

(No Model.)

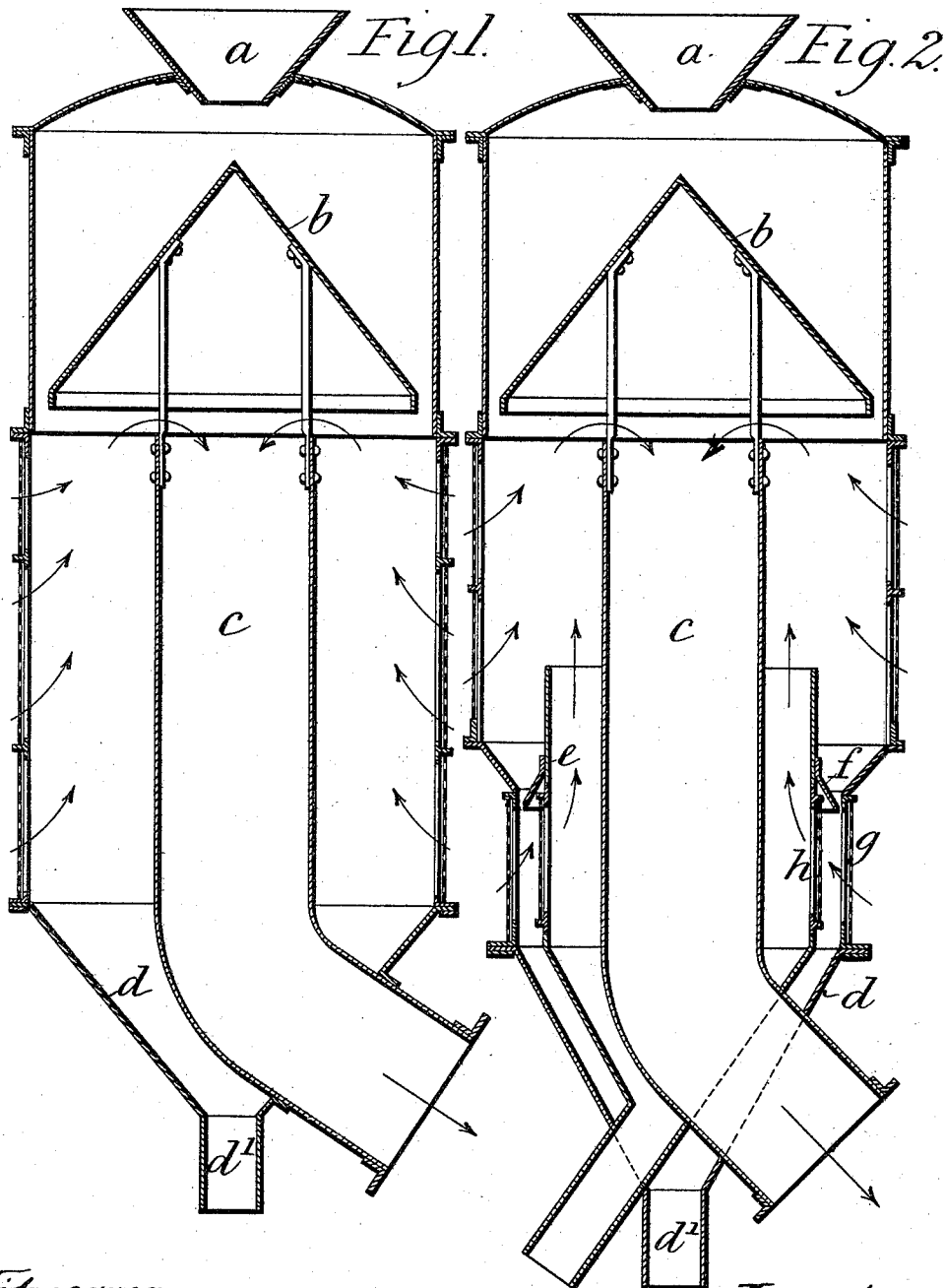
2 Sheets—Sheet 1

H. PAPE & W. HENNEBERG.

APPARATUS FOR GRADING AND REMOVING DUST FROM PULVERIZED
ORE, &c.

No. 584,647.

Patented June 15, 1897.



Witnesses.

