

J. B. KIRBY.
 VACUUM CLEANING MACHINE.
 APPLICATION FILED SEPT. 15, 1913.

Patented May 14, 1918.
 3 SHEETS—SHEET 1.

1,265,789.

Fig. 1

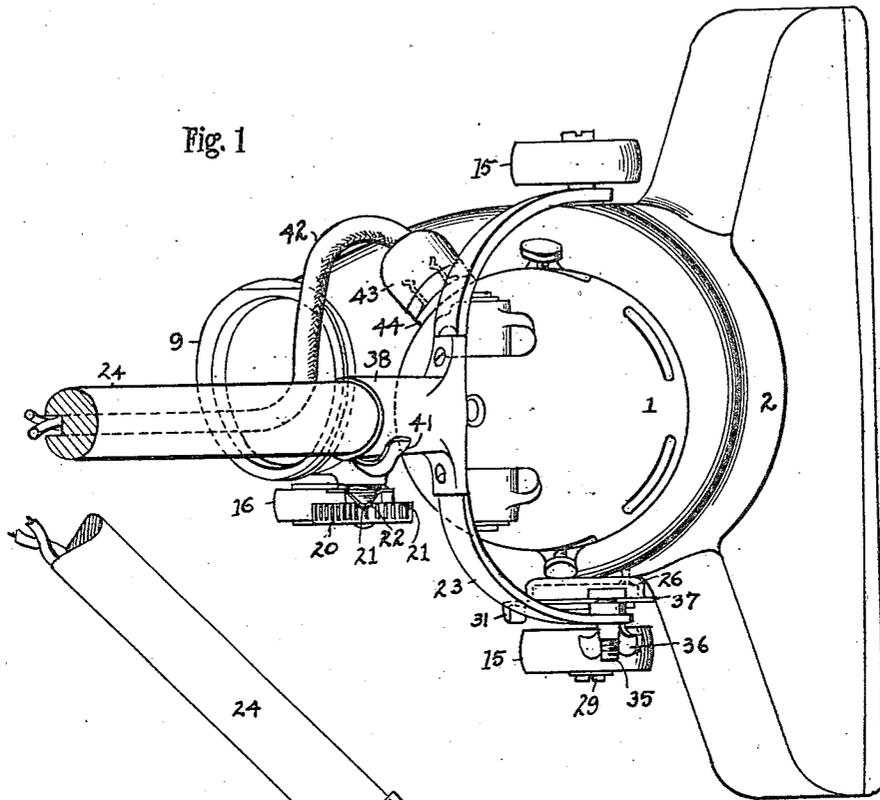
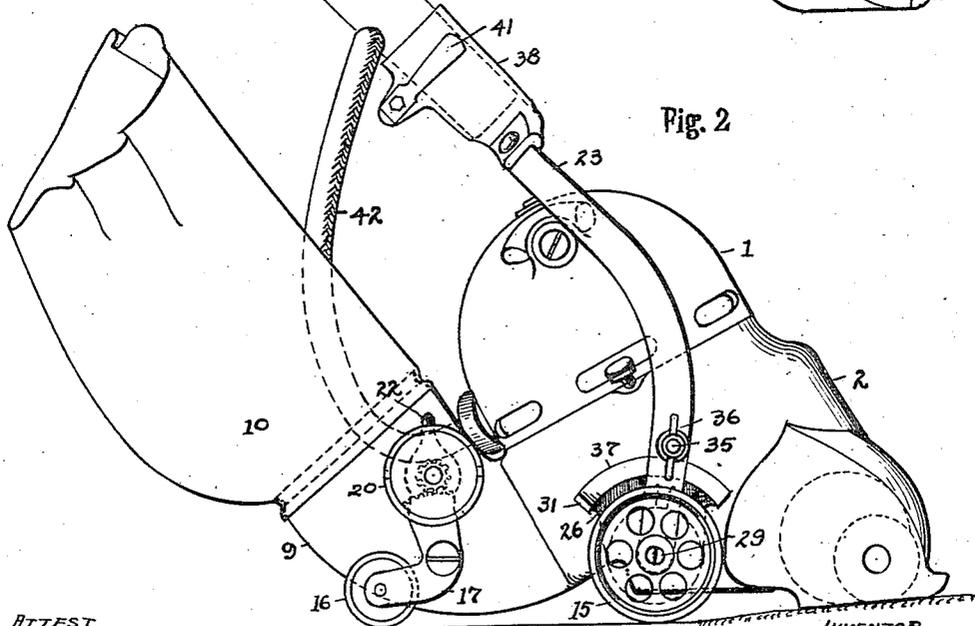


