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AMALGAMATOR.

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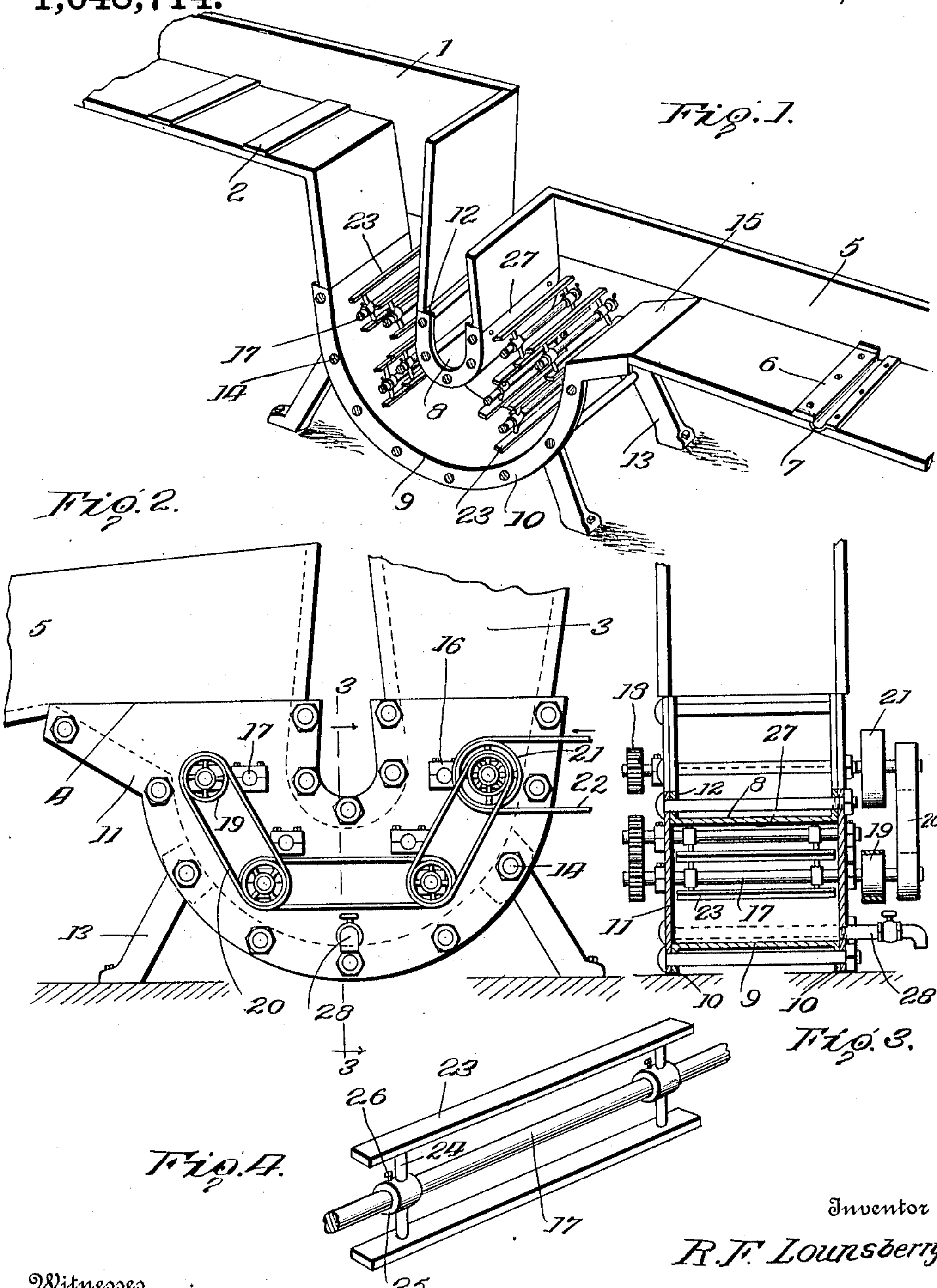

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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AMALGAMATOR.

