(No Model.) 2 Sheets—Sheet 1.

A. HUNTER.

DUST COLLECTOR.

No. 449,535. Patented Mar. 31, 1891.

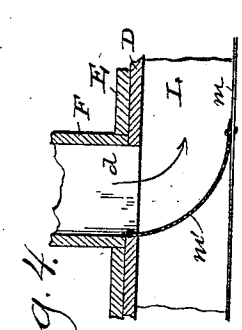


Fig. 4.

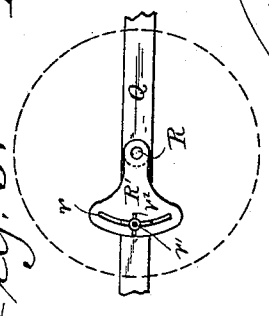


Fig. 3.

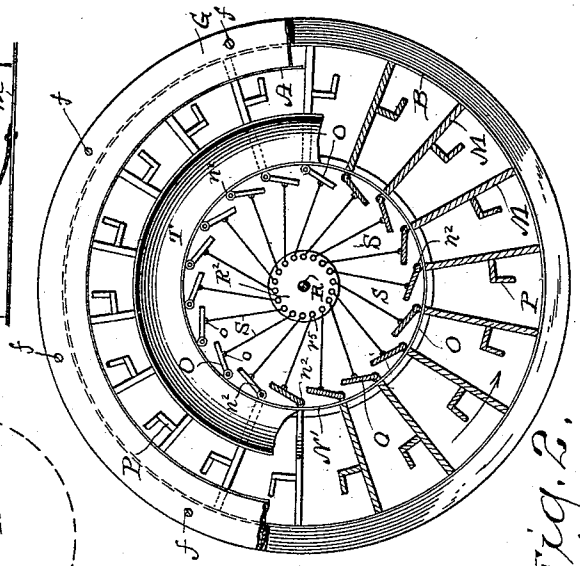


Fig. 2.

