R. F. LOUNSBERRY.

AMALGAMATOR.

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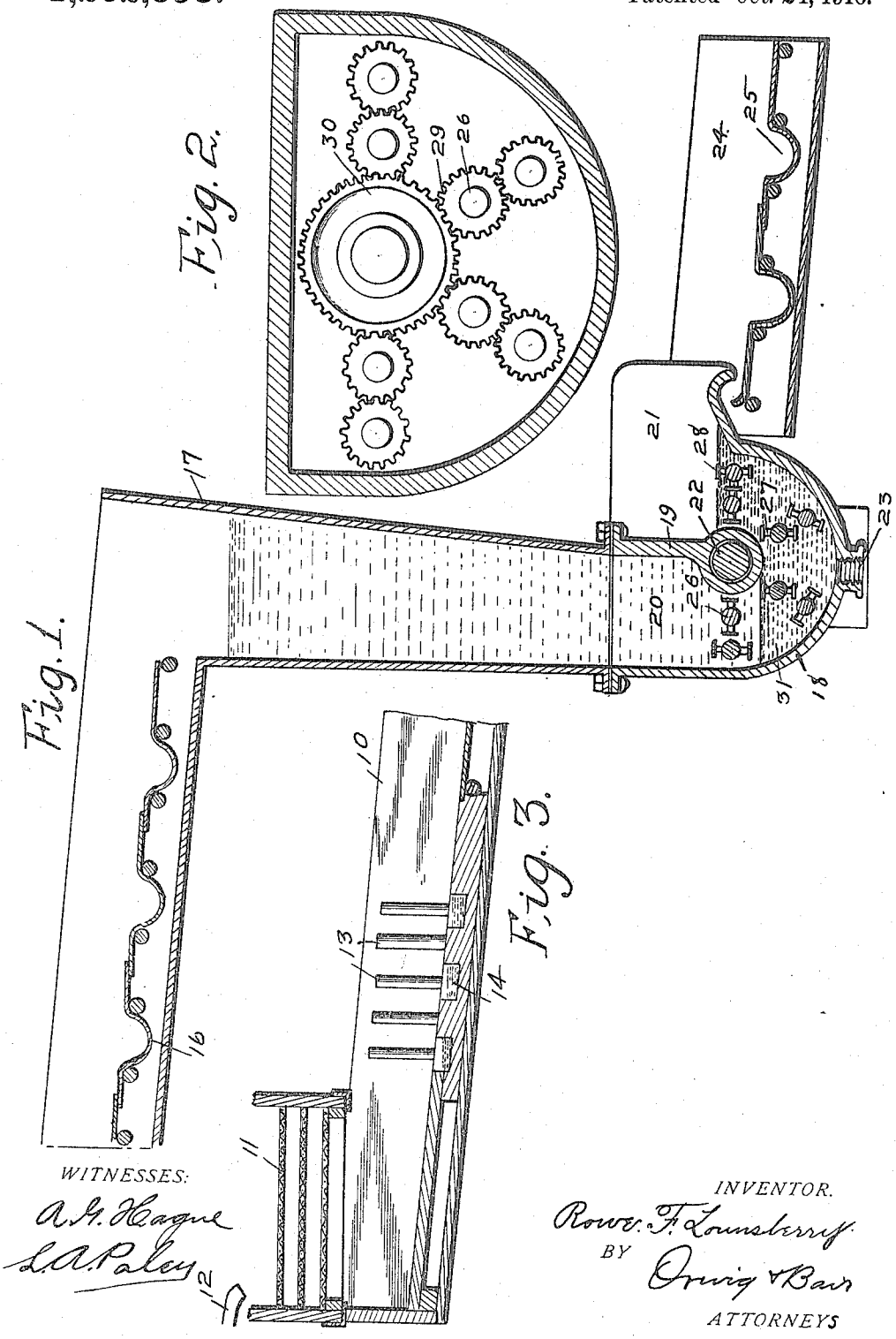
1,202,398. Patented Oct. 24, 1916.



WITNESSES:

A. H. Hague

L. A. Paley

INVENTOR.

Rowe. F. Lounsberry.

BY

Orwig & Barr

ATTORNEYS

UNITED STATES PATENT OFFICE.

ROWE F. LOUNSBERRY, OF SHERIDAN, WYOMING, ASSIGNOR TO MID-CONTINENT MACHINERY COMPANY, OF SHERIDAN, WYOMING, A CORPORATION OF WYOMING.

AMALGAMATOR.

1,202,398. Specification of Letters Patent. Patented Oct. 24, 1916.

Application filed March 29, 1913. Serial No. 758,056.

To all whom it may concern:

Be it known that I, ROWE F. LOUNSBERRY, a citizen of the United States, residing at Sheridan, in the county of Sheridan and State of Wyoming, have invented a certain new and useful Amalgamator, of which the following is a specification.

The object of my invention is to provide an improved apparatus for separating precious metals from ores and sand and for amalgamating the same with mercury so that the precious metal such as gold may be recovered from the amalgamated gold and mercury.

My object is to provide an apparatus involving only simple and inexpensive machinery and by which a relatively large quantity of gold bearing ores and sand may be run through the mercury in a comparatively short time and a high percentage of the gold in the gold bearing ores and sand may be brought into such contact with the mercury that amalgamation will take place.

A further object is to provide in an amalgamator, mechanism for separating gold or other precious metals from gold ore.

