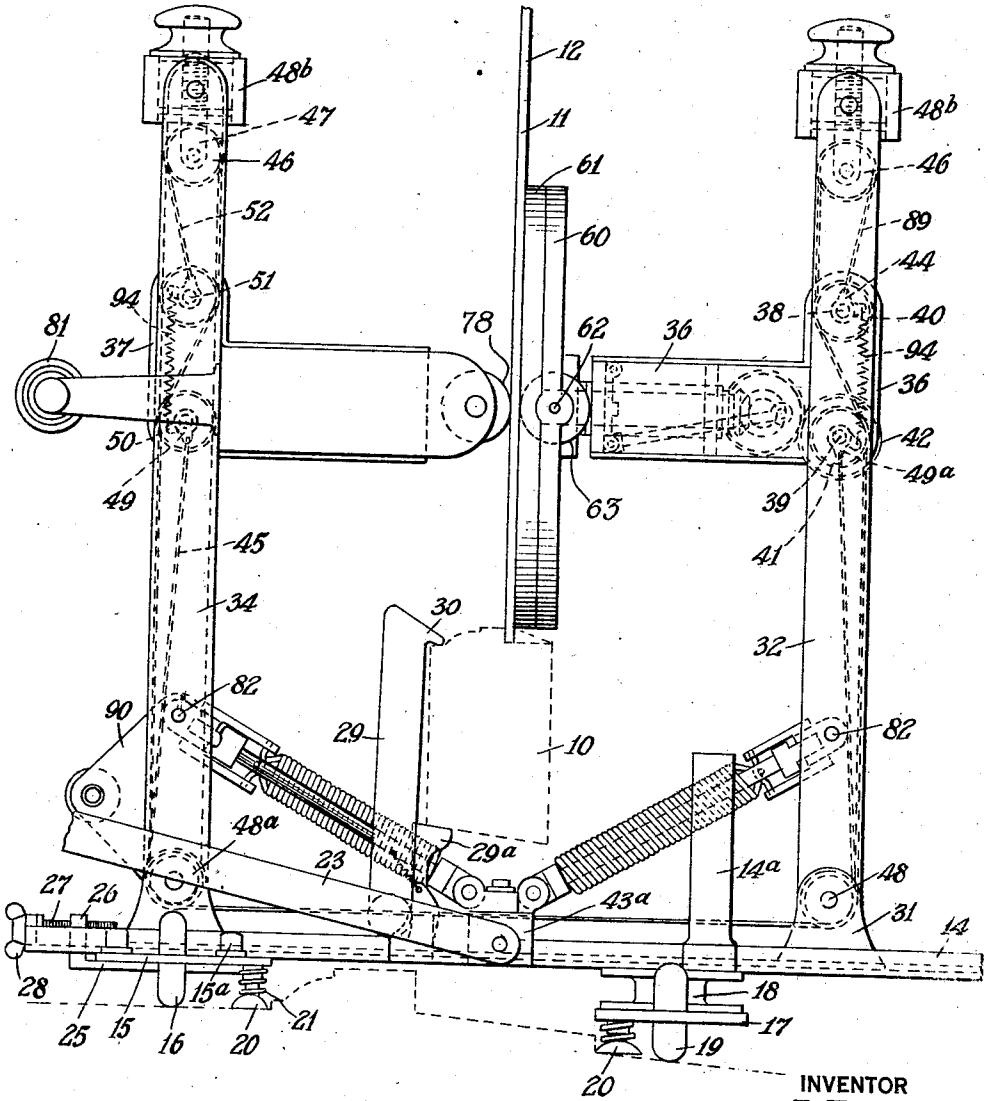
May 4, 1926. 1,583,346

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WINDOW CLEANING DEVICE

