J. W. GIBBONS.

WINDOW CLEANER.

APPLICATION FILED DEC. 30, 1909.

993,239. Patented May 23, 1911.

4 SHEETS—SHEET 1.

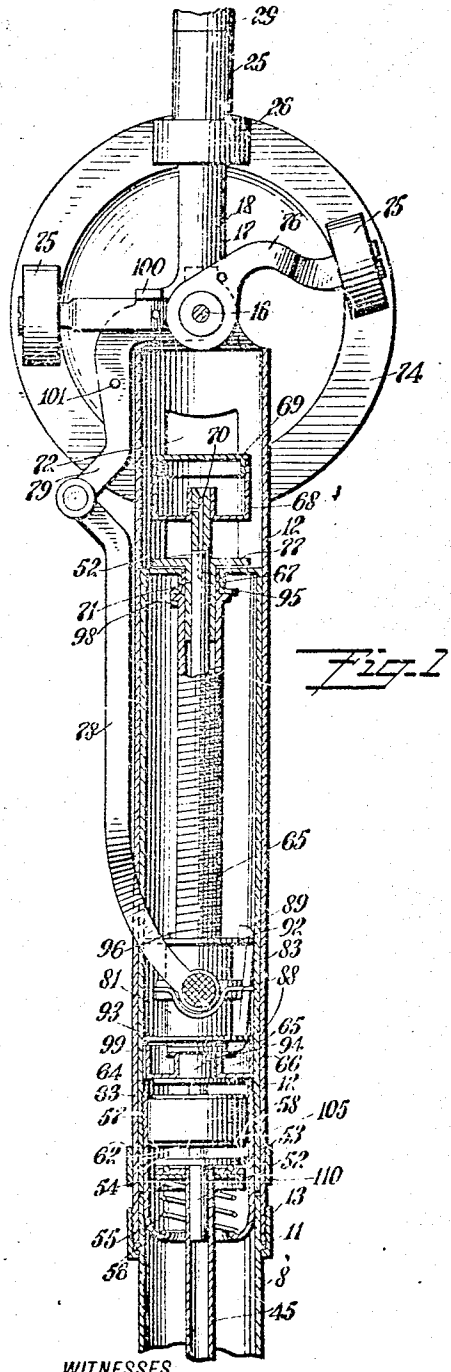

Fig. 1

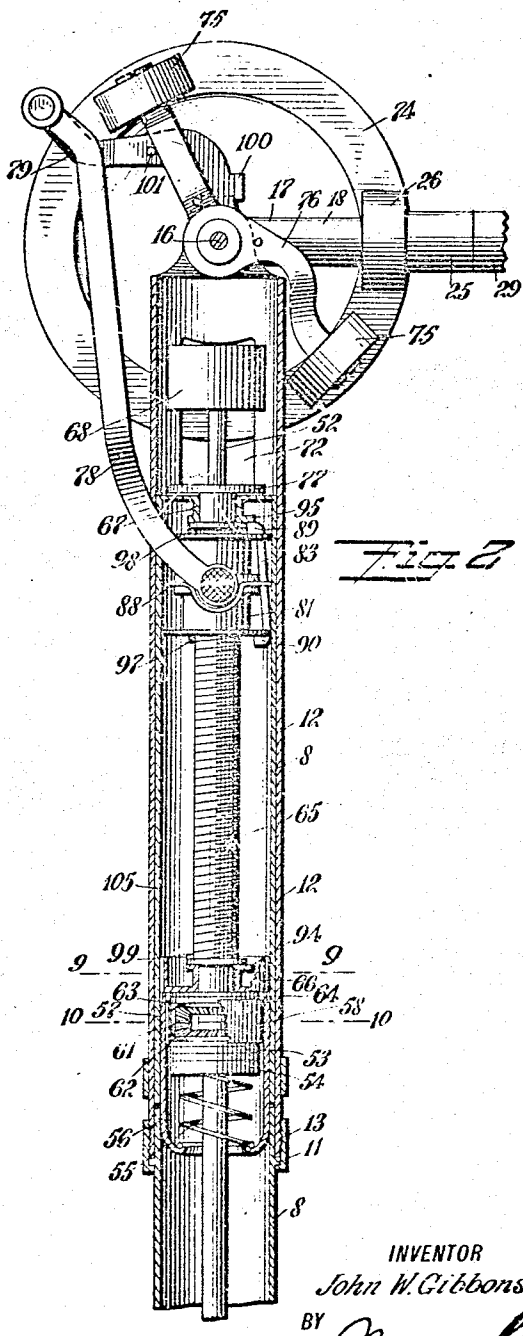

Fig. 2

WITNESSES