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To all whom it may concern:

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

This invention relates to amalgamators or machines for saving the fine free or "flour" gold from the auriferous matter in which it is contained.

The object of the invention is to provide an apparatus of simple construction which may be operated with a greater degree of efficiency than the machines heretofore provided and which will require very little attention on the part of the operator.

The invention seeks to improve the general construction and arrangement of the several parts whereby the durability of the machine will be increased without a like increase in the cost of production.

The invention is illustrated in the accompanying drawings and will be hereinafter fully described, the novel features being subsequently pointed out in the appended claim.

In the drawings: Figure 1 is a perspective view of my complete amalgamator with one side removed; Fig. 2 is a side elevation; Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2; Fig. 4 is a detail perspective view of one of the beaters or agitators.

In carrying out my invention, I employ a sluice box or trough 1 consisting of side walls and a bottom having transverse riffles 2 thereon for the purpose of catching and retaining any heavy particles of gold which may settle to the bottom of the trough or sluice and fail to pass along the same with the water and other matter flowing therethrough. The sluice or trough 1 terminates in a well constituting the longer leg 3 of a siphon-like chamber, the shorter leg 4 of which opens into a conduit 5 for carrying off the tailings or waste matter.

Within the bottom of the conduit 5 I secure an amalgamating plate 6 consisting preferably of a copper sheet having a transverse trough or groove 7 formed therein and secured to the bottom of the conduit so that as the waste matter flows out through the conduit it will be forced to pass over this plate and any fine particles of gold which may have escaped from the siphon or amalgamating chamber will be caught in the said pocket and thereby saved.

The legs 3 and 4 of the siphon are connected by an upper inverted arch 8 and a lower substantially semi-circular plate 9 forming the bottom of the chamber and arranged concentric with the inverted arch. This bottom plate 9 is provided with the longitudinal depending flanges or ribs 10 at its edges constituting rims to which the side plates 11 may be bolted, and the inverted arch 8 is likewise provided with similar rims or flanges 12 to which the said side plates are bolted in order that the sides of the amalgamating chamber may be closed. Feet or other supports 13 are fitted upon some of the bolts 14 inserted through the flanges 10 and the side plates to aid in supporting the apparatus, and the ends of the side walls and of the lower extremities of the legs of the siphon are secured to the said side plates 11, the inverted arch 8 and the bottom 9, in any convenient or preferred manner, so that the inner surfaces will be flush and present no obstacle to the flow of the water and gravel to be treated. It will be noted, more particularly upon reference to Fig. 1, that the discharge side of the shorter leg of the siphon is broadened by deflecting or turning rearwardly the upper portion of the bottom 9, as shown at 15, whereby the liquid material rising through the amalgamating chamber may spread out and thus escape gradually in a thin stream instead of being forced out under more or less pressure by the action of the agitators, and, consequently, a thorough saving of all fine particles of gold will be effected. In order to accelerate the action of the ore or sand and water upon the mercury as it enters the amalgamating chamber, the longer leg 3 has its walls converging downwardly, as clearly shown in Figs. 1 and 2 so that the full benefit of the weight of matter in the said leg 3 will be obtained.

Journal boxes 16 are secured upon the outer faces of the side plates 11 and these journal boxes may be of any suitable or preferred construction. Mounted in the said journal boxes and extending transversely

through the amalgamating chamber are the series of agitator shafts 17 which are arranged in pairs at intervals through the amalgamating chamber and are provided at one side of the apparatus with gear wheels 18 which intermesh so that the shafts of each pair will rotate in opposite directions. At the opposite side of the machine, pulleys 19 are provided on the ends of the said shafts and these pulleys are connected by a series of belts 20 whereby motion is imparted to all the pulleys and the shafts upon which they are mounted from a master pulley 21 connected by a driving belt 22 with any preferred type of prime mover.

