

A. E. CLIFTON & W. W. PRESTON.
VACUUM CLEANER.
APPLICATION FILED DEC. 20, 1909.

971,595.

Patented Oct. 4, 1910.

Fig. 1.

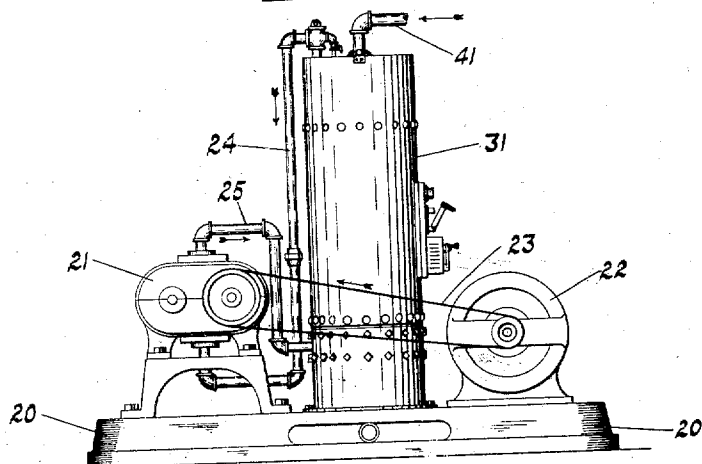


Fig. 2.

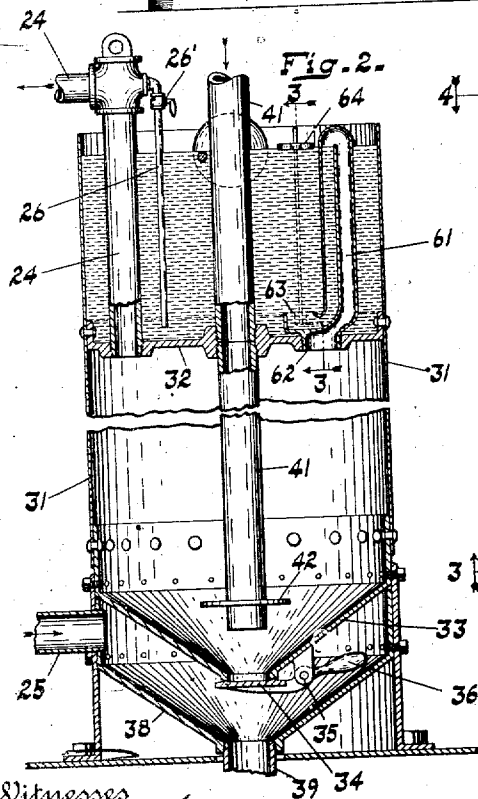


Fig. 3.

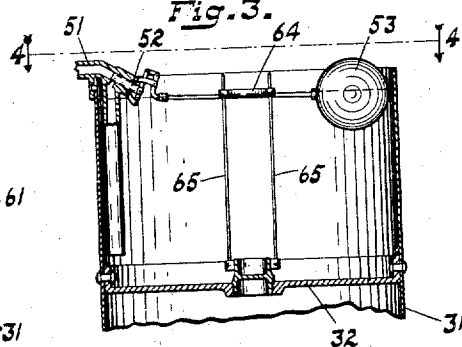
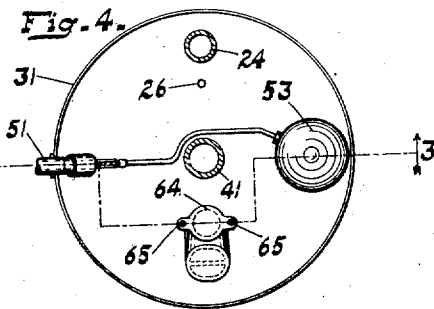


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

ARCHER E. CLIFTON AND WORTH W. PRESTON, OF CONNERSVILLE, INDIANA, ASSIGNORS TO UNITED VACUUM APPLIANCE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

VACUUM-CLEANER.

971,595.

Specification of Letters Patent.

Patented Oct. 4, 1910.

Application filed December 20, 1909. Serial No. 534,164.

