Oct. 11, 1932. H. E. SIPE 1,882,304

WINDOW OPERATING DEVICE

Filed June 2, 1928

Fig. 1,

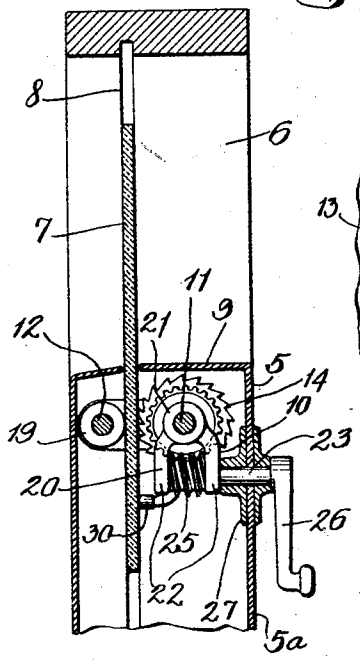


Fig. 2,

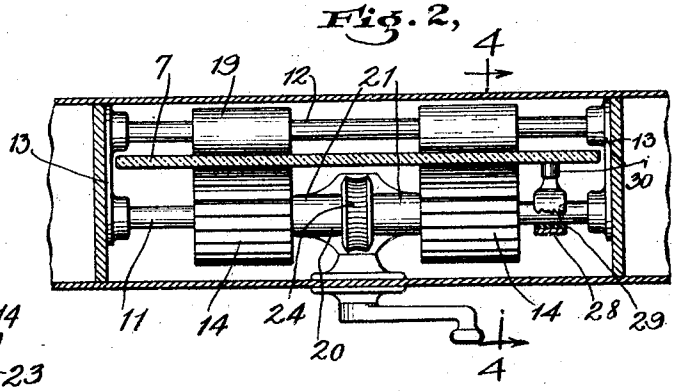


Fig. 3,

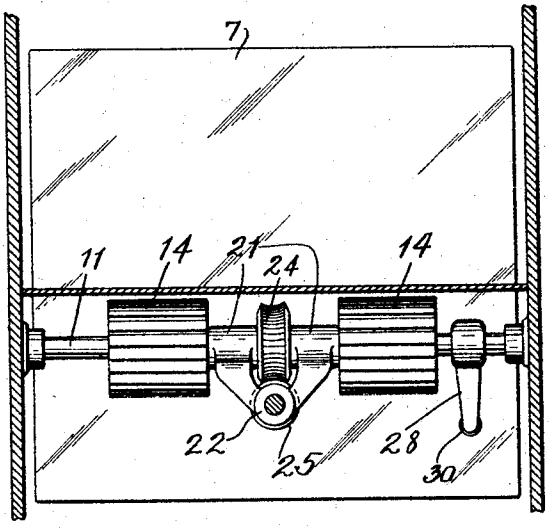
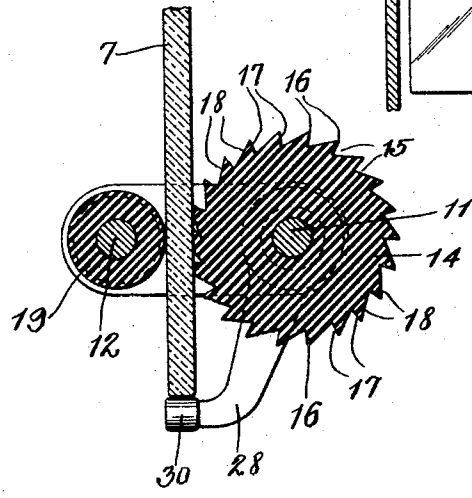


Fig. 4,



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UNITED STATES PATENT OFFICE

HARRY E. SIPE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO NATHANIEL L. FOSTER, OF MONTCLAIR, NEW JERSEY

WINDOW OPERATING DEVICE

Application filed June 2, 1928. Serial No. 282,289.