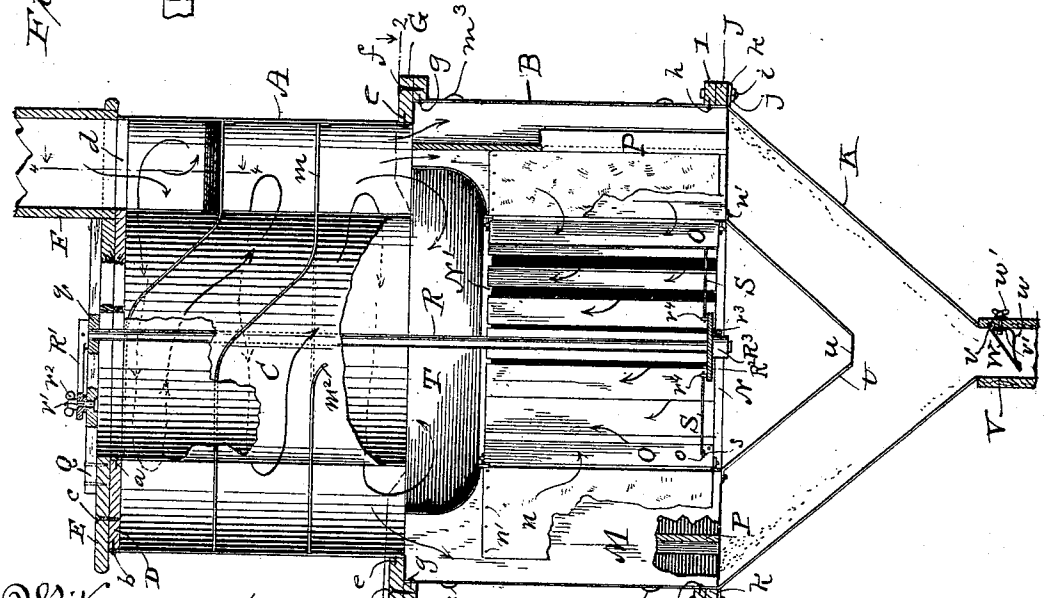


Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

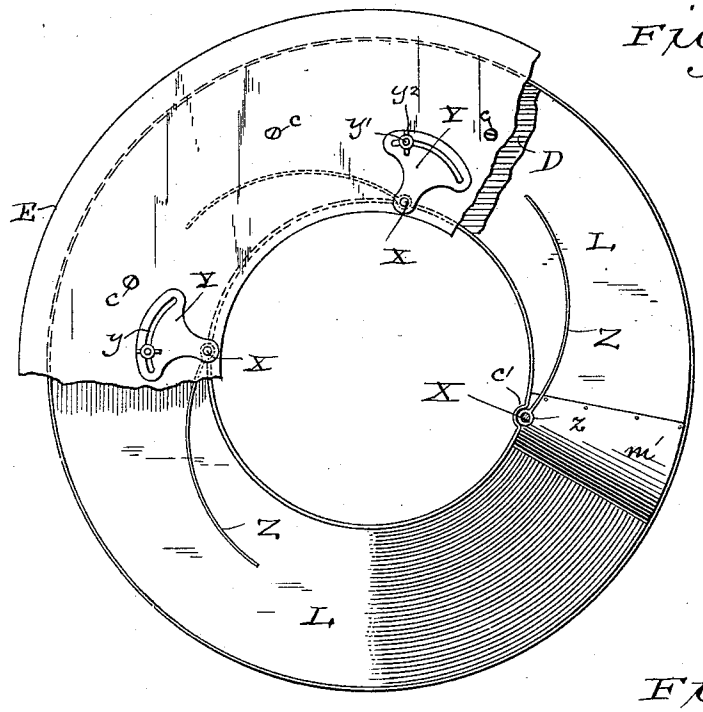
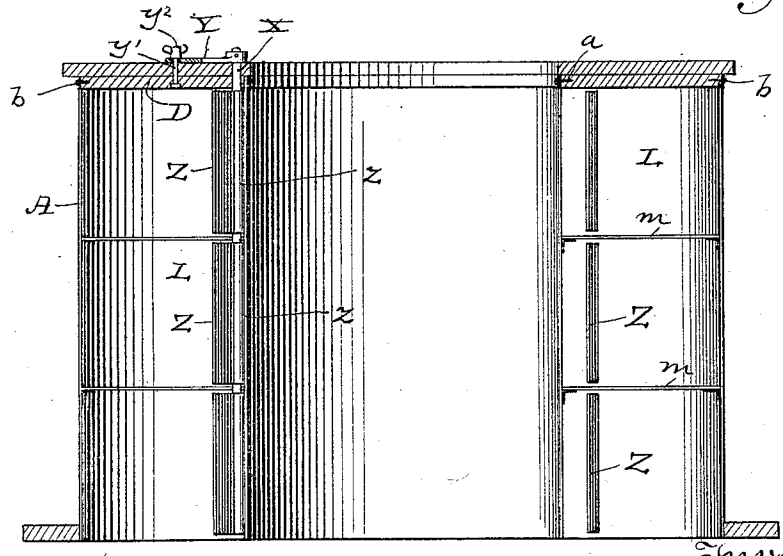


Fig. 6.



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UNITED STATES PATENT OFFICE.

ANDREW HUNTER, OF MILWAUKEE, WISCONSIN.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 449,535, dated March 31, 1891.

Application filed March 14, 1890. Serial No. 343,824. (No model.)

To all whom it may concern:

Be it known that I, ANDREW HUNTER, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Dust-Collectors; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to dust-collectors; and it consists in certain peculiarities of construction, as will be fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a vertical central section through the main part of my device, with parts broken away and parts shown in elevation. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1. Figs. 3 and 4 are details of construction. Fig. 5 is a plan view, partly broken away, of the upper part of my device, showing additional valves applied thereto; and Fig. 6 is a vertical central section of the same part.

My machine consists, primarily, of a double cylinder, preferably of metal, the upper part A being of less diameter than the lower part B, and for convenience I will hereinafter allude to said parts as cylinders A and B, the upper one being provided with a central open-ended circular tube C, preferably of metal, extending from the line of the top to the bottom line of said cylinder A, there being an annular plate D, preferably of wood, surrounding said tube C at its top and suitably secured thereto, as by nails or screws *a*, said plate D filling up all the space at the top between the tops of the parts A and C, and being secured to the cylinder A, as by nails or screws *b*. Above this is another annular plate E, (also preferably of wood,) which rests on and projects beyond the top edge of the cylinder A, the plate E being suitably secured to the plate D, as by screws *c c*. The plates D E are cut through at the point *d* to receive the lower end of the air-inlet spout F. The lower end of the cylinder A is surrounded by an annulus G, (preferably of wood,) secured thereto, as by nails or screws *e* and resting on the top edge of the cylinder B, and secured, as by screws *f*, to another annulus H, (also preferably of wood,) surrounding the outside of the top of the cylinder B and secured thereto, as by nails or screws *g*. The lower part of the cylinder B is secured, as by screws or nails *h*, to an annulus I, which latter is secured above another annulus J, (both preferably of wood,) as by bolts *i*, passing through both parts I and J and through the flange *k* of a (preferably metallic) inverted conical chamber K and securing-nuts *j*.

