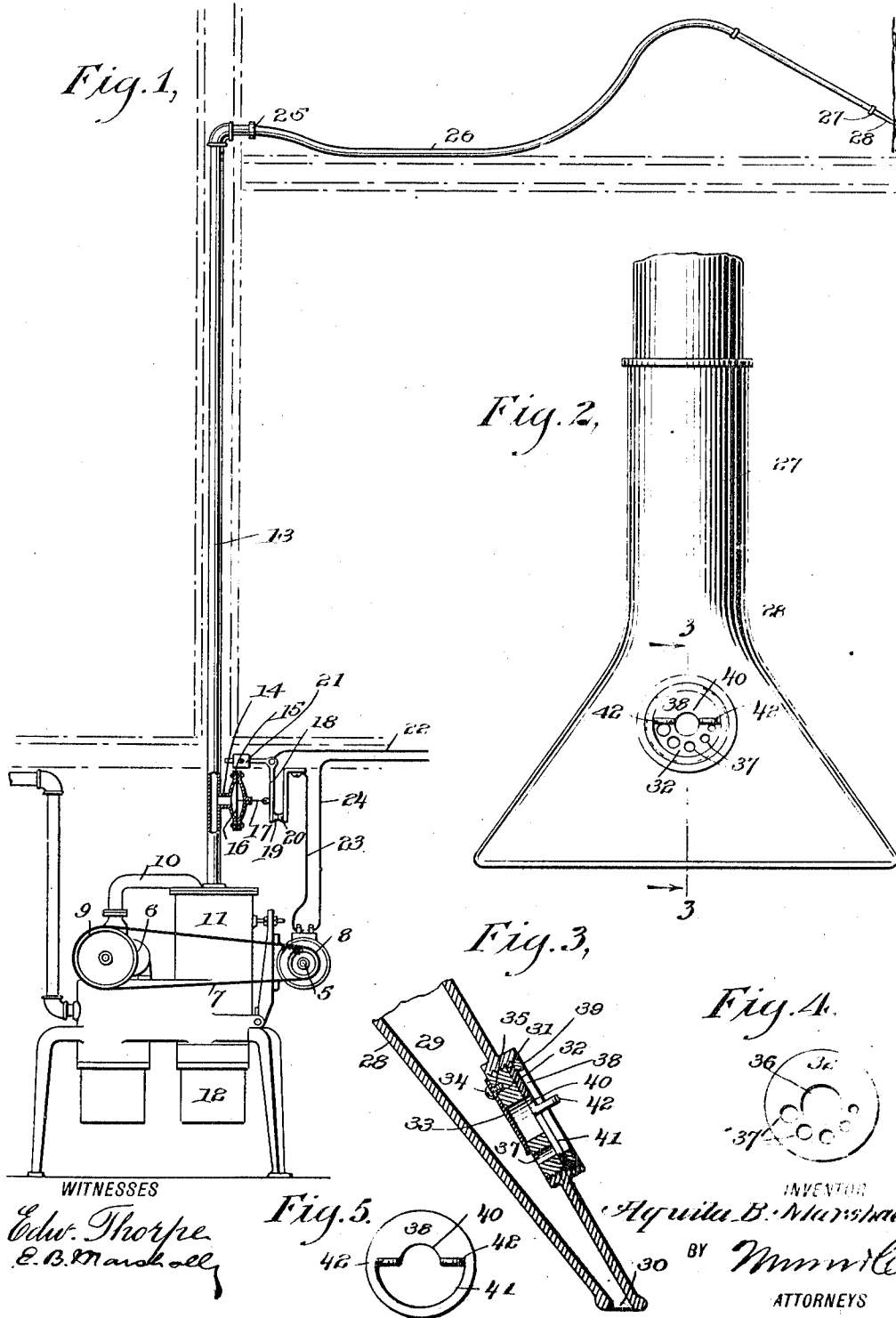


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VACUUM CLEANER.
APPLICATION FILED JUNE 27, 1913.

