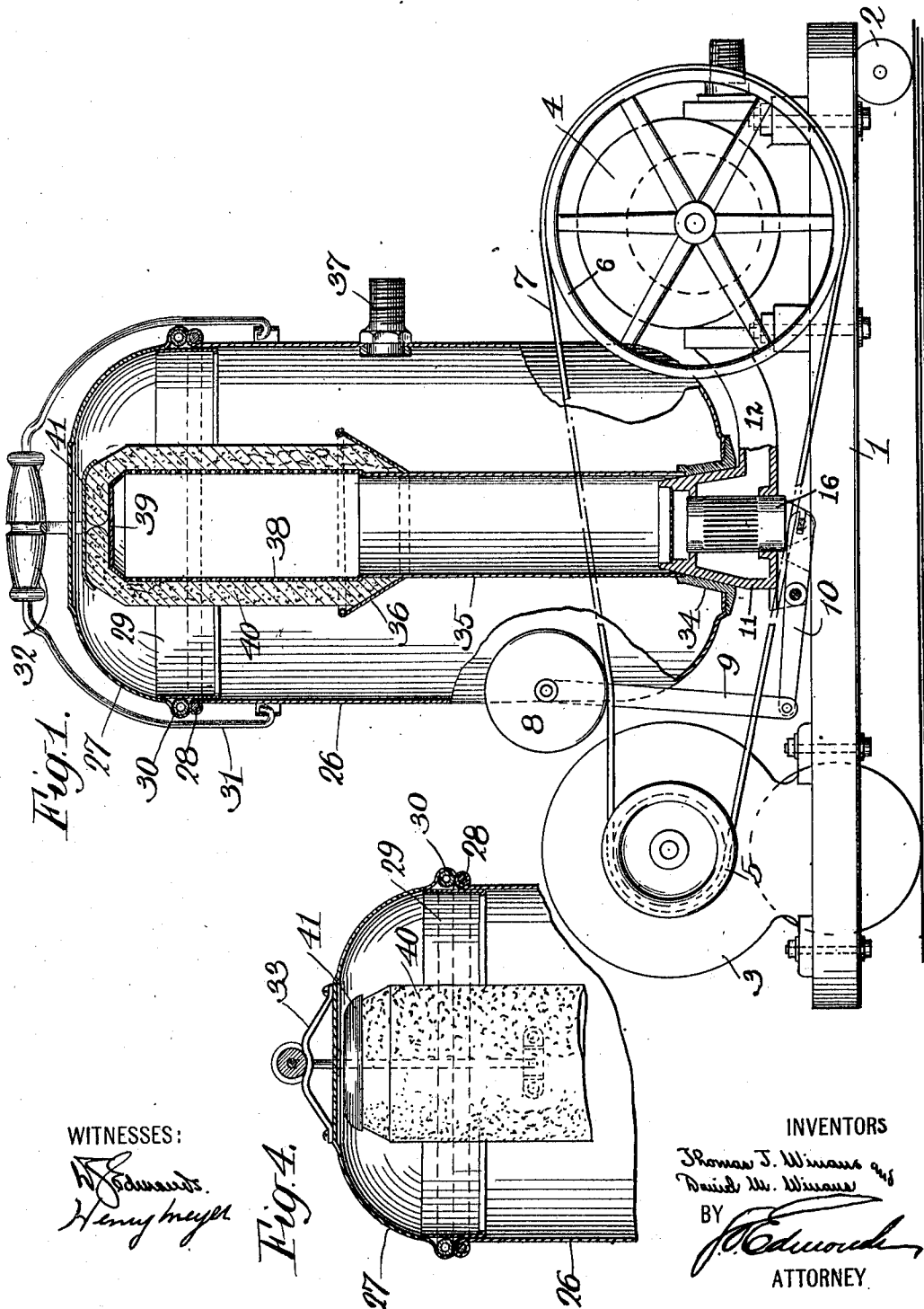


T. J. & D. M. WINANS.
CLEANING APPARATUS.
APPLICATION FILED AUG. 25, 1909.

1,003,844.

