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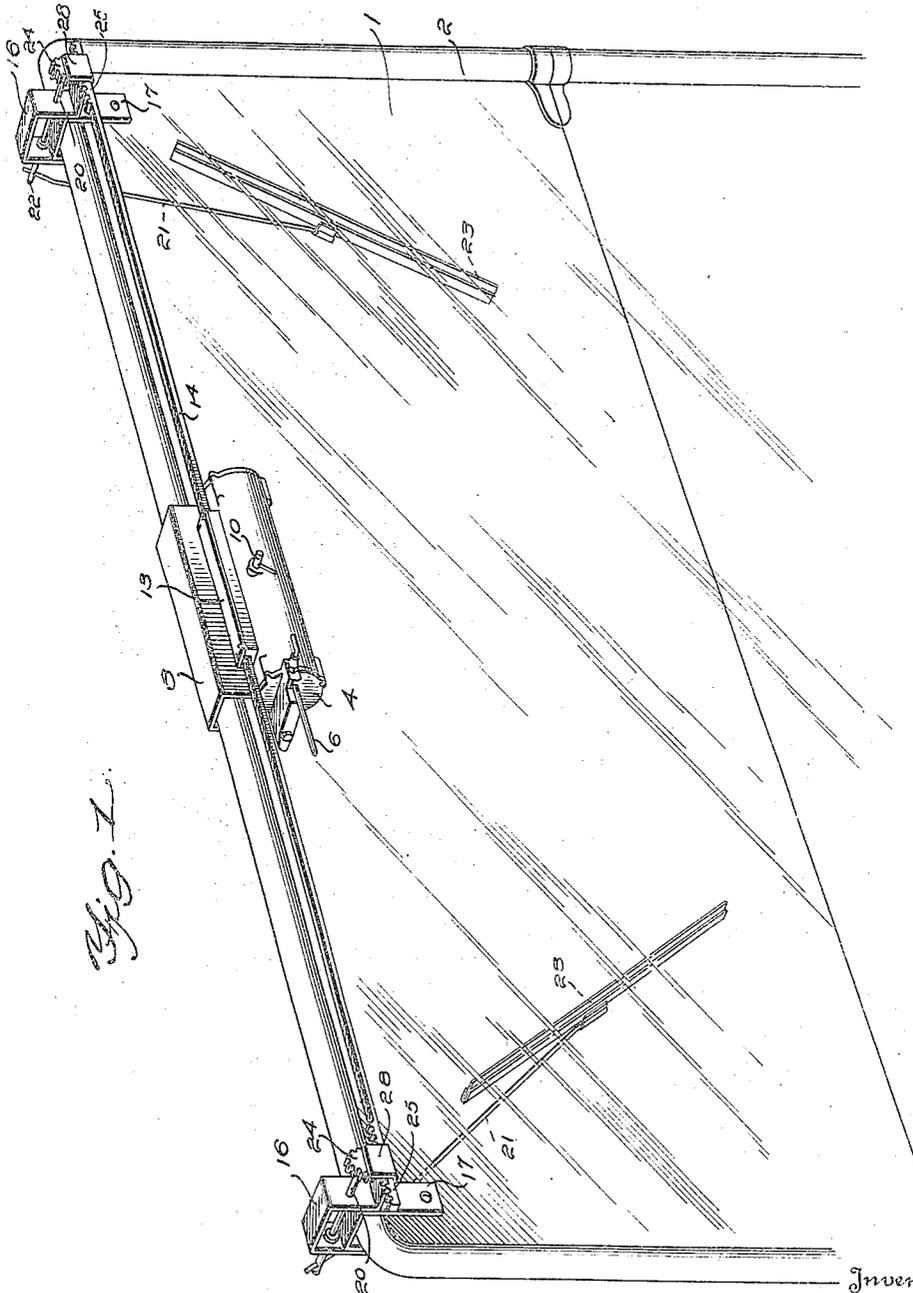
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F. G. FOLBERTH ET AL

