

W. F. M. McCARTY.
HYDRAULIC CONCENTRATING APPARATUS.
APPLICATION FILED MAY 6, 1911.

1,050,483.

Patented Jan. 14, 1913.

2 SHEETS—SHEET 1.

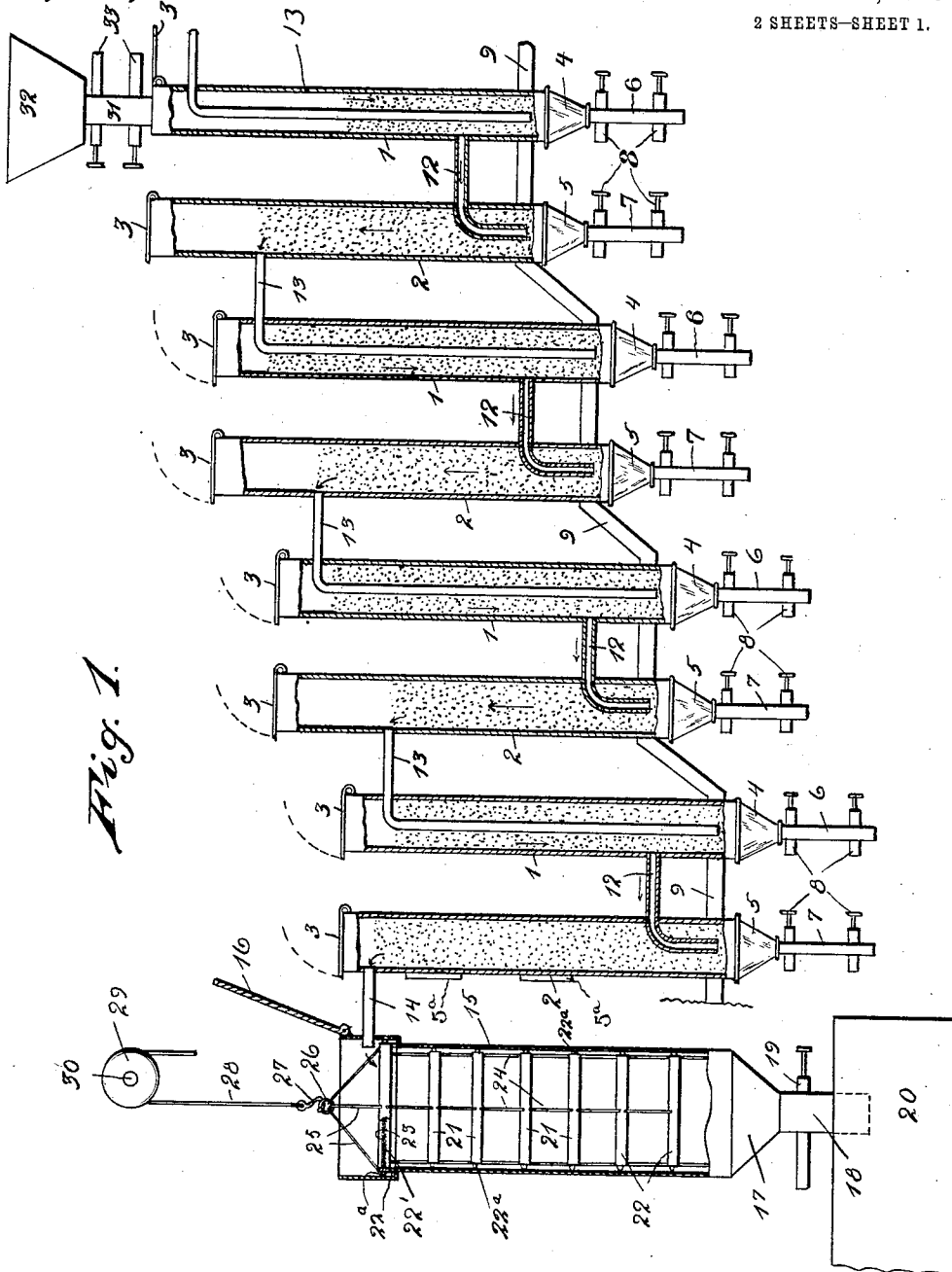


Fig. 1.