To all whom it may concern:

Be it known that we, ARCHER E. CLIFTON and WORTH W. PRESTON, citizens of the United States, residing at Connorsville, in the county of Fayette and State of Indiana, have invented a certain new and useful Vacuum-Cleaner, of which the following is a specification.

The object of the present invention is to produce a machine for performing cleaning operations by the vacuum system which upon the cessation of any particular cleaning operation will automatically discharge the waste material or cleanings which have been gathered.

Said invention consists, broadly, in the incorporation in a cleaning apparatus of valves, the operation of which is controlled by the vacuum tension in such manner that the contents of the receiving tank will automatically discharge upon the cessation of the operation of the vacuum pump.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts, Figure 1, is a side elevation of an apparatus of the character in question embodying the present invention: Fig. 2 a central sectional view of the tank and the various pipes and valves; Fig. 3 a detail sectional view of the upper portion of the apparatus, the section line being taken at right angles with the plane of Fig. 2, and extending to one side in order to include the water inlet valve, as seen when looking in the direction indicated by the arrows from the broken line 3 3 in Fig. 4, the central ingress pipe for cleanings being omitted for purposes of clearness, and Fig. 4 a top or plan view as seen when looking downwardly from the broken line 4 4 above Fig. 3.

A complete machine with all the parts assembled is illustrated in Fig. 1. A vacuum pump 21 is shown as being driven from an electric motor 22 by a belt 23. The suction pipe 24 from the pump leads to the vacuum chamber, and the discharge air pipe 25 is shown as leading to within the structure but outside the vacuum chamber. This pipe 25 might lead to atmosphere without impairing the operation of the machine functionally, but leading it to within this inclosure muffles the discharge and also disposes of the small amount of water con-

tained in the discharge. The pump, motor, and connections, being of any ordinary or desired form, need not be further described herein. These, as well as the main body 31, are all mounted upon a base 20, so that the machine as a whole may be assembled and sold as a unit. It may be remarked that the side of the tank above the electric motor is a convenient place upon which to mount the switch and other electrical control devices (when an electric motor is used for power), as is shown in Fig. 1.

The body 31 has a transverse wall 32 near its upper end which forms the bottom of a water tank of appropriate size. The suction pipe 24 leading from the vacuum pump passes through this wall and terminates with an open end in the vacuum chamber below, as is best shown in Fig. 2. It may be here remarked that a small water pipe 26 leads from a suitable point in this vacuum pipe (preferably just above the top of the water tank) down into and nearly to the bottom of said water tank, and furnishes the water supply necessary to prime and seal pump 21. The quantity of water which shall be supplied to the pump by this means is controlled by valve 26'. Near the lower end of body 31 is another transverse wall 33, preferably hopper-shaped in form, and the cylindrical shell together with these walls 32 and 33 constitute the vacuum chamber. This lower wall 33 has a central discharge opening, and this is controlled by a valve 34 pivotally mounted at 35. Said valve is equipped with a counterweight 36 slightly heavier than the valve itself, so that it will normally remain closed, but when the pressure is off, it will open and allow the contents of the chamber to be discharged. The suction force, however, when the machine is in operation will serve to overcome the weight of the contents and hold this valve tightly closed, and the contents thus supported until the operation ceases.

The ingress pipe 41 starts from near the bottom of the tank, preferably just above the valve 34, and leads thence preferably upwardly through wall 32 and thence out and away to the point from whence it is desired to draw the waste material or cleanings in the cleaning operation. The lower end of this pipe 41 is submerged during the cleaning operation, and a shield-like flange 42

surrounding said lower end serves to assist in properly distributing the incoming cleanings in the water covering the end of said pipe. The upper water-containing tank is supplied by a water ingress pipe 51 controlled by a valve 52 which is operated by a float 53, in a similar manner as is common in flushing tanks.

