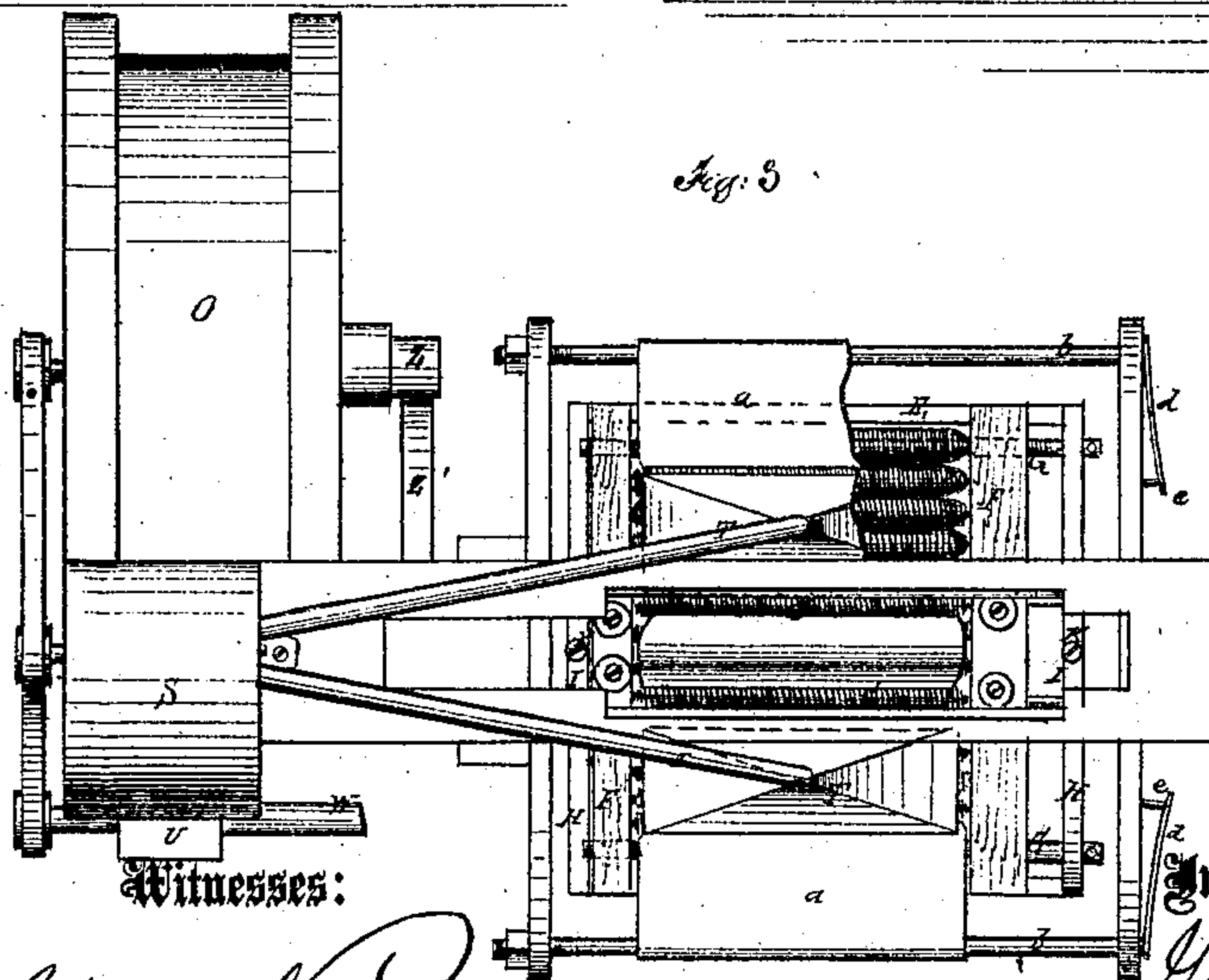
