H. A. THUNEMAN.

DUST SEPARATOR.

APPLICATION FILED FEB. 18, 1916.

1,215,890.

Patented Feb. 13, 1917

2 SHEETS—SHEET 1.

Fig. 1

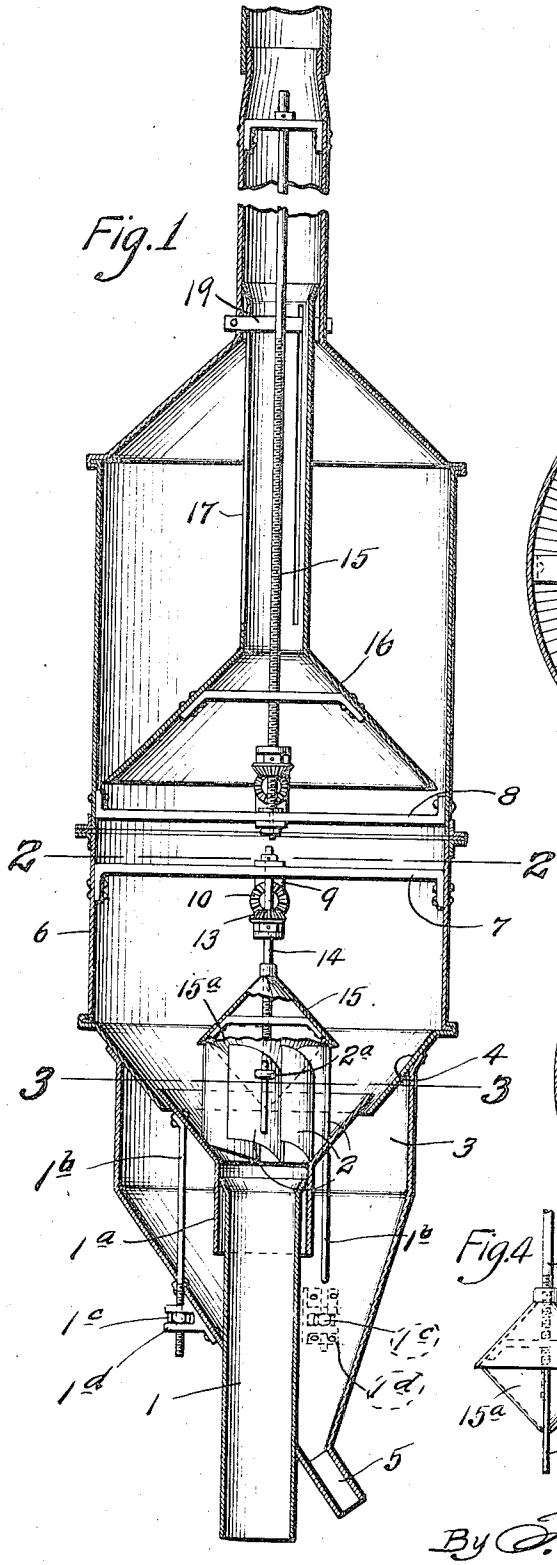


Fig. 2

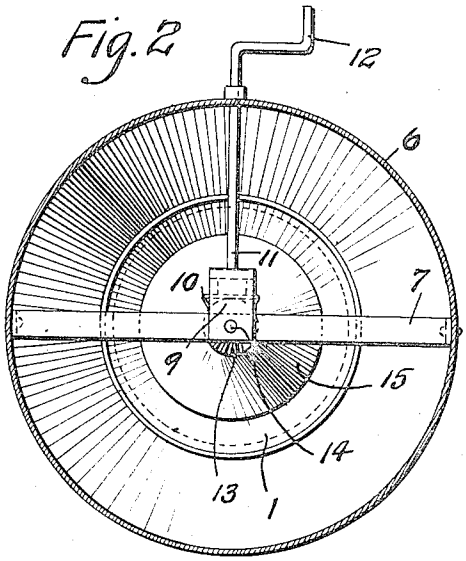


Fig. 3

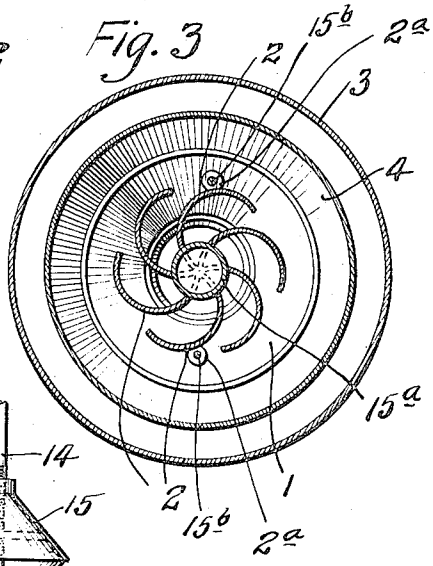


Fig. 4

Inventor
Harry A. Thuneman
By [illegible] Atty.