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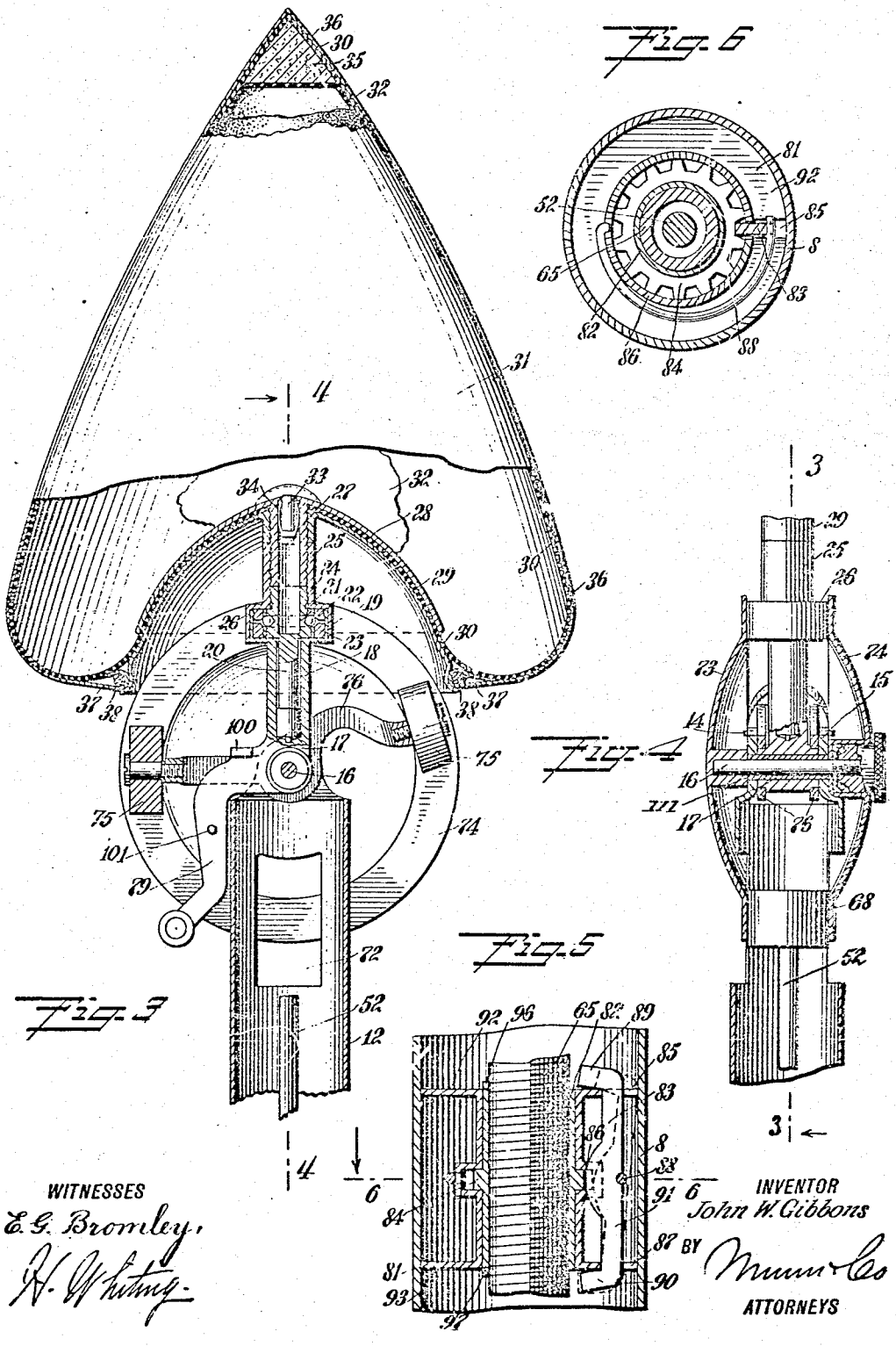
4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

Fig. 8

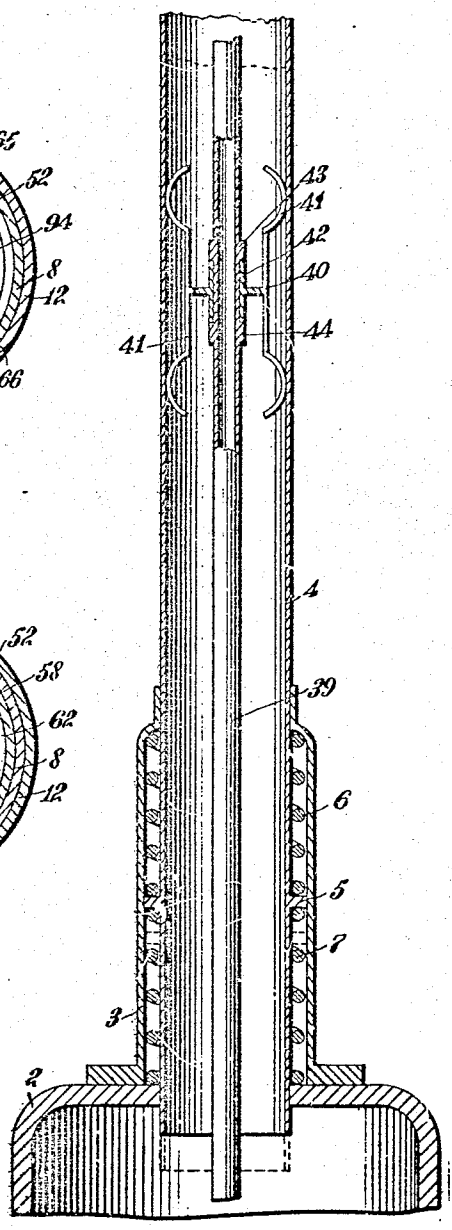


Fig. 9

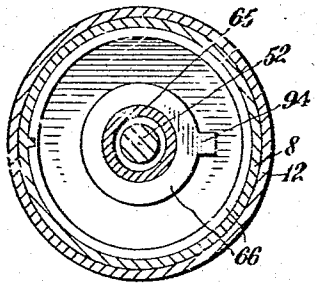
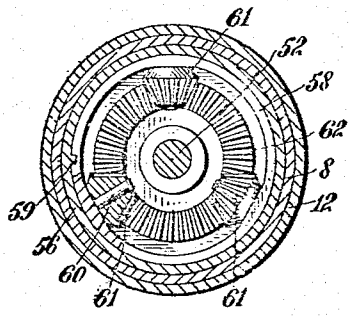


