(No Model.) 2 Sheets—Sheet 1.

P. W. REARDON.

DRY ORE SEPARATOR.

No. 263,808. Patented Sept. 5, 1882.

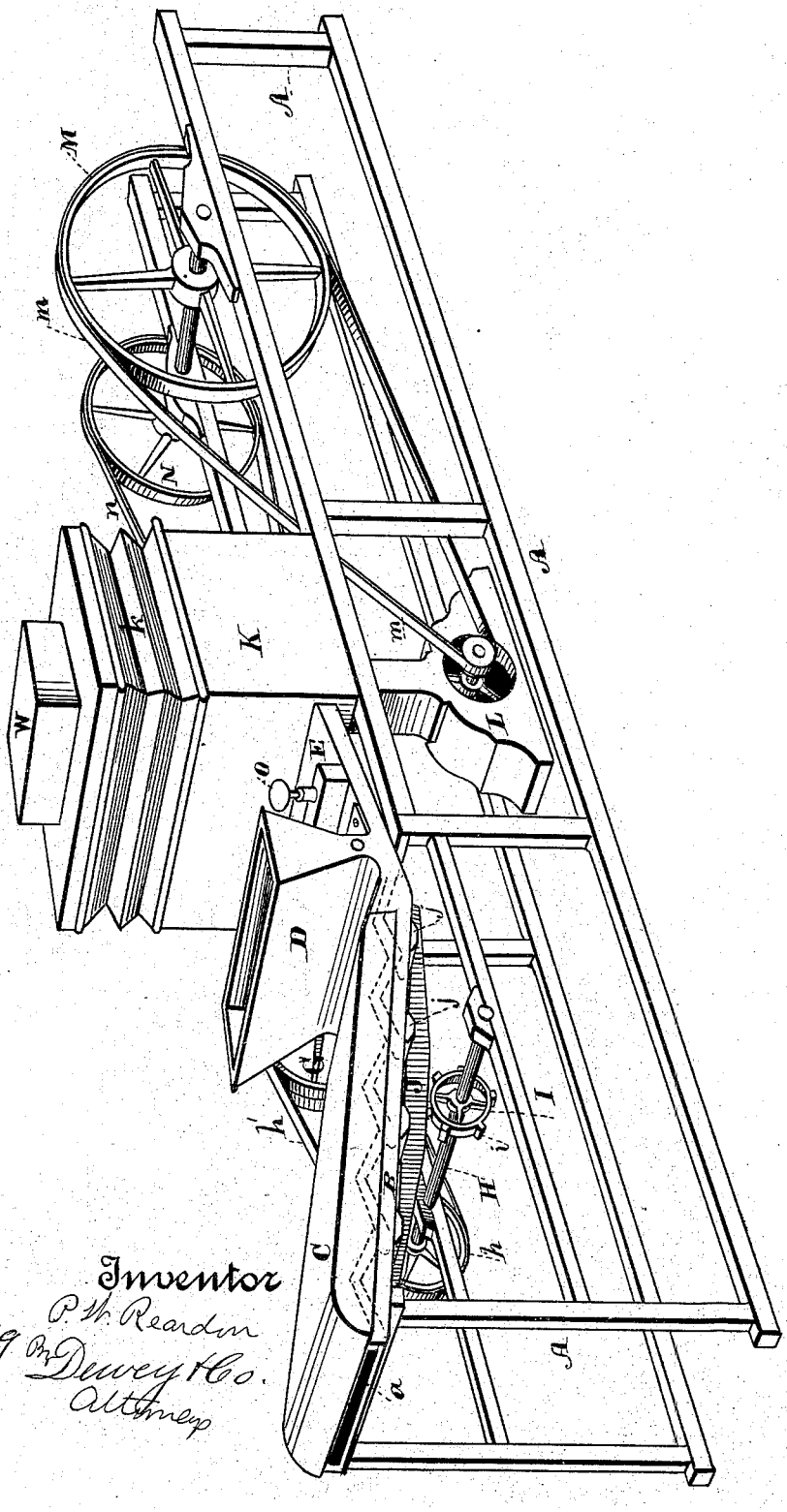

Fig. 1.

