March 29, 1927. L. A. BARETT ET AL 1,623,028

AUTOMATIC WINDSHIELD CLEANER

Filed Aug. 9, 1924

Fig. 1

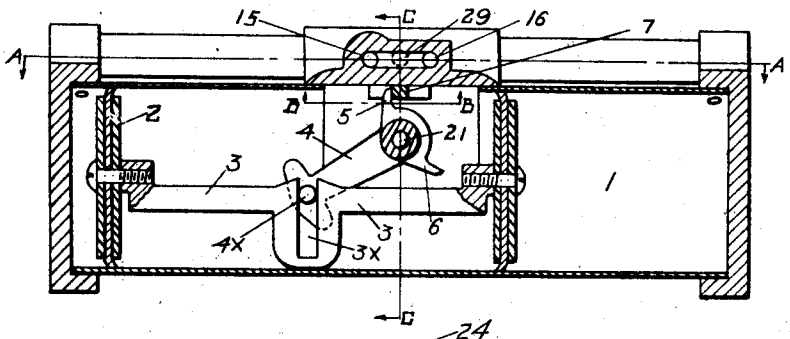


Fig. 3

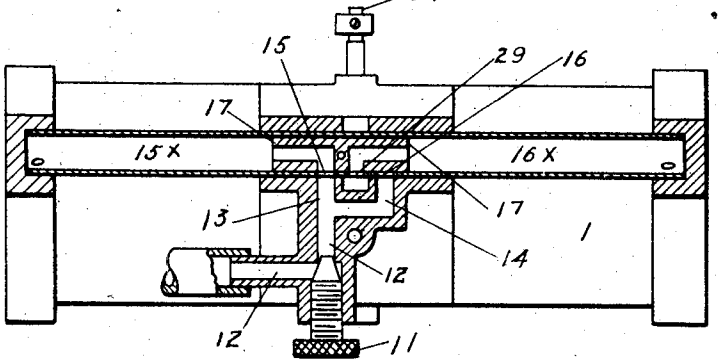


Fig. 2

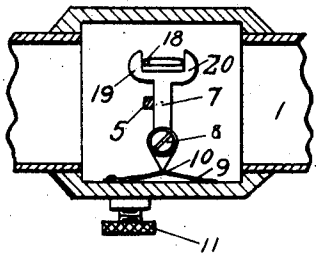


Fig. 4

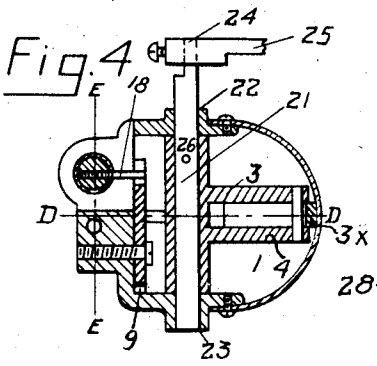
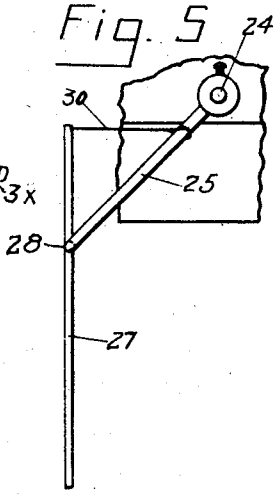


Fig. 5



Louis A. Barett
Chester Hunt
Inventors

By Charles W. Barett
Attorney

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UNITED STATES PATENT OFFICE.

LOUIS A. BARETT AND CHESTER HUNT, OF LYNN, MASSACHUSETTS; SAID HUNT ASSIGNOR TO SAID BARETT.

AUTOMATIC WINDSHIELD CLEANER.

Application filed August 9, 1924. Serial No. 731,208.

Our invention relates to window cleaners, and more particularly to the type used on the windshields of motor vehicles.

It has for its objects, to provide an improved mechanism of few working parts, to insure increased strength and wearing qualities, to minimize construction and upkeep costs, to provide a simplified means for holding the piston movements over a fixed course, to provide for the cleaning of a greater space area than has heretofore been possible with cleaners of similar type, and to provide other advantages and results, many of which are made evident from the following specification.

Referring to the accompanying drawings which form a part of this specification, Figure 1 is a cross sectional view on the line D—D in Figure 4. Figure 2 is a sectional view on lines B—B in Figure 1, in the direction of arrows. Figure 3 is a cross sectional view on the lines A—A in Figure 1, and lines E—E, in Figure 4. Figure 4 is a sectional view on line C—C in Figure 1, in direction of arrows, and depicting the relative position of the parts when the rocker arm and coacting bearing are in the plane of section. Figure 5 shows our improved squeegee mounting.

Referring again to Figure 1, 1 shows the cylinder, 2 shows the piston, 3 shows the connecting rod, having intermediate its ends the U shaped bearing 3^{x}. 4 shows the rocking arm adapted to slide in said bearing. 5 and 6 show extension fingers on the rocking arm 4. 15^{x} and 16^{x} show the channel connecting the ports 15 and 16 with the respective ends of the cylinder.