WINDSHIELD CLEANER

Filed May 11, 1921

4 Sheets-Sheet 1



*Fig. 1.*

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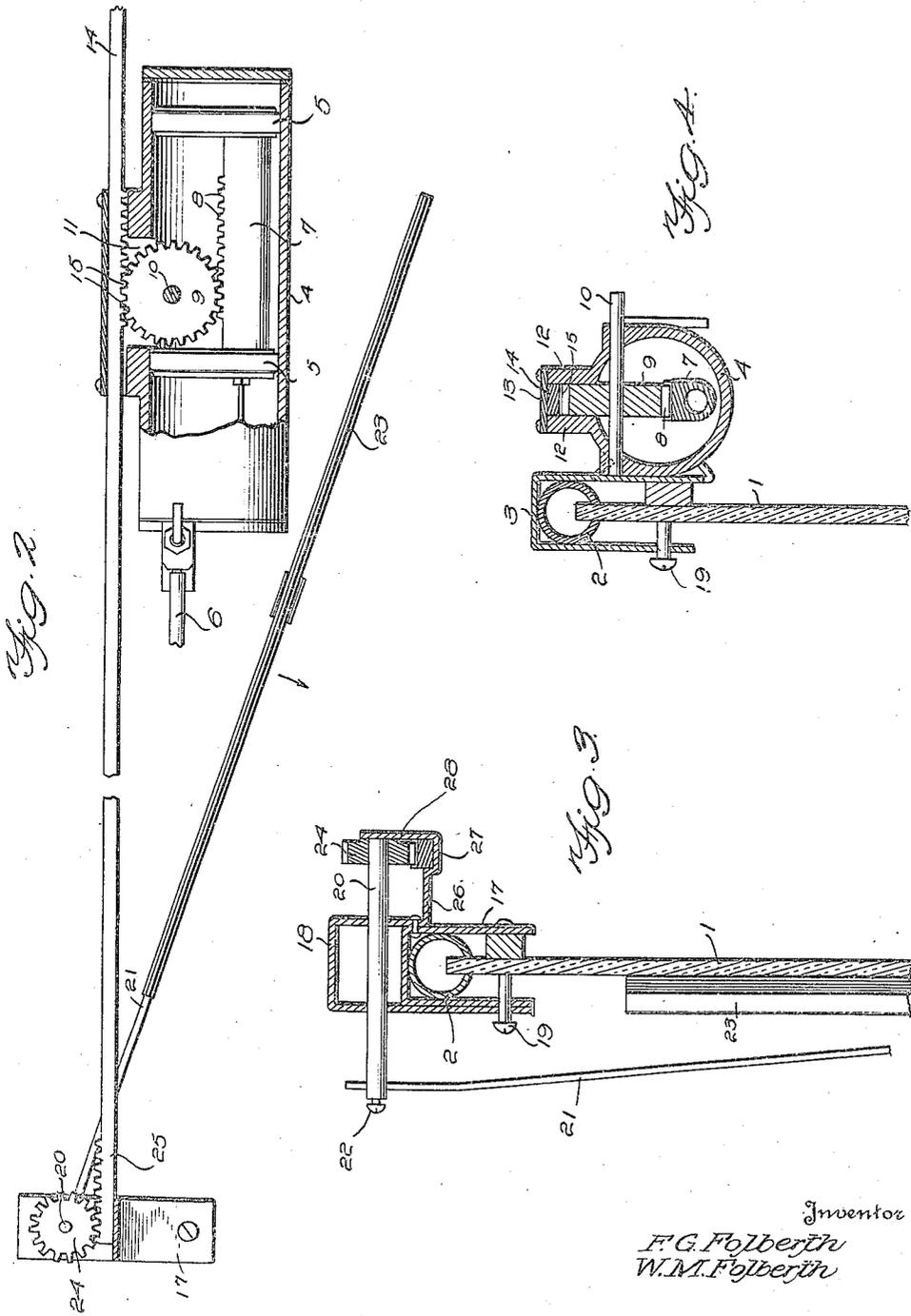
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WINDSHIELD CLEANER

