E. U. DAINES.

WINDOW CLEANING DEVICE.

APPLICATION FILED MAY 5, 1913.

1,072,832.

Patented Sept. 9, 1913.

2 SHEETS—SHEET 1.

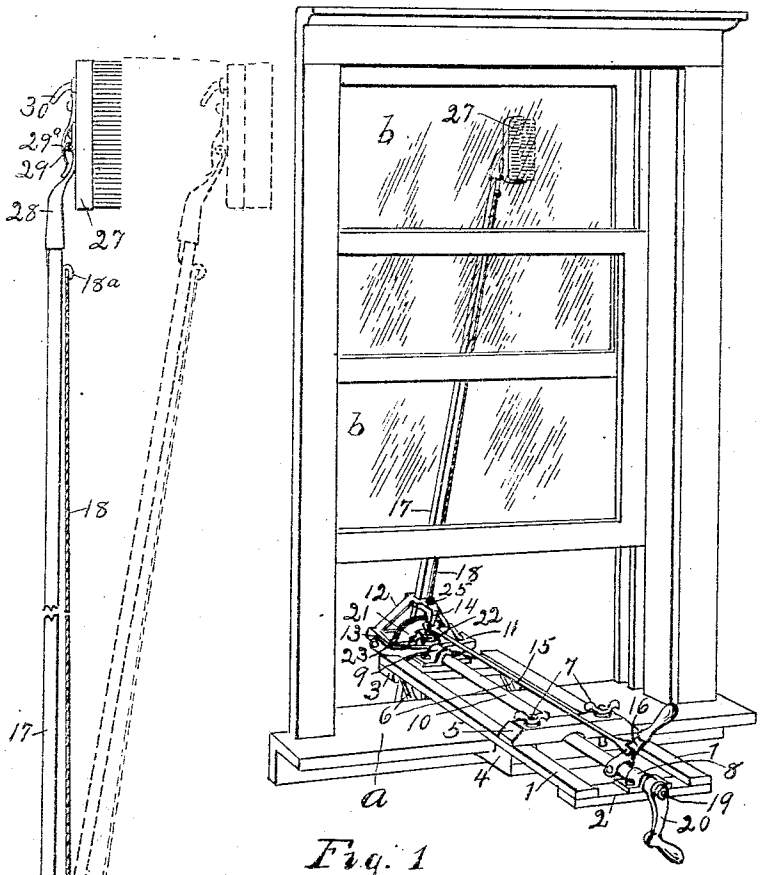


Fig. 1

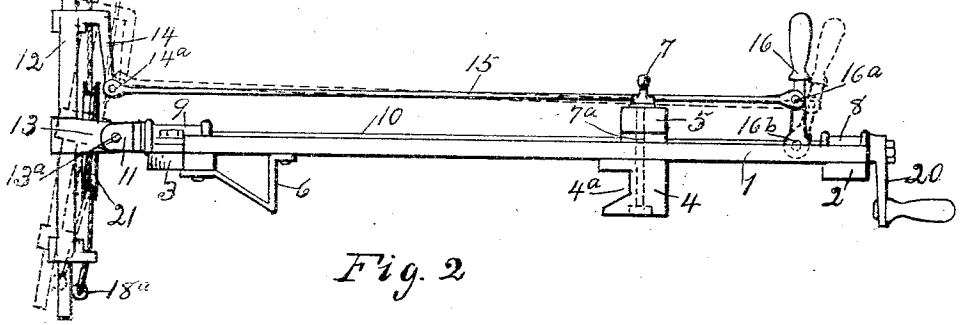


Fig. 2

Witnesses

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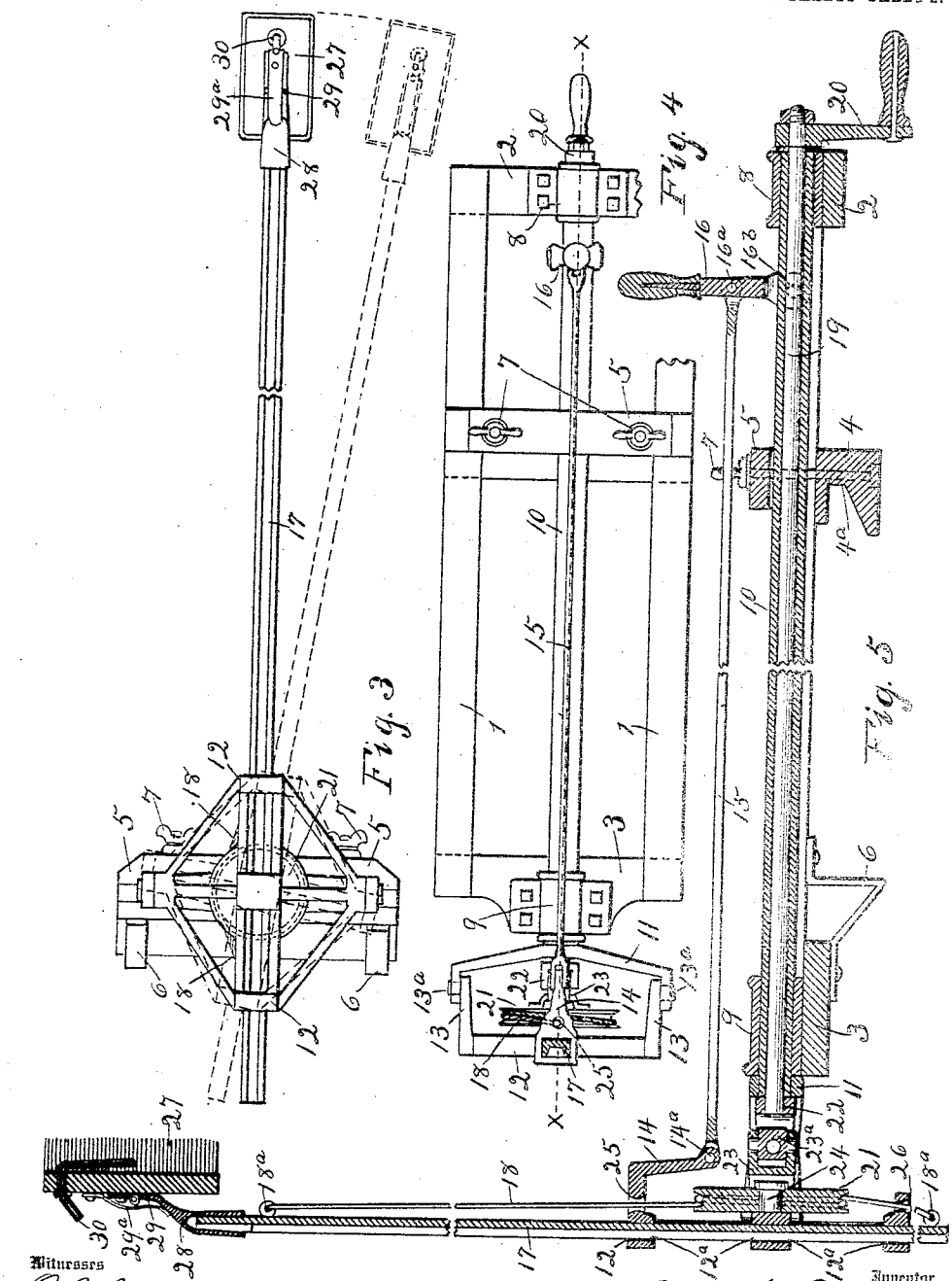


Fig. 3

Fig. 4

Fig. 5

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WINDOW-CLEANING DEVICE.

1,072,832. Specification of Letters Patent. Patented Sept. 9, 1913.

Application filed May 5, 1913. Serial No. 765,450.

To all whom it may concern:

Be it known that I, EDWIN U. DAINES, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Window-Cleaning Devices; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to a window cleaning device, and consists in the construction and arrangement of parts hereinafter more fully set forth and pointed out particularly in the claims.

The object of the invention is to provide safe, simple and effective means whereby the outer surfaces of upper story windows may be quickly and easily cleaned in such manner as to obviate the necessity of exposing the operator to a position of danger within the window or upon the casing or ledge thereof, as is the usual practice. The operation of cleaning windows with my device may be accomplished entirely from within the building.

