

W. SNEE.
GOLD SEPARATOR.

APPLICATION FILED DEC. 29, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

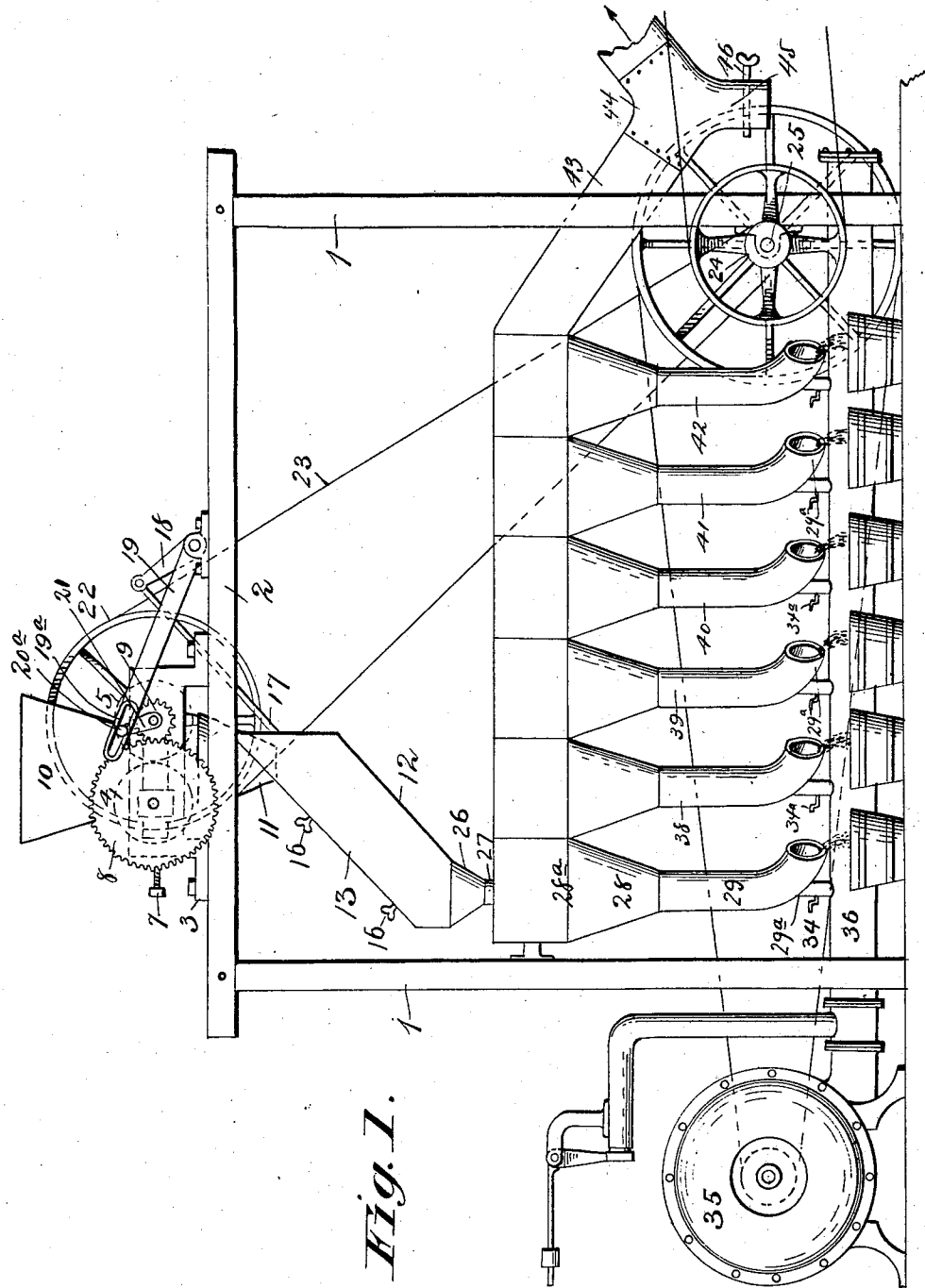


Fig. 1.

