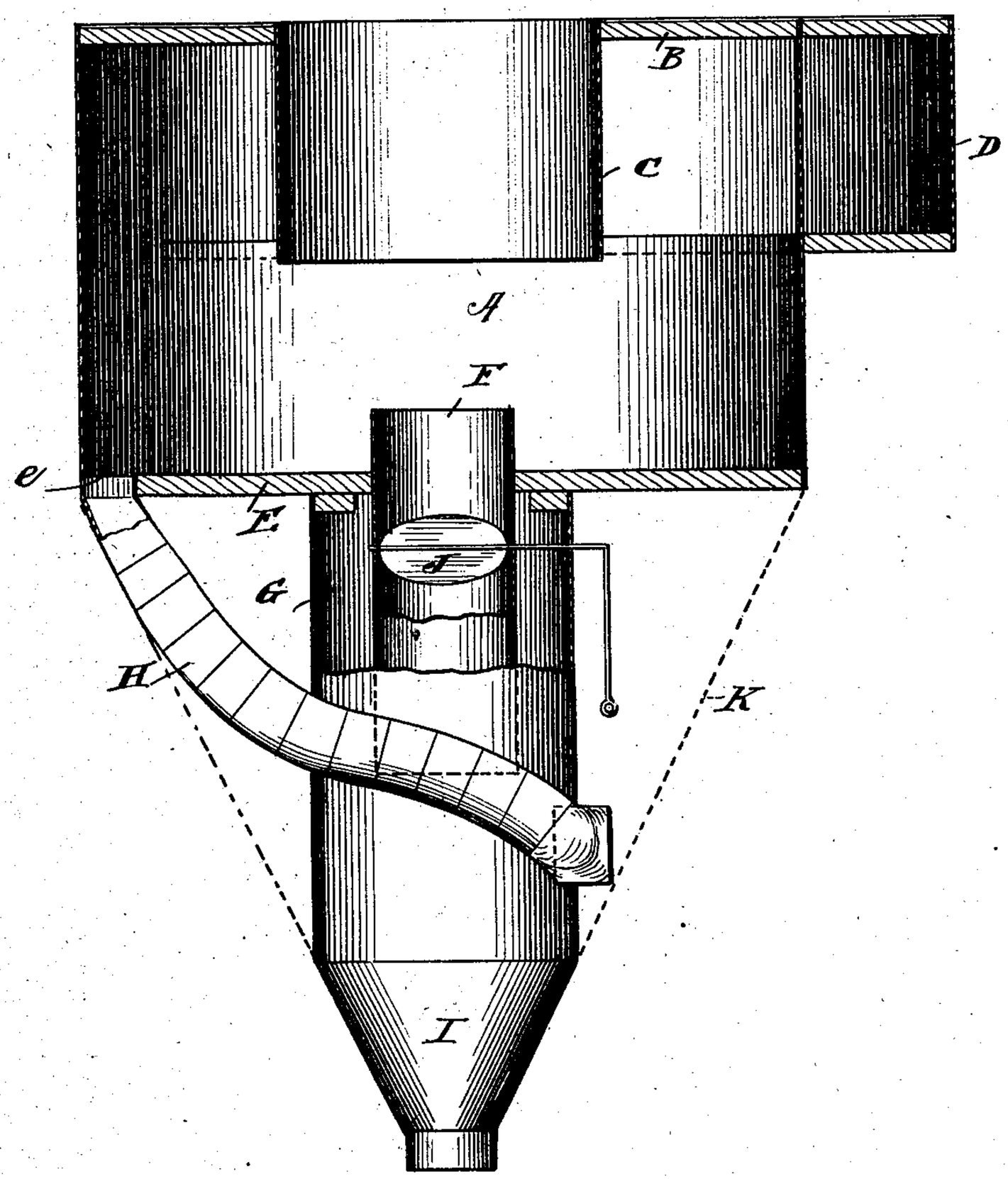
(No Model.) 2 Sheets—Sheet 1.

W. E. ALLINGTON.

DUST COLLECTOR.

No. 604,871. Patented May 31, 1898.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

