O. M. MORSE.

DUST COLLECTOR.

APPLICATION FILED MAY 16, 1904.

926,206. **Patented June 29, 1909.**

2 SHEETS—SHEET 1.

Fig. 1

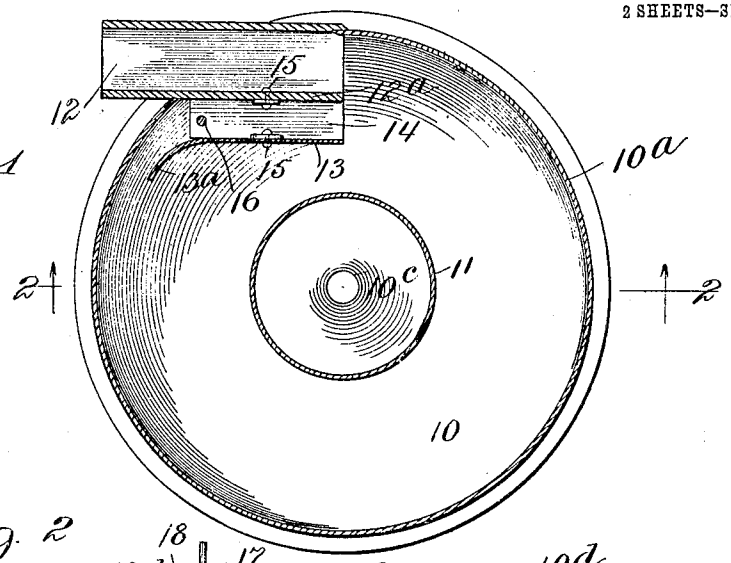
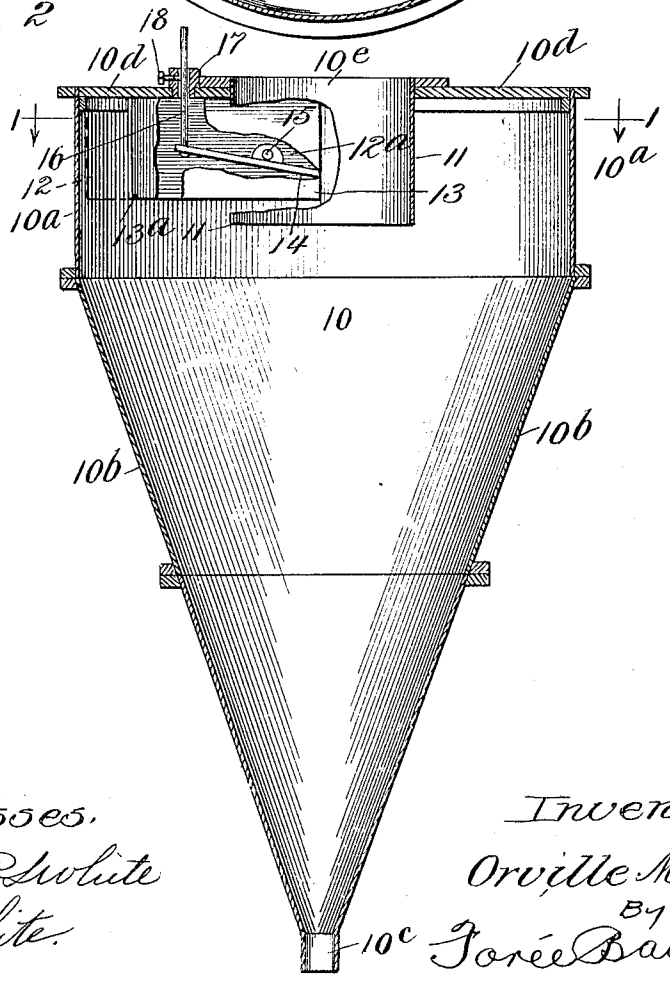


Fig. 2



Witnesses.
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2 SHEETS—SHEET 2.