Fig. 10



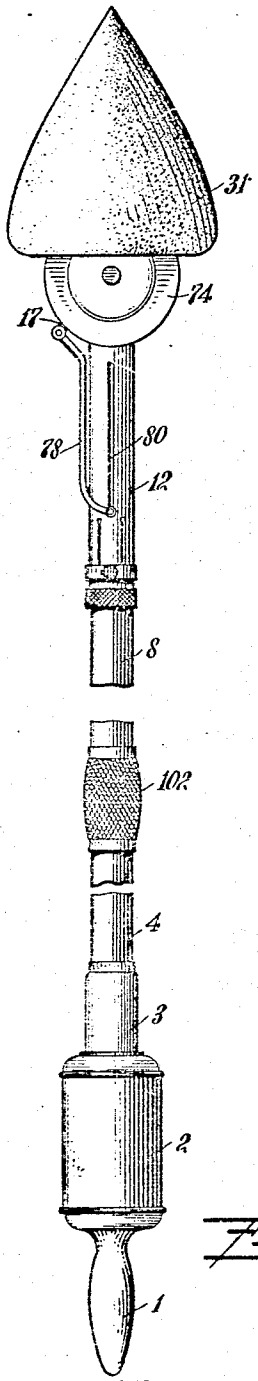


Fig. 7

WITNESSES

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4 SHEETS—SHEET 4.

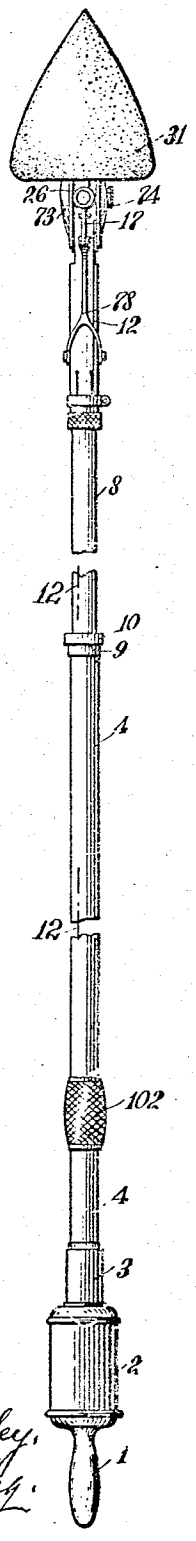

Fig. 11

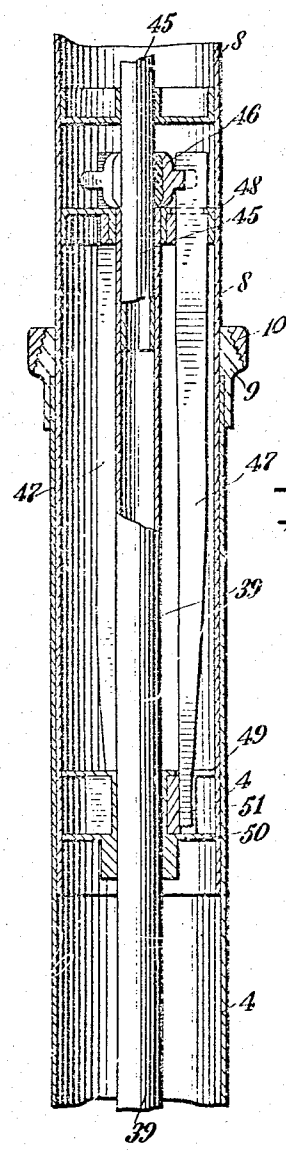

Fig. 12

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN WOOD GIBBONS, OF BAKER CITY, OREGON.

WINDOW-CLEANER.

993,239. Specification of Letters Patent. Patented May 23, 1911.

Application filed December 30, 1909. Serial No. 535,562.

To all whom it may concern:

Be it known that I, JOHN W. GIBBONS, a citizen of the United States, and a resident of Baker City, in the county of Baker and State of Oregon, have invented a new and Improved Window-Cleaner, of which the following is a full, clear, and exact description.

This invention relates to a new and improved device for cleaning windows or the like, which is in the form of a flexible pneumatic wiper that is adapted to be rotated by a suitable source of power at any suitable angle.

An object of this invention is to provide a device which will be simple in construction, easily adjusted and operated, and efficient in its operation.

Another object of this invention is to provide a window cleaner with a buffer, and means for tilting the buffer to various angles with its support.

A further object of this invention is to provide a tiltable pneumatic buffer with means for tilting the same from the source of power, and with means for automatically disconnecting the tilting means from the source of power when a predetermined position of the buffer has been reached.

A further object of this invention is to provide a window cleaner with a buffer which may be tilted to various angles with its support, and with means for simultaneously driving the buffer in any of its adjusted positions.

A still further object of this invention is to provide a window cleaner which may be adjusted as to its length without interfering with the source of power, so as to reach different points on the surface to be cleaned.

These and further objects, together with the construction and combination of parts, will be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a vertical section of the device adjacent the top thereof, showing the parts in such a position that the buffer extends in alinement with its support; Fig. 2 is a view similar to Fig. 1, showing the parts in another position, in which the buffer extends substantially at right-angles to its support; Fig. 3 is a view in elevation, partly in section on the line 3—3 of Fig. 4, of the extreme upper end of the window cleaner; Fig. 4 is a detail vertical section, taken on the line 4—4 of Fig. 3, and showing the driving connection of the buffer with the source of power; Fig. 5 is an enlarged vertical section through the tilting mechanism, showing the means for connecting the operating nut to the sleeve; Fig. 6 is a horizontal section on the line 6—6 of Fig. 5; Fig. 7 is a contracted view in elevation, showing the relative parts of the buffer; Fig. 8 is a vertical section adjacent to the lower end of the window cleaner; Fig. 9 is a horizontal section on the line 9—9 of Fig. 2; Fig. 10 is a horizontal section on the line 10—10 of Fig. 2; Fig. 11 is a view in elevation, taken at right-angles to the view shown in Fig. 7, showing the relative position of the assembled parts of the window cleaner; and Fig. 12 is an enlarged vertical section on the line 12—12 of Fig. 11, showing the means for adjusting the length of the window cleaner.

