

Aug. 7, 1928.

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F. J. BECKER

SCREENING DEVICE

Original Filed Dec. 31, 1923

FIG. 1.

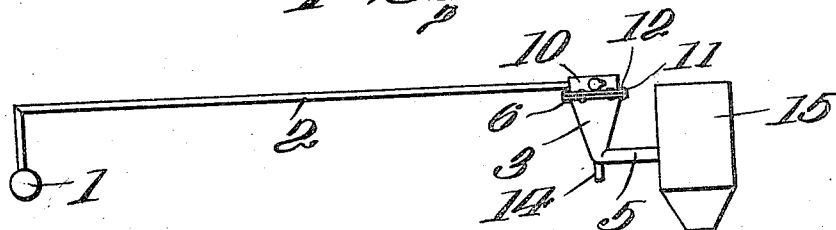


FIG. 2.

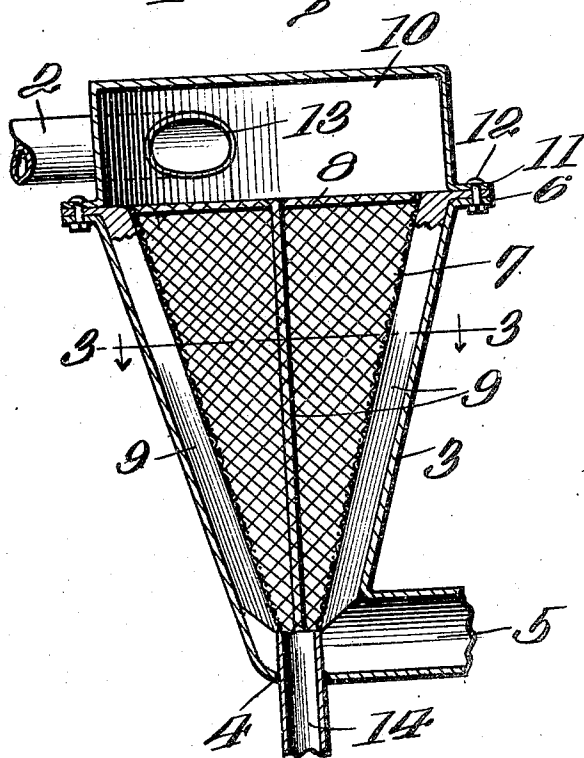
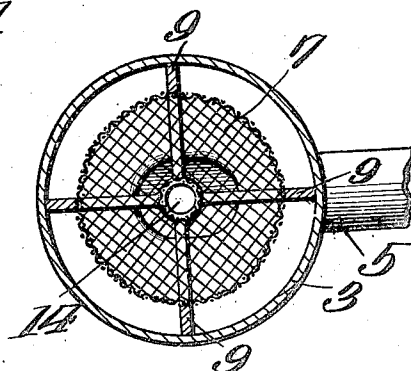


FIG. 3.



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UNITED STATES PATENT OFFICE.

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SCREENING DEVICE.

Application filed December 31, 1923, Serial No. 683,693. Renewed January 25, 1928.

This invention relates to a screening device or screening pulverized material and is especially adapted to be used for screening precious material so that all the precious particles of the materials to be screened can be collected, thereby overcoming the difficulties now existing with devices of this kind now in use.

Another object of my invention is to provide a screening device which is especially adapted to be used in connection with a grinder in which the pulverized material is carried away from the grinder by air, the construction being such that the screening device can be readily placed in the air pipe line leading from the grinder without changing the installation in any way.

Another and further object of the invention is to provide a screening device which is exceedingly simple and cheap in construction, the same being formed of parts so connected that they can be readily assembled or taken apart and when assembled, the various parts will be secured together by bolts passing through each of the parts.

A further object of my invention is to provide a screening device with a closed top for preventing the escape of the dust laden air so that all of the precious material in the air passing through the screening device can be collected.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

In the drawings,

Figure 1 is a diagrammatic view illustrating the installation of my improved construction of screening device;

Figure 2 is a vertical section through the same; and

Figure 3 is a section taken on line 3—3 of Figure 2.

In the drawing 1 indicates a grinder and 2 the air pipe leading from the grinder for conveying the material to the separator or screen, the above description being given so that the application of my improved construction of a screening device to the ordinary pipe line used in connection with a grinder can be readily understood.

In carrying out my invention I employ a funnel-shaped shell 3 provided with an opening 4 and a lateral discharge chute 5. The upper edge of the funnel-shaped shell 3

is provided with an annular flange 6 which is apertured as clearly shown and for the purpose hereinafter fully described.

Arranged within the shell 3 is an inverted conical shaped screen 7 carried by a frame composed of an annular ring 8 adapted to rest on the flange 6 of the shell 3 and provided with depending ribs 9 forming a support for the screen 7 so as to space the screen 7 away from the inner wall of the shell 3.

Said ring 8 also closes the space between the upper edge of the screen and the upper portion or edge of the shell 3.

