(No Model.)

R. L. DOWNTON.

DUST ARRESTER AND COLLECTOR.

No. 383,801. Patented May 29, 1888.

Fig. I.

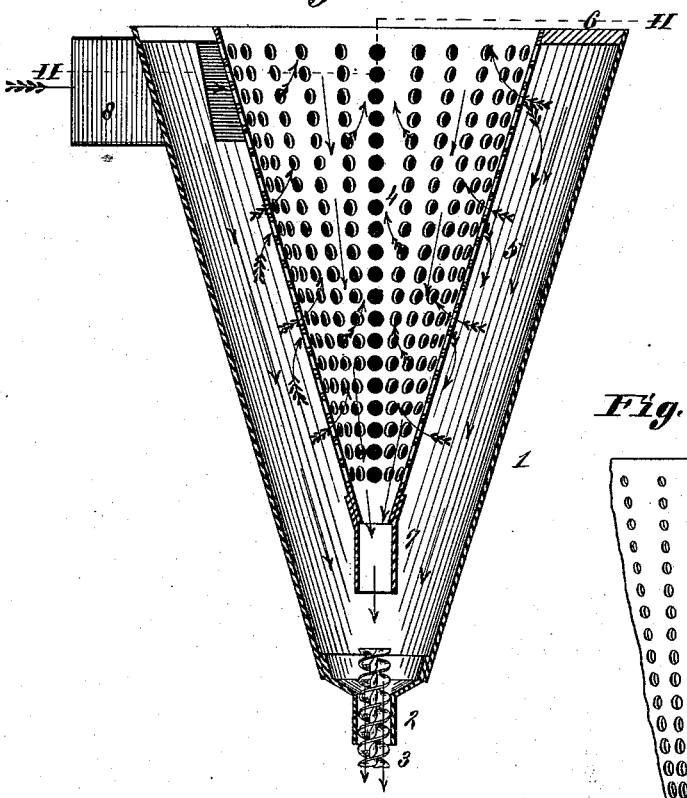


Fig. III.

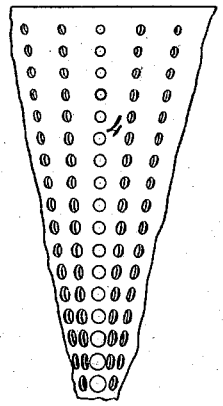
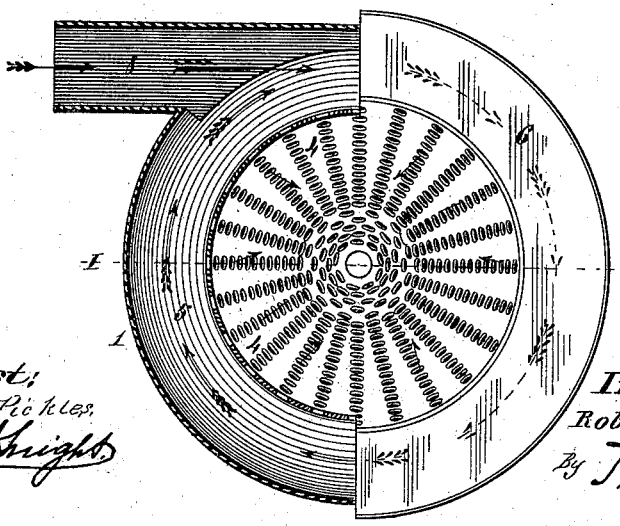


Fig. II.



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UNITED STATES PATENT OFFICE.

ROBERT LUCASS DOWNTON, OF ST. LOUIS, MISSOURI.

DUST ARRESTER AND COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 383,801, dated May 29, 1888.

Application filed October 4, 1887. Serial No. 251,463. (No model.)

To all whom it may concern:

Be it known that I, ROBERT LUCASS DOWNTON, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Dust Arresters and Collectors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure I is a vertical section of my improved arrester and collector. Fig. II is a horizontal transverse section taken on line II II, Fig. I. Fig. III represents a modification.

My invention relates to an improved device for the purpose of arresting and collecting the dust and fine particles of material carried into the machine, the device being particularly intended for use in connection with flour-mills, for arresting and collecting the fine flour; but it may be used in connection with other machines or manufactories for arresting and collecting their dust.

