(No Model.)

J. CHARLTON.

DUST COLLECTOR.

No. 590,033. Patented Sept. 14, 1897.

Fig. 1.

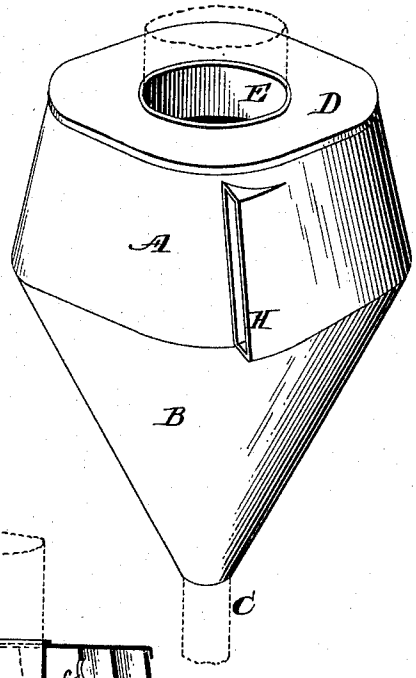


Fig. 2.

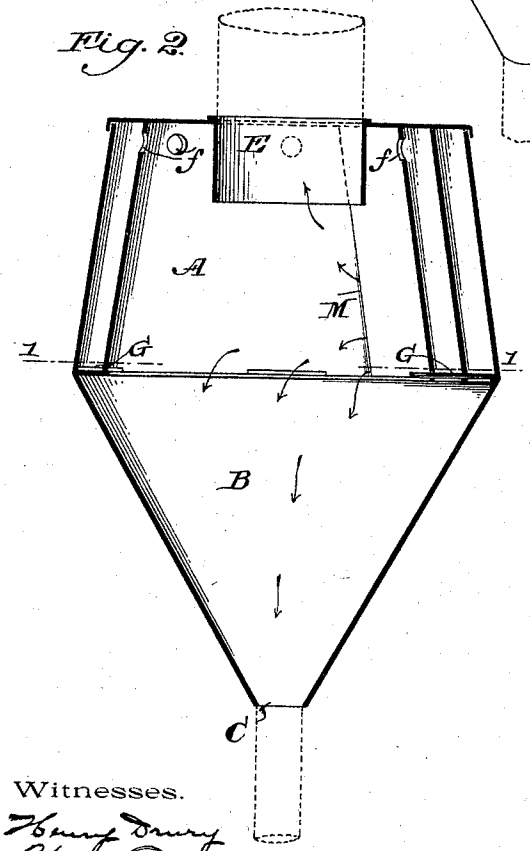
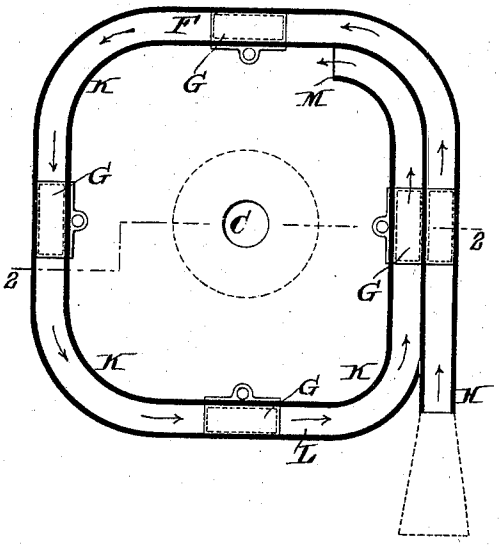


Fig. 3.



Witnesses.

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DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 590,033, dated September 14, 1897.

Application filed April 10, 1897. Serial No. 631,500. (No model.)

To all whom it may concern:

Be it known that I, JOHN CHARLTON, of the city and county of Philadelphia, State of Pennsylvania, have invented an Improvement in Dust-Collectors, of which the following is a specification.

My invention has reference to dust-collectors; and it consists of certain improvements, which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

The object of my invention is to provide a suitable construction of dust-collector, which shall quickly and positively separate the dust, shavings, sawdust, &c., from the air.

In carrying out my invention I provide the collector with an upper chamber, inclosing a spiral flue, which ultimately opens to the interior of said chamber, and is formed of straight and curved portions, into the outer end of which the air under pressure, together with the dust, shavings, sawdust, &c., is forced and compelled to take a rotary action before being delivered into the interior of the chamber, the construction being such that the heavier materials are subjected to the action of centrifugal force and gravity, so as to separate the same from the air, with the object in view of delivering the said materials to the lower part of the chamber, while the air ascends and escapes from an upper central flue. I furthermore provide the spiral flue with openings near the upper part at intervals to permit the ready escape of air after the material has been put under the action of centrifugal force, the object being to avoid excessive disturbance of the materials after the separation is more or less accomplished, so that at the final discharge of the material into the inner chamber it shall be discharged from the lower portion of the spiral flue out of the most active zone of the air-currents and thereby permitted to fall by gravity, while the air rapidly escapes from the upper portion. The inner chamber is furthermore provided with a tapering bottom leading to a discharge-flue for the purpose of conveying away the refuse so collected. I further prefer to provide the lower part of the spiral flue at intervals with valves for the purpose of cleaning the said flues in case of clogging from excessive duty or otherwise.