Filed May 21, 1925 3 Sheets-Sheet 1

FIG. 1



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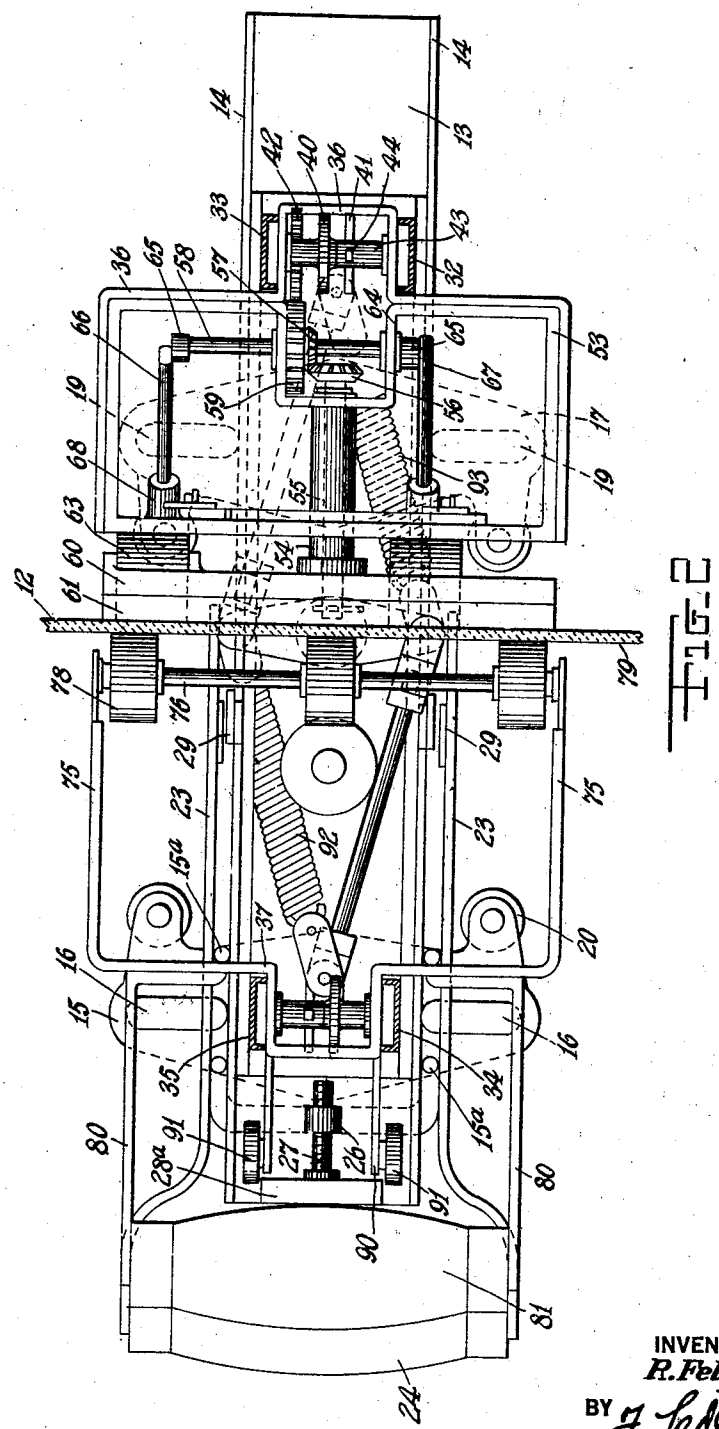


