(No Model.)

H. COOK.

AMALGAMATOR.

No. 351,580. Patented Oct. 26, 1886.

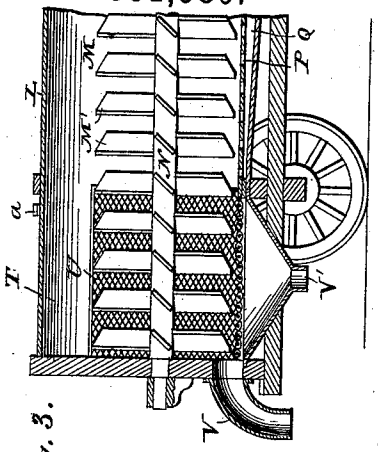


Fig. 3.

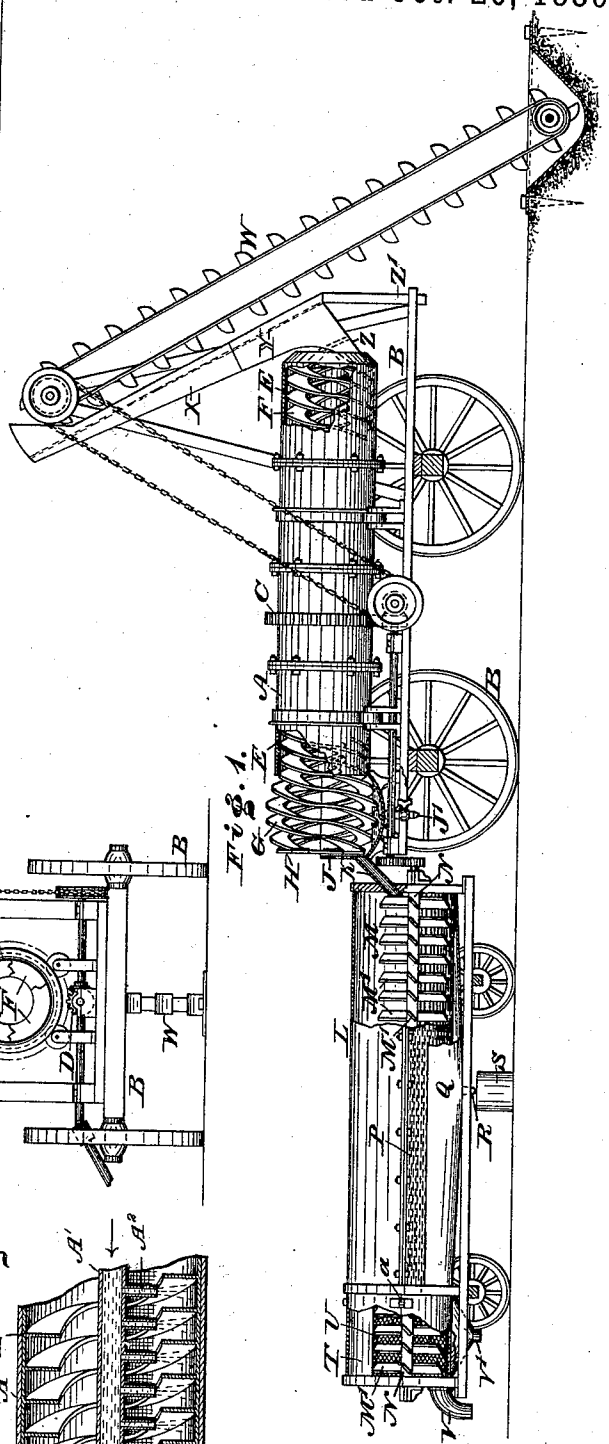


Fig. 1.

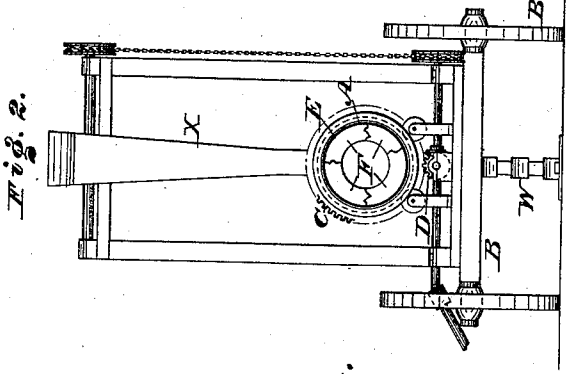


Fig. 2.

Fig. 4.

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UNITED STATES PATENT OFFICE.

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AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 351,580, dated October 26, 1886.

Application filed January 12, 1886. Serial No. 188,307. (No model.)

To all whom it may concern:

Be it known that I, HENRY COOK, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Amalgamators, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 represents a partial side view and partial vertical section of an amalgamator embodying my invention. Fig. 2 represents an end view thereof. Fig. 3 represents a vertical section of an end portion of one of the cylinders, including the dust-chamber and adjacent parts, on an enlarged scale. Fig. 4 represents a sectional view of a portion of the receiving-cylinder on an enlarged scale.

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

My invention consists of an apparatus adapted for separating gold from auriferous earth, with or without the use of water, and taking gold, silver, and other amalgamating minerals from pulverized ores, as will be hereinafter set forth.

Referring to the drawings, A represents a cylindrical or other shaped receiver, which is mounted on a suitable frame or truck, B, so as to be capable of rotation, motion being communicated to said receiver by means of a toothed annulus, C, which is connected with the periphery of the receiver and meshes with a pinion or gear wheel, D, to which power is suitably imparted.