Witnesses:

F. L. Orvand.

Frank G. Radelfinger

Inventor:

Wm Snee,
by Louis Ragger & Co.,
Attorneys.

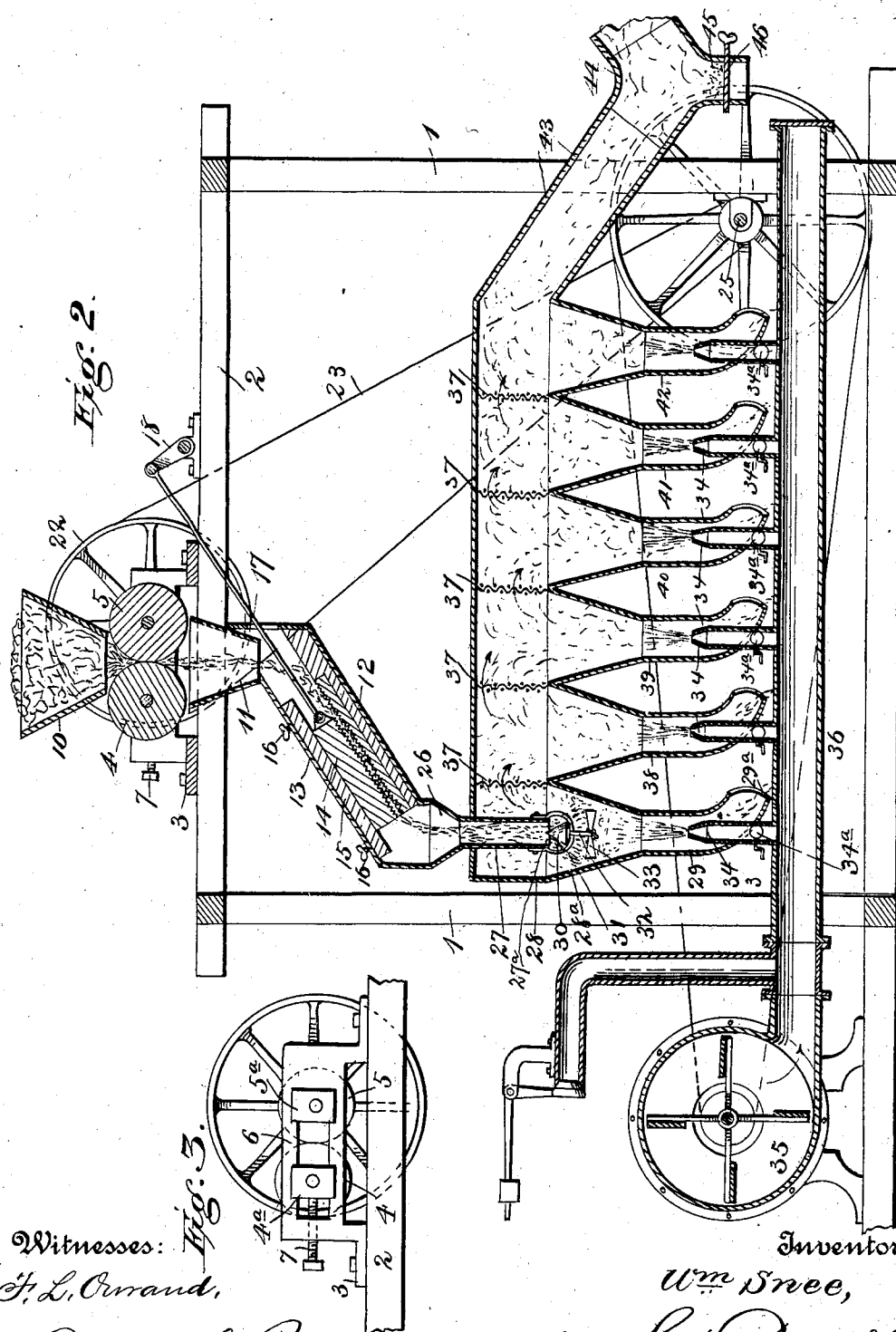
No. 739,231.

