(No Model.) 2 Sheets—Sheet 1.

S. P. MOODY.

MACHINERY FOR EXTRACTING GOLD.

No. 601,212. Patented Mar. 22, 1898.

FIG. II.

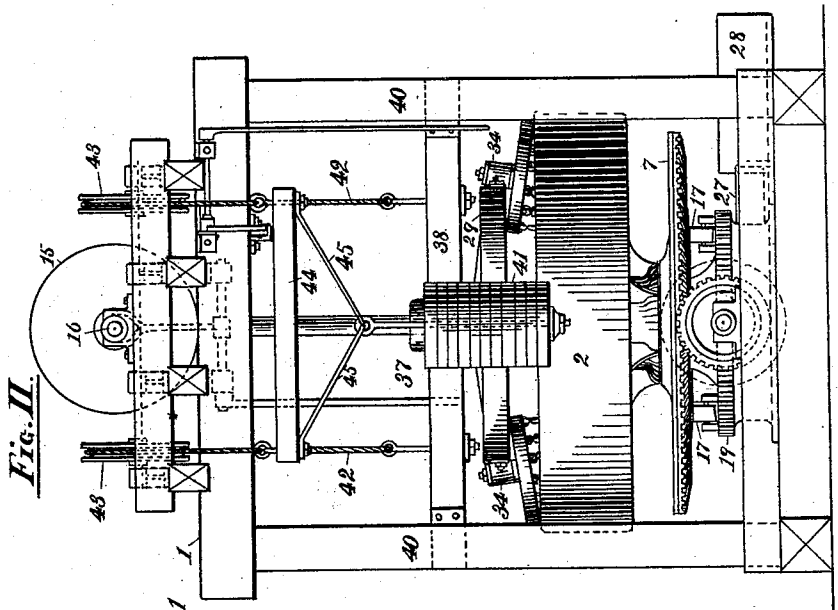
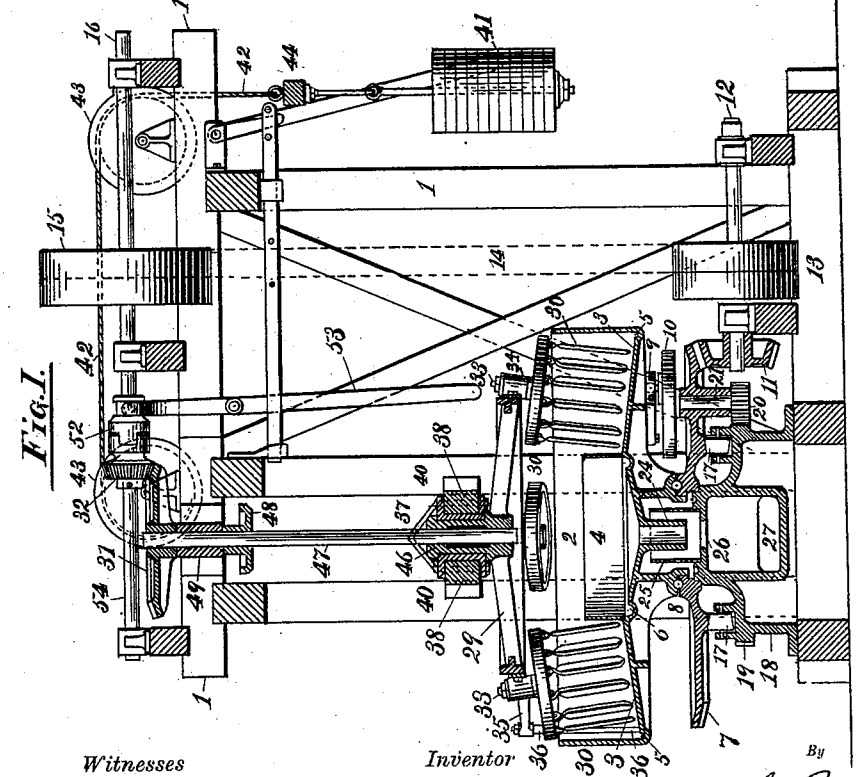


FIG. I.



Witnesses

K. Edmund Morris,

H. Sanderson

Inventor

Stephen P. Moody

By

J. Richards

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. III.