FIG. 2

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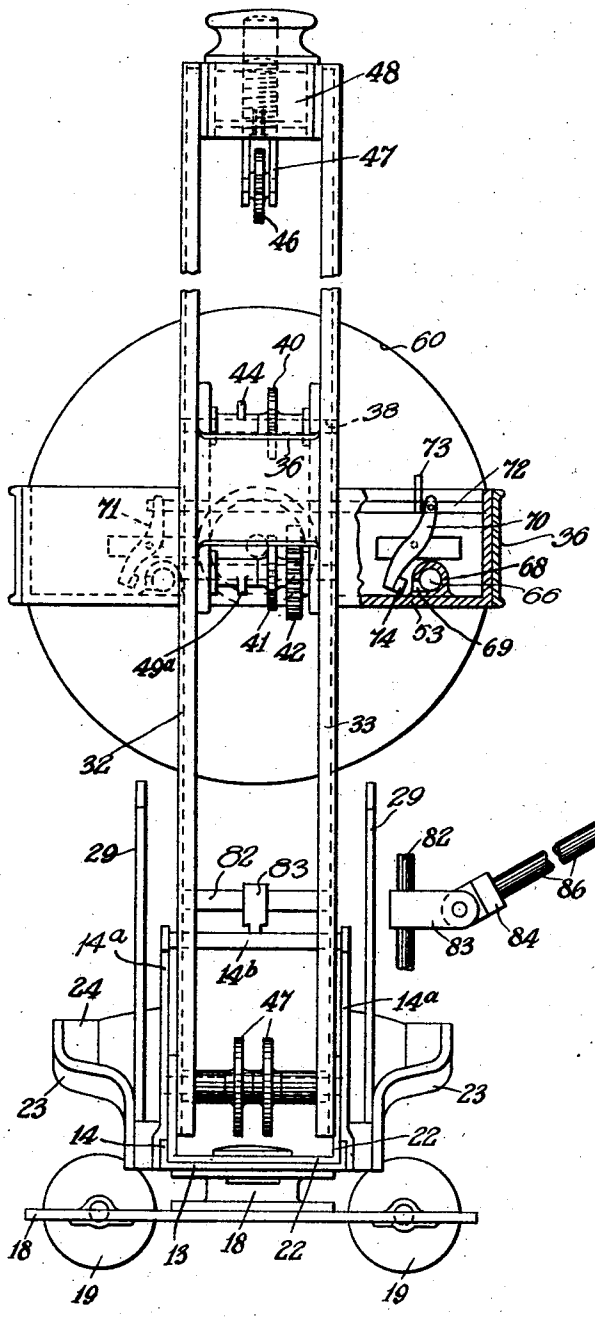
May 4, 1926. 1,583,346

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WINDOW CLEANING DEVICE

Filed May 21, 1925 3 Sheets-Sheet 3

FIG. 3



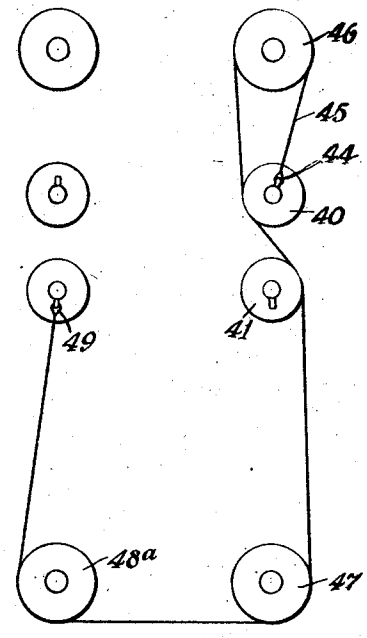


FIG. 4

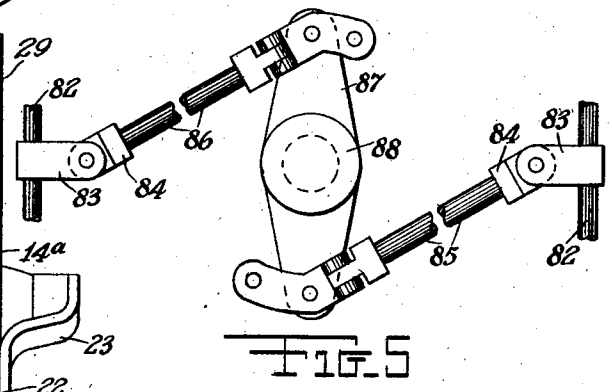


FIG. 5

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Patented May 4, 1926. 1,583,346

UNITED STATES PATENT OFFICE.

RICHARD FELGNER, OF BROOKLYN, NEW YORK.

WINDOW-CLEANING DEVICE.

Application filed May 21, 1925. Serial No. 31,833.

To all whom it may concern:

Be it known that I, RICHARD FELGNER, a citizen of Germany, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Window-Cleaning Devices, of which the following is a specification.

The main object of this invention is to provide a device by which the outer surfaces of window panes may be cleaned from a position within the room. In cleaning the outer surfaces of window panes, it is usual for a person to seat himself upon the sill to carry on the cleaning operations exterior of the room. In doing this, the cleaner lays himself open to injury thru a fall. It is to prevent this danger that the herein described device has been designed, having for its main purpose the operation of a cleaning pad which may have ready access to any pane of the exterior surface of a window pane and be operated safely from a position within the room.

