

A. GOODHART.
Ore Pulverizer and Separator.

No. 215,912.

Patented May 27, 1879.

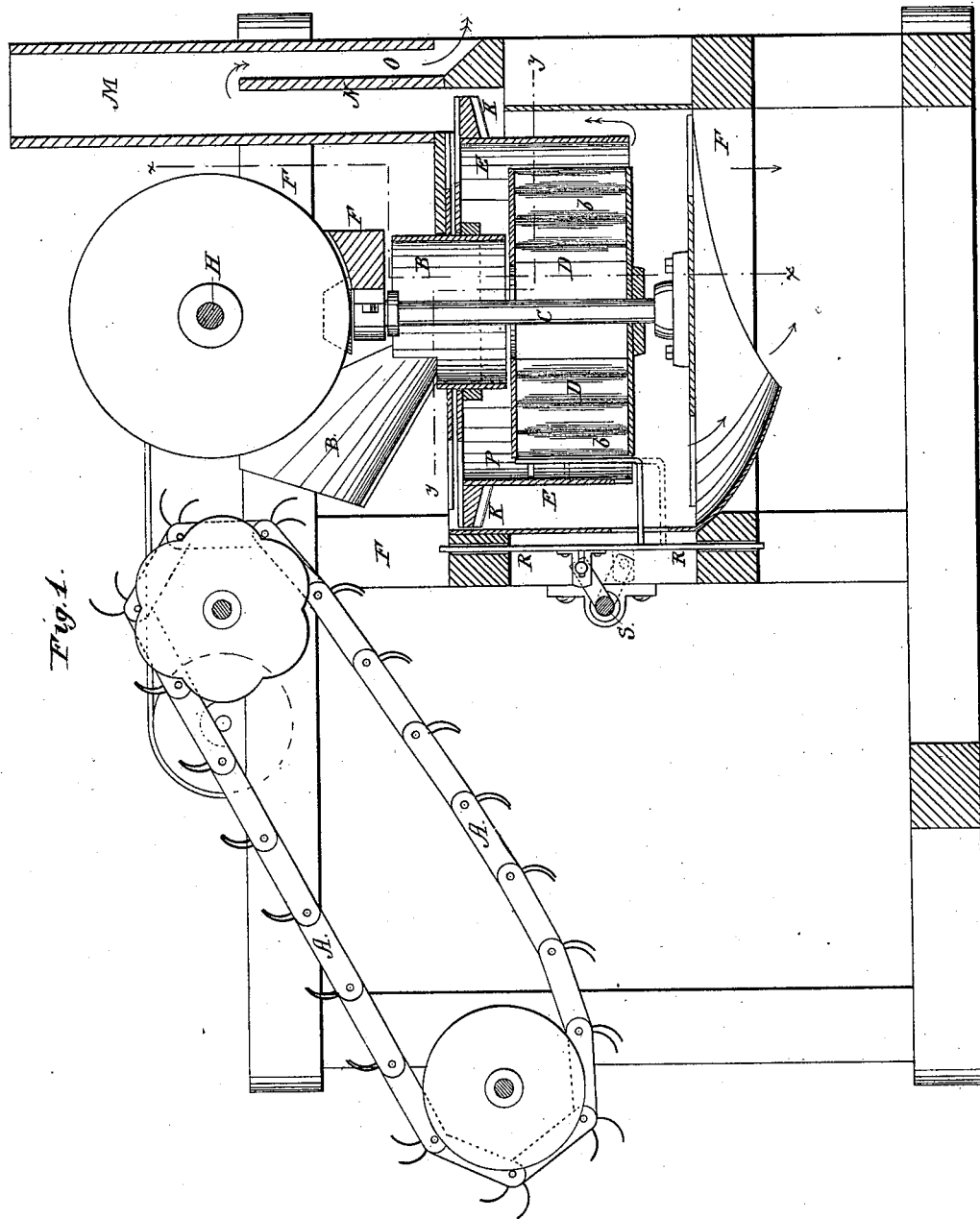


Fig. 1.