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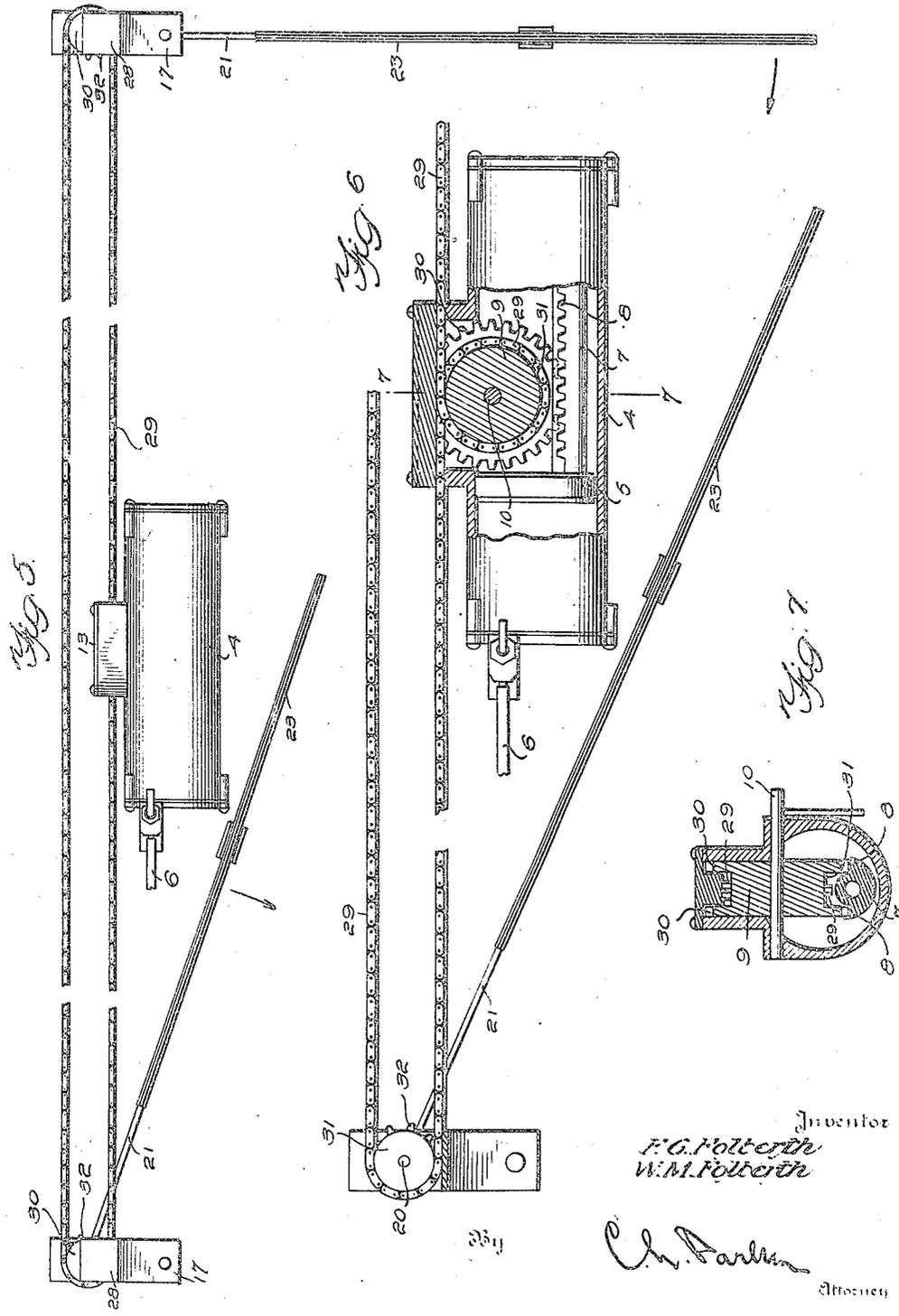
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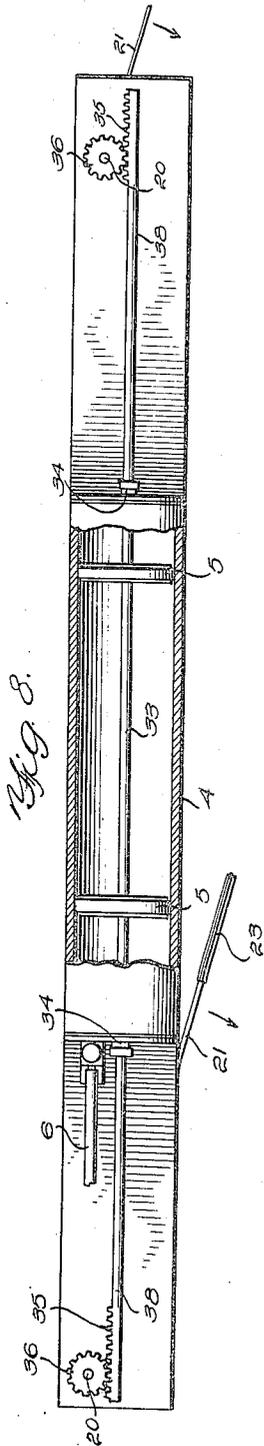


Fig. 8.

