4 Sheets—Sheet 1.

G. C. WETMORE & F. S. RICE.

Dry-Ore Separators.

No. 200,808. **Patented Feb. 26, 1878.**

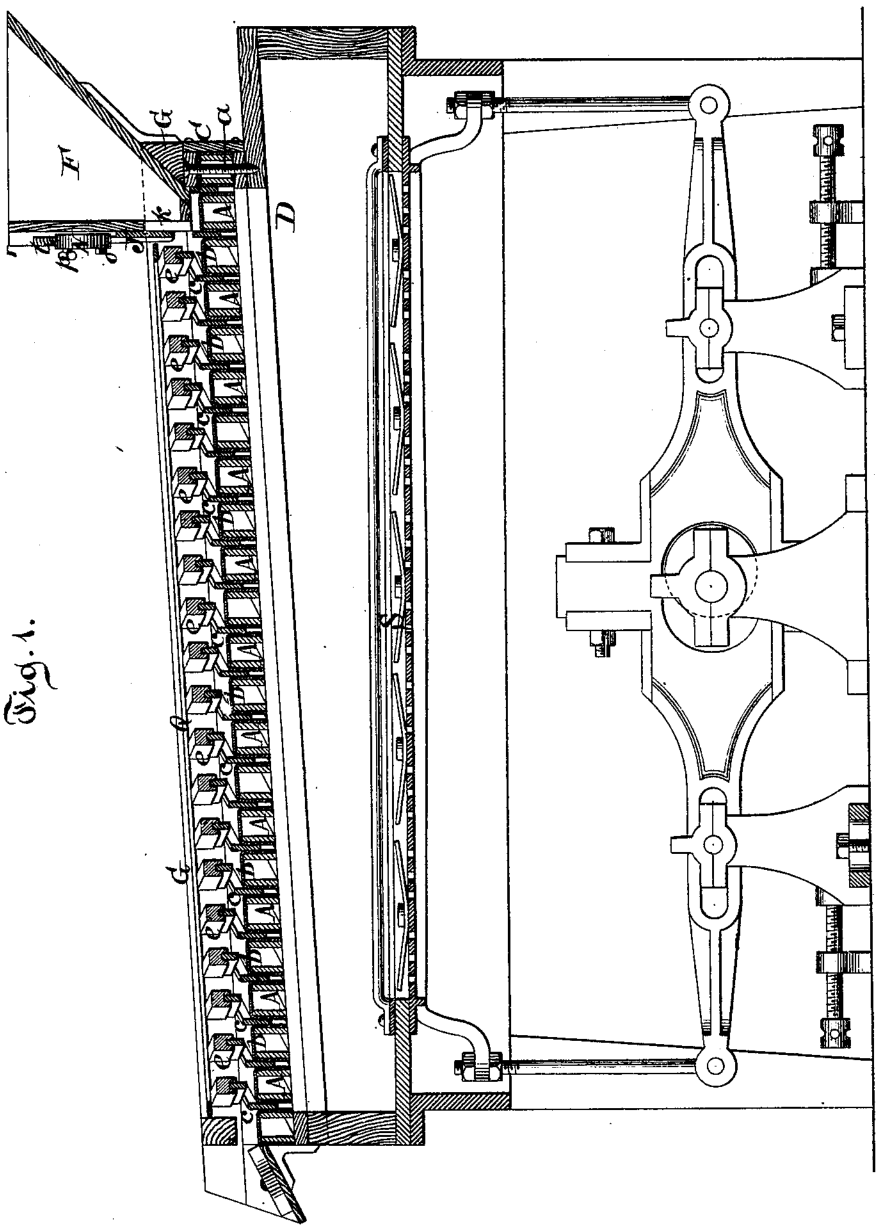

Fig. 1.

