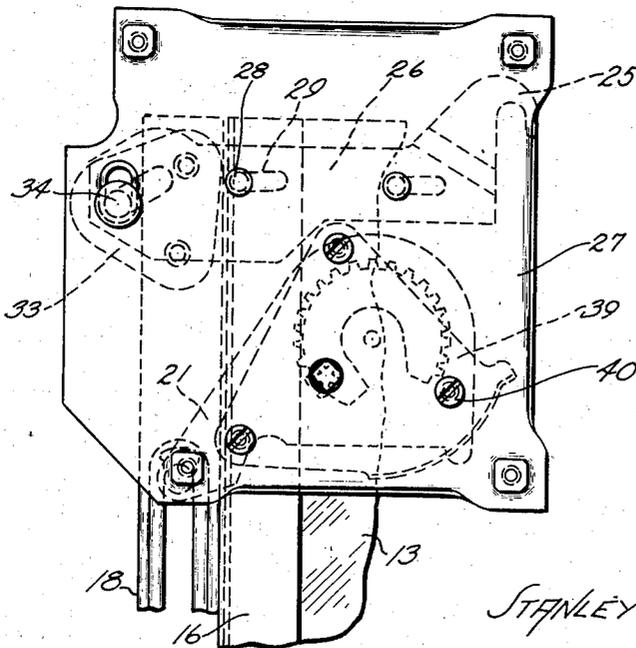


FIG. 6.

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UNITED STATES PATENT OFFICE

2,292,964

WINDOW REGULATOR

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Application November 2, 1940, Serial No. 363,969

6 Claims. (Cl. 268—122)

This invention relates to vehicle window regulators but more particularly to a regulator for actuating an automobile window such as a rear quarter window, to cover and uncover the window opening.

An object is to produce a window regulator by which the window is first shifted relative to the window guides into which edge portions of the window enter when the window is in closed position, and subsequently rocked for uncovering the window opening.

Another object is to produce a vehicle window regulator by which the window is first rectilinearly shifted to cause it to clear the window guides or channels and subsequently rocked in a curvilinear path to its open position.

A further object is to produce a simple and efficient window regulator mechanism having the new and improved features of construction, arrangement and operation hereinafter described.

For purposes of illustration but not of limitation, an embodiment of the invention is shown on the accompanying drawings in which

Figure 1 is a fragmentary side elevation of the rear end portion of an automobile, parts being broken away to show the regulator mechanism;

Figure 1a is an enlarged sectional view on the line 1a—1a of Figure 1;

Figure 2 is an enlarged vertical sectional elevation on the line 2—2 of Figure 1;

Figure 3 is an enlarged vertical sectional elevation on the line 3—3 of Figure 1;

Figure 4 is an enlarged side elevation of the window regulator mechanism viewed from the inside of the body, showing a portion of the window panel, a part of the main plate being broken away to show details of the regulator arm and associated parts, the parts being disposed in the position assumed when the windows is in its fully raised or closed position;

Figure 5 is a view similar to Figure 4 showing the position of the parts after the window panel has been rectilinearly shifted or moved away from the edge engaging channels or guides; and

Figure 6 is a view similar to Figures 4 and 5 but showing the position assumed when the window panel is in its fully lowered or fully opened position.

The illustrated embodiment of the invention comprises an automobile body 10 having a side door 11 in rear of which is a window opening 12 commonly referred to as the rear quarter window opening which is generally in the shape of a quadrant having two straight sides and a generally arcuate side. Adapted to cover and uncover the window opening 12 is a window panel or glass 13, two of the edges of which are enclosed in a frame 14 and the curved portion of the frame is adapted to fit into a channel or guide 15 for sealing purposes. Secured to the

lower edge of the window panel 13 is a U-shaped channel member 16 which embraces the lower edge portion of the panel and has a strip of felt or other similar material 17 positioned between the channel and the panel. Suitably secured as by welding, to the underside of the channel 16 is a retainer 18. The retainer 18 has its right-hand edge abutting the adjacent frame portion 14 and the opposite end terminates near the central portion of the channel 16. At the left-hand end portion of the retainer 18 (Figure 1), is an elongate guide slot 19, the longitudinal edges of which are outwardly embossed (Figure 3) and a pin 20 which is secured to a swinging arm 21 is adapted to ride along the slot 19.

As shown, a wire band 22 on the pin 20 is disposed on one side of the guide slot 19 and cooperates with a spring pressed washer 23 on the other side of the retainer for holding the parts in place against rattling. An opposite end portion 24 of the pin 20 projects on the opposite side of the regulator arm 21 to engage recurrently a hooked end portion 25 of a slide plate 26 as will hereinafter appear. The slide plate 26 is mounted to slide horizontally upon a main supporting plate 27 and for that purpose a pair of headed rivets 28 carried by the main plate 27 project through horizontally elongate slots 29 in the slide plate 26. The main supporting plate 27, as shown on Figure 2, is suitably secured by screws to outwardly pressed bosses 30 formed on the supporting panel 31 of the automobile body.

Secured to one end of the retainer 18, as by rivets 32, is a bracket 33 which carries a headed pin 34. The pin 34 extends through a vertically disposed diagonal slot 35 in the slide plate 26, the right-hand end portion of the slot being uppermost and the left-hand edge of the slot being lowermost (Figure 4). The pin 34 also extends through a vertically elongate slot 36 formed in the main plate 27. Mounted on the pin 34 and interposed between the bracket 33 and slide plate 26 is a spring washer 34a which holds the slide in the adjusted position.

