

(No Model.)

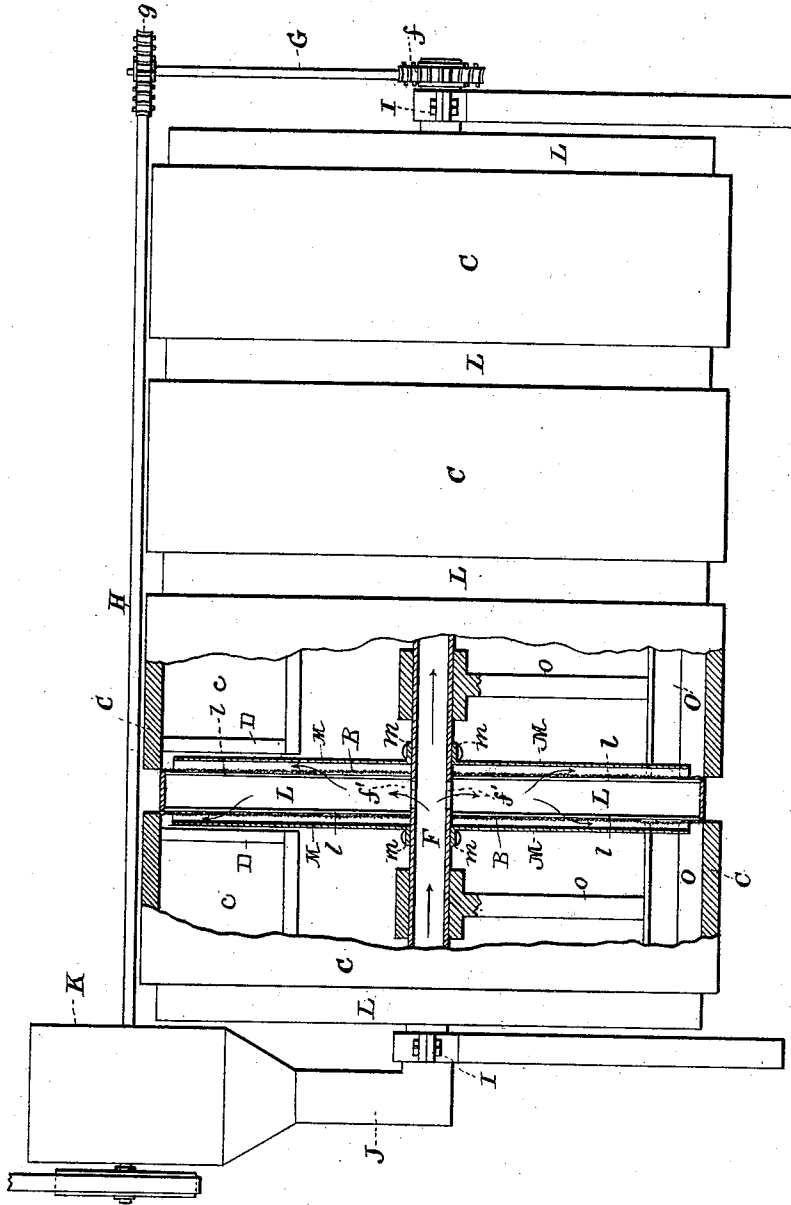
4 Sheets—Sheet 1.

J. M. CASE.
DUST COLLECTOR.

No. 407,949.

Patented July 30, 1889.