Referring again to Figure 2, 7 shows a lever, pivoted at 8, operated by the fingers 5 and 6, (see also Figure 1) and thrown off center for the purpose of respectively opening and closing the ports by action of the spring 9 on the wedge-shaped end 10. As shown in Fig. 2, the spring 9 is in the form of a flat strip or ribbon secured at its ends to the cylinder and bent intermediate its ends to provide an upwardly projecting V-shaped portion tensionably engaging the wedge-shaped end 10 of the lever so that when the latter is perpendicular to the spring, the wedge-shaped end will be centered upon the V-shaped portion of the spring, in which position the edges of the wedge-shaped end of the lever and the projection on the spring are coincident. When this coincidence is broken by moving the lever off center with respect to the spring, the retractile force of the latter acting upon either side of the wedge-shaped end of the lever will pivot the latter to complete the throw of the valve. 18 shows a pin, extending from the port closing slide 17 (see Figure 3) adapted to engage, and cause the slide 17 to be operated by, the forks 19 and 20 of the lever 7. 29 shows the atmospheric opening which, by action of the slide 17, connects with the cylinder end opposite that in which the suction functions.

Referring again to Figure 3, 11 shows the thumb screw by means of which the suction channel 12 is opened and closed. 13 and 14 show continuation channels leading to the ports 15 and 16 and the port closing slide 17.

Referring again to Figure 4, 21 shows the shaft, operating in the bearings 22 and 23, to which shaft is fixed at 24 the squeegee arm 25. 26 shows a pin by means of which the shaft 21 is secured to the rocker arm 4. In order that rocker arm 4 may be adapted to provide a simplified means for holding the reciprocating piston in one fixed line of travel within the cylinder in which it moves, the arm is made integral with a supporting sleeve encircling shaft 21 and secured thereto by pin 26 previously referred to. The rocker arm itself consists of two substantially spaced apart parallel extensions having a cross pin 4^{x} connecting their outer extremities, which cross pin engages in the slide bearing 3^{x} of the connecting rod. The extension fingers 5 and 6 are also integral with the sleeve and project from opposite sides thereof as shown in Figure 1. During the reciprocation of the piston, the spaced apart elements of the rocker arm engage on opposite sides of the connecting rod 3 and serve to steady the same in its movement while moving freely up and down with the cross pin as it is swung from one side to the other of its pivot by the continuous reciprocation of the piston.

Referring again to Figure 5, 27 shows the squeegee, attached off its center to the arm 25 at 28, so that in operation the lower end of the squeegee is retarded in its window wiping progress, thus giving a nearer vertical sweep to the cleaning stroke. The top of the squeegee is anchored to the arm 28, by a suitable connection 30, to preserve its near vertical position.

Similar numeral references refer to similar parts throughout the various views.

In operation, the thumb screw 11 being at open and connection being had with the engine or other suction source at the channel 12, starting at the position shown in Figure 3, suction is had through the channels 12, 13, 14, 15, and 15×, thus drawing the piston 2 in the direction of the suction. By action of the connecting rod 3 at 3× the rocking arm 4 is brought to a position at which the finger 5 contacts with and presses the lever 7, to a point at center on the spring 9. (See Figure 2.) By action of the spring 9 on the point 10, the lever 7 is thrown off center, the port 15 is thereby closed and simultaneously the port 16 is opened, causing a reversal of the action described, during which reversal process the piston travels in the opposite direction. This action is repeated as long as the suction continues. The arm 25, secured at 24 to the shaft 21, insures during operation, a steady sweep of the squeegee back and forth over the area to be cleaned.

It will be understood that the specific construction described herein is but an optional form and that various changes therein may be resorted to without departing from the spirit of the invention or the scope of the following claims:

1. An operating motor for windshield cleaners comprising a cylinder, a member reciprocable therein, valve means to alternatively place opposite ends of the cylinder in communication with a source of suction and including a port-closing slide having an operating pin, a shaft journaled cross-wise of the said cylinder, a rocker arm fixed on the said shaft and operatively connected with the reciprocable member so as to impart oscillating motion to the shaft when the member is reciprocated, a lever pivoted to the cylinder on the inside thereof and adjacent the fixed end of the said rocker arm, one end of said lever being forked to provide spaced fingers adapted to alternately engage the operating pin of the said port-closing slide for reciprocating the latter, tensioning means fixed to the said cylinder and bearing against the opposite end of the lever to accelerate the movement of the latter when the said opposite end is off center, and extension fingers carried by the said rocker arm and adapted to alternately engage and shift the said lever until the said opposite end is in position to be acted upon by the said tensioning means.

2. An operating motor for windshield cleaners comprising a cylinder, valve means to alternately place opposite ends of the cylinder in communication with a source of suction and including a port-closing slide, a reciprocable plunger within the cylinder, and a pair of separately pivoted members mounted within the cylinder to operate in intersecting planes and having adjacent portions disposed for mutual abutment so that the rocking of one member will impart a rocking motion to the other member, one of said members being operatively engaged with the said slide for reciprocating the same and the other member being operatively engaged with the said reciprocable plunger.

3. An operating motor for windshield cleaners comprising a cylinder, a reciprocable plunger therein, valve means to alternately place opposite ends of the cylinder in communication with a source of suction and including a port-closing slide, a lever pivoted on the inside of the cylinder with one end operatively connected to the slide for moving the same and being wedge-shaped at its opposite end, a flat tensioning spring secured to the cylinder and bent intermediate its ends to provide a projecting V-shaped portion tensionably engaging the said wedge shaped end of the lever for accelerating the pivotal movement of the latter when off center with respect thereto, and plunger-actuated means for shifting the said lever at the completion of each stroke of the plunger to place the said wedge-shaped end in position to be acted on by the said spring.

In testimony whereof we affix our signatures.

LOUIS A. BARETT.
CHESTER HUNT.