W. H. FORD.

WINDOW CLEANER.

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1,077,402.

Patented Nov. 4, 1913.

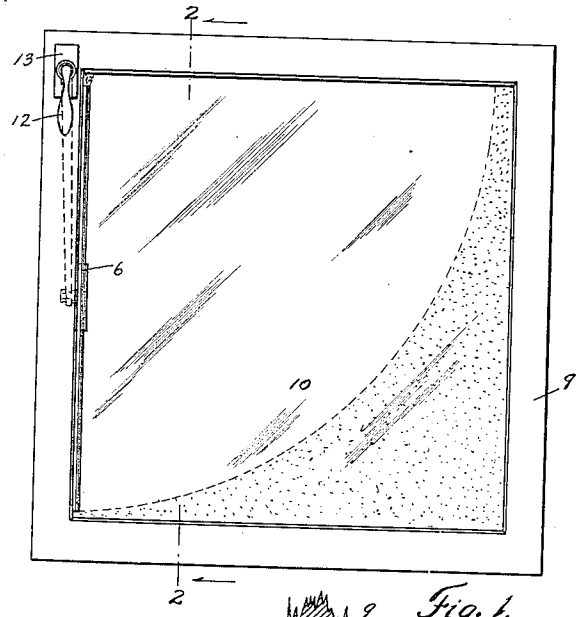


Fig. 1.

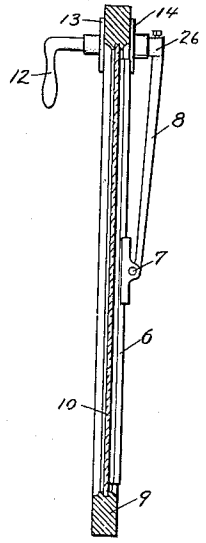


Fig. 2.

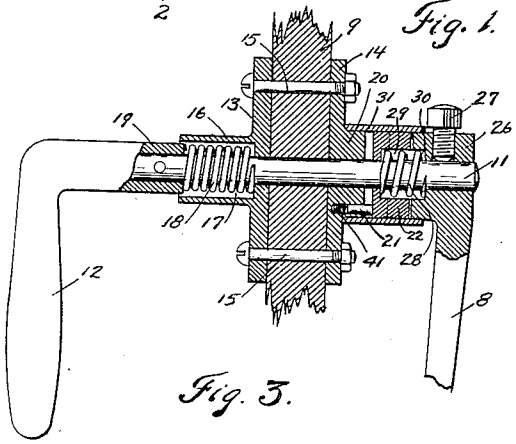


Fig. 3.

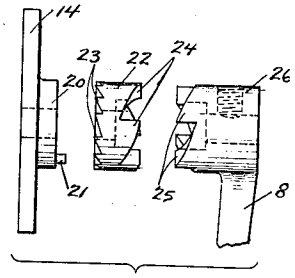


Fig. 5.

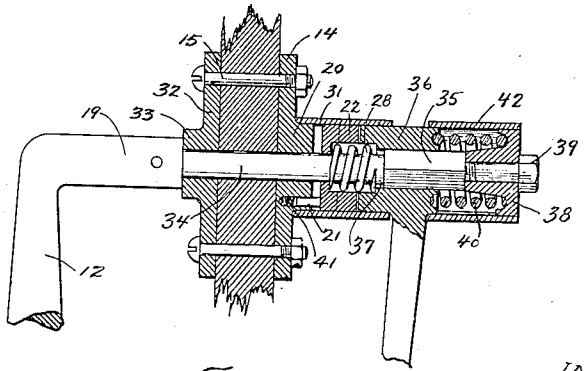


Fig. 4.

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WINDOW-CLEANER.

1,077,402. Specification of Letters Patent. Patented Nov. 4, 1913.

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To all whom it may concern:

Be it known that I, WILLIAM H. FORD, a citizen of the United States of America, and a resident of the city of Buffalo, Erie county, New York, have invented certain new and useful Improvements in Window-Cleaners, of which the following is a full, clear, and exact description.

My invention relates generally to window cleaning devices and more particularly, to that type of devices which are adapted to be operated from the inside of the window to remove dirt, rain, sleet or snow from the outside thereof.

One of the principal objects of my invention has been to provide a device in which the cleaning rubber shall be thrown out of contact with the window on the upward or idle stroke and automatically thrown into contact with the window just previous to the downward or working stroke of the cleaner.

Furthermore, I have sought to provide a window cleaner which may be adapted for use on railway car windows, automobile wind shields and like places, where it is desired to operate the cleaner from the inside of the window.

