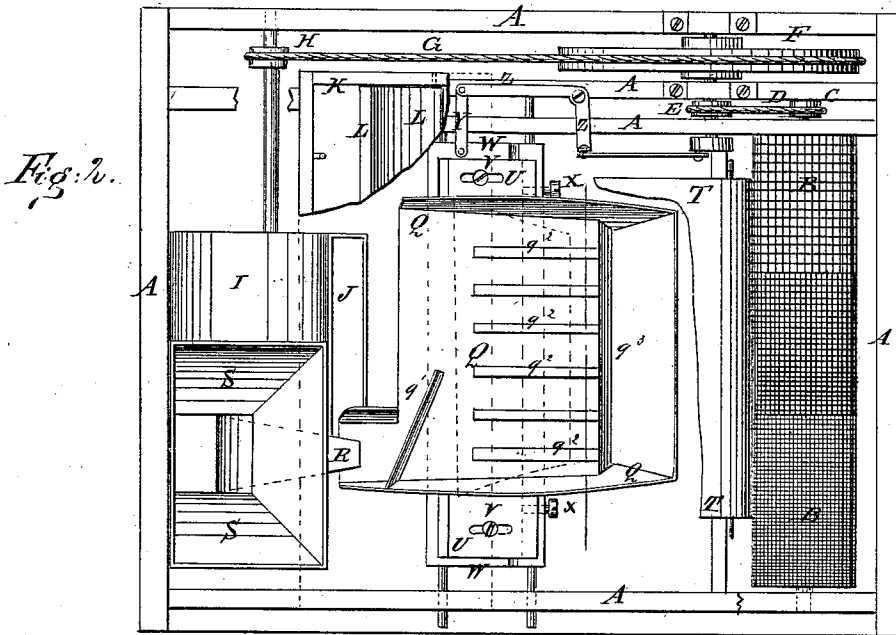
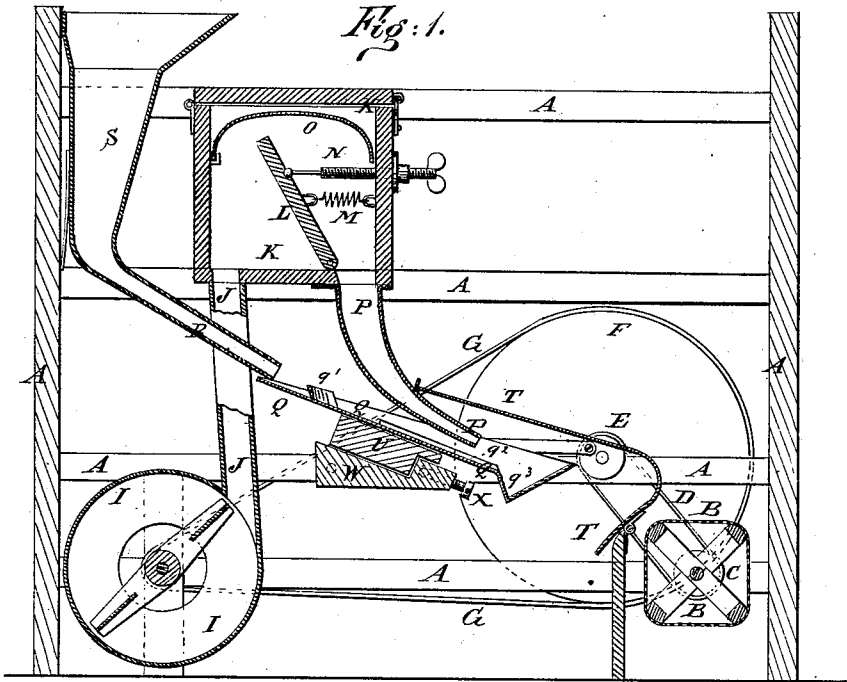


D. L. HOWARD & T. D. ATKINSON.  
Ore-Separator.

No. 206,452.

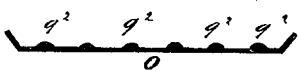
Patented July 30, 1878.



WITNESSES:

*C. W. N. A.*  
*C. Sedgwick*

*Fig: 3.*



INVENTOR:

*D. L. Howard*  
*T. D. Atkinson*

BY

*M. M. M.*

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

DENISON L. HOWARD AND THOMAS D. ATKINSON, OF NOTTAWA, MICHIGAN.

## IMPROVEMENT IN ORE-SEPARATORS.

Specification forming part of Letters Patent No. **206,452**, dated July 30, 1878; application filed March 19, 1878.

