

No. 817,975.

PATENTED APR. 17, 1906.

H. L. KENT.  
SCREENING APPARATUS.  
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Fig. 1.

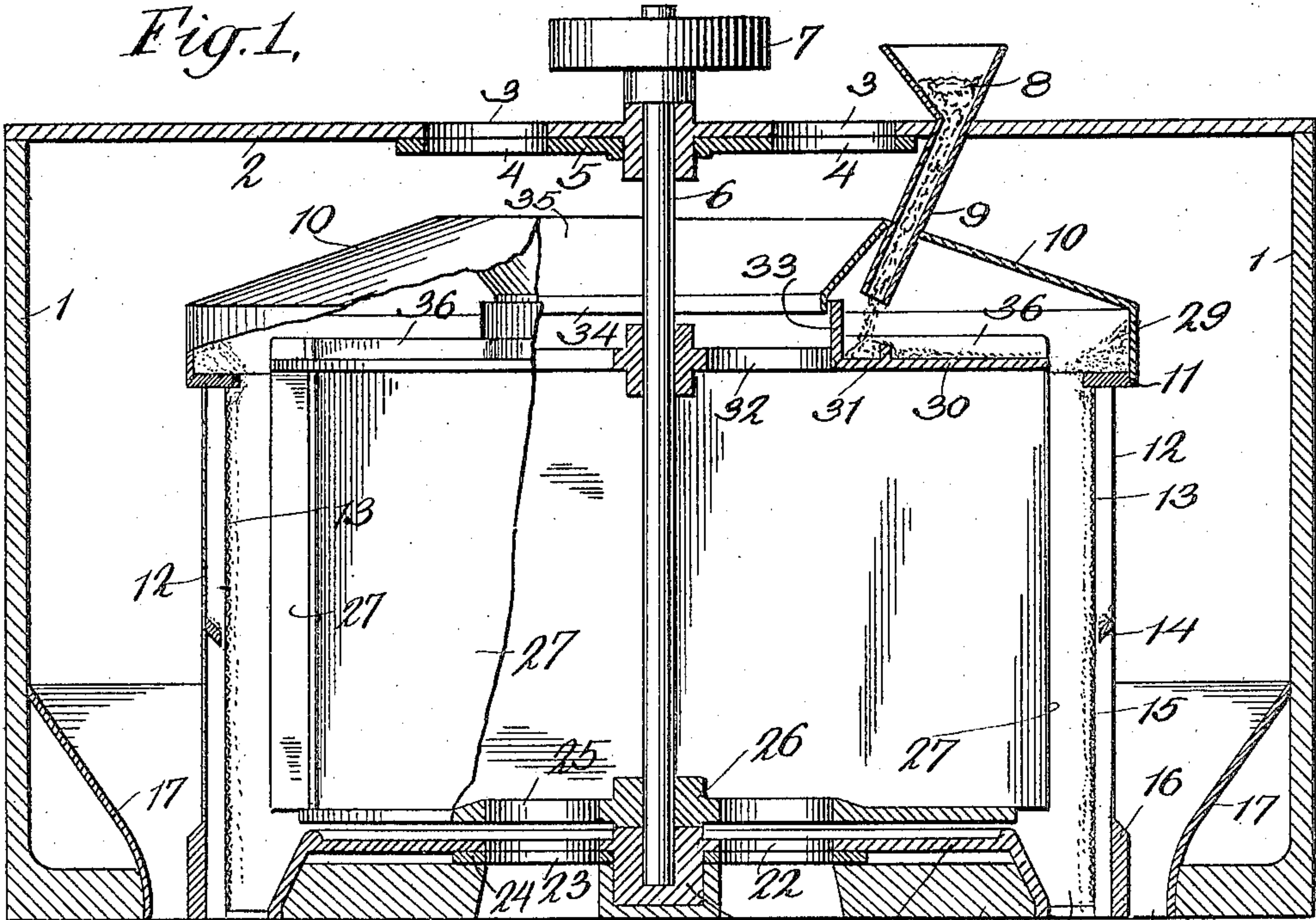


Fig. 2.