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Witnesses

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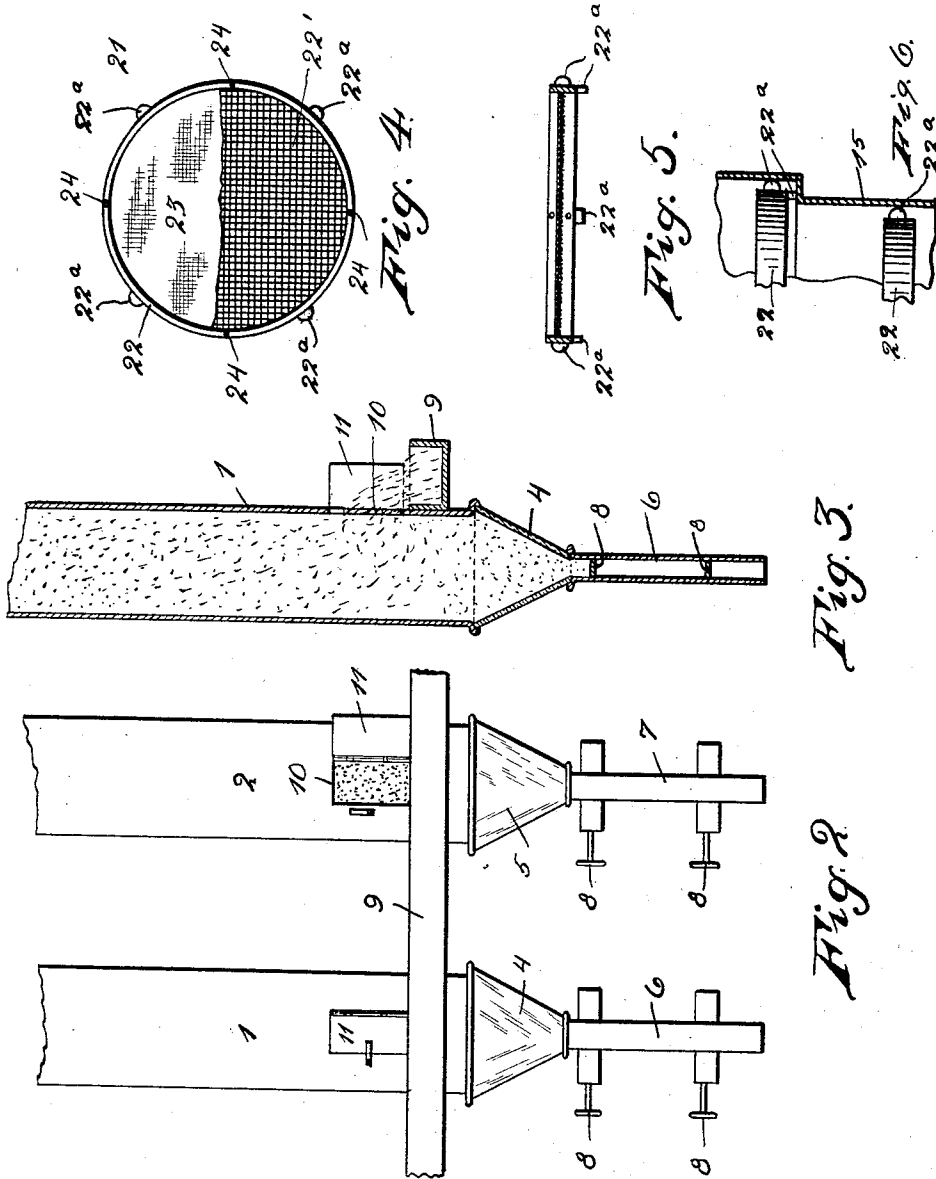
R. L. Furber

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HYDRAULIC CONCENTRATING APPARATUS.