Referring more particularly to the separate parts of the device, 1 indicates a handle, which is secured to the casing 2 of a motor, which may be of any suitable form, such as electric, pneumatic or hydraulic. The casing 2 has secured thereto a cylindrical tubular casing 3, which incloses the lower end of a tube 4. The tube 4 is provided with a circular flange 5, by means of which it is adjustably supported by a plurality of springs 6 and 7, which impinge on opposite sides thereof and support the tube 4 in a floating manner relative to the casing 2 and the tubular casing 3.

Telescoping in the upper end of the tube 4, there is provided another tube 8, which is adapted to slide in and out of the tube 4, and is secured thereto by means of a tapered split ring 9, which rests on the upper end of the tube 4, and is adapted to be forced to bite the tube 8 by means of a wedge screw threaded ring 10, which engages a similar screw thread on the tapered split ring. The tube 8 supports at its upper end by means of a circular flange 11, an outer tube 12, which is secured to the tube 8 by means of an an-

gular nut ring 13, which engages the tube 12 by means of a screw-threaded connection, and has a circular flange which engages the under side of the flange 11. The lower end of the tube 12 is split and is forced into the nut ring 13 by means of a band 110. The upper end of the tube 12 is provided with a pair of flanges 14 and 15, which are suitably perforated to form journal bearings for a pin shaft 16. This pin shaft 16 forms intermediate the flanges 14 and 15 a pivotal point for a bell crank lever 17. Intermediate the lever 17 and the pin shaft 16, there is provided a bushing 111 to take up the wear. The upper arm 18 of the bell crank lever 17 is in the form of a tube near its lower end, and expands at its upper end to form a cylinder 19. Within the tubular portion of the arm 18, there is rotatably supported in any well known manner, a shaft 20, which is provided with a raceway 21, in which are adapted to rotate a plurality of bearing rollers 22, which run on their opposite sides in a raceway formed in a bushing 23 secured in any well known manner to the cylindrical portion 19 of the arm 18.

The upper end of the shaft 20 has a screw-threaded connection at 24 with a collar 25. The lower end of the collar 25 is expanded to form a cylindrical drive roller 26, which incases the cylindrical portion 19 of the arm 18. The roller 26 by this means has an anti-friction connection with the upper end of the arm 18. The collar 25 which has formed thereon the drive roller 26, is secured at its upper end by means of a screw-threaded connection to a hollow tube 27, which is formed on and preferably integral with a clamping member 28. The clamping member 28 co-acts with a similar clamping member 29, which has a screw-threaded connection with the tube 27 to grip a projecting casing 30 of a buffer 31. This projecting casing 30 is preferably formed of suitable flexible material, such as leather, and is shaped somewhat similar to a conical heart.

Within the casing 30, there is provided a suitable inflator 32, which is preferably made of some impervious material, such as rubber, oil silk or the like. The inflator 32 is provided with a suitable check valve 33, whereby it may be blown up, and this check valve 33 is provided with a plurality of springs 34, whereby it may be securely locked within the tube 27 on the clamping member 28.

Secured in the apex of the conical buffer casing 30, there is provided a resilient conical tip 35, which may be formed of any suitable stiff yet yielding material, such as cork. The buffer casing 30 is covered by a removable wiper 36, which may be of any suitable material, such as chamois skin, coarse cloth, or the like. In fact, the wiper 36 is interchangeable, so that different grades of wiper may be used at different periods of the cleaning operation. The wiper 36 is of a form suitable to fit tightly over the casing 30, and is provided at its lower end with a plicature 37, in which is secured an elastic cord or ring 38, made of any suitable material, such as rubber. The plicature 37 with the cord or ring 38 therein is adapted to fit snugly between the casing 30 and the clamping member 29, and also rests in a circular groove formed in the latter.

Having disclosed the particular arrangement of some of the elements of the cleaner, I now come to the means for driving the buffer. At the lower end of the cleaner (as shown in Fig. 8) extending into the motor casing 2 and secured to the motor therein, there is provided a tubular power shaft 39, which is provided with a floating bearing 40 intermediate its upper and lower ends. The floating bearing 40 consists of a plurality of springs 41, which are secured to a collar 42 in such a manner that they bite the inner surface of the tube 4. The collar 42 engages between a pair of circular flanges 43 and 44 formed on the tubular shaft 39, so that the floating bearing always moves with the shaft 39 in any of its adjusted positions relative to the tube 4. One of the principal objects, however, of the springs 41 is to permit the tube 8 to slide within the tube 4, compressing the springs 41 as the tubes move relative to each other, without changing the relative position of the floating bearing with respect to the shaft 39.

Telescoping in the upper end of the tubular shaft 39, as illustrated in Fig. 12, there is provided a tubular shaft 45, which is adjustable relative to the shaft 39. In order to drive the shaft 45 from the shaft 39 in any adjusted position, there are provided a plurality of clutch shoes 46, which are secured to the short ends of a plurality of levers 47 in any well known manner. The levers 47 are fulcrumed adjacent to the shoes 46 in a collar 48 which is secured to the upper end of the shaft 39. The lower ends of the levers 47 extend through slots 49 in a casing collar 50, which is also secured to the shaft 39. Within the casing collar 50 there are provided a plurality of weights 51, which are secured in any well known manner, as by means of dovetailing, on the lower ends of the levers 47. By this means, whenever the shaft 39 rotates, the centrifugal force of the weights 51 will spread out the lower ends of the levers 47, thereby causing the upper ends of these levers to move inwardly, thus forcing the clutch shoes 46 into engagement with the tubular shaft 45, thereby forming a centrifugal clutch, which makes a drive connection between the shaft 39 and the shaft 45.