The above and other objects will become apparent in the description below, in which characters of reference refer to like-named parts in the drawing.

Referring briefly to the drawing, Figure 1 is a side elevational view of a window cleaning device, showing the same in position for operation.

Figure 2 is a top plan view of the device, showing the entire mechanism for cleaning a window pane and moving the device to any position on the window frame.

Figure 3 is an end elevational view of Figure 1.

Figure 4 is a schematic view, showing the means for simultaneously lifting the cleaning pad and the bracing carriage.

Figure 5 is a top plan view of the frame adjusting mechanism.

Referring in detail to the drawing, the numeral 10 shows the rim or window frame in dotted lines. This window frame serves as a framing member for a glass window pane 11 in all types of windows. It is the purpose of this invention to provide a mechanism for cleaning the exterior surface 12 of the window pane. This device consists of a channelled plate 13 which serves as the supporting carriage for the entire device and is provided with parallel retaining walls 14. Beneath one end of the supporting carriage, a substantially oval plate 15 is mounted. This plate 15 extends transversely beneath the supporting carriage and is retained upon a pair of rollers 16 which are journalled in the plate and are adapted to support one end of the device. Beneath the supporting carriage and near the opposite end of the same, is an additional plate member 17 of similar outline and size as the plate 15 and is rigidly secured at a position beneath the level of the plate 15 by being mounted on the lower face of a flanged hub 18. This plate also serves as a means for journalling the axle studs of rollers 19. Each of the plates 15 and 17 are provided with studs at the lower ends on which inverted cup-shaped washers 20 are secured and these cup-shaped washers are adapted to be urged down-wardly by the pressure of coil springs 21. In order to urge said washers into contact with the surfaces of the window sill to prevent the device from moving across the window sill when the same is being operated, a second channelled plate 22 is slidably mounted within the supporting carriage 13 and is also provided with parallel side walls on which various members which it is desired to move with this channelled plate, are secured. A pair of arms 23 have their ends secured to a bracket 43^a on the movable carriage at a position intermediate the length of the latter. The opposite ends of these arms 23 are connected by a handle bar 24, said handle bar being manipulated when it is desired to shift the supporting carriage to various positions along the length of a window sill. At one end of the supporting carriage between the plate 15 and the handle 24, a flange 25, rigid with the plate 15, extends outwardly from the end of the supporting carriage and is provided with a lug 26 in which a threaded hole is provided. Into this threaded hole, the shank of a screw 27 is inserted. A bearing 28^a is rigid on one end of the supporting carriage 13 and is provided with a clear hole in which one end of the screw is loosely rotatable. This end of the screw 27 which passes thru member 28^a has a wing nut 28 secured thereon and which is used for manipulation. The screw by being rotatably fixed in member 28^a and in threaded engagement with the lug 26 moves the latter and by such movement slides the plate 15 longitudinally beneath the supporting carriage to the position desired. Said plate 15 has pairs of guide studs 15^a arranged on

both sides of the supporting carriage exterior of the retaining walls 14. A pair of levers 29 are pivotally mounted at their lower ends on the arms 23, and at their upper ends, are formed into hook members 30, said hooks being adapted to engage the corners of the window frames to retain the latter in lowered position seated on a platform 29[a]. Near the opposite side of the supporting carriage 13 a pair of levers 14[a] are pivoted on the side walls 14 of said carriage and their upper ends are connected by a stud 14[b]. Said levers are used to support the outer or upper window frame when the latter is lowered for cleaning purposes.

