M. PLOTNITZKY.

WINDOW CLEANER.

APPLICATION FILED APR. 22, 1916.

1,197,763. Patented Sept. 12, 1916.

Fig. 1.

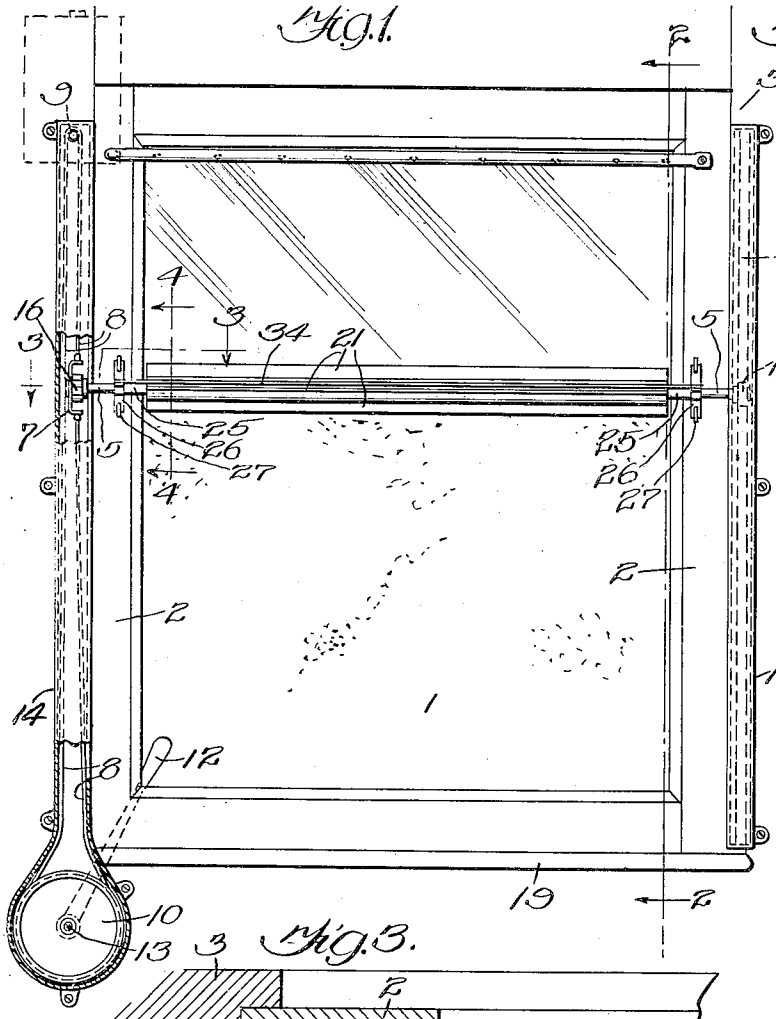


Fig. 2.

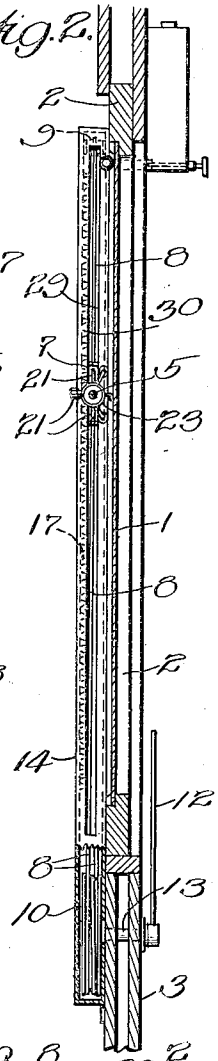


Fig. 3.

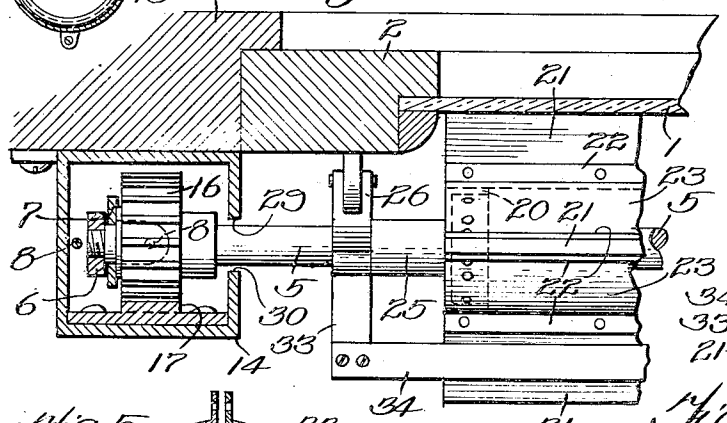


Fig. 4.