Fig. 2



ATTEST
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 S. C. MURKIN

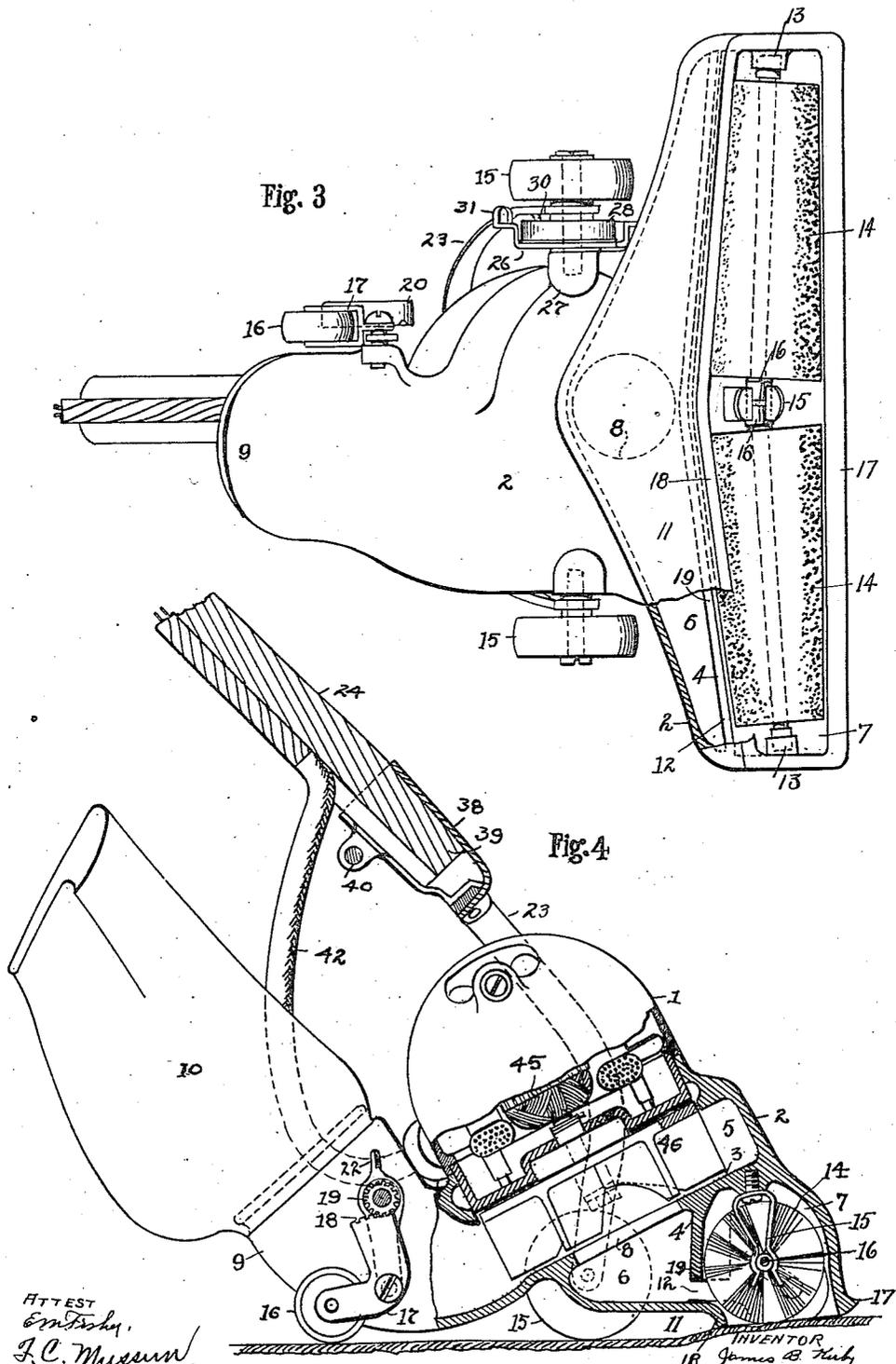
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