The above object is attained by the structure illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of my invention as applied to the sill of a window in position for operation. Fig. 2 is a side elevation of the device showing by dotted lines a portion thereof in an adjusted or tilted position. Fig. 3 is an end elevation also indicating by dotted lines a tilted position. Fig. 4 is a plan view of the device partly in section, and having the frame-work broken away at the lower right-hand corner. Fig. 5 is a sectional view of the device taken on dotted line x—x of Fig. 4.

Referring to the drawings by the characters of reference marked thereon, a represents the sill and b the sash of an ordinary window.

1—1 represent the side members of the supporting frame to which are attached at opposite ends the cross members 2 and 3.

6 represents sleeve brackets attached to the lower side of the cross member 3, and also to the side members 1—1 of the supporting frame (see Figs. 2 and 5), said brackets being adapted to engage the outer edge of the window sill, as shown in Fig. 1.

4 represents a cleat engaging the under face of the side members 1—1, and having a recess 4^a in its inner face adapted to engage the inner edge of the window sill.

5 represents a cleat or clamping member which engages the upper face of the side members in line with the cleat 4, and is drawn into fixed contact with the side members through the medium of the engaging bolts 7^a carrying thumb nuts 7, by means of which the cleats are clamped to the frame and the device anchored or secured in a fixed position to the window sill, as shown in Fig. 1.

Mounted on the cross members 2 and 3 of the supporting frame, respectively, are journal bearings 8 and 9, and journaled in said bearings is a sleeve or tubular shaft 10, said shaft carrying at its outer end a yoke 11.

12 represents a cross-head having rearwardly projecting arms 13 which are pivoted at 13^a to the yoke 11 (see Fig. 4), and extending rearwardly and downwardly from the upper end of said cross-head is an arm 14 to which one end of the connecting rod 15 is pivoted at 14^a, the opposite end of said connecting rod being pivoted at 16^a to the hand lever 16 which is bifurcated at its lower end and is pivoted at 16^b to the tubular shaft 10 at a point near the rear end thereof.

Lying within the sleeve or hollow shaft 10 is a solid shaft 19 carrying at one end a crank arm, while the opposite end of said shaft is connected through the medium of an ordinary universal joint composed of members 22, 23 and 23^a, as clearly shown in Fig. 5, to the grooved pulley 21 journaled on the stud 24 of the cross-head 12, whereby a flexible connection is effected at a point on a horizontal line with the pivotal connection between the yoke 11 of the shaft 10 and the arms 13 of the cross-head 12, enabling said cross-head to be tilted to an angular position, as shown in Fig. 2, through the medium of the hand lever 16 and its connecting rod 15.

Mounted in parallel ways 12^a of the cross-head 12 is a mast or staff 17 in the form of a channel rail, and attached at points near the opposite ends of said staff through the hooks or eyes 18^a are the opposite ends of a cable 18, which, extending through the

guide ways 25 and 26 of the cross-head 12, is rove about the pulley 21, as shown in Figs. 4 and 5.

It will be seen that the cable is so rove about the pulley as to enter and leave the groove of said pulley at one side thereof, as shown in Fig. 3, whereby as the shaft 19 is rotated through the medium of the crank arm 20, revolving the pulley 21 through the universal coupling as described, the cable will be caused to wind onto and unwind from said pulley, causing the staff to travel lengthwise within the guide-ways 12^a of the cross-head as the pulley 21 is rotated in either direction.

Mounted on the upper end of the staff 17 is a brush, sponge or other suitable cleaning agent 27 which is pivotally carried upon the socket arm 28 that receives the tapered upper end of said staff, said brush being flexibly held in a vertical position through the medium of the hinge 29 and the tension of the spring 29^a, one end of which is secured to the back of the brush, while the free end overlaps the hinge and bears upon the socket arm 28, as shown in Figs. 2 and 5, whereby said brush is permitted to retain a vertical position through the action of said hinge and spring as the mast 17 is tilted through the medium of the lever 16 and the connecting rod 15, when said brush is brought against the outer surface of the window pane, as shown in Figs. 1 and 2.

