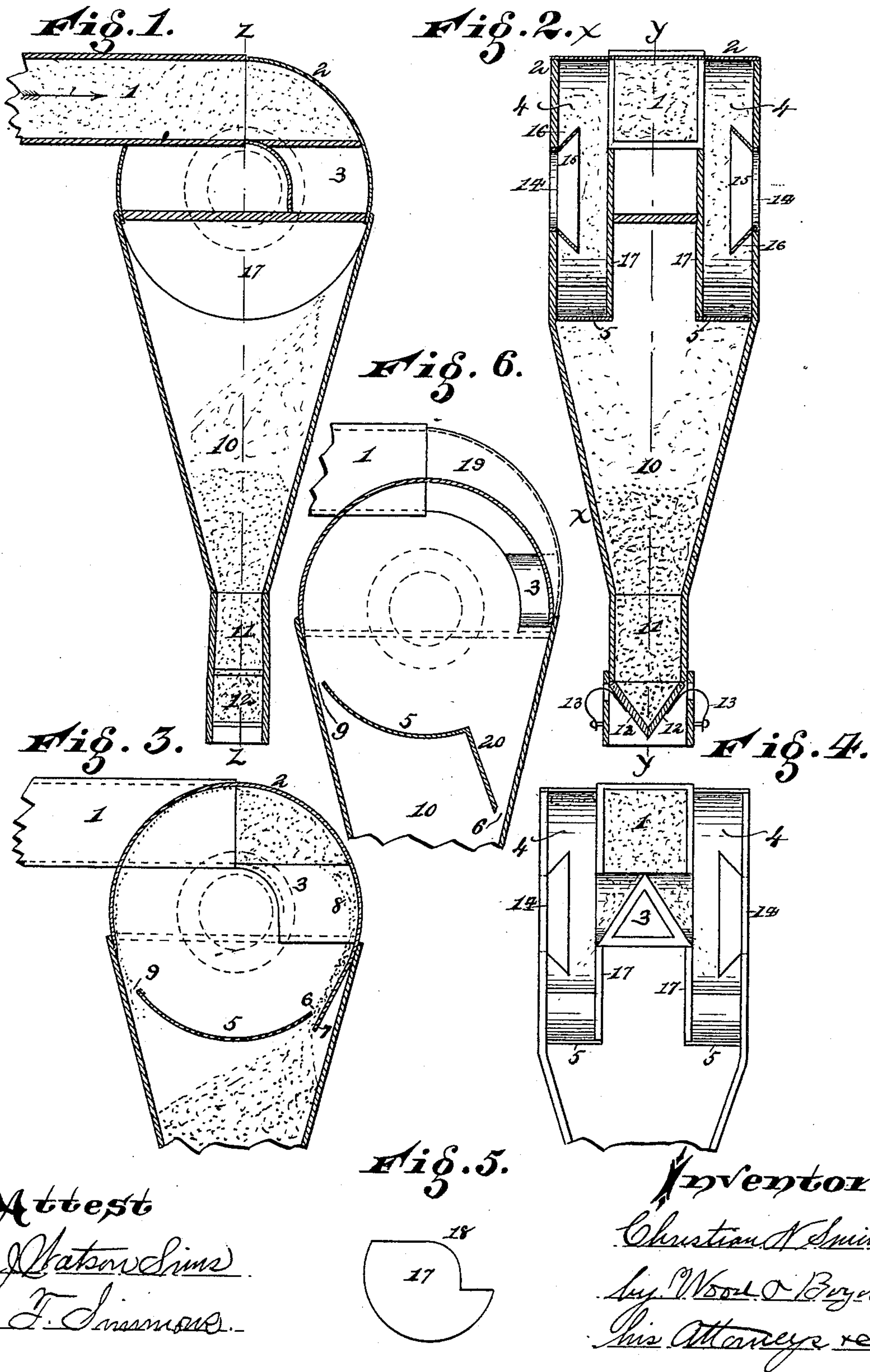


(No Model.)

C. N. SMITH.
DUST COLLECTOR.

No. 390,100.

Patented Sept. 25, 1888.



UNITED STATES PATENT OFFICE.

CHRISTIAN N. SMITH, OF DAYTON, OHIO.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 390,100, dated September 25, 1888.

Application filed March 13, 1888. Serial No. 267,108. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN N. SMITH, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful
5 Improvements in Dust-Collectors, of which the following is a specification.

The object of my invention is to provide a novel dust-collector which will completely separate the dust from the air and deposit the
10 dust in a box or other suitable receptacle and discharge the purified air back into the room or compartment from which it was taken.

Another object of my invention is to provide a novel dust-collector which can be run with
15 little power and require a small amount of air to effect the operation of collecting the dust, separating it from the air, and depositing it in a suitable compartment.

The invention consists in the features of construction and combination of devices, herein-
20 after described and claimed, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a central vertical section on the
25 line *yy*, Fig. 2. Fig. 2 is a vertical section on the line *zz*, Fig. 1. Fig. 3 is a detail section. Fig. 4 is a detail front elevation. Fig. 5 is a detail of one of the central partition disks. Fig. 6 is a detail sectional view showing a
30 modification.