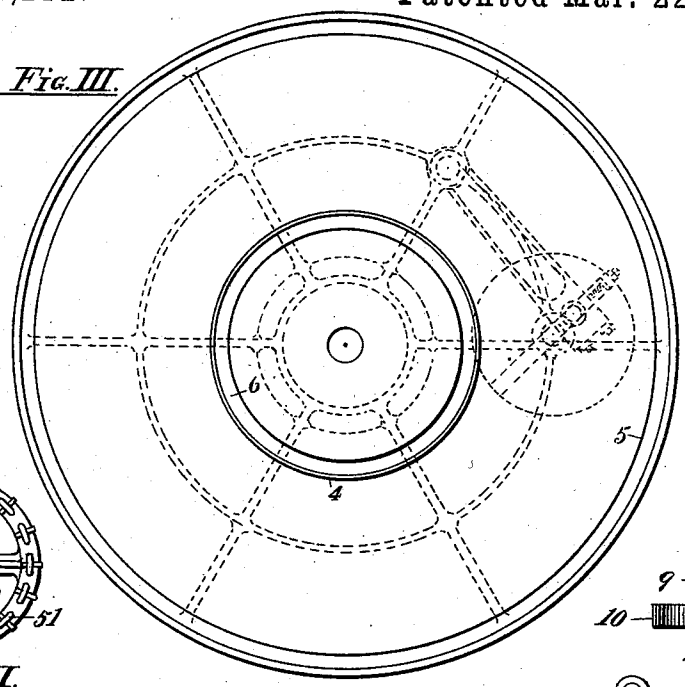


Fig. V.

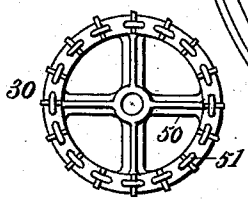


Fig. VI.

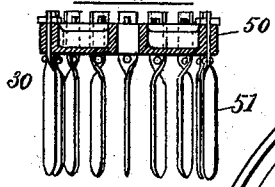


Fig. VIII.

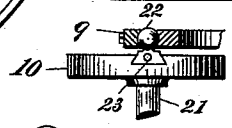


Fig. VII.

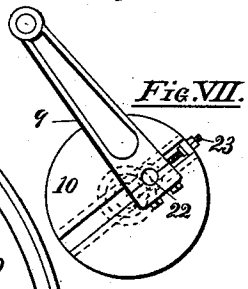
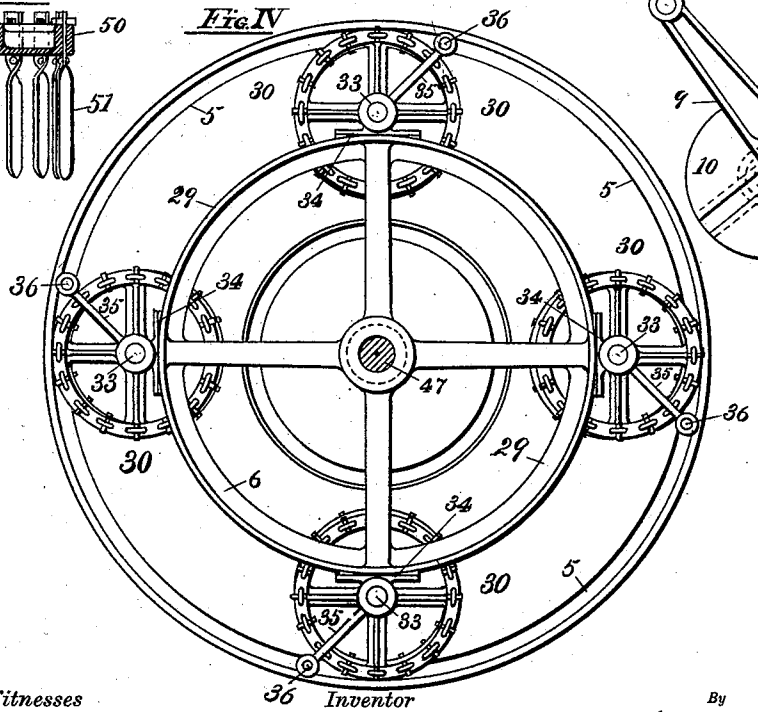


Fig. IV.



Witnesses

H. Lockwood Merins.

H. Sanderson

Inventor

Stephen P. Moody

By

J. Richards

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

STEPHEN P. MOODY, OF MAGALIA, CALIFORNIA, ASSIGNOR OF ONE-HALF TO ROBERT F. JACKSON, OF CHICO, CALIFORNIA.

MACHINERY FOR EXTRACTING GOLD.

SPECIFICATION forming part of Letters Patent No. 601,212, dated March 22, 1898.

Application filed March 29, 1897. Serial No. 629,798. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN P. MOODY, a citizen of the United States, residing at Magalia, county of Butte, and State of California, have invented certain new and useful Improvements in Machinery for Extracting Gold, of which the following is a specification.

My invention relates to that class of machinery and apparatus directed to the process of washing and amalgamation wherein the gold is, by reason of its affinity for quicksilver, separated from the gangue or earthy matter, and especially to the extraction and saving of flour or finely-comminuted gold from gravel, sand, or other auriferous material.

