(No Model.)

3 Sheets—Sheet 1.

C. P. WATTERSON.

AMALGAMATOR.

No. 562,681. Patented June 23, 1896.

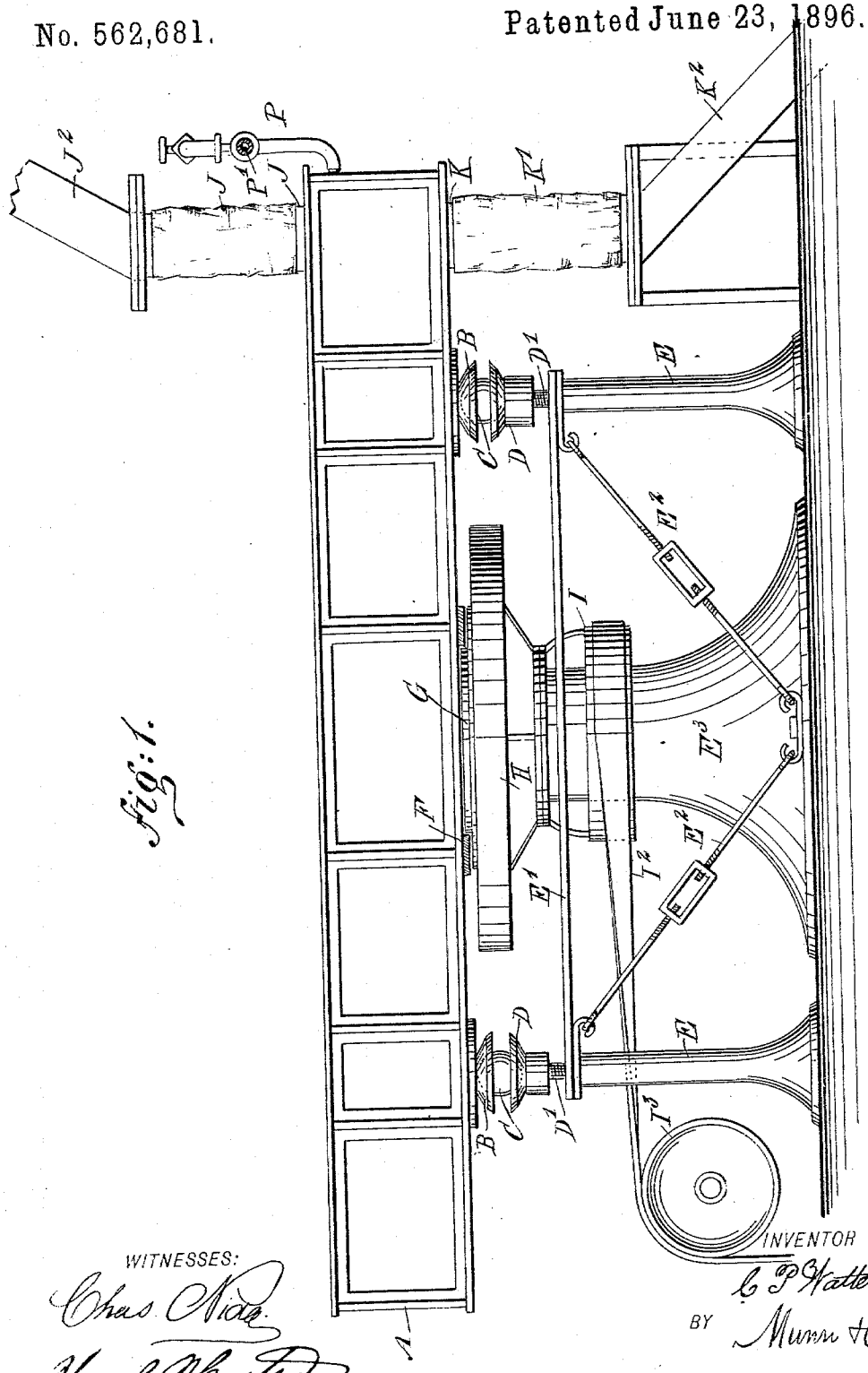

Fig: 1.

