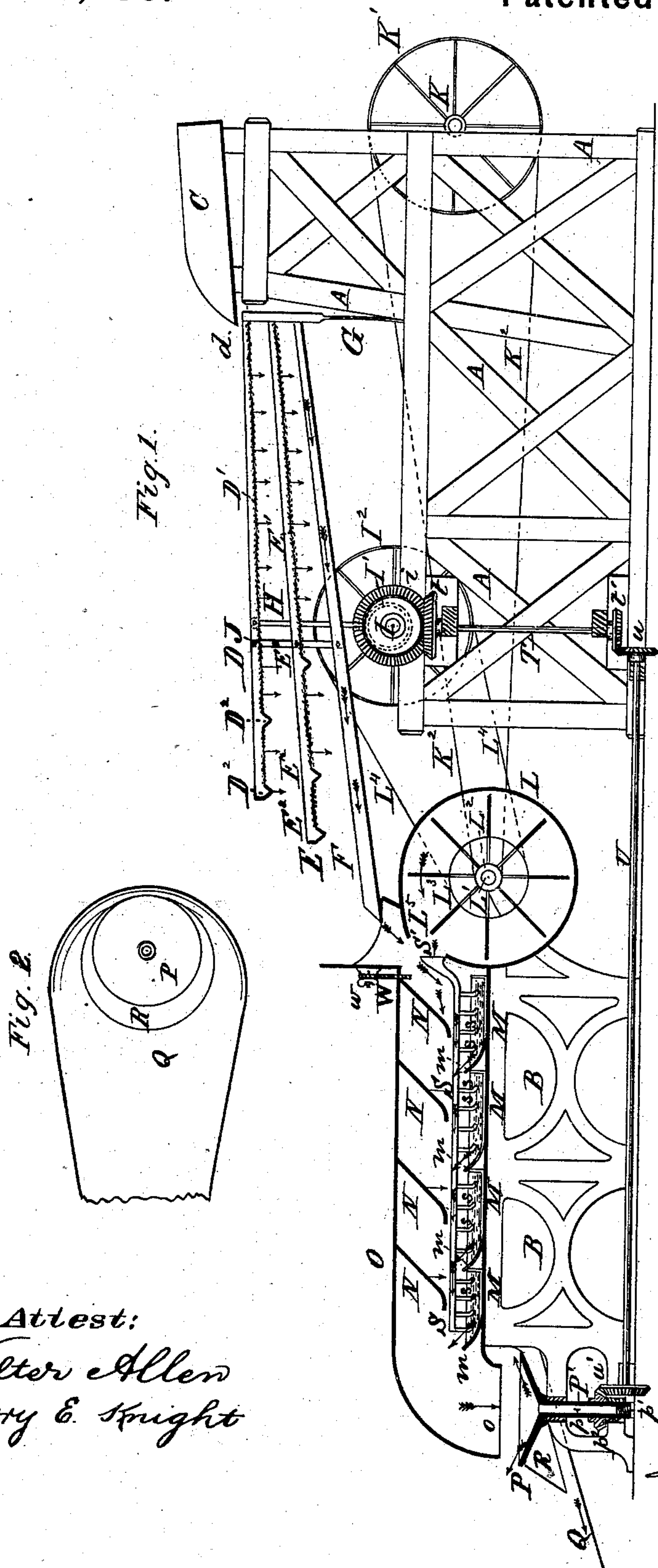


(No Model.)

R. M. McDERMOTT.
Amalgamator.

No. 237,300.

Patented Feb. 1, 1881.



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UNITED STATES PATENT OFFICE.

ROBERT M. McDERMOTT, OF ST. LOUIS, MISSOURI.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 237,300, dated February 1, 1881.

Application filed July 8, 1880. (No model.)

To all whom it may concern:

Be it known that I, ROBERT M. McDERMOTT, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Apparatus and Process for Amalgamating Ores or Sands Containing Valuable Metals, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a machine or apparatus hereinafter set forth and claimed, and to the described process, the scope being indicated in the claim.

Figure 1 is a longitudinal section of the machine. Fig. 2 is a top view of the centrifugal separator and the amalgam-plate.

A A and B B are parts of the supporting-frame. C is a box or hopper from which the disintegrated ore is discharged upon the upper end, *d*, of the pan D. The bottom of the pan D is shown as consisting, for the most part, of wire work or gauze D'; but in place of the gauze I may use perforated plate-metal. The meshes in the wire-work or holes in the plate are made of such a size as to allow the passage through them of all material below certain dimensions.

D² D² are transverse troughs in the pan-bottom, containing mercury to amalgamate and detain any metal passing. The refuse material is discharged from one or both of the lower corners of the pan.