Fig. 3

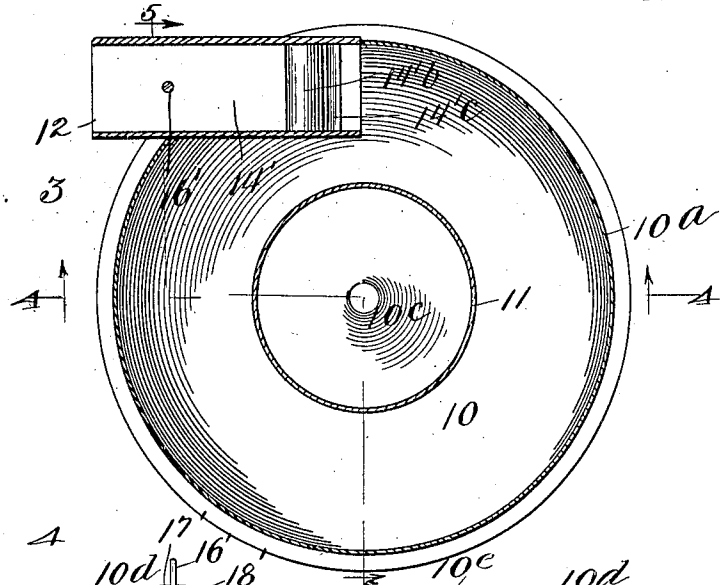


Fig. 4

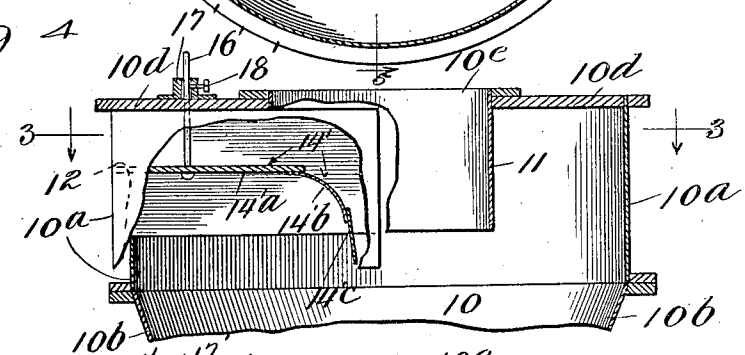
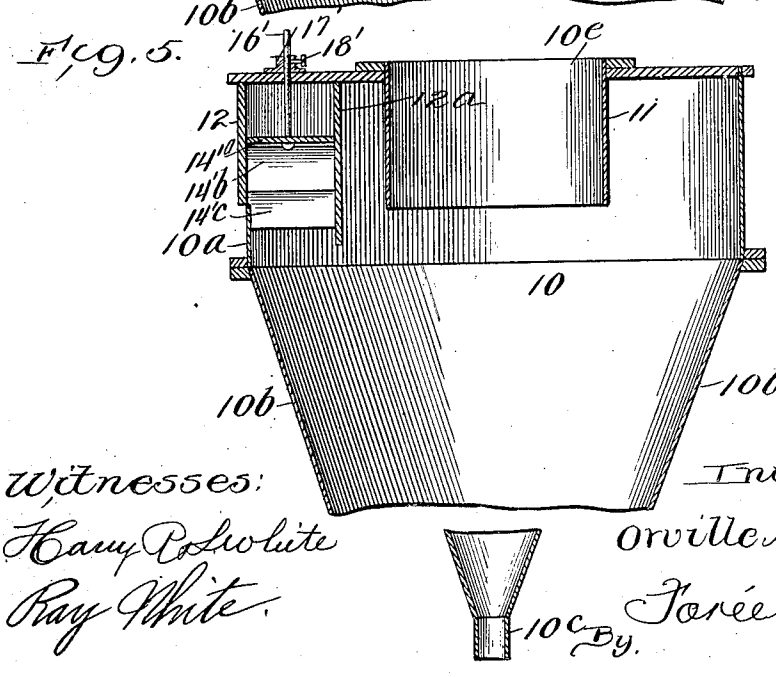


Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

ORVILLE M. MORSE, OF JACKSON, MICHIGAN.

DUST-COLLECTOR.

No. 926,206. Specification of Letters Patent. Patented June 29, 1909.

Application filed May 16, 1904. Serial No. 208,067.