The object of the described means of attachment of the several parts A, B, and K is to render them readily separable and detachable when required for cleansing, repair, or other purpose.

The space in the upper cylinder A between its inner wall and the outer wall of the tube C is divided by a continuous flooring or partition *m* into a circuitous air-trunk L, which starts from just below the opening *d* at the base of the air-inlet spout F, (where there is a curved deflecting-plate *m'* to direct the dust-laden currents of air into said trunk L,) and passes around on a line with the top of the cylinder A to within a short distance of the point whence it started when it forms an inclination equal to the depth of the air-trunk, and then again passes around horizontally on a lower plane until it again reaches a point opposite the line of its last downward deflection, where said floor ends, as shown at m^2. The lower cylinder B is provided with a series of radiating partitions M, (preferably of wood,) extending inward from the wall of said cylinder to a circular line practically in line with that of the tube C above, the outer edge of said partitions being held to the wall of the said cylinder, as by screws m^3 m^3. The surfaces of said partitions are preferably partly covered with hanging cloths *n*, (such as burlaps,) just tacked to the upper ends of the same, as shown at *n'* in Fig. 1, and which as they hang closely against the surfaces of said partitions cannot well be represented in Fig. 2, while the inner edges of the said partitions M may rest against and be secured in any suitable manner to a metallic or other ring N, and at the top of said inner edges of the said partitions M there is another ring N', both of these rings N N' being provided (in the construction shown in the present drawings) with radially-projecting screw-eyes n^2 n^2, which receive vertical pintles on the

top and bottom adjacent edges of the vertical gates or valves O, (although this hinge-connection may be made in any suitable manner,) said edges of said gates being in line with the inner edges of the said radial partitions M, which latter are preferably provided each with an L-shaped projection P.

Q is a cross-piece secured on top of the plate E and extending across the top opening of the tube C and provided with a central perforation *q*, through which projects downward a suspending rod R, the top of which is secured to the hub of a quadrant-shaped lever R′, provided with an arc-slot *r*, for the reception of a bolt *r*′, passing through the said cross-piece Q and having a thumb-nut *r*² on its upper end. The lower end of the rod R carries a disk R², held in place by means of a collar R³ and set-screw *r*³, and said disk is provided near its periphery on its upper surface with a series of pins *r*⁴ *r*⁴, each of which is received in the eye *r*⁵ of a rod S, whose other end is bent or hooked, as shown at *s*, to engage with a staple *o* on the lower part of the adjacent face of one of the gates or valves O.

The upper inner part of each of the radial partitions M is cut away to receive the side edge of a rounded or inclined deflecting-band T, which may be either dish-shaped, as shown in the drawings, or conical with oblique sides, as preferred, the lower opening of said band being in line with the tube C above and the inner vertical edges of the partitions M below, while the upper edge of said band extends to a circular line about midway between the bases of the tube C and upper cylinder A and forms, with the tops of the partitions M, the open bottom of the said cylinder.

U is an inverted conical chamber, provided with a small opening at the base, as shown at *u*, and having a flange *u*′ at the top, preferably secured to the bottom edges of the partitions M, and projecting down into the similar inverted conical chamber K, which latter has a dust-outlet V at its bottom controlled by a trap-door W, hinged thereto, as shown at *v*, said trap-door W being controlled by a spring *w*, having a loose bearing-point at *v*′ and an adjusting-screw *w*′, as shown in Fig. 1, so that by screwing the screw *w*′ in the free end of the spring will lower and permit the free end of the trap-door W to fall, while a reverse motion of the said screw will raise said free end of the spring and permit it to close said door.

In Fig. 1 I have shown my circuitous air-trunk L as wholly unobstructed; but in Figs. 5 and 6 I have shown a series of vertical rods X, (which may be suitably journaled in vertical bends *c*′ of the tube C,) and whose tops pass through the plates D E and above the latter receive quadrant-shaped levers Y, having arc-slots *y* for the reception of bolts *y*′, passing through said plates D E and having thumb-nuts *y*² on their upper ends and a series of vertical segmental gates or valves Z Z, whose inner ends are bent around said rods X, as shown at *z z*, said gates being located within the circuitous air-trunk L, as shown, whereby the passage in the said air-trunk may be more or less restricted, when desired, to compress the air in its passage.

