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Ira M Phelps
Amalgamator

PATENTED JUL 11 1871

Fig 1

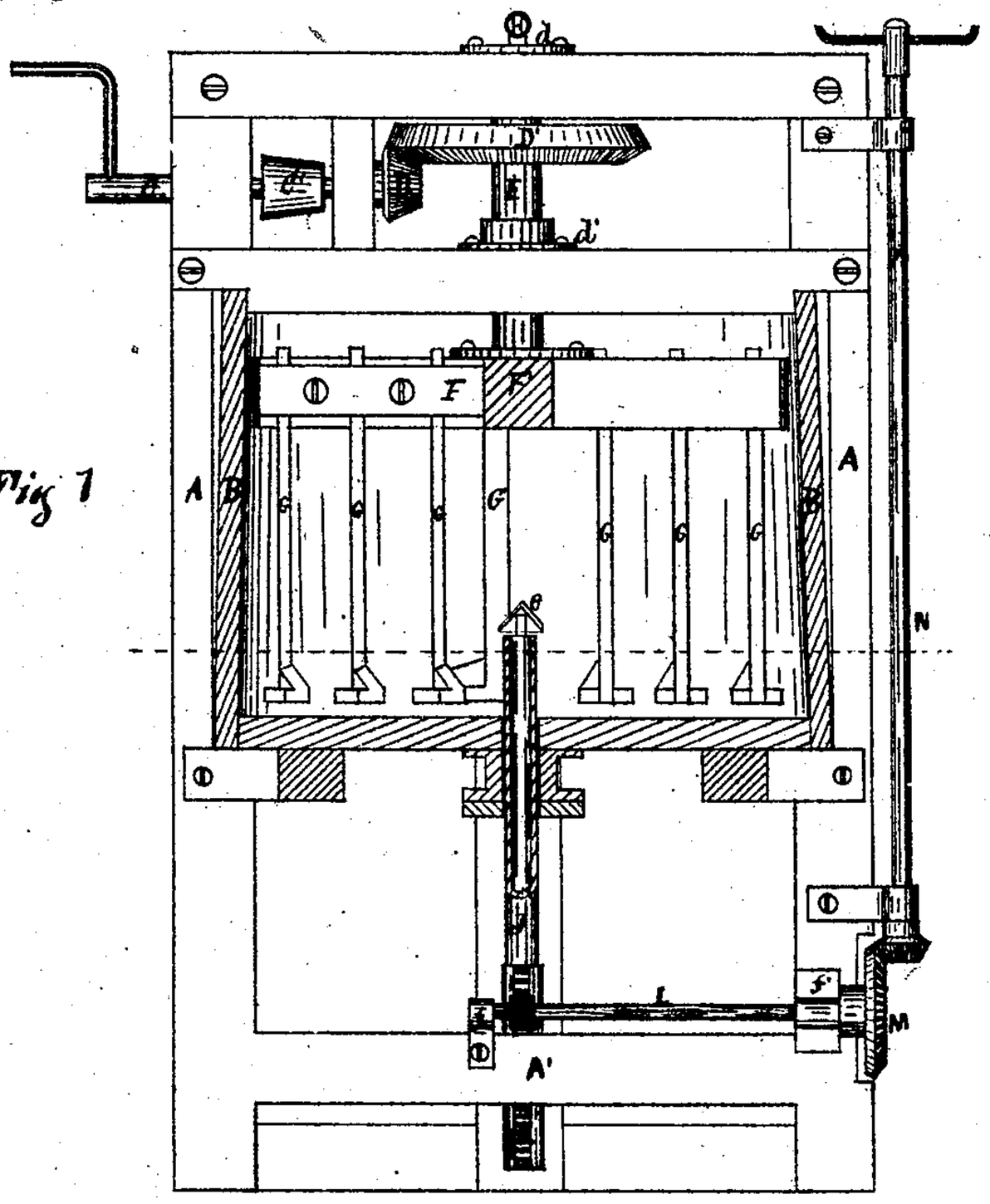


Fig 3

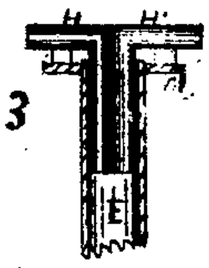
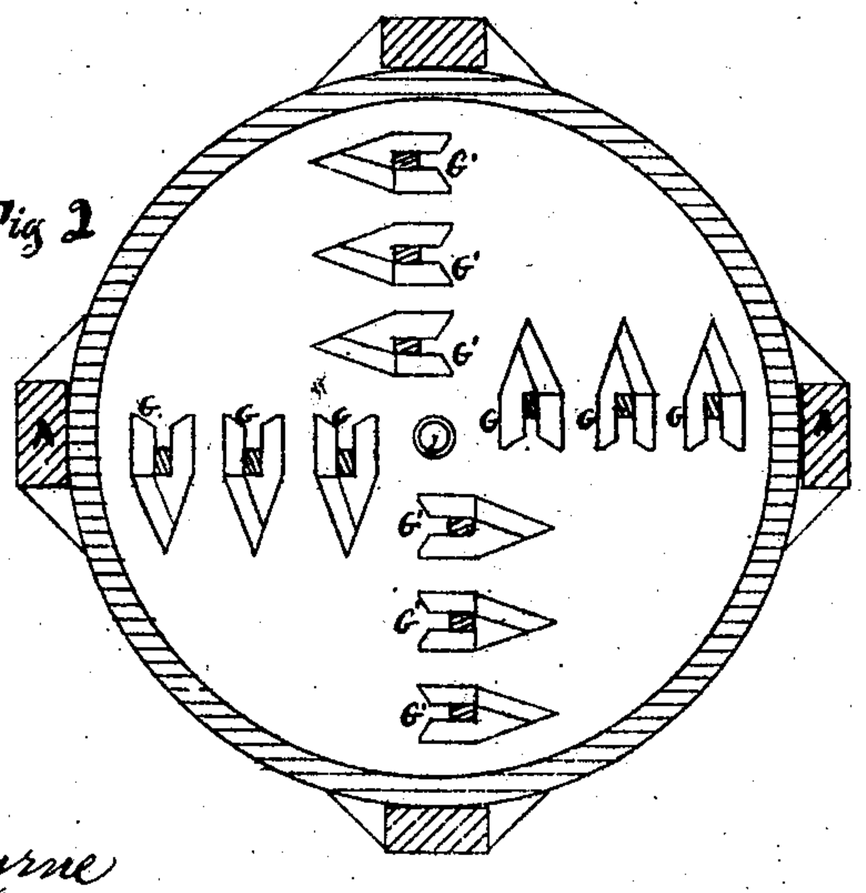