To all whom it may concern:

Be it known that I, ORVILLE M. MORSE, of Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Dust-Collectors; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in dust collectors, and more particularly to the type of machines known as centrifugal or vortex dust collectors.

The primary object of my invention is to provide in a collector of the type specified a means for regulating the pitch of the angle of longitudinal progression of the whirling material within the casing.

To this end it consists in providing in a dust collector a deflecting agency in substantially the plane of the air inlet adapted to deflect portions of the air in transit toward the dust outlet of the machine, said deflector being adjustable to vary the ratio of the air which it deflects to the quantity of air at the time entering the casing.

In the drawings wherein I have illustrated two operative embodiments of my invention; Figure 1 is a section of one form of collector taken on line 1—1 of Fig. 2. Fig. 2 is a central vertical section on line 2—2 of Fig. 1 with parts broken away. Fig. 3 is a transverse section on line 3—3 of Fig. 4, showing a modified form of collector. Fig. 4 is a section on line 4—4 of Fig. 3 with parts broken away, and Fig. 5 is a section taken on line 5—5 of Fig. 3.

Throughout the drawings like numerals of reference refer always to like parts.

Referring now to the embodiment of my invention illustrated in Figs. 1 and 2, 10 indicates generally a dust collector casing of any well known form, that herein illustratively shown comprising an upper cylindrical portion 10^a, a conical lower portion 10^b, terminating in an axial outlet spout 10^c, a deck 10^d covering the cylindrical portion 10^a and having an axial air outlet 10^e.

11 indicates the tubular guard conforming with the outlet 10^e and extending downward into the casing.

12 indicates a tangential peripheral inlet spout for the dust laden air, having its wall nearest the axis of the casing extended as at 12^a into the area inclosed by the casing.

Arranged in the plane of the air inlet spout 12 is a deflecting agency adapted to deflect portions of the dust laden air downward, and adjustable to vary the ratio of the deflected and undeflected portions of the air.

In the specific structure 13 indicates a shield having its body lying parallel to and at a suitable distance radially inward from the extension 12^a of the inlet spout and preferably provided at its rear end (with reference to the direction of rotation of the air) with a curved portion 13^a extending into approximate parallelism with the casing wall 10^a.

14 indicates a deflecting agency comprising a flat plate mounted between the inlet extension 12^a and the shield 13 upon pivots 15—15 so that the said plate may be tilted to various angles relative to a horizontal plane through the inlet 12. Any suitable means may be provided for adjusting and positioning the plate 14 such devices being herein shown as a rod 16 connected at its lower end to the deflector plate and extending upward through a boss 17 on the deck 10^d of the collector, said boss being provided with a set screw 18 for positioning the rod 17.

In the operation of the machine, dust laden air blown through the tangential inlet 12 is directed in a circular path by the casing wall and sets up a whirl or vortex in the casing. Normally the material thus introduced tends to travel downward to a certain extent in the casing in a spiral path of relatively small pitch, until a point is reached where the pressure created by the incoming air thereabove overcomes the centrifugal effect of the whirl and forces the air inward into the central zone in alinement with the tubular guard, whence the air flows upward and escapes. The dust particles forced by centrifugal effect to the casing wall, are not carried up by the air but continue in their travel to the dust outlet 10^c.

I have found that in its first circuit of the casing the air travels in substantially a plane of the inlet and, therefore, in the machine heretofore described, at the end of its first circuit the path of travel of said air is intercepted by the shield 13 and the extension 12^a. The dust particles, driven to the periphery of the casing by centrifugal effect find their

way through the space between the curved end 13ª of the shield 13 and the casing wall, and are deflected by the extension 12ª of the tangential inlet into a course parallel with that of the incoming air, so that it does not cut off the inlet spout and produce back pressure upon the air impelling devices.

