

(No Model.)

C. BALLARD.
PNEUMATIC ORE CONCENTRATOR.

No. 431,313.

Patented July 1, 1890.

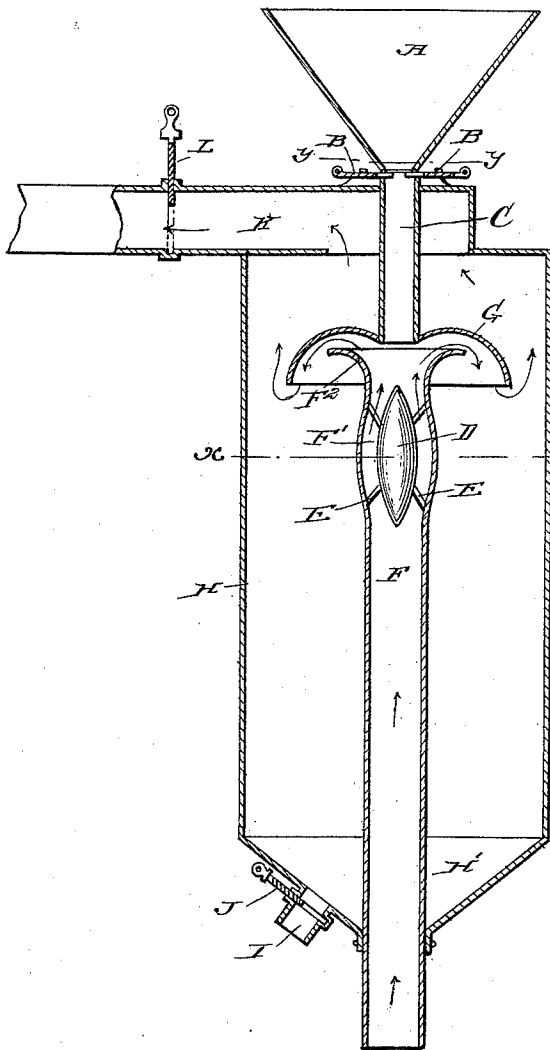


Fig. 1.

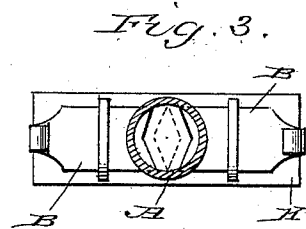
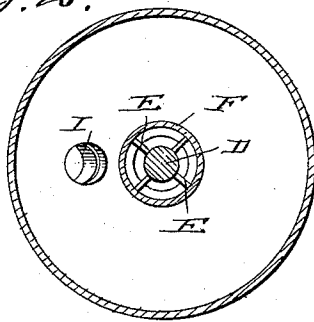


Fig. 3.

Fig. 2.



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CHARLES BALLARD, OF PUEBLO, COLORADO.

PNEUMATIC ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 431,313, dated July 1, 1890.

Application filed November 15, 1889. Serial No. 330,403. (No model.)

To all whom it may concern:

Be it known that I, CHARLES BALLARD, of Pueblo, in the county of Pueblo and State of Colorado, have invented a new and Improved
5 Pneumatic Ore-Concentrator, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved ore-concentrator which is
10 simple and durable in construction, very effective in operation, and specially designed to concentrate by means of an exhaust-blast pulverized ores, such as are usually passed through water-jigs.

15 The invention consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying
20 drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a sectional view of
25 the same on the line *xx* of Fig. 1, and Fig. 3 is an enlarged sectional plan view of part of the improvement on the line *yy* of Fig. 1.

The improved ore-concentrator is provided
30 with a hopper A, into which the pulverized ores to be treated are placed. On the lower end of the hopper A are arranged suitable slides B, opening into a pipe C and serving to regulate the amount of pulverized ores passing from the hopper A into the pipe C. The
35 lower end of the pipe C discharges onto a body D, suspended by rods E in a chamber F' of a vertical pipe F, opening at its lower end into the outer air and provided at its upper end with an outwardly-curved flange F²,
40 the top of which extends to within a short distance of the lower end of the pipe C. The body D may be circular or elliptical, as shown, the chamber F' being correspondingly shaped, there being enough room between the outer
45 surface of the body D and the inner surface of the chamber F' to permit the valuable metals to pass down into the lower part of the pipe F.

On the lower end of the pipe C is secured
50 an annular hood G, arranged over the annular flange F², as is plainly shown in Fig. 1.

The pipe C, the hood G, and part of the pipe F, with the body D, are inclosed in an air-tight casing H, provided in its lower end with a funnel H', from which opens an outlet I, 55 adapted to be opened and closed by a slide J.

The upper end of the casing H connects with a channel or pipe K, connected with an exhaust-fan of any approved construction. In the channel or pipe K is held a valve L 60 for regulating the exhaust-blast.

The operation is as follows: When the exhaust-fan is set in motion, a current of air is drawn from the outside through the pipe F, over the annular flange F², is guided down- 65 ward by the hood G, and then passes up into the channel K and to the exhaust-fan. The ore to be treated is previously sized by suitable means, is passed into the hopper A, and descends through the pipe C into the upper 70 end of the pipe F, striking onto the body D, so that the ore is distributed all around, giving the air-blast a chance to act on all the distributed particles. Particles heavy enough to fall against the blast surrounding the body 75 D descend and are discharged through the pipe F, while the lighter particles are carried up by the blast and are thrown over the annular flange F² against the hood G, to be pressed downward, so that the lighter particles or tailings settle in the hopper H', from which they can be drawn off at suitable intervals through the inlet I by opening the slide J. The air alone passes upward into the channel K, as previously described. Now it 85 will readily be seen that no power is needed to handle the heavy particles of ore, as they fall by their own weight, sufficient blast to carry off the light material being all that is necessary. The space between the flange F² 90 and the hood G should be of the same size as the space surrounding the body D in the chamber F'. The object in having the capacity of the overflow the same as that of the air-space in the chamber F' is that particles 95 heavy enough to fall against the pressure of air surrounding the body shall not be carried over, and that any particles not heavy enough to fall against said pressure shall be carried over and not remain in the separating-cham- 100 ber.

Having thus fully described my invention, I

claim as new and desire to secure by Letters Patent—

5 1. In a pneumatic ore-concentrator, the combination, with a pipe opening at one end into the outer air and provided at its other end with an annular curved flange, of a body suspended in the said pipe, and a feed-pipe opening onto the said body and carrying a hood held over the said annular flange, substantially as shown and described.

10 2. In a pneumatic ore-concentrator, the combination, with a pipe opening at one end into the outer air and provided at its other end with an annular curved flange, of a body suspended in the said pipe, a feed-pipe opening onto the said body and carrying a hood held over the said annular flange, and a casing inclosing the said feed-pipe, hood, and body and

connected with an exhaust-fan, substantially as shown and described. 20

3. In a pneumatic ore-concentrator, the combination, with a pipe opening at one end into the outer air and provided at its other end with an annular curved flange, of a body suspended in the said pipe, a feed-pipe opening onto the said body and carrying a hood held over the said annular flange, a casing inclosing the said feed-pipe, hood, and body and connected with an exhaust-fan, and a hopper provided with slides which regulate the flow of ore to the said feed-pipe, substantially as shown and described. 25 30

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Witnesses:

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