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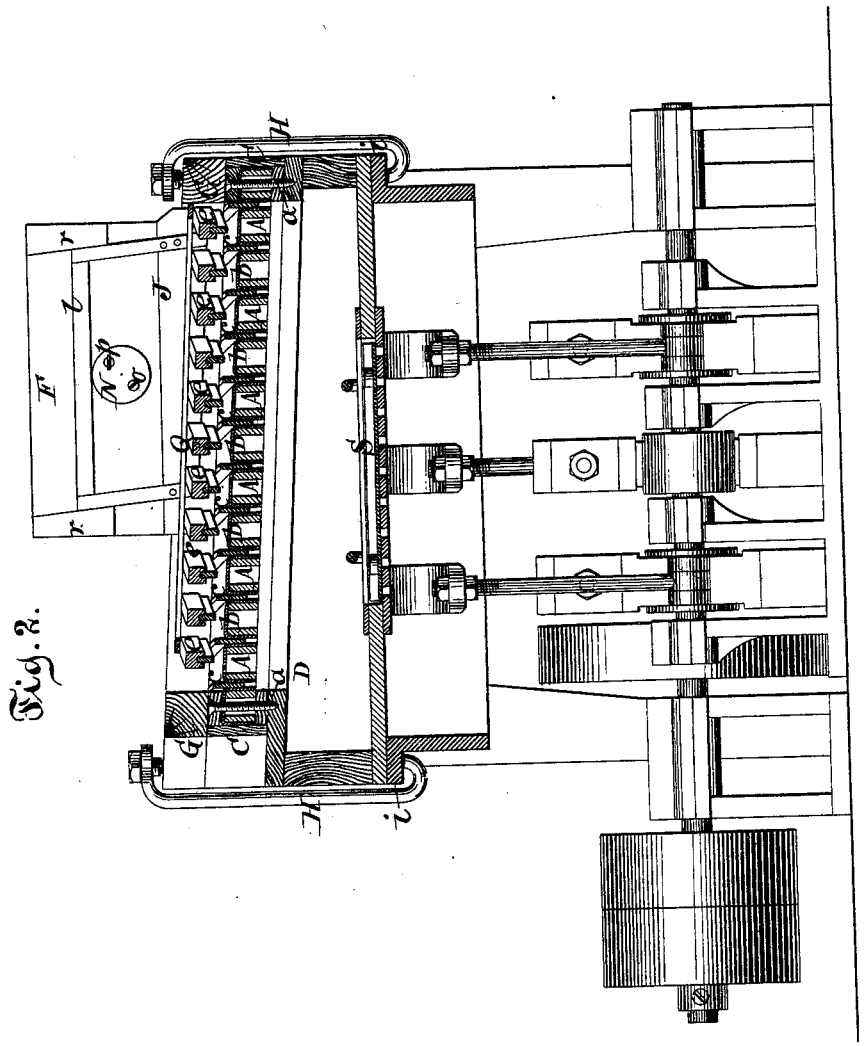

Fig. 2.

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Fig. 3.