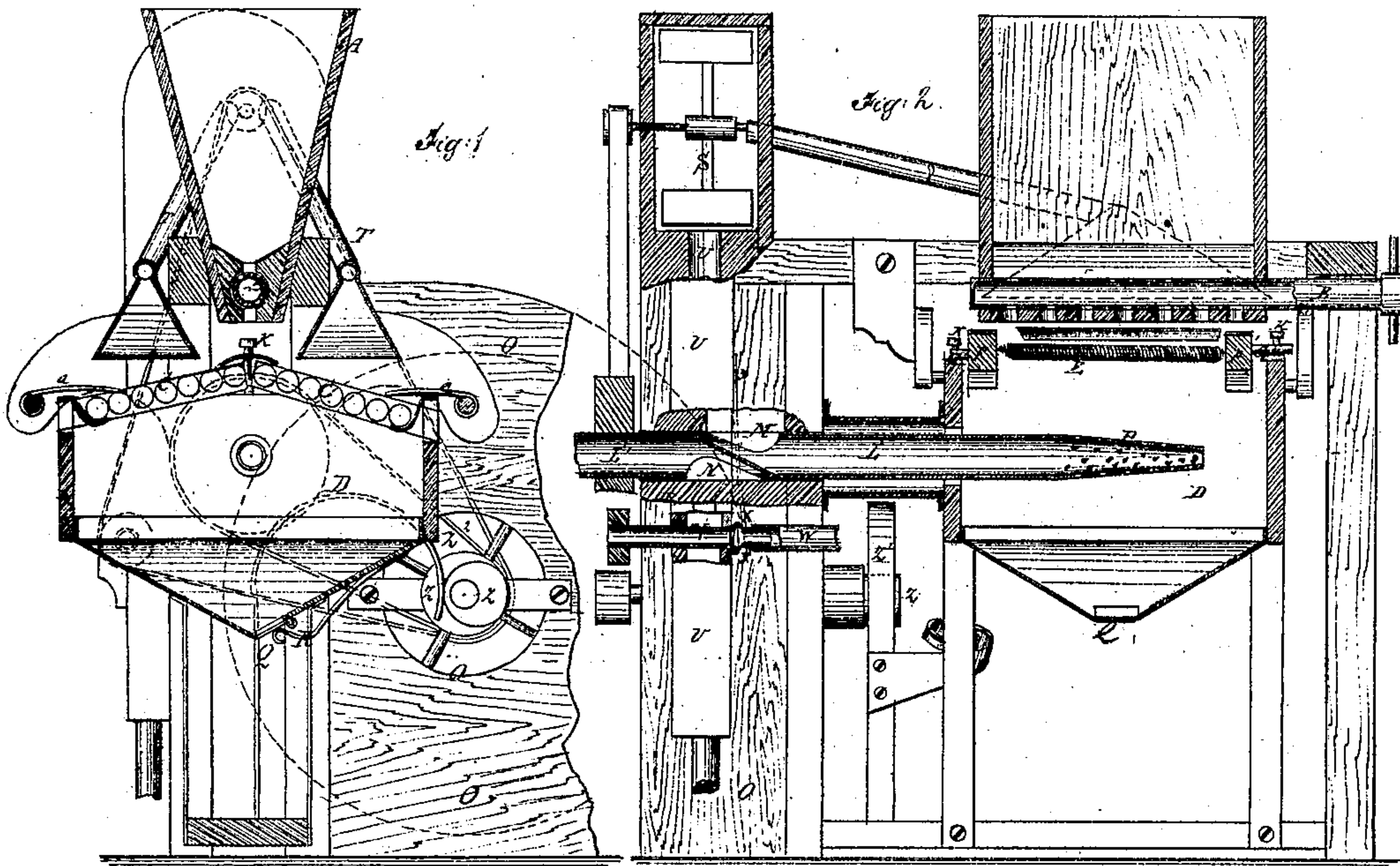


