J. B. ATWATER.

Ore Amalgamator.

No. 40,894. Patented Dec. 15, 1863.

Fig. 1.

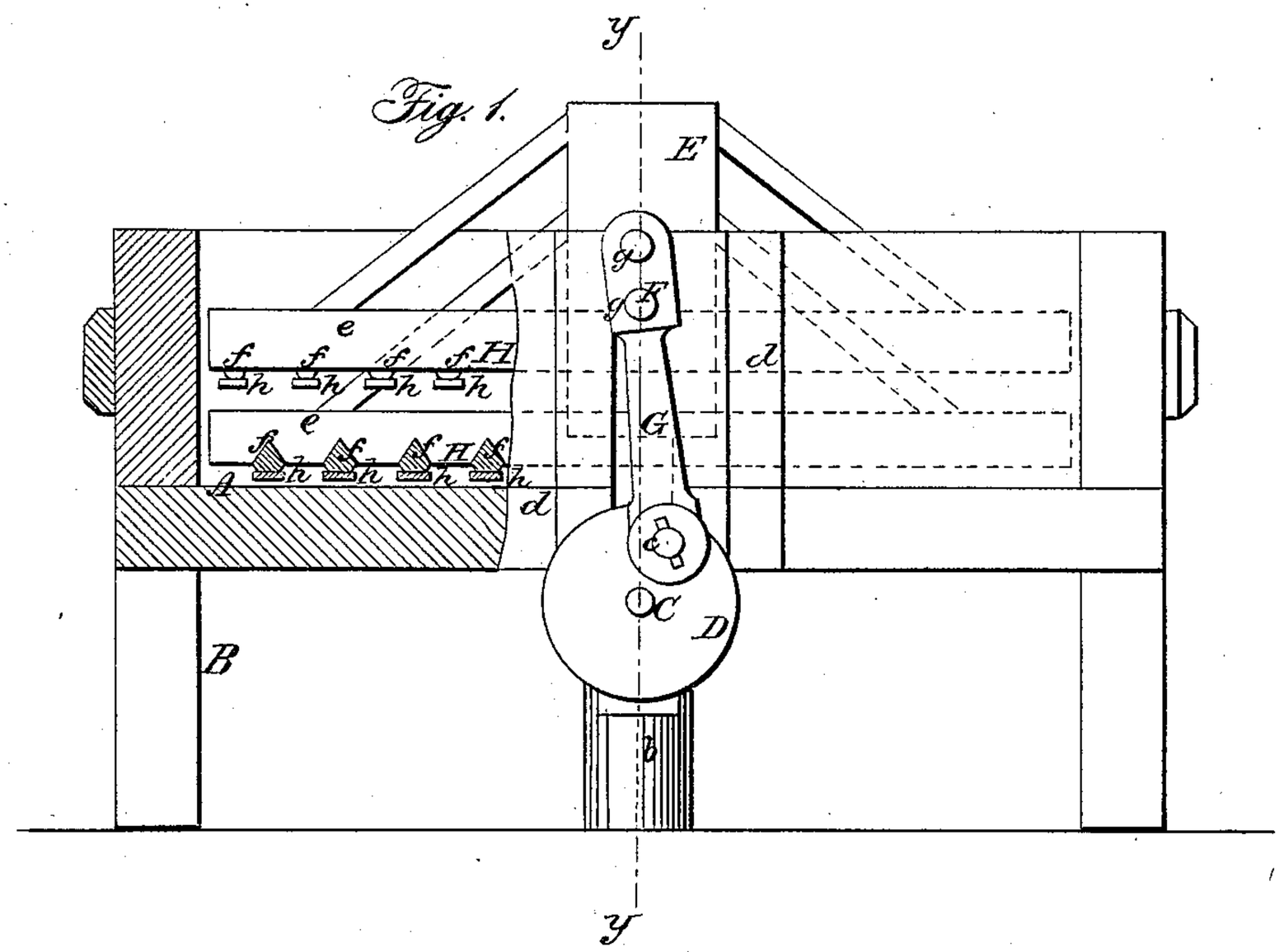
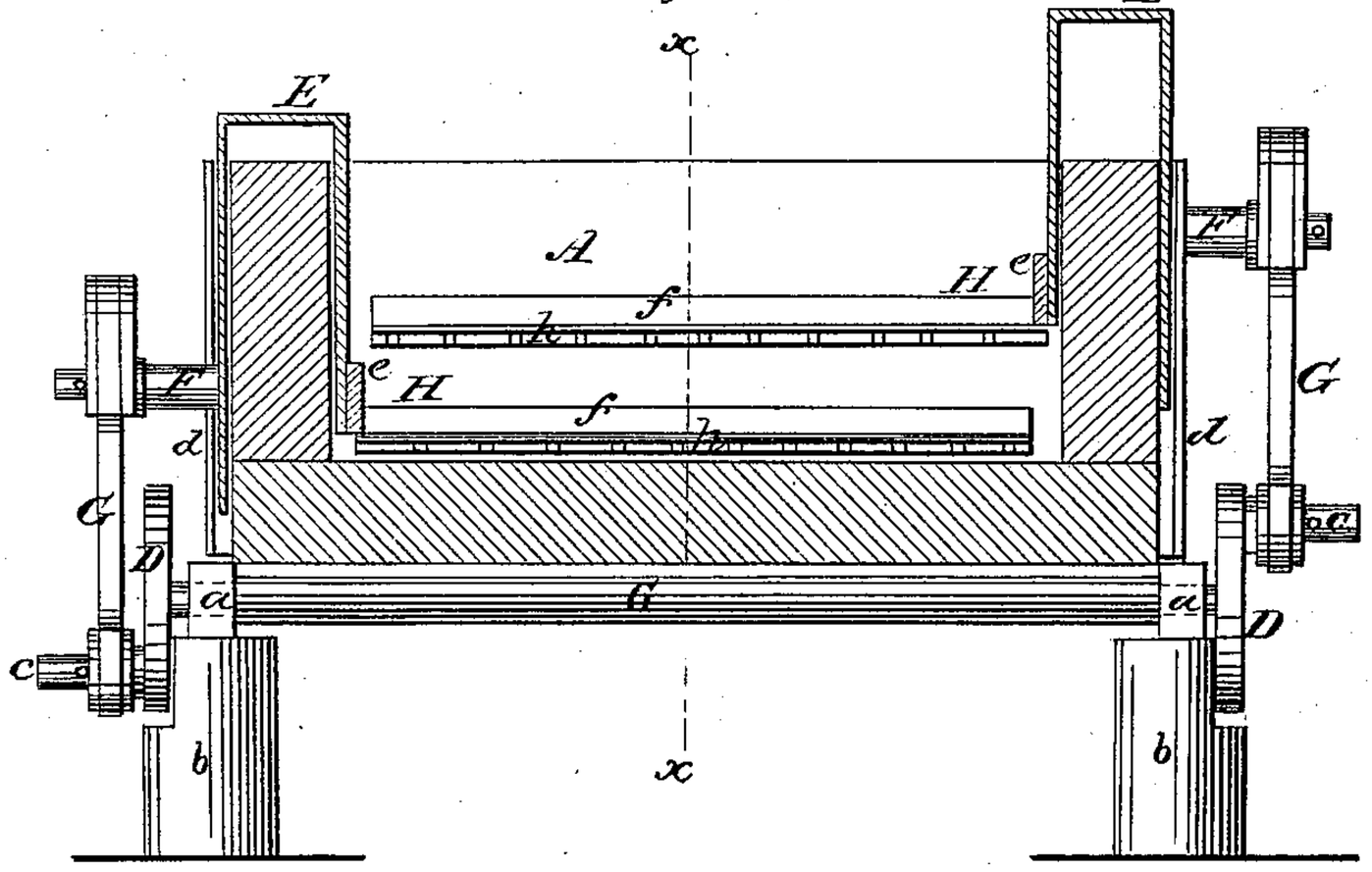