Patented Sept. 19, 1911.

2 SHEETS-SHEET 1.



WITNESSES:

H. Edwards
Henry Meyer

Fig. 4.

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Thomas J. Winans and
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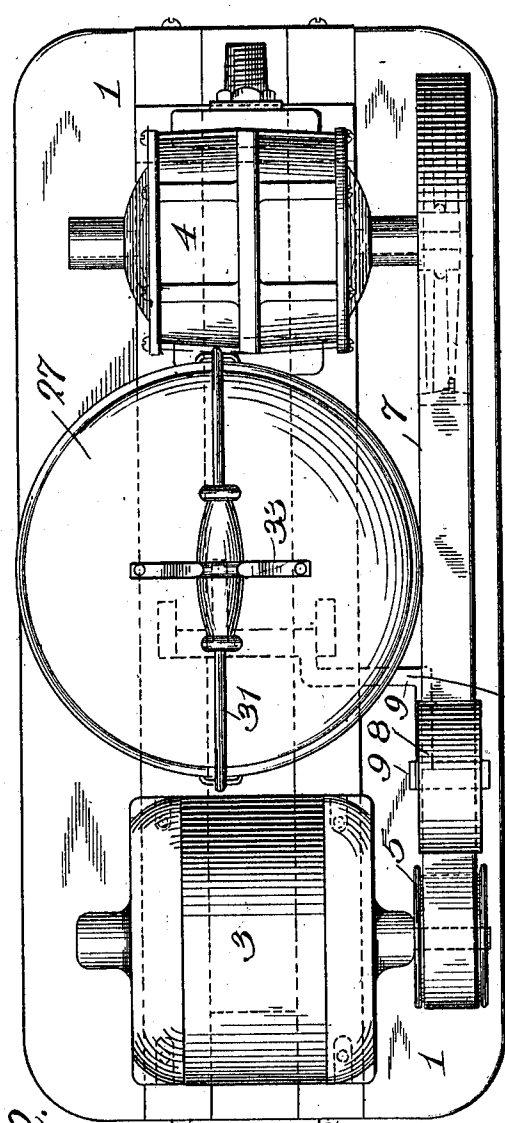


Fig. 2.

WITNESSES:

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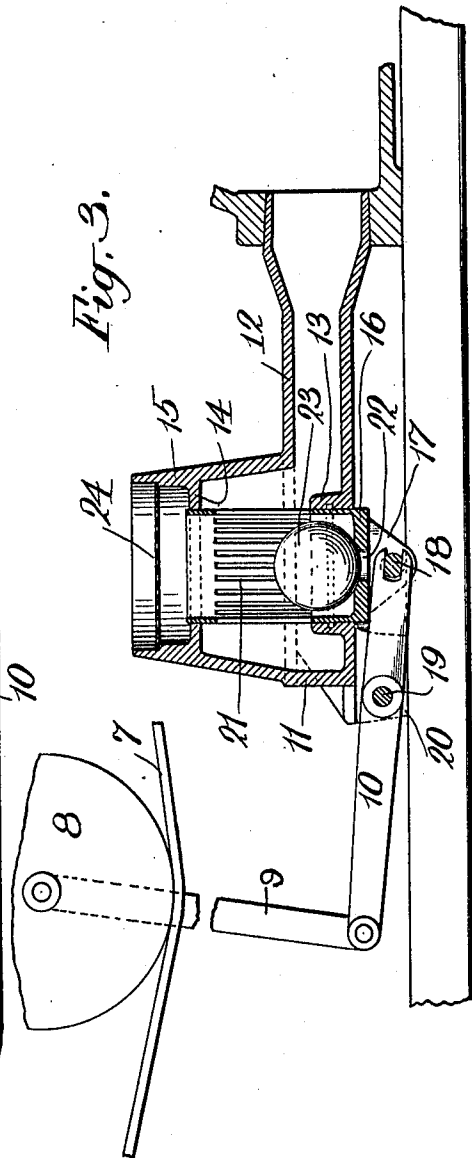


Fig. 3.

