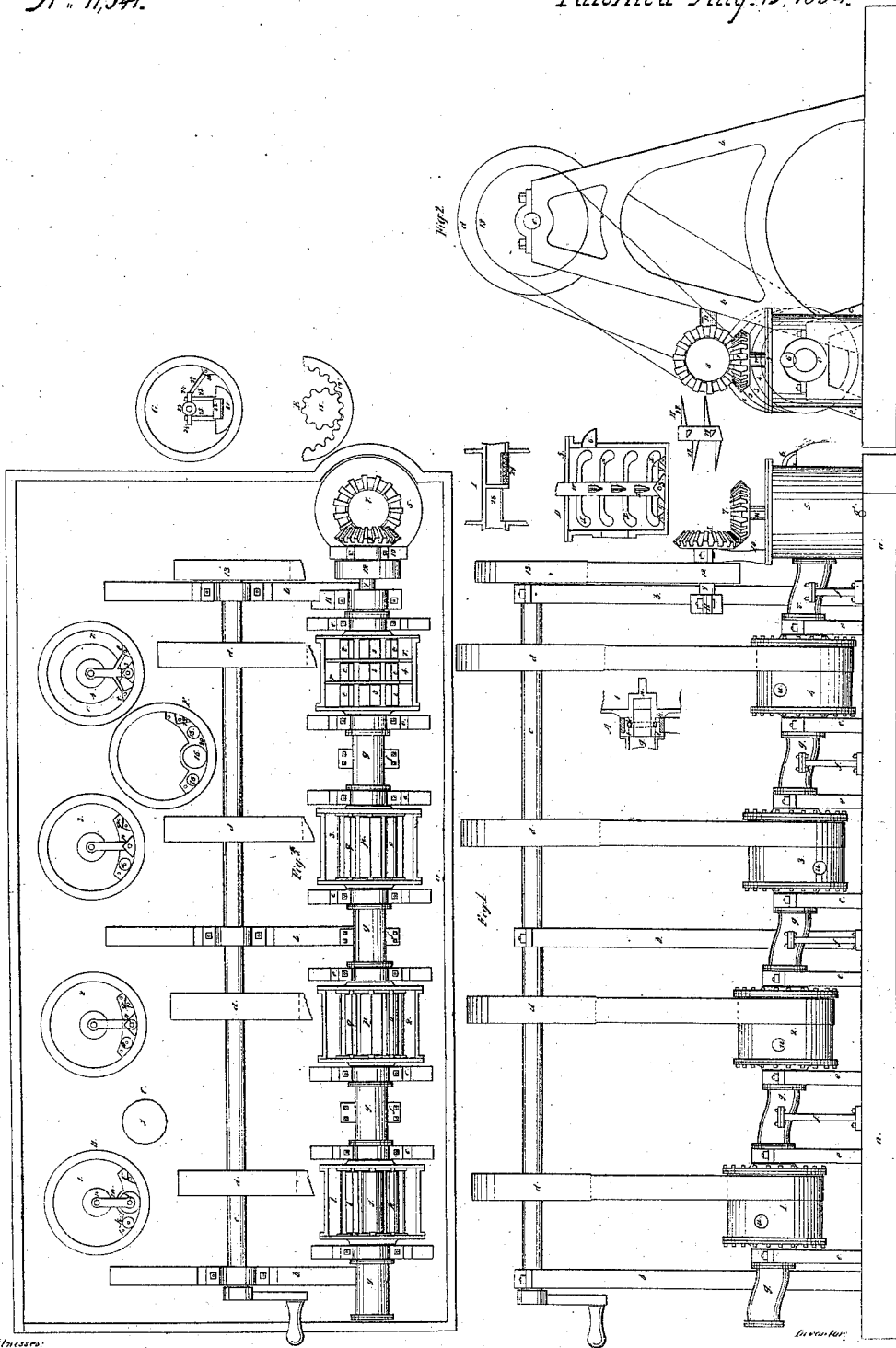


A. S. Wright

Ore Amalgamator,

No. 11,541.