Fig 2



Witnesses
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UNITED STATES PATENT OFFICE.

IRA M. PHELPS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN APPARATUS FOR AMALGAMATING GOLD AND SILVER.

Specification forming part of Letters Patent No. 116,865, dated July 11, 1871.

To all whom it may concern:

Be it known that I, IRA M. PHELPS, of Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Amalgamators; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a side elevation of my improved amalgamating apparatus, a portion of which is cut through the center, showing its internal parts. Fig. 2 is a cross-section or plan taken on line *x x*; and Fig. 3 is a vertical central section of a portion of the shaft carrying the agitator, detached.

Similar letters of reference indicate like parts in the several figures of the drawing.

The object of my invention is to provide an apparatus for grinding and triturating pulverized gold and silver ores, and, at the same time, for amalgamating the gold and silver metals; and the improvements consist in a shaft carrying the agitators, which is made hollow, and is provided with pipes, through which hot or cold water may be introduced into the tank containing the ore; also, in a central discharge-pipe, through which dirt, dirty water, and light particles of ore and other matter are discharged as they are washed by the agitator and water, whereby the amalgam may be collected without material loss.

In the drawing, A represents the frame-work, which may be made as shown, or may be made in any suitable form that will receive the operating parts of the machine or apparatus. B is the tank, into which the pulverized ore is introduced, firmly secured to and within the frame, as shown in Fig. 1. C is the main driving-shaft, which is secured in suitable bearings affixed to the frame, and upon which shaft is mounted a cone-pulley, C′, around which is passed a suitable belt for imparting the requisite rotary motion to said shaft. D is a bevel-gear pinion, which is secured upon the inner end of shaft C, and engages with a corresponding gear-wheel, D′, on a vertical hollow shaft, E, secured in bearings *d d′* affixed to the cross-girts of the frame, whereby, as said shaft is rotated, a rotating movement is imparted to shaft E. Affixed to the lower end of shaft E are cross-bars F F′, to which is firmly secured a system of agitators, G and G′. H and H′ are pipes, which are firmly secured to bearing *d* of shaft E, and extend downward through said shaft for the purpose of introducing water into the center of the tank. J is a hollow tube, which is secured vertically within the center of the tank, and extends downward through the center of cross-girt A′ of the frame, and is so arranged as to admit of a free-and-easy vertical movement. The said tube is provided with a conical-shaped cap, *e*, firmly affixed thereto and in such a manner as to provide an opening between its lower side and the upper end of the tube, through which the water may be discharged from the tank; and the cap also prevents the water, as it is introduced into the tank through shaft E, from passing into the tube, and is thrown outward toward or against the sides of the tank. Firmly affixed to the lower portion of the said tube is a rack, K, which engages a gear-pinion, K′, on a horizontal shaft, L, which is secured in bearings *f f* affixed to the frame. Mounted upon the outer end of shaft L is a bevel-gear wheel, M, which engages a corresponding pinion, M′, on a vertical shaft, N, secured in bearings *g g* affixed to the frame. Said shaft is also provided, at its upper end, with a lever, *h*, by which a rotary motion may be imparted to the said shaft, so as to raise or lower the tube for the purpose of drawing off the water contained in the tank.

My said improved amalgamator is operated as follows: The ore containing the gold or silver metal, after being properly pulverized, is introduced into the tank, and a sufficient amount of cold water is added to form a mash of the consistency of ordinary mortar when the requisite amount or quantity of mercury is added. A rapid rotary motion is then imparted to the agitator and continued from three to four hours, after which the motion is decreased by the adjustment of the belt upon the cone-pulley and the tank filled with hot water. Tube J is then lowered sufficiently to allow the water to escape through it; the tube is then raised and a fresh supply of water added, and is drawn off in like manner, which operation is repeated until the ore is washed from the metal and the amalgamation is completed.

Having thus described the nature and object

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

1. The central discharge-tube J, in combination with rack K, pinion K′, shaft L, wheel M, pinion M′, and shaft N, or other equivalent mechanism, whereby a vertical movement may be imparted to said tube, substantially as and for the purpose described.

2. The hollow shaft E, in combination with pipes H and H′, substantially as and for the purpose described.

3. In combination, the hollow shaft E, wheel D′, pinion D, shaft C, and cone-pulley C′, the whole arranged to operate substantially as and for the purpose described.

IRA M. PHELPS.

Witnesses:

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