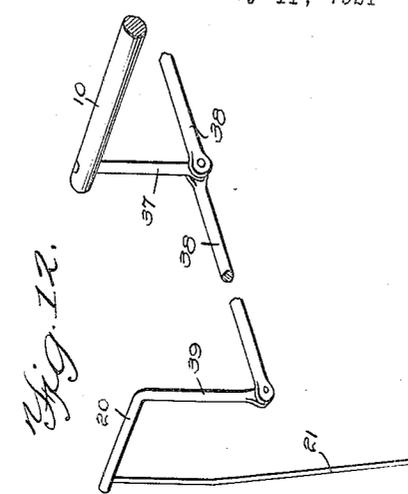


Fig. 12.

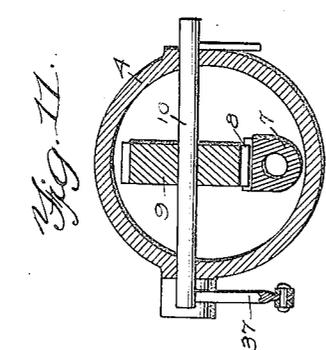


Fig. 11.

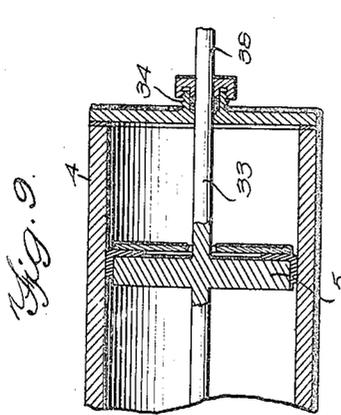


Fig. 9.

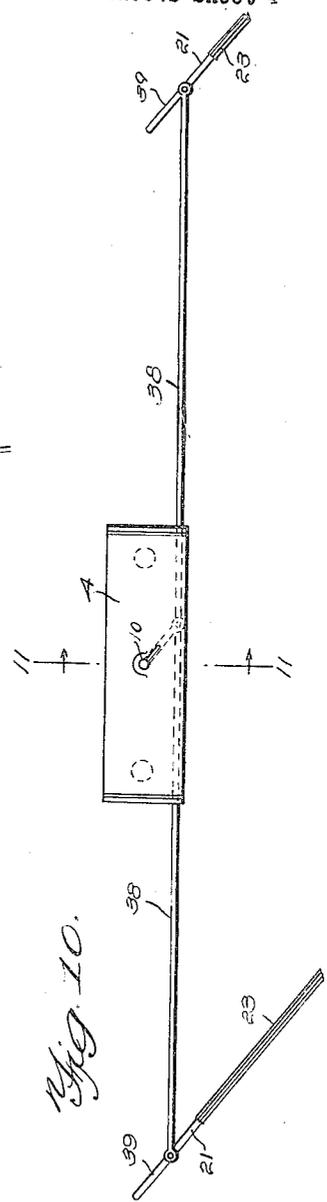


Fig. 10.

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# UNITED STATES PATENT OFFICE.

FRED G. FOLBERTH AND WILLIAM M. FOLBERTH, OF CLEVELAND, OHIO, ASSIGNORS  
TO THE FOLBERTH AUTO SPECIALTY COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

## WINDSHIELD CLEANER.

Application filed May 11, 1921. Serial No. 468,485.

*To all whom it may concern:*

Be it known that we, FRED G. FOLBERTH and WILLIAM M. FOLBERTH, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Windshield Cleaners, of which the following is a specification:

This invention relates to windshield cleaners, and it comprises a pair of cleaner elements adapted to be arranged in spaced relation on a windshield, an actuating member to oscillate said cleaner elements, and operating means for said actuating member.

In the present invention, we provide a windshield cleaner which may be motor driven or driven in any other suitable manner in which a pair of cleaner elements are employed, the cleaner elements being preferably arranged adjacent the sides of the windshield. The cleaner elements are connected in any suitable manner to an actuating member whereby the cleaner elements are oscillated. A single operating member is connected to the actuating member in any suitable manner to drive said actuating member whereby the cleaner elements may be oscillated.

In the forms of the invention herein disclosed, we have employed a motor operated device of substantially the construction shown in the copending application of William M. Folberth, filed January 25, 1919, Serial No. 272,143.

The main shaft of the motor is provided with suitable gearing or other means to oscillate the actuating member and the actuating member is connected to the cleaner elements by means of suitable gearing, whereby the cleaner elements will be oscillated in the arc of a circle when the actuating member is oscillated.