1,050,483.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM F. M. McCARTY, a citizen of the United States, residing at Rocky Ridge, in the county of Frederick and State of Maryland, have invented certain new and useful Improvements in Hydraulic Concentrating Apparatus, of which the following is a specification.

This invention relates to hydraulic concentrating and amalgamating apparatus and has special reference to apparatus for the treatment of gold bearing sands, crushed or pulverized ore and the like, and particularly auriferous sands wherein the gold exists in an extremely divided condition or is so coated with a silicious, oleaginous, argillaceous or other covering, that amalgamation by present methods is difficult or impossible.

An important object of this invention is to provide apparatus of the character mentioned for the recovery of difficultly or non-amalgamable gold, which will be inexpensive to construct, efficient in use, and which can be operated at the minimum expense.

A further object of this invention is to provide concentrating and amalgamating apparatus in which, where water is scarce, such water may be used repeatedly without materially impairing the efficiency of operation.

Other objects and advantages of this invention will be apparent in the course of the following specification, in which like numerals are employed to designate like parts throughout the same, and wherein,

Figure 1 is a partly diagrammatic sectional view through the entire apparatus, Fig. 2 is an enlarged fragmentary side view of one pair of concentrating tanks, Fig. 3 is a vertical transverse section through one of the concentrating tanks, Fig. 4 is a plan view of a strainer member, Fig. 5 is a vertical cross-sectional view of the same, and Fig. 6 is an enlarged detail section through the upper end portion of the strainer casing or shell.

In the drawing wherein is illustrated a preferred embodiment of my invention, the numerals 1 and 2 designate pairs of vertically disposed concentrating tanks, the pairs being arranged in stepped relation to occupy positions in different horizontal planes, as shown. Each of the tanks 1 and 2 has its upper end closed by a swinging door or lid 3. The lower ends of the tanks 1 and 2 have inverted frusto-conical con-

centrate basins 4 and 5, respectively, secured thereto, which basins are formed of transparent material, such as glass. Connected with the basins 4 and 5, are draw-off pipes 6 and 7, respectively, each of which is provided with a pair of cut-off slide valve structures 8. Disposed upon one side of the concentrating tanks is a trough 9, which conforms to the stepped arrangement of the pairs of receptacles 1 and 2, as shown, and discharges on to a conveniently located dump (not shown). Each of the tanks 1 and 2 is provided near its lower end and adjacent the trough 9 with a discharge opening 10, through which material may pass from the tanks into said trough. The opening 10 is normally closed by a swinging door 11, which may be held in its closed position by any suitable means.

In each pair, the tank 1 has communication with the adjacent tank 2 by means of a pipe 12, disposed near the lower end of the tanks. Each of the tanks 2 is provided near its upper end with an outlet pipe 13, preferably materially smaller in cross-section than pipe 12, which extends into the adjacent tank 1 of the next pair. This pipe is vertically disposed within the tank 1 and terminates above and near the concentrate basin 4. The tank 2 of the lowermost pair preferably has one or more glass covered sight openings 5^a to show the height of sand or pulverized ore therein, and is provided near its upper end with a water discharge pipe 14, preferably of the same cross-sectional area as pipes 13, which discharges into the upper end of a vertical shell or casing 15. The upper end of this casing is provided with a hinged door or lid 16 and the lower end of the casing preferably comprises a tapering portion 17, to which is attached a discharge pipe 18 provided with a cut-off valve structure 19. The pipe 18 preferably discharges into a settling tank 20. Disposed within the casing 15 are a plurality of spaced superposed suitably supported coarsely woven porous blankets 21, preferably of camel's hair, each of which, as clearly shown in Figs. 4 and 5, comprises a circular frame 22 upon which is secured a wire screen or netting 22' serving to support the camel's hair cloth 23 upon which mercury is preferably sprinkled. The uppermost frame 22 is preferably supported by a shoulder formed in the upper portion of the casing 15 and the other frames 22 arranged

