May 1, 1951 J. B. PARSONS 2,551,545

WINDOW REGULATOR MECHANISM

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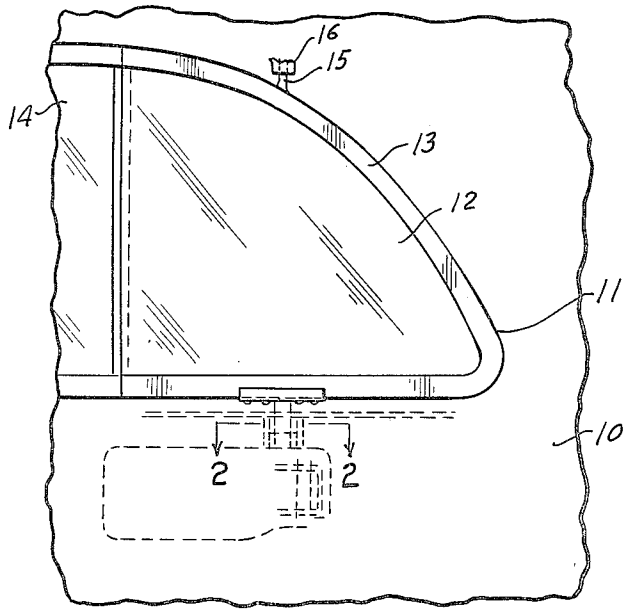


FIG. 1.

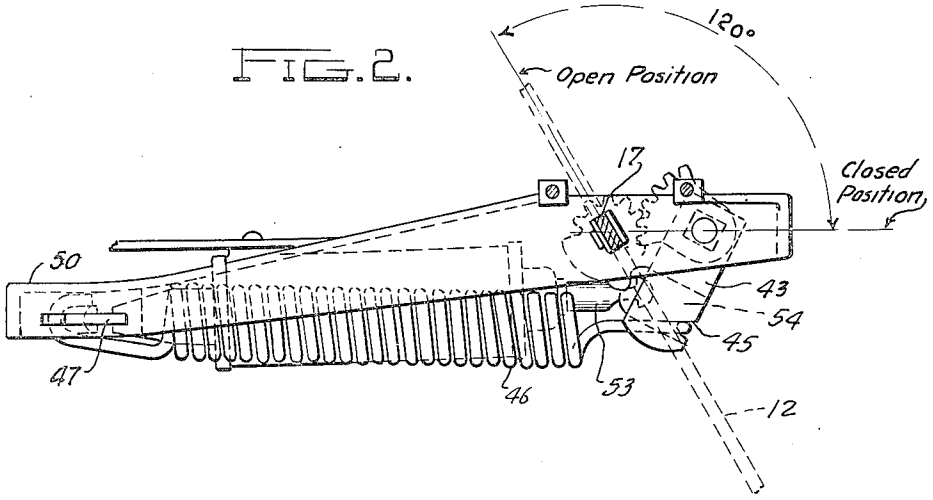


FIG. 2.

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FIG. 3.

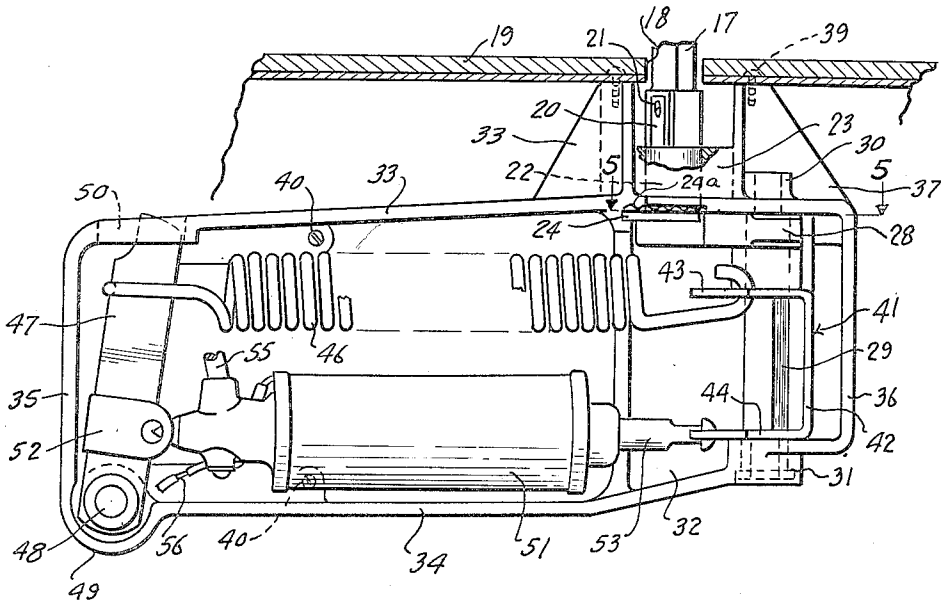
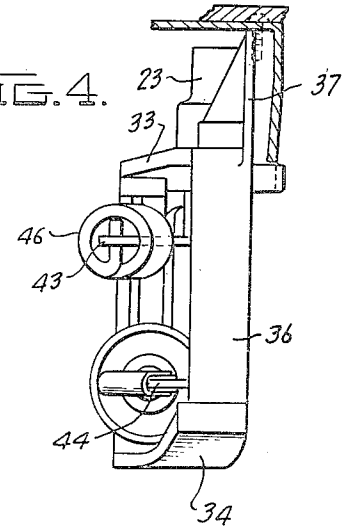


FIG. 4.



