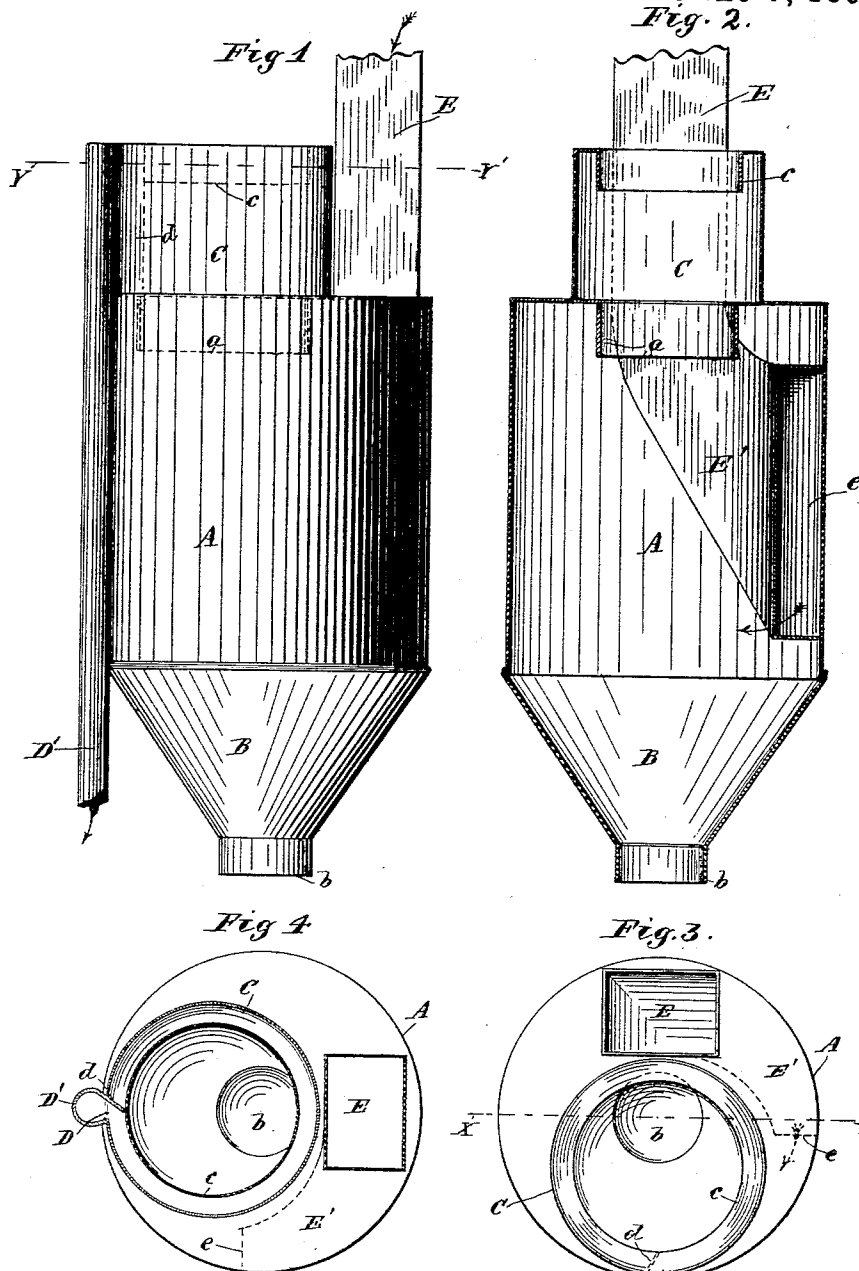


(No Model.)

H. L. DAY.
DUST COLLECTOR.

No. 476,524.

Patented June 7, 1892.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY L. DAY, OF MINNEAPOLIS, MINNESOTA.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 476,524, dated June 7, 1892.

Application filed June 3, 1891. Serial No. 394,951. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. DAY, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Dust-Collectors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to dust-collectors of that sub-class wherein the separation is effected by momentum, and has for its object to provide a more efficient and cheaper construction for the purpose.

To this end the invention consists in certain novel points of construction and arrangement of the parts, which will be hereinafter fully described, and particularly pointed out in the claims.

A dust-collector constructed in accordance with my invention is illustrated in the accompanying drawings, wherein, like letters referring to like parts throughout—

Figure 1 is a side elevation of the device. Fig. 2 is a vertical section of the same in a plane near the mouth of the delivery-section of the inlet spout on the line X X' of Fig. 3. Fig. 3 is a plan view of the device, and Fig. 4 is a horizontal section on the line Y Y' of Fig. 1.

A B C are the collecting-chambers, of which A is the central or cylindrical section, B the conical or bottom section, and C the supplementary chamber or dust-cap at the top. The central chamber A is relatively large and is provided with the centrally-located clean-air discharge *a* at its top. The conical section B is secured to the bottom of the section A and is provided with the ordinary dust-discharge *b*. The supplementary chamber C is mounted on the top of the main chamber surrounding the clean-air discharge *a*, and is itself provided in its top with a centrally-located clean-air discharge *c*. The chamber C has in one of its vertical walls a slot provided with an inwardly-projecting lip *d*, forming a tangential dust-discharge D, which is covered by a discharge-tube D', directing away whatever dust may be discharged from the chamber C. This supplementary chamber C and its connecting parts is only employed when it is desired to carry the separation to the utmost

degree of refinement. For ordinary purposes it is not required.