Each of the agitator shafts 17 carries a pair of beaters or blades 23 consisting of flat iron strips having radial arms 24 on their inner sides which terminate in hubs 25 fitted around the agitator shafts and secured thereto by set screws 26, as shown and as will be readily understood. The pairs of agitators or beaters are preferably arranged as shown in Fig. 2 with two pairs near the bottom of the amalgamating chamber at opposite sides of the center thereof, and a pair at each side of the said chamber near the top thereof. The agitators are thus disposed so that they will act on the entire body of mercury placed in this chamber and effect a thorough commingling of the mercury with the sand, water and gold fed thereinto. The upper agitators are arranged above the lowest point of the inverted arch 8 so that the operation of these agitators will not cause the mercury to move under the arch and leave a free space below the same but will cause the mercury to work against the arch and this action is increased by securing a copper plate 27 to the said inverted arch which by forming an amalgam with the adjacent portion of the mercury will effectually prevent the free passage of the sand or other gold-bearing bodies past the arch without mingling with the mercury. It will be noted, however, that the upper agitators are not so far above the lowest points of the inverted arch as to fill and choke the legs of the siphon and thus interfere with the free flow of the material in large quantities. Moreover, by employing agitators of open form disposed transversely of the amalgamating chamber, the material is not forced through the mercury at such speed as will prevent its thorough treatment but is commingled with the mercury so that all particles of the gold will be reached and saved. The lower pairs of agitators are also spaced apart sufficiently to permit the gold to settle at the bottom of the amalgamating chamber and will not act directly thereon so as to scrape it from the bottom and force it to and out of the discharge end of the chamber, so that, after being separated from the sand and other matter, it will be collected and none of it will be lost.

The operation of the apparatus will, it is thought, be readily understood. The water is turned into the sluice or trough 1 from any convenient source of supply and the sand or other gold-bearing material is shoveled into the trough or sluice so that the flow of the water will carry the said material to the well 3 down which it will drop to a body of mercury placed in the amalgamating chamber. The mercury will at the beginning of the operation be caused to rise in the shorter leg or side of the siphon-like amalgamating chamber under the influence of the weight of material in the well 3. The agitator shafts being set in motion the mercury will be stirred so that the sand and water and the gold contained therein will be thoroughly commingled with the mercury and the greater weight of the mercury reacting on the said materials will force the lighter particles up into the shorter leg of the siphon from which they will overflow into the conduit 5 and thence escape. After the machine is started, the mercury will seek to maintain a constant level in the amalgamating chamber, and this action, accompanied by the rotation of the agitators, will cause the entire body of material to pass through the mercury so that all of the sand and other light, valueless material will be forced from the amalgamating chamber while the gold will be retained therein and may be drawn off with the mercury through the discharge faucet or other form of outlet 28 to be subsequently separated by any well-known process.

My improved amalgamator is exceedingly simple in the construction and arrangement of its parts, and the essential parts are reduced to the fewest possible number so that the operation of the machine may be easily accomplished without any liability of the parts getting out of order or choking, so as to arrest the successful use of the apparatus. The agitators are of a simple open form so that they will move through the mercury and the material fed thereto without excessive friction, and at the same time will thoroughly agitate the contents of the amalgamating chamber so that the gold and mercury will be thoroughly commingled and all the particles of gold will be saved.

Having thus described my invention, what is claimed is:

In an amalgamator, the combination of spaced concentric inverted arches, side plates connecting said arches and forming therewith a U-shaped amalgamating chamber, a series of agitators arranged transversely in pairs within said chamber, a pair of agitators being arranged adjacent each end of the chamber just above the lowest

point of the upper arch and a pair adjacent the bottom of the chamber at each side of and spaced from the center of the same, and means on the exterior of the chamber for simultaneously rotating all the agitators, the members of each pair of agitators rotating in opposite directions.

In testimony whereof I affix my signature in presence of two witnesses.

ROWE F. LOUNSBERRY. [L. S.]

Witnesses:
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