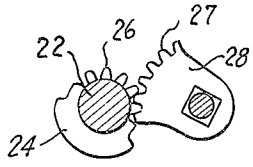


FIG. 5.

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UNITED STATES PATENT OFFICE

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WINDOW REGULATOR MECHANISM

John B. Parsons, Toledo, Ohio

Application April 21, 1948, Serial No. 22,482

3 Claims. (Cl. 268—117)

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This invention relates to vehicle window regulators, but more particularly to a power operated regulator for actuating a ventilating vane on an automobile body of the type adapted either to scoop air inside the vehicle when in one position, or to exhaust fuel gases, smoke and the like from the inside of the vehicle when in another position.

An object is to produce a new and improved regulator mechanism of the above type which is adapted to rock the vehicle ventilating vane to a selected position, the same being readily installed in the vehicle body and being controlled from a remote station.

Another object is to produce a regulator mechanism of the above character which is in the form of a unitary assembly and which can be readily and conveniently mounted in position of use and which is operable automatically to rock the ventilating vane to the desired position of adjustment.

Other objects and advantages of the invention will hereinafter appear, and for purposes of illustration but not of limitation, an embodiment of the invention is shown in the accompanying drawings, in which

Figure 1 is a fragmentary elevation of a side portion of an automobile body showing a ventilating vane;

Figure 2 is an enlarged transverse sectional view on the line 2—2 of Figure 1;

Figure 3 is an enlarged side elevation of the regulator mechanism installed in position of use, the adjacent vehicle body portion being shown in section and broken away;

Figure 4 is an end elevation of the regulator mechanism; and

Figure 5 is a sectional view substantially on the line 5—5 of Figure 3.

The illustrated embodiment of the invention comprises a side wall panel 10 of an automobile body or door, provided with a triangularly shaped window opening 11 which is adapted to be covered by a window glass 12, two sides of which are enclosed by a channel frame 13. The rearward edge of the window glass 12 is adapted to abut against a window glass 14 which is suitably mounted in the panel 10. The frame 13 is mounted for rocking movements about an up and down axis, there being a pintle 15 projecting upwardly from an upper portion of the frame into a suitable bracket 16 and depending from the lower portion of the frame 13 is a shaft 17 which projects through an opening 18 in a vehicle part 19. The shaft 17 is rectangular in

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cross section and fits into a socket member 20 and is secured in place by a screw 21. The socket member 20 is rigid with a shaft 22 which is journalled in a frame part 23.

On the lower end portion of the shaft 22 is an arcuate flange 24 which is adapted to rotate in a groove 25 in the regulator frame and directly beneath the flange 24 and on the opposite side of the shaft 22 are gear teeth 26 meshing with teeth 27 on a sector 28. Directly above the flange 24 is an undulated spring washer 24a which exerts a spring pressure against the flange and serves as a brake to hold the shaft 17 in the position of adjustment, thereby eliminating unwarranted rocking movement of the shaft. The sector 28 is mounted on a shaft 29, the upper and lower ends of which are cylindrical to rotate in bearing bosses 30 and 31 respectively. The shaft 29 intermediate the end portions is squared in cross section and the gear sector 28 is provided with a square hole to fit the squared portion of the shaft. Manifestly, by rotating the shaft in one direction, the vane or window glass 12 is rocked to and from closed position. Figure 2 indicates the arc of movement of the window glass from its fully open position to its closed position.

The frame which supports the regulator mechanism may be formed from a die casting and has a body 32, an upper flange 33, a lower flange 34 and end flanges 35 and 36. The bearing portion 23 and bearing boss 30 are integral with the flange 33 projecting upwardly therefrom. Reenforcing webs 37 and 38 reenforce the bearing portion 23 and screws 39 extend through the vehicle part 19 to assist in mounting the frame in position. Likewise, screws 40 connect the body 32 of the frame to a suitable supporting panel, as will be readily understood.

Mounted on the squared portion of the shaft 29 is a U-shaped sheet metal actuating arm 41 consisting of a vertical portion 42 and substantially parallel arms 43 and 44, the arms 43 and 44 having aligned rectangularly shaped apertures to fit the squared portion of the shaft so that rocking of the actuating arm 41 imparts corresponding rocking movement to the shaft 29. In the outer end portion of the arm 43 is a notch 45 and in hooked engagement with the notch 45 is one end of a helically coiled spring 46. The opposite end of the coil spring 46 hooks over the ouer side of a compensating arm 47, the opposite end of which is pivoted on a stud 48 mounted within an arcuate corner extension 49 of the frame. The opposite or free end of the compen-

sating arm 47 projects into a slot 50 in the flange 33 of the frame to afford limited rocking movements of the arm. As will hereinafter more fully appear, the coil spring, through the connections described, actuates the ventilating vane or window glass 12 to open position.