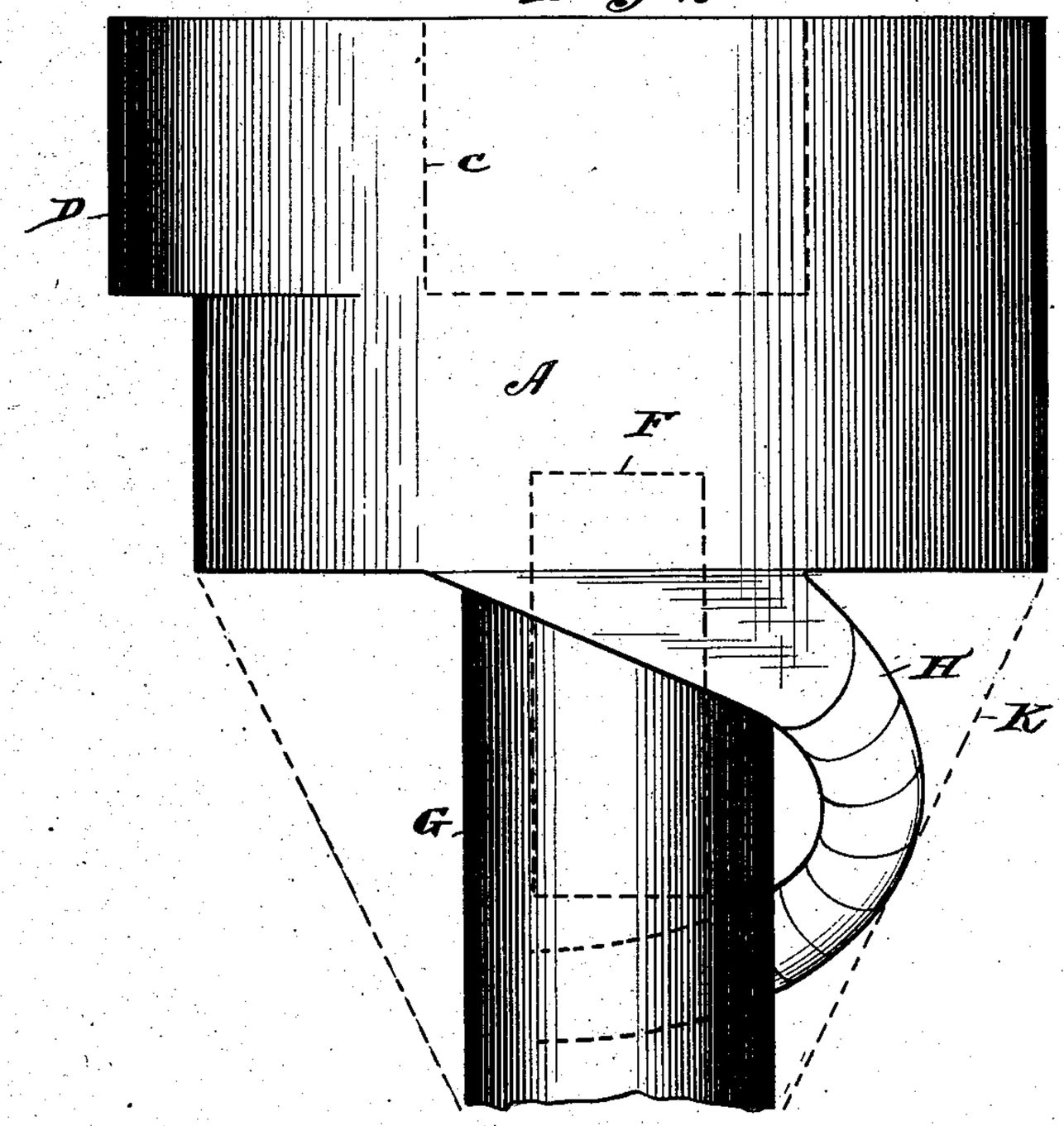
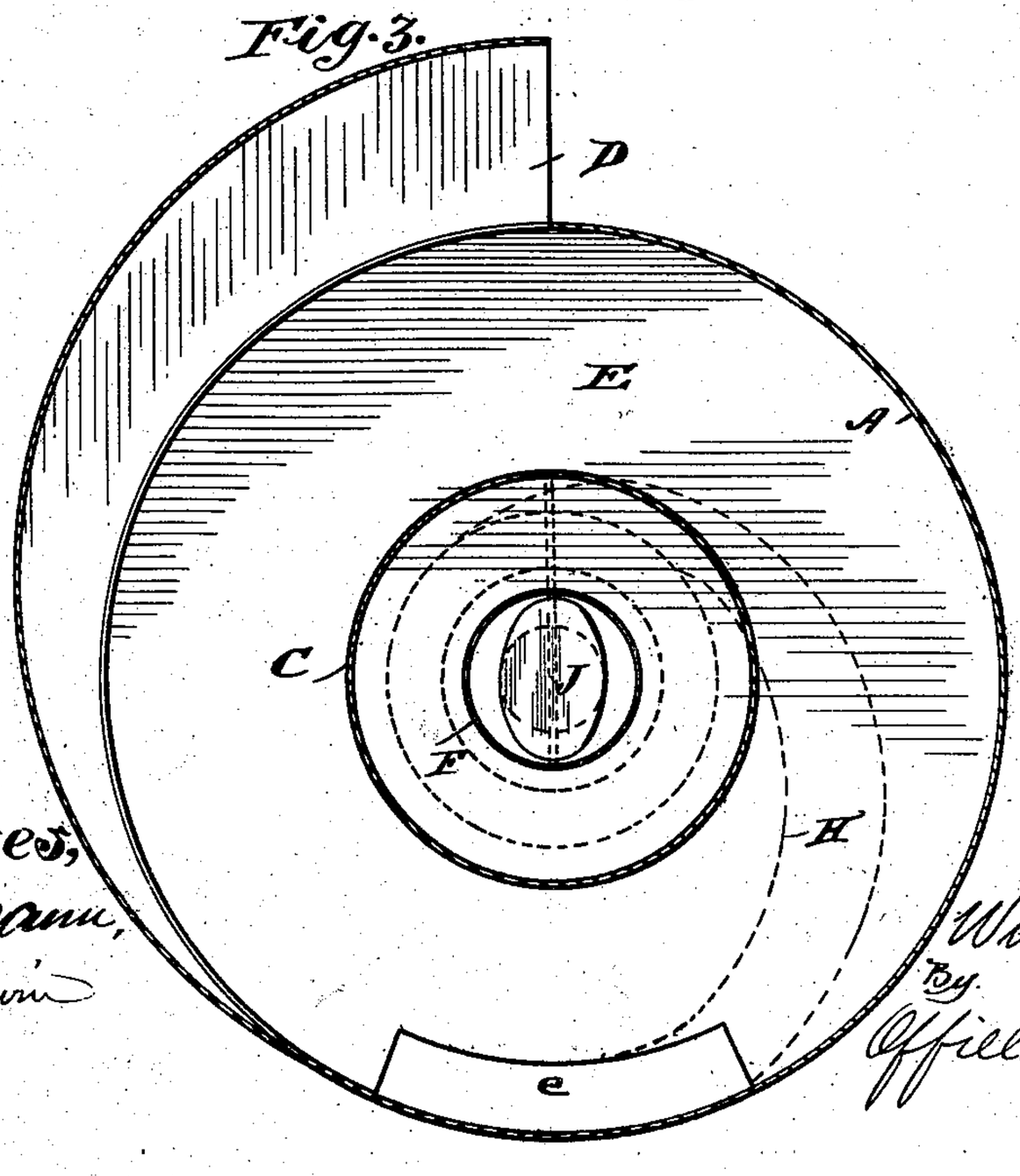