PATENTED SEPT. 15, 1903.

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2 SHEETS—SHEET 2.



Witnesses:
J. L. Orrand,

Frank G. Radelfinger,

Inventor:

Wm Snee,

by Louis Bagge & Co.,
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM SNEE, OF WEST ELIZABETH, PENNSYLVANIA, ASSIGNOR OF
THREE-FOURTHS TO JOHN A. SNEE, OF PITTSBURG, PENNSYLVANIA.

GOLD-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 739,231, dated September 15, 1903.

Application filed December 29, 1902. Serial No. 137,035. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SNEE, a citizen of the United States, residing at West Elizabeth, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Gold-Separators, of which the following is a specification.

My invention relates to crushers and separators for mineral-bearing ore; and the object of the same is to construct a dry crusher for reducing the quartz to powder and a pneumatic separator for separating the granules of mineral from the sand while the whole mass is in its dry condition.

The simple and novel construction employed by me in carrying out my invention is fully described and claimed in this specification and illustrated in the accompanying drawings, forming a part thereof, in which—

Figure 1 is a side elevation of my complete apparatus set up in working order. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is an end elevation of the feed-rollers and guides.

Like numerals of reference designate like parts in the different views of the drawings.

The numeral 1 designates a suitable framework supporting a floor 2, upon which my improved crusher is mounted. This crusher is designed to reduce the quartz to a fine powder and comprises, essentially, a base 3 and two crushing-rollers 4 and 5 of equal diameter. These crushing-rollers are journaled in boxes 4^a and 5^a, respectively, mounted on the base 3. The boxes 4^a for the roller 4 are adjustably mounted in guides 6 and are normally held against movement by a set-screw 7. By this means the coarseness of the crushed material is controlled. The roller 4 carries a gear 8, which meshes with a smaller gear 9 of about one-fourth the diameter of the gear 8, so that the rollers travel at different speeds and tend to polish or flatten the grains of gold. A hopper 10 serves to hold a supply of ore to be crushed, and a spout 11 catches the ground material as it falls from between the rolls.

Located just below the spout 11 is an inclined plane 12, which may be slightly roughened, and mounted above this plane is a guide

13, parallel therewith, and a rubber 14 is mounted to slide between the guide and the plane to serve to complete the grinding of the ore. A wear strip or shoe 15 is mounted in the guide 13 and is held by adjusting-screws 16, by means of which the pressure of the rubber 14 on the plane 12 may be regulated. The rubber 14 is actuated by means of a rod 17, connected at one end thereto and pivoted at its other end to the short arm 18 of an elbow-lever, the long arm 19 of which has a slot 19^a formed therein, which is engaged by a crank-pin 20^a, seated in a crank 21, keyed on one of the spindles of the roller 5, the other spindle of which carries a fly-wheel 22, which is driven by a belt 23, which passes over a pulley 24, fixed on a main driving-shaft 25, which is driven from some source of power. The dry ground material runs down by gravity and drops off of the lower end of the plane 12, where it is caught by a hopper 26, fixed on the upper end of a spout 27, which extends downward and into the mouth of a closed separator 28, having an enlarged hopper-shaped mouth 28^a and a reduced body 29. A right cone 30 is located opposite the mouth 27^a of the spout 27 and is supported by arms 31, attached thereto. A stem 32 is seated in the base of the cone 30 and serves as an axle to support a horizontal fan 33, set to catch a blast of air issuing from a nozzle or twyer 34, extending into the lower end of the body 29 of the separator and pointed to direct a blast upwardly. The nozzle is supplied with a valve 34^a to regulate the flow of air which is supplied by a blower 35, which communicates with the nozzle 34 by means of a pipe 36. The blower 35 is of ordinary construction but of large capacity. A screen 37 is mounted in the upper end of the mouth 28 of the separator.