FIG. 1 -



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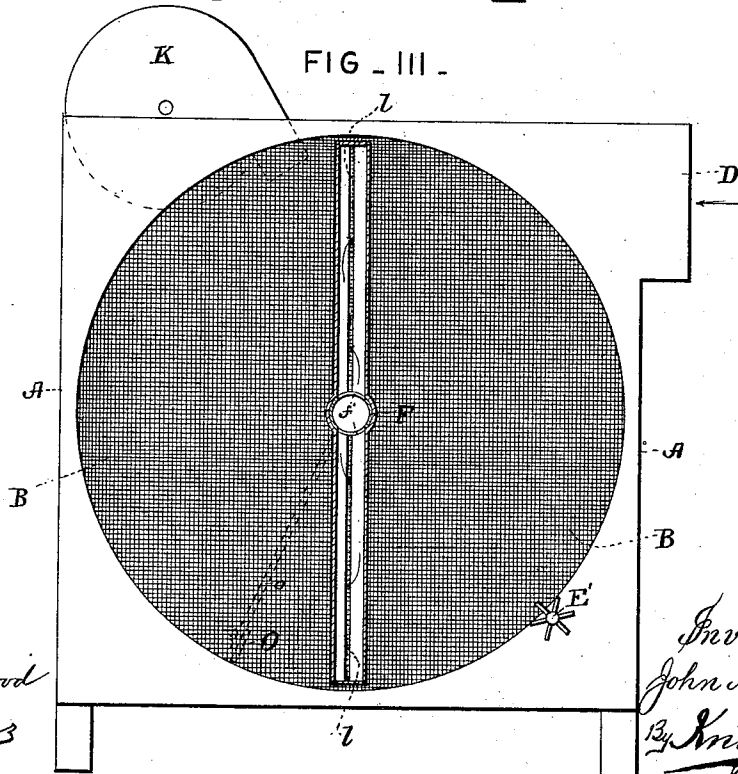
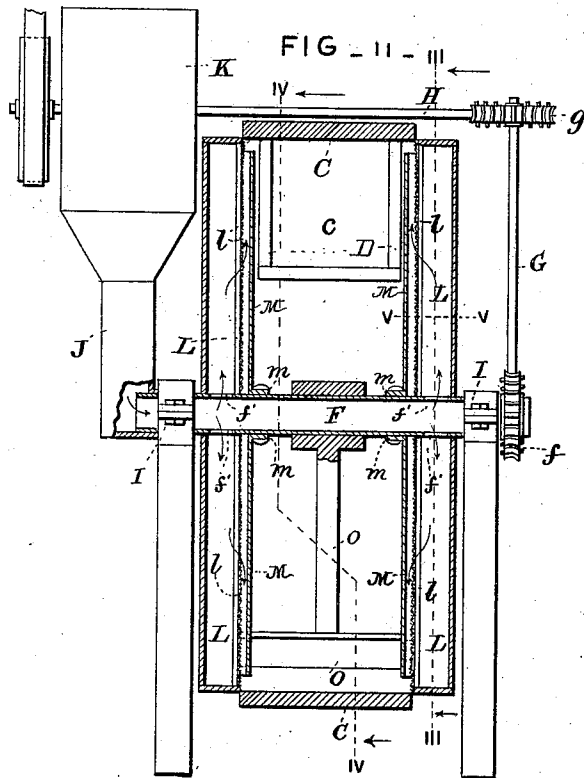
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FIG. IV.

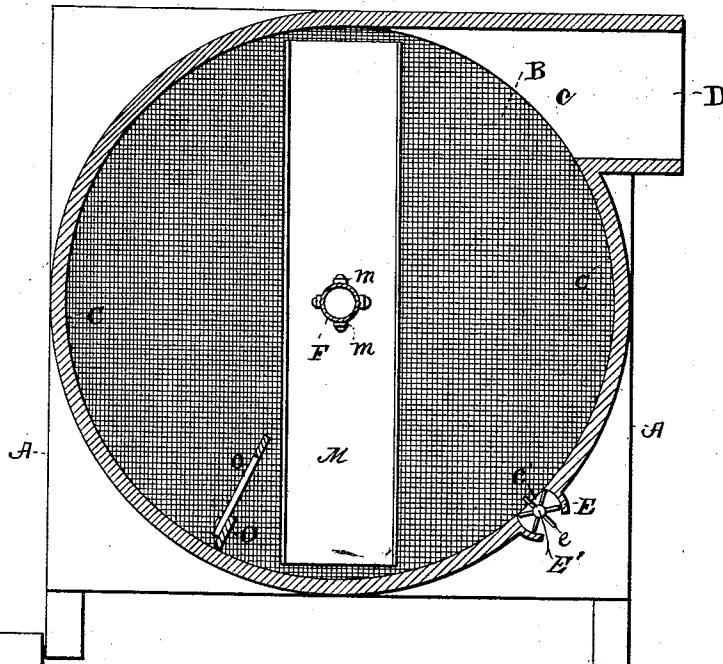
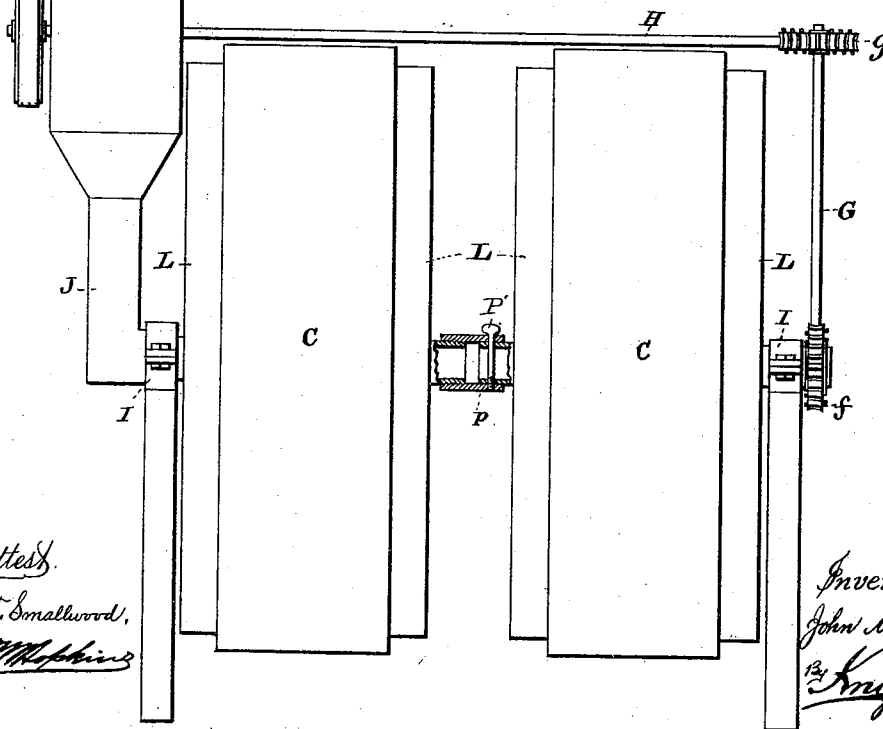