My invention will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved dust-collector. Fig. 2 is a vertical section of same on line 2 2 of Fig. 3, and Fig. 3 is a sectional plan view on line 1 1 of Fig. 2.

A is the upper chamber, and is formed with flat sides connected by round corners, and, furthermore, is preferably inclined inward as we approach the top. The upper part of this chamber is closed by a head D, having a central aperture E, formed with a downwardly-extending rim. The lower part of the chamber A is open and connects with a downwardly-extending and tapering funnel-shaped bottom B, terminating in a discharge-orifice C, with which to connect a tube leading to the place of reception for the materials collected.

The walls of the chamber A are provided with a spiral flue F, having an entrance-orifice H, which connects with the blast-flue in which the fan (not shown) is located and into which the materials collected from the different parts of the factory are sucked. This spiral flue F is formed of straight portions L, connected by curved portions K, and makes a little more than a complete circuit of the chamber and finally terminates in a nozzle M of its full height. Near the upper portion of this flue are arranged apertures *f*, through which the excessive quantities of air may escape to relieve the pressure and force acting upon the materials to be separated, so as to avoid having an excess of air in the spiral passage-way at the terminal or discharge end.

It is preferable that the portion of the flue F into which the materials are first forced shall not be provided with such apertures, but after the directive movement and centrifugal action is once secured the valve-openings may then act to relieve the pressure of the blast, so as to permit a gradual settling of the dust, chips, &c., to a lower plane, to the end that when the materials reach the nozzle M they will be practically in the lower half thereof, while the air may freely escape from

the upper half. This operation enables the specific gravity of the materials being treated to come into play to cause their downward movement and ready separation without excessive action within the chamber A. Where this separation in the flue does not take place and the blast drives the dust, &c., into the inner chamber with the full force, there is great tendency for portions of the dust and lighter material to be carried upward through the aperture E instead of being deposited and carried off by the flue C, leading from the lower part of the bottom B. In view of the great length of the spiral flue F it is desirable to provide several doors or flues G in the lower parts, and preferably in the bottom, so that in case of clogging from any deranged action or excessively-heavy deposits the flues may be readily cleaned by withdrawing the valves and putting in the arm or scraper to draw the materials out.

The combination of the straight portions L and curved portions K of the spiral flue F enables me to produce the necessary centrifugal action without excessive friction, since the curved portions secure the necessary centrifugal action while the straight portions act as flues without abnormal friction. This will be evident when we consider that the rush of the material and air around one of the corners will have a tendency to project the said material diagonally across the straight portion L and practically clear of both the vertical walls of said straight portion, and this action is repeated at each corner.

While I prefer the construction shown, it is evident that the minor details may be modified without departing from the spirit of the invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a dust-collector, the combination of a large upper chamber having an air-escape aperture at its top and terminating at the bottom in a funnel to lead off the materials collected, and provided with a spiral flue arranged about the walls of the upper chamber and into the outer end of which the air and materials are delivered and from the inner end of which they are delivered into the interior of the chamber, the said spiral flue extending completely around the upper chamber, and being composed of straight portions alternately arranged intermediate of curved portions whereby the friction to the passage of the materials through the flue is reduced to a minimum while maintaining the centrifugal action for separation, and a series of removable doors arranged at intervals in the lower part of the spiral flue for discharging the materials deposited therein directly into the funnel-shaped bottom.

2. In a dust-collector, the combination of the upper chamber having an aperture at its top and terminating at the bottom in a funnel to lead off the materials collected and provided with a spiral flue arranged about the walls of the upper chamber and into the outer end of which the air and materials are fed under pressure and from the inner end of which they are delivered into the interior of the upper chamber, the said spiral flue extending completely around the upper chamber and being composed of straight portions alternately arranged with intermediate curved portions whereby the friction to the passage of the materials through the flue is reduced to a minimum while maintaining the centrifugal action for separation, and a series of apertures opening from the upper part of the said spiral flue into the interior of the upper chamber.

In testimony of which invention I hereunto set my hand.

JOHN CHARLTON.

Witnesses:
R. M. KELLY,
PAUL NEUMEISTER.