WITNESSES:

W. W. Hollingsworth
Amos W. Hart

INVENTOR:

Alex. Goodhart

BY

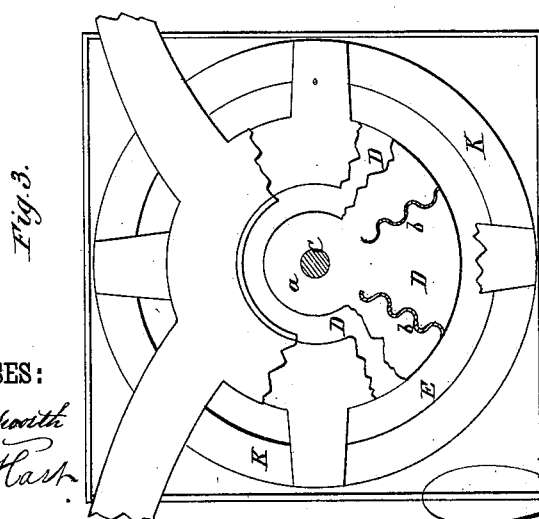
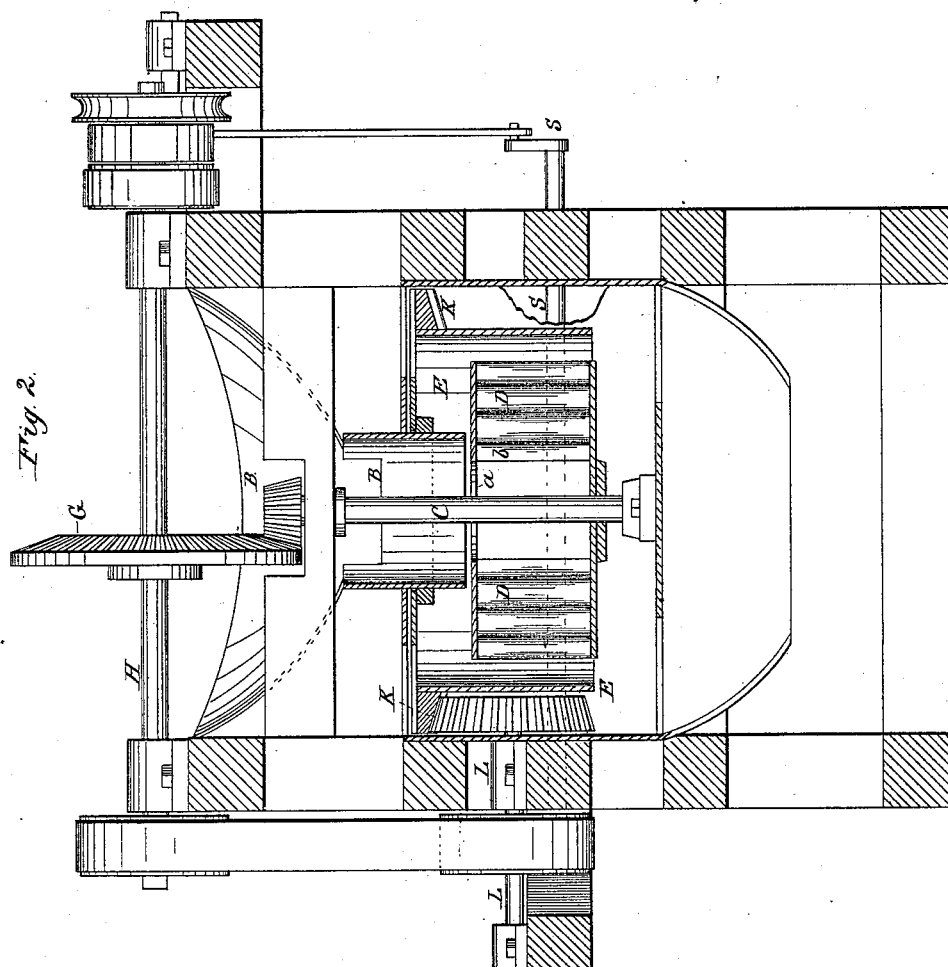
Wm. B.

ATTORNEYS.

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UNITED STATES PATENT OFFICE.

ALEXANDER GOODHART, OF CARLISLE, PENNSYLVANIA.

IMPROVEMENT IN ORE PULVERIZER AND SEPARATOR.

Specification forming part of Letters Patent No. **215,912**, dated May 27, 1879; application filed January 30, 1879.

To all whom it may concern:

Be it known that I, ALEXANDER GOODHART, of Carlisle, in the county of Cumberland and State of Pennsylvania, have invented a new and useful Improvement in Separators for Iron and other Ores; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention is an improvement in the class of dry-ore-separating machines for separating metallic ores from gangue or foreign matter by centrifugal action.

The improvements relate to the construction of the cylinder into which the ore-matter is first received, and by which the lumps of earth mingled with or containing or adhering to the ore particles are subjected to a preliminary pulverizing action, and to the employment, in connection with such pulverizer, of a surrounding-cylinder, which revolves in the opposite direction, and completes the pulverizing process begun by the other.

