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W. A. MERRALLS.

METHOD OF AND APPARATUS FOR EXTRACTING GOLD.

No. 412,643. Patented Oct. 8, 1889.

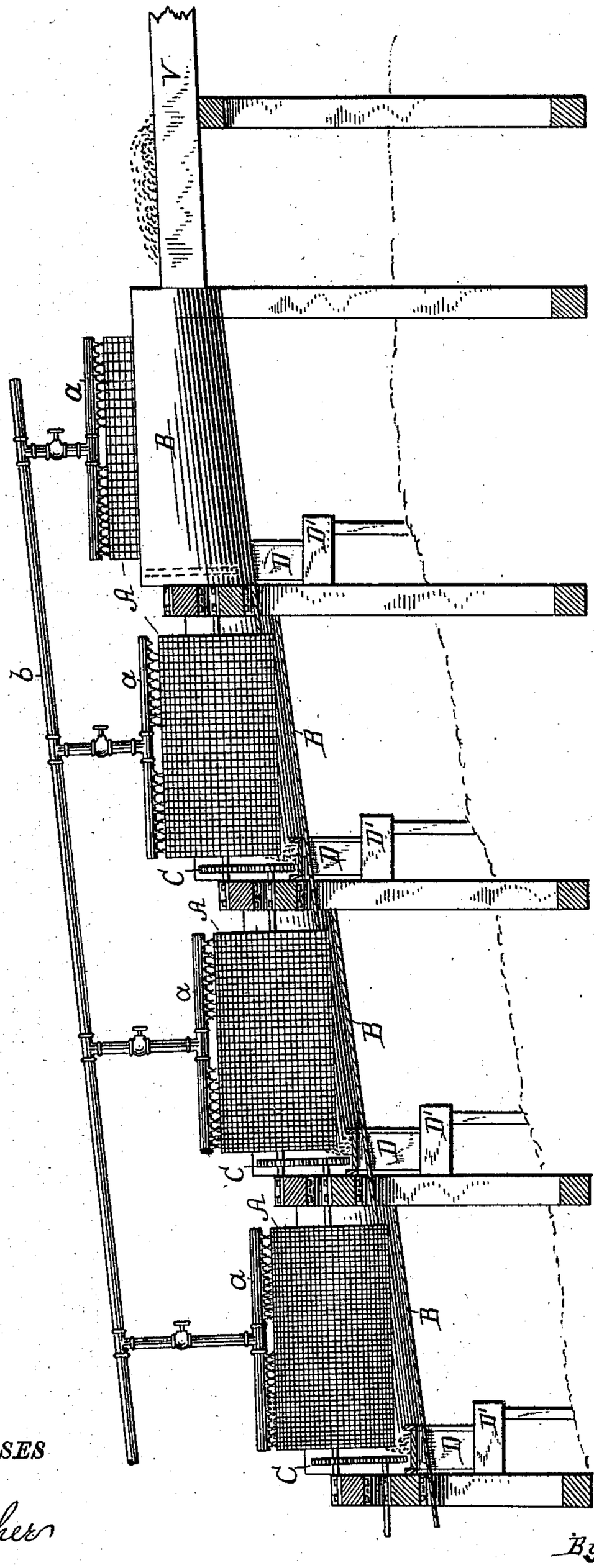

Fig. 1.

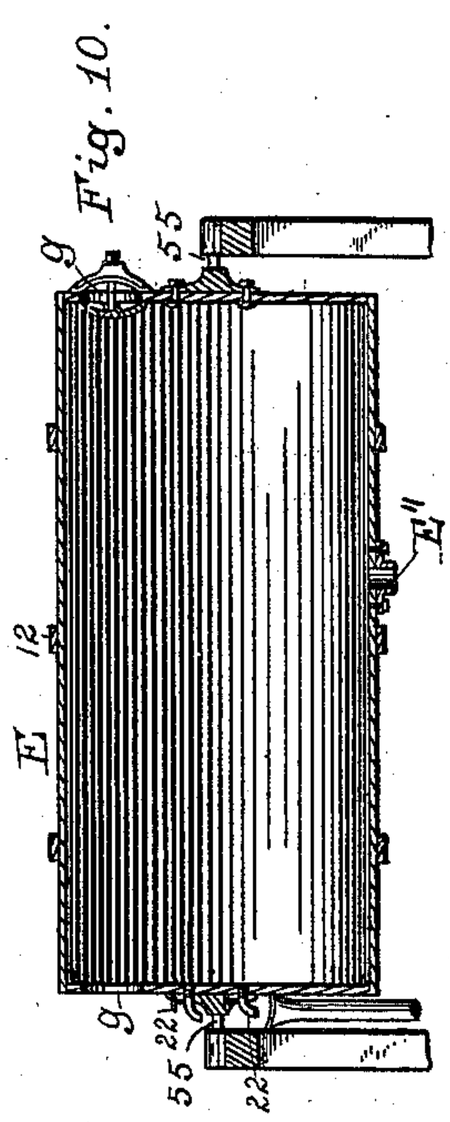

Fig. 10.

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