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THOMAS J. WINANS AND DANIEL M. WINANS, OF BINGHAMTON, NEW YORK, ASSIGNORS TO THE WINANS MACHINE COMPANY, OF BINGHAMTON, NEW YORK, A CORPORATION OF NEW YORK.

CLEANING APPARATUS.

1,003,844.

Specification of Letters Patent.

Patented Sept. 19, 1911.

Application filed August 25, 1909. Serial No. 514,495.

To all whom it may concern:

Be it known that we, THOMAS J. WINANS and DANIEL M. WINANS, citizens of the United States, residing at Binghamton, in the county of Broome, State of New York, have invented certain new and useful Improvements in Cleaning Apparatus, of which the following is a specification.

This invention relates to apparatus for cleaning by the employment of an air pump arranged to draw air and dust into a collector wherein the dust is gathered.

The object of the invention is to provide an apparatus of this character which is portable, which is efficient, reliable and economical in operation, which is simple in construction and can therefore be manufactured at a low cost, and which is convenient to use.

The invention resides in the construction of the collecting device whereby practically all of the dust is taken out of the air before the latter is allowed to escape, and whereby the dust collected may be readily disposed of.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a view of the apparatus partly in elevation and partly in section, Fig. 2 is a top view of the apparatus, Fig. 3 is a sectional elevation of the belt-tightener and the operating device therefor, and Fig. 4 is a detail view in section of a portion of the collector.

Referring to these drawings, 1 indicates a base mounted on suitable rollers 2, and having an electric motor 3 and an exhaustor 4 secured thereon. The shaft of the motor is provided with a pulley 5 and the shaft of the exhaustor with a pulley 6, and a belt 7 runs on these pulleys to transmit rotary motion from the motor to the exhaustor. The belt 7 is of such length that when disposed as shown in Fig. 1 it is loose enough upon the pulleys to permit of considerable slip, and therefore the motor 3 can run with its pulley 5 slipping freely under the belt. The belt, however, is retained upon the pulley 5 by flanges provided at the sides of the pulley. A belt-tightener is provided, however, whereby the belt 7 may be caused to grip the pulleys 5 and 6

tightly enough to effect a substantial reduction in the amount of this slip. The belt-tightener consists of an idle pulley 8 mounted upon a shaft carried by a link 9 which is pivotally connected at its lower end to one end of a pivotally mounted lever 10.

Mounted upon the base 1 is a member 11 forming a support for the collector and the connecting passage-way from the collector to the exhaustor 4. A portion 12 of the member 11 is of tubular form as shown in Fig. 3 and its end is connected to the inlet opening of the exhaustor 4. In the bottom of the member 11 is a circular opening the wall of which is increased in length by a flange 13. In line with this opening is an opening of the same size formed by a web 14 on the interior of a tubular upwardly extending portion 15 of the member 11. A cylindrical piston 16 fits snugly within this opening and is adapted to move vertically therein in response to changes of pressure within the member and the collector which is connected thereto. The piston 16 has two depending ears 17 carrying a pin 18. This pin passes through a slot formed in the end of the lever 10, this lever being adapted to rock upon a short shaft 19 which extends between the legs 20 formed on the member 11 and by which the member is secured to the base 1. The cylindrical piston 16 is provided with a plurality of slots 21 lying between the flanges 13 and 14. In the base of the piston 16 is an opening 22 leading to the atmosphere. This opening is normally closed by a ball valve-member 23, the upper surface of the bottom of the piston 16 about the opening 22 being formed to provide a seat for the ball 23. The interior of the tubular portion 15 above the flange 14 is formed to provide a shoulder upon which a screen 24 is secured. The exterior of the tubular portion 15 is tapered as shown in Figs. 1 and 3.