G. Copeland,

Ore Separators.

No. 103574.

Patented May 31. 1870.



Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

GEORGE COPELAND, OF DENVER, COLORADO TERRITORY.

IMPROVEMENT IN ORE-SEPARATORS.

Specification forming part of Letters Patent No. **103,574**, dated May 31, 1870.

To all whom it may concern:

Be it known that I, GEORGE COPELAND, of Denver, in the county of Arapahoe and Territory of Colorado, have invented a new and Improved Ore-Separator; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

This invention relates to improvements in dry-ore-separating apparatus; and consists in new and improved means for subjecting the pulverized ore to the action of distributed gusts of air as it falls from a sieve to a hopper below, by which the gangue is prevented from falling with the heavier particles, and is thrown back to be thrown off by skimmers, and the dust is caused to be taken up by suckers, and delivered to water-spray, for being moistened and conducted to a receiver, and retained for further operation, all as hereinafter more fully specified.

Figure 1 is a transverse sectional elevation of my improved apparatus. Fig. 2 is a sectional elevation taken at right angles to the plane of Fig. 1; and Fig. 3 is a top view, partly in horizontal section.

Similar letters of reference indicate corresponding parts.

A is a hopper at the top of the machine for the reception of the pulverized ore, into which it may be conveyed by any suitable means. It has numerous holes along the bottom for the delivery of the ore, and a rotary perforated valve, B, for regulating or stopping the discharge. C represents a sieve placed under the hopper B, and over another hopper, D, and arranged to shed each way from the center line of the delivery-orifices of the hopper above. This sieve is formed of spiral wire coils or springs E, stretched from the end blocks F F' parallel with each other, forming meshes or reticulations, which may be varied for finer or coarser ore, and for varying them the blocks are made adjustable to or from each other by means of the screw-threaded rods G G', by which they are connected, and by which they are supported on the bars H of the frame. The blocks F F' are jointed at the center, and the screw-rods G' thereat rest at the ends on

plates I on the tops of the bars H, having adjusting-screws K, by which they may be raised or lowered for varying the angle of the shed. L is a two-way revolving blast-pipe, receiving air alternately through the orifices M N from the fan O, and projecting into the hopper D, where it has a perforated nozzle, P, through which the air is delivered in gusts among the falling particles of heavier matter, and acting on the gangue and other light matters on the sieve, to toss it up and separate it from the heavier. The part L' of the air-pipe is intended to conduct the air admitted through the passage N to another similar hopper at the other side of the blast-fan, to which like attachments are connected, constituting a double-acting machine, whereby the continuous blast from the fan D is delivered to each set in alternate gusts. The hopper D is closed, except at the top, and is provided with an escape-valve, Q, at the bottom, held closed by a spring, R, which will resist the force of the blast, but will yield under the weight of an accumulation of ore sufficiently to let it escape from time to time, and prevent the hopper from filling. S represents a sucker-fan attached to the top of the machine, and having two funnel-mouthed pipes arranged above the sieves to take up the fine light dust, and convey it away through the pipe U to a receptacle. The pipe U receives jets of water from a revolving perforated pipe, V, to which a hose-pipe, W, is jointed at X, and held in contact by a spring, Y, or other suitable means. These water-jets, mixing with the dust, prevent it from being carried away in the air. The sieve has a reciprocating or shaking motion imparted to it by an eccentric wheel, Z, on the shaft of the fan D, acting on a spring, Z¹, connected to the sieve-supports, which are arranged in any suitable way for vibration. The air-blast tube L L' is operated by a blast, Z², from the fan-shaft, working over a pulley on it, and the sucker and water-jet tube are also operated by belts from the same shaft; or they may be operated in any approved way. *a* represents skimmers placed at the lower edges of the sieves, and lapping over the upper surfaces a short distance they are arranged on oscillating shafts *b*, having spring-arms *d* and holding-pins *e*, by which they may be raised or lowered, and held at any required position for

skimming off the coarse and light particles of gangue, which are floated down over the sieve and above the heavier particles of ore by the action of the sieves and the air.

This apparatus is adapted for the separation of dry quartz of any kind and dry placer-sands. The feed-hopper and valve B may be dispensed with, and the dry pulverized ore may be fed directly to the sieves by hand or other means, as preferred, and other sieves may be used, instead of such as I have described; but I prefer to use these.

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

1. The combination of the air and ore receiving hopper D with the sieves at the top of the air-blast pipe L, and a blower arranged to deliver the air in gusts and in jets, substantially in the manner described.

2. The combination, with the sieves, receiving-hopper D, and air-blast pipe, of a sucker-fan, funnel-shaped sucking-pipes, and a delivery-pipe, substantially as specified.

3. The combination, with the delivery-spout U, for the dust, of a water-jet-distributing

apparatus for moistening the dust, substantially as specified.

4. Ore or other sieves composed of the spiral wire springs E, arranged side by side and stretched between end blocks or bars, and either arranged for adjustment by stretching or relaxing the springs or not, substantially as specified.

5. The arrangement of the blocks F F', in two parts, jointed together, and the plates I and adjusting-screws K, with the projecting rods G', for varying the height or pitch of the sieves, substantially as specified.

6. The combination of the blocks F F', spiral wire springs E, and the screw-threaded adjusting-rods G G', substantially as specified.

7. The combination of the skimmers and the sieves, substantially as specified.

8. The combination, with the sieves, hopper D, and air-blast pipe, of the feed-hopper A and revolving perforated valve B, substantially as specified.

GEORGE COPELAND.

Witnesses:

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