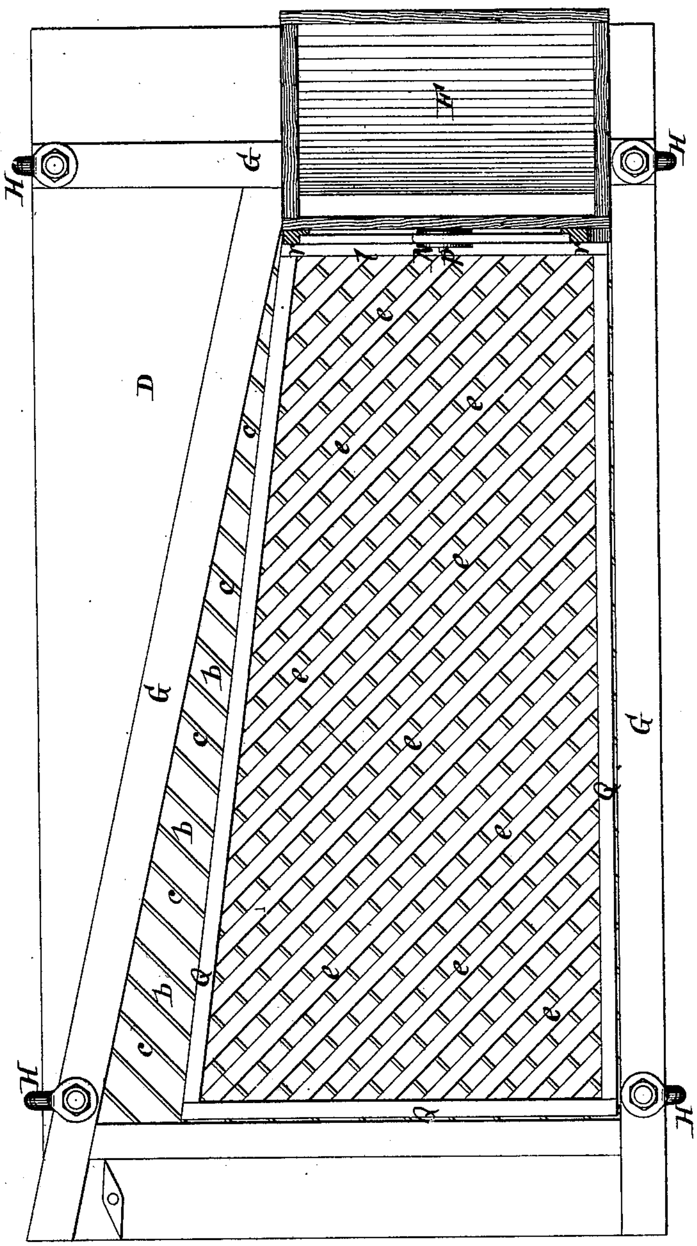

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Fig. 4.

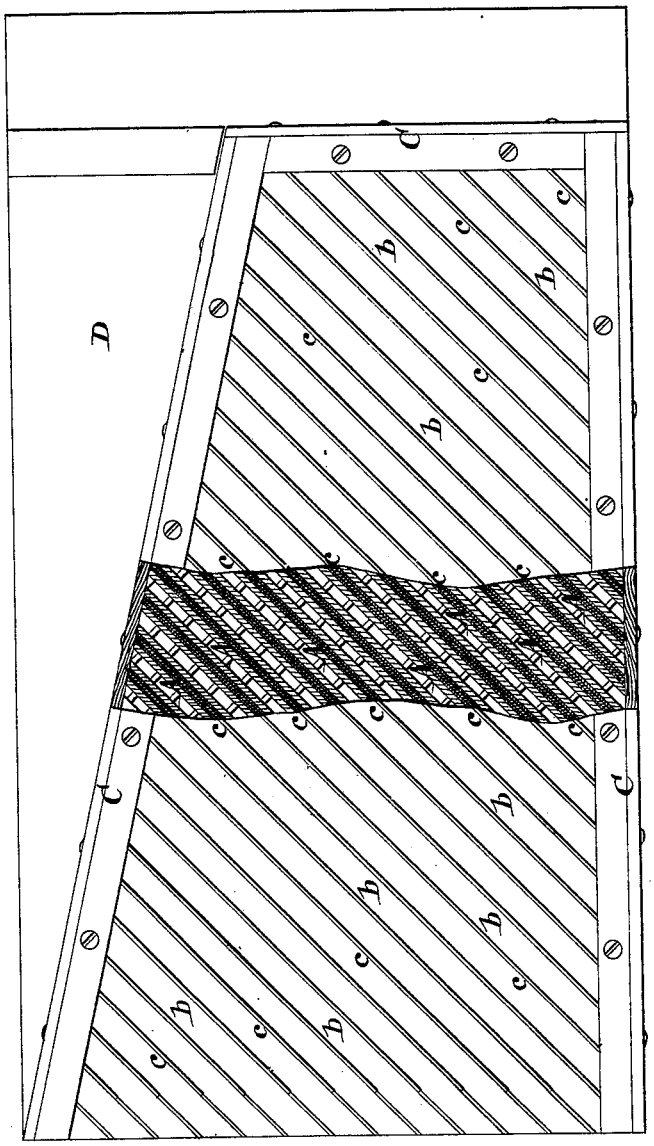
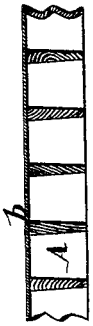