FIG. VIII.



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FIG. VII.

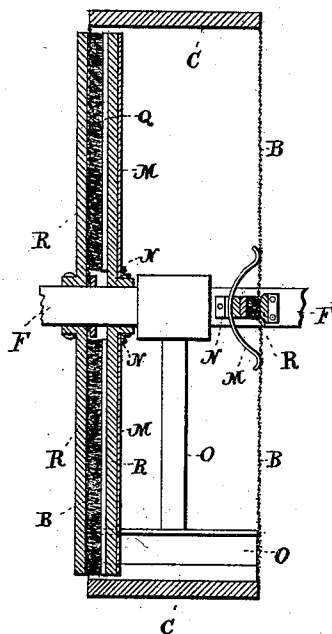


FIG. V.

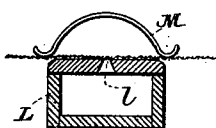


FIG. VI.

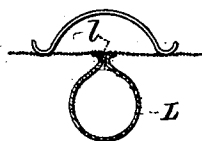
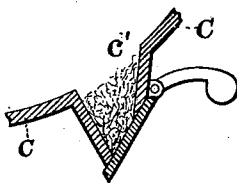


FIG. IX.



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UNITED STATES PATENT OFFICE.

JOHN M. CASE, OF COLUMBUS, OHIO, ASSIGNOR TO THE CASE MANUFACTURING COMPANY, OF SAME PLACE.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 407,949, dated July 30, 1889.

Application filed June 21, 1887. Serial No. 242,020. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. CASE, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Dust-Collectors, of which the following is a full, clear, and exact description.

The invention consists in certain features of novelty, which are hereinafter particularly pointed out in the claims, being first fully described with reference to the accompanying drawings, in which—

Figure I is a side elevation, partly in section, of a dust-collector embodying my invention. Fig. II is a similar view of a dust-collector of smaller capacity embracing the same features. Figs. III and IV are vertical transverse sections of the same on the line III III and IV IV, respectively, Fig. II, looking in the direction of the arrow. Fig. V is a transverse section of one of the air-tubes and its opposing shield on the line V V, Fig. II. Fig. VI is a similar view showing an air-tube of slightly-modified construction. Fig. VII is a vertical longitudinal section of one of my improved dust-collectors modified with respect to the means for dislodging the dust from the dust-arresting cloth. Fig. VIII is an elevation of a pair of dust-collectors mounted upon a common shaft with means for arresting one while the other is in operation. Fig. IX is a detail view showing a modification of the discharge-valve.

The principle involved in the present invention is the same as that involved in my improvements in dust-collectors which form the subject of four applications filed on the 30th day of March, 1887, and serially numbered 233,009, 233,010, 233,011, and 233,012, respectively, the present invention being different from my said former inventions only in the details of construction.

In my former invention the dust-arresting cloth and the device for dislodging the dust from the meshes thereof have a relative reciprocating motion, while in the present invention the movement is rotary, the advantage being that the machine may be constructed at a much less expense and in a more compact form.