Patented Aug. 15, 1854.



Witness:
Samuel D. ...
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UNITED STATES PATENT OFFICE.

A. S. WRIGHT, OF SAN FRANCISCO, CALIFORNIA.

GOLD-AMALGAMATOR.

Specification of Letters Patent No. 11,541, dated August 15, 1854.

To all whom it may concern:

Be it known that I, ATKINS S. WRIGHT, of San Francisco, in the county of San Francisco and State of California, have invented a new and useful Machine for Amalgamating Gold-Bearing Ores with Quick-silver; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the drawings making a part of this specification, in which—

Figure 1, is a side elevation, Fig. 2, an end elevation, and Fig. 3, is a plan of the machine.

Figs. A, B, C, D, E, F, G, H, and I, exhibit various details and modifications.

a, a, Fig. 1 is the base or bed; *b, b*, are standards rising from the same and supporting a line shaft *c, c*, upon which pulleys or drums *d, d*, are placed; these drums differ in size so as to communicate a motion which will vary.

Rising from the bed *a, a*, are a number of short blocks and standards, the blocks *e, e*, supporting cylinders 1, 2, 3, 4, which revolve from belting passed over the drums *d, d*; the standards *f, f*, supporting the curved connecting pipes *g, g*, of the cylinders 1, 2, 3, 4.

The cylinders have their journals hollow, the inlet being smaller than the outlet. The outside of the journals have grooves turned, and rings (*h*, Fig. A) are fitted, and over this a flange piece, *i*, is placed; to this the flanges of the curved pipes, *g*, are secured and the whole strapped to the blocks (standards) *e, e*, thus allowing the cylinders an independent movement. On the interior of the cylinders, knives, cutters, friction irons, rollers, &c., are used, so as to produce friction and break the ore and to cause the final deposit of the gold at the bottom of the cylinders, while the ore and refuse matter is carried off.

Fig. B, represents the interior of cylinder 1 Fig. 1, in which the broken ore or quartz is first received; this carries a faced roller *J*, of sixteen sides (seen more distinctly in Fig. C) and a small roller, *K*, in advance of it, and in the rear a cutter *L*, all held in a slight frame suspended by rods, *m*, attached to a shaft, *n*, passing across the cylinder and attached to its heads in such a manner as not to interfere with the flow of the ore in and out of the cylinder,

(as seen at Fig. A). The cylinder revolving causes these to strike anything falling at the bottom. The cylinders 2 and 3, Fig. 1, are similarly arranged excepting that they carry a small roller, *o*, a friction plate or burnisher, *p*, and a cutter, *q*. Cylinder 4, differs somewhat from the rest, having two flanges *r, r*, (seen better in Fig. 3 in which sections are cut in the cylinders, and the rollers, cutters, &c., are alone represented in position). These flanges subdivide the cylinder into three chambers, and in each of these chambers a friction plate, *s*, and two cutters, *t, t*, work suspended from the shaft as in the other cylinders; holes are pierced in the flanges so that communication exists in the chambers. These cylinders are arranged in line and have a uniform inclination; that is, cylinder 2, is lower by some six inches more or less than cylinder 1; and cylinder 3 is lower than cylinder 2, and so on continued, by which means or arrangement the cylinders are filled equally during the operation of the machine. Small air-tight doors, *u*, Fig. 1, are made in the cylinders for the purpose of removing the matter collected in the cylinders after they have been in operation. From cylinder 4 (Fig. 1) a curved pipe, *v*, connects with an upright cylinder, 5, inside of which a shaft, *w*, (see Fig. D also) carrying beaters or feathers, revolves; at the foot of this shaft, cutters, *y*, and friction plates *z*, (Fig. D)—only one of which is seen—are attached. 6, Fig. 1, is the outlet for the ore, dirt, and refuse matter, and 6' is the outlet for the amalgam. On the projecting head of said shaft a bevel wheel, 7, is placed which gears into another—8—attached to a horizontal shaft—9—which is supported in place by an upright—10—raised from the cylinder—5'—and by an offset—11—from the standard *b*. 12—Fig. 1—is a pulley on the shaft connecting by a belt to a drum—13—on the line shaft *c, c*.