My improvements consist of a main vessel or pan having a rotary and also a reciprocating motion and therein stirring-vanes mounted in disks revoluble about their own axes and driven around the pan by a revolving frame on which these axes are held, moving oppositely to the main pan; and, also, they consist in various other novel features that will be pointed out and explained in connection with the drawings and in the claims at the end of this specification.

The objects of my invention are to secure continuous and complete agitation of the auriferous gravel, sand, or other material, also of the amalgam, to provide large and ample surfaces and compound movements to facilitate selection, increase the working capacity of the machinery, and to provide convenient and rapid means for sluicing and cleaning, with other objects that will be explained in the description to follow.

Referring to the drawings, Figure I is an elevation, partially in section, showing an amalgamating-machine made according to my invention. Fig. II is an elevation of the same machine at a right angle to Fig. I. Fig. III is a top view of the main pan. Fig. IV is also a top view of the main pan and of the stirring mechanism therein. Fig. V is a plan view of one of the rotary stirring-disks. Fig. VI is a section through Fig. V. Fig. VII is a plan view of the crank-disk and connection to produce a reciprocating motion of the main pan. Fig. VIII is an edge view, partially in section, of Fig. VII.

Like numerals of reference apply throughout.

The machine-frame 1 is of the usual construction, arranged to support the various parts, as seen in Figs. I and II.

2 is a large revolving pan having a curb-ring 4 in the center and a sloping bottom 3, terminating at the groove 5, next to the outer wall, that extends all around the pan, as seen in Figs. III and IV.

The pan 2 is supported on the large bevel gear-wheel 7 by means of the ball-bearing 8, and is free to turn thereon by means of the connecting-rod 9 and the crank-wheel 10, as hereinafter explained.

The bevel-wheel 7 is driven by the pinion 11 on the shaft 12, and this shaft in turn driven by the pulleys 13 and a band 14, (shown in dotted lines,) and extending up to the pulley 15 on the shaft 16, to which latter power is applied to drive the whole machine.

The gear-wheel 7 rests on the rollers 17, set in the base-frame 18, so the weight of the pan 2 and its contents are supported wholly on rolling bearings.

Around the base-frame 18 is a circular toothed rack 19, in which meshes the spur-pinion 20 on the shaft 21, on which is fastened the crank-wheel 10. This shaft 21, having its bearing in the large wheel 7 and the circular rack 19 being fixed, the crank-shaft 21 is driven about its own axis and is at the same time carried around by the wheel 7. The crank-wheel 10 and link 9 thus impart a reciprocating or oscillating motion to the pan 2 in the plane and course of its revolution, causing gravel or other material on the surfaces 3 to slide or be loosened therefrom. This reciprocating motion of the pan 2 is governed in range or extent by the eccentricity of the crank-pin 22, which is adjusted by a screw 23, as seen in Fig. III. If no motion is required, the pin 23 is moved to the center of the wheel 10 and the link 9 acts only as a driving device for the pan 2.

In the center of the pan 2 is a downwardly-

projecting nozzle 24, within a corresponding inverted nozzle 25, and opposite an aperture 26, connecting with a lateral-discharge conduit 27, formed integrally with the base-frame 18 and extending to a waste-flume 28.

The purpose of the nozzle is to enable the pan 2 to be conveniently sluiced out and cleaned when the curb-ring 4 is removed and the stirring mechanism raised, as hereinafter explained. The groove 6, inside the curb-ring, catches any amalgam that may be on the surfaces 3, and washed inward when sluicing.

Reverting now to the stirring and agitating mechanism, these consist of circular harrows 30, mounted on the revolving frame 29, driven by the shaft 47, bevel-wheels 31 32, and shaft 54. These harrows 30, of which there can be two or more, are mounted loosely on the axes 33 and revolve about their own center by reason of the greater speed and resistance on the outside or next to the walls of the pan 2, also because the material being treated is deeper and tends by centrifugal force to bank against the sides of the pan 2.

Projecting from the bearings 34 are arms 35, in which are fixed bars 36, that extend down into the groove 5 to stir and agitate the quicksilver therein and cause it to amalgamate with the gold that is washed outward from the surfaces 3.

The revolving frame 29 is supported in a shell-bearing at 37, its weight resting on the cross-timbers 38, that slide up and down between the posts 40, so the whole of the stirring mechanism can be hoisted clear of the pan 2, when the latter is to be sluiced out and cleaned.

The stirring mechanism and the beams 38 are counterweighted by means of a weight 41, ropes 42 passing over pulleys 43, as seen in Figs. I and II, the weight 41 being equalized by means of a bar 44 and diagonal links 45, that keep an equal tension on the ropes 42, and thus maintain the beams 40 in a true horizontal plane.

The shell 46 in the bearing 37 has the usual feature or key that permits the bearing 37 to slide up or down on the shaft 47. A drip-cup 48, below the bearing at 49, prevents oil from running down the shaft 47.