Referring to the drawings, A represents the end walls of the casing, which may be of any desired shape, (those here shown being square,) and provided with large apertures, over which cloth B is tightly stretched, said cloth being sufficiently fine to arrest all the dust, but yet permit the passage of the air freed from its impurities. Situated between the end walls A is a drum C, which is preferably circular in form, at least on the lower side, and continuous at its inner periphery with the openings through the end walls A. At the upper side this drum is cut away, as at *c*, and communicates with an air-trunk D, by which the dust-laden air is conducted to the machine. The drum is also cut away near the bottom portion, as at *c'*, for the purpose of permitting the dust arrested by the machine to be discharged. This opening is closed by a valve so arranged as to permit the ready discharge of the accumulated dust and dirt, but at the same time prevent the escape of impure air. To this end a cylindrical valve-casing E, open at one side for communicating with the opening *c'* and at the opposite side for the discharge of the dust, is secured to the outside of the drum C, as shown in Fig. IV. Journalled concentrically within this valve-casing is a shaft E', from which project radially longitudinal blades *e*, so disposed as to intercept at all times the passage through the valve-casing. The accumulated dust is scraped up to and falls through the opening *c'* into the pockets formed by blades *e*, and when the shaft E' is rotated, by means hereinafter described, said dust is discharged through the opening in the opposite side of the valve-casing E. If desired, this rotary valve may be replaced by the simpler and very well-known weighted valve shown in Fig. IX.

The operation of so much of the device as has thus far been described is perfectly clear. The impure air enters the casing at *c*, the impurities being arrested by the cloth B as the air passes through it.

The next thing in order is to describe the means for keeping the meshes of the cloth free and open.

F represents a shaft which passes through the casing centrally with respect to the drum C and the openings over which the dust-ar-

resting cloth is stretched. On one end of this shaft is a worm-wheel *f*, with which gears a worm on shaft G, which latter is in turn provided with a worm-wheel *g*, which is engaged by a worm formed on a shaft H. The shaft F turns in suitable bearings I, and in the form of the device shown in Figs. I, II, III, IV, and VIII is hollow and communicates at one end with an air-trunk J, leading from a fan K, by which air is forced into said shaft for the purpose which will appear presently. The devices for cleaning the several cloths are alike in every respect, so that a description of one will suffice. Secured perpendicularly to this shaft, and at such a point that it will move in contact with the outer surface of the separating-cloth B, is an air box or tube L, which may be constructed of several pieces and of rectangular shape in cross-section, as shown in Fig. V, or of a single piece of sheet-metal tubing, as shown in Fig. VI. The interior of this air box or tube communicates with the interior of the shaft F through apertures *f'* cut through the latter, and the side of the said box which is in contact with the cloth B is provided throughout its length with a very narrow slit *l*. It will thus be seen that the air forced into the hollow shaft F will escape through the openings *f'* into the air boxes or tubes L, whence it escapes through the slits *l* and passes through the cloth B in a very thin film, thereby blowing the accumulated matter out of the meshes and dislodging from the inner surface of the cloth all matter which may be held in contact therewith by reason of the constantly out-rushing current of air. This air box or tube extends diametrically across the surface of the cloth, so that every portion of the latter will be subjected to the action of the air-current as the boxes are moved over it by the rotation of the shaft F. Means must, however, be provided for preventing that matter which has been thus dislodged from being again forced into contact with the inner surface of the cloth by the current of air which is constantly rushing through it from within the casing. To this end I secure to the shaft a guard or shield M, which is situated on the interior of the cloth B, and lies in the same plane as the air-tube L. This guard is preferably of the shape in cross-section shown in Figs. V and VI, the edges being curved backward in order to prevent abrading the surface of the cloth B against which they have contact. This shield extends diametrically from one side of the drum C to the other, and may be secured to the shaft F and braced in any suitable or desired manner which shall give it the requisite rigidity. In Fig. II it is shown slit, so as to form tongues which are bent at right angles to the plane of the shield and secured to the shaft by bolts, screws, or rivets. It is shown in Fig. VII as provided with a simple perforation of such shape as to permit the passage of the shaft without having a space between them, and is secured to the shaft by separate angle-irons or brackets N. This shield effectually pre-

vents the passage of air outward through that portion of the cloth which is for the time being being acted upon by the air-blast from the tube or box L, and thereby forms a dead-air space within which the dislodged dust and other matter is precipitated to the bottom of the drum C. The construction of this shield should be such that the shaft F does not completely cut off communication between its two ends, so that the dust which is dislodged from the upper part of the cloth may pass directly through the dead-air space to the bottom of the drum. This, however, is not essential, and, if desired, the opposite ends of the shield may be made and secured to the shaft separately, so that its opposite ends have no internal communication. The dust having fallen onto the bottom of the drum C is caught by a scraper O, which is fixed to the shaft F by an arm *o*, and scraped into the opening *c'*. The wings *e* of the valve may be of such width as to project into the air-chamber beyond the inner surface of the drum C, and so situated on the shaft E' with respect to each other that one of them will always be projecting into the path of the scraper O, whereby the valve may be turned by the scraper each time it passes a distance equal to the distance between two of the wings *e*; or, if desired, the valve-stem may be provided outside the casing with a tappet-wheel, with teeth similarly arranged, to be operated by the air tubes or boxes, in which case the wings *e* should not project beyond the casing E.