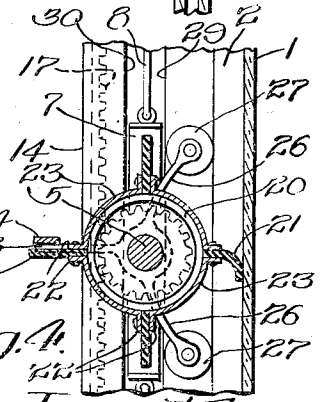
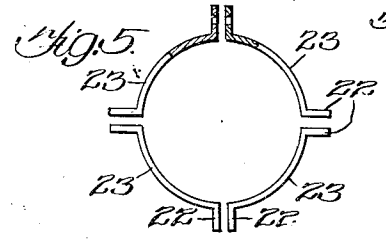


Fig. 5.



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UNITED STATES PATENT OFFICE.

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WINDOW-CLEANER.

1,197,763. Specification of Letters Patent. Patented Sept. 12, 1916.

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To all whom it may concern:

Be it known that I, MAX PLOTNITZKY, a subject of the Czar of Russia, and having legally declared my intention of becoming a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Window-Cleaners, of which the following is a specification.

My invention relates to cleaners for windows of various types, especially the window in front of the motorman's position in an electric car, or the cab window of a locomotive or the wind shield of a motor vehicle. It is well known that accidents frequently occur as a result of rain, snow or other obstruction gathering on the outside of the windows through which the operator of the car or other vehicle must look to determine whether or not the way ahead is clear.

The object of my invention is to provide means whereby the front of the window may be instantly cleaned with very slight effort upon the part of the motorman or driver who is behind the window.

I obtain my object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front view of a window equipped with apparatus embodying my invention. Fig. 2 is a vertical section on the line 2—2, Fig. 1. Fig. 3 is a plan section on the line 3—3, Fig. 1. Fig. 4 is a vertical section on the line 4—4, Fig. 1. Fig. 5 is an end view of the sectors which hold the squeegees in place.

Similar numerals refer to similar parts throughout the several views.

In the form selected to illustrate the invention, the glass pane 1 is mounted in a window frame 2, the frame being held in the casing 3 in any suitable manner. These parts are here shown in conventional form and may assume various shapes, sizes and construction according to the situation in which the window is used. Extending across the window is a shaft 5 supported at one end in a journal 6 which in the present case is yoke shaped and is held in place by a nut 7 screwing on to the reduced threaded end of the shaft as shown in detail in Fig. 3. An endless cable 8 is attached at one end to the journal 6 and thence passes upward over an upper pulley 9, thence downward and around a sheave 10, thence upward to the bottom of the journal, where it is fastened. The sheave 10 is rotated by any suitable means, manual or mechanical. In the present instance, I have shown the sheave as rotated by a hand lever 12 which is fastened to the drum shaft 13. Said shaft is journaled on the window casing in any suitable manner and by preference the sheave and cable are inclosed in a housing 14.

Rigidly attached to each end of shaft 5 is a spur pinion 16 which travels in a toothed rack 17 arranged vertically within the housing 14 and within the housing 18 at the opposite side of the window. Housing 18 is similar to housing 14, except that the sheave-containing portion at the lower end is absent. The teeth of the rack 17 face toward the window. Rigidly fastened to the shaft 5 is a drum 20. A number of vanes or squeegees 21, preferably of rubber, are fastened to the drum in any suitable manner. In the preferred construction shown they are bolted between the flanges 22 of the sectors 23 which encircle the drum and are shown separately in Fig. 5. By bolting the flanges together the squeegees are firmly held in place and the sectors tightly grip the drum as to rotate therewith.

