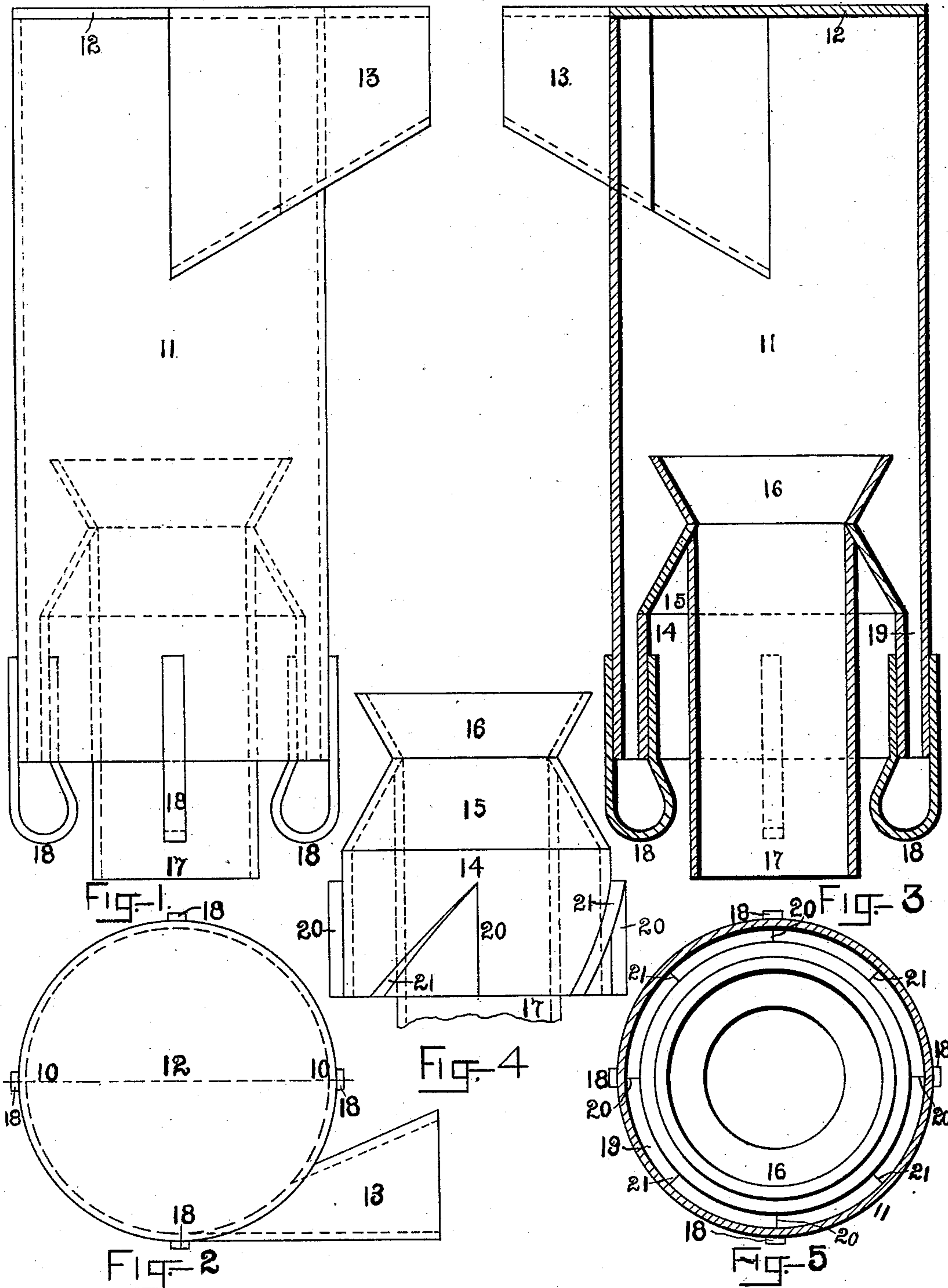


(No Model.)

J. A. & E. F. WOODBURY.
DUST COLLECTOR.

No. 424,157.

Patented Mar. 25, 1890.



WITNESSES:
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JAMES A. WOODBURY, OF WINCHESTER, AND EDWARD F. WOODBURY, OF BOSTON, MASSACHUSETTS.

DUST-COLLECTOR.

SPECIFICATION forming part of Letters Patent No. 424,157, dated March 25, 1890.

Application filed May 5, 1888. Serial No. 272,969. (No model.)

To all whom it may concern:

Be it known that we, JAMES A. WOODBURY, of Winchester, county of Middlesex, and State of Massachusetts, and EDWARD F. WOODBURY, of Boston, in the county of Suffolk and State of Massachusetts, have jointly invented certain new and useful Improvements in Dust-Collectors, of which the following, taken in connection with the accompanying drawings, is a specification.

Our invention relates to improvements in dust-collectors designed for the separating of dust and shavings from the air by centrifugal force, a blower being used to give the dust-laden air the required velocity.

