

R. STEIN.
SEPARATOR.

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916,625.

Patented Mar. 30, 1909.

2 SHEETS—SHEET 1.

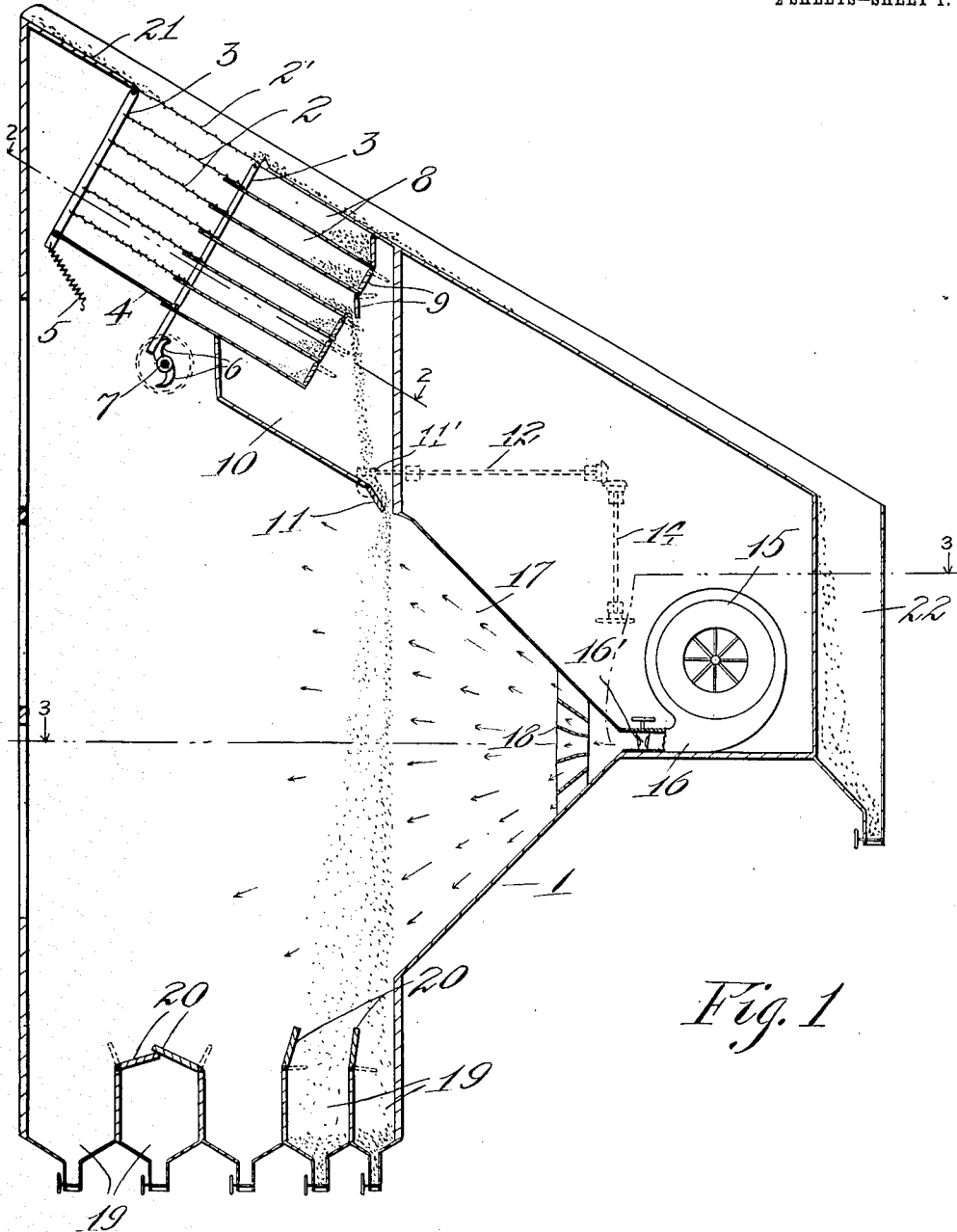


Fig. 1

WITNESSES:

