

(No Model.)

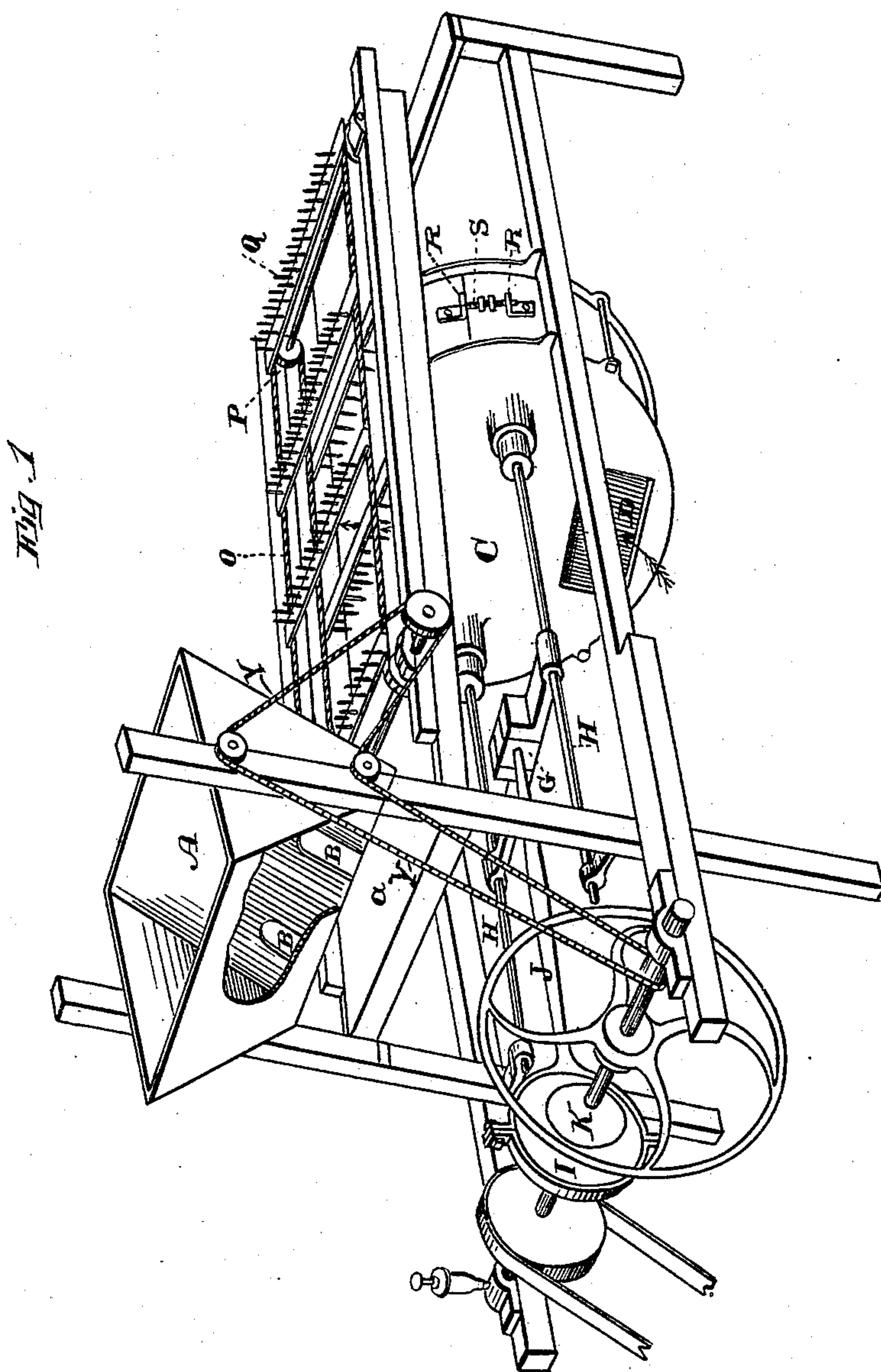
2 Sheets—Sheet 1.

J. C. McCURDY.

DRY ORE SEPARATOR.

No. 278,160.

Patented May 22, 1883.



Witnesses,
J. H. Maise
Jos. A. Bayless.