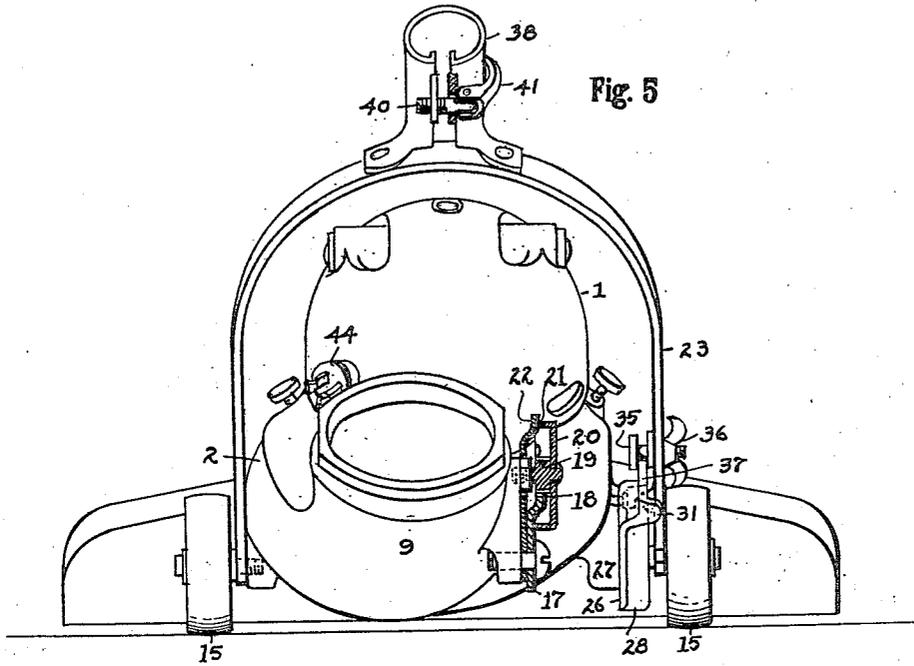


Fig. 5

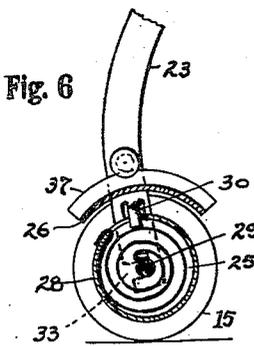


Fig. 6

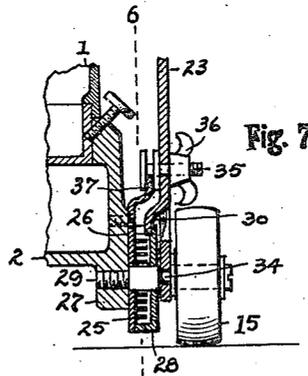


Fig. 7

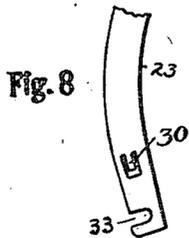


Fig. 8

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UNITED STATES PATENT OFFICE.

JAMES B. KIRBY, OF CLEVELAND, OHIO.

VACUUM CLEANING-MACHINE.

1,265,789.

Specification of Letters Patent.

Patented May 14, 1918.

Application filed September 15, 1913. Serial No. 789,746.

To all whom it may concern:

Be it known that I, JAMES B. KIRBY, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Vacuum Cleaning-Machines, of which the following is a specification.

This invention relates to a vacuum cleaning machine comprising an improved supporting and controlling mechanism substantially as hereinafter shown and described and more particularly pointed out in the claims. In general, the object of the invention is to provide elevating and lowering mechanism and spring tension means to fix and maintain the nozzle end of the machine in efficient suction relations with the surface to be cleaned, and the propelling and guiding parts for the machine also co-act with such mechanism and means to produce satisfactory operating results.

In the accompanying drawings, Figure 1 is a plan view of the machine with the upper end of the handle broken away and the dust bag removed, and Fig. 2 is a side elevation of the machine with a portion of the dust bag in place. Fig. 3 is a bottom view of the machine, and Fig. 4 a sectional elevation thereof. Fig. 5 is a rear view of the machine without the handle and dust bag the elevating mechanism being shown in cross section. Fig. 6 is a detail view on line 6-6, of Fig. 7, of the handle mounting, including a spring connection, an adjustable connection, and a stop for the handle. Fig. 7 is a sectional view of this mounting and a part of the casing vertically on the line of the handle, and Fig. 8 is a detail view of the notched end of the handle yoke.