The device is an improvement upon patents issued to me October 7, 1873, No. 143,442, and April 20, 1875, No. 162,158.

In inventing this machine I have two leading objects in view, the first being to prevent any resistance or back-pressure to the air-current in the delivery-flue, and the second being to prevent any portion of the dust being carried out of the machine by the air-current. Both of these difficulties exist in all machines made for this purpose within my knowledge, and, as stated, I seek to overcome them.

My invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, 1 represents an outer imperforate cylinder, which is preferably made in the form of a cone, as shown in the drawings. It has a delivery-spout, 2, at its lower end, which may be provided with a forced-feed screw, 3, if desired. Within the cylinder 1 is a second cylinder, 4, preferably (but not necessarily) conforming in shape, but not in size, with the outer cylinder. This cylinder is perforated and as it is smaller than the outer cylinder there is a chamber or space, 5, left between them. This space or chamber 5 is closed at top, as shown at 6. The upper end of the cylinder 4 is open, and the lower end is preferably provided with a delivery-spout, 7.

The air, carrying with it the dust to be settled and collected, enters through a flue, 8, having a tangential opening located at the top of the machine, and which delivers the air and dust tangentially into the chamber 5 between the cylinders. After entering this chamber the air circulates therein and escapes through the perforations in the cylinder 4 and out at the open upper end of the cylinder, as indicated by the arrows. The cylinder 4 acts to retard the passage of the air in the chamber and substantially prevents the passage of the dust. On entering the chamber 5 the air comes in contact with the cylinder 4, and a portion of it, of course, escapes through the upper end of the cylinder; but the blast cannot entirely escape through the upper end of the cylinder, and a portion of it passes downward and escapes through the cylinder at a lower point. The escape is gradual, and is distributed from top to bottom of the cylinder—that is, the greater amount escapes through the upper portion of the cylinder, and a gradually-decreasing amount escapes through the cylinder beneath this point. The result is, that there is no acute point or single place through which the air escapes, and, accordingly, dust is not carried out with the air, and, moreover, the surface through which the air escapes being large, there is no back-pressure in the delivery-flue to the passage of the air. The dust, as stated, accumulates in the chamber 5, and, passing down the inner wall of the cylinder 1, is delivered through the lower end of the cylinder. A portion of it would also gather on the outside of the cylinder 4; but from here it drops or falls off as it accumulates, and passes down through the delivery end of the outside cylinder. Supposing a portion of the dust should pass through the cylinder 4, it will accumulate on the inner wall of the cylinder and be delivered through the lower end, 7.

The perforations in the cylinder 4 may be of any desirable size or shape, and when the blast is such that the dust would be forced through the openings adjacent to the flue-opening they may differ in size from top to bottom of the cylinder, as shown in Fig. III; but I do not confine myself to this form.

I claim as my invention—

1. In a dust arrester and collector, the combination of the outer imperforate cylinder, an inner perforated cylinder smaller than the outer cylinder, and a flue having a tangential opening, through which the air and dust are deposited into the chamber between the cylinders, substantially as and for the purpose set forth.

2. In a dust arrester and collector, the combination of the outer imperforate cylinder, inner perforated cylinder, and delivery-flue having a tangential opening, said cylinders being in the form of a frustum of a cone, and the inner cylinder being smaller and conforming in shape with the outer cylinder, substantially as and for the purpose set forth.

3. In a dust arrester and collector, the combination of the outer imperforate cone-shaped cylinder open at its lower end, inner perforated cylinder smaller than and conforming in shape with the outer cylinder, and a tangential delivery-flue opening into said outer cylinder at the top of the machine, the inner cylinder being open at top and bottom, substantially as and for the purpose set forth.

4. In a dust collector and arrester, the combination of the outer imperforate cylinder, an inner cylinder smaller than the outer cylinder, and a flue through which the air and dust are deposited into the chamber between the cylinders, said inner cylinder having perforations varying in size, substantially as set forth.

ROBERT LUCASS DOWNTON.

Witnesses:
SAML. KNIGHT,
EDWD. S. KNIGHT.