1,106,231.

Patented Aug. 4, 1914.



UNITED STATES PATENT OFFICE.

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VACUUM-CLEANER.

1,106,231.

Specification of Letters Patent.

Patented Aug. 4, 1914.

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To all whom it may concern:

Be it known that I, AQUILA B. MARSHALL, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Vacuum-Cleaner, of which the following is a full, clear, and exact description.

My invention has for its object to provide a vacuum cleaner having a suction cleaning tool with a spring valve for normally closing a valve opening in the tool, but which will open should the mouth of the tool inadvertently become closed or partially closed when used by an inexperienced operator, to permit the entrance of air to the main before the pressure in the main is reduced to a point at which the motor for driving the vacuum pump is automatically stopped by atmospheric pressure; means being provided for stopping the motor by atmospheric pressure when the pressure in the main falls to a predetermined point.

Still another object of the invention is to provide the tool with a plurality of openings which are normally covered by a valve, but which may be opened as desired by the operator, to admit a supply of air at the rear of the mouth of the tool, thereby regulating the flow of the air into the mouth of the tool, and permitting the use of the tool for a great variety of purposes, without changing the suction at the pump.

Still other objects of the invention will appear in the following complete specification, in which the preferred form of the invention is disclosed.

In the drawings similar characters of reference indicate corresponding parts in all the views, in which—

Figure 1 is an elevation showing the invention with parts broken away to illustrate the automatic means for operating the switch of the electric motor; Fig. 2 is an enlarged view showing the suction cleaning tool; Fig. 3 is a sectional view on the line 3—3 of Fig. 2; Fig. 4 is a view showing the valve seat in the tool; and Fig. 5 is a view showing the valve in plan.

By referring to the drawings it will be seen that an electric motor 5 is provided, which is connected for driving a rotary pump 6, by means of the belt 7, which connects the pulley 8 on the shaft of the motor

5 with the pulley 9 on the pump 6. A pipe 10 leads from the separator 11 to the rotary pump 6, and below the separator 11 there is a dust bucket 12, all constructed in a manner which is readily understood.

Leading to the separator 11 there is a suction main 13, and connected with the suction main or pipe 13 there is a pipe 14, which leads to a casing 15 having a diaphragm 16, movable by a change of pressure in the suction main or pipe 13. This diaphragm 16 is connected by a cord 17 with a switch arm 18 having a contact member 19, for engaging a contact member 20. The switch arm 18 is held with its contact 19 yieldingly in engagement with the contact 20 by its weighted arm 21, so that a circuit having the wires 22, 23 and 24, and connected with the motor 5, will be closed, when there is sufficient pressure in the pipe or suction main 13 to hold the diaphragm in the position shown in Fig. 1 of the drawings. However, when the pressure is decreased in the pipe or suction main 13, the diaphragm 16 will be drawn away from the contact point 20, carrying with it the cord 17 and the switch arm 18, to move the contact member 19 out of engagement with the contact 20. This will break the circuit through which the current flows to the motor 5, thereby stopping the motor.

In the suction main or pipe 13 there is an inlet 25, with which may be connected the pipe or hose 26, with which is connected the pipe portion 27 of the suction cleaning tool 28, this suction cleaning tool 28 having a chamber 29 with which communicates the mouth 30 of the suction cleaning tool. This suction cleaning tool 28 is constructed with a threaded opening 31, in which meshes the valve seat 32, shown in Fig. 4 of the drawings, there being a spring valve 33 at the inner side of the valve seat 32, which is held in place by a screw 34, disposed through an opening in the spring valve 33, and meshing in the threaded orifice 35 in the valve seat 32. This valve seat 32 has a central opening 36, and a plurality of valve openings 37, disposed therearound, the valve 38 shown in Fig. 5 of the drawings being provided for closing the valve openings 37, as may be desired. This valve 38 is disposed at the outer side of the valve seat 32, and is adapted to rotate to close one or more of the valve openings 37, as may be desired,

a ring 39 with a thread being provided for meshing in the threaded opening 31, for preventing the movement of the valve 38 out of position. This valve 38 has a central opening 40, which registers with the opening 36 in the valve seat 32, so that the opening 36 is never covered by the valve 38, although this opening 36 is normally held closed by the spring valve 33.