This invention relates to devices for use in connection with window panels or in fact movable panels of any kind or class adapted to be moved into several positions in their supports, for example, in the opening and closing of a window, and more particularly to the operation of the windows in the several parts of a motor vehicle; and the object of the invention is to provide a window operating device of the class specified employing as a window engaging or operating member, one or more rollers composed of resilient material preferably rubber or a composition of rubber, and still further to the provision of a ribbed, tooth-like or roughened surface on the periphery of said roller or rollers adapted to be flexed and placed under compression in engaging the window panel in the operation of raising and lowering the same; a further object being to provide a device of the class described the operating roller of which serves to maintain the window panel in different positions of adjustment and against accidental displacement, the operating device including a backing roller also preferably composed of resilient material and preferably provided with a smooth surface; a still further object being to provide a frictionally operated arm having a cushioned end adapted to normally engage one surface of the window panel and to be moved into a position beneath the panel when in a fully closed position to also aid in maintaining the panel against accidental displacement and vibration; a further object being to provide a crank geared to the rubber drive roller or wheel preferably through a worm gearing to maintain the operating roller against rotation by the weight of a window panel and to permit of the movement of said roller only through the cranking or other means provided; and with these and other objects in view, the invention consists in a device of the class and for the purpose specified which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:—

Fig. 1 is a cross sectional view of a part of a window panel support showing my improved operating device mounted in connection therewith.

Fig. 2 is a sectional plan view of the construction shown in Fig. 1.

Fig. 3 is a sectional side view of the structure shown in Figs. 1 and 2; and,

Fig. 4 is an enlarged sectional view on the line 4—4 of Fig. 2 and showing one of the parts in a different position.

In the drawing I have shown for the purpose of illustrating one use of my invention, part of a door 5 of a motor vehicle having at its upper end portion a window opening 6, which is controlled by a window panel 7. It will be understood that my invention is not limited to this use, and my improved operating device may be employed in connection with window panels of any kind or class of support, for example on the windshield, or in doors, cabinets or the like.

It will be understood that the panel 7 is mounted in connection with the door 5 in the usual guide grooves 8 which may be of conventional or any desired construction. Mounted within the door below the sill 9 of the window opening 6 is one of my improved operating devices 10 which consists of two shafts 11 and 12 arranged in spaced and parallel relation and having bearings in bracket faces 13 disposed at the opposite end portions of said shafts, the brackets being arranged beyond the side edges of the window panel 7 as will be apparent to permit of the free movement of the panel downwardly between said brackets as clearly seen in Figs. 2 and 3 of the drawing.

In the construction shown, I preferably mount two driving or operating rollers 14 at spaced intervals on the shaft 11, said rollers being adhered or otherwise fixed to the shaft 11. In the construction shown, the periphery of the rollers are provided with longitudinally arranged recesses 15 which are substantially V-shaped in cross sectional form, and form corresponding and substantially

V-shaped tooth or rib-like projections 16 having radial walls 17 and tangentially arranged walls 18 as clearly seen in Fig. 4 of the drawing so that the members 16 are capable of flexing in the clockwise rotation of the rollers as seen in Fig. 4, and to be placed under compression in this rotation, the recesses 15 permitting the rubber in the members 16 to flow laterally when placed under compression, insuring a firm and positive engagement with the smooth surface of the panel 7.

Mounted on the shaft 12 are backing rollers 19 which are arranged in common alinement with the rollers 14 so as to back up the panel 7 where the pressure of the rollers 14 is exerted thereon preventing the possibility of cracking or breaking the glass panel. While the rollers 19 are preferably composed of rubber, the same may be composed of any suitable material and may be in fact of a solid or rigid nature to prevent lateral displacement or stress upon the panel, and if composed of rubber will be of a more rigid body with respect to resiliency than the body of the rollers 14.

Arranged on the shaft 11 between the rollers 14 is a bearing block 20 having two bearings 21 in which the shaft 11 is mounted and two downwardly extending bearings 22 in which the crank shaft 23 is mounted. Secured to the shaft 11 between the bearings 21 is a worm gear 24 which meshes with a worm 25 mounted on the shaft 23 between the bearings 22. At the outer end of the shaft 23 is a crank lever 26 by means of which said shaft and the device as a whole is operated.