From the above description and by referring particularly to Figures 4 to 6, it will be apparent that when the regulator arm 21 is rocked or swung in a clockwise direction, the pin 24 on the outer end of the regulator arm engages the hooked end portion 25 of the slide plate 26 and causes the plate 26 to move to the right. This movement of the slide plate 26 causes the window panel 13 to move downwardly because of the pin 34 riding in the slots 35 and 36, the edge of the slot 35 operating as a cam to force the pin 34 downwardly in the slot 36 to the position indicated on Figure 5. Since the pin 34 is fixed to the bracket 33 which in turn is carried by the window panel 13, it will be manifest that the

latter is caused to shift rectilinearly a distance sufficient for the window or its frame 14 to be moved substantially clear of the channel or guide 15. It will be understood that the above shifting movement of the slide plate 26 to the right is limited by the length of the slots 29 and substantially upon the completion of this movement, the pin 24 on the regulator arm 21 will have moved clear of the hook 25 and continue its movement along the guideway 19 in the retainer 18. Such continued swinging movement of the regulator arm 21 in a clockwise direction will cause the window panel 13 to swing to the right and downwardly about the pin 34 as an axis. Manifestly by swinging the regulator arm 21 in the opposite direction or in a counterclockwise direction, the window panel 13 will first be rocked or swung upwardly to cover the window opening 12 and thereafter the sliding movement of the slide plate 26 to the left of Figures 4 to 6 will impart upward rectilinear shifting movement to the window panel to move the edge portions thereof into the guide or panel 15 to effect a satisfactory seal.

Swinging movement may be imparted to the regulator arm 21 in any desired manner. In this instance the arm is in the shape of a sector and is formed with an arcuate series of internal teeth 37, a projection 38 providing the pivotal mounting of the arm to the regulator mounting plate 39. The plate 39 is suitably secured by screws 40 to the main plate 27. Meshing with the internal teeth 37 is a pinion 41 which forms a part of a clutch assembly 42, the latter having a squared shaft 43 to receive a crank handle 44. An escutcheon 45 is disposed between the handle 44 and the inside panel of the body. The spring clutch 42 is well known to those skilled in this art and forms no part of the present invention. Suffice it to say that the clutch or brake serves to retain the arm 21 in the position of adjustment. One form of clutch of this character is shown and described in the patent to Floraday No. 1,985,655, dated December 25, 1934.

From the above description it will be apparent that by rotating the handle 44 in one direction, the regulator arm 21 may be moved in such manner as to shift the window panel 13 downwardly or rectilinearly to move the edge portions thereof sufficiently away from the channel or guide 15 to enable it subsequently to be swung or rocked downwardly about the pin 34 as an axis. The window may be stopped in any intermediate position and will be held in the adjusted position by means of the clutch or brake mechanism 42 above mentioned. The rotation of the crank handle 44 in the opposite direction will first rock or swing the window panel 13 upwardly into position adjacent the channel 15 and continued movement of the handle will shift the window panel into sealing engagement with the channel.

It is to be understood that numerous changes in details of construction, arrangement and operation may be effected without departing from the spirit of the invention especially as defined in the appended claims.

What I claim is:

1. Regulator mechanism for a vehicle window mounted for curvilinear movements to and from closed position, said mechanism comprising means for initially imparting a shifting movement rectilinearly to the window, and means for

subsequently imparting a curvilinear movement to the window causing movement thereof toward open position.

2. Regulator mechanism for a vehicle window mounted for curvilinear movements to and from closed position, said mechanism comprising means for initially imparting a shifting movement rectilinearly to the window, means for subsequently imparting a curvilinear movement to the window causing movement thereof toward open position, and an operator common to said means for successively actuating same.

3. Regulator mechanism for a vehicle window mounted for curvilinear movements to and from closed position, said mechanism comprising means for initially imparting a shifting movement rectilinearly to the window, means for subsequently imparting a curvilinear movement to the window causing movement thereof toward open position, and a rotary crank handle operatively connected for successively rendering said means effective.

4. The combination of a vehicle window, guides for receiving edge portions of said window, a retainer carried by an edge portion of the window and having a longitudinally elongate guide, a mounting plate, a slide plate having limited sliding movements along said guide, a bracket portion on said retainer having a pivot pin providing an axis for swinging movement of said window, said main plate having an elongate slot to receive said pin and said slide plate having a diagonally disposed slot through which the pin extends, a swinging arm having a pin mounted for sliding movement in said elongate guide, and means on said slide plate engageable by said pin for recurrently imparting sliding movement to said slide plate in one direction or the other, thereby to shift the window in and out of said window-receiving guide.

5. The combination of a vehicle window, guides for receiving edge portions of said windows, a retainer carried by an edge portion of the window and having a longitudinally elongate guide, a mounting plate, a slide plate having limited sliding movements along said guide, a bracket portion on said retainer having a pivot pin providing an axis for swinging movement of said window, said main plate having an elongate slot to receive said pin and said slide plate having a diagonally disposed slot through which the pin extends, a swinging arm having a pin mounted for sliding movement in said elongate guide, and a hook portion on one end of said slide plate adapted recurrently to receive said pin for imparting sliding movement to said slide plate according to the direction of swinging movement imparted to said arm.

6. The combination of a vehicle window panel movable to cover and uncover a window opening, guides into which edges of said panel enter when in closed position, regulator mechanism for said window panel, said regulator mechanism comprising means for initially imparting shifting movement rectilinearly to the window for shifting same in a direction away from said guides, means for subsequently imparting a curvilinear movement to the window causing movement thereof toward open position, and an operator common to said means for successively actuating same.

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