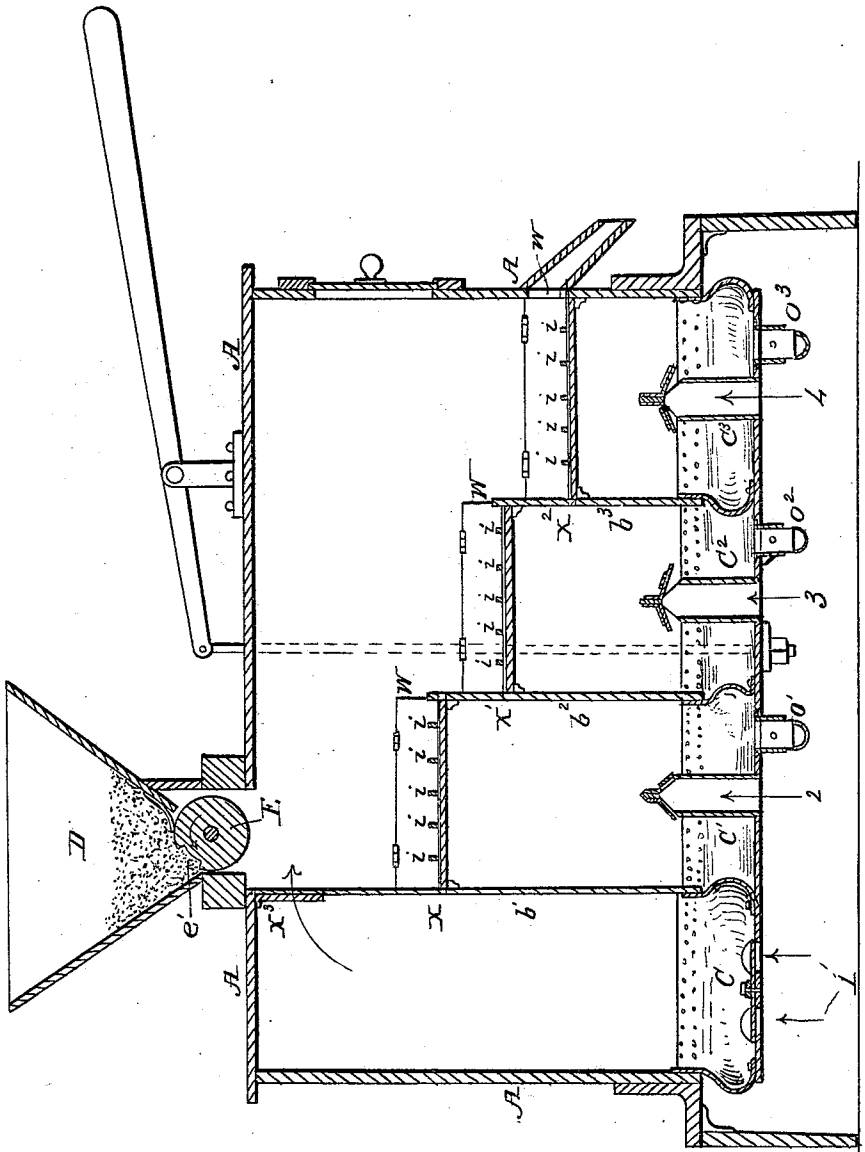
E. L. SEYMOUR.

Ore Separator.

No. 29,198. Patented July 17, 1860.



Witnesses:

Lotrohus Jr

Francis F. Brantz

Inventor:

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UNITED STATES PATENT OFFICE.

EDWARD L. SEYMOUR, OF NEW YORK, N. Y.

ORE-SEPARATOR.

Specification of Letters Patent No. 29,198, dated July 17, 1860.

To all whom it may concern:

Be it known that I, EDWARD L. SEYMOUR, of the city and State of New York, have invented certain new and useful Improvements in Machinery or Apparatus for Concentrating Auriferous and Argentiferous Ores and other Minerals when in a granulated or pulverized state.

My present device for this purpose acts upon the same principle as others heretofore patented to me—viz., lifting and projecting the particles of the ore under treatment by a blast, or current of air, and allowing them to settle according to their specific gravity.

The following specification embraces a full and clear description of the improvements I have now devised in machinery of this nature, and which I desire to claim.

For details of construction and operation I will now refer to the accompanying drawing, forming a part of this specification.

The drawing, at a scale of about one inch to the foot, may represent an average size of machine on my plan here set forth.

A, represents a box or case—say—of wood, of rectangular or other form, subdivided by three or more partitions b^1, b^2, b^3, of less height, each, successively. Between each of said partitions is extended, on a proper frame, a removable sieve: the plane of the sieve-cloth being represented by the red lines x, x^1, x^2. Under each of the compartments formed by the aforesaid partitions is a bellows. The drawing represents four of them c, c^1, c^2, c^3. They are connected and operated together in any convenient and usual manner—not necessarily to be described. The inlet air passages to these bellows project upward into the three last above named,—for a reason which I shall presently explain—some distance. The arrows 2, 3, 4, will indicate the same. The outlet of air from each chamber, above each bellows, is through its corresponding sieve. The sieve of chamber C, however, is in a vertical plane, and is indicated by x^3, the blast through it being horizontal, as indicated by the arrows.