Nancy S. S. S.
Thos. A. Green

Inventors.

Hermann Pape
Wilhelm Henneberg.
By James L. Norris
Atty.

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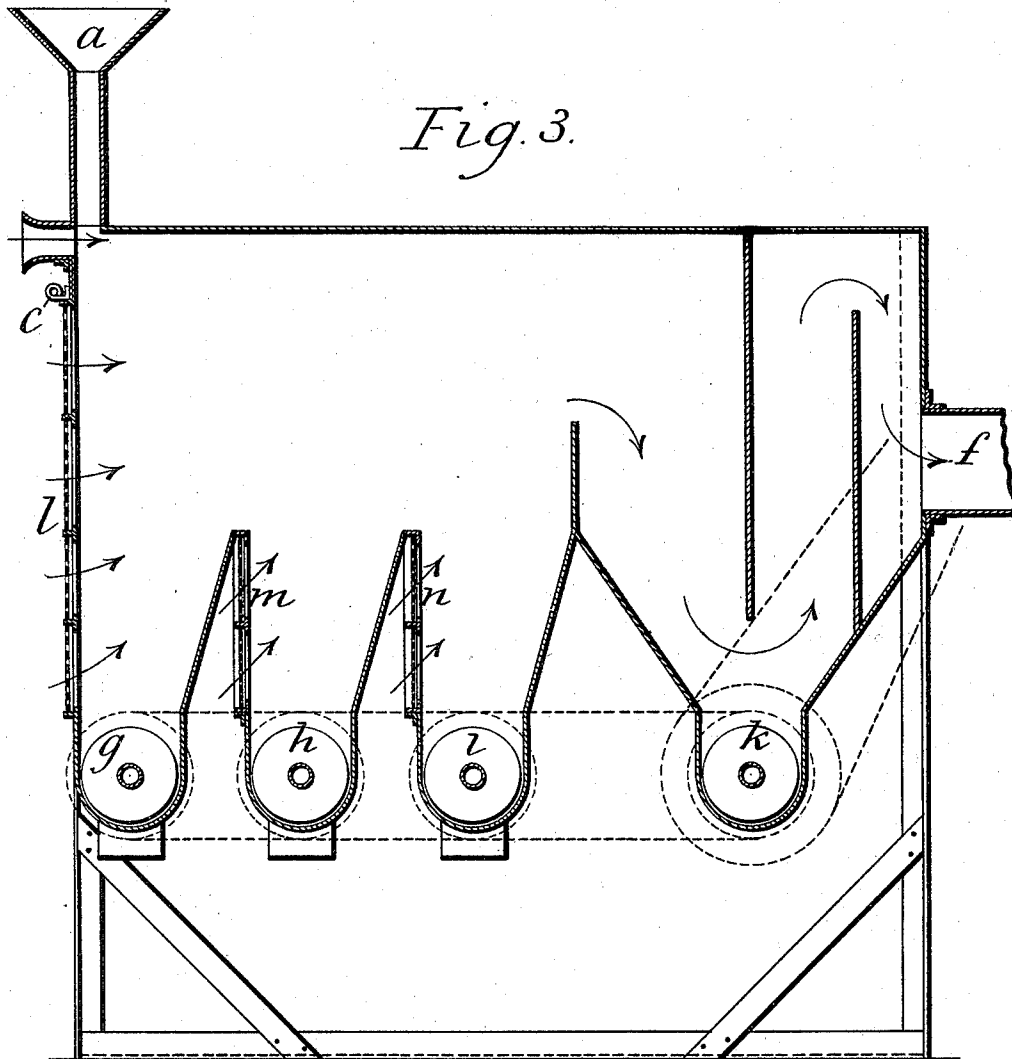
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UNITED STATES PATENT OFFICE.

HERMANN PAPE AND WILHELM HENNEBERG, OF HAMBURG, GERMANY.

APPARATUS FOR GRADING AND REMOVING DUST FROM PULVERIZED ORE, &c.

SPECIFICATION forming part of Letters Patent No. 584,647, dated June 15, 1897.

Application filed October 31, 1896. Serial No. 610,752. (No model.)