WITNESSES:

Chas. Neide.

Geo. G. Foster Jr.

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C. P. Watterson

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3 Sheets—Sheet 2.

(No Model.)

C. P. WATTERSON.

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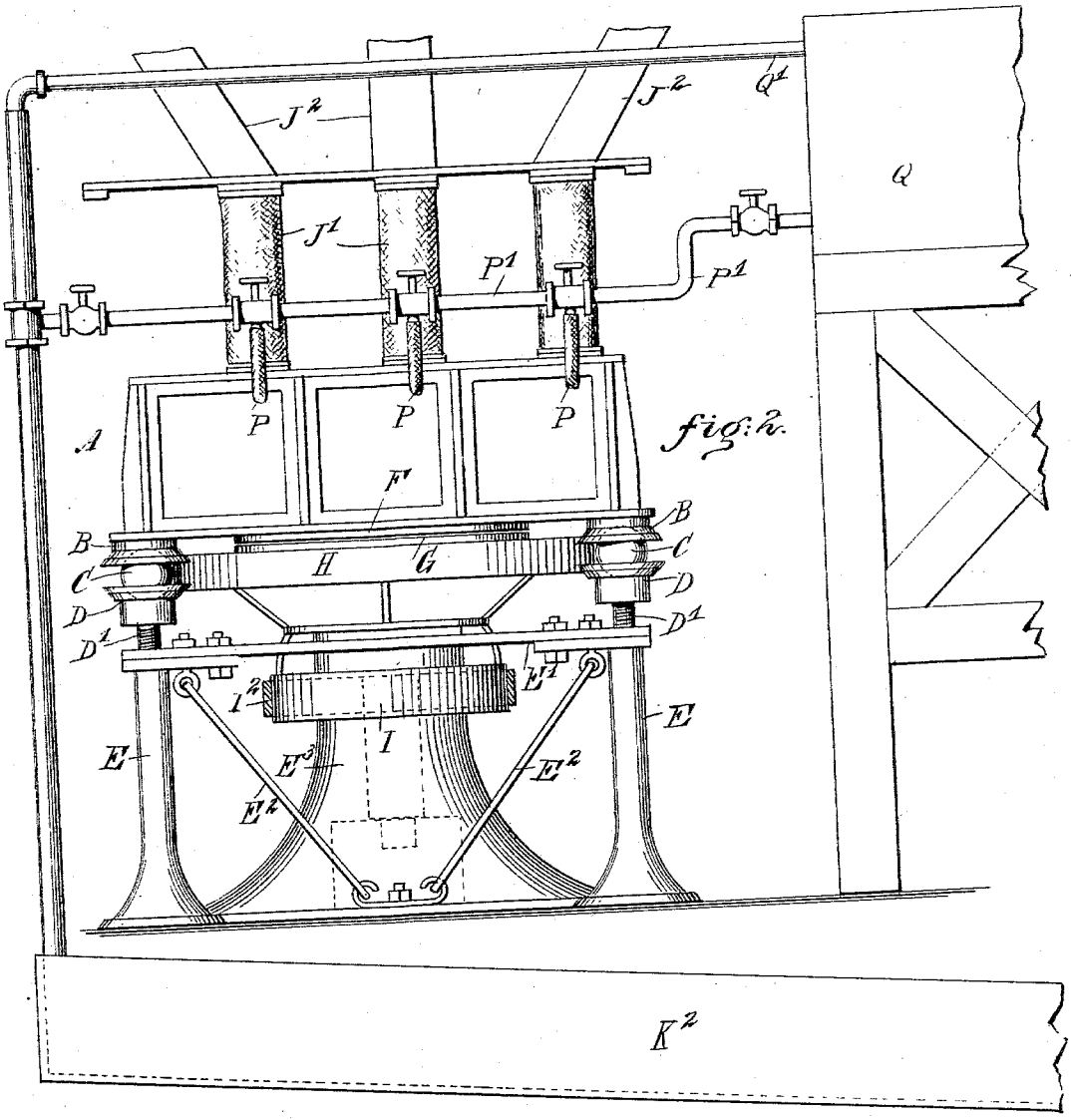

fig: 2.

