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G. SIMPSON & W. J. BURTON.

DUST COLLECTOR.

APPLICATION FILED DEC. 29, 1903.

Fig-1-

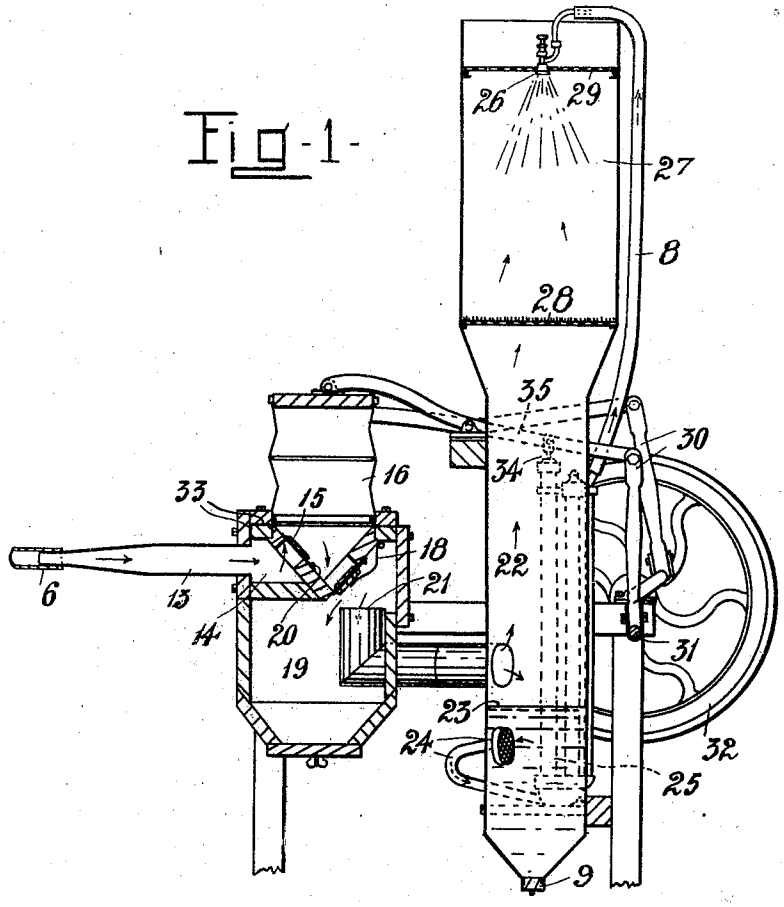
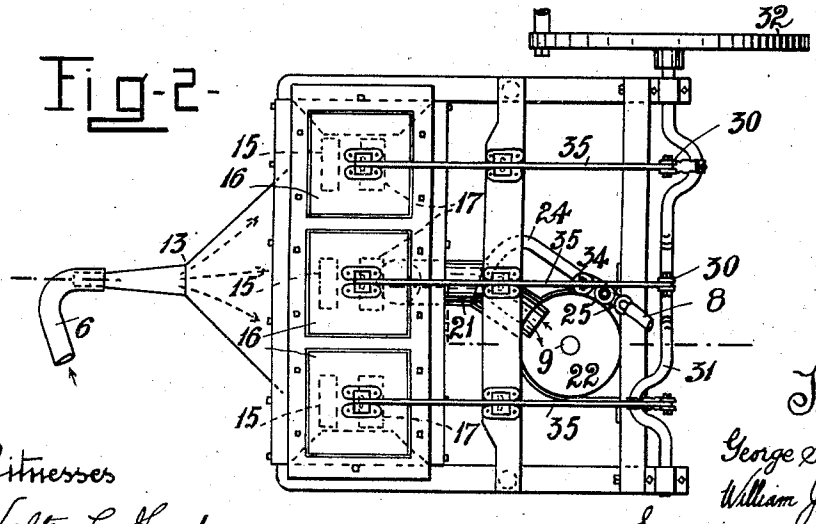


Fig-2-



Witnesses

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No. 785,525. Patented March 21, 1905.

UNITED STATES PATENT OFFICE.

GEORGE SIMPSON, OF RICHMOND, NEAR MELBOURNE, AND WILLIAM JOSEPH BURTON, OF RICHMOND, VICTORIA, AUSTRALIA

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 785,525, dated March 21, 1905.

Application filed December 29, 1903. Serial No. 187,054.

To all whom it may concern:

Be it known that we, GEORGE SIMPSON, mechanic, residing at 54 Gardner street, Richmond, near Melbourne, and WILLIAM JOSEPH BURTON, accountant, residing at 13 Waltham street, Richmond, in the State of Victoria, Commonwealth of Australia, subjects of the King of Great Britain, have invented Improvements in Dust-Collectors, of which the following is a specification.

This invention retates to dust-collectors such as are used in machines for removing dust from carpets, upholstered furniture, walls, and other surfaces, and has been devised in order to provide improvements whereby not only dust, but septic matter and other impurities, may be collected and effectively prevented from escaping from same. The collector is also more conveniently portable and may be worked by hand, while it is, furthermore, simpler in construction, and the dust is collected behind the pumping-chamber, whereby considerable power is saved.

Referring to the accompanying drawings, Figure 1 is a plan of the apparatus, and Fig. 2 is a central vertical section on line VII VII of Fig. 1.