To all whom it may concern:

Be it known that we, HERMANN PAPE and WILHELM HENNEBERG, engineers, citizens of Hamburg, residing at 36 Hohe Bleichen, Hamburg, in the Empire of Germany, have invented certain new and useful Apparatus for Grading and Removing Dust from Pulverized Ore and other Granulated Materials, of which the following is a specification.

10 This invention relates to apparatus for removing dust from pulverized ores and such like substances and, if necessary, to separate the residue into grades of different size or gravity.

15 There are already in use various apparatus by which falling pulverized materials are acted on by currents of air which carry away the dust and deflect more or less the falling material so that the particles of different size and gravity are collected in separate groups. 20 In such apparatus it is very desirable that the current of air should, as far as possible, act upon the powdered material throughout the whole fall of the particles, that it should be practicable to vary the velocity of the current at different places, and that "eddies" should be avoided in the interior of the apparatus. In order to fulfil these conditions, the sides of the apparatus by which the air enters are constructed of sieve fabrics or finely-perforated metal or other material. In passing through these the air-current meets with frictional resistance which is greater the smaller the apertures and the greater the thickness of the perforated or pervious material, so that the quantity of the air which passes through it depends upon its texture and thickness. Thus with a given volume of air exhausted the inflow of air from without may be spread 40 over a pervious surface of any desired area, and the air-current may thus be made to play upon any required height of fall if the texture or material forming the sides of the apparatus is suitably selected. No eddies are formed, as the air-filaments, immediately after passing the pervious side, unite into one steady current passing through the apparatus; also, the velocity of successive parts of the height may be varied by varying the thickness and 50 perforations of the corresponding parts of the sides.

Figure 1 of the accompanying drawings rep-

resents an apparatus of cylindrical form for the removal of dust. The material drops through the funnel *a* on the conical distributor *b* and thence in the form of an annular stream down the interior of the apparatus. By a central exhaust-tube *c* air is drawn through the pervious sides, separating the dust, which is carried away by the tube *c*, while the material freed from dust passes away by the cone *d* to the central chute *d'*. Fig. 2 represents a similar apparatus modified so as to effect not only the removal of the dust, but also a classification or grading of the granulated residue. For this purpose there is provided an internal vessel *e*, into which the least heavy particles drop, being deflected by the air-current entering at *g*. In order to prevent eddies at the upper edge of *e*, air is drawn through it, entering through the pervious side *h*, the conical deflector *f* preventing the air drawn through *g* from flowing upward without passing through *h*. Fig. 3 is a section of an apparatus of rectangular form.

The crushed material dropping through the funnel *a* is first acted on by air entering at *b*, driving forward the lightest particles, while the heaviest fall into the first recess and are carried away by a worm or other conveyer *g*. Air-currents entering at successive places *l m n* act in the same way, separating the material into classes, which are removed by the conveyers *h, i, and k*, the dust passing away by the outlet *f*.

The arrangement of pervious sides in apparatus for grading pulverized materials may be varied in many ways; but it is essential that they should be such that the air-currents are directed on the descending material through a considerable height of its fall.

The use of ventilating perforated sides in air-sifting-machines may be varied as to many other details; but the object of ventilating-sides will remain the same—viz., to distribute the air-current over a surface of such size and shape that the falling material is met throughout a sufficient length of fall by a steady-flowing current of air.

Having thus described the nature of this invention and the best means we know of carrying the same into practical effect, we claim—

In an apparatus for separating dust from

pulverized materials, the combination with
a cylindrical casing having pervious walls
and provided at its upper end with a feed-
hopper and at its lower end with a discharge-
5 outlet, of an air-exhaust pipe extending up
through the bottom of the casing to the up-
per portion thereof, a conical deflector ar-
ranged above the upper end of said pipe, a
cylindrical shell arranged between the lower
10 portion of the air-exhaust pipe and the walls
of the casing, said shell having an open upper
end and provided at its lower end with a dis-
charge-spout projecting through the bottom
of the casing and having pervious side walls,

and a conical deflector arranged above said 15
pervious side walls and between the casing
and shell, substantially as described and for
the purpose specified.

In testimony whereof we have signed our
names to this specification, in the presence of 20
two subscribing witnesses, this 12th day of
October, A. D. 1896.

HERMANN PAPE.
WILHELM HENNEBERG.

Witnesses:

E. H. MUMMENHOFF,
CHAS. H. BURKE.