E E' is my inlet-spout for introducing the dust-laden air, of which parts E is the entrance-section and E' the delivery-section of the said spout. The section E or inlet proper enters the collecting-chamber A, parallel with the axis of the said chamber, while the section E' is of a curved or spiral form and may be either formed integral with the section E or separate therefrom and secured within the chamber A. Preferably the delivery-section spreads in the vertical direction and narrows or contracts in the radial direction of the chamber to give an elongated discharge-mouth *e* of the same area as the body of the spout, or larger than same. This form of discharge-mouth is of importance for a certain purpose, as will presently appear. This axial entrance or entrance parallel with the axis of the collecting-chamber, in co-operation with a curved or spirally-arranged delivery-section for the inlet-spout, is the important feature of my invention. The delivery-section is of less extent than a complete circle. This fact is also of importance in respect to its function. The effect of this arrangement of the inlet and discharge section of the inlet-spout is a very considerable separation within the inlet-spout itself and the delivery of the dust from the bottom of the discharge-section of the said-spout at a point nearest to the dust-discharge of the collecting-chamber and the delivery of the separated or clean air from the top of the discharge-mouth of the said section at a point nearest to the clean-air discharge. In other words, a large part of the separation is effected at once at the change of direction from the section E to the section E' of the inlet-spout, causing most of the dust to be immediately precipitated to the bottom of the delivery-section and be discharged therefrom and permitting the clean air or a large part of the same to immediately escape through the clean-air discharge *a*. The fact that the delivery-section is less than a complete circle causes the dust to be delivered directly from the bottom plate of the same before it can be gathered up and thrown against the outer wall of the same under the whirling motion of the air. If this delivery-section made a complete turn or was equal to

or greater than a complete circle the dust would be thrown to the outer wall of the same and delivered therefrom onto the periphery of the cylinder A and would be spread over the whole surface of the same under the whirling motion of the dust-laden air. In other words, the peculiar form and relation of the sections E and E' of the inlet-spout both secures and preserves the separation between the air and the dust, permitting the former to be conducted directly to the air-discharge and the latter directly to the dust-discharge. This has two very important results, to wit: It greatly lessens the amount of separation or work to be performed in the chambers A and B, and, second, enables the separation effected in the said chambers to be carried to a much greater degree, so that when the air escapes through the discharge *a* it will be sufficiently clean for all practical purposes. In other words, my form of inlet and discharge section enables the necessary separation to be effected with a minimum amount of separating-surface. So long as this form of inlet and discharge section is preserved it is immaterial what form or shape is given to the chamber A. The said chamber may be of any shape which will permit the whirling motion of the air. The dust-discharge, however, from the said chamber should always be at some point nearest to the bottom of the discharge-mouth *e*, and the clean-air discharge *a* should always be at some point nearest to the top of the said discharge-mouth. These points being preserved, the conical section B might be entirely omitted by equipping the cylinder A with a bottom having a dust-discharge at any point therein, but preferably at some point near its junction with the side walls of the said chamber, or the dust-discharge might be in the side of the cylinder A.

It is of course understood that the dust-laden air is introduced through the spout E E' under a high pressure in the customary way.

So far as effecting the partial separation within the delivery-section is concerned, the discharge-mouth of the said section might be either round or square in cross-section, so long as the said section was less than a complete circle; but such a form of discharge-mouth would not deliver the air and dust at such remote points from each other. In other words, the elongation of the said discharge-mouth in the axial direction and its contraction in the radial direction enables the clean

air to be delivered therefrom nearer to the air-discharge from the chamber A and the dust nearer to the dust-discharge of the said chamber.

As before stated, I have found by actual practice that I do not need to employ a supplementary cylinder C and its immediately connected parts, though if it is employed the separation will of course be carried to a still higher degree of perfection, removing the last and finest particles of dust.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a dust-collector, the combination, with a collecting-chamber, of an inlet-spout for the dust-laden air, having its body arranged to enter the said chamber parallel with the chamber's axis, and a curved or spiral delivery-section for said inlet-spout within the said collecting-chamber, substantially as described.

2. In a dust-collector, the combination, with a collecting-chamber, of an inlet-spout entering the chamber parallel with the axis of the same, and a curved or spirally-arranged delivery-section for the dust-laden air within the said chamber spread out or extended in the axial direction and contracted in the radial direction with reference to said chamber, substantially as and for the purpose set forth.

3. In a dust-collector, the combination, with a collecting-chamber, of an inlet-spout for the dust-laden air, having its body arranged to enter the said chamber parallel with the axis of the chamber and provided with a curved or spiral delivery-section within the said chamber of less extent than a complete circle, substantially as and for the purpose set forth.

4. In a dust-collector, the combination, with a collecting-chamber provided with a clean-air discharge at its receiving end and a dust-discharge at its delivery end or side, of an inlet-spout for the dust-laden air entering the receiving end of the said chamber parallel with the axis of the same and provided with a curved or spiral discharge-section of less extent than a complete circle and terminating in a discharge-mouth, which is extended in the axial direction and contracted in the radial direction with reference to said chamber, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY L. DAY.

Witnesses:

JAS. F. WILLIAMSON,
E. F. ELMORE.