The tubular shaft 45 has secured at its upper end, as illustrated in Figs. 1 and 2, by any well known means, a shaft 52, which is

provided with a friction disk 53, which is supported by an anti-friction bearing 54. The anti-friction bearing 54 is supported by means of a spring 55 on a support 56, which is adjustably secured, by means of a screw-threaded connection 57, to a tube 105 extending in alinement with the tube 8. The purpose of adjustably securing the support 56 to the tube 105 is so that the wear on the parts (to be described) connected thereto can be taken up.

Located above the friction disk 53, there is provided a floating casing or ring 58, which has a slot-and-key connection 59 with the support 56, so that it is capable of vertical movement and yet held from rotation. The ring 58 forms a support for a plurality of stub shafts 60, which rotatably support a plurality of bevel pinions 61, which lie between and form a driving connection between a pair of bevel gears 62 and 63, that are loosely mounted on the shaft 52. The under surface of the gear 62 and the upper surface of the gear 63 form friction surfaces which are adapted to engage respectively with the friction disk 53 and a friction disk 64 secured on a tubular screw-threaded sleeve 65. The friction disks 53 and 64, however, are normally held out of engagement with the friction surfaces of the gears 62 and 63 by the springs 6 and 7, which floatingly support the lower end of the tube 4 relative to the casings 2 and 3 and the shaft 39. The lower end of the screw-threaded tubular sleeve 65 is journaled in a bearing in a ring 66, which is slidingly connected to the tube 105 and rests on top of the supporting member 56. The upper end is journaled in a bearing 67 formed in the upper end of the tube 105.

The shaft 52 extends up through the gears 62 and 63 and through the hollow screw-threaded shaft 65 adjacent the upper end of the tube 12, where it is provided with a hollow cylindrical roller 68, which is secured thereon in any well known manner. The roller 68 is provided with a removable screw-threaded cap 69, which forms with the roller 68 a suitable combined drive roller and lubricator container. The oil or other lubricant which is contained in the roller 68 is adapted to pass through feed channels 70 down to a bearing 71, which journals the shaft 52 adjacent to the bearing 67 of the sleeve 65. The bearing 71 is formed in a friction disk 77 which is secured to the sleeve 65 and adapted to rotate the same in one direction, in a manner to be described hereinafter. The tube 12 is provided with cut-out portions 72 on each side thereof, through which the drive roller 68 is adapted to be projected.

Pivotally secured to the pin shaft 16 in any well known manner, there are provided a pair of friction disks 73 and 74, which bear on opposite sides of the drive roller 68, and are adapted to be driven thereby. In order to keep the friction disks 73 and 74 properly spaced apart at all times, there are provided a plurality of idle rollers 75, secured on the arms of a bracket 76, which is pivotally secured to the pin shaft 16 on each side of the bell crank lever 17.

It has been shown that the buffer 31 is capable of being tilted from a vertical position to a position at right angles to its supporting tube. There now remains to be shown the means for tilting the buffer. As has been previously described, the screw-threaded sleeve 65 is provided with a friction disk 64 on its lower end, which is capable of being forced into engagement with the upper friction surface of the bevel gear 63. There is also provided at the upper end of the screw-threaded sleeve 65 the friction disk 77, which is adapted to come in contact with the upper friction surface of the drive roller 68. It will thus be seen that a movement of the handle 1 relative to the tube 4 in either direction will bring either of the friction disks 53 or 64 into engagement with the friction surfaces of the bevel gears 63 and 62, thereby rotating the screw sleeve 65 in one direction, or will bring the friction disk 77 in contact with the lower friction surface on the drive roller 68, thereby rotating the screw sleeve in the other direction. The purpose of rotating the sleeve 65 is to reciprocate a bifurcated link 78, which is pivotally connected to the other arm 79 of the bell crank lever 17. The bifurcated ends of the link 78 extend through slots 80 in the sides of the tubes 12 and 8, and pivotally engage a sleeve 81. The sleeve 81 is rotatably supported on a nut 82, which has a screw-threaded engagement with the threaded sleeve 65. The sleeve 81 is adapted to be detachably connected to the nut 82 by means of a pawl 83, which is adapted to engage midway its ends between the teeth on a ratchet gear 84 formed on the nut 82, and which is slidingly secured in slots 85, 86 and 87 formed in flanges on the sleeve 81. The pawl 83 is normally held in engagement with the ratchet gear 84 by means of a contractile spring 88, which encircles the pawl 83 and the sleeve 81. The pawl 83 is in the form of a double bell crank lever, with two short arms 89 and 90 and a common long arm 91. When the pawl 83 is in its locking position in engagement with the ratchet gear 84, the short arms 89 and 90 are at an angle to the flanges 92 and 93 on which they fulcrum, so that if the outer ends of either of the short arms 89 or 90 come in contact with an obstruction, they will tilt the pawl, as is illustrated in one case in Fig. 5, from the full-line position indicated, to the dotted line position, thus removing the pawl from engagement with the ratchet wheel 84. In order to tilt the pawl 83 and thus disen-

gage it from the ratchet wheel 84, there is provided on each of the bearings 66 and 67, lugs 94 and 95, which are adapted to form stops extending in the path of the short arms 90 and 89 of the pawl bell crank lever 83, thus removing the pawl out of engagement with the ratchet gear 84. When this occurs, the nut 82 will be free to rotate independent of the sleeve 81, thus preventing the mechanism from tilting the buffer beyond a predetermined position, and also preventing a breakage due to advancing the shifting mechanism too far in either direction. In order to cause the nut 82 to rotate with the screw-threaded sleeve 65 at each end of its reciprocation and thus positively force the pawl 83 out of engagement with the ratchet gear 84, there is provided on each end of the nut, lugs 96 and 97, which are adapted to engage with corresponding lugs 98 and 99, secured on the extreme ends of the threaded sleeve 65. The bell crank lever 17 which operates to tilt the buffer 31 also moves the bracket 76 and with it the rollers 75. This is accomplished by means of a pair of lugs 100 and 101 formed on the arm 79 of the bell crank lever 17, which are spaced apart so as to form a limited relative movement of the bell crank lever before it operates the bracket 76 in each direction. In order to facilitate the operation of obtaining the relative movement of the tube 4 to the motor shaft and the handle 1, there is provided a grip handle 102 of any suitable form and secured in any suitable manner to the tube 4.