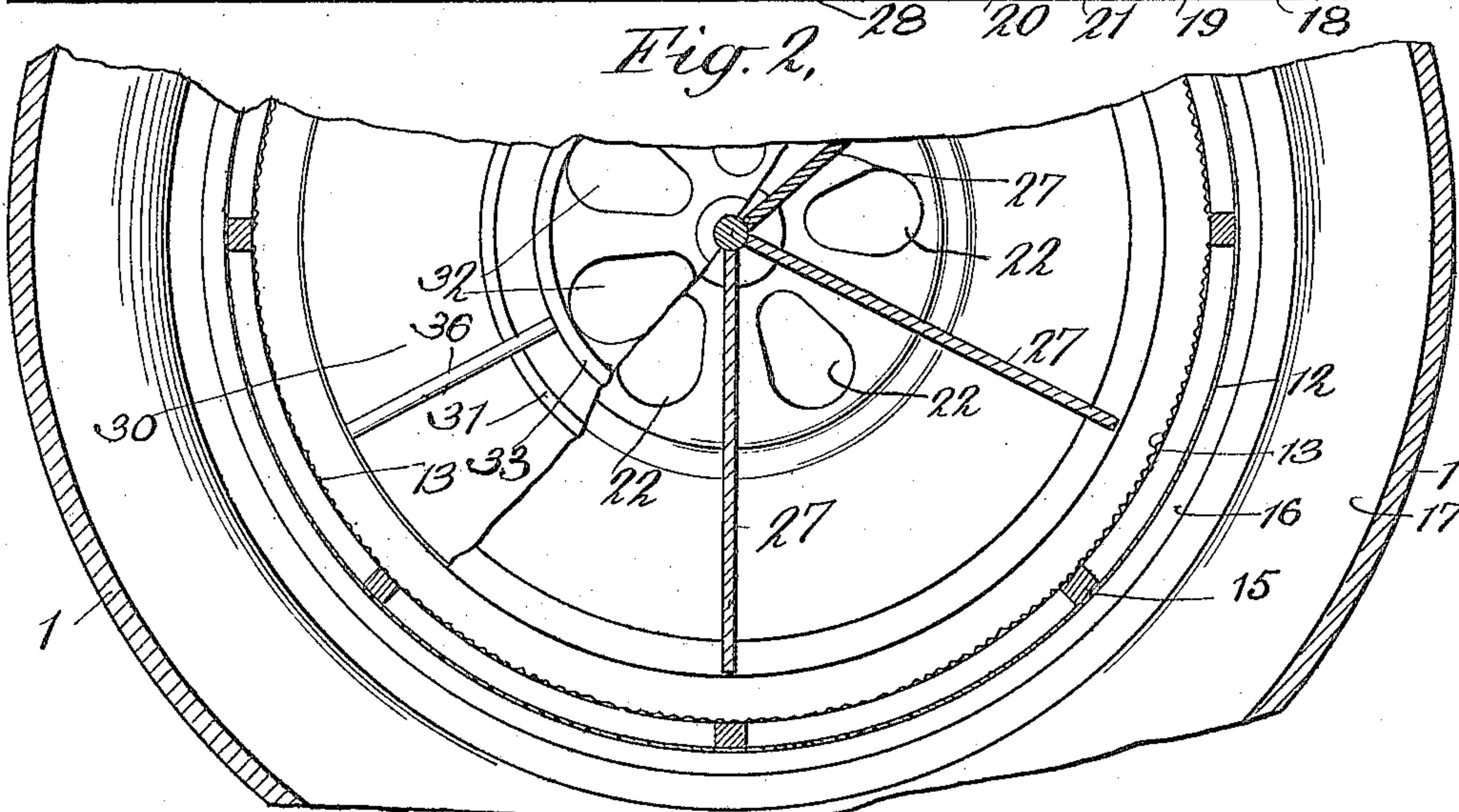


Fig. 3.

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## SCREENING APPARATUS.

No. 817,975.

Specification of Letters Patent.

Patented April 17, 1906.

Application filed April 6, 1904. Serial No. 201,823.

*To all whom it may concern:*

Be it known that I, HORACE L. KENT, a citizen of the United States, and a resident of Brooklyn, city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Screening Apparatus, of which the following is a specification, taken in connection with the accompanying drawings, which form a part of the same.