A modification of the interior arrangement of the cylinders is shown at Fig. E which would occupy the place of cylinder 1; this has a corrugated surface—14—on its inside face and a heavy loose corrugated roller—15—running over it and at the bottom. The second modification, Fig. F, may consist of a large roller, smooth or faced—16—(similar to the one in Fig. C) and small rollers—18, 18—and cutters—19—running independent in a slight frame—20—.

The next cylinder is shown by Fig. G; a heavy casting —21— rests upon the bottom of the cylinder, which is divided into sections; on the back of it a mold is made to receive a square iron —22— which runs across the cylinder, and at its ends nearly touching said cylinder. The shaft —23— Fig. G, is made firm and stationary with openings to allow the flow of the pulverizing ore in and out of the cylinder which revolves around it; projecting from the shaft are two eye irons —24— which receive four rods (two shown) —25— which unite with the cross-iron —22— making the whole a stationary frame. Between the iron 22 and the sections 21, in the mold, a certain interval is left, so that in case the sections become choked from an over-charge of material, they will move upward until the iron 22 stops them. The iron thus serves the double purpose of check and guide for the sections to rise upon. The object of having sections instead of one solid casting, is that the material falling in contact is in irregular heaps, consequently only one or two sections will rise at a time to avoid the choking, thus giving an equal pressure at all points and with less injury to the stationary parts, and which would not be accomplished by one solid piece.

26 is a cutter acting on the face above the sections and supported by arms —27— (one seen) attached to the shaft.

Fig. H is a modification of the arrangement presented in Fig. D on the inside of cylinder 5. Here sharp cutting arms —27— of an acute angle shape, both in projection and section, winding spirally around the shaft are used.

Fig. I is a modification of the cylinder shaft. 28 Fig. I, is a hollow shaft, and 29 is a sieve which is to regulate the size of the ore as it passes from the cylinder after having passed under the action of the cutters, &c., in the cylinder. Sieves of different qualities must be used, No. 1 cylinder taking the coarser and No. 4 the finer, Nos. 1 and 2 the medium.

The ore passes, from the mill, through a pipe into No. 1 cylinder, and through each

horizontal cylinder successively—by way of the hollow trunnions—into the stationary vertical cylinders, and in its passage is subject to the action of rollers, burnishers, knives, &c., as may be arranged in each cylinder, and thus each particle of gold is necessarily brought into contact with the quicksilver, and the desired amalgam formed. Above and immediately over each cylinder is a drum fixed to a shaft supported by standards. The drums increase in size from left to right. Belts pass around each drum and the corresponding cylinder below it. To the end of the shaft—which carries the drums—power is applied and motion is communicated to each horizontal cylinder by the belts and to the shaft of the vertical cylinder by a belt passing around an upper and lower drum which give motion to a vertical and horizontal bevel wheel. The mercury is placed into each cylinder at a small door (in Fig. 1) on its surface or at any other convenient place in the end of the cylinder.

What I claim as my invention and desire to secure by Letters Patent is—

The method described for amalgamating gold in hollow revolving cylinders upon horizontal axes, said axes, journals or trunnions being hollow to admit the pulverized quartz or ore from one cylinder into another, the inlets through the trunnions being smaller than the ends of the outlets; the said cylinders connected by flanges or pipes with grooves turned into the axes or trunnions, and rings fitted into the grooves and covered by the flanges, the whole being so connected as to make them water or steam tight and so arranged as to give a fall of about six inches to each cylinder, said cylinders containing rollers, knives, burnishers and other analogous arrangements to produce friction, scour the ore and produce the amalgam with quicksilver, the whole arranged and combined substantially as is herein set forth.

A. S. WRIGHT.

Signed in presence of—

H. A. STEARN,
JAMES GORDON.