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2 SHEETS—SHEET 2.

Fig. 5

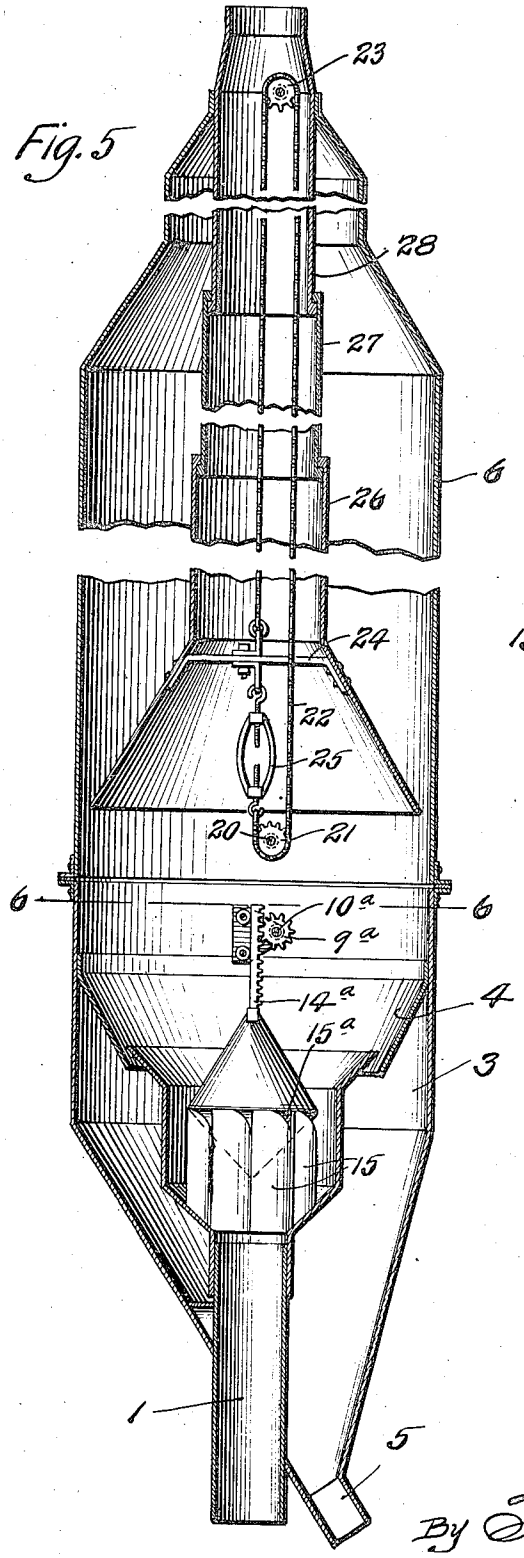


Fig. 6

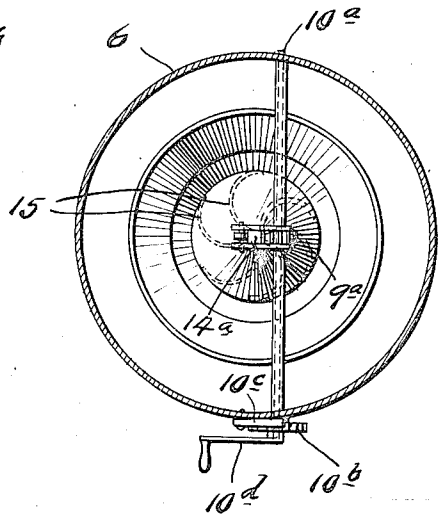
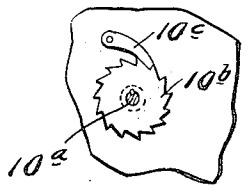


Fig. 7



Inventor

Harry A. Thuneman

By F. C. Cornwell Atty.

UNITED STATES PATENT OFFICE.

HARRY A. THUNEMAN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO WILLIAMS PATENT CRUSHER AND PULVERIZER COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

DUST-SEPARATOR.

1,215,890. Specification of Letters Patent. Patented Feb. 13, 1917.

Application filed February 18, 1916. Serial No. 79,057.

To all whom it may concern:

Be it known that I, HARRY A. THUNEMAN, a citizen of the United States, residing at city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Dust-Separators, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view of my improved dust separator.

Fig. 2 is a sectional view on line 2—2 of Fig. 1.

Fig. 3 is a sectional view on line 3—3 of of Fig. 1.

Fig. 4 is a detail view of the adjustable cone.

Fig. 5 is a vertical sectional view of a modified form of dust separator.

Fig. 6 is a cross sectional view on line 6—6.

Fig. 7 is a detail view of the ratchet.

This invention relates to a new and useful improvement in dust separators, the object being to provide a novel means of adjustment for the several adjustable parts of the apparatus.