In the preferred construction I provide a carriage for causing the drum to travel parallel to and at the proper distance from the window pane. According to the design selected to illustrate the invention, this carriage has two sleeves 25 fitting loosely over shaft 5 and abutting the ends of drum 20. Two arms 26 extend obliquely in opposite directions toward the window frame and at their ends carry antifriction rollers 27. This carriage also serves the purpose of holding the pinions 16 in mesh with the racks 17 although this function is also served by the flanges 29 of the housings 14 and 18, which flanges border the vertical slot 30 through which the shaft enters into said housings.

Extending outward from each of the sleeves 25, are two arms 33 which support a cross bar 34. This cross bar is in position to be struck by the squeegees as the latter pass, and the result is that the bar scrapes from the squeegees any snow, dust, mud or moisture which may have collected upon them. Thus the squeegees are automatically kept clean.

In operation, as soon as any deposit collects upon the front of the window, the operator grasps the hand lever 12 and turns the sheave 10 in one direction or the other,

depending upon which direction he wishes the cleaning elements to travel. Normally, the operator will leave the shaft 5 and parts carried thereby either at the top or bottom of the window so as not to obstruct the view. If the parts are at the bottom of the window, he rotates the drum in the direction to raise said shaft. Let it be assumed that the shaft is at the bottom of the window and the operator wishes to clean the window: He rotates the lever in a direction to raise the journal 7. This applies power positively to one end of the shaft to raise it; the shaft in rising, however, is forced to rotate by reason of the fact that the pinion is in mesh with the rack 17. But the rotation of the shaft causes the pinion on the opposite end to rotate at the same speed and hence both ends of the shaft must rise at the same rate, notwithstanding the fact that the power to raise the shaft is applied at one end only. As the shaft rotates it causes the squeegees 21 to brush the outside surface of the glass. As the rack 17 and the window glass 1 are on opposite sides of the shaft, it follows that the squeegees will rotate in the same direction in which they are traveling across the pane. The edges of the squeegees as they contact the pane will travel faster than the shaft travels across the pane and consequently any given point of the pane will be scraped by more than one of the squeegees, thus rendering it certain that the surface of the glass will be well cleaned. The carriages 25, 26, traveling as they do along the front of the window pane, will hold the drum at the proper distance from the pane to get the best results; it also holds the cleaning bar 34 in position and permits it to forcibly scrape the mud, snow or moisture from the squeegees.

It will thus be seen that the cleaner may be caused to travel in either direction, up or down, and will always cause the vanes or squeegees to travel faster than the main shaft and in the same direction as the main shaft at the time when the parts are acting upon the pane. The parts will also automatically be kept clean and, hence, will not bring back to the window any of the material that has once been removed from it. Another point to be noted in my construction is that the squeegees are mounted so close to the pane that they must bend in order to pass the pane, consequently, they afford some resistance to the rotation of the shaft. This resistance is created at a point which is farther from the center of the shaft than is the rack 17, and as the shaft cannot descend unless it rotates it will be seen that the squeegees act efficiently to hold the device in any position in which it may be left.

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

1. A window cleaner having stationary vertical racks arranged at each side of the window, a shaft extending from one rack to the other in front of the window, pinions fastened to the end of said shaft, and cooperating with the racks, means for positively raising and positively lowering said shaft, and resilient vanes projecting radially from said shaft and fixed thereon for cleaning the window, the racks being stationary and having their teeth pointing inward toward the window whereby the bodily movement of the shaft upward or downward causes the shaft to rotate and causes the vanes to scrape the window in the same direction as the bodily movement of the shaft, and a vane-cleaning bar traveling with said shaft and located parallel thereto close enough to be engaged by the vanes as the vanes rotate past it.

2. A window cleaner having stationary vertical racks arranged at each side of the window, a shaft extending from one rack to the other in front of the window, pinions fastened to the end of said shaft, and cooperating with the racks, means for positively raising and positively lowering said shaft, and resilient vanes projecting radially from said shaft for cleaning the window, the racks being stationary and having their teeth pointing inward toward the window whereby the bodily movement of the shaft upward or downward causes the shaft to rotate and causes the vanes to scrape the window in the same direction as the bodily movement of the shaft, a vane-cleaning bar traveling with said shaft and located parallel thereto close enough to be engaged by the vanes as the vanes rotate past it, and a carriage traveling upon the front of the window and supporting said bar to thereby prevent it from being rotated by the vanes.

In witness whereof, I have hereunto subscribed my name.

MAX PLOTNITZKY.