The shield 13 serves to prevent the rebound of the dust particles which contact with the extension 12ª from being carried into the axial path of air efflux. It will be apparent that by positioning the deflector plate 14 at an angle relative to the normal path of the air, by vertical adjustment of the rod 17, a portion of the dust laden air coming within the passage provided by the shield 13 and the extension 12ª of the dust inlet, will be deflected downward, while the remaining portion of the air will be permitted to pass on its normal course. The ratio of the quantity of air thus allowed to take its normal course to the quantity of air deflected downward will obviously be varied by the elevation or depression of the rear end of plate 14, and the consequent variation of the area of presentation of the plate to the moving air body. It will further be apparent that the positive deflection of the air in a direction longitudinally of the casing tends to force the air therebeneath toward the lower end of the casing and increases the pitch of the spiral path of descent both of the air and the dust. I find that by this means I can regulate the speed with which the dust will travel to the dust outlet from the upper end of the casing, and that I can thereby also regulate the delivery of the air to the dust outlet 10ᶜ.

In Figs. 3 and 5 I have illustrated another operative embodiment of my invention, wherein the general form of the casing and the tangential inlet are the same as before, but the deflector member is arranged directly in the path of the incoming air, within the tangential inlet. In said drawings 14′ indicates a deflecting agency comprising a plate 14′ª, secured at its forward end (with reference to the direction of travel of the air) to a flexible strip, 14′ᵇ, preferably of metal, the opposite end of which is secured to the upright stationary member 14′ᶜ, preferably slightly inclined from a vertical plane, and cutting off the lower portion of the front end of the inlet. An adjustable rod 16′ and a set screw 18′ are provided for permitting the adjustment of the plate 14′ª, as in the construction before described.

It will be apparent that the operation of this device is generally the same as that heretofore described save that the angle of downward projection of the air deflected by the deflecting agency is constant, but it will be apparent that the ratio of the quantity of air permitted to take its normal course and the quantity of air deflected downward will be varied by adjustment of the plate-portion 14′ª of the deflecting agency, 14′, and that consequently the course of travel of the air, which is the result of these conflicting forces, will be changed by adjustment of the portion 14ª of said deflecting agency.

While I have herein described in detail two operative embodiments of my invention, the same is herein done for the purpose of showing the facility with which changes may be made in the specific structure thereof without departing from the spirit and scope of my invention, and I do not desire to be understood as limiting the broad conception of my invention to the specific forms shown by way of illustration.

Having described my invention, what I claim and desire to secure by Letters Patent of the United States, is:—

1. In a centrifugal dust collector comprising a casing symmetrical with respect to a vertical axis to provide an inclosed area wherein the air may whirl, and provided with a tangential air inlet, an air discharge opening in its top, and a dust discharge opening in its bottom, a deflector arranged with respect to the inlet to direct air downward, and adjustable with respect to the top of the casing to permit more or less of the incoming air to pass thereover in an undeflected path.

2. In a dust collector, the combination with a casing comprising a substantially cylindrical head and a conical body, said casing having a tangential inlet for the dust-laden air and a dust outlet at a point remote from said inlet, of a plate adjustable to change its angle of inclination arranged in the plane of the inlet to deflect portions of the dust-laden air toward the outlet, and means for securing the plate in adjusted positions.

3. In a dust collector, the combination with a casing comprising a substantially cylindrical head and a conical body, of a tangential inlet leading into said head having its wall nearest the axis of the casing extended into the interior of the casing, and a deflecting agency arranged in the plane of said inlet, adjustable to vary its vertical presentation to the moving air body, and means for adjusting said plate, as described.

4. In a dust collector, the combination with a casing 10, comprising a head 10ª and a body 10ᵇ, of a tangential inlet opening into the head 10ª provided with an extended side wall 12ª, a shield parallel to said wall 12ª, and a deflecting agency pivoted between said walls.

5. In a dust collector, the combination with a casing 10, comprising a head 10ª and a body 10ᵇ, of a tangential inlet 12, opening into the head 10ª provided with a side wall extension 12ª projecting into the casing, a

shield 13 parallel to the extension provided with a curved end 13^a extending into substantially parallelism with the casing wall, and a plate pivotally mounted between said extensions 12^a and shield 13, and means extending to the exterior of the casing for adjusting the inclination of said plate.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

ORVILLE M. MORSE.

Witnesses:
W. B. KNICKERBOCKER,
FORÉE BAIN.