Within the receiver A and fixed thereto is a copper cylinder or lining, E, to the interior of which is secured a spiral flange, F, formed of copper and extending from end to end of said receiver. While copper is preferred, any other metal having an amalgamating surface may be substituted in lieu thereof without departing from my invention. A spiral, G, is connected with the end of the flange F and extends beyond the receiver and has its outer end secured to a ring, H, whereby the same is supported, said spiral being made of iron.

Supported on the frame or truck B is a mercury bath or vessel, J, the same being located at the bottom of the spiral G, so that the latter dips thereinto, and is provided with a spout, K, which extends from the bath into what is termed a "waste-mercury saver," the same consisting of a stationary copper cylinder or receiver, L, having within it a beater, M, formed of paddles or vanes M′, attached to a rotary shaft, N, the latter being mounted on the ends of said cylinder L and operated from the gearing by which the receiver A is rotated. The lower half or lower portion of the cylinder L is slotted, as at P, and below the same is a trough, Q, which has a spout, R, leading to a receptacle, S.

At the end of the cylinder L opposite to the spout or trough K is a communicating dust chamber and indicator, T, within which is a screen, U, which incloses a number of paddles or vanes of the beater M, the wall of said chamber being formed of sections hinged together, as at *a*. At the outer end of the chamber T is a discharge-spout, V, for tailings, and below the screen U is a spout, V′.

The cylinder is supplied by an elevator, W, which is supported on the frame or truck B, and has its buckets operated from the gearing employed to rotate the cylinder or receiver A, an endless chain passing around a pulley on a sprocket-wheel, around which the bucket chain or belt passes. The elevator discharges into a chute, X, which has a screen, Y, thus dividing the chute in such manner that the fine particles of earth pass through the screen into a spout, Z, by which they are directed into the receiver A, while the coarse matter rolls down the screen and reaches a place of collection by means of a spout, Z′.

Mercury is admitted into the receiver A, and the rotation of the latter, with its inner spiral flange, causes the earth and mercury to move toward the discharge end of said receiver and turn and overturn in their passage the particles of minerals coming in contact with the mercury-coated copper. Particles of gold that are too large to adhere to the copper are carried through the receiver by the earth and directed into the mercury bath J, where the dirt, &c., is carried through or over the same. The bath acts as a nugget-saver in the treatment of auriferous earth and as a mercury-saver in the treatment of pulverized ores. The earth then enters the cylinder L of the waste-mercury saver, wherein the mixed earth and waste mercury or overcharge from the receiver A are beaten by the vanes M′, thus advancing the earth and dashing it against the

side of the cylinder. The mercury adheres to the copper of said cylinder, and escapes through the slots P into the trough Q, whereby it is collected in the receptacle S. As the slots are kept closed by the mercury, the other matters in the cylinder are prevented from escaping through the same. The upper portion of the cylinder L may be removed when access is desired to the interior of the same for cleansing and other purposes. The fine particles of dust pass through the screen U, and access to the chamber T serves to indicate any loss of mercury from the cylinder L. The dust enters the spout V' from chamber T, whereby it may be collected and afterward returned to the amalgamating cylinder or receiver A, the mercury in said dust serving to recharge said receiver. The tailings leave the chamber T through the spout V, whereby they may be collected.

For the treatment of pulverized ores I pass a pipe, A', through the receiver A, and provide the same with a series of branches, A^2. (See Fig. 3.) Water is admitted into said pipe and discharged into the receiver behind the ores, so that the latter are washed down the spiral flange as the receiver revolves. By these means the ores are always passed over a clean bright surface of charged copper, which greatly increases the facility for catching the mineral. The overcharge of mercury is collected in the bath or trough J, from whence it may be drawn off through the plug or cock J' at the bottom thereof. An overcharge of mercury loosens the amalgam adhering to the copper cylinder or lining F, and thus the amalgam is worked down by the sand and ore through the channels formed by the spiral flange F. The inner end of the stationary mercury bath J meets the adjacent end of the rotating cylinder or receiver A, whereby the amalgam from the cylinder A enters said bath and is removable by the plug or cock J', above referred to.

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

1. In an amalgamator, the receiver A, in combination with the cylinder E, having continuous spiral flanges from one end of the same to the other end thereof, said cylinder and flanges being of copper, and an outer spiral of iron connected to said inner spirals, and a mercury bath located below said outer spiral and below the level of the cylinder E, all substantially as described.

2. In an amalgamator, a receiver, in combination with a dust chamber or indicator, a rotary shaft journaled in both the receiver and dust-chamber and provided with vanes, a screen in said dust-chamber surrounding the vanes in the said chamber, and a spout leading from the portion of the chamber outside of the said screen, all substantially as and for the purpose set forth.

3. A mercury-saver consisting of a stationary cylinder or receiver having within it a rotary beater, the lower portion of said cylinder being slotted, substantially as described.

4. A cylinder, L, having a slotted portion, P, and a trough, Q, below the same, with a discharge-opening, substantially as described.

5. In an amalgamator, the receiver L and chamber T, in combination with the shaft N, with vanes M', screen U, covering the vanes of the shaft in said dust-chamber, and spout V, all substantially as described.

6. In an amalgamator, the dust-chamber U, formed of hinged sections and provided with a beater inclosed in a screen, the portions of the chamber inside and outside of the screen having, respectively, outlet-spouts, substantially as and for the purpose set forth.

7. A rotary receiver with an interior spiral connected to an outer spiral, in combination with a mercury bath, into which said outer spiral dips, a slotted receiver in communication with said mercury bath, a trough located below said slotted receiver and provided with a dust-chamber, a beater common to said slotted receiver and dust-chamber, a screen in said dust-chamber inclosing the portion of said beater therein, and outlet-passages to said dust-chamber, all substantially as and for the purpose set forth.

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