10 The opening 40 in the valve 38 is not only sufficiently large to uncover the opening 36 at all times, but it also extends beyond the opening 36 at 41 so that it may be moved to uncover the valve openings 37 as may be desired, the valve 38 being adapted to uncover one or more of these openings 37, or, if desired, cover all the valve openings 37 to prevent the air from passing therethrough.

The spring valve 33 is adjusted with reference to the diaphragm 16, and the switch arm having the weighted arm 21, so that the spring valve 33 will move under a reduction of pressure in the pipes 26 and 13, before the pressure has been sufficiently reduced to operate the diaphragm 16, and the switch arm 18 having the weighted arm 21. It will therefore be seen that as the opening 36 is never covered by the valve 38, there is no danger of a movement of the diaphragm 16 to throw the switch arm 18 and break the circuit, thereby stopping the motor, even should the carelessness of the operator bring the mouth 30 of the suction cleaning tool 28 into contact with a surface which will prevent the passage of air into the suction cleaning tool 28, through its contact 30. However, when the pipe 26 is removed from the inlet 25, and a cap or valve is placed over the inlet to prevent air from passing therein, the reduction of pressure in the pipe 13, caused by the suction of the rotary pump 6, will draw in the diaphragm, and by the means described, move the switch arm 18 to move the contact 19, with the switch arm, so that the contact will no longer engage the contact 20. This will break the circuit, and stop the motor.

In order to obtain the best results with the suction cleaning tool, it is necessary to regulate the suction at the mouth 30 of the suction cleaning tool 28, and this I accomplish by uncovering the valve openings 37, as may be desired, these valve openings 37 serving as by-passes to permit the air to enter the pipes, and suction main, without passing through the mouth 30. When one of these valve openings 37 is uncovered by the valve 38, the suction at the mouth 30 of the tool is slightly less than is the case when all the valve openings 37 are covered, and

when two of these valve openings 37 are uncovered by the valve 38, a still further reduction in suction at the mouth 30 is obtained. In this way the suction at the mouth of my suction cleaning tool 28 may be adjusted to clean under the most favorable conditions articles of various kinds of material. The valve 38 has thumb pieces 42 by which it may be readily rotated.

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

1. In a vacuum cleaner, a suction cleaning tool having a mouth, a valve seat spaced therefrom and having a central valve opening and a valve opening disposed at one side thereof, a resilient valve secured to the inner side of the valve seat for closing the central valve opening and a valve mounted for rotating on the valve seat and having an opening for the passage of air to the central opening in the valve seat, the opening in the second mentioned valve having an extension at one side for uncovering the second valve opening with the rotation of the second mentioned valve.

2. In a vacuum cleaner, a suction cleaning tool having a mouth and a threaded opening spaced therefrom, a valve seat with a thread meshing in the threaded opening, the valve seat having a central valve opening and a valve opening disposed at one side thereof, a resilient valve secured to the inner side of the valve seat for closing the central valve opening, and a valve mounted for rotating on the valve seat and having an opening for the passage of air to the central opening in the valve seat, the opening in the second mentioned valve having an extension at one side for uncovering the second mentioned valve opening with the rotation of the second mentioned valve.

3. In a vacuum cleaner, a suction cleaning tool having a mouth, a valve seat spaced therefrom and having a central opening and a second opening, a resilient valve for normally closing the central opening in the valve seat, and a valve mounted for rotating on the valve seat, the second mentioned valve permitting the passage of air to the central opening in the valve seat at all times, and being adapted for closing the second mentioned opening in the valve seat.

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

AQUILA BOLTON MARSHALL.

Witnesses:

WM. COSGROVE,
G. A. FRAMM.