

E. L. SEYMOUR.

MACHINE FOR SEPARATING AND CONCENTRATING MAGNETIC AND
OTHER ORES.

No. 85,700.

Patented Jan. 5, 1869.

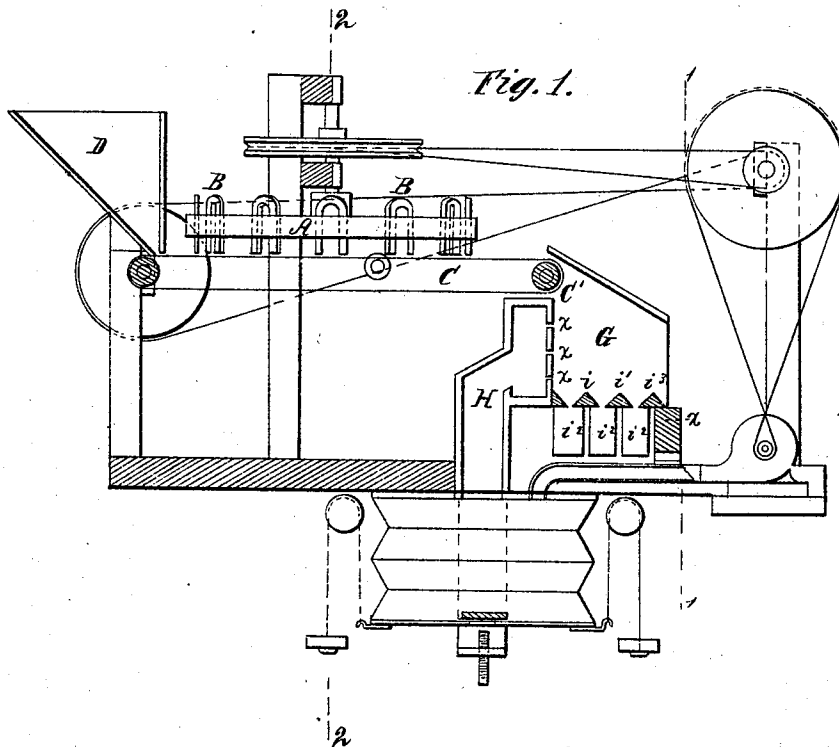
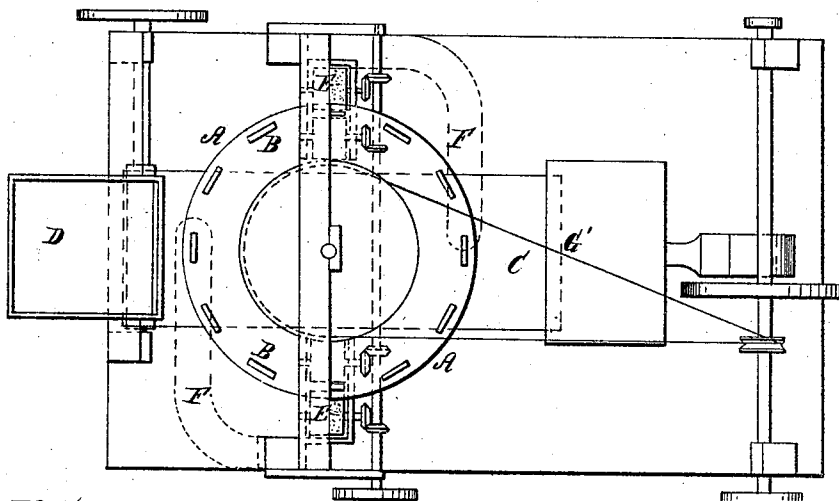


Fig. 2.



Witnesses

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Inventor

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Fig. 3.