The construction of the collector is illustrated in Figs. 1 and 4. It consists of a tank of cylindrical form having dome-shaped ends to better enable it to resist external pressure. The tank has a body portion 26 and a detachable cover 27. The edge of the body portion is turned over a stiffening wire 28 and to the edge of the cover 27 is secured

a sheet-metal strip 29 adapted to enter slightly within the body portion of the tank 26; the metal of the cover 27 at the edge thereof is curled outwardly so as to provide between it and the strip 29 a seat for a compressible packing ring 30. When the cover is placed upon the tank the strip 29 fits snugly within the body of the tank and the packing ring 30 is compressed against the stiffened upper edge of the tank so that the entrance of air at the joint between the tank and its cover is precluded. The cover is held tightly in this relation by a bail 31 pivotally mounted upon the tank 26 and having a handle 32 mounted thereon so as to be free to rotate. In the handle 32 is a circumferential groove. Secured to the top of the cover 27 is a handle 33 of such height that when the bail 31 is brought to an upright position the handle 32 will receive the member 33 in the groove therein and will hold the cover firmly in place. The handle or member 33 is bent as shown in Fig. 4 so as to retain the bail 31 in this position.

Secured to the bottom of the tank 26 is a flanged sleeve 34 the opening through which is tapered to correspond with the taper of the tubular portion 15 of the member 11. Secured to this sleeve 34 is a sheet-metal tube 35 which extends upwardly through the tank almost to the top thereof. A deflector 36 is secured to the tube 35 at about the middle of the latter. The air and dust are drawn into the tank at a point opposite this deflector through a connector 37 secured to the side wall of the tank and arranged to facilitate the connection of a flexible tube thereto. Above the deflector 36 the tube 35 is provided with a plurality of openings 38. The top of the tube 35 is closed by a detachable sheet-metal cap 39. Over the upper perforated end of the tube 35 is a removable sleeve 40 of filtering material, its lower end entering the deflector 36. The top of this sleeve is closed. The filtering material which we prefer to employ in making the sleeve 40 is cotton-batting in sheet form, as this is very inexpensive and forms an excellent filtering sleeve which will take up even the finest dust, and at the same time, permit the air to pass freely therethrough. Preferably a piece of commercial cotton-batting cut to the proper size is wound about the upper end of the tube 35 over the perforations 38, its lower edge extending within the deflector 36. The upper edge of this sleeve 40 is turned inwardly over the cap 39 and preferably a circular sheet-metal plate 41 is placed over the upper end of the sleeve 40 so as to hold the inwardly turned edge of the latter properly in place, and preclude the entrance of air at the center thereof.

It will be seen that the apparatus is portable so that it is adapted for use in a household.

In operating the cleaner, electric connection is made from the motor to a lamp socket or wall receptacle. When the current is turned on the motor will begin to rotate and will drive the exhauster. Prior to beginning the operation, the pressure within the tank 26 is atmospheric pressure, and therefore the belt 7 is loose upon the motor and exhauster pulleys, since the belt-tightener pulley 8 rests with very little weight upon the belt 7. This allows the belt to slip freely upon the pulley 5 so that the rotor of the exhauster is rotated at low speed as compared to the speed of the motor. In this way the motor is brought up to speed without consuming an excessive amount of current, and therefore without the liability of blowing a fuse in the motor circuit. At this time the exhauster will be drawing air through the cleaning device, connected to the tank by the connector 37, the tank 26 and the tubular member 12. Now, if the cleaning device is applied to a surface to be cleaned the air will not be drawn so freely through the tank and therefore the pressure within the tank will be lowered. This will cause the piston 16 to move upwardly in the chamber in which it is located, thus rocking the lever 10 and drawing the pulley 8 downwardly so as to tighten the belt 7 upon the motor and exhauster pulleys and reduce the slip of the belt upon the pulley 5. This increases the speed at which the exhauster is driven and correspondingly increases the suction of the exhauster. The automatically operated belt-tightener thus serves as an automatic clutch for connecting the motor and the exhauster in such a manner that the speed of the exhauster relative to the speed of the motor is automatically regulated in accordance with the work of cleaning performed by the apparatus.