The machine comprises a motor and fan casing having a base section 2 adapted to ride on wheels and to be propelled and guided by a handle. This base section contains a fan chamber and a collecting nozzle, the latter having a downwardly facing elongated inlet mouth, and the fan chamber having a laterally projecting outlet connection 9 whose end is upwardly turned for the attachment of the dust bag 10. The fan chamber and motor casing are preferably tilted rearwardly from the nozzle and at an angle to the vertical, thus lowering the machine and rendering it more compact and less liable to upsetting, though the present

improvements are not limited to cleaners possessing this feature. Also the nozzle may be equipped with brushes, or the like agitating mechanism, though the present invention is not strictly limited to cleaners so equipped. However the height of the nozzle above the floor does have a decided effect upon the operation of the brushing devices and one of the features of this invention is a device for adjusting this height. Accordingly I have illustrated a cleaner having a brush chamber 7 above the inlet mouth, and provided with suitable shaft bearings 13 at its ends and middle for the rotatable brushes 14. The bottom peripheral surfaces of these brushes are substantially flush and parallel with the bottom edges of the nozzle and these edges sustain an elevated position above the floor, more or less, as conditions may require. However, the carpet or other article which is being cleaned is usually lifted into engagement with the nozzle and the brushes by the suction of the fan, and the brushes are rotated mainly by contact with the floor or carpet as the machine is propelled forward or back on its supports.

The supporting mechanism for the machine comprises two main wheels 15, 15 mounted upon laterally extending axle projections at opposite sides of the casing near the center of gravity of the machine, and a single wheel 16 carried by a crank arm 17 pivotally mounted at the rear of the machine as by being secured to one side of elbow 9. The vertical segment of crank arm 17 has gear teeth 18 engaged with a small pinion 19 which is affixed to the stem of a hand wheel journaled to the casing at one side of the crank arm pivot. This wheel has a flanged rim provided with a set of notches 21 in its edge adapted to interlock with a detent 22. Rotation of hand wheel 20 tilts the crank arm 17 and wheel 16 thus rocking the casing 2 about the fulcrum afforded by the axes of wheels 15, and the detent 22 and notches 21 fix the parts in set relation. This arrangement permits the nozzle end of the casing to be adjusted and fixed in different spaced relations with the floor or surface over which the machine rides in order that proper suction may be obtained on different kinds of surfaces. However, the suction at the nozzle tends to tilt the casing to lower the nozzle with a corresponding reduction or cut-off of the air gap or space between the

nozzle and the floor. This tendency is overcome by interposing a spring connection between the casing and the handle 24 by which it is operated, preferably between the casing
 5 and the yoke 23 of this handle, and arranging this spring so as to tend to lift the handle, whereby a rearward or downward pull on the handle will tend to lift the nozzle. The preferred construction comprises a
 10 convolute spring 25 secured at its inner end to a fixed segmental plate 26 on lug 27 of casing 2, and hooked at its outer end to the flange of a cupped disk 28 sleeved to rotate on the axle screw or bolt 29 of one
 15 of the wheels 15, see Fig. 7. Disk 28 has a slotted flange engaged by a projection 30 struck up from one leg of yoke 23, and the spring 25 exerts a lift action in opposite directions to the casing 2 and the handle 24.
 20 In other words the nozzle is constantly raised from the floor by the spring, and the handle tends to spring to an upright position. A down pressure on the handle increases the spring tension to uphold the
 25 nozzle, but a lateral projection 31 on the segmental plate 26 fixed to the side of the casing opposite the open side of disk 28 serves as a stop to limit the lowering of the handle relative to the casing. Spring 25 is also
 30 utilized to retain the yoke 23 in pivotal connection with bolt 29, a notch 33 being provided in the yoke end to engage the reduced portion 34 of the bolt 29, and the spring exerting its tension to hold the yoke upon the
 35 bolt through the medium of lug 30 and the disk 28. By this arrangement this end of the yoke may be attached and detached without removing the disk and the wheel opposite thereto. A direct tilting action to the casing
 40 by the handle is avoided by pivotally connecting the yoke to the axle bolts of the main wheels 15, but in cleaning stairs or furniture it is desirable to fasten the casing immovably to the yoke 23. This result is accomplished by clamping the yoke 23 to the segmental flange 37 by a headed screw 35 and thumbnut 36 on one leg of the yoke 23. Yoke 23 is also provided with a split socket 38 to receive the tapered end 39 of the handle
 50 24, and a screw 40 having a lever 41 pivoted eccentrically thereto serves to clamp the socket upon the handle and permits convenient removal of the handle. Removability of the handle requires a separable electrical
 55 connection for the motor as the electrical cord connection 42 for the motor is also carried by the handle. Therefore this connection 42 has a free and flexible end depending from the handle with one member 43 of a separable plug attached thereto. The other
 60 member 44 of the plug is mounted upon the upper casing section 1 which contains the electric motor 45 and supports the suction fan 46 at its bottom. Section 1 is made removable to give access to the fan chamber

in section 2, and the separable plug for the electrical motor connections facilitate separability of the said sections.