In the accompanying drawings, forming part of this specification, Figure 1 is a vertical longitudinal section of my improved machine. Fig. 2 is a vertical transverse section on line *x x* of Fig. 1. Fig. 3 is a detail horizontal section on line *y y* of Fig. 1.

A indicates an endless traveling elevator, for conveying the ore and the foreign earthy matter with which it is mixed from the ore-bank or other source of supply to the hopper B of the separator.

I do not here claim said elevator, but purpose taking out separate Letters Patent therefor, and will hence omit description of its construction.

From the hopper B the material to be separated passes down through the eye or opening *a* around the shaft C of the pulverizer or pulverizing-cylinder D, and is by the latter discharged laterally against the side of the cylinder E, which surrounds the sides of said pulverizer, and is arranged concentrically therewith, but revolves in the opposite direction.

The particular construction and operation of these parts and others whose action is dependent on theirs are as follows: The shaft C is stepped vertically in suitable bearings attached to cross-bars of the wooden frame F, and rotary motion is imparted to it by the

bevel-gear G, fixed on the motor-shaft H. The pulverizer D is attached to shaft C, and consists of parallel top and bottom plates, the lower one being imperforate, and the other provided with a central opening, *a*. Between said top and bottom plates are fixed vertical wings *b*, which extend from the eye *a* to the periphery, and are slightly curved in the direction opposite that in which the cylinder rotates. Said wings are also corrugated vertically to enable them to more readily and thoroughly break up and disintegrate the lumps and particles of mingled or adhering ore and earthy matter, as said lumps come forcibly in contact with them, in consequence of the rapid rotation of the cylinder D—that is to say, the motion of the latter causes the ore-matter, by the principle of centrifugal action, to pass with great rapidity from the center *a* to the periphery, where it is arrested by the surrounding cylinder E; and in so doing it must come successively in forcible contact with the corrugations or ribs of the wings *b*, and is thus subjected to a progressive pulverization, which is finally completed and perfected by the matter stirring against the cylinder E. This culminating result is due in part to the cylinder E revolving rapidly in a direction opposite to that of the pulverizing-cylinder. It has also been found by experiment that such opposite action is attended by another advantage, namely, that the clay or other earthy matter adheres less firmly and in less quantity to the side of the cylinder.

The main portion of the ore-matter which has thus been pulverized escapes downward between the cylinders D E, and is delivered onto an elevator, (not shown,) by which it is conveyed to a suitable shaking or other screen, (not shown,) for final separation of the ore particles from the clay, sand, or other mineral substance.

The cylinder E is provided with a bevel-gear, K, which extends around and is attached to its upper edge on the outer side. This gear meshes with a pinion on a shaft, L, which derives rotating motion through belt from the driving-shaft H.

The blast incidental to the rotary action of the pulverizer D has vent downward, and also upward, through flue M. The latter has a

short vertical central partition, N, on one side of which is a passage, O, leading downward. The finer lighter portion of the dust will be carried off by the flue M, and discharged at some convenient point; but the ore particles which the blast carries into the flue, being of superior gravity, will be arrested in the eddy created just above the partition N, and escape down the passage O and fall upon the elevator (not shown) along with the other ore-matter.

In order to remove from the inner surface of cylinder E such earthy matter as may adhere thereto, I employ a vertically-reciprocating scraper, P, which is attached to a bar, R, working in guides and operated by a crank-shaft, S, having rotary motion imparted to it by suitable connection with the motor-shaft H.

By the above construction and arrangement of parts I produce a machine which will quickly and perfectly pulverize the ore-matter and effect the preliminary separation of the iron particles from the other earthy substances.

What I claim is—

1. In an ore-separator, the rotary pulverizer constructed of the horizontal parallel top and bottom plates and the interposed wings, corrugated and arranged vertically, and attached to and connecting said plates, as shown and described.

2. In an ore-separator, the combination of the open-bottomed cylinder E and the pulverizer having the radial wings *b*, said cylinder and pulverizer rotating in opposite directions, and the former inclosing the sides of the latter, as specified.

3. In an ore-pulverizer, the vertically-reciprocating scraper and the crank-shaft and guide-bar, in combination with the rotating cylinder E, as and for the purpose specified.

The above specification of my invention signed by me this 10th day of January, 1879.

ALEX. GOODHART.

Witnesses:

CHAS. A. PETTIT,
SOLON C. KEMON.