The object of our invention is to produce a dust-collector from which the purified air and the dust may be discharged without reversing the direction of travel of either the air or the dust in their passage through the collector, which insures a very perfect separation of the dust and shavings from the purified air and with the minimum power required. We attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 represents collector in elevation, and Fig. 2 is a plan of Fig. 1. Fig. 3 is a vertical sectional view of the collector on section line 10 10 of Fig. 2, looking toward the dust-laden-air inlet. Fig. 4 represents in elevation outlet-cylinder with its connected parts and illustrates means of reducing the area of the annular dust-outlet, and Fig. 5 is a plan of Fig. 4 with the addition of the body of the collector being represented in cross-section.

The parts composing the collector are made usually of plate-iron riveted and soldered together.

Nomenclature of parts composing the collector: collector-body 11, collector-head 12, dust-laden-air inlet 13, outlet-cylinder 14, frustum 15, inverted frustum 16, air-outlet pipe 17, and outlet-cylinder-supporting strips 18.

The collector-body 11, cylindrical in form, is closed at its top by means of the head 12, and is provided with the dust-laden-air inlet 13, tangentially connected therewith. The outlet-cylinder 14 is fastened in its position

within the lower end of the collector-body by means of the bent strips 18. The outside diameter of the outlet-cylinder is such compared with the inside diameter of the collector-body as to leave the annular dust-outlet 19. This annular dust-outlet is open throughout its discharge-end, forming an annular discharge-orifice, which permits the free escape of the dust. To the upper part of the outlet-cylinder is secured the hollow frustum 15, to which is secured the inverted hollow frustum 16, and to which is suspended the air-outlet pipe 17 within the outlet-cylinder.

For some conditions of use it may be desirable to contract the area of the annular dust-outlet. This may be accomplished by the placing of the area-reducing strips 20 and 21, as represented by Figs. 4 and 5, as follows: To reduce the area of the annular dust-outlet 19 one-half, four vertical strips 20 are placed quartering within the annular dust-outlet 19, and to the top of each of the strips 20 may be fastened one of the strips 21, which extends to the bottom of the collector to point halfway between the vertical strips. For some conditions of use the inverted hollow frustum 16 and the strips 20 and 21 may be dispensed with. The purified-air-outlet pipe 17 should be extended to such a place as may be most convenient. These proportions and sizes should be and may be varied to comply with or to suit the different conditions required when separating different kinds of dust-laden air.

The operation of the collector is as follows: The dust-laden air is forced into the collector by means of a blower in the usual common way through blower discharge-pipe (not shown) and through dust-laden-air inlet into the collector. The velocity of the blast is such that all dust having a greater specific gravity than the air by reason of centrifugal force obtained by the forced rotary motion of the dust-laden air due to its tangential entrance into the collector will attain a high spirally-rotating motion, thereby imparting weight or kinetic energy to the dust by the centrifugal force thus obtained, and thereby force the dust to occupy an annular space at the inner periphery of the collector-body. The motion of the dust being downward spirally, the dust

is finally forced into the annular dust-outlet, where it loses its imparted weight and falls therefrom without being reversed out of the collector by means of the force of gravitation, while the air which has been purified from the dust is forced out of the collector without being reversed through the air-outlet pipe, which is centrally located as regards the whirling column of air in the same direction as the dust.

The collector is designed to accomplish the perfect separation of dust-laden air, and possesses the following claimed advantages: The kinetic energy or weight imparted to the dust is retained until the dust is out of disturbing influence causes, and the dust, without being reversed, falls from the collector by gravitation, while the purified air is forced out of the collector, without being reversed, in the same direction as the dust and with the expenditure of a minimum amount of power. The effect of these claimed advantages is to obtain a maximum separating efficiency with a minimum expenditure of power.

The supporting-strips, as 18, are claimed in our application for Letters Patent for centrifugal shavings and dust-collectors, filed March 26, 1888, Serial No. 268,565.

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

1. A dust-collector comprising an imperforate cylindrical body provided with a tight head at one end, and a tangential inlet for the dust-laden air, an air-outlet cylinder shorter and smaller than said body disposed therein near the opposite end thereof, one end of said cylinder opening into said body, and an an-

nular dust-outlet between said body and cylinder, said dust-outlet having an annular discharge-orifice, substantially as described.

2. In a dust-collector, the combination of the collector-body 11, provided with head 12, dust-laden-air inlet 13, and a dust-outlet 19, with the outlet-cylinder 14, provided with frustums 15 and 16, and purified-air-outlet pipe 17, substantially as described.

3. In a dust-collector, the collector-body 11, provided with the dust-outlet 19, and means placed within said dust-outlet for reducing its area, in combination with the outlet-cylinder 14, placed within the lower end of the collector-body and provided with the purified-air-outlet pipe 17, within the outlet-cylinder, substantially as and for the purpose set forth.

4. A collector for separating dust from air, provided with a cylindrical body, a closed head, a dust-laden-air inlet, and an annular dust-outlet having an annular discharge-orifice from which the dust falls without being reversed during its passage through the collector, and a purified-air outlet, through which the air is forced without being reversed during its passage through the collector, the whole in combination and for operation substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 2d day of May, A. D. 1888.

JAMES A. WOODBURY.
EDWARD F. WOODBURY.

Witnesses:

GEORGE PATTEN,
J. L. BAILEY.