The harrows 30 consist of disks 50, having teeth 51, the latter preferably made of twisted bars, inserted and keyed into the disks 50, as seen in Figs. V and VI. In this manner the pitch or obliquity of the teeth can be made at any required angle which experiment shows best suited for the kind of material to be treated.

In operating the machinery the pan 2 is charged with gravel or other material to be treated. The stirring machinery is lowered and started. If all motions of the machine are required, the eccentric or crank in the disk 10 is set to give the required reciprocating motion to the pan 2 and the belt 14 is shifted to the fast pulley on the shaft 12, setting the pan 2 into rotation, also reciprocation or oscillation in the plane of its movement.

If it is desired to treat material by revolution of the pan 2 alone, the stirring devices remaining fixed, the clutch 52 is disengaged by means of the lever 53, stopping the shaft 54 and gear-wheels 31 32, that drive the shaft 47. The harrows 30 will then continue to revolve on their own axes 33. This method of operating is adapted to heavy or tenacious material or in the first treatment of a charge in the pan 2. The result is four different motions—to produce agitation of the material, the rotation and reciprocation of the pan 2, the rotation of the harrows 30 on the frame 29, and the rotation of the harrows 30 about their own axes. Of these various motions one or more can be employed separately or all can operate at once, as the material is free or tenacious, fine or course, the result being that each particle of gold is brought into contact with the quicksilver and amalgamates therewith.

Having thus described the nature and objects of my invention, what I claim is—

1. In a washing and amalgamating machine, the combination of a revoluble pan having outer circular wall and removable inner curb-ring, provided with an outwardly-sloping bottom, annular channel 5 just within the outer circular wall, and annular channel 6, just within the inner curb-ring 4, and central-discharge sluiceway, and a main gear-wheel beneath the said pan, supporting the same, through which the said sluiceway discharges, substantially as specified.

2. In a washing and amalgamating machine, the combination of a revoluble pan having outer circular wall and inner curb-ring, provided with an outwardly-sloping bottom, annular channel 5 just within the outer circular wall, and annular channel 6, just within the inner curb-ring 4, and central-discharge sluiceway, a main gear-wheel beneath the said pan, supporting the same, antifriction-bearings between the said revoluble pan and said main gear-wheel, and means for giving the said pan an oscillatory angular motion in addition to its rotary motion, substantially as specified.

3. In a washing and amalgamating machine, the combination of a revoluble pan having outer circular wall and inner curb-ring, provided with an outwardly-sloping bottom, annular channels 5 and 6, and central-discharge sluiceway, a main gear-wheel beneath the said pan supporting the same, and rotary stirring devices mounted on a frame revolving oppositely to the revolution of the said pan, each free to rotate on its own axis, substantially as specified.

4. In a washing and amalgamating machine, the combination of a revoluble pan having outer circular wall and inner curb-ring, provided with an outwardly-sloping bottom, annular channels 5 and 6, and central-

discharge sluiceway, a main gear-wheel beneath the said pan supporting the same, rotary stirring devices mounted on a frame revolving oppositely to the revolution of the said pan, each free to rotate on its own axis, and means for giving the said revoluble pan an oscillating angular motion in addition to its rotary motion, substantially as specified.

5. In a washing and amalgamating machine, the combination of a revoluble pan having outer circular wall and inner curb-ring, provided with an outwardly-sloping bottom, annular channels and central-discharge sluiceway, a main gear-wheel beneath the said pan, supporting the same, and rotary stirring devices mounted on a frame revolving oppositely to the revolution of the said pan, each free to rotate on its own axis, said revolving frame being counterweighted and vertically adjustable, whereby it may be easily raised clear of the pan for flushing and cleaning, substantially as specified.

6. In a washing and amalgamating machine, the combination of a revoluble pan having outer circular wall and inner curb-ring, provided with an outwardly-sloping bottom, annular channels, and central-discharge sluiceway, a main gear-wheel beneath said pan, supporting the same, and rotary stirring devices mounted on a frame revolving oppositely to the revolution of the said pan, each free to rotate on its own axis, said rotary stirrers being provided with harrow-like teeth which project downward into the channel 5, substantially as specified.

7. In a washing and amalgamating machine, the combination of a revoluble pan having outer circular wall and inner curb-ring, provided with an outwardly-sloping bottom, annular channels, and central-discharge sluiceway, a main gear-wheel beneath said pan, supporting the same, and rotary stirring devices mounted on a frame revolving oppositely to the revolution of the said pan, each free to rotate on its own axis, and means for throwing the said revolving frame and rotary stirrers into and out of gear connection with the driving mechanism, substantially as specified.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

STEPHEN P. MOODY.

Witnesses:
R. F. JACKSON,
H. SANDERSON.