By the construction just described the powdered ore is directed toward the cone 30, which spreads the stream of crushed material which receives the impact of the air-blast from the nozzle 34, the force of which is regulated to raise the light particles and force them through the screen 37 and to permit the heavy grains of gold to fall and run out the lower end of the separator, which is curved to form a spout 29^a.

In order to insure the complete separation of the precious metal, several additional separators 38, 39, 40, 41, and 42, which are connected one to the other and separated by
 5 screens 37, through which the powdered material is forced by air-blasts issuing from nozzles 34, connected to the pipe 36 and provided with valves 34^a, which serve to regulate the force of the blast through the nozzles
 10 34. A discharge-chute 43 is connected to the last separator 42 of the series and has an elbow 44 therein, within which a trap 45 is mounted to catch and retain any heavy gold-bearing material which has floated over and
 15 passed through the screens 37 of the separators. The material caught by the trap can be removed through a sliding bottom 46, mounted in suitable guides and normally secured against withdrawal by suitable means.
 20 In operation the ore is first reduced to manageable size before being placed in the hopper 10, from whence it passes down through the rollers 4 and 5, which are driven at different speeds to free the particles of gold from the
 25 base materials, so that they will have greater specific gravity and be more easily separated from the sand. The action of the rubber 14 will still further reduce the size of the base material and also clean the gold. The cone
 30 30 will spread the stream out thin and enable the blast of air to easily float the light material, which will ascend and pass out through the screen 37. The blasts issuing from the other nozzle 34 in the separators are graduated by means of the valves 34^a, the force
 35 of the blast in the first separator 38 being the greatest. That in the separator 38 is a little less and so on down to the last separator 42, which has the weakest blast of all. The force
 40 of the blast used will vary with the coarseness of the gold. The most of the gold will be recovered by the first separator 28, while the others will receive fine gold or gold-bearing sulfurets or even baser metal depending
 45 on the force of the air-blasts employed. The number of separators may be varied at pleasure and a greater or less number than shown may be employed, depending on the material to be separated.
 50 I do not wish to be limited as to details of construction, as these may be modified in many particulars without departing from the spirit of my invention.

While I have specifically mentioned gran-

ules of gold as the precious material to be 55 separated, my separator is equally applicable to the separation of any mineral of high specific gravity which occurs in the ore in the form of grains and not uniformly distributed throughout the mass. 60

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a pneumatic separator, the combination of a casing having a closed hopper-shaped 65 upper portion and a reduced lower body portion open at the bottom, a screen mounted in an opening in the side walls of said hopper-shaped portion, a feed-spout extending into the said upper portion of said casing to a point below the bottom of said screen, and a nozzle 70 extending into said reduced portion and in alinement with said feed-spout to direct a blast of air against the powdered ore entering through said spout, substantially as described. 75

2. In a pneumatic separator, the combination of a separator or casing comprising a closed hopper-shaped mouth and a reduced body open at its lower end to form a spout, 80 a screen mounted in an aperture in said casing, a spout extending into said mouth, a cone mounted opposite the lower end of said spout and bearing a stem carrying a fan, and a nozzle extending into said reduced body 85 and directed toward said fan to drive it to break up the stream issuing from said nozzle to float the lighter particles and force them through said screen, substantially as described. 90

3. In a pneumatic separator, the combination of a casing, a screen mounted in an aperture in the walls of said casing, a spout extending into said casing and extending down to a point below said screen, a fan 95 mounted below the lower end of said spout, and a nozzle mounted to direct a blast of air against said fan to break up the stream of ground material and float all but the heavy grains and drive them through said screen, 100 substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM SNEE.

Witnesses:

BENNETT S. JONES,

FRANK G. RADELFINGER.