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE C. WETMORE, OF NEW YORK, AND FRANCIS S. RICE, OF TICONDEROGA, N. Y.

IMPROVEMENT IN DRY-ORE SEPARATORS.

Specification forming part of Letters Patent No. **200,808**, dated February 26, 1878; application filed August 7, 1877.

To all whom it may concern:

Be it known that we, GEORGE C. WETMORE, of the city, county, and State of New York, and FRANCIS S. RICE, of Ticonderoga, in the county of Essex and State of New York, have invented a new and useful Improvement in Dry-Ore Separators, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a longitudinal vertical section of our machine. Fig. 2 is a cross-section thereof. Fig. 3 is a plan or top view of the same. Fig. 4 is a like view of the ore-bed. Fig. 5 is a longitudinal section of a portion of one of the sections of the bed.

Similar letters indicate corresponding parts.

Our improvement relates to that class of ore-separators for which Letters Patent of the United States were granted to William Hooper, March 22, 1870, No. 101,132, and also April 17, 1877, No. 189,734.

It consists in constructing the ore-bed of a series of independent frames or sections, extending in a diagonal direction, and each covered with cloth, or its equivalent material, of a series of upwardly-projecting ribs running parallel to said frames or sections, and of a suitable inclosing-frame, so that either of the opening frames or sections can be removed, if desirable, without disturbing the remainder, while by the ribs channels are formed in the bed for the guidance of the ore, and at the same time a cheap, strong, and durable bed is obtained; also, in enlarging or expanding the ore-bed toward its lower or tail end, whereby a gradually-increasing space is formed to receive the heavy and light particles of ore which are separated and directed toward the opposite sides of the bed, in the passage of the ore from the upper to the lower end thereof, and thereby the liability of a recommingling of said particles is obviated; further, in combining with the ore-bed a hopper, which is located at one end of said bed and provided with a sliding gate over its discharge-opening, operated by a cam or eccentric, so that said gate can be conveniently held either wholly or partially open, or held shut, and hence the quantity of ore discharging from the hopper on the bed can be regulated.

In the drawing, the letter A designates a series of open frames or sections, composing the ore-bed of this machine; and *b* are strips of cloth or other similar material, by which each of said frames or sections are covered, the latter being open on top and bottom, and the cloth being stretched across the top and a portion or the whole of the sides thereof.

We construct the open frames or sections A, by preference, of two parallel strips of wood, or other suitable material, and cross-pieces, by which the stubs are joined, the cross-pieces being made to taper toward their upper ends, as seen in Fig. 5

Between the open frames or sections A are interposed ribs *c*, in form of strips of sheet metal or other suitable material, these ribs or strips being so arranged as to project above the top edge of the open frames or sections A, and thus serve to form channels on the ore-bed.

The letter C designates a frame, which incloses the open frames or sections A and the ribs *c*, each side or length of this frame being constructed of an upper and lower flange, and of a side or end piece, as clearly shown. The open frames or sections A, with the ribs *c*, are arranged diagonally in respect to the frame C, and said sections A are clamped between the said upper and lower flanges and the end or side piece thereof.

The frame C is secured to the top part of the air-chamber D of the apparatus by screws *a*, and this top part of the air-chamber is diagonally inclined, so that the frame C and the remaining parts of the ore-bed are brought in a corresponding or diagonally-inclined position immediately above said air-chamber. The upper edges of three sides of the frame C extend above the upper edges of the sections A, so as to confine the ore upon its bed; but the upper edge of the remaining side of said frame—namely, the lower or tail end—is made flush with the upper edges of said sections A, so as to provide for the escape of the ore at the tail of the apparatus.