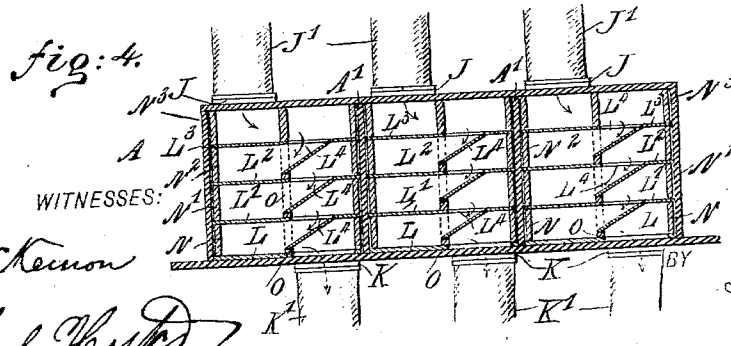

fig: 4.

WITNESSES:

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(No Model.) 3 Sheets—Sheet 3.

C. P. WATTERSON.

AMALGAMATOR.

No. 562,681. Patented June 23, 1896.

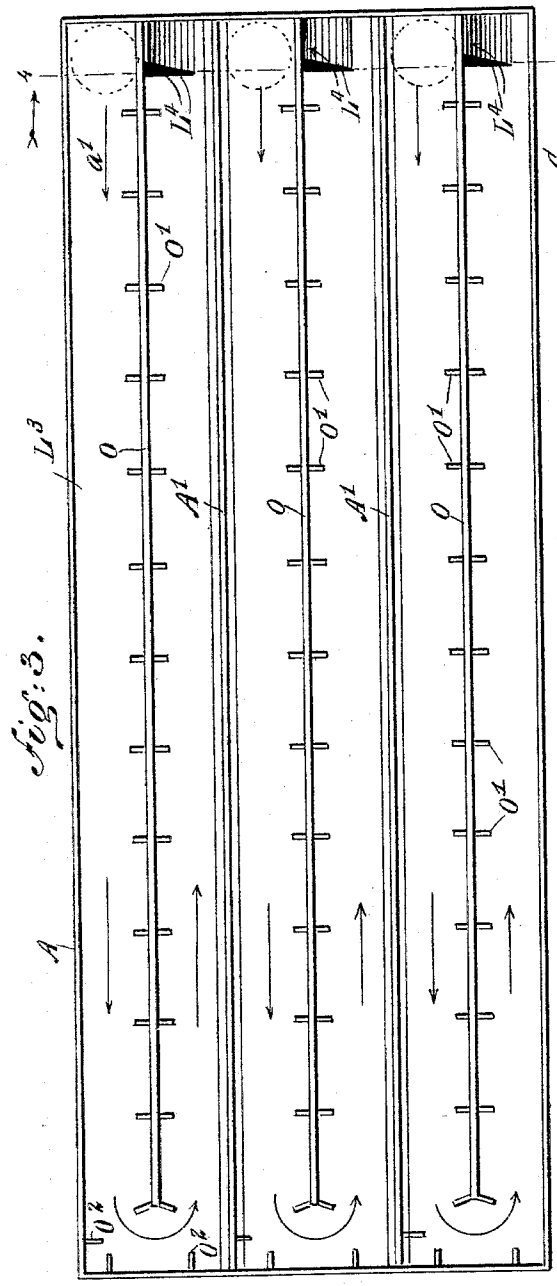

Fig. 3.