The operation of the device will be readily understood from the above description.

When it is desired to clean a window or the like, the buffer 31 is covered by a suitable cleaning wiper 36, which is interchangeable, so that in the first part of the operation, a wiper made of rather coarse material may be used, and later, a smooth soft wiper, such as a chamois skin. The buffer 31 is driven by the friction roller 26, which engages between the friction disks 73 and 74, which are in turn driven by the friction roller 68 secured to the shaft 52. The shaft 52 is secured to the shaft 45, which is connected in driving relation with the shaft 39 by means of the centrifugal clutch, and the shaft 39 is driven by the motor in the casing 2. When it is desired to adjust the device to a different length, so as to reach a portion of the window or other surface not previously treated, the taper ring or nut 10 is unscrewed, and the split ring 9 will then automatically spring away from the tubes 4 and 8, permitting them to be adjusted relative to each other. The connection of the shaft 39 with the shaft 45 is such that the centrifugal clutch is only in action when the shaft 39 is in motion, so that it will not interfere with the telescoping of the parts. When the desired adjustment has been obtained, the taper nut 10 may be screwed up, binding the split ring 9 on the tubes 4 and 8, thus securely locking them together in their adjusted position.

If it is desired to tilt the buffer 31 to an angle other than vertical, so as to get into inaccessible corners, the handle 1 is pushed up, and the handle 102 pulled down, so as to cause the tube 4 and the parts connected thereto to move downward relative to the shaft 39 and the parts connected to said shaft. The upward movement of the shaft 39 and with it the shaft 45, will bring the friction disk 53 in contact with the friction surface on the bevel gear 62. This will cause the bevel gear 63 to rotate in the opposite direction to the shaft 45. The downward movement of the tube and its appended parts has also brought the friction disk 64 in engagement with the friction surface of the bevel gear 63, thereby causing the screw-threaded sleeve 65 to rotate in the opposite direction to the shafts 39 and 45. When this occurs, the nut 82, together with the sleeve 81, will commence to travel up from the position shown in Fig. 1, thereby gradually tilting the buffer 31 from the position indicated in Fig. 1 to the position indicated in Fig. 2. Any intermediate position between these two positions may be obtained by simply relieving the pull tending to hold the tubes and shafts out of their relative normal position. The springs 6 and 7 will then automatically bring the parts back to their normal position, and the friction disks will be forced out of engagement with the bevel gears, thereby ceasing to rotate the threaded sleeve 65, and thus stopping the travel of the nut 82 and the sleeve 81. If the pull on the handles 1 and 102 is not relieved, however, and the rotation of the screw-threaded sleeve 65 continues, eventually the short arm 89 of the pawl 83 will come in contact with the lug 95 on the bearing 67, causing the pawl to spring out of engagement with the ratchet gear 84 against the tension of the spring 88. When this occurs, the lugs 96 on the nut 82 will have come in contact with the lug 98 on the sleeve 65, causing the nut 82 to rotate with the sleeve, and positively aiding the throwing of the pawl 83 out of engagement with the gear 84. Thus, the nut 82 would rotate with the sleeve 65, and the sleeve 81 will not be forced to advance any farther.

When it is desired to return the buffer 31 from its right-angular position to its vertical position, or to any intermediate position, the handles 102 and 1, instead of being pulled toward each other, are pushed away from each other, so that the friction disk 77 comes in contact with the under surface of the drive roller 68, thereby causing

the screw-threaded sleeve 65 to rotate in the same direction as the shafts 52, 45 and 39. Thus, the nut 82, not being forced by the lugs 96 and 98 to rotate with the sleeve 65, will remain stationary as to rotation, and will advance downward, allowing the pawl 83 to slip into engagement with the ratchet gear 34, thereby causing the nut and sleeve to advance positively downward until the distorting tension on the handles 1 and 102 is relieved. If, however, this distorting tension should not be relieved, the nut 82 and the sleeve 81 will pass downward until they reach the lower limit of their reciprocation, when the short arm 90 of the pawl 83 will come in contact with the lug 94 on the bearing 66, forcing the pawl 83 out of engagement with the ratchet gear 84. At the same time, the lug 96 on the nut 82 will come in contact with the lug 99 on the threaded sleeve 65, causing the nut to rotate with the sleeve, and positively force the pawl 83 out of engagement with the ratchet gear 84. The nut 82 will then rotate with the sleeve 65 and cease to advance itself, and thus stop advancing the sleeve 81 and the buffer connected thereto. The pressure of the buffer against the surface to be cleaned is transmitted indirectly to the sleeve 65, causing an upward or downward thrust as the case may be. It is necessary, therefore, to take up the wear incident to this thrust by the vertical adjustment of the sleeve 65. In order to do this the securing band 110 is loosened, and the angle nut 13 unscrewed and slipped down away from the tube 12. The tube 12 can then be slipped off, thus exposing the tube 105, which is then lifted off the tube 8. The supporting member 56 can then be readily screwed in or out, thereby taking up the wear due to the end thrust of the threaded sleeve 65.