Witnesses,
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(No Model.) 2 Sheets—Sheet 2.

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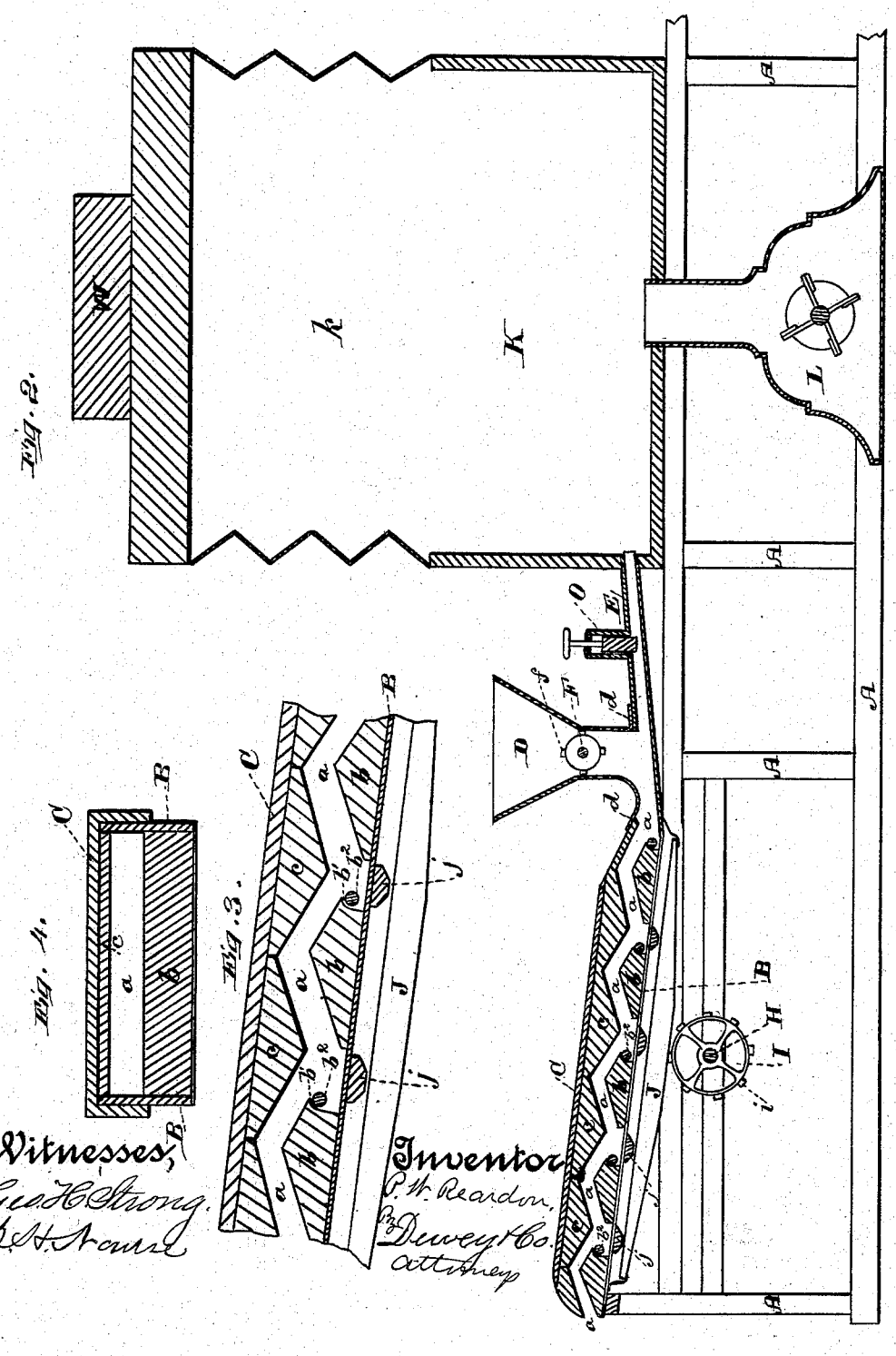

UNITED STATES PATENT OFFICE.