This invention relates to screening apparatus, and relates especially to apparatus in which material is allowed to fall adjacent the face of the screen and the smaller particles are deflected and forced through the screen.

In the accompanying drawings, in which the same reference-numerals refer to similar parts in the several figures, Figure 1 is a vertical sectional view. Fig. 2 is a partial horizontal section of the same. Fig. 3 is a partial vertical section of a modified construction.

In the illustrated embodiment of this invention an upright or substantially vertical screen is indicated, and the material, which may be cement, rock, mineral substance, or other material, passes through feeding means by which it is allowed to fall adjacent the face of the screen and substantially parallel to the same. This stream of falling material is acted upon by deflecting means, such as a blast-fan or similar deflecting device, and the smaller particles are deflected toward and through the screen, while the heavier particles do not come into such contact with the screen or weir as to clog the same.

In Fig. 1 the upright screen 12 is indicated as being of circular form and may be supported in any desired way, a series of uprights 15 being indicated, to which this screen is secured. If desired, a second screen 13, preferably of somewhat coarser mesh and stronger material, may be mounted adjacent the screen 12, so as to act as a guard-screen. It is not necessary, however, that a plurality of screens be employed in every instance. As is seen in Fig. 3, a single screen 40 may be used, and, furthermore, the screen instead of being cylindrical, as is indicated in Fig. 1, may have a tapered form flaring downward, as indicated in Fig. 3, or having its lower end contracted.

The material is acted upon by suitable feeding means, so as to feed it in a thin and uniform stream which is allowed to fall adjacent the screen. As indicated in Fig. 1, the feed-

ing-head 30 is mounted upon a suitable shaft 6 and can be rotated by the pulley 7. This head comprises the annular collar 33 and the ledge 31, which is somewhat lower, and also comprises a series of ribs 36, which may be substantially radial. The feeding-shelf 11 is preferably located at a slightly-lower level than the feeding-head, and the hood 10, which is preferably formed with the sloping upper faces indicated, serves to inclose this feeding-space and to prevent the disturbance of the feed by excessive air-currents. The material 8, which is fed down the spout 9 of the hopper, falls upon the feeding-head and after passing over the ledge 31 is thrown outward within the ribs 36 and collects upon the feeding-shelf 11, forming the sloping pile of material 29, against which the additional material strikes, thus preventing the abrasion or wearing of the shelf and adjacent parts. The material falls from the inner edge of this feeding-shelf in a substantially uniform sheet or stream which normally tends to fall adjacent the screen-face and substantially parallel thereto.

A fan or similar deflecting device may be used to deflect the lighter particles of the falling stream of material toward and through the screen or screens. In Figs. 1 and 2 the fan is indicated as composed of a series of fan-blades 27, mounted in this case so as to be rotated with the feeding-head, a lower fan-head 26 being mounted upon the shaft 6 and the fan-blades being thus securely held. The lower end of the shaft 6 rotates in a suitable bearing 28 in the base-plate 20. The screen and other parts of the apparatus are preferably inclosed in a suitable casing which is formed with a top 2, having a number of valve-apertures 3. These apertures are controlled by the valve 5, which is provided with cooperating apertures 4, but which when rotated is adapted to close these apertures, and thereby govern the access of air to the casing at this point. The base-plate 20 is formed with similar valve-apertures 22, controlled by a similar rotary valve 24, having the apertures 23. In this way air may be admitted to the extent desired, and this air passes into the fan through the opening formed by the central part 34 35 of the hood and through suitable holes 32 in the feeding-head of the fan. The air passing through the holes in the base 21 enters the lower fan-head through the holes 25, and the air is driven outward under centrifugal action through the screens.



The air passing through the screens may of course circulate upward within the casing and again pass through the fan by moving downward through the throat of the hood and the holes 32, or, if desired, a similar closed circulation may take place below the screens.