The movable carriage 22 is slidably mounted in the fixed carriage 13, has corners or ends of its retaining walls formed into ears 31 to which the lower ends of channelled guide frames 32, 33, 34, and 35, are secured. The channelled frames, when the device is in use, are in normally upright position. The channelled frames are pivotally connected to the ears 31 and work in pairs, frames 32 and 33 cooperating and the remaining frames 34 and 35 cooperating together in a similar manner. These cooperating frames are spaced-apart from each other and have their flanges or side walls facing toward each other in order to permit the slidable mounting of vertically moving carriage frames 36 and 37 therein. The vertically moving carriage frame 36 is slidably mounted between the vertical guide frames 32 and 33 and supports a pair of shafts 38 and 39. These shafts have their ends fixed within the sides of the vertically moving frame 36 one above the other and on the upper shaft 38, a toothed wheel 40 is rotatably mounted. The lower shaft 39 has a similar toothed wheel 41 rotatably mounted thereon to which a gear wheel 42 is permanently secured. On the upper shaft 38 adjacent the hub of the toothed wheel 40, a sleeve 43 is loosely mounted on said shaft and is provided with an eyelet lug 44. One end of a chain 45 is secured to this eyelet lug 44 and is trained to course upwardly around a toothed wheel 46 which is rotatably mounted in a bifurcated yoke 47, the latter being mounted on a boss 48[b] rigid at the top of the vertical frames 32 and 33. This chain courses halfway around and over the toothed wheel 46 and then passes downwardly to engage the periphery at the inner side of the toothed wheel 40 from there being deflected outwardly toward the opposite side of the periphery of the wheel 41 which it engages and rotates and then passes vertically downward around the toothed wheel 47 which is mounted on a shaft 48, from whence it passes horizontally across the movable carriage and is trained a quarter turn about a toothed wheel 48[a] and then is connected to the eyelet lug 49 mounted upon a sleeve loosely mounted on a shaft 50, which is secured in the vertically moving carriage frame 37. Between each of the cooperating eyelets which are mutually mounted on the carriages 36 and 37, springs 94 are coupled to the eyelets and are adapted to take up the slack of the chains 45 and 52 by their tension. The shaft 50 constitutes the lower member of a pair of shafts 50 and 51 which are carried in the vertically moving carriage frame 37, and these shafts are provided with toothed wheels in a similar manner as just described for the opposite carriage 36, and have a separate chain 52 connected thereto in the same identical manner, as just described and illustrated schematically in Figure 4, the purpose for mounting these chains to cooperate with the toothed wheels in the manner set forth, being to permit the simultaneous lifting or lowering of the carriages 36 and 37. It will be seen that these vertical frames are both provided with the members 48[b] from each of which a toothed wheel 46 is suspended from a bifurcated yoke 47. Two chains 45 and 52 are used. One chain has one of its ends connected to the eyelet mounted on the carriage 37 and passes upwardly around the toothed wheel 47 mounted between the frames 34 and 35 and then courses downwardly around the various pulleys to be finally connected to the eyelet 49[a] which is loosely mounted on the lower shaft 39. The vertically moving carriage 36 has a member 53 thereon which is hollow and open at the top and serves as a container in which any cleaning fluid may be filled. This container is rigidly supported upon the carriage 36 and within its confines has a sleeve 54 which passes thru the container and houses a spindle 55. The spindle 55 passes entirely thru the chamber of the container in the sleeve 54 and at its one end has a bevelled gear 56 attached thereto. The latter meshes with a pinion bevelled gear 57 which is rigidly mounted on a shaft 58, the latter being rotatably secured in the walls of the container. This shaft also has a spur gear 59 secured thereto adjacent the pinion 57 and meshes with the gear 42 mounted upon the shaft 39. The opposite end of the spindle has a relatively large disk 60 mounted thereon whose lower face is covered with a felt or similarly soft cleaning pad 61 adapted to normally lie in contact with the surface 12 of the window pane. The disk 60 is provided with a plurality of lugs which journal a shaft 62 on which a plurality of rollers 63 of rubber or similar other material are mounted. The spindle 58 rotatably mounted within the container projects from both sides of the container walls 64 and upon its ends, hubs 65 are mounted from which eccentric pins project. These eccentric pins engage the ends of reciprocat-

ing arms 66 and 67. The opposite ends of the reciprocating arms 66 and 67 are adapted to slidably enter into hollow bosses 68 which have openings 69 formed in their sides. Thru these openings 69, fluid enters from the container 53 and is urged upon the peripheries of the rollers 63 by the reciprocating and plunger-like action of the arms 66 and 67.