PATRICK W. REARDON, OF SAN JOSÉ, CALIFORNIA.

DRY-ORE SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 263,808, dated September 5, 1882.

Application filed June 23, 1882. (No model.)

To all whom it may concern:

Be it known that I, PATRICK W. REARDON, of San José, county of Santa Clara, State of California, have invented an Improved Dry-Ore Separator; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to certain improvements in that class of ore-separators known as "dry-ore separators."

Referring to the accompanying drawings, Figure 1 is a perspective view of a machine embodying my invention. Fig. 2 is a longitudinal vertical section of a portion of it. Fig. 3 is a vertical longitudinal section of the riffle-box. Fig. 4 is a transverse section of same.

A represents an elongated open frame. At one end of this, upon its top, is secured a box, B, the sides of which are of metal, wood, or other firm material, and its bottom is of flexible material, such as leather. This box covers the width of frame A, and has a slight upward inclination, as shown. Inside of it are secured, transversely to the flexible bottom, successive strips or riffles *b*. These extend the whole width of the box, and are separated from each other, as shown. They are made triangular in shape, the apex extending upward about half the height of the box. The fronts of these riffles are cut away and curved out to form overhanging lips or flanges *b'*, under which are secured rubber or elastic buffers or rollers b^2, extending across the faces of the riffles.

C is another box of equal length with box B, and of sufficient width to fit over its top, its sides lapping over the sides of the under box. Under the top of box C are secured transversely a number of blocks or strips, *c*, triangular in shape, the apexes of which extend downwardly between those of riffles *b* on the under box, and their sides lie parallel with the sides of those below. Between these strips *c* and riffles *b* is thus formed a sinuous or undulating passage, *d*, which, on account of the position of the entire riffle-box, has an upward tendency to the end of the frame.

D represents a hopper, which is secured at and over the entrance of the riffle-box by flanges *d*, which are secured to the top of box C and to the top of a frame or box, E, which I shall hereinafter describe. The hopper extends across the width of frame A, and has journaled in its throat a feeder-shaft, F, the circumference of which is provided with longitudinal flanges *f*, which are of sufficient width to close the throat of the hopper as they pass down by its sides. This feeder-shaft extends through the hopper and is provided with a double pulley, G. Under the frame is journaled a shaft, H, carrying a pulley, *h*, to which a belt, *h'*, extends from pulley G. The shaft H carries a tappet-wheel, I, the projections *i* upon which come in contact with a bar, J, suspended above. This bar tapers to both ends, and is adapted to be driven against cleats *j*, secured under the flexible bottom of box B.

K is an air-tight reservoir having an expanding flexible top, *k*, upon which a suitable weight, W, may be placed. This reservoir is supported by frame A, and is supplied with air, which is forced in through the bottom by any suitable form of blower, (here designated by L.) The continuous supply of air forced by the blower into the flexible reservoir K fills said reservoir constantly with a volume of air, which is immediately and continuously subject to the steady pressure of the weight W, which tends to collapse said reservoir, thereby forcing the air out through E in a regular, steady current.

M is the driving-wheel, to which power is applied. From it a belt, *m*, extends to the blower L, and from a pulley, N, upon the same shaft a belt, *n*, passes to the double pulley G.

E is a wide box or flat pipe opening from the side of the air-reservoir. Its top extends down to the rear side of the throat of the hopper, and its bottom extends under the throat and into the entrance of the riffle-box, resting upon the bottom of the box B near the face of the first riffle. This flat pipe has a downward inclination, and is of equal width to the air-reservoir, the throat of the hopper, and the riffle-box.

O is a valve fitting across the passage of the flat pipe E, operated by screws, and adapted to open or close said passage.