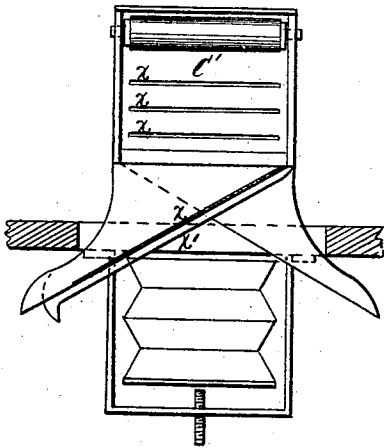


Fig. 4.

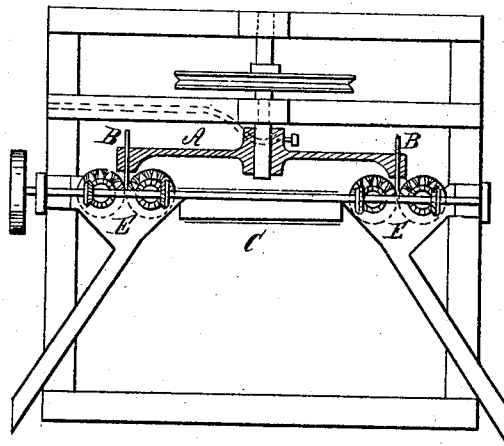
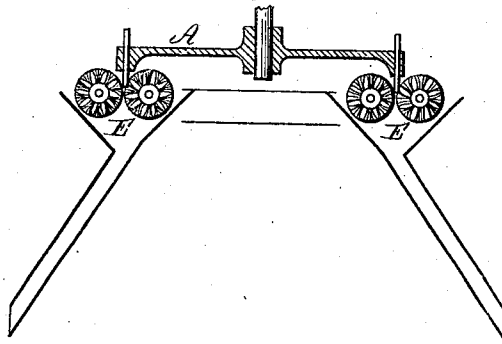


Fig. 5.



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

Letters Patent No. 85,700, dated January 5, 1869.

IMPROVED MACHINE FOR SEPARATING AND CONCENTRATING MAGNETIC AND OTHER ORES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, EDWARD L. SEYMOUR, of the city and State of New York, have invented a certain new and improved Machine for Separating and Concentrating Magnetic and other Ores, of which this specification, in connection with accompanying drawings, gives a full and clear description.

Figure 1 shows a longitudinal vertical section of one form of my machine, and

Figure 2, a plan view of the same.

Figure 3, a vertical transverse section through line 1 1 of fig. 1;

Figure 4, a vertical transverse section through line 2 2 of fig. 1; and

Figure 5, a vertical transverse section of magnet-wheel and rotating brushes, (but for which, may be substituted other arrangements and devices,) for clearing the magnets of adhering ore.

Like letters of reference indicate like parts in the different figures.

The most brief manner of setting forth the nature of my invention will be to proceed at once to the detailed description.

A is a horizontal wheel, say of some hard wood, in which are inserted, at right angles to its plane, and projecting through it, one or more circular rows of horse-shoe magnets, B.

This wheel, while the machine is in action for separating magnetic ores, is kept in constant rotation by any convenient means, as also are imparted the other motions, and the power to enable the machine to perform its functions, as will be readily understood, and requires no special description.

C is an endless apron, of any material that will present a tolerably smooth surface, and that will not greatly vary in its tautness, (as an apron or broad belt,) by ordinary changes of temperature or fair use, and is distended over proper rollers, and likewise kept in constant motion, carrying the ore under but not in contact with the poles of the magnets B.

The ore, in a granulated state, is fed into a hopper, D, from which it is delivered upon the endless apron C.

The rear wall of the lower end of D has attached to it a narrow apron or packing-strip, to prevent the escape of the granulated ore rearward.

To regulate the rapidity of the feed from the hopper to the endless apron, is an adjustable gate—a common device.

As the granulated or pulverized ore is carried forward by the endless belt, the rotating magnets pass over the film or layers of it, and attract the magnetic particles, and carry them off from the others, and then, to break the adhesion of such particles to and separate them from the magnets, the latter, in the form of the machine here shown, come in contact with stationary rotating brushes, E E, on opposite sides of wheel A, (see figs. 2, 4, and 5,) and are detached, falling into

proper conduits to receive them, and convey them to proper receptacles till wanted.