My invention consists in the apparatus hereinafter described by which the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claim and illustrated in the accompanying drawings, in which:

Figure 1 shows a vertical, central, sectional view of a form of my apparatus. Fig. 2 shows a vertical, transverse, sectional view through the receptacle that contains the mercury, and Fig. 3 shows a vertical, central, sectional view of the receiving end of the conveyer.

In order to attain the purposes noted above, it is necessary to have a receptacle for the mercury and means for agitating it, and one of the mechanisms I have devised for use is that herein illustrated and described, and I shall therefore first describe the mechanism illustrated and later the operation.

The reference numeral 10 indicates an inclined trough or chute through which gold bearing ores or sand may be carried with water to the amalgamator. At the receiving end of this chute 10 is a number of sieves 11 for grading the material conveyed to the chute. Above the chute is a nozzle 12 through which the water may be introduced to carry the gold bearing ores and sand through the sieves and through the chute. Just beyond the sieves is a series of upright pegs 13 to form an obstruction and break up large particles of gold bearing ores and sand that may pass through the chute. Preferably adjacent to these pegs is a series of pockets 14 in which mercury may be placed when desired to amalgamate with any free gold or other precious metals. Beyond the pegs 13 the bottom of the chute is preferably formed of thin copper plates 15 having pockets 16 formed therein and in which some of the gold or heavy metals may be retained by gravity while the gold bearing ores and sand are flowing through the chute. At the delivery end of the chute is a pressure forming stand pipe 17 open at both ends.

Communicating with the bottom of the stand pipe 17 is an amalgamating bowl 18, the bottom of which is preferably semi-cylindrical in shape and there is a vertical partition 19 extended part way down into the bowl, thus forming at one side a receiving chamber at 20 to communicate with the stand pipe 17, and at the other end a discharge portion 21. The lower end of the partition 19 is preferably formed hollow and a power shaft 22 is extended through it. At the bottom of the bowl 18 is a pipe 23 through which the amalgamated mercury and precious metals may be drawn off. At the discharge end of the bowl is a discharge conveyer 24 to carry off the water and other material after the gold has been removed from it. This is also preferably provided with pockets 25 to receive either mercury or precious metals that may pass through the bowl. Contained within the bowl is a number of pairs of agitators. Each agitator comprises a shaft 26, a number of radial arms 27 and two blades 28 opposite each other and attached to the arms 27. On each shaft is a pinion 29, the pinions on each pair of agitators being in mesh with each other and the agitators being so arranged that the blade 28 on one agitator will come between the blades 28 on the other agitator of the pair. On the shaft 22 is a pinion 30 which is in mesh with the inner pinion 29 on each pair of agitators. These pairs of agitators are

preferably arranged in about the manner shown in Fig. 1 and obviously when the power shaft 22 is rotated, all of the agitators will be driven by the pinions. The amalgamating bowl is provided with a quantity of mercury 31 normally above the level of the bottom of the partition 19.

In practical operation the gold bearing ores and sand are first reduced to a relatively fine size and then run through the sieves 11 with the current of water into the stand pipe 17. When the stand pipe is full the weight of the column of water therein resting upon the mercury will cause the mercury at the discharge end of the amalgamating bowl to rise slightly within the amalgamating bowl but not far enough to overflow through the discharge end of the amalgamating bowl; that is to say, the column of mercury at the discharge end of the bowl will approximately counterbalance the weight of the water and other material in the stand pipe. When the weight of the water and other material in the stand pipe becomes excessive, it will force the column of mercury directly under the material to a point below the level of the partition 19, whereupon this material will then pass under the partition and rise by gravity up through the column of mercury at the delivery end of the partition. During the time that this material is moving upwardly through the column of mercury the agitators will thoroughly disintegrate the material so that each particle of the material may be acted upon by the mercury and the gold in the material amalgamated with the mercury. Another advantageous result obtained by this violent agitation is that the mercury is broken up into small globules and the material being treated is thereby enabled to pass through it more rapidly than though the mercury were not agitated. Assuming that the agitators are all running and that material is being supplied to the stand pipe 17, then a rapid rotary movement of the agitators will cause the material in the stand pipe to be broken up into small particles and forced down through the mercury so that every part of said material is exposed to the action of the mercury. As is well known the precious metals such as gold will unite or amalgamate with the mercury and be retained therein while the water, sand, gravel, etc., will be forced up through the column of mercury at the discharge end of the bowl and will pass out through the discharge chute. The operation of my apparatus thus consists in first providing a receptacle containing mercury; then applying pressure to material to be fed into the mercury in an amount to slightly overbalance the weight of the column of mercury in the discharge end of the receptacle so that the material is intermittently fed by gravity to pass upwardly through the column of mercury at the discharge end of the receptacle and then to provide means for agitating the mercury to such an extent that the pressure of the material and the agitation together will cause the material to pass through the body of mercury so that the precious metals therein may come in contact with the mercury and be amalgamated therewith.

I claim as my invention:

A mechanism for amalgamating metal comprising an upwardly opening channel-shaped receptacle, having a discharge opening in its bottom, said receptacle having a central, transverse partition provided with a bearing at its lower end, a shaft in said bearing, a plurality of shafts arranged in said receptacle, means for transmitting rotation from said first shaft to said plurality of shafts, said receptacle having on one side of said partition a spout, and having on the other, side walls extending above the level of the point of discharge of the spout.

Des Moines, Iowa, March 19, 1913.

ROWE F. LOUNSBERRY.

Witnesses:
M. WALLACE,
S. ROBINSON.