Means for closing or opening the circulation of the fluid contained in the container thru these openings 69 is provided by the pivoted levers 70 and 71 whose upper ends are pivotally connected to a slide bar 72 from which a thumb stud 73 projects. The lower ends of the levers are provided with smaller lugs 74 which are adapted to swing with the levers 70 and 71 and are adapted further to seal the openings 69 in the bosses 68 when the bar 72 is manipulated or moved in the proper direction so that said lugs 74 enter into the openings 69, in this manner closing circulation of the fluid from the confines of the container into the hollow portion of the bosses in front of the ends of the arms 66 and 67.

To distribute the pressure evenly on both sides of the window pane 11, a mechanism is provided on the carriage 37 directly opposite the carriage 36 whereby the tendency of the pressure against one side of the glass pane is equalized by an additional pressure on the opposite side of the pane. This frame 37 has arms 75 extending from opposite sides toward the center of the device, and in the ends of these arms, the ends of a spindle 76 are rotatably mounted, this spindle having at spaced-apart positions, a plurality of rollers 78 mounted thereon which are adapted to contact with the interior surface 79 of the window pane. A pair of plates 80 are mounted upon the vertically moving carriage 37 between which a handle bar 81 is mounted which is adapted to be grasped and manipulated by the hand of the operator.

The vertical guide frames 32, 33, 34, and 35, are pivoted at their lower ends upon the ears 31 and are adapted to be adjusted radially to fit in the thickness of the window pane. Adjustment of these guide frames is had by providing each of the cooperating frame members with a stud 82. One of these studs is mounted between each of the pairs of the vertical guide frames, that is, one stud is mounted between the guide frames 32 and 33, and another stud is mounted between the guide frames 34 and 35. Intermediate the length of these studs, an anchoring block 83 is mounted so that the same may be rotated upon the stud. These blocks in cooperating with tongued members 84, are mounted on the ends of rods 85 and 86 and form a universal joint. The rods 85 and 86 pass angularly toward the center of the moving carriage 22 and have their ends connected pivotally to a bar 87 which is pivotally mounted centrally on a screw 88 and is adapted to transmit an angular movement of one pair of the vertical guide frames to the other pair so that when one pair of guide frames is moved outwardly, the opposite pair are moved similarly and a corresponding distance in the opposite direction from the actuated bar.

The device is used for cleaning the exterior surfaces of window panes such as that indicated by the numeral 12 and may be shifted to various positions along the window sill. The fixed supporting carriage 13 is mobile and may be shifted to any position on the sill by simply grasping the handle 24. When the device is being set into place on a window sill, the handle 81 is pulled toward the operator so that the device may be tilted in order to project that part of the slide carriage which supports the vertical guide channels 32 and 33 to a position exterior of the window sill. By pulling on the handle 81, the vertical guide channels, which are pivoted on the studs 48, are rotated away from each other and when the entire device has been firmly set in the desired place on the sill, this handle 81 is again pushed toward the window pane which in turn rotates the vertical bars of guide rails 32, 33, 34, and 35, toward each other until the cleaning pad 61 lies flush upon the exterior surface 12 of the window pane 11. By again grasping this handle 81 and moving the same upwardly and downwardly, the disk 60 on which the cleaning pad 61 is mounted, is rotated. The carriage 37 when being lowered, simultaneously lowers the carriage 36 on which the cleaning apparatus is mounted, thru the novel training of the chain about the pulleys, as illustrated in Figure 4. Lowering both carriages simultaneously is accomplished by suspending the carriage 36 from one of the chains, which latter extends upwardly and is trained about the upper toothed wheel 46 and then passes downwardly around various toothed wheels training about the toothed wheel 47 and passing over the carriage 37 to be trained about the toothed wheel 48[a] from which it extends upwardly and is connected to the eyelet 49[a], which is loosely mounted on the shaft 39 forming part of the carriage 36. The opposite chain is connected to an eyelet 44 mounted on the shaft 38, forming part of this same carriage 36, and courses downwardly and around to the opposite carriage 37 to an eyelet 49 mounted on a lower shaft 50 forming part of said carriage 37. It will be seen from this manner of arranging the chains to train about the described pulleys in the manner shown, that while one chain lifts up the carriage 37, the opposite end of the same chain is paid out and per-