Either of the open frames or sections A can

be removed independently of the remaining sections, so that if either of them becomes worn by use it can be taken out and repaired or replaced by a new one.

The open frames or sections A can be made in various other ways than the one shown; and, if desired, moreover, the ribs *c* can be made in one piece therewith.

One of the sides of the frame C is arranged obliquely to the other sides thereof, so as to enlarge or expand the ore-bed horizontally toward its lower or tail end, as seen in Fig. 4. The object of this arrangement is to form a gradually-increasing space from the upper to the lower end of the ore-bed to receive the heavy and light particles of ore, which are directed toward the opposite sides of the bed by the channels formed therein, and by skimmers *e*, placed above the bed, respectively, so that the ore is not liable to recommingle after it has been separated on the bed. At the upper end of the ore-bed is located a hopper, F, which is supported by a frame, G, placed above the frame C of the ore-bed, and which, as well as said frame C and the top part of the air-chamber, is held in position by clamps H, catching over the frame G and under flanges *i*, formed on the lower section of the air-chamber, as clearly seen in Fig. 2. Said frame G has a corresponding shape to the frame C of the ore-bed, and by being placed above said frame C it constitutes a box to prevent the escape of ore from the sides of the bed. The hopper F has a discharge-opening, *k*, (see Fig. 1,) in its inner side, and over this opening is arranged a gate, J, which is secured to a frame, *l*, resting on the face of a cam or eccentric, N, the latter being pivoted to the inner side of the hopper F, as at *o*, and having a set-screw, *p*, by which it is adjusted and held in its different positions. The frame *l* slides in ways *r*, formed on the inner side of the hopper F, and when the eccentric N is turned in one or the other direction said frame *l* is slid up or down in these ways, and thereby the gate J is opened or shut, as the case may be. By this adjustable gate J, I am enabled to regulate the quantity of ore discharging from the hopper F on the ore-bed.

The skimmers *e* are secured to a frame, Q, which is made of such shape as to leave a passage between it and one of the sides of the ore-bed, as seen in Fig. 3.

The bellows S and the mechanism for operating the same has the same general shape, as shown and described in Patent No. 189,734, above referred to.

The operation of our invention is as follows: The bellows below the ore-bed being put in operation forces a series of intermittent currents of air up through the cloth stretched over the sections. The ore is meanwhile being discharged in proper quantities on the ore-bed from the hopper. The currents of air thus forced through the cloth agitate the ore, causing the lighter portions to rise to the top of the heavier portions. The heavy portions travel to one side of the ore-bed in the channels formed by partition *c*, and are conducted toward the tail, while the lighter portions, which rise to the top, are directed by the skimmers *e* to the opposite side and toward the tail, the light and heavy portions being discharged at the tail, on opposite sides thereof.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a dry-ore separator of the character specified, an ore-bed constructed of a series of open frames or sections, extending in a diagonal direction, and each covered with cloth, or its equivalent material, of a series of upwardly-projecting ribs running parallel to said open frames or sections, and of a suitable inclosing-frame, substantially as and for the purpose described.

2. In a dry-ore separator of the character specified, an ore-bed which is enlarged or expanded toward its lower end or tail, and provided with a series of ribs, *c*, in combination with the skimmers *e*, the whole constructed to separate the heavy from the lighter portions of the ore, and discharge the same on opposite sides at such enlarged lower portion of the ore-bed, substantially as specified.

In testimony that we claim the foregoing we have hereunto set our hands and seals this 2d day of August, 1877.

GEO. C. WETMORE. [L. S.]
FRANCIS S. RICE. [L. S.]

Witnesses:
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E. F. KASTENHUBER.