J. PATTERSON.

Apparatus for Concentrating and Amalgamating Gold, &c.

No. 221,350. **Patented Nov. 4, 1879.**

Fig. 1.

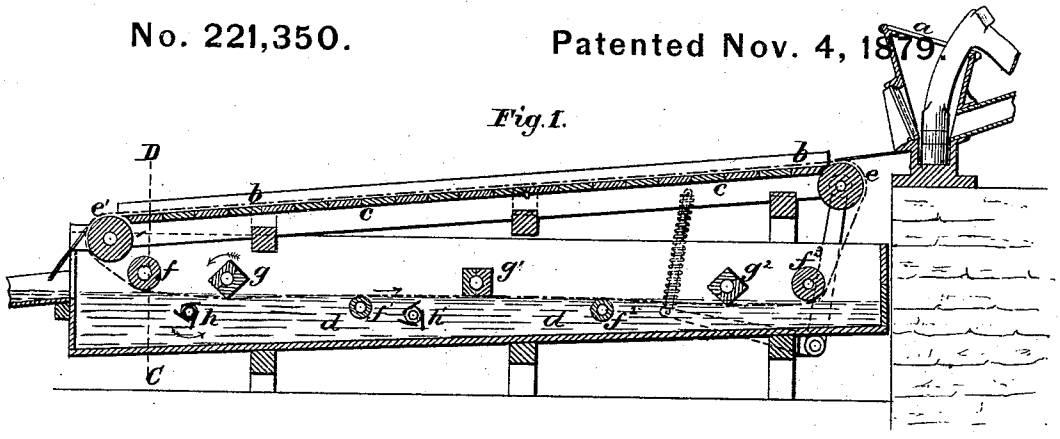


Fig. 2.

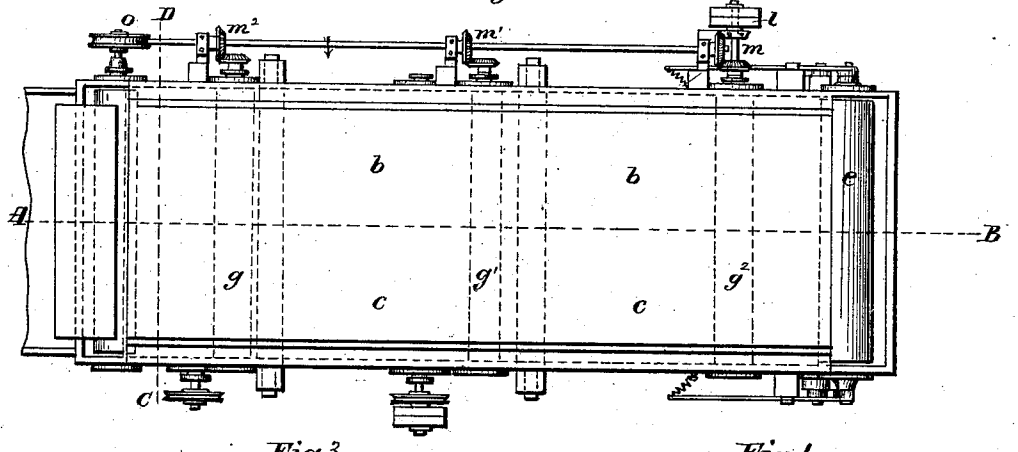


Fig. 3.

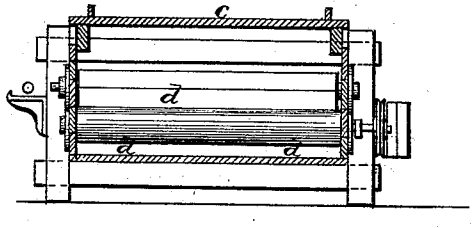


Fig. 4.

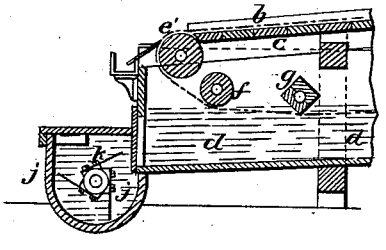


Fig. 5.

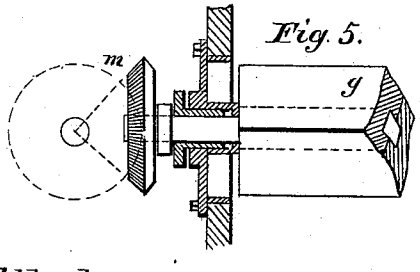


Fig. 6.

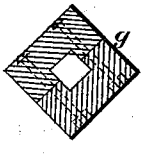
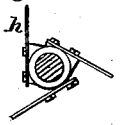


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN PATTERSON, OF INVERNESS TERRACE, COUNTY OF MIDDLESEX, ENGLAND.

IMPROVEMENT IN APPARATUS FOR CONCENTRATING AND AMALGAMATING GOLD, &c.