mits the opposite carriage to be lifted, which is accomplished by the remaining chain, that is, while the chain 52 is lifting the carriage 37, the opposite end of said chain 52 is paid out and permits lifting of the opposite carriage 36, which lifting is accomplished by the chain 89, the latter being trained around an upper toothed wheel 46 between the vertical guide channels 32 and 33. This arrangement of the chains permits the carriages 37 and 36 to be simultaneously lowered and lifted so that as the cleaning pad 61 is being pressed against the exterior surface of the window pane 11, the interior surface of said pane is pressed by the rollers 78 forming part of the structure of the carriage 37. The vertical guide channels 32 and 33 form one pair of members between which the carriage 36 is slidable, is adapted to be synchronously moved toward the window pane or away from the window pane with the guide channels 34 and 35 which carry the carriage 37. This is accomplished by providing the mechanism shown in Figure 5 so that when the stud 82, connected to the members 34 and 35, is pulled, one end of member 87 is rotated and causes its opposite end to move in the reverse direction so that the stud 82 mounted between the opposite members 32 and 33 are also rotated outwardly. A pair of springs 92 and 93 span the distance between members 83 and the ends of the element 87 opposite to connecting elements 85 and 86 as illustrated in Figure 2, the purpose being to centralize member 87 so that the vertical guides 32, 33, 34, and 35, normally stand in vertical position. The shaft 39 which supports the toothed wheel 41, in addition, has a gear 42 thereon which is rigid with the toothed wheel 41 and rotates therewith so that as the toothed wheel is being rotated during sliding movement of the carriage 36, the gear wheel 42 is correspondingly rotated and transmits rotation to the gear wheel 59 which rotates the spindle 58. This spindle having a pinion gear 57 mounted thereon which is in mesh with the bevelled gear 56, rotates the latter and causes rotation of the disk 60 and cleaning pad 61 thru the medium of the shaft 55. The container 53 is normally filled with a cleaning fluid which flows thru openings 69 into the bosses 68 in front of the plunger arms 66 and 67, which in turn during reciprocation, urges the contained liquid from holes upon the periphery of the rollers 63 and which lie in contact with the surface of the window pane to be cleaned.

I claim:—

1. A device of the class described comprising a mobile carriage and rollers supporting said carriage, one set of rollers being mounted adjustably beneath one end of the mobile carriage, a second carriage slidable longitudinally in the first-named carriage, vertical guide channels pivoted at their lower ends on the second carriage, vertically moving carriages guided between the vertical channel members and a pair of chains connected to said vertically moving carriages and adapted to simultaneously lift and lower said carriages, when one of the latter is moved, and a cleaning disk rotatably mounted on one of said vertically moving cariages and means for rotating said disk when one of said vertical carriages is moved.

2. A device of the class described comprising a mobile carriage, a second carriage slidable horizontally in the mobile carriage, pivoted guide channels extending vertically from the slidable carriage, vertically moving carriages mounted between said guide channels, chains connecting said vertically moving carriages, said chains passing over pulleys and having an arrangement so that when one vertical moving carriage is lifted or lowered, the opposite vertical carriage performs similar movement and a cleaning disk mounted on one of said vertical carriages, and means for rotating said cleaning disk simultaneously with the movement of said vertically moving carriages.

3. A device of the class described comprising a mobile carriage, a second carriage slidable horizontally in the mobile carriage, pivoted guide channels extending vertically from the slidable carriage, vertically moving carriages mounted between said guide channels, chains connecting said vertically moving carriages, said chains passing over pulleys and having an arrangement so that when one vertical moving carriage is lifted or lowered, the opposite vertical carriage performs similar movement and a cleaning disk mounted on one of said vertical carriages, said vertical carriages having shafts and toothed wheels rotatable on said shafts, a gear wheel fixed to one of the toothed wheels on one vertical carriage, a spindle supporting said cleaning disk, a train of gears connecting the gear adjacent the toothed wheel with the spindle and adapted to rotate the cleaning disk, said chains being in engagement with said toothed wheel causing rotation of the cleaning disk.

In testimony whereof I affix my signature.

RICHARD FELGNER.