The flexible air-tight hose 6, having at its end a mouthpiece or cleaner, is directly connected to a fan-shaped funnel 13, which delivers the dust, &c., into an expanding and distributing chamber 14, fitted with a number of valves 15, corresponding to the number of pumps 16 in the V-shaped pump-chamber. At the rear of this pump-chamber are corresponding outlet-valves 17, normally held closed by springs 18 and discharging into a settling or collecting chamber 19. The inlet-valves 15 for the inward passage of the blast, carrying with it the various impurities from the distributing-chamber 14 to the pump-chamber, are preferably made of india-rubber backed with light pieces of wood to increase their rigidity and are hinged at the lower ends, as at 20, Fig. 1. The outlet-valves 17 are of similar construction, but are hinged at their upper ends onto the opposite side of the pump-chamber and are so placed that they open just beside the apex of the chamber, and thus allow a free passage of the blast, with its impurities, into the settling or collecting chamber 19. It is in this settling-chamber 19 that the heavier particles are caught and fall to the bottom, and in order to facilitate the removal of this deposit this chamber is made hopper-shaped at its base and is provided at the bottom with a door. The finer dust, however, is still suspended and is carried on with the draft through the pipe or conduit 21 to the fine-dust-collecting tank 22, which may be of any suitable kind. We prefer, however, to use the special construction illustrated in the drawings at Fig. 1. This tank 22 is composed of a water-tight casing, of galvanized iron or other suitable material, in the bottom of which is some soapy water 23 or other liquid to create a foam, so that the surface of the water is just below the mouth of the pipe or conduit 21. Any heavy particles that may have been carried forward by the draft will here be deposited into the water. A few inches below the opening of said pipe or conduit 21, and thus well below the surface of the liquid 23, is an outlet-pipe 24, to which is connected a continuously-acting force-pump 25 of any suitable structure, by means of which the foam-producing liquid 23 is conveyed through the pipe 8 and is delivered through a rose or nozzle 26 into the enlarged upper portion 27 of said tank or tower in the form of a spray. When using soapy water, the upward draft of air meeting the water as it is sprayed into the chamber causes the formation of bubbles and helps to atomize and distribute it all over the internal area of the tank 22 in such a manner as to readily absorb or collect the finer particles of dust. The tank 22 is provided at or about its middle point with a diaphragm 28, of canvas, cloth, or other suitable porous material, which prevents the larger portions of fine dust from going any farther, and thus acts as a rough filter, while, furthermore, the air passing through the pores of the diaphragm is somewhat broken up, which assists in the formation of bubbles on meeting the descending spray. Some of the finer dust, however, will even get through this diaphragm 28, but is efficiently arrested by the downward-flow-

ing frothy spray of soapy water, which carries the caught particles down to the bottom. The kind of material which is most suitable for this diaphragm is one with a heavy pile on its upper side only. The draft of air keeps this waving in an upward direction, thus offering a larger area on which the dust, &c., arrested in the upper portion of the tank may be deposited. In order to further guard against the escape of any of the fine dust, the tank is provided near its upper end with a second diaphragm 29, of suitable porous material, which allows the clean draft of air to escape. The tank is also fitted with a plug or cock 9, so that the dirty liquid 23 may be easily removed therefrom and fresh added by pouring it in from the top of said tank through the diaphragms 28 and 29.

The crank-arm 30 on the crank-axle 31 (which is provided at one end with a driving-wheel 32) is so arranged that there is a continous suction through the hose 6, &c., to the pump-chamber anda continuous draft from the settling-chamber 19 through the pipe or conduit 21 into the dust-collecting tank or tower 22.

The settling-chamber, &c., may be conveniently made of wood, and all the joints are suitably packed with rubber packing 33 or the like in order to make them air-tight.

The power for driving the force-pump 25 is obtained by connecting the piston 34 of same to the rocking arm 35, working one of the bellows 16 of the pump-chamber.

In cases where the fine dust can be conveniently discharged out a window the dust-collecting tower may be dispensed with and the pipe 21 extended through the window, so that the discharge of the dust will be into the atmosphere.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. A dust-collector involving a casing having a **V**-shaped partition provided with openings closed by flap-valves and forming a pump-chamber, a horizontally-extending partition arranged in said casing and forming in connection with one side of said **V**-shaped partition a dust-expansion chamber, an inlet for said expansion-chamber, said horizontally-extending partition in connection with the other side of said **V**-shaped partition forming a dust-settling chamber within said casing, an outlet for said settling-chamber, a cylinder communicating with said outlet and containing a body of water in the lower portion thereof, diaphragms arranged in said cylinder at the upper portion thereof, a spraying device arranged in the upper portion of said cylinder, and means communicating with said spraying device and the liquid at the lower portion of said cylinder for forcing said liquid through said spraying device.

2. A dust-collector involving a casing having a sectional partition provided with openings closed by flap-valves and forming a pump-chamber, a partition arranged in said casing and forming in connection with one section of the first-mentioned partition, a dust-expansion chamber, an inlet for said expansion-chamber, said second-mentioned partition in connection with the other section of said first-mentioned partition forming a dust-settling chamber within said casing, and an outlet for said settling-chamber.

3. A dust-collector involving a casing having a central partition provided with openings closed by flap-valves and forming a pump-chamber, a partition arranged in said casing and forming in connection with one section of the first-mentioned partition a dust-expansion chamber, an inlet for said expansion-chamber, said second-mentioned partition in connection with the other section of said first-mentioned partition forming a dust-settling chamber within said casing, an outlet for said settling-chamber, and a dust-arresting means communicating with said outlet.

4. A dust-collector involving a casing having a sectional partition provided with openings and forming a pump-chamber, valves for closing said openings, a partition arranged in said casing and forming in connection with one of the sections of the first-mentioned partition a dust-expansion chamber at the front of and communicating with the pump-chamber, an inlet for said expansion-chamber, said second-mentioned partition in connection with the other section of said first-mentioned partition forming a dust-settling chamber within said casing at the rear of and communicating with the pump-chamber, and an outlet for said settling-chamber.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

GEORGE SIMPSON.
WILLIAM JOSEPH BURTON.

Witnesses:
EDWARD WATERS, Junr.,
WILLIAM HERBERT WATERS.