The air and dust are drawn through the cleaning device and the connector 37 to the interior of the tank 26, wherein the deflector 36 serves to direct the larger and heavier particles downwardly into the bottom of the tank 26. The air laden with the finer particles passes upwardly within the tank to the filter 40 through which the air passes and which collects the finer particles of dust. The air passes through the perforations 38 to the interior of the tube 35, then downwardly through the screen 24, the slots 21 in the piston 16 and the tubular member 12 to the exhauster. If at any time the passage of air through the apparatus is so obstructed as to cause the motor 3 to be overloaded, the suction of the exhauster will so reduce the pressure within the tank as to cause the ball valve 23 to be raised slightly from its seat, and in this case air will pass freely from the atmosphere through the opening 22 so as to afford a relief for the abnormal conditions, and thus protect the

motor and the circuit leading thereto against injury due to the passage of too large a current therethrough.

5 The continued use of the apparatus results in the collection of dust and dirt in the bottom of the tank around the tube 35 supporting the deflector 36, and when a large amount of dirt has been collected the tank should be emptied. This may be readily
10 done by merely lifting the tank from its seat upon the tapered sleeve 15. This method of mounting the tank permits of its ready removal while affording an air-tight connection at the joint between the sleeves 34 and
15 15. When the tank has been removed to the place desired for dumping the dirt the bail 31 may be turned from over the cover and the cover removed, whereupon the dirt collected in the bottom of the tank may be dumped out. The filter 40 may then be removed and burned as the dust collected by the filter is so fine that its removal from the
20 filter could hardly be effected. A filter 40 made of cotton-batting is so inexpensive, and a new one may be so readily supplied, that we deem it better to burn a filter which has been used until it is filled with dust rather than to try to remove the dust from the filter.

30 Having described our invention, what we claim as new therein and desire to secure by Letters Patent of the United States, is:

35 1. In a cleaning apparatus, a collector comprising an upright cylindrical member having an opening in the lower end thereof, a tapering tubular member mounted in said opening and serving to removably support the collector, a tube mounted on the collector and extending upwardly within the same a
40 substantial distance, said tube being of small diameter compared to the diameter of the collector to provide free space between the

tube and the wall of the collector for the collection of dust, a deflector mounted upon the tube a substantial distance above the
45 bottom of the collector, said cylindrical member having an inlet opening opposite the deflector, and said tube having a plurality of perforations in the cylindrical wall thereof above the deflector, and fibrous material wound upon the perforated portion of
50 the tube above the deflector, substantially as set forth.

2. In a cleaning apparatus, a collector comprising an upright cylindrical member
55 having an opening in the lower end thereof, a tapering tubular member mounted in said opening and serving to removably support the collector, a tube mounted on the collector and extending upwardly within the same a
60 substantial distance, said tube being of small diameter compared to the diameter of the collector to provide free space between the tube and the wall of the collector for the collection of dust, a deflector mounted upon the
65 tube a substantial distance above the bottom of the collector, said cylindrical member having an inlet opening opposite the deflector and said tube having a plurality of perforations in the cylindrical wall thereof
70 above the deflector, a filter comprising a sheet of fibrous material wound about the perforated portion of said tube above the deflector, and a plate bearing upon and closing the upper end of said cylindrical filter, sub-
75 stantially as set forth.

This specification signed and witnessed this 23rd day of August 1909.

THOMAS J. WINANS.
DANIEL M. WINANS.

Witnesses:

H. J. GAYLORD,
F. J. BAUMANN.