The shaft 23 projects through the inner face of the door and passes through bearing members 27 secured to the inner face 5*a* of the door. The crank is arranged on the shaft 23 inwardly of the inner face 5*a* of the door, permitting of the free rotation of the crank to operate the window panel. It will be understood that in rotating the crank 26 in either direction, the shaft 11 will be rotated through the worm 25 and worm wheel 24 correspondingly rotating the rollers 14 to raise or lower the panel 7. By virtue of the worm drive, the panel 7 will be maintained in its positions of adjustment against displacement in that the rollers 14 are locked against rotation by virtue of such gearing.

I also preferably employ a hook-shaped arm 28 which is frictionally supported on the shaft 11, preferably by means of a rubber bushing 29, note Fig. 2 of the drawing. The hook end of the arm 28 is provided with a cushioned facing 30 of felt, rubber or similar material. In the operation of raising the panel 7, the arm 28 is moved in the direction of the panel and the cushioned end 30 normally engages one side face of the panel under tension as seen in Figs. 1 and 3 of the drawing. When the panel has been moved into its fully raised position, the hook end of the arm 28 will be moved beneath the panel to act as a safety means, preventing the possibility of the panel's dropping in its support.

It will be noted that in the operation of lowering the panel 7, the arm 28 through its frictional engagement with the shaft 11, will be moved from beneath the panel 7 and out of engagement with said panel, permitting of its free downward movement, which is controlled however by the frictional and tensional engagement of the rollers 14 with said panel. It will also be understood that the frictional engagement of the arm 28 with the shaft 11 is comparatively light and not sufficient to exert any excessive pressure upon the panel 7 in the operation of raising the same. As a matter of fact, the arm 28 may or may not be employed.

It will be understood that my invention is not necessarily limited to the use of two sets of rollers 14—19 as one set of these rollers will be amply sufficient, especially in working upon comparatively small panels, and on the other hand, a greater number of the rollers may be employed if desired when working upon wider panels or the control from a single operating means. As hereinbefore stated, while I have shown and described one use of my invention, I am not necessarily limited to this use nor am I necessarily limited to the specific details of construction herein shown and described, and various changes therein and modifications thereof may be made within the scope of the appended claims without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. An operating device for window panels comprising a driven roller mounted to engage one side face of said panel, the periphery of said roller having projecting bodies adapted to be placed under compression in engaging the panel to be operated and for supporting said panel against movement in its different positions of adjustment, a backing element disposed on the opposite side of said panel and in alinement with said roller, means involving a worm and worm wheel for actuating said roller, and for preventing the rotation of said roller and shifting of said panel when said last named means is at rest, a crank for rotating said worm, and other means operated through said worm and worm wheel and adapted to cooperate with said panel to aid in supporting the panel in closed position.

2. A window panel operating device of the class described comprising a roller composed of yieldable material, means for operating said roller, the periphery of said roller having a plurality of projecting yieldable members spaced circumferentially thereof and adapted to be flexed and placed under com-

pression in engaging said window panel to operate the same, the flexed and compressed portions of said roller serving to maintain the panel in different positions of adjustment, the roller operating means involving a worm gear drive locking said roller against movement other than through the operation of the worm of said drive and also retaining the panel against opening movement, a roller disposed at the opposite side of the panel in alinement with and adapted to back the first named roller, another set of rollers arranged to engage the panel at a point in spaced relation to the first named set and operated through said driving means, and other means cooperating with said panel and actuated through said driving means and adapted to be placed beneath the panel when in a fully closed position.

3. A panel operating device of the class described comprising a driven roller mounted to engage one side face of said panel, the surface of said roller engaging the panel having a plurality of circumferentially spaced and longitudinally arranged tooth-like projecting members composed of yielding material, each member consisting of a radially arranged wall and a tangentially arranged wall, said panel being raised in the rotation of said roller in the direction of the radial walls of said projecting members, and said members being flexed and placed under compression in engaging and operating said panel and to support said panel against downward movement in different positions of adjustment.

4. A panel operating device of the class described comprising a driven roller mounted to engage one side face of said panel, the surface of said roller engaging the panel having a plurality of circumferentially spaced, tooth-like projections normally inclined upwardly at the point of engagement with the panel, said members being adapted to be flexed and placed under compression in engaging and operating said panel and to support said panel against downward movement in the different positions of adjustment thereof by virtue of the inclination and compression of said members.

In testimony that I claim the foregoing as my invention I have signed my name this 31st day of May 1928.

HARRY E. SIPE.