For actuating the ventilating vane in the opposite direction, or toward its closed position, a piston and cylinder assembly 51 has one end connected by a suitable clip 52 to the compensating arm 47 on the end portion adjacent the pivot stud 48, the piston rod 53 of the assembly being connected by a suitable clip 54 to the outer end portion of the lever arm 44 of the actuating member 41.

Detail illustration and description of the piston and cylinder assembly 51 are not given because the same forms no part of the present invention. Suffice it to say that liquid under pressure is forced into the cylinder through a tube 55 to force the piston rod outwardly of the cylinder. Within the cylinder is disposed a solenoid control valve which is adapted to be energized through a lead 56 and upon being energized, the valve is unseated to permit the introduction of pressure fluid. When the solenoid is deenergized, the valve is seated to trap the liquid within the cylinder, thereby to hold the piston in its position of adjustment. Manifestly, the outward movement of the piston rod 53 rocks the actuating member 41 and places the coil spring 46 under tension. When it is desired to open the window glass 12, the solenoid within the cylinder 51 is energized and through the action of the spring 46, the piston rod and its piston is moved inwardly of the cylinder, forcing the liquid therefrom through the tube 55. Reference is hereby made to my Patent No. 2,400,572, dated May 21, 1946, wherein a complete description and illustration of this mechanism is set forth.

From the above description, it will be manifest that I have produced an exceedingly simple, compact, unitary assembly which can be delivered to the automobile or body manufacturer as a unit for installation either in the door of the vehicle or in the vehicle body, according to the position of the triangular ventilating vane. The frame can conveniently be produced from a die casting or from a stamping, the assembly being exceedingly simple. Provision of a compact unitary assembly of this character obviates difficulties heretofore experienced in the mounting of the various parts within a vehicle body. It is further to be understood that the structure can be controlled from a single switch which controls the electrical current to the solenoid control valve above mentioned, and which is part of the piston and cylinder assembly 51. It will further be recognized that the actuating unit, together with the toothed members, affords substantial power for effecting the desired window movement.

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 vehicle windows or the like, comprising a rigid frame, a shaft on said frame and having one end rotatably mounted thereon, a second shaft spaced laterally from said first shaft and having opposite ends rotatably mounted on said frame, the intermediate portion of said second shaft being polygonal in cross section, a driving connection between said shafts whereby rotative movement of said second shaft is imparted to said first shaft, an actuating member on said second shaft for movement therewith, a pair of arms on said actuating member, said actuating member being U-shaped and the arms thereof having aligned polygonal holes fitting the intermediate portion of said second shaft, power means carried by said frame and connected to one arm for imparting rotative movement thereto in one direction, and a spring carried by the frame and connected to the other arm for imparting rotative movement thereto in the opposite direction.

2. Regulator mechanism for vehicle windows or the like, comprising a rigid frame consisting of a flat body, side walls rigid with said body, said frame being horizontally elongate, a shaft journalled at one end in one side wall, said last side wall having a recess, a collar on said shaft fitting said recess to hold the same against axial movements, an integral mounted bracket projecting from one side of said frame and having a pair of parallel ribs disposed respectively on opposite sides of said shaft, a second shaft spaced laterally from said first shaft and having opposite ends rotatably mounted in adjacent side walls of said frame, a gear sector connection between said shafts for transmitting rotative movement from said second shaft to said first shaft, a U-shaped actuating member fitting said second shaft for rotation therewith, said second shaft being polygonal in cross section and the arms of said actuating member having polygonal apertures to fit said second shaft, and separate power means connected to the arms of said U-shaped actuating member respectively for imparting rotative movements thereto.

3. Regulator mechanism for vehicle windows or the like, comprising a rigid frame consisting of a flat body, side walls rigid with said body, said frame being horizontally elongate, a shaft journalled at one end in one side wall, said last side wall having a recess, a collar on said shaft fitting said recess to hold the same against axial movements, an integral mounted bracket projecting from one side of said frame, a second shaft spaced laterally from said first shaft and having opposite ends rotatably mounted in adjacent side walls of said frame, a gear sector connection between said shafts for transmitting rotative movement from said second shaft to said first shaft, a U-shaped actuating member fitting said second shaft for rotation therewith, said second shaft being polygonal in cross section and the arms of said actuating member having polygonal apertures to fit said second shaft, power means carried by said frame and connected to one arm for imparting rotative movement thereto in one direction, and a spring carried by the frame and connected to the other arm for imparting rotative movement thereto in the opposite direction.

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