The discharge of water from the water tank into the vacuum chamber is by means of a siphon-like passage 61, the lower end of which opens freely into the vacuum chamber, at 62, and the other end of which, at 63, is controlled by a vertically-movable valve 64, designed to normally float on the surface of the water, and which is guided as it approaches and recedes from the valve-seat by guide rods 65. The operation is, so far as this part of the apparatus is concerned, when the vacuum pump is set in motion, and the air begins to be exhausted from the vacuum chamber, that the water in the tank will flow by means of the siphon-like passage 61 from said tank into said vacuum chamber until the valve 64 becomes seated. The valve 64 being firmly seated under the suction exerted by the vacuum pump, so that the vacuum chamber is completely and efficiently closed, said chamber has meantime received into itself the quantity of water which has just previously been in the water tank above. At this point in the operation the suction becomes strong enough to effectuate the cleaning operation; and, as will be readily understood, the pump is kept in motion until the desired cleaning has been performed. When the pump is stopped, the suction in the vacuum chamber of course ceases, and the valve 64, under the weight of the water thereon, will open, discharging the water and the dirt or cleanings which has been gathered into it through the opening in the wall 33, whence it runs off into the sewer, or to whatever point the construction provides for. In the construction shown, a hopper-like receiver 38 is provided with a discharge pipe 39 leading therefrom, and a preferred arrangement is to have this pipe connect with a sewer.

As will be readily understood, as soon as the water from the water tank has been drawn into the vacuum chamber by the means above described, the float 53 will fall, opening valve 52, and permitting a fresh supply of water to run into said tank and fill it to the limit permitted by the float 53. This will, however, remain shut off from the siphon-like passage 61 so long as the suction in the vacuum chamber continues, as the valve 64 will be held to its seat at opening 63 by the force of the vacuum. As soon, however, as the vacuum force is discontinued, valve 64 will float to the top of the water, and the apparatus is then ready for further use. As will be observed, all these

operations are performed automatically upon the starting up of the vacuum pump, so that the apparatus needs no attention, except such as is required to keep it in repair and its bearings properly lubricated, thus rendering it exceptionally well calculated for use in dwellings, small business blocks, and other places where a skilled operator cannot economically be employed.

Having thus fully described said invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a vacuum cleaner, of a pump, a vacuum chamber, a connection leading from said pump to said chamber, a tank having a predetermined water supply arranged adjacent to said chamber, a passage from said chamber to said tank through which the supply of water will be drawn upon application of vacuum tension, a valve for closing said passage when the contents of the tank have been discharged and which will be held in said position so long as the vacuum tension continues, a water supply pipe to said tank, a valve in said pipe operated to be closed by the filling of the tank and opened by the discharge thereof, a cleanings pipe extending to within said chamber, and a valve to said chamber adapted to be held closed by the vacuum tension and to open by gravity when said tension is released.

2. The combination, in a vacuum cleaner, of a pump, a vacuum chamber, a connection leading from said pump to said chamber, a cleanings pipe leading from said vacuum chamber, a tank for a predetermined water supply, a water-inlet valve interposed between said tank and the vacuum chamber, an automatically operating valve for controlling the supply of water to said tank, a valve controlling the exit passage to said chamber, the water-inlet valve and the exit-passage controlling valve being arranged to be closed by the vacuum tension created by the operation of the pump and to open automatically upon the cessation of such tension.

3. The combination, in a vacuum cleaner, of a vacuum chamber, a pump, a connection from said pump to said chamber, a pipe for conveying the cleanings into said vacuum chamber, a discharge valve to said vacuum chamber adapted to be held closed by the vacuum and to open by gravity when the vacuum tension is released, a water tank for supplying water to the vacuum chamber, a valve between said tank and said chamber arranged to be held closed by the vacuum tension created by the operation of the pump and to open automatically upon the cessation of such tension.

4. The combination with the vacuum chamber of a vacuum cleaner, of a water tank arranged adjacent to said vacuum chamber, a siphon-like passage leading

from near the bottom of the water tank to said vacuum chamber; a float valve for controlling the ingress opening to said siphon-like passage adapted to be held closed by the vacuum tension and when released to float upon the water in the tank, and means for supplying the tank with water.

5. The combination, in a vacuum cleaner, of a vacuum chamber, a vacuum pump, a connection between said pump and said chamber, an ingress pipe for leading the cleanings to said vacuum chamber, a water supply for said vacuum chamber into which the incoming cleanings will be precipitated, a valve for controlling the discharge opening to said chamber adapted to be held closed by the vacuum tension therein and to open by gravity, a water tank positioned above the vacuum chamber, a discharge passage from said tank to said chamber controlled by a valve arranged to be held closed by the vacuum tension and to be opened when such tension is released by floating upon the incoming water thereto, said valve, a water supply pipe to said tank, and a float valve controlling said water supply pipe.