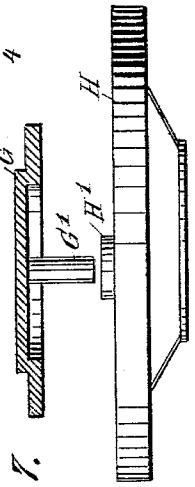

Fig. 7.

Fig. 6.

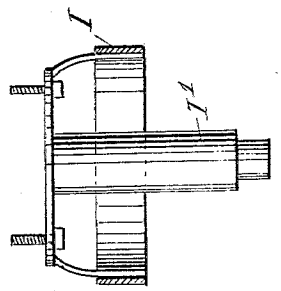

Fig. 8.

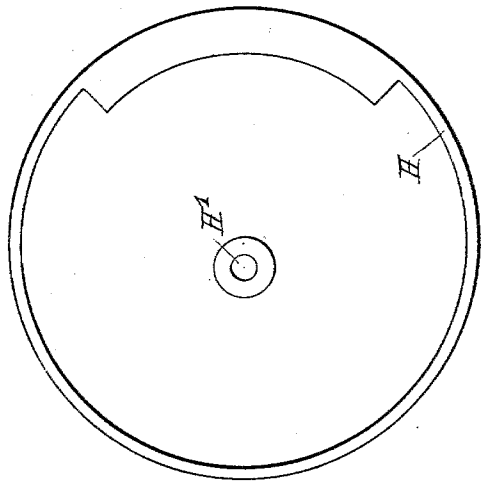

Fig. 5.

WITNESSES:

Chas. Neal

Rud. G. Hoover

INVENTOR

C. P. Watterson

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES P. WATTERSON, OF FARMINGTON, UTAH.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 562,681, dated June 23, 1896.

Application filed October 16, 1895. Serial No. 565,822. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. WATTERSON, of Farmington, in the county of Davis and Territory of Utah, have invented a new and Improved Amalgamator, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved amalgamator for treating gold-bearing sand, stamp-mill pulp, and other material to save the precious metals contained therein, in an effective, quick, and economical manner.

The invention consists principally of a gyrating box provided with copper plates, and a longitudinal guide-strip for the said plates, each strip extending from one end of the box to within a short distance of the other end, to cause the material passing upon the plate on one side thereof to travel along the same and back on the other side.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is an end elevation of the same. Fig. 3 is a plan view of the box, the feed-pipes having been removed and their relative positions being indicated by dotted lines. Fig. 4 is a transverse section of the same. Fig. 5 is a plan view of the fly-wheel. Fig 6 is a side elevation of the same. Fig. 7 is a sectional side elevation of the eccentrically-mounted disk, and Fig. 8 is a sectional side elevation of the pulley for driving the box.

The improved amalgamator is provided with inverted cups B, resting on balls C, supported in cups D, provided with threaded shanks D′, screwing in posts E, connected with each other by framework E′ and by adjustable links E^2 to the base of a horizontal post E^3, as is plainly shown in Figs. 1 and 2. The cups D, when turned, are screwed up or down, so as to enable the operator to set the box A at a perfect level.

On the under side of the box A, and at or near the middle thereof, is secured a ring F, engaged by an eccentric disk G, having its shaft G′ set in a hub H′, held eccentrically on a fly-wheel H, on which is secured or formed a pulley I, supported by arms or spokes projecting outwardly and downwardly from the wheel provided with a shaft I′, mounted to turn in suitable bearings in the central post E^3. A belt I^2 passes over this pulley I and also passes over an idler I^3 to suitable machinery for imparting a rotary motion to the pulley I, fly-wheel H, and eccentric disk G, to cause the box A to gyrate on the balls C as its support.