In the drawings 1 indicates an inlet pipe whose upper end tesescopes into an adjustable section 1^a having outwardly flared portions in which latter are arranged curved blades 2. 3 is the lower portion of the separator casing containing an inclined flange 4 which is spaced apart from the flaring upper end of the inlet pipe and over which flaring upper end the heavier particles of material will fall by gravity into the lower portion 3 of the separating chamber from which lower portion leads a discharge spout 5. 1^b are rods secured to the flanged portion of the adjustable section 1^a, with which coöperate nuts 1^c in brackets 1^d secured on the section 3. The purpose of thus providing some means for adjusting the flared section of the inlet pipe, to which the blades are secured, is to vary the size of the tailings discharge and in this manner I am enabled to regulate the size of the tailings. 6 indicates the walls of the upper portion of the separating chamber to which are secured bars 7 and 8. To the bar 7 is secured a bracket 9 constituting a mounting for a miter gear 10 mounted on the inner end of the rod 11 having a crank handle 12 at its outer end. This miter gear meshes with a miter gear 13, mounted on vertical rod 14 whose lower end has threaded engagement with an A-shaped cap piece 15. This cap piece carries a cone shaped downward extension 15^a, see Fig. 4, the purpose of which is to deflect the currents outwardly and upwardly as they issure from the curved blades. By adjusting the cap piece upwardly a certain percentage of the air may be permitted to pass into the separating chamber after it has passed beyond the curved blades 2. The cap piece is preferably provided with means such as eyes 2^a on wings 2, through which slide rods 15^b on the cone, whereby said cap may move vertically but is prevented from rotating. The bar 8, before referred to, supports a similar hand-operated miter gear construction whereby a threaded rod 15 may be rotated to adjust the flared lower end 16 of the exit pipe 17 and thereby regulate the size of the expansion chamber in which the separation is effected. Suitable means is provided, such as a cross bar 19, passing through slots in the pipe 17, to prevent the rotation of said pipe while permitting its vertical movement. Of course the larger the expansion chamber, the finer the particles of dust which escape through the exit pipe.

In Figs. 5, 6, and 7, I have shown a modified form of dust separator, in which the cone 15^a is adjusted vertically by means of a rack 14^a coöperating with pinion 9^a mounted on the rod 10^a. There is a ratchet wheel 10^b on the end of the rod coöperating with pawl 10^c and having a handle 10^d whereby the same may be rotated. By this means the cone may be quickly adjusted.

In Fig. 5 I have also shown means for quickly adjusting the hood at the lower end of the exit pipe, this consisting of cross shaft 20 having a sprocket 21 arranged thereon, said cross shaft having a ratchet wheel for coöperating with the pawl and being provided with a handle similar to that shown in Fig. 7. A chain 22 passes over the sprocket wheel, said chain passing over an idle sprocket wheel 23 and being connected to cross rod 24 in the hood. A turn-buckle 25 is arranged in the length of the chain to take up the slack. The hood in this instance is mounted upon the lower section of a series of telescoping pipe sections 26, 27,

and 28, the object of these being to enable the hood to be raised in the separating chamber without requiring a great amount of head room. The form of adjustment shown in Fig. 5 differs from that shown in Fig. 1 principally in the facility for quick adjustment, otherwise the two forms are substantially the same, except that the modification shown in Fig. 5 saves head space and thereby reduces the height of the separator.

Having thus described my invention, what I claim is:

1. A dust separator comprising a separating chamber, an inlet pipe leading thereinto, curved blades at the upper end of said inlet pipe, and an adjustable cap fitting over said curved blades, and provided with a downwardly extending cone-like projection which in its lowermost position extends down into the blades so as to deflect the air outwardly before it leaves the influence of said blades.

2. A dust separator comprising a separating chamber, an inlet pipe leading thereinto, a flanged cone adjustably mounted on the inner end of said inlet pipe, means for adjusting said cone so as to carry the space between the outer edge of said cone and its coöperating wall, through which space the tailings pass, and means carried by said adjustable cone for imparting a whirling motion to the dust laden air.

3. A dust separator comprising a casing, an inlet pipe leading into the lower portion thereof, a flanged cone section mounted on said inlet pipe whereby the outer edge of said cone section may be adjusted with respect to a wall of said casing with which it coöperates thereby regulating the discharge opening for the tailings, means for adjusting said cone section, a series of blades carried by said adjustable section for imparting a whirling motion to the incoming dust laden air whereby the tailings are forced over the edge of said cone section, and a discharge pipe for the fines, said discharge pipe having a flared lower end extending nearly to the walls of the casing, and means for adjusting said discharge pipe within the casing whereby the size of the expansion chamber formed by the casing may be regulated.

In testimony whereof I hereunto affix my signature this 16th day of February, 1916.

HARRY A. THUNEMAN.