In the accompanying drawings, we have shown several embodiments of the invention. In this showing:

Figure 1 is a perspective view of a windshield cleaner showing one form of the invention applied,

Figure 2 is a front elevation of a portion of a windshield cleaner shown in Figure 1, parts being shown in section,

Figure 3 is a vertical sectional view through one of the cleaner elements,

Figure 4 is a vertical sectional view through the motor,

Figure 5 is a front elevation of a modified form,

Figure 6 is a similar view showing the connection between the motor shaft and the actuating member,

Figure 7 is a vertical sectional view on line 7—7 of Figure 1,

Figure 8 is a side elevation of another form, parts being shown in section,

Figure 9 is a detail enlargement of one end of the cylinder, in the form shown in Figure 8 of the drawings,

Figure 10 is a side elevation of another form of the invention,

Figure 11 is a sectional view on line 11—11 of Figure 10, and,

Figure 12 is a detail view.

Referring to Figures 1 to 4 of the drawings, the reference numeral 1 designates a windshield mounted in a suitable frame 2. A bracket 3 is arranged on the top of the windshield frame in any suitable manner, this bracket being adapted to receive and support a cylinder 4 which forms the operating mechanism of the windshield cleaner. A pair of pistons 5 are arranged in this cylinder, the pistons being adapted to be operated by means of pressure or suction, as desired. The actuating means employed in the application of William M. Folberth, referred to, may be employed to operate the pistons, the cylinder being connected to the intake manifold by means of a pipe 6. As the manner in which the pistons are operated and the valve mechanism by means of which alternate ends of the cylinder are connected to the pipe 6 forms no part of the present invention, a detail description thereof is deemed unnecessary. The pistons 5 are connected by means of a web 7, having rack teeth 8, arranged thereon. A gear 9 meshing with the rack teeth is mounted on a main motor shaft 10. As shown, the cylinder is provided with an opening 11, arranged in the top, and the gear projects through this opening. Above the opening, the cylinder wall is extended upwardly, as at 12, to form a guideway, the extensions 12 being connected by means of a plate or cover 13. An actuating member in the form of a rod 14 is arranged within this guideway, the actuating member ex-

tending substantially the entire width of the windshield. As shown, the actuating member is provided with rack teeth 15, adapted to mesh with the teeth of gear wheel 9. Arranged adjacent the sides of the windshield and spaced from each other are a pair of supports 16 for the cleaner elements. As the construction of each of these members is identical, a detail description of one will suffice. The supporting member comprises an inner U-shaped bracket 17 adapted to be arranged over the windshield frame and an outer bracket 18, one arm of which contacts with one of the arms of the bracket 17. The contacting arms of the brackets are provided with alined openings for the reception of a screw 19 to retain the brackets in position. The outer member is provided with alined openings for the reception of a shaft 20, the shaft having a rod or arm 21, secured thereto in any suitable manner, as by set screw 22. The cleaner element 23 is carried by this arm. The opposite end of the shaft is provided with a gear wheel 24, adapted to mesh with rack teeth 25 arranged on the actuating member. As shown, the inner arm of the bracket 18 is extended as at 26, and is depressed as at 27, to form a guide-way for the end of the actuating member. The extreme end of the arm is extended upwardly, as at 28, to engage the end of the shaft 20 and prevent longitudinal movement of the shaft.

In the form of the invention shown in Figures 5 to 7 of the drawings, the actuating member in the form of a flexible chain 29 is employed. The gear 9 is provided with two sets of gear teeth 30, arranged at opposite sides thereof, the central portion of the gear being reduced, as at 31. The chain is adapted to surround this portion of the gear, and may frictionally engage it as shown, or the reduced portion may be provided with sprocket teeth (not shown) to furnish a more positive drive. As shown, a pair of racks 8 are provided, meshing with the two sets of gear teeth 30.

The chain 29 passes over sprocket wheels 31 arranged on the shafts 20 of the cleaner elements, the sprocket wheels being provided with suitable sprocket teeth 32.

Referring to Figures 8 and 9 of the drawings, the cylinder 4 is provided with the usual pair of spaced pistons 5, connected by a rod 33. The rod extends through the cylinder heads in each direction, being provided with suitable packing, as indicated at 34. Adjacent the ends of the rod, sets of rack teeth 35 are provided, adapted to mesh with a gear 36 on the shaft of the cleaner element.