The box A is provided with a number of longitudinally-extending partitions A′, dividing the box into several compartments, each of which is provided on top with an inlet J, connected by a tube J′ with a chute J^2, through which passes the material to be treated. Each compartment is also provided on its bottom with an outlet K, connected by a chute K′ with a discharge-chute K^2 for carrying off the tailings. Each of the compartments in the box A is provided with a series of horizontally-disposed plates L, L′, L^2, and L^3, located one above the other, and made of copper, coated with quicksilver, so that the precious metals contained in the material passing over the plates is taken up and retained by the plates. The several plates L, L′, L^2, and L^3 are separated one from the other by frames N N′ N^2 N^3, as is plainly shown in Fig. 4, whereby individual chambers are formed in each compartment, the said chambers, however, being connected with each other, as hereinafter more fully described.

The uppermost chamber in each compartment is connected with its respective inlet J, while the lowermost chamber is connected with its outlet K. Each of the frames N, N′, N^2, and N^3 is provided with a longitudinally-extending guide-strip O, arranged at or near the middle of the chamber, and extending from one end of the plate to within a short distance of the other end, as will be readily understood by reference to Fig. 3. Each guide-strip O is provided on both sides with transversely-extending flights O′ to assist in moving the material forward on each side of the strip, as will be hereinafter more fully described. Additional flights O^2 are also arranged on each frame N^3 near that end of the strip I extending within a short distance of the end of the box. (See Fig. 3.)

Into each of the uppermost chambers at the

inlet J discharges a water-supply pipe P, as illustrated in Figs. 1 and 2, the several pipes P being connected with a supply-pipe P′, connected with a tank Q, containing water, and located a suitable distance above the box A, so that the water flows under pressure into the several chambers at one side of the strip O. An overflow-pipe Q′ leads from the tank Q to the tailing-chute K^2, so as to wash the tailings down the same after their discharge from the box by the outlets K and tubes K′.

The operation is as follows: When the machine is set in motion, a gyrating motion is given to the box A, and the material, fed through the chutes J^2 into the uppermost chambers of the several compartments in the box A, is delivered on one side of the guide-strip O in each of the said chambers, and by the gyrating motion of the box the material travels forward in the direction of the arrow a' on one side of the strip O. The forward motion of the material is facilitated by the flights O′, until the material finally reaches the end of the uppermost chamber, so as to be guided by the flights O^2 to the other side of the strip O, and to then travel backward along this side of the chamber, to finally pass through an opening L^4 in the top of the copper plate L^3 down into the second chamber at one side of the strip O in the second chamber. The material then travels along one side of the strip O in the second chamber in the same manner as it did in the first chamber, to finally pass on its return through an opening L^4 into the third compartment in the same manner as it did from the first chamber into the second chamber. The same operation is repeated in this chamber, and likewise in the next, so that the material passes over all the coated copper plates in this compartment, whereby the precious metal is well separated from the tailings and is taken up by the quicksilver to form an amalgam. The tailings finally pass from the bottom chamber through the outlet K′ into the tailing-chute K^2, to be washed off to one side of the machine.

It is understood that any desired number of compartments may be formed in the box, and any desired number of copper plates with guide-strips may be arranged in each compartment to form chambers connected with each other, so that the material passes from one chamber to the other to separate the precious metals from the tailings.

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

1. An amalgamator, comprising a box having means for imparting a gyrating motion and provided with copper plates located one above the other, to form connected chambers, and a guide-strip extending in each chamber from one end to within a short distance of the other end, so that the material passes over the copper plates on one side of the guide-strip, to then return on this copper plate, but on the other side of the guide-strip, substantially as shown and described.

2. In an amalgamator, a box having means for imparting gyrating movement, the amalgamator having a series of horizontal and amalgamated plates, each having an opening, a second series of plates inclined and respectively located below the openings in the horizontal plates, and a series of guide-strips or partitions extending longitudinally with the box and respectively located above each horizontal plate, the guide strips or partitions having the ends which are adjacent to the openings engaging the adjacent end of the box and having the opposite ends separated from the end of the box which is adjacent to said ends, substantially as described.

CHARLES P. WATTERSON.

Witnesses:
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LEONORA M. CANNON.