1 represents an inlet-spout or dust-conveyer in which the fan or blast is usually located (but which fan is not shown in the drawings,) for driving the current of air into the shell or
35 casing 2, in which two circular chambers, 4, are formed, one on each side of the inlet-spout.

3 represents a curved dust-spreader situated within the casing between the chambers 4 and under the point where the dust-laden
40 air is received. It is of V shape in cross-section, as shown in Fig. 3, the curve projecting around, so as to serve as a guide to direct the dust to the outer periphery of the chambers 4.

5 represents segmental sections of the cham-
45 bers, forming the lower walls thereof. These sections are broken at the point 6, and preferably project within the terminal edge of case 2 at the point 7. The object of these openings 6 is to allow the escape of the dust which hugs
50 or moves along the periphery of the chambers

4 near the outer side walls, as indicated by the dots 8 in Fig. 3.

9 represents an opening at the opposite end of said segment 5, to allow any air which may escape through the openings 6 to re-enter the
55 chambers 4.

10 represents a projecting spout or exit from the case. It is made of tapering form, terminating in the rectangular end 11, in which is inserted two spring-closed valves, 12. 60

13 represents the springs, which may be adjusted so as to have a sufficient tension to hold the valves normally closed against the weight of the dust to prevent the exit of air, thus holding the spout 10 full of accumulated dust. 65 As the weight of the dust accumulates, the valve 12 will open sufficiently to allow it to escape, thus keeping the spout 10 under seal against the escape of air in that direction, causing all the air to return through the opening
70 9 into the casing.

In order to discharge the purified air out of the chambers, I have provided at the center of the outer wall of each chamber a circular opening, 14, having a circular inwardly projecting
75 and flaring wing, 15. As the dust in the current of air is heavy, it is projected farther forward under the pressure until it strikes against the outer side walls of the chambers, where it is held by centrifugal force and prevented from
80 escaping with the currents of purified air through the opening 14 by means of the wings 15, so that the air will pass out of the opening 14, while the dust will project into the recess 16 between the wings 15 and the sides of the
85 casing 2.

17 represents circular disks of the form shown in Fig. 5, with a portion, 18, cut away, into which the V-shaped spreader and spout are placed. The disks 17 constitute the in-
90 ner walls or sides of the chambers 4.

The principle of operation of my device is as follows: A blast is driven into the spout 1, which sucks or drives in the dust into the compartment where the device is located, the
95 spreader 3 directing it against the sides of the chambers 4. The dust, being heavier, is thrown outward in contact with the side walls and periphery of the chambers 4, as indicated by dotted line 8. The open space 6 between these
100

ment 5 of the chambers and the casing at 7 allows the escape of dust. The lower end of the spout 10, being closed by the accumulation of the dust in the bottom, prevents the escape of air therefrom, and it is drawn back in the case through the opening 9 and escapes out of the central orifices, 14, on either side of the partitions 17. The space between these partitions being a dead-space, the bottom may be closed, if desired. If any dust should be carried back through the opening, it will go around the exterior space and into the current through the spout. By having the opening 6 near the periphery of the disk and making it comparatively small the dust will principally go out at that point. A portion of the blast, however, will be carried around inside of the segments 5 and join the main current again. Some of the separation takes place below the segments 5 within the spout 10, where said separation occurs by gravity in a space where comparatively a small amount of current exists. The segments 5 materially cut off the action of the blast within the spout 10. The recesses 16 at the sides of the wings 15 prevent the dust from escaping out of the apertures 14, as before explained. The modification shown in Fig. 6 consists in introducing the spout mostly outside of the circle of the case and enlarging the case-opening, as at 19, and carrying the spreader 3 near the outside of the case; also, in changing the form of the segments 5 by depending one end down, as at 20, to insure the dropping of the dust out of orifice 6 and allowing it to go back into the case through orifice 9.

Having thus described my invention, what I claim is—

1. A dust-collector consisting of a casing divided into two side chambers, each having its outer side provided with an exit-orifice, 14, an inlet-spout, 1, entering the casing between said chambers, an air-spreader, 3, located between the chambers, to divert the air and dust thereinto, and the segments 5, constituting the lower walls of the chambers and having the exit and re-entering orifices 6 and 9 at the respective ends, substantially as described.

2. A dust-collector consisting of a casing divided into two side chambers, each having in its outer side an air-exit orifice, 14, provided with an inwardly-projecting circular wing, 15, an air inlet spout, 1, entering the casing between said chambers, an air-spreader, 3, located between the chambers, to divert the air thereinto, and segments 5, constituting the bottom walls of the chamber and having the exit and re-entering orifices 6 and 9 at their respective ends, substantially as described.

3. A dust-collector consisting of a casing divided into two circular chambers, each having in its side an air-outlet, 14, provided with an inwardly-projecting flaring wing, 15, to form a recess, 16, an air inlet spout, 1, entering between the chambers, to pass air thereinto, and segments 5, constituting the bottom walls of the chambers and having the exit and re-entering orifices 6 and 9 at their respective ends, substantially as described.

In testimony whereof I have hereunto set my hand.

CHRISTIAN N. SMITH.

Witnesses:

ROBERT ZAHNER,
J. WATSON SIMS.