The pulverized ore to be treated is placed in the funnel D, from which it is to be "fed" to the first sieve x. Having found that the different ores, "tailings," &c., cannot be treated with one and the same rapidity, if anything like a proper separation and concentration is desired, I found it necessary to have a variable feed that can be adjusted so as to supply the ore from the funnel to the sieve x, in a manner varying from an almost continuous stream, to an intermittent and quite limited deposit from moment to moment. The device I employ for that purpose is a revolving cylinder E, closing the lower aperture of the feed-funnel, said roller having a straight or spiral groove e', as seen, which, when E, is in the position shown, of course fills with ore; and as E, rotates in the direction of the arrow, the ore is dropped upon the sieve beneath. It will be obvious that the rapidity or continuity of the supply may be varied by increasing or lessening the rapidity of rotation of E, which may of course, by proper connection with some moving part of the machine (as for instance, the device actuating the bellows) be made automatic, or "self-acting."

As the ore falls upon the first sieve—none of the sieves, I should here state, being intended as sifters, but as platforms to hold the ores, while pervious to the air-blast;—the constant yet intermittent action of the bellows forcing the air through the sieve and superincumbent ore, the latter is raised "in suspension"—as it were—and again allowed to fall, rapidly and alternately, according to the rapidity of the strokes or blasts of the bellows. This causes the particles of ore, earth, &c., to settle in strata according to their relative specific gravities—the heaviest lowest. It will be understood that the combined lifting and rolling action of the air-current upon the particles of pulverized ore would tend to spread them outward in every direction; but, each horizontal sieve being inclosed on all sides except in "front," where there is only a low "wall" w, the height of which (the same varies with the nature of the ore) regulates the thickness of the layer of the ore upon each sieve at one time, the ore, as it accumulates on the first sieve x, being constantly supplied by the rotating cylinder E, after reaching the level of the aforesaid "front-wall" w, must pass over it unto the second sieve next succeeding, and subsequently unto the third, and so on; being assisted in its onward passage by the combined action of the horizontal and the vertical currents of air which, being confined on all sides but one, flow, of course, in that direction.

It might at first be concluded that the different sieves would act as well if ar-

ranged in one continuous plane; but such is not the case. The particles having the greatest difference or contrast of specific gravity and bulk are separated, to a great extent, on the first sieve; yet, considerable valuable matter, such as fine particles of gold, silver or other metal, sulfurets, &c., pass over to the next sieve, and are there—as it were—re-treated separately. If the sieves were on the same plane, the friction and mechanical pressure against each other of the particles of the ore as it lay in one continuous layer—so to say—of so great a length, would very much impede the onward progress of the ore and render quite impossible a proper separation and concentration; but, by placing the sieves in the form of "steps," as shown, this is obviated, and the means provided of applying the horizontal blast, if needed, over each sieve, in combination with the vertical one through it. The principal object of this horizontal blast I will now explain:

As the thin sheet of pulverized ore falls from the "feed-funnel," the lighter and more impalpable earthy dust, by the force and impact given it by the coarser and heavier particles falling with it, is made to clog the fine meshes of the receiving sieve; to prevent which I employ the horizontal current (at x^3) of air to blow through the falling ore (before the latter reaches the sieve) carrying forward, mostly out into the air, the fine dust mentioned, and thus effectually preventing the sieves from being choked up.

Some of the fine metallic dust is likely, from time to time, to percolate through the sieves and fall into the bellows below. In order that it may not clog the "air-valves" or "pallets' or pass through the same, I found it necessary to raise the latter, as shown. When the accumulation of valuable metallic dust in the bellows has become considerable, it can be removed by the plugs o^1, o^2, o^3, or in any other convenient manner. When the valuable concentrated matter has accumulated in sufficient quantity, upon the sieves, it can be removed through corresponding apertures or doors, or in any convenient usual manner.

There are, in practice, various causes—such as the difference in the dryness or dampness of the ore, the difference in the size of the particles of the same, &c., or a variation in the force of the blast passing through the ore while being treated, that would tend, at times, to cause the ore to pass from one sieve to another too quickly, or before the heavier particles have thoroughly settled as a "bottom-stratum," which practical difficulty I remove by the application of a series of bars or ribs *i*, *i*, *i*, &c., to impede the onward flow of the lower part of the ore to the next sieve, while not impeding the upward flow of the air-current through the mass, to lift and settle the different particles according to their relative specific gravities. It is immaterial to the effect desired whether the bars or ribs above or upon the sieves be straight, curved, or angular, as long as they are of a proper height, which latter varies, according to the fineness of the grain of the ore, from one-eighth of an inch, or even less, to one inch, but should never exceed half the height of the "front-wall" *w*.

Having now fully explained the nature of my invention, what I therein claim and desire to secure by Letters Patent, is as follows:

1. The arrangement of a series of horizontal and stationary sieves, each acted upon by an air-blast from bellows—when arranged in steps—as explained—and so that the pulverized ore driven from each preceding one—by the air-blast—shall fall upon, and supply the next; all in the manner and for the purpose made known.

2. With sieves so acting and arranged, the combination of the transverse ribs *i*, *i*, *i*, &c., for the purpose set forth.

E. LUIS SEYMOUR.

Witnesses:

E. LOTHIUS.

FRANCIS X. BRAULIK.