Inventor,
J. C. McCurdy
By Dewey & Co
Attorneys

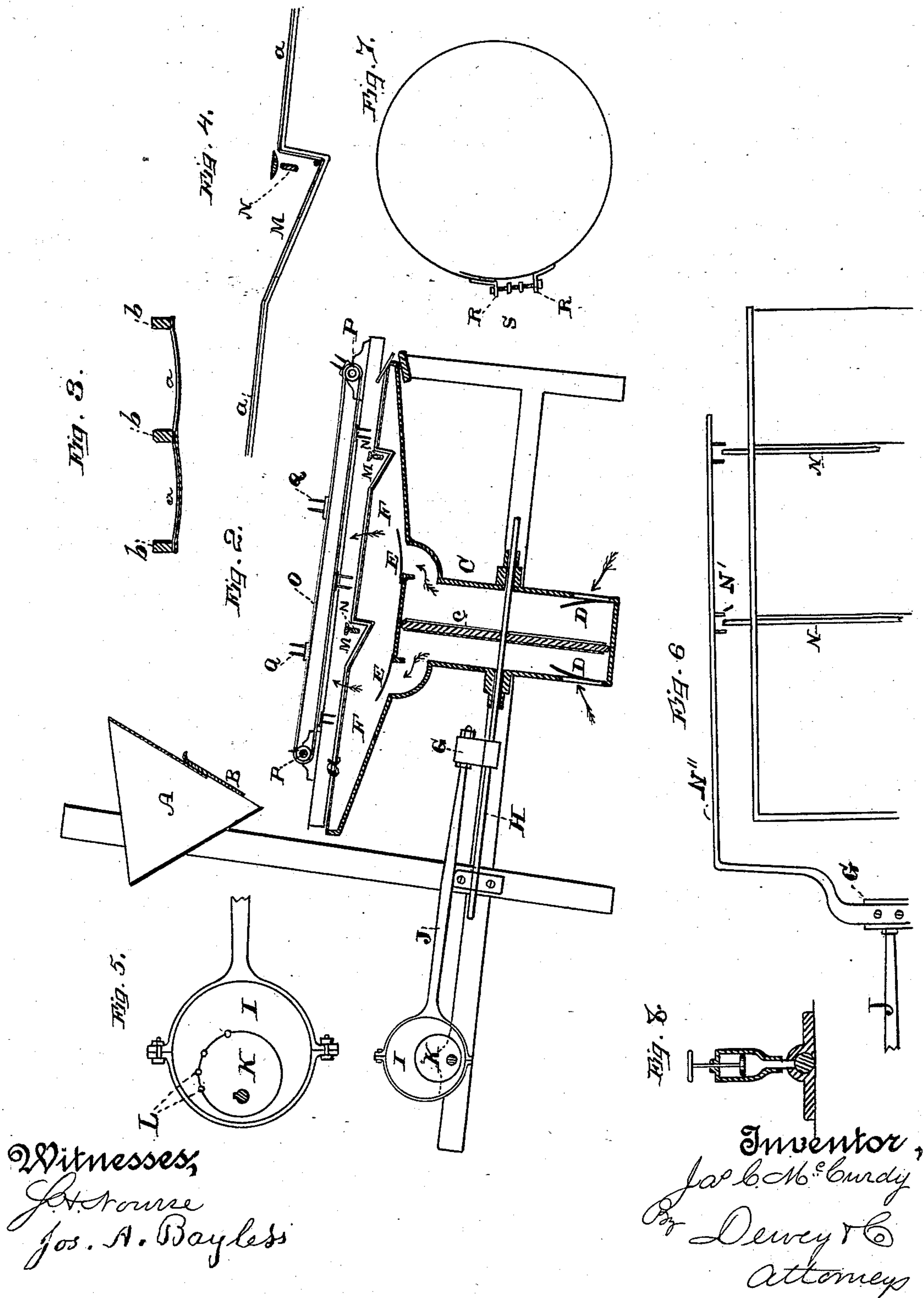
(No Model.)

2 Sheets—Sheet 2.

J. C. McCURDY.
DRY ORE SEPARATOR.

No. 278,160.

Patented May 22, 1883.



UNITED STATES PATENT OFFICE.

JAMES COLLINS McCURDY, OF SAN FRANCISCO, CALIFORNIA.

DRY-ORE SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 278,160, dated May 22, 1883.

Application filed October 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES COLLINS McCURDY, of the city and county of San Francisco, 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 an improved apparatus for separating gold and valuable heavy metals or sulphurets from the lighter materials with which they are mixed when in a dry state.

It consists of a series of parallel sluices formed of wire-gauze covered with cloth of any suitable fibrous material, having depressions or riffles formed at intervals, and agitators vibrating within these riffles. Above the whole is a moving chain belt having projecting teeth, by which the mass of material is kept stirred up while a blast apparatus beneath forces a current of air up through the screens, the whole separating and settling the heavier particles, while the lighter ones are carried out over the rear of the apparatus and discharged. A feed-hopper supplies the material as fast as it is needed, and a means is provided for regulating the force of the blast apparatus to suit the work, all of which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a perspective view of my apparatus. Fig. 2 is a longitudinal vertical section of same. Fig. 3 is a transverse section of the ore-bed. Fig. 4 is an enlarged view of one of the riffles. Fig. 5 shows the double eccentric. Fig. 6 is a top view of the ore-bed, showing agitators and lever for moving the same. Fig. 7 shows means for tightening cylinder. Fig. 8 is the oil-cup.