A tube 30 is inserted through the back of the brush, communicating with the bristles thereof and extending outwardly from the brush back in the form of a sleeve or nipple to receive a hose connection to provide for a source of water supply to the brush 27, as shown in Figs. 2 and 5.

It will be seen from the foregoing arrangement and construction that the device, when secured in position upon a window sill, may be so controlled and operated through the lever 16 and crank arm 20 as to cause the brush or cleaning agent to be raised and lowered by the mast through the action of the cable in winding upon and unwinding from the pulley when rotated in either direction by the crank arm 20. Said brush may also be swung horizontally in the arc of a circle across the window pane by imparting an oscillating motion to the lever 16, which in turn will rock the hollow shaft 10, carrying with it the cross head and its mast, while a reciprocatory motion imparted to the lever 16 will, through the connecting rod 15, cause the cross-head to rock upon its pivotal bearing, with the yoke 11 carrying the brush toward or from the window horizontally in the arc of a circle, as shown by dotted lines in Fig. 2. It will therefore be possible to cause the brush or cleaning member carried on the end of the mast to cover the entire plane or surface of the window pane, when either or both sash may be treated by raising or lowering either sash to make it accessible for ease or convenience in the operation of cleaning.

While provision is made for the attachment of a hose to convey water to the cleaning member, it will also be desirable to employ at the upper end of the mast a scraper or wiping member for the purpose of drying the window glass, and for this reason the brush shown is made detachable so as to permit its removal and the substitution of any other suitable agent therefor.

The principal features in my invention lie in the construction and association of the several parts in such manner as to secure through mechanical action the manipulation of the mast, with any suitable cleaning agent or member mounted thereon, so as to enable the entire surface of the glass to be covered or gone over by the operator of the device from a point of safety within the building.

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

1. A device for cleaning windows comprising a supporting frame, means for detachably securing said frame to the window sill, a sleeve journaled in bearings on said frame, a cross-head pivotally mounted on said sleeve and having a parallel way formed therein, a staff movably carried in said way, a lever pivoted to said sleeve, a rod pivotally connecting said lever to said cross-head, a shaft journaled in said sleeve, a pulley journaled on said cross-head and having a flexible connection with said shaft, means for connecting said pulley with said staff, and means for rotating said shaft to impart a reciprocating motion to said staff.

2. A device for cleaning windows comprising a supporting frame, clamping members for detachably securing said frame to a window sill, a sleeve journaled in bearings on said frame, a yoke carried on said sleeve, a cross-head pivoted to said yoke and having a parallel way formed diametrically therein, a staff mounted to slide in said way, a lever pivoted to said sleeve, a connecting rod pivotally attached at one end to said lever and at its opposite end to said cross-head, a shaft journaled in said sleeve, a pulley journaled in said cross-head and having a flexible connection with said shaft, a cable rove about said pulley and having its opposite ends attached to opposite ends of said staff, a crank attached to said shaft for rotating said shaft and pulley to raise and lower said staff, a cleaning member detachably mounted on said staff.

3. A device for cleaning windows consisting of a rectangular supporting frame composed of parallel side members and

having cross members attached to the ends thereof, depending brackets attached to the ends of said side members, clamping cleats engaging the opposite faces of said side members, means for drawing said cleats into fixed contact with said members, journal bearings mounted on said frame, a sleeve journaled in said bearings, a yoke carried on one end of said sleeve, a cross-head pivoted to said yoke and having a parallel way formed diametrically therein, a staff slidingly mounted in said way, a lever pivoted to said sleeve, a connecting rod pivotally attached at one end to said lever and at its opposite end to said cross-head, a shaft journaled in and extending through said sleeve, a pulley journaled in said cross-head, a universal coupling connecting said pulley with said shaft, a cable rove about said pulley and passing through guide-ways in said cross-head, the opposite ends of said cable being attached to opposite ends of said staff, a crank attached to said shaft for rotating said shaft and pulley to impart a reciprocating motion to said staff, and a cleaning member flexibly and detachably mounted on said staff.

In testimony whereof, I sign this specification in the presence of two witnesses.

EDWIN U. DAINES.

Witnesses:
O. B. BAENZIGER,
M. E. BROESAMLE.