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM E. ALLINGTON, OF SAGINAW, MICHIGAN.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 604,871, dated May 31, 1898.

Application filed March 15, 1897. Serial No. 627,601. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. ALLINGTON, of Saginaw, Michigan, have invented a certain new and useful Improvement in Dust-Collectors, of which the following is a specification.

This invention relates to that class of dust-collectors wherein a dust-laden air-current is delivered into a separating-chamber provided with outlets for the purified air and the separated dust, and in which the separation is effected by centrifugal force which masses the particles carried upon the air-current upon the peripheral wall of the chamber, the latter being of such form as to conduct the material to the dust-outlet, while the purified air escapes in a different direction.

In this class of machines the dust and air outlets are located axially of the machine and usually at opposite ends of the separating-chamber, and the commercial form of the dust-collector has a cylindrical body into which the air is delivered, with a conical or tapering portion in open communication with the cylindrical portion, the purified-air outlet being located in the top or head of the cylindrical portion and the dust-outlet at the tip of the conical portion. Dust-collectors of this type are illustrated in the patent to Noah W. Holt, dated August 20, 1889, No. 409,465.

In the operation of machines of this class the dust-laden air entering through the tangential inlet-spout under considerable pressure is given a whirling or gyrating motion by reason of the shape of the walls of the chamber, and owing to the constant influx of the current in the upper portion of the chamber the dust and other heavier particles are driven downwardly in a spiral path, which spiral path may be said to be generated near the mouth of the air-inlet and to continue around the casing of the machine to a point near the dust-outlet. This action produces a rarefaction within the body of the separating-chamber, and thereby two ingoing air-currents are induced, one entering through the axis of the dust-outlet and the other through the axis of the purified-air outlet. The dust and air both escape in annular layers around the edges of their respective outlets or concentric to the ingoing currents.

Heretofore dependence has been had upon the tapering portion of the casing to carry the separated dust from the periphery of the casing to the dust-outlet, and therefore, as above stated, the cylindro-conoidal form is the standard construction and is the best that has yet been devised. This form is, however, objectionable, because of the cost of construction and of the expense attendant upon its shipment, since these dust-collectors, although very light in weight, are bulky and the conical portion thereof is especially difficult to pack.