A is a hopper into which the material to be treated is placed, and from which it is discharged by gates B, which may be adjusted to suit the work. The material falls upon a series of longitudinal parallel sluices, *a*, which are composed of cloth, canvas, or other fibrous material, overlying wire screen-cloth. Longitudinal ribs *b* support this cloth at intervals, allowing it to sink or belly downward between the ribs, and thus form the series of separate sluices, along which the material travels to the discharge-point. Intermittent blasts of air are forced upward through the sluices by a plunger,

c, working in a cylinder, C, which is provided with inlet-valves D, and outlet-valves E, the latter opening into a chamber, F, beneath the sluices, so that the air will be forced through all parts of the latter. This chamber has the greatest depth at the center, and the bottom inclines upward toward each end, so as to decrease the depth, as shown. This reduced space into which each stroke of the plunger forces the air produces a more effective action of the blast upon those portions of the sluices which are more distant from the point of admission.

The plunger *c* is connected with a cross-head, G, by a rod or rods, H, and they are connected with the eccentric I by a rod, J. The operation of this mechanism will be to lift the mass of material from the sluice by a series of puffs from the blast apparatus. The eccentric I has within it another eccentric, K, around which it may be turned, so that the throw of both will be in the same direction; or they may be made to stand in opposite directions, which will reduce the stroke to nothing. Holes L are made through the intersection of these two eccentrics, and they may be turned to any desired point and there fixed by introducing a pin, half of which projects into one and half into the other, thus locking them firmly together.

The surfaces of the sluices have depressions or riffles M formed in them at intervals, and within these are agitators N, which extend across the full width of the sluices and have their lower edges projecting slightly down into the riffles, so that when caused to vibrate by suitable connections, N', attached to bar N'', bolted to head G, and reciprocating with it, they keep the mass stirred and loosened up. Above the whole of the sluices and driven by a drive-chain, Y, from the main shaft is an endless belt or chain, O, passing over rollers P at each end, and having teeth Q projecting downward toward the sluices, so as to act as a rake and stir the sand and keep it moving toward the point of discharge.

The inclination of the machine and the action of the stirrers moving above the sluices causes the heavier particles to settle to the bottom and eventually become lodged in the riffles M, while the lighter material will pass off over the discharge end. As the sluices keep

the material separated, each one acts in a measure independent of the others, and the material is prevented from traveling from side to side as it moves along. The machine may thus be made of considerable width, and a single feed-hopper and single blast apparatus will be sufficient for the whole.

In order to make a tight joint of the piston and to take up any wear as it takes place, the exterior shell of the cylinder is made of thin metal, and, instead of being solid, the edges overlap, the inner one being beveled off so as to present a smooth surface to the piston. Outside the cylinder are fixed the flanges R, through which screws S pass, and when these screws are tightened up the overlapping edges of the cylinder allow it to be drawn together and made smaller, thus fitting the packing closely. This may be done until it is necessary to replace the packing with new, when it may be again let out to its fullest size. The piston is by this means kept tight with but little trouble.

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

1. In a concentrating apparatus, the series of parallel sluices *a*, formed of wire-gauze and cloth, and having the longitudinal separating ribs *b* and the depressed transverse grooves or riffles M, and the vibrating stirrers or agitators N, in combination with the cylinders C,

plungers *c*, valves D E, and the chamber F, substantially as herein described.

2. In a dry concentrating apparatus, the parallel sluices *a*, having the depressed riffles M, the chamber F, the blast-cylinder C, piston *c*, and agitators N, in combination with the endless traveling belt or chain provided with projecting teeth, substantially as herein described.

3. In a dry concentrator, the parallel sluices *a*, formed with riffles, and the agitators and stirrers, in combination with the air-blast cylinder C, plunger *c*, connecting-rods H and J, the double eccentric I K, having key-openings L, and the pin for adjustment, substantially as herein described.

4. The parallel sluices *a*, formed with riffles M, the agitators N, and the traveling belt provided with stirrers, in combination with the air-blast cylinder C and the intervening distributing-chamber, F, tapered or decreased in depth toward each end, substantially as herein described.

5. In combination with the reciprocating piston or plunger *c*, the cylinder C, having its edges overlapped, the flanges R, and tightening-screws S, substantially as set forth.

In witness whereof I hereunto set my hand.

J. COLLINS McCURDY.

Witnesses:

G. W. EMERSON,
S. H. NOURSE.