In the form of the invention shown in Figures 10 to 12 of the drawings, the construction of the cylinder and pistons is the

same as in Figures 1 to 7. A crank arm 37 is arranged on the actuating shaft, the crank arm being rigidly secured to the shaft and being oscillated by the oscillation of the shaft. A pair of links 38 are connected to this arm and the ends of the links are secured to cranks 39, carried by the cleaner shaft 20.

In the operation of the form shown in Figures 1 to 4 of the drawings, the pistons 5 are reciprocated in the cylinder by suitable means, causing the motor shaft 10 to be oscillated by engagement of the gear wheel 9 and the rack teeth 8. This oscillation is transmitted to the actuating member 14 by the rack teeth 15 and the cleaner elements 23 are oscillated in an arc of a circle by means of gear wheels 24 and rack teeth 25.

In the form of the invention shown in Figures 5 to 7 of the drawings, the engagement of the chain 29 with the gear wheel 9 causes the chain to be oscillated when the motor shaft 10 is oscillated, and this oscillation is transmitted to shafts 20 by means of sprocket wheels 31, engaging the chains 29.

In the form of the invention shown in Figures 8 and 9 of the drawings, reciprocation of the pistons in the cylinder causes the sets of rack teeth 35 to be reciprocated, oscillating the gears 36 and thus oscillating the cleaner elements. The operation of the form of the invention shown in Figures 10 to 12 of the drawings is substantially the same as in the other views. However, the use of the gear connection between the actuating member and the cleaner shaft is eliminated, and these members are connected by means of cranks 39, whereby the cleaner elements are oscillated when the main shaft 10 is oscillated.

It will be apparent that by means of the present invention, a pair of cleaner elements arranged on a windshield in spaced relation to each other may be oscillated from a single source of power. As stated, the motor herein disclosed by means of which the power is furnished forms no part of the invention except in the combination claimed, and other means for oscillating the actuating member and thus oscillating the cleaner elements may be employed.

It is to be understood that the forms of our invention herewith shown and described are to be taken as preferred examples of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described our invention, we claim:

1. Windshield cleaning apparatus comprising a pair of pivotally mounted cleaner elements, said cleaner elements being pivoted

in substantially the same horizontal plane and being adapted to oscillate in the same vertical plane between points beneath the plane of the pivots, an actuating member 5 connected to said cleaner elements to oscillate them, a cleaner motor arranged in substantially the same horizontal plane with the pivots of said cleaner elements and having an oscillating motor shaft connected to 10 said actuating member.

2. Windshield cleaning apparatus comprising a pair of pivotally mounted cleaner elements, said cleaner elements being pivoted in substantially the same horizontal 15 plane and being adapted to oscillate in the same vertical plane between points beneath the plane of the pivots, an actuating member connected to said cleaner elements to oscillate them, a motor arranged in substantially the same horizontal plane with the 20 pivots of said cleaner elements, a motor shaft adapted to be oscillated by said motor, and a gear wheel mounted on said shaft and engaging said actuating member, to operate 25 it.

3. Windshield cleaning apparatus comprising a pair of supporting members adapted to be arranged on a windshield, a cleaner shaft mounted in bearings in each of said 30 supporting members, cleaner elements arranged on said shaft on one side of said windshield and adapted to be oscillated in substantially the same plane, gear wheels mounted on said shafts, an actuating member 35 extending between said shafts, said actuating member being provided with rack teeth engaging said gear wheels, a main operating shaft arranged between said cleaner shafts, a gear wheel secured to said main operating shaft, and means for operating 40 said actuating member when said gear wheel is oscillated.

4. Windshield cleaning apparatus comprising a pair of supporting members arranged in spaced relation on a windshield, 45 cleaner shafts mounted in said supporting members, cleaner elements arranged on said shafts on one side of said windshield and adapted to be oscillated in substantially the same plane, gear wheels arranged on said 50 shafts, an actuating member extending between said shafts, said actuating member being provided with rack teeth meshing with said gear wheels, and being further provided with rack teeth arranged intermediate 55 said gear wheels, a main shaft arranged adjacent said intermediate rack teeth, a gear wheel secured thereto and meshing with said intermediate rack teeth, and power operated means for oscillating 60 said main shaft.

In testimony whereof we affix our signatures in presence of two witnesses.

FRED G. FOLBERTH.

WILLIAM M. FOLBERTH.

Witnesses:

FRED I. JONES,

H. C. BLOCKER.