Arranged over the shell is a cover section 10 having an annular flange 11 apertured to register with the apertures of the ring 8 of the screen support and through which bolts 12 are adapted to pass for securing the cover, screen support and shell together as clearly shown, the cover being of substantially the same diameter as the upper end of the funnel shaped shell. The cover is provided with a tangentially arranged inlet 13 into which the air pipe 2 extends so that the pulverized material conveyed by the volume of air passing through the pipe 2 will enter the cover in such a manner that a whirling action of the air and material is obtained within the shell, the coarser particles of material striking the screen and dropping by gravity are then discharged through a discharge spout 14 formed on the lower end of the inverted conical-shaped screen, said spout extending through the opening 4 formed in the shell. The shell 3 and the cover 10 may be said to comprise a casing which is entirely closed except for the inlet 13, the discharge opening 4 and the discharge chute 5.

The smaller particles which are thrown up against the screen pass through the screen and are carried with the current of air out the discharge spout 5 into a settling chamber 15 from which they can be collected.

From the foregoing description it will be seen that I have provided a screening device in which a casing is formed having a closed top and provided with a discharge spout at its lower end, one of said spouts being formed at the apex of an inverted conical shaped screening unit so as to allow the larger particles or tailings of the material to be separated to pass out through the discharge spout while the smaller particles, which are carried by the current of air, pass

through the screen and are conveyed to a settling chamber where they are collected and the air allowed to pass out of the settling chamber.

- 5 By constructing the screening device in this particular manner, the current of dust-laden air entering the closed top of the receptacle causes a whirling action of the air and material carried thereby so as to throw
10 the same against the screen in order to separate the finer particles from the coarser particles, the finer particles passing out of the receptacle with the current of air.

As shown in the drawing, the screen 7 is
15 spaced away from shell 3, a distance great enough to provide for the free flow of the air which comes in through air pipe 2. Also the discharge chute 5 is made of greater diameter than air pipe 2; whereas, discharge
20 spout 14 is of lesser diameter than air pipe 2. Since the cover 10 is locked down and no vent is provided through it, all the air that comes in by pipe 2 must escape by either outlet chute 5 or discharge spout 14.
25 Since discharge spout 14 is smaller than outlet pipe 5, the air cannot all escape through this pipe, and there will be a tendency for pressure to build up inside the screen. However, since discharge chute 5
30 is larger than the inlet, the pressure difference inside and outside this screen will be only enough to cause the air current to flow through the screen and substantially no back pressure will build up; thus very little
35 air will be forced out discharge spout 14. The air current passing through screen 7 will assist the centrifugal force generated in the device in shifting the material and will carry out of the mechanism all of the
40 fine material which, as has been pointed out, can be collected, for example, in a settling chamber 15.

What I claim is:—

1. A screening device of the kind described comprising a funnel-shaped shell
45 having an opening in its bottom and a lateral discharge spout, said shell being provided with an annular flange at its upper edge, a ring disposed on said flange having
50 depending converging ribs terminating short of the end of the shell, a funnel-shaped screen disposed on said ribs terminating short of the bottom of the shell adjacent the ends of the ribs, a closed circular cover
55 having an annular flange disposed on said ring and provided with a tangentially disposed inlet, and bolts passing through said ring and flanges of the shell and cover re-

spectively for securing said members together.

2. A screening device for fine materials comprising in combination an inverted conical screen; a shell enclosing the same with the wall of the shell spaced therefrom, said
60 shell at its upper portion being closed except for a tangential inlet through which the material to be screened is introduced by an air current into the upper portion of the
65 screen; a discharge pipe of smaller cross sectional area than the inlet leading from the bottom of the screen; a discharge pipe
70 leading from said shell of sufficient cross sectional area so that the pressure on the outside of said screen will be less than the pressure inside said screen, whereby the air
75 current will be caused to flow through said screen; and collecting means connected with said last mentioned discharge pipe.

3. A structure as defined in claim 2, in which the second mentioned discharge pipe
80 has a greater cross sectional area than the inlet pipe.

4. A screening device for fine materials comprising in combination an inverted conical screen; a casing enclosing the same and
85 spaced away therefrom, the upper end of the casing being closed and opening only into the upper open end of the screen, said upper end of the casing being provided with
90 a tangential inlet through which the material to be screened is introduced by an air current; a discharge pipe for the lower end of the screen; and a discharge pipe leading
95 from the lower portion of the space formed between the screen and casing.

5. A screening device for fine materials comprising in combination a ring shaped member; a plurality of ribs extending downwardly therefrom, said ribs converging toward their lower ends; an inverted conical
100 screen mounted on said ribs and making a close fit with the ring, said screen being open at its lower end; a discharge pipe extending therefrom; a conical shell placed
105 about the ribs and held in spaced relation to the screen by said ribs; a discharge spout opening into the lower end of the shell; and a closed cover overlying the upper open end
110 of the screen, said cover being provided with a tangential inlet for the introduction of an air current carrying the material to be screened, said inlet being of an area less than that of the discharge spout.

In testimony whereof I hereunto affix my signature.

FRANK J. BECKER.