Specification forming part of Letters Patent No. **221,350**, dated November 4, 1879; application filed June 30, 1879.

To all whom it may concern:

Be it known that I, JOHN PATTERSON, of Inverness Terrace, in the county of Middlesex, England, have invented a new and useful Improvement in the Means of and Apparatus for Concentrating and Amalgamating Gold and other Metals and Metalliferous Substances, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to that class of ore washers or concentrators in which an endless moving blanket is independently shaken, by beaters or other means, while in motion to free the metal from its surface; and the invention consists in the combination of a water-cistern, an endless moving web or blanket, beaters to knock off the stuff from the web into the cistern and to agitate the water therein, and amalgamated plates revolving in the water in said cistern to catch whatever metal may fall in the cistern, as hereinafter described and claimed.

Figure 1 is a longitudinal section on the line A B. Fig. 2 is a plan. Fig. 3 is a transverse section on the line C D. Fig. 4 is a longitudinal section of the extension of cistern; Figs. 5 and 6, details of the angular beaters; Fig. 7, details of the revolving amalgamators, each consisting of one or more amalgamated copper plates.

a is the mortar, from which the stamped pulp issues. *b* is the blanket, formed into an endless web. *c* is the table or strake on which the endless web is supported. *d* is a cistern under the table or strake, containing water and for the concentrated stuff. *e* and *e'* are rollers, over which the blanket passes. Roller *e* also serves as a tightening-roller, by means whereof the endless web is kept at a proper tension, being controlled by the springs or weights through the bell-cranked levers, as shown. *f* *f'* f^2 f^3 are supporting-rollers for the endless web *b*, to keep it in position while being washed in the water by means of the angular beaters. *g* *g'* g^2 are revolving washing rollers or beaters, which, being angular, impart, when in motion, a quick succession of taps or blows to the back of the endless web while at work, and so bring its surface containing the concentrated stuff, by violent dashes, into and from the water, whereby the stuff is completely washed from the fibers or hairs of the endless web and deposited in the cistern.

h, *h'*, and *k* are the amalgamated copper plates, immersed in the cisterns *d* and *j*, and caused to rotate so as to bring their amalgamated surfaces into intimate contact with the gold, silver, or other metals which may have escaped the amalgamated plates sometimes employed inside the mortar, and also the amalgamated plates sometimes placed on the tables outside the mortar, and over which the pulp and slime have passed on their way to the concentrator.

j is an extension of the cistern *d*, wherein are placed revolving amalgamators. In this part the cistern may be divided into two or more compartments by partitions, so as to enable the concentrated stuff introduced into them from the concentrator to be operated upon by the rotating amalgamated plates *k* for any length of time found necessary to completely take hold of the remaining metal contained therein.

The mode of operation is as follows: When it is deemed necessary to wash the endless web, the driving-strap is moved onto the fast pulley *l*, which, by its connection through the bevel-wheels *m* *m'* m^2, puts in motion the washing-beaters *g* *g'* g^2, which violently slap the back of the endless web, causing it to dip into the water, as shown, while the carrying-rollers *f* *f'* f^2 f^3 keep it in proper position to receive the impact from the washing-rollers, so as thoroughly to remove the concentrated stuff from the endless web to the cistern of the concentrator. Simultaneously with this movement of the washing-rollers, and by means of the worm-wheel and worm *o*, the rollers *e* *e'*, carrying the endless web, cause it to move over the table or strake *c* until the portion of the endless web which has been washed is returned to the top of the table. Then, by withdrawing a clutch or clutch-box, or other shipper that may be attached to the worm *o*, the endless web ceases to move, while the washing-beaters continue the washing of that part of the endless web immediately over the cistern until the attend-

ant stops them by returning the driving-strap to its loose pulley.

The endless web may be washed without stopping the stamps.

The revolving amalgamated plates *h*, *h'*, and *k* may be driven by a strap from any convenient turning-shaft and the speed regulated at will.

When it is necessary to remove the collected amalgam, the amalgamators are withdrawn through openings in the side of the cistern, and afterward, when they are returned to their places, the openings are closed by glands of substantially the same construction as those shown applied to the beaters in Fig. 5.

This apparatus is equally applicable to the treatment of pulp coming from the batteries and to the treatment of the tailings coming from the tables or strakes.

The endless web may be made of skins or any textile materials.

I prefer the angular washing rollers or beaters, as being simple and efficient; but I do not confine myself to any particular form of washing roller or beater.

What I claim, and desire to secure by Letters Patent, is—

In an apparatus for concentrating and amalgamating metals, the combination of a water-cistern and an endless moving web, beaters to knock off the stuff from the web into the cistern and agitate the water therein, and amalgamated plates revolving in the water in said cistern to catch whatever metal may fall in it, substantially as specified.

Witnesses: JOHN PATTERSON.
PHILIP M. JUSTICE,
ALLEN I. JONES.