It is the object of my invention, first, to produce a machine which conforms in its construction to the established laws of action of these machines; second, to effect an economy in the cost of manufacture and transportation. To accomplish these objects, I employ a construction substantially as shown in the accompanying drawings, in which—

Figure 1 is an elevation, partly in vertical section, the dotted lines indicating the form of the cone heretofore employed, but which is dispensed with in the present improvement. Fig. 2 is an elevation at right angles to the view shown in Fig. 1, the power portion of the outlet-pipe being broken away. Fig. 3 is a sectional plan view.

In carrying out my invention I preferably employ a cylindrical casing A, having a head or cover B, in which is arranged a tubular guard C and to which the air is delivered through the tangential inlet-spout D. These parts are of usual construction. The lower end of the cylindrical casing is partially closed by the diaphragm-plate E and constitutes what may be called the "primary separating-chamber." This bottom plate E has near its periphery an aperture *e* and also a central opening for the passage of the relief-pipe F. To the lower side of this diaphragm-plate E, I connect the cylindrical pipe G, which is the secondary separating-chamber and into which a portion of the air passes with the separated dust. This secondary chamber G is connected with the aperture *e* by the spiral pipe H, and said pipe terminates between and substantially in line with the aperture *e* and the inlet D and enters the secondary chamber tangentially. The pitch or inclination of the pipe H will of course cor-

respond or be proportioned to the dimensions and arrangement of the other parts; but it is found that the dust will perform a complete revolution while passing from inlet to outlet, and therefore I have located the opening *e* at a point opposite the inlet from the fan and have extended the pipe H near to the axis of the machine, where it delivers through an opening in the side of the pipe G, tangentially to the axis of the latter. The lower end of the chamber G may be left open, or it may be provided with a small cone I to prevent the scattering of the dust. The relief-pipe F may have a valve J therein which will control the passage of the air from the interior of the chamber G upwardly through said relief-pipe and thence outwardly through the tubular guard. The chamber G, pipe H, and relief-pipe F are all readily detachable from the cylindrical portion of the casing and may be slipped into the cylindrical portion through the tubular guard, thus making the entire structure more compact and therefore more economical to ship. A further economy is secured in the quantity of material employed. The pipes F and G being straight and relatively small require less work and less material in their construction than the cone now commonly employed, the outlets of which are represented by the dotted lines K in Figs. 1 and 2.

The details of construction may be varied—as, for example, the relief-pipe and cone may be omitted and the forms of the other parts varied.

It will be found that my construction will be serviceable and will catch the dust quite closely, and while it is not claimed for this structure that it will effect as close a separation as machines which have heretofore been employed, it has certain advantages on the score of economy and is also of such form that it may be used in situations where the standard machine could not be conveniently placed.

I claim—

1. In a dust-collector, the combination with a primary separating-chamber into which the dust-laden air-current is delivered, of a secondary chamber of cylindrical form from which the separated dust is discharged, the axial portions of said chambers being in open communication with each other for the return of the purified air from the secondary to the primary chamber and a pipe or passage connecting said chambers, the connecting pipe or passage communicating with the primary chamber near its peripheral wall and with the secondary chamber tangential to the axis thereof, substantially as described.

2. In a dust-collector, the combination with a primary chamber having a tangential inlet for the dust-laden air, a purified-air outlet and a bottom wall having an aperture therein near the periphery of the chamber, and a secondary chamber of cylindrical form communicating with the primary chamber through a central aperture in its bottom wall, and also by an external pipe or passage connecting the peripheral aperture and said secondary chamber and entering the latter tangentially, substantially as described.

3. In a dust-collector, the combination with a casing providing a primary chamber into which the dust-laden air is delivered, said chamber having a peripheral outlet in its bottom wall for the separated dust, of a secondary chamber of cylindrical form located below the primary chamber and an external duct or passage connecting said chambers, said duct or passage leading from said peripheral aperture to and entering the secondary chamber tangentially, and an air relief-pipe connecting said chambers, substantially as described.

4. In a dust-collector of the class described, the combination with a casing constituting a primary separating-chamber into which the dust-laden air-current is delivered, said primary chamber having its bottom wall provided with a peripheral dust-outlet, of a secondary chamber of cylindrical form and an external spiral pipe or passage connecting said secondary chamber tangentially with the peripheral dust-outlet, substantially as described.

5. In a dust-collector of the class described, the combination with the primary and secondary air-chambers of cylindrical form having an external spiral pipe or passage connecting their peripheries, the secondary chamber having a dust-outlet to which its walls converge and the primary chamber having a purified-air outlet with a relief-pipe connecting said primary and secondary chambers, substantially as described.

6. In a dust-collector of the class described, the combination with primary and secondary air-chambers of cylindrical form having a spiral pipe or passage connecting their peripheries, the secondary chamber having a dust-outlet to which its walls converge and the primary chamber having a purified-air outlet with a relief-pipe connecting said primary and secondary chambers, and a valve in said relief-pipe, substantially as described.

WILLIAM E. ALLINGTON.

Witnesses:
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