therebelow may be advantageously connected with each other and the uppermost rim by axially arranged cables 24. The blankets 21 are preferably so fitted within the casing 15 that water may pass not only through but around the blankets. The circular frames 22 are provided with spacers 22^a, more clearly shown in Figs. 4, 5 and 6. Cables 25 are connected with the uppermost frame 22 and these cables are connected at their upper ends with a ring 26, adapted for detachable engagement with a hook 27 carried by a cable 28, that is trained about a pulley 29. This pulley is rotatably mounted upon a stationary support 30. It will thus be seen that means are provided to elevate the frames 22 for removing the blankets from the casing 15. When the apparatus is in operation the hook 27 is disengaged from the ring 26 and the lid 16 is closed if desired.

I have shown the tank 1 of the uppermost pair, as having its lid 3 in an open position so that a sand or ore supply pipe 31 may be inserted within the upper end of said tank. This supply pipe has connection with a hopper 32 and the passage of material through the pipe 31 is controlled by a pair of cut-off slide valve structures 33. Any number of pairs of the concentrating tanks 1 and 2 may be provided and any desired number of the tanks 1 may be provided with a hopper to feed material to the same.

In the operation of the apparatus the auriferous sand or crushed ore is preferably introduced into the upper end of one of the tanks 1 of the uppermost pair. The water at suitable pressure, preferably about two hundred pounds per square inch, is supplied through the pipe 13 and is discharged in a downward direction into the lower portion of the tank 1. This water thoroughly agitates the sand or crushed ore, the heavier particles of gold or gold bearing particles gravitating into the transparent concentric basins 4, within which is placed a suitable quantity of mercury to form an amalgam with the gold. The operator can observe the collection of the concentrates in the concentrate basins and when the concentration has continued to the desired point, the concentrates and amalgam may be withdrawn for further treatment, by manipulation of the valves 8. The flow of water carries the sand from one set of tanks to another, the finer particles of the gold being finally carried through the pipe 14 and discharged upon the blankets 21 where it is held by being entangled in the fibers of the camel's hair, and may be recovered by washing or burning. From time to time the sand contained in the tanks 1 and 2 above the level of the doors 10, may be discharged into the trough 9 by opening the doors 10. The out-

let pipe 18 discharges into the settling tank 20, from which from time to time, it may be pumped or otherwise forced through the tanks 1 and 2, in the manner above described. It will thus be seen that the water may be used over again without any material decrease in volume, which is important in localities where the supply of water is scarce.

It is to be understood that the form of my invention herewith shown and described, is to be taken as a preferred embodiment of the same, and that various changes in the size, shape, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. In apparatus of the character described, the combination with a plurality of upstanding classifying and concentrating tanks having both ends thereof normally closed, of a plurality of long pipes connected with the outlet sides of alternate tanks in one set near and spaced from the upper ends thereof and extending through the inlet sides of the tanks in the second set near and spaced from the upper ends thereof and extending downwardly therein in spaced relation from the walls thereof and terminating at the ends of the same to discharge a classifying stream into the lower ends of such tanks, a plurality of short pipes connected with the outlet sides of the tanks in the second set near and spaced from the lower ends of the same and passing through the inlet sides of said alternate tanks near and spaced from the lower ends thereof and extending downwardly therein in spaced relation from the walls of the same and terminating at the lower ends of such tanks to supply a classifying stream to the lower ends thereof, and means to supply a classifying stream under pressure to the end tank.

2. In apparatus of the character described, pairs of upstanding concentrating and classifying tanks, a pipe connected in each pair with one tank near and spaced from the lower end thereof and discharging into the second tank of the same pair at the lower end thereof, a pipe connected with one tank of one pair near and spaced from the upper end thereof and discharging into a tank of the other pair near the lower end of the same, and means to supply a classifying stream to one tank.

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

WILLIAM F. M. McCARTY.

Witnesses:

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