The operation of the machine is as follows: To secure the best results I prefer to suitably grade the ore by means of screens before feeding it. I put it in the hopper, and the feeder-shaft F, with its flanges *f*, (revolved by the pul-

leys G h and belt h',) will permit but a certain quantity to pass through the throat at a time, thus avoiding an overcrowding of the riffle-box. The ore falls through the throat, over the width of the bottom plate of the flat pipe E. By the operation of the blower L and the pressure-reservoir K a steady sheet of air is forced through pipe E against the ore, which is thereby carried into the riffle-box and against the face of the first riffle. Here the elastic buffer or roller b^2 acts as a cushion, and the ore drops down, the heavier concentrations lodging in the curved face of the riffle, while the lighter particles are thrown up by the current of air and forced upward through the undulating passage a and down to the next riffle, where more concentrations are saved, and so on throughout. The upward inclination of the entire riffle-box, as well as the inclined riffles, adds to the result by causing the heavier particles to roll back or lodge, while only the lighter ones finally reach the discharge end. In addition to this the ore is kept agitated within the riffle-box by the revolution of the tappet-wheel I, which, knocking against the tappet-bar, causes the latter to knock against the cleats j, and thus to impress the flexible bottom of the riffle-box. This has a settling tendency upon the ore.

By the valve O, I can regulate the intensity of the air-current, adapting it to various grades of ore.

I am aware that dry-ore separators have been used in which means have been employed to force a steady current or quantity of air into a reservoir; but in this device, as in all other machines of this class of which I am aware, the separation is effected by intermittent blasts or gusts of air directed upon the ore. In my device this is not so. I deem it essential to the effective operation of my machine that the air directed upon the ore should be a steady current. By this means the operation is a continuous one, and the ore is not affected as it would be were it subjected to intermittent gusts.

By removing the upper box, C, access may be had to the riffles to remove the concentrations.

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

1. In a dry-ore separator, the riffle-box consisting of the under box, B, provided with transverse triangular riffles b, having cut-away or curved faces and overhanging lips b', and the upper overlapping box, C, provided with transverse triangular strips c, between which and riffles b an undulating passage, a, is formed, in combination with a hopper or ore-feeding device communicating with the passage a, and means for directing a current of air within said passage, substantially as and for the purpose herein described.

2. In a dry-ore separator, the upwardly-inclined riffle-box consisting of the under box, B, provided with transverse triangular riffles b, having curved faces and lips b' and rubber or elastic cushions b^2, and the upper box, C, provided with strips c, between which and riffles b an undulating passage, a, is formed, in combination with an ore-feeding device and means for directing a current of air within said passage, substantially as and for the purpose herein described.

3. In a dry-ore separator, the riffle-box consisting of the under box, B, provided with a flexible bottom having cleats j and the transverse triangular riffles b, and the upper box, C, provided with transverse triangular strips c, between which and the riffles b an undulating passage, a, is formed, an ore-feeding device, and means for directing within it a current of air, in combination with the means for striking the flexible bottom of said riffle-box, consisting of the tapered bar J, tappet-wheel I, and driving mechanism for said wheel, substantially as and for the purpose herein described.

4. In a dry-ore separator, the upwardly-inclined riffle-box consisting of the boxes B and C, provided with the transverse triangular riffles b and c, between which an undulating passage, a, is formed, and means for directing a current of air within said passage a, in combination with the hopper, D, and the revolving feeder-shaft F, having flanges f, substantially as and for the purpose herein described.

5. In a dry-ore separator, an upwardly-inclined riffle-box provided with an undulating passage, a, and an ore-feeding device communicating with said passage, in combination with the compressed-air reservoir K, wide flat pipe E, and the blower L, substantially as and for the purpose herein described.

6. A dry-ore separator comprising the riffle-box consisting of the boxes B and C, having transverse triangular riffles b and c, between which an undulating passage, a, is formed, a feed-hopper, D, and feeder-shaft F, having flanges f, in combination with the air-reservoir K, having weighted flexible expanding top k, the wide flat pipe E, the valve O, the blower L, driving-belt m, and pulley M, substantially as and for the purpose herein described.

In witness whereof I hereunto set my hand.

PATRICK W. REARDON.

Witnesses:

M. POMEROY,

C. H. SIMONDS.