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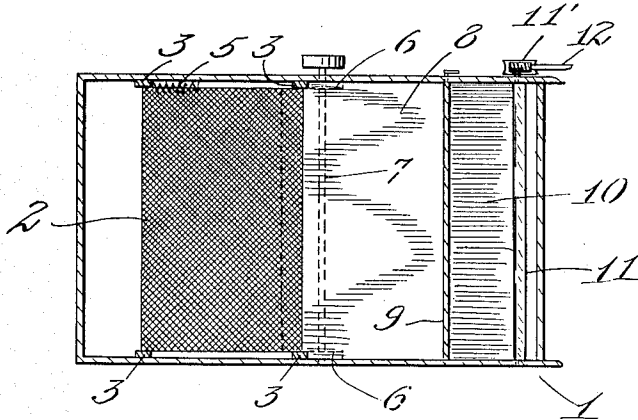


Fig. 2

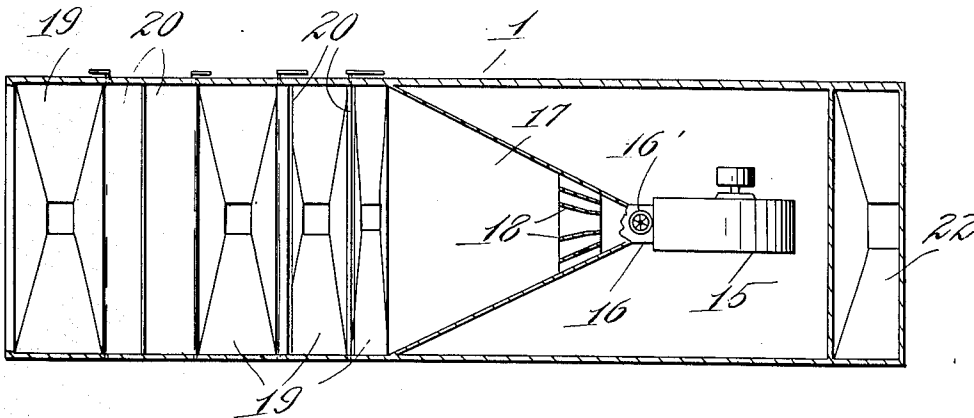


Fig. 3

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UNITED STATES PATENT OFFICE.

ROBERT STEIN, OF SEATTLE, WASHINGTON.

SEPARATOR.

No. 916,625.

Specification of Letters Patent.

Patented March 30, 1909.

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To all whom it may concern:

Be it known that I, ROBERT STEIN, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Separators, of which the following is a specification.

My invention relates to certain improvements in separators, particularly adapted for separating ore and has for its primary object to provide an efficient apparatus of this character wherein the materials are separated in traveling across the path of a current of air.

A further object resides in the provision of suitable mechanism by which the materials are first segregated by screens and the graded lots deposited into separate bins, whereby materials of predetermined size or volume can be fed for separation by the air.

With the above and other objects in view, to be referred to as the description progresses, the invention resides in the structural features, arrangement and combinations of parts, hereinafter described and more particularly pointed out in the claims hereto annexed.

Referring now to the accompanying drawings, in which like numerals of reference indicate like parts throughout the several views: Figure 1 is a view shown in vertical section of an apparatus constructed in accordance with my invention. Fig. 2 is a section taken on line 2—2 of Fig. 1, and Fig. 3 is a horizontal sectional view of the apparatus, taken on line 3—3 of Fig. 1.