Fig. 2.



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UNITED STATES PATENT OFFICE.

J. B. ATWATER, OF CHICAGO, ILLINOIS.

IMPROVED APPARATUS FOR AMALGAMATING PRECIOUS METALS.

Specification forming part of Letters Patent No. **40,894**, dated December 15, 1863.

To all whom it may concern:

Be it known that I, J. B. ATWATER, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Device for Amalgamating Precious Metals; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side sectional view of my invention, taken in the line *x x*, Fig. 2, nearly one-half of the device being bisected; Fig. 2, a transverse vertical section of the same, taken in the line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

This invention consists in the employment or use of one or more reciprocating frames, composed of a series of bars constructed in such a manner, and arranged in connection with a tray or vessel to hold the quicksilver and "tailings" or ore, that both the small and large particles of metal contained in the tailings or ore will be brought in contact with the quicksilver, and a thorough amalgamation effected.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a rectangular tray or box, constructed of any suitable dimensions and supported at a proper height by a framing, B. Underneath the tray or box A there is a transverse shaft, C, which works in suitable bearings, *a*, on uprights *b b*, and on each end of this shaft there is keyed a crank-pulley, D, the wrist-pins *c* of which are placed in opposite positions to each other with respect to the shaft C, as shown in Fig. 2.

E E represent two sliding or reciprocating plates or caps, which are fitted on the sides of the tray or box A, the outer portions of the plates or caps working between guides *d d*, and having each a rod or arm, F, projecting horizontally from them, as shown clearly in Fig. 2. The rods or arms F F are connected by pitmen G to the crank-pulleys D D, and to the inner side of each plate or cap E there is attached a frame, H, which is composed of a bar, *e*, having parallel arms or beaters *f* attached at right angles, the arms or beaters of one frame being in line with the centers of the spaces between the arms or beaters of the other frame, so that the two frames may rise and fall alternately, or move simultaneously in opposite directions, without interfering with each other. The pitmen G have each two holes, *g g*, made in them, one above the other, as shown in Fig. 1, the use of which will be presently explained. The arms or beaters *f* of the frames H have each a strip or bar, *h*, attached to them. These bars project a little beyond the sides of the arms or beaters, and the latter may have their sides a little inclined inward at their lower parts, so that the edges of the bars *h* may serve as elevators, as will be presently shown.

The operation is as follows: The quartz or ore is crushed as fine as is desirable, and is then dried by artifical heat or otherwise. The tray or box A is then supplied with quicksilver, and the ore is then sifted upon the quicksilver to the depth of two or three inches. The frames H H, which were previously removed, are then placed in the tray or box A, and the pitmen G connected with the plates or caps E by fitting the rods or arms F in the lower holes *g* of the pitmen. The shaft C is rotated by any convenient power, and the arms or beaters *f* pass through the pulverized dried ore and into the bed of quicksilver, the elevators *h* just submerging themselves into the latter. As the frames H rise the elevators *h* carry up a quantity of quicksilver, which is distributed in globules through the ore and upon the top surface of the same, and by the reciprocating action of the arms or beaters *f* the larger particles of gold are driven in contact with the quicksilver and are amalgamated, while the globules distributed by the elevators through the mass of ore come in contact with and amalgamate all of the fine particles of gold. The amalgamation being perfected, the rods or arms F are fitted in the upper holes *g* of the pitmen G and the device again put in operation. The arms or beaters *f* now operate on the surface of the ore, and the countless number of globnles are, by the force of impact, driven through the ore, and mingled with the quicksilver below. The frames H are now removed from the tray or box A, and the refuse raked off. This process of amalgamation may be continued until the

quicksilver becomes inactive. The latter then is subjected to a process of straining, evaporation, &c., as usual.

The device may be used with wet ore or pulp by admitting a stream of the latter through the tray or box A, the latter being put in communication with the quartz-mill by means of a suitable conductor. In this operation the rods or arms F are fitted in the lower holes *g* of the pitmen G, and the finer particles of gold are amalgamated with the globules, while larger particles are driven into the bed of quicksilver and absorbed thereby, in the same way as described in the first or dry-ore process.

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

The employment or use of one or more reciprocating frames, H, provided with arms or beaters *f*, having bars *h*, or their equivalents, attached to form elevators, in connection with the tray or box A, all arranged to operate in the manner substantially as and for the purpose herein set forth.

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Witnesses:
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