Reference is to be had to the accompanying drawings, forming part of this specification, in which like characters of reference indicate like parts, throughout the several views of which:

Figure 1 is a front elevation of a window showing my device attached thereto. Fig. 2 is a sectional elevation taken on line 2—2 of Fig. 1. Fig. 3 is a sectional view of the working parts of my device and is taken on the center line thereof. Fig. 4 is a similar view of a modified form of my device. Fig. 5 is a side elevation of the ratchet and cam-shaped means of my device and shows them slightly separated for clearness of illustration.

In the drawings, 6 represents the rubber cleaner of my device which is of the usual type employed for this purpose. This cleaner is pivotally united at 7, to the outer end of the cleaner arm 8. The cleaner 6 and cleaner arm 8 are placed on the outside of the window sash 9 with the cleaner 6 arranged to work over the outside surface of the window pane 10. The cleaner arm 8 is rigidly secured at its inner end to a shaft 11 which preferably passes through the window sash 9 and has rigidly secured to its opposite end an operating handle 12.

The shaft 11 is rotatably carried by the bearing plates 13 and 14, arranged on the inside and outside respectively, of the window sash 9 and secured in place by bolts 15 or other suitable fastening means. The inner bearing plate 13 is provided with an outwardly extending hub 16, having a central recess 17 formed therein. Within this recess is a helical spring 18, which is disposed about the shaft 11 and bears against the hub 19 of the operating handle 12, thus serving to keep the parts normally in the position shown in Fig. 3. The outer bearing plate 14, secured to the outside of the window sash, is provided with a hub 20 in the face of which is disposed a spring pressed ratchet pin 21, which is arranged to normally extend beyond the face of said hub by the pressure of the spring 41.

22 is a ratchet ring which is rotatably disposed on the shaft 11 and adjacent to the face of the hub 20 of the bearing plate 14. The ring is provided on one of its faces with a plurality of ratchet teeth 23, which are engageable with the spring pressed ratchet pin 21 carried by the bearing plate 14. This ring is also provided on its opposite face with a plurality of cam-shaped teeth 24. These teeth engage the co-acting cam-shaped teeth 25 provided on the inner face of the cleaner arm hub 26. The hub 26 is provided preferably with a set screw 27 or other suitable means, whereby the cleaner arm 8 may be securely locked in position on the shaft 11.

28 is a cushion spring which is arranged about the shaft 11 and is disposed within recesses 29 and 30, provided in the ring 22 and hub 26, respectively.

31 is an annular casing, which is secured at its inner end to the bearing plate 14 and extends outwardly over the ratchet ring 22 and a portion of the hub 26, thus protecting the same from the weather and dust and dirt.

Referring now to the modified form shown in Fig. 4, the inner bearing plate 32, secured to the inside of the window sash, is provided with a solid hub 33 against which the hub 19 of the operating handle 12

bears. The shaft 34 in this form is longitudinally stationary and provided with an end portion 35 which is of square cross section. The cleaner arm hub 36 is provided with a square aperture 37 which is slidably but non-rotatably mounted on the end portion 35 of the shaft 34. 38 is a spring washer which is secured to the end portion 35 of the shaft preferably by the bolt 39 and between the inner face of this washer and the outer face of the hub 36 is disposed a helical spring 40 which serves to keep the cleaner arm normally in the position shown in this figure. An annular casing 42 is carried at one end by the hub 36 and extends over the washer 38, thus incasing the spring 40 and the outer end of the shaft 34.

When operating the form of my device first described, the handle 12 is manually rotated so as to bring the cleaner 6 at the upper edge of the window sash 9. When rotating the handle 12, the shaft 11 and arm 8 are also rotated and as the hub 26 of the said arm rotates, it tends to rotate the ratchet ring 22. The spring pressed pin 21, however, engages with the ratchet teeth on the ring and thus prevents its rotation in this direction. When the ratchet ring 22 is prevented from rotating the hub 26 will rotate independently thereof and, due to the cam-shaped teeth 24 and 25, the hub 26 will be moved axially and the cleaner 6 carried out of contact with the window-pane 10.

When the cleaner has been moved to the uper end of the window, the teeth 25 will have ridden up to the high points of the co-acting teeth 24 where they will again be drawn into engagement therewith by the force of the spring 18. This draws the cleaning arm 8 inwardly and again brings the cleaner 6 in contact with the window, whereupon the window-pane may be cleaned, as shown in Fig. 1, by a downward movement of the cleaner. When the teeth 24 and 25 are drawn into engagement, the cushion spring 28 absorbs the shock and prevents the cleaner from striking the window with too great a force.