Reference numeral 1 indicates a suitable casing, in the upper portion of which are a plurality of screens or sieves 2, arranged one above the other and connected at their ends to rigid members 3, pivoted at their upper ends, as shown. These sieves or screens form the grading means of the apparatus, the upper screen being of comparatively coarse mesh, and those below the same being each formed of a finer mesh than the preceding one, and at the bottom a solid wall 4 is provided, the same being secured to members 3. This grading means is swung so as to agitate the materials deposited thereon by a suitable spring 5, and suitable cam wipers 6, fixed to a shaft 7, to which power is applied, as by a belt (not

shown), said cam wipers being adapted to engage the depending extension of one of the members 3, as clearly shown in Fig. 1, and swing the grading means in one direction, and said spring returning the grading means to its normal position, as the wiper moves from engagement with member 3, as will be readily understood.

Screens 2 are set at a suitable inclination, and their lower or discharge ends project into bins 8, in which the graded materials are stored. Bins 8 are provided with doors 9, which normally are closed so as to prevent the materials being discharged into the hopper 10. Hopper 10 has a discharge mouth provided with a suitable gate 11, which may be adjusted to vary the width of the stream of material falling from the hopper. Said gate, as now considered, is supported for swinging, and on the projecting end of one of its pivots is provided with a worm gear, with which a worm 11', meshes. Worm 11' is fixed to a shaft 12, which is coupled to a suitable shaft 14, arranged to be within convenient reach of the operator, by suitable beveled gears, as shown.

Reference numeral 15, indicates a fan, which may be operated in any desired manner. Communicating with the outlet opening of the casing of said fan is a pipe 16, having a valve 16'', through the medium of which the discharge of air through the said pipe is controlled. Pipe 16 leads to a flared mouth 17 in front of which the material falling from hopper 10 passes. As now considered, the upper wall of mouth 17 extends to and is secured to said hopper at a point in proximity to the mouth thereof (see Fig. 1), whereby the material immediately upon leaving the hopper is subjected to the action of the air. Within the mouth 17 are suitable deflectors 18, which distribute the air both vertically and horizontally in an even manner. In the lower portion of casing 1 are bins 19, arranged longitudinally of the path of the air discharged by the fan, and below the same, said bins being provided with deflectors 20 hinged to the side walls of the bins, so as to be capable of being adjusted more or less over the adjacent bins, as is found desirable to cause the falling materials to be caught in predetermined bins.

In operation, one of the doors 9 is opened, and the contents of its bin allowed to discharge into hopper 10. The valve 16' is now operated to regulate the force of the air rela-

tively to the grade of material to be fed from the hopper. Then gate 11 being opened, the material falls in sheet form from the hopper across mouth 17. The lighter materials will
 5 obviously be deflected farthest in the direction of the travel of the air and be caught in those bins 19 arranged farthest from mouth 17, while the heavier particles will be caught in the nearer bins, as will be readily under-
 10 stood.

The invention is particularly adapted for separating gold and other minerals from sand and powdered quartz or gravel, but I do not wish myself to be understood as limiting my invention to this particular use. The
 15 material to be graded is fed by gravity down an inclined chute 21 and onto a fixed screen 2', arranged directly over screens 2, and such material as falls through said screen 2' will be
 20 graded, as previously described. The remainder passes from screen 2' and is preferably caught in a suitable receptacle or bin 22.

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

1. A separator comprising a hopper, a gate for controlling the discharge of material

therefrom, means to grade the material, means to control the graded material where-
 by the different grades of material can be dis- 30
 charged into said hopper one at a time, means to direct air for discharge through the material falling from said hopper, means to vary the force of the air, and means to catch
 35 the falling material.

2. A separator comprising a hopper, a gate for controlling the discharge of material therefrom, a plurality of bins communicating with said hopper, means for normally pre-
 40 venting material falling from said bins into said hopper, a plurality of screens arranged one above the other and arranged to discharge each into its own bin, means to direct
 45 air for discharge through the material falling from said hopper, and means arranged lengthwise of the path of said air and below the same for catching the falling material.

Signed at Seattle, Washington this 20th day of November 1907.

ROBERT STEIN.

Witnesses:

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 FRANCES H. RICHARDSON.