*To all whom it may concern:*

Be it known that we, DENISON LOCKWOOD HOWARD and THOMAS DAWSON ATKINSON, of Nottawa, in the county of St. Joseph and State of Michigan, have invented a new and useful Improvement in Gold-Separators, of which the following is a specification:

Figure 1 is a vertical section of our improved apparatus. Fig. 2 is a top view of the same, parts being removed and parts being broken away to show the construction. Fig. 3 is a detail cross-section of the pan.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved apparatus for separating gold from sand and dust or powdered rock, which shall be so constructed as to effect the separation of the gold without using water, and which shall be simple in construction, convenient in use, and effective in operation.

A represents the frame of the machine. B is the grader, which is made by covering different sections of a square or octagonal frame with wire-cloth, gradually increasing in the size of its mesh long or square. The sand is fed into the grader B, and passes out in portions of uniform fineness, which graded sand is received in separate compartments of a receiver placed beneath it.

The journals of the grader B revolve in bearings attached to the frame A, and to one of said journals is attached a pulley, C, around which passes a band, D. The band D also passes around a pulley, E, attached to the journal of the wheel F. The journals of the wheel F revolve in bearings attached to the frame A, and motion is given to the said wheel from any convenient power.

Around the wheel F passes a band, G, which also passes around a pulley, H, attached to the shaft of the fan-blower I, which is secured in the rear lower part of the frame A.

The discharge-spout J of the fan-blower I is made wide and thin, projects upward, and is connected with a slot in the rear part of the bottom of the air-chest K, so as to discharge the blast into said chest K in a wide thin sheet. The chest K is divided into two compartments by a partition, L, which is hinged at its lower edge to the forward part

of the bottom of the said chest K. The upper part of partition L is drawn toward the front of the air-chest K, thus forming a V-shaped compartment, which spreads the air by a spiral spring, M, attached to it and to the said front, and is pushed back to adjust it at any desired inclination by a set-screw, N, passing in through the front of the said air-chest K and resting against the said partition L.

O is an arched plate, the edges of which rest upon hooks or other supports attached to the front and rear sides of the air-chest K, and which, in connection with the partition L, serves as a guide and distributor to the blast as it passes over the upper edge of the said partition L.

In the forward part of the bottom of the air-chest K is formed a slot, in which is secured the end of the spout P for discharging the blast. The discharge-spout P becomes gradually narrower and thinner, and is curved forward, so as to discharge the blast upon the pan Q with increased force, and at a very slight inclination with the plane of the said pan.

The pan Q is set at an inclination of about twenty degrees, and receives the sand at a rear corner from a spout, R, leading from a hopper, S, attached to the rear part of the frame A.

To the pan Q, near the end of the feed-spout R, is attached an inclined flange,  $q^1$ , to guide the sand to the middle part of the said pan Q. To the pan Q are attached slight ribs  $q^2$ , to assist in distributing the sand and to check the gold, causing it to settle. Along the lower edge of the pan Q is formed a groove or trough,  $q^3$ , to receive the gold, and which may be supplied with quicksilver, to take up the fine particles of gold.

T is a plate, the upper edge of which rests upon the lower part of the blast-discharge spout P, and its lower part is curved downward and rearward. The plate T is designed to hold the blast down upon the pan Q and confine the sand as it is blown off and guide it to the lower part of the machine, whence it may be removed as required. The pan Q is secured to the bar U, the end parts of which are slotted transversely to receive the bolts V, by which it is secured to the bar W. The

bar U is adjusted upon the bar W by the set-screws X, which pass through a flange formed upon the forward edge of the said bar W, and rest against the forward edge of the said bar U. To the ends of the bar W are attached rods, which slide in bearings in the frame of the machine. To one end of the bar W is pivoted the end of a connecting-bar, Y, the other end of which is pivoted to the end of an arm of the elbow-lever Z. The lever Z is pivoted at its angle to the frame A, and to the end of its other arm is pivoted the end of the connecting-bar A', the other end of which is pivoted to the crank-pin of a crank-wheel, B', attached to the end of the journal of the wheel F.

By this arrangement the pan Q will constantly receive a lateral shake as the sand and gold are passing over it, so that the gold may be below the sand when exposed to the blast of air.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination of the air-chest K, provided with the hinged partition L, the spiral spring M, the set-screw N, the arched plate O, and the tapering discharge-spout P, with the spout J of the fan-blower I, and with the oscillating separating-pan Q, substantially as herein shown and described.

2. The combination of the adjustable bar U and its fastening-bolts V and adjusting-screws X with the separating-pan Q, and with the bar W, that supports and oscillates the said pan, substantially as herein shown and described.

DENISON LOCKWOOD HOWARD.  
THOMAS DAWSON ATKINSON.

Witnesses:

WM. SADLER,  
GEO. J. SADLER.