What I claim is:

1. A suction cleaner comprising a nozzle section tiltably mounted upon a support arranged substantially midway of its length and having at its forward part a transversely-extending, downwardly-facing, elongated inlet mouth, a handle pivotally connected to said section, and spring tension means connecting said nozzle section and handle and adapted to rock the nozzle section and lift the nozzle from the surface when the handle is moved from upright to operating position.

2. In a suction cleaner, a tiltable casing having a nozzle formed at its forward part with a transversely-extending, downwardly-facing, elongated inlet mouth, supporting wheels journaled to said casing substantially midway of its length with their axes parallel to said inlet mouth, a handle pivoted to said casing upon an axis transverse to said handle and parallel to the wheel axis, and a tension device between said handle and casing arranged to tend to raise the inlet mouth from the floor when said handle is held in operating position.

3. In a suction cleaner, a tiltable casing having a fan chamber, and an electric motor located above said fan chamber, a collecting nozzle beneath said fan chamber at one side and having a transversely-extending, downwardly-facing, elongated inlet mouth, supporting wheels journaled to said casing with their axes parallel to said inlet mouth and spaced rearwardly therefrom, a handle pivoted to said casing upon an axis transverse to itself and parallel to the wheel axes, and a tension device between said handle and the casing arranged to raise the inlet mouth from the floor when said handle is held in operating position.

4. In a suction cleaner, a motor and fan casing having a nozzle formed at its forward part with a transversely-extending, downwardly-facing, elongated inlet mouth, a pair of wheels pivoted one on each side of said casing at the rear of said nozzle and arranged to support said tiltable casing above the floor, said wheels being located substantially beneath the center of gravity of the casing, a handle having a yoke pivoted to said casing upon an axis parallel with the axis of said wheels, and a convolute spring interposed between the casing and yoke and arranged to tend to draw said nozzle and handle together upwardly.

5. In a vacuum cleaning machine, a suction device and a casing therefor having a nozzle, a pair of wheels pivoted one on each side of said casing, a handle having a yoke pivotally connected with said casing, a cupped member rotatably mounted concentrically

tric with said yoke pivot, a convolute spring connecting said member and the casing and interengaging connections between said member and said yoke.

5 6. In a vacuum cleaning machine, a casing having a pair of oppositely extending axle projections, supporting wheels rotatably mounted upon said projections, a handle having a yoke with a notched end piv-
10 otally and detachably connected with one of said projections, and a spring connected to said yoke and casing and arranged to hold said yoke upon its projection.

15 7. In a vacuum cleaning machine, a casing having a pair of oppositely extending axial projections, supporting walls rotatably secured upon said projections, a handle having a yoke one arm of which is pivoted to one of said projections and the other arm of
20 which is formed with a notched end engaged with the other of said projections; a member rotatably mounted upon said last named projection and detachably engaged with said yoke, and a convolute spring connect-
25 ing said member and casing and arranged to rotate such member in a direction to raise the yoke, said yoke having its notch on the side toward which the tension of the spring tends to move it and arranged to be de-
30 tached from said projection without disconnecting the spring from said member and casing.

35 8. In a vacuum cleaning machine, in combination, a casing having a nozzle, a pair of wheels pivoted one on each side of said casing in the rear of said nozzle and approxi-

mately beneath the center of gravity of said casing, a third wheel carried by said casing in the rear of said first wheels, means for raising and lowering said last wheel
40 with respect to the casing, a handle pivoted to said casing upon an axis substantially parallel with the axes of said first wheels, and resilient connections between said handle and casing arranged when said handle
45 is depressed to tend to raise said nozzle from the floor and depress said third wheel.

9. In a vacuum cleaning machine, a casing having at its forward part a trans-
50 versely-extending downwardly facing elongated inlet mouth, a pair of carrying wheels pivoted one on each side of said casing in the rear of said inlet mouth and approxi-
55 mately beneath the center of gravity thereof, a rear supporting wheel carried by said casing, the plane which is tangent to said wheels passing a substantial distance below
60 said inlet mouth, a handle pivoted to said casing upon an axis parallel to said carrying wheels, and resilient connections be-
65 tween said handle and casing arranged, when said handle is held in operating position, to hold said rear wheel on the floor and prevent the casing being tilted forwardly by the suction.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES B. KIRBY.

Witnesses:

F. C. MUSSUN,
E. M. FISHER.