E is a pan beneath the pan D, and constructed in the same manner, except that the meshes of the gauze E' (or holes, if plate-metal is used) are smaller, so as to retain the coarser parts, while allowing the finer parts to pass through. This pan is provided with amalgamating-troughs E² for mercury, similar to those D² before described. The refuse matter from trough E is discharged at one or both of the lower corners. Beneath the pan E is an imperforate-bottomed pan, F, carrying all the finer material which had passed through the pans D and E to a series of amalgamating-pans, M. The pans D E F are supported at the upper end upon flexible bars G, and supported between the ends upon eccentric rods H, that have vertical reciprocation by means of eccentrics on the shaft I, the eccen-

tries being shown by dotted lines I'. The pans D E F are connected by bars J at the sides.

K is the main shaft, carrying a belt-wheel, K', communicating rotation to the shaft L' of the fan or blower L by means of a belt, K², and pulley L².

L³ is a pulley on the fan-shaft, connected by a belt, L⁴, with a pulley, I², upon the eccentric-shaft I.

The material drops from the pan F into the first of a series of amalgamating-pans, M M, &c., passing in its descent before the vent L⁵ of the pan L. The air-blast blows the material against an inclined deflecting-plate, N, from which it is deflected downward upon the surface of the mercury contained in the pan, where the metal becomes amalgamated; but the earthy parts are blown forward upon the surface of the mercury and up the inclined end *m* of the pan and against the second deflector N, and so on, over the mercury contained in one pan after another, until the sand and dust reach the down-turned mouth *o* of the case O, through which they are discharged upon the centrifugal cup or receiver P, from whose edge the sand and dust are discharged, while any mercury that may have been carried from the pans M with the sand will percolate through the sand into the receptacle *p* in the hollow shaft P' of the centrifugal separator. The receptacle *p* is closed by a removable screw-plug, *p'*, to allow the discharge of the mercury from time to time. The material escaping from the periphery of the cup P falls upon an inclined copper or copper-faced plate, Q, which is so inclined as to cause the sand to slip down it, whereas the amalgam, if there is any mixed with the sand, will adhere to the plate, and thus be preserved.

R is a fixed plate or collar surrounding the shaft P' and preventing the material clogging the shaft.

The centrifugal separator P may be driven in any suitable manner. I have shown as a means for this end a bevel-wheel, *i*, on the shaft I, engaging a bevel-wheel, *t*, on the shaft T, which carries another bevel-wheel, *t'*, engaging a bevel-wheel, *u*, on the shaft U. The shaft U carries a bevel-wheel, *u'*, engaging a bevel-wheel, *p*², on the shaft P' of the centrifugal separator.

It is not necessary that the centrifugal separator should have a continuous rotation, as it may have an oscillatory movement, which, while it would not give equal regularity in the centrifugal discharge, would be more effective in agitating the sand and causing the mercury to percolate through it.

S is an air-pipe. There may be one at each side of the series of pans M. These pipes have funnel-mouths S', opening to the mouth or vent L⁵ of the fan L, so as to receive air, which is carried along the pipes S and discharged through nozzles s into the mercury in the troughs, to agitate it and keep the surface clear, so that it will be in the best condition to act on any metal that comes in contact with it. The funnels should be made removable to allow a change in area to adjust the quantity of air to the quality of the ore being treated; otherwise such adjustment may be made by a valve in each pipe S.

W is a movable plate or damper to regulate the air-blast. This damper is supported in the top of the case O, through which it works, and is held to its adjustment by a set-screw, w.

The agitating-blast through the pipes S is not absolutely necessary to the successful operation of the machine; neither is the centrifugal separator necessary; but these, while not necessary, are valuable features of the machine.

I claim herein as new and of my invention—

1. The combination of pan D, having mercury-trough D², pan F, amalgamating pan or pans M, fan or blower L, and deflector plate or plates N, as set forth.

2. The amalgamator having pans D E, with mercury-troughs D² E², pan F, amalgamating pan or pans M, fan or blower L, and deflector plate or plates N, for the purpose set forth.

3. The combination of pans D E, pan F, blast-fan L, amalgamating pan or pans M, deflector or deflectors N, and mercury-agitator S S' s, for the purpose set forth.

4. The combination of the shaking-pans D E, pan F, fan L, amalgamating pan or pans M, with air deflector or deflectors N, and the centrifugal separator P, substantially as and for the purpose set forth.

5. In combination with a centrifugal separator, the inclined amalgam-collecting plate Q, substantially as and for the purpose set forth.

6. The described process of amalgamating ore—namely, by passing it, when in a dry and granulated or pulverulent condition, over one or more sifting-pans having in their bottoms troughs containing mercury, then discharging it over a blast of air into a pan or pans containing mercury, and in which the ore and mercury are subjected to a reverberatory blast and the mercury is agitated by a current or currents of air injected into it by nozzles entering beneath its surface.

ROBERT M. McDERMOTT.

Witnesses:

SAML. KNIGHT,
GEO. H. KNIGHT.