To prevent the incidental mechanical adhesion of any non-magnetic particles of ore to the magnets, I, for one plan, affix a spring-hammer or hammers, F, (see fig. 1,) under which the bows of the magnets pass, and dropping from one to the other, as the wheel rotates, is designed to jar off any such particles as last referred to.

The ore, after passing under A, is carried on by the belt C, and falls at *c* into a closed chamber, G, (see fig. 1,) which may be, say, of twenty or thirty inches' depth transversely.

The wall of this chamber next to *c* has horizontal slots, *z z*, extending across it, (such slots, slits, or orifices being adjustable in vertical width, by movable slides or gates, if necessary,) and such slits or long, narrow openings are exits for blasts of air from a small chamber or flue, H, to which air is supplied from a reservoir, into which it is continually forced, and moderately compressed, by any proper means.

Such reservoir is to be supplied with an escape-valve, or other device, to keep the pressure of the contained air within certain limits, as desired, according to the ore being treated.

A plurality of blast-chambers and reservoirs may be employed, but I consider this useless.

As the thin sheet of ore, mixed with different impurities, and of differing coarseness and specific gravity of granules, falls at *c*, the jets of air issuing horizontally from the long apertures *z*, project and separate the particles of different characters. The heavier, falling upon the inclined sides of the nearest "bridges" *i*, descend through the passages or spaces between them to their own special receptacles or conduits *i'*. The particles next heavier will fall upon the inclines of the "bridges" or "sheds" further off, and in like manner descend into conduits leading to other receptacles. Particles of lighter and baser quality will be projected further, and fall on "bridge" *i''*, for example. But inasmuch as very fine particles of value might adhere to larger, lighter, and baser particles, I make the transversely-inclined chute or conduit of *i'*, with two or more separate floors, (see *x x'*, fig. 3,) which is a vertical transverse section through line 1 1 of fig. 2, as before stated, *x* being perforated or made of sieving, (sieve-cloth,) and *x'*, a smooth plate.

Now, the impact of the coarser particles just referred to upon the "bridge" *i'*, would tend to jar off the major portion of the finer particles, and allow them to fall through the perforations of *x* and go to their own distinct receptacle, while the others would roll on and fall into another.

The number, size, and form of the "bridges" may of course be varied.

In treating ores unmixed with magnetic ores, A may remain inactive or be disconnected.

My machine may be variously modified, without affecting the nature of certain features that I claim.

I may, in treating certain ores, leave certain of the "bridges" perforated, as well as the inclined conduits referred to.

Having now fully described my present machine for separating and concentrating ores,

What I claim, and desire to secure by Letters Patent, is as follows:

1. I claim in an ore-separating machine, the plan of separating the granules of ore of different coarseness and specific gravities, by passing through a falling sheet of such ore, a series of air-jets of adjustable and uniform force, substantially in the manner described.

2. I claim, in combination with the reservoir, from which such air-jets emanate, or with some vessel or conduit communicating with said reservoir, the application of any convenient device, by which the pressure of the air in the latter and the force and reach of the jets may be adjusted and regulated according to

the nature of the ore under treatment, substantially as and for the purpose explained.

3. I claim the combination of the horizontally-rotating magnets, and the endless carrier-belt C, or its equivalent, arranged and acting substantially in the manner and for the purpose described.

4. I claim the use of one or a series of long horizontal slits, *z z*, or any other kind of apertures that may be suitable, connecting with a single reservoir or with distinct reservoirs of compressed air, substantially as and for the purpose explained.

5. I claim the employment of the angular ore-separating "bridges" or "sheds," substantially as and for the purpose set forth.

6. I claim the plan of making one or more of said bridges or conduits therefrom, or both perforated, for the purpose explained.

Witnesses:

WM. FILERE,
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E. L. SEYMOUR.