6. The combination, in a vacuum cleaner, of a vacuum chamber, a vacuum pump, a connection between said pump and said chamber, an ingress pipe for leading the cleanings to said vacuum chamber, a water supply for said vacuum chamber into which the incoming cleanings will be precipitated, and a valve for controlling the discharge

opening to said chamber adapted to be held closed by the vacuum tension therein and to open by gravity, a water supply tank for supplying the water to the vacuum chamber, a passage from said tank to said chamber, a valve for controlling said passage, said valve being held closed by the vacuum tension and opened by the water in the tank when the vacuum tension is released.

7. The combination, in a vacuum cleaner, of a vacuum chamber, a vacuum pump, a water supply tank above said vacuum chamber, a connection leading from said vacuum chamber to above said water tank and thence to said pump, a valve at the lower end of the vacuum chamber for discharging the contents thereof adapted to be closed by the vacuum tension and to be opened by gravity, a connection from the water tank to the vacuum chamber, and a valve controlling said connection adapted to be closed when the vacuum tension draws the water from said water tank into said vacuum chamber and to open when the tension in the vacuum chamber is released.

In witness whereof, we have hereunto set our hands and seals at Connersville, Indiana, this sixteenth day of December, A. D. one thousand nine hundred and nine.

ARCHER E. CLIFTON. [L. S.]
WORTH W. PRESTON. [L. S.]

Witnesses:

JOSEPH M. WILKIN,
RUBY PARRIS.

Correction in Letters Patent No. 971,59

It is hereby certified that in Letters Patent No. 971,595, granted October 4, 1910, upon the application of Archer E. Clifton, and Worth W. Preston, of Connersville, Indiana, for an improvement in "Vacuum-Cleaners," the State of incorporation of the assignee was erroneously given as "New York," whereas said State should have been given as *New Jersey*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 3d day of January, A. D., 1911.

[SEAL.]

E. B. MOORE,
Commissioner of Patents.

from near the bottom of the water tank to said vacuum chamber; a float valve for controlling the ingress opening to said siphon-like passage adapted to be held closed by the vacuum tension and when released to float upon the water in the tank, and means for supplying the tank with water.

5 5. The combination, in a vacuum cleaner, of a vacuum chamber, a vacuum pump, a connection between said pump and said chamber, an ingress pipe for leading the cleanings to said vacuum chamber, a water supply for said vacuum chamber into which the incoming cleanings will be precipitated, 10 a valve for controlling the discharge opening to said chamber adapted to be held closed by the vacuum tension therein and to open by gravity, a water tank positioned above the vacuum chamber, a discharge passage from said tank to said chamber controlled by a valve arranged to be held closed by the vacuum tension and to be opened 20 when such tension is released by floating upon the incoming water thereto, said valve, a water supply pipe to said tank, and a float valve controlling said water supply pipe. 25

6. The combination, in a vacuum cleaner, of a vacuum chamber, a vacuum pump, a connection between said pump and said chamber, an ingress pipe for leading the cleanings to said vacuum chamber, a water supply for said vacuum chamber into which the incoming cleanings will be precipitated, and a valve for controlling the discharge

opening to said chamber adapted to be held 35 closed by the vacuum tension therein and to open by gravity, a water supply tank for supplying the water to the vacuum chamber, a passage from said tank to said chamber, a valve for controlling said passage, said 40 valve being held closed by the vacuum tension and opened by the water in the tank when the vacuum tension is released.

7. The combination, in a vacuum cleaner, of a vacuum chamber, a vacuum pump, a 45 water supply tank above said vacuum chamber, a connection leading from said vacuum chamber to above said water tank and thence to said pump, a valve at the lower end of the vacuum chamber for discharging 50 the contents thereof adapted to be closed by the vacuum tension and to be opened by gravity, a connection from the water tank to the vacuum chamber, and a valve controlling said connection adapted to be 55 closed when the vacuum tension draws the water from said water tank into said vacuum chamber and to open when the tension in the vacuum chamber is released.

In witness whereof, we have hereunto set 60 our hands and seals at Connersville, Indiana, this sixteenth day of December, A. D. one thousand nine hundred and nine.

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