The operation of my device will be readily understood from the foregoing description of its construction. The dust-laden air enters the machine through the air-inlet spout F and travels rapidly through the circuitious air-trunk L. The specific gravity of the dust being heavier than the air causes the former to be thrown against the inner wall of the cylinder A and kept always in contact therewith during its passage from the top to the bottom by the force of the air until it reaches a point where it drops into the cylinder B, which cylinder, being larger at that point, releases the air-pressure and allows the separated dust to fall down into the dead-air chamber K and out through the dust-outlet V, whose spring-controlled trap-door W prevents the air from escaping at this point also, which air, now free from dust and adjacent to the wall of the cylinder B, finds an easy egress between the radial partitions M into the central space between them and up and out through the tube C, while the air which was originally adjacent to the outside of said tube C and free from dust (the dusty air, as already explained, being forced against the wall of the cylinder A in its passage through the wind-trunk) is deflected inwardly by the band T and passes up and out through the tube C without ever going into the lower cylinder B. As the dust drops down from the cylinder B and the air leaves it to enter between the radial partitions M, the air is forced against the latter and the L-shaped projections P thereon break the current and prevent it from carrying dust to the outlets guarded by the gates O and intercept this dust, which will drop down into the dead-air chamber K beneath, and if any dust escapes these projections P it will adhere to the described hanging cloths *n*, and when said cloths are loaded the dust will drop by gravity down to said chamber.

The function of the chamber U is to receive (and discharge at its orifice *u*) any foreign matter which might possibly drop into the machine from above, and the opening *u* is made very small, so as to prevent forming a current from below up through the central air-opening of the machine.

The object of the gates O is to regulate the openings between the central chamber and the chambers formed by the radial partitions M, leading into the center of the machine, thereby controlling the discharge of the air, either by compressing it when the current is too weak or opening out said gates when the current is strong, which is done by a movement of the lever R′ in the required direction.

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

1. In a dust-collector, the combination, with a dust-collecting chamber, of a double cylinder above the same, the upper portion of said cylinder being of less diameter than the lower part, a central open-ended vertical tube within said upper part, a circuitous air-trunk surrounding said tube and communicating with said lower part of the double cylinder, and a series of radial partitions extending toward the center of said lower part, substantially as set forth.

2. In a dust-collector, the combination, with a dust-collecting chamber, of a double cylinder above the same, the upper portion of said cylinder being of less diameter than the lower part, a central open-ended tube within said upper part, a circuitous air-trunk surrounding said tube and communicating with said lower part of the double cylinder, a series of radial partitions extending toward the center of said lower part, a series of gates or valves hinged to the inner edges of said radial partitions, and a shifting-lever and a series of rods connecting said gates or valves therewith for simultaneously operating said gates or valves, and thereby controlling the openings between the central chamber and the chambers formed by the said radial partitions, substantially as set forth.

3. In a dust-collector, the combination, with a dust-collecting chamber, of a double cylinder above the same, the upper portion of said cylinder being of less diameter than the lower part, a central open-ended tube within said upper part, a circuitous air-trunk surrounding said tube and communicating with said lower part of the double cylinder, a series of radial partitions extending toward the center of said lower part and having gates or valves hinged to their inner edges, a cross-piece above said upper part of the double cylinder, a rod suspended therefrom and extending down through the center of both parts thereof, a plate on the bottom thereof, a series of rods connecting said plate with the said hinged gates, and an operating-lever on the suspended rod, substantially as set forth.

4. In a dust-collector, the combination, with an upper cylinder containing an air-tube and surrounding air-trunk, of a communicating lower cylinder containing a series of radially-arranged vertical partitions and a dead-air chamber below said lower cylinder, substantially as set forth.

5. In a dust-collector, the combination, with an upper cylinder containing an open-ended air-tube and surrounding air-trunk, of a communicating lower cylinder of increased diameter containing a series of radially-arranged vertical partitions and a series of vertical angular projections extending from said partitions, substantially as set forth.

6. In a dust-collector, the combination, with an upper cylinder containing an air-tube and surrounding air-trunk, of a communicating lower cylinder of increased diameter containing a series of radially-arranged vertical partitions having a series of gates or valves hinged to their inner edges, and a rod and lever, and connecting-rods for simultaneously operating the same, substantially as set forth.

7. In a dust-collector, the combination, with a dust separating and collecting section, of a cylinder above the same, a central open-ended vertical tube within said cylinder, a circuitous air-trunk occupying the space between said cylinder and tube and communicating with the section below, a series of gates or valves within said air-trunk, a rod extending through said cylinder and secured to said gates or valves, and an operating-lever on said rod, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

ANDREW HUNTER.

Witnesses:
H. G. UNDERWOOD,
WM. KLUG.