In using this apparatus for the screening of pulverized material the screening action is very rapid, because the material does not come into such contact with the face of the screen as to clog the same, but, on the contrary, the stream of material falls adjacent the screen-face and the lighter particles are deflected and blown through the screen, and where a multiple screen is used, as is indicated in Fig. 1, the lighter particles are forced through the guard-screen 13 and then are forced through the finer screen 12. In order to keep the larger particles, which do not pass through the screen, more effectively out of contact with the screen-face, a number of guides may be employed, and these guides may have the inclined form 14, serving to remove the falling material to the proper distance from the screen-face. These deflectors are not so necessary where a downwardly-flaring screen 40 is used, as indicated in Fig. 3, since in that case the material thrown outward by the feeding-head 42 and falling from the feeding-ledge 39 is not deflected to such an extent against the screen-face as to interfere with the proper action. In this modified form of apparatus shown in Fig. 3 the deflection of the finer particles is caused by the fan-blades 38, rotated by the pulley 37, as in the other case, these blades being mounted between the feeding-head and the lower fan-head 43. As the particles are deflected outward through the screen they are to some extent given a rotary motion, so that instead of moving directly outward and passing perpendicularly through the screen they pass through at an angle to the screen-face, so that the particles passing through the screen are finer than if they were allowed to move perpendicularly to the screen-face in passing through. In this way a fifty-mesh screen will give a separation equivalent in some cases to what would be produced by a one-hundred-mesh screen under ordinary circumstances. The fine or screened material is discharged through the chute 18 between the partitions 16 and 17, and the coarse or unscreened material is discharged from the annular chute or opening 19. (Shown in Fig. 1.) The discharge of these materials may be aided, if desired, by the blast of the fan.

It is of course understood that those familiar with this art may make many modifications in the form, proportions, and number of parts of this apparatus. Parts of the same may be employed without using the whole, and parts may be employed in connection with other devices without departing from the spirit of this invention or losing the ad-

vantages of the same. I do not, therefore, desire to be limited to the details of the disclosure which has been made in this case; but

What I claim as new, and what I desire to secure by Letters Patent, is set forth in the appended claims:

1. In screening apparatus, a circular screen, a circular guard-screen adjacent said screen to protect the same, a casing inclosing said screens and provided with adjustable valves controlling openings therein, a vertical rotary fan within said screens and formed with a feeding-head having ledges and ribs, an inclosed annular feeding-shelf adjacent said screen to receive material from said head and to allow a stream of said material to fall adjacent the face of said screens, portions of said material being deflected and blown through said screens by said fan and a guide to carry said falling material out of contact with a face of said screens.

2. In screening apparatus, an upright circular screen, a casing inclosing said screen, a vertical rotary fan within said screen, a rotary feeding-head, a feeding-shelf cooperating with said head to receive material therefrom and to allow a stream of said material to fall adjacent the face of said screen, and a guide to carry said falling material out of contact with said screen-face, said material falling out of the path of said fan, portions of said falling material being deflected and blown through said screen by said fan.

3. In screening apparatus, a substantially circular upright screen, a guard-screen adjacent said screen, a stationary feeding-shelf having a flatter angle than the angle of repose of the material, means to feed material to said shelf to form a pile thereon against which the material impinges to produce a falling stream of material adjacent said guard-screen and a vertical rotary fan within said screens out of the path of said falling material.

4. In screening apparatus, a substantially upright screen, a casing inclosing said screen, blast devices within said screen, a feeding-head to receive material, a stationary feeding-shelf having a flatter angle than the angle of repose of the material cooperating with said head to form on said shelf an inclined pile of material against which the material supplied from said head impinges so as to produce a stream of falling material adjacent said screen, portions of said material being deflected and blown through said screen by said blast devices.

5. In screening apparatus, a substantially upright screen, a casing inclosing said screen, a rotary fan within said screen and provided with a feeding-head, a stationary feeding-shelf cooperating with said head to receive material therefrom to form a pile of material on said shelf against which the material from said head impinges to produce a stream of



falling material adjacent said screen, said feeding-shelf and head being substantially inclosed to secure uniform feed of material.

5 6. In screening apparatus, a substantially upright screen, a feeding-shelf, a rotary feeding-head within said shelf and cooperating therewith to form an inclined pile of material on said shelf against which the material from

said head impinges so as to produce a stream of material falling over the edge of said shelf 10 and adjacent said screen.

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