The device shown in Fig. 4 is operated as above described except that the hub 36 of the cleaner arm is moved longitudinally on the square portion 35 of the shaft 34, against the tension of the helical spring 40 and the same results accomplished as are accomplished by the device shown in the other figures.

It will of course be understood that when the cleaner arm of each form of my device is moved in the direction to clean the window, the ring 22 will be engaged with the teeth on the hub of the cleaner arm and be thereby rotated with the cleaner arm. At the same time the pin 21 will be depressed as the ratchet teeth 23 are rotated past it.

The device as shown in the drawings is designed to have the cleaner work through an arc of substantially ninety degrees. The ratchet ring is, therefore, provided with four cam-shaped teeth. Should it be desired to have the cleaner arm rotate one hundred and eighty degrees, then only two teeth would be provided or if forty-five degrees is the amount of movement desired, then the ring would be provided with eight teeth. Obviously, these changes, as well as many other detailed modifications of the details herein shown and described may be made without departing from the spirit of my invention or the scope of the appended claims and I do not wish to be limited to the exact embodiment herein shown and described.

Having thus described my invention, what I claim is:

1. A window cleaning device comprising, a longitudinally movable shaft, means for rotating said shaft, a cleaner, a cleaner arm non-rotatably carried by said shaft, said arm being pivotally united at its outer end to said cleaner and longitudinally movable and rotatably mounted means carried by said shaft for moving said cleaner in and out of contact with the window-pane.

2. A window cleaning device comprising, a longitudinally movable shaft, means for rotating said shaft, a cleaner, a cleaner arm non-rotatably carried by said shaft, said arm being pivotally united at its outer end to said cleaner, spring means for moving said cleaner into contact with the window-pane being cleaned and longitudinally movable and rotatably mounted ratchet and cam-shaped means carried by said shaft for moving said cleaner into and out of contact with the window-pane.

3. A window cleaning device comprising, a longitudinally movable shaft, means for rotating said shaft, a cleaner, a cleaner arm non-rotatably carried by said shaft, said arm being pivotally united at its outer end to said cleaner, a spring carried by said shaft for moving said cleaner into contact with the window-pane, a ratchet ring rotatably carried by said shaft, a spring pressed ratchet pin engageable with said ratchet ring and cam-shaped means carried by said shaft, whereby said cleaner may be moved into and out of contact with the window-pane.

4. A window cleaning device comprising, a longitudinally movable shaft, means for rotating said shaft, a cleaner, a cleaner arm pivotally united to said cleaner, said cleaner arm having a hub non-rotatably mounted on said shaft, said hub being provided with a purality of cam-shaped teeth, a ratchet ring rotatably mounted on said shaft, said ratchet ring being provided with a plurality of co-acting cam-shaped teeth and a plurality of ratchet teeth, a spring pressed

ratchet pin engageable with said ratchet teeth and a spring for keeping said cam-shaped teeth in engagement.

5. A window cleaning device comprising a longitudinally movable shaft, means for rotating said shaft, a cleaner, a cleaner arm pivotally united to said cleaner, said cleaner arm having a hub non-rotatably mounted on said shaft, said hub being provided with a plurality of cam-shaped teeth, a ratchet ring rotatably mounted on said shaft, said ratchet ring being provided with a plurality of co-acting cam-shaped teeth and a plurality of ratchet teeth, a spring pressed ratchet pin engageable with said ratchet teeth, a spring for keeping said cam-shaped teeth in engagement and a cushion spring disposed between said cleaner arm hub and said ratchet ring.

6. A window cleaning device comprising an axially slidable shaft, an inner and outer bearing plate for said shaft, an operating handle non-rotatably secured to the inner end of said shaft, a spring disposed between said inner bearing plate and said operating handle, a cleaner, a cleaner arm pivotally united to said cleaner and having a hub rigidly secured to the outer end of said shaft, said hub being provided with a plurality of cam-shaped teeth, a ratchet ring rotatably mounted on said shaft, said ratchet ring being provided with a plurality of co-acting cam-shaped teeth and a plurality of ratchet teeth, a spring pressed ratchet pin carried by said outer bearing plate and engageable with the ratchet teeth on said ratchet ring and a cushion spring disposed between said cleaner hub and said ratchet ring, whereby said cleaner will be thrown out of contact with the window-pane when moved in one direction and thrown into contact with the same when moved in the opposite direction.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM H. FORD.

Witnesses:
PETER G. BRADLEY,
J. WM. ELLIS.