In Fig. I, I have shown a number of these dust-collectors arranged on a single hollow shaft, and situated in such proximity to each other that the space between the outer surfaces of the cloth B on the adjacent sides of two adjacent catchers is just sufficient to admit the air box or tube L, which is provided on each of its opposite sides with a longitudinal slit, whereby each box may operate to clean two cloths.

In Fig. VIII, I have shown two entirely separate and distinct catchers, such as shown in Fig. II, secured on one hollow shaft which is jointed by a collar P, screwed onto one portion of the shaft and fastened to the other by means of a pin P', so that one end may be rotated without the other, thereby stopping one of the machines while the other is at work, the continuity of the shaft for the purpose of an air-duct being unbroken.

In Fig. VII, I have shown a modification of the device, which may be fully understood on reference to my previous applications, already referred to. This cleaner here employed is not pneumatic. A brush Q is secured to the inside of the shield M, so as to have contact with the surface of the cloth for brushing off the impurities. Secured to the shaft, outside of the cloth B, and directly opposite the brush, is an arm or support R, which bears against the cloth and holds it to the action of the brush.

I do not claim in this application anything which is shown in either of my aforementioned applications.

In the foregoing part of this specification, and in the claims which follow, I mention a fan as the means for producing the necessary current of air through the dust-arresting cloth; but I desire to have it understood that I do not regard my invention as limited thereto. It is manifest that a pump, or, in fact, any pneumatic apparatus, may be employed, and such is the interpretation which I desire to place upon the word "fan" as employed in the claims.

Having thus described my invention, the following is what I claim as new therein, and desire to secure by Letters Patent:

1. The combination, with the casing and dust-arresting cloth, of a shaft, an air-tube secured thereto so as to move in close proximity to the surface of the cloth and having a slit for projecting air against said cloth, a fan having communication with said air-tube, and a shield secured to the shaft inside the cloth and situated directly opposite the air-tube, substantially as and for the purpose set forth.

2. The combination, with the casing and the dust-arresting cloth, of a hollow shaft, a fan communicating with said shaft, an air-tube secured to said shaft and having communication with the interior thereof, said tube having an aperture through which air is directed against and through said cloth, and a shield secured to the shaft on the opposite side of the cloth and directly opposite the air-tube, substantially as set forth.

3. The combination, with a number of casings situated at suitable distances apart and having dust-arresting cloth arranged on their adjacent sides, of a hollow shaft passing through all of said casings, a fan communicating with said hollow shaft, a single air box or tube secured to the shaft between each two casings so as to have contact with the cloth on the adjacent sides of said casings, each box having openings in its opposite sides for directing a current of air against

and through said cloth, and a shield located opposite each air-box on the insides of the casings, substantially as set forth.

4. The combination, with a plurality of casings situated at suitable distances apart and having cloth arranged; substantially as described, for arresting the dust, of a hollow sectional shaft common to all of said casings, a fan communicating with said shaft, air boxes or tubes secured to said shaft so as to have contact with the dust-arresting cloth and having communication with the interior of said shaft, slits formed in the sides of said boxes which have contact with the cloth, shields situated inside the casings and secured to the shaft opposite the air-boxes, means for rotating said shaft, and means for disconnecting the sections of said shaft whereby the rotation of a portion of the shaft may be checked while the whole of it is available as an air-conduit, substantially as set forth.

5. The combination, with the drum C, having the discharge-aperture *c'*, and the end walls A, having openings for the egress of air, of the dust-arresting cloth secured over said openings, a shaft passing through the casing concentrically with the drum, means secured to said shaft for dislodging the dust from the cloth, and a scraper secured to said shaft for scraping the dirt to the discharge-aperture, substantially as set forth.

6. The combination, with the drum C and the dust-arresting cloth situated at the end thereof, of the shaft passing through said cloth concentrically with the drum, a cloth-cleaner secured to said shaft extending diametrically across the cloth, and a shield secured to the shaft and having contact with the cloth on opposite sides of the cleaner for preventing the egress of air through that portion of the cloth which is for the time being being operated upon, substantially as set forth.

JOHN M. CASE.

Witnesses:

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E. D. ANDERSON.