W. KENDRICK.

Amalgamator.

No. 55,114. Patented May 29, 1866.

Fig: 1.

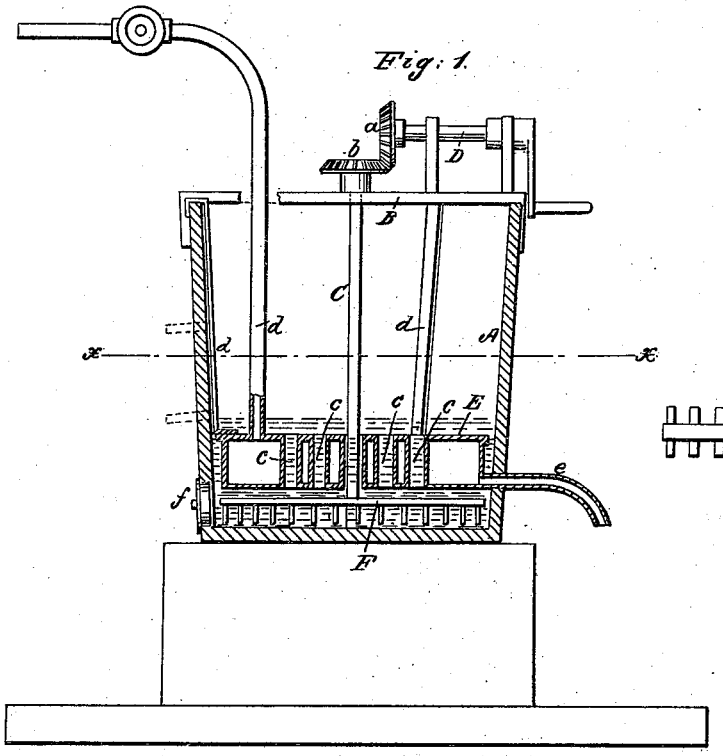


Fig: 3.

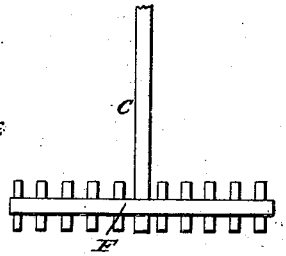
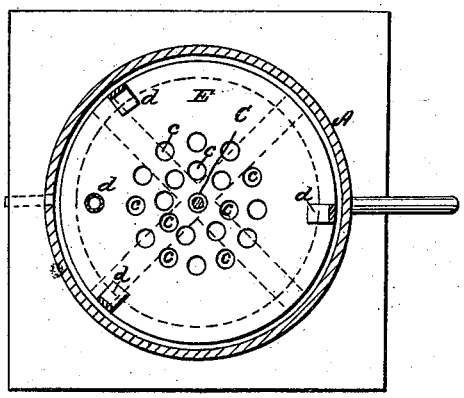


Fig: 2



Witnesses:

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UNITED STATES PATENT OFFICE.

WASHINGTON KENDRICK, OF NEW YORK, N. Y.

IMPROVED AMALGAMATOR.

Specification forming part of Letters Patent No. **55,114**, dated May 29, 1866; antedated May 14, 1866.

To all whom it may concern:

Be it known that I, WASHINGTON KENDRICK, of the city, county, and State of New York, have invented a new and Improved Amalgamator; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical central section of this invention. Fig. 2 is a horizontal section of the same. Fig. 3 is a detached side elevation of the agitator in a modified form from that shown in the previous figures.

Similar letters of reference indicate corresponding parts.

This invention consists in the arrangement of a tubular heater in the interior of the tank or vessel containing the ground ore, mercury, and water, and placed below the surface of the water, in combination with suitable hot-air or steam pipes in such a manner that the steam or heated air, on being passed into the heater, by its action upon the flues or tubes, produces an agitation, causing the water, ground ore, and mercury to form a continuous current up through the tubes and down on the outside of the heater, whereby the combination of the mercury with the precious metals in the ore is greatly facilitated, and at the same time a separation of the ore can be effected.

In combination with the heater, an agitator is used to impart to the contents of the tank a circular motion in addition to the current produced by the upward draft in the heated tubes, whereby the effect of the mercury on the precious metal or metals contained in the ore is still further increased; or said agitator may be used independent of the heat to create an upward current for the purpose of separating or washing the ore.

A represents a tub or tank, made of wood or any other suitable material, of any desirable size or capacity, according to the quantity of ore to be treated in one batch. Through the center of this tank, which is best made conical or cylindrical, rises an arbor, C, which has its bearing below in a suitable socket in the bottom of the tank and above in a cross-bar, B, and to which a rotary motion is imparted by a crank or other suitable means mounted on a horizontal shaft, D, which connects with the vertical arbor C by a bevel-gear, *a b*, or any other suitable mechanism.

The vertical arbor C passes through a tubular heater, E, and on its bottom end is mounted the agitator F. The heater is composed of a hollow drum closed on all sides and provided with a series of vertical tubes, *c*, and it is suspended from hook-straps *d*, which catch over the top edge of the tank A, and it may be so arranged that it can be raised or lowered to accommodate its position to the quantity of ore in the tank. Its diameter is somewhat smaller than that of the tank, leaving an annular space between its periphery of the inner surface of the tank, and it is furnished with a supply-pipe, *d*, and a discharge-pipe, *e*. If the heater is made adjustable up and down, the latter pipe, instead of passing out through the side of the tank, passes down through its bottom, a stuffing-box being provided to prevent leakage.

The agitator F, which is mounted on the bottom end of the arbor C, is composed of four (more or less) arms armed with pins, which project from the upper or lower surfaces thereof, or which may be made to pass clear through the arms, as shown in Fig. 3. This agitator may also be made adjustable on the arbor, or the arbor may be so arranged that it can be raised, together with the agitator, to give access to the interior of the tank for the purpose of cleaning.

The charge, consisting of ground ore, water, and mercury, is introduced into the tank from above, and a man-hole, *f*, in the side of the tank near its bottom, serves to withdraw the charge when the amalgamation is complete.

After the charge has been introduced the separation of the ore may be effected by imparting to the agitator a rapid rotary motion without the application of heat. By the action of the agitator the contents of the tank are driven up through the tubes *c* in the heater, the light parts first and the heaviest last.

Suitable pipes applied in the sides of the tank serve to carry off the sand and water, and these pipes ought to be arranged at different levels, as shown in red outlines in Fig. 1,

For the purpose of amalgamation, steam, either wet or superheated, or hot air, is admitted to the heater E through the supply-pipe *d*, and by the heat an upward current is created in the tubes *c*, causing the contents of the tank to rise and to form a continuous current up through said tubes and down over the circumference of the drum.

By this arrangement the water, ore, and mercury are heated without coming in direct contact with the steam or air, and by the motion up through the tubes and down over the edges of the heater the mercury is brought in intimate contact with the precious metals contained in the ore, and the amalgamation is facilitated.

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

1. The use for amalgamating and separating ores of a tubular heater, E, provided with suitable pipes for injecting and discharging wet or superheated steam or hot air, in combination with the tank A, constructed and operating substantially as and for the purpose set forth.

2. The agitator F, in combination with the tubular drum E and tank A, constructed and operating substantially as and for the purpose described.

W. KENDRICK.

Witnesses:
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