While I have shown a form of window cleaner in which the device is of the extensible or adjustable form, I may provide a device for housework without this adjustable feature.

I may also make various changes and modifications within the scope of the appended claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In a device of the class described, the combination with a support, of a buffer adjustable to a plurality of positions, connected to said support, means for driving said buffer, said buffer remaining normally fixed relative to said support during the driving operation, and means operated by said driving means for selectively adjusting said buffer to any one of its positions.

2. In a device of the class described, the combination with a support, of a buffer pivotally connected to said support, means for driving said buffer, and means operated by said driving means for swinging said buffer on said support.

3. In a device of the class described, the combination with a support, of a buffer pivotally connected to said support, means for driving said buffer, means for adjusting said buffer, and means for bringing said last-mentioned means into operative connection with said first-mentioned means.

4. In a device of the class described, the combination with a support, of a buffer pivotally connected to said support, means for driving said buffer, adjustable relative to said support, means for operating said means, adapted to swing said buffer, and means for adjusting said driving means relative to said support, for actuating said last-mentioned means.

5. In a device of the class described, the combination with a support, of a buffer adjustably connected with said support, a reciprocable member adapted to adjust said buffer, means for actuating said member, and means for driving said last-mentioned means in either direction.

6. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a member for adjusting said buffer, rotatable means for operating said member, and means for rotating said means in either direction.

7. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a member for adjusting said buffer, a screw-threaded member for operating said last-mentioned member, and means for rotating said screw-threaded member in either direction.

8. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a nut connected to said buffer and adapted to adjust said buffer, a screw for operating said nut, and means for rotating said screw in either direction.

9. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a nut operatively connected with said buffer, a screw for reciprocating said nut, means for driving said buffer, and means for bringing said driving means into operative connection with said screw.

10. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a link connected to said buffer, a sleeve pivotally connected to said link, a nut removably connected to said sleeve, a screw for operating said nut, and means for rotating said screw.

11. In a device of the class described, the combination with a support, of a buffer ad-

justably connected to said support, means for adjusting said buffer, and means for automatically stopping said adjusting means.

12. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, means for adjusting said buffer, and means for automatically stopping said adjustment when said buffer has reached a predetermined point.

13. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a sleeve operatively connected with said buffer, means for operating said sleeve, and means connecting said sleeve to said operating means.

14. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a sleeve operatively connected to said buffer, means for operating said sleeve, means for normally connecting said sleeve to said operating means, and means for automatically disconnecting said sleeve from said operating means.

15. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a sleeve operatively connected to said buffer, a nut detachably connected to said sleeve, a screw for operating said nut, and means for operating said screw.

16. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a sleeve operatively connected to said buffer, a nut, a pawl for detachably connecting said nut to said sleeve, a screw for operating said nut, and means for operating said screw.

17. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a sleeve operatively connected to said buffer, a nut, a pawl for detachably connecting said sleeve to said nut, means for normally holding said pawl in its connecting relation, and means for automatically throwing said pawl out of connecting relation.

18. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a sleeve operatively connected to said buffer, a nut having a ratchet gear thereon, a pawl on said sleeve adapted to engage said ratchet gear to lock said sleeve to said nut, a screw for operating said nut, and means for operating said screw.

19. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a sleeve operatively connected with said buffer, a nut having a ratchet gear thereon, a pawl on said sleeve, means for forcing said pawl into engagement with said ratchet gear, a screw for driving said nut, means for operating said screw, and means for automatically forcing said pawl out of engagement with said ratchet gear.

20. In a device of the class described, the combination with a support, of a bell crank lever pivoted to said support, a buffer rotatably supported on said bell crank lever, a link pivotally connected to said bell crank lever, means for driving said buffer, and means operated by said driving means for actuating said link.

21. In a device of the class described, the combination with a support, of a bell crank lever pivotally connected to said support, a buffer rotatably supported on said lever, a link for operating said buffer, a sleeve for operating said link, a nut having a ratchet gear thereon, a pawl on said sleeve adapted to engage said ratchet gear to connect said sleeve to said nut, a screw for operating said nut, and means for rotating said screw in either direction.

22. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, means for adjusting said buffer, a screw for operating said means, friction disks secured to said screw, and a drive shaft adapted to engage said friction disks to rotate said screw in either direction.

23. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, means for adjusting said buffer, a rotary member for operating said means, a plurality of friction disks secured to said rotary member, a drive shaft, a drive roller having a friction surface thereon, a gear having a friction surface thereon, adapted to be driven by said drive shaft, and means for bringing either of said friction surfaces into engagement with said friction disks.

24. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, means for adjusting said buffer, a rotary member for operating said means, a drive shaft, means on said drive shaft for rotating said member in one direction, and means on said drive shaft for rotating said member in the opposite direction.

25. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, means for adjusting said buffer, a rotary member for operating said means, a drive shaft, a plurality of friction members on said drive shaft, a bevel gear adapted to engage one of said friction members, a second bevel gear operatively connected with said first-mentioned bevel gear so as to rotate in the opposite direction and having a friction surface thereon, a plurality of friction disks on said rotary member, and means for either bring-

ing one of said friction members on said drive shaft into connection with one of said friction disks or into connection with said friction surface on said second-mentioned bevel gear.

26. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, a roller for driving said buffer, a plurality of friction disks for driving said roller, a roller for driving said friction disks, and means for driving said last-mentioned roller.

27. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, means for adjusting said buffer, a roller for rotating said buffer, a friction disk for driving said roller, a roller for driving said friction disk, and means for driving said last-mentioned roller.

28. In a device of the class described, the combination with a support, of a buffer adjustably connected to said support, means for adjusting said buffer, a roller for rotating said buffer, a plurality of friction disks for driving said roller, means for keeping said friction disks in properly spaced relation, and means for driving said friction disks.

29. In a device of the class described, the combination with a support, of a buffer pivotally connected to said support, means for swinging said buffer, a roller for rotating said buffer, a plurality of friction disks for rotating said roller, means for keeping said friction disks in properly spaced relation, a roller for rotating said friction disks, and means for driving said last-mentioned roller.

30. In a device of the class described, the combination with a support, of a bell crank lever pivotally connected to said support, a buffer rotatably supported on said bell crank lever, a roller connected to said buffer, a plurality of friction disks for rotating said roller, a bracket pivotally connected to said support and having a plurality of rollers thereon adapted to keep said disks in properly spaced relation, means for operating said bell crank lever, and means on said bell crank lever for operating said bracket.

31. In a device of the class described, the combination with a support, of a bell crank lever pivotally connected to said support, a buffer rotatably supported on said bell crank lever, a roller for driving said buffer, a plurality of friction disks for driving said roller, a bracket pivotally connected to said support and having a plurality of rollers thereon adapted to keep said friction disks in properly spaced relation, means for operating said bell crank lever, and means on said bell crank lever for operating said bracket, so as to permit a relative motion of said lever with relation to said bracket.

32. In a device of the class described, the combination with a support comprising a plurality of relatively adjusted members and means for locking said members in a plurality of adjusted positions, of a buffer rotatably connected to said support, and means for driving said buffer in any adjusted position of said members of said support.

33. In a device of the class described, the combination with a support comprising a pluraiity of relatively adjustable members, of a buffer connected to said support, and means for driving said buffer, comprising a plurality of relatively adjustable members.

34. In a device of the class described, the combination with a support comprising a plurality of relatively adjustable members, of a buffer connected to said support, and means for driving said buffer, comprising a plurality of relatively adjustable members and means for connecting said last mentioned members in driving relation.

35. In a device of the class described, the combination with an adjustable support, of a buffer connected to said support, and means for driving said buffer, comprising a plurality of relatively adjustable members and a centrifugal clutch for operatively connecting said members.

36. In a device of the class described, the combination with an adjustable support, of a buffer connected to said support, and means for rotating said buffer, comprising a plurality of relatively adjustable members and a clutch secured to one of said members and adapted to engage another of said members, to secure said members in driving relation.

37. In a device of the class described, the combination with an adjustable support, of a buffer rotatably connected to said support, a shaft for rotating said buffer, comprising a plurality of adjustable members, and a centrifugal clutch for connecting said members of said shaft, said centrifugal clutch comprising a plurality of weighted levers and gripping shoes secured to said levers.

38. In a device of the class described, the combination with a support comprising a plurality of telescoping members, a split ring for securing said members together and a taper nut for tightening said split ring, a buffer rotatably connected to said support, and means for rotating said buffer, comprising a plurality of adjustable members and means operatively connecting said last-mentioned members.

39. In a device of the class described, the combination with a support comprising a plurality of adjustable members, a split ring for securing said members in any adjusted position and a taper nut for contracting said split ring, a buffer rotatably supported on said support, means for driving said buffer, comprising a plurality of relatively adjust-

able members, and a centrifugal clutch secured to one of said members and adapted to grip another of said members.

40. In a device of the class described, the combination with a support, of a buffer rotatably connected to said support, driving mechanism for rotating said buffer, said driving mechanism being adjustable relative to said support, and means for adjusting said driving mechanism relative to said support.

41. In a device of the class described, the combination with a support, of a bearing slidingly mounted in said support, and a shaft mounted in said bearing, said bearing comprising a plurality of spring members adapted to grip said support by an expanding tension and contact therewith, whereby said shaft is held in spaced relation from said support.

42. In a device of the class described, the combination with a motor casing, of a support adjustably connected to said casing, springs for yieldingly securing said support to said motor casing, a buffer rotatably supported on said support, and a motor shaft for driving said buffer.

43. In a device of the class described, the combination with a support, of a buffer rotatably supported on said support, a motor shaft for rotating said buffer, and a plurality of floating bearings for said motor shaft, slidingly mounted in said support.

44. In a device of the class described, the combination with a motor casing, of a tube adjustable relative to said casing, a buffer rotatably supported on said tube, a shaft for rotating said buffer, and a floating bearing for said shaft adapted to yieldingly engage said tube.

45. In a device of the class described, the combination with a motor casing, of a tube adjustably connected to said casing, a buffer rotatably supported on said tube, a shaft for rotating said buffer, a spring support for said shaft, and a floating bearing adapted to hold said shaft centrally of said tube.

46. In a device of the class described, the combination with a support comprising a plurality of adjustable members and means for securing said members in any adjusted position, of a pneumatic buffer rotatably connected to said support, and means for rotating said buffer, comprising a plurality of adjustable members and means for connecting said last-mentioned members in driving relation.

47. In a device of the class described, the combination with an adjustable support, of a buffer adjustably connected to said support, means for adjusting said buffer, and means for driving said buffer in any adjusted position of said support and said buffer.

48. In a device of the class described, the combination with an adjustable support, of means for locking said support in any adjusted position, a buffer adjustably connected to said support, means for adjusting said buffer, and means for driving said buffer in any adjusted position of said support and said buffer.

49. In a device of the class described, the combination with a support, comprising a plurality of adjustable members and means for locking said members in any adjusted position, of a buffer adjustably connected to said support, means for adjusting said buffer, and means for driving said buffer in any adjusted position, comprising a plurality of adjustable members and means for connecting said last-mentioned members in driving relation in any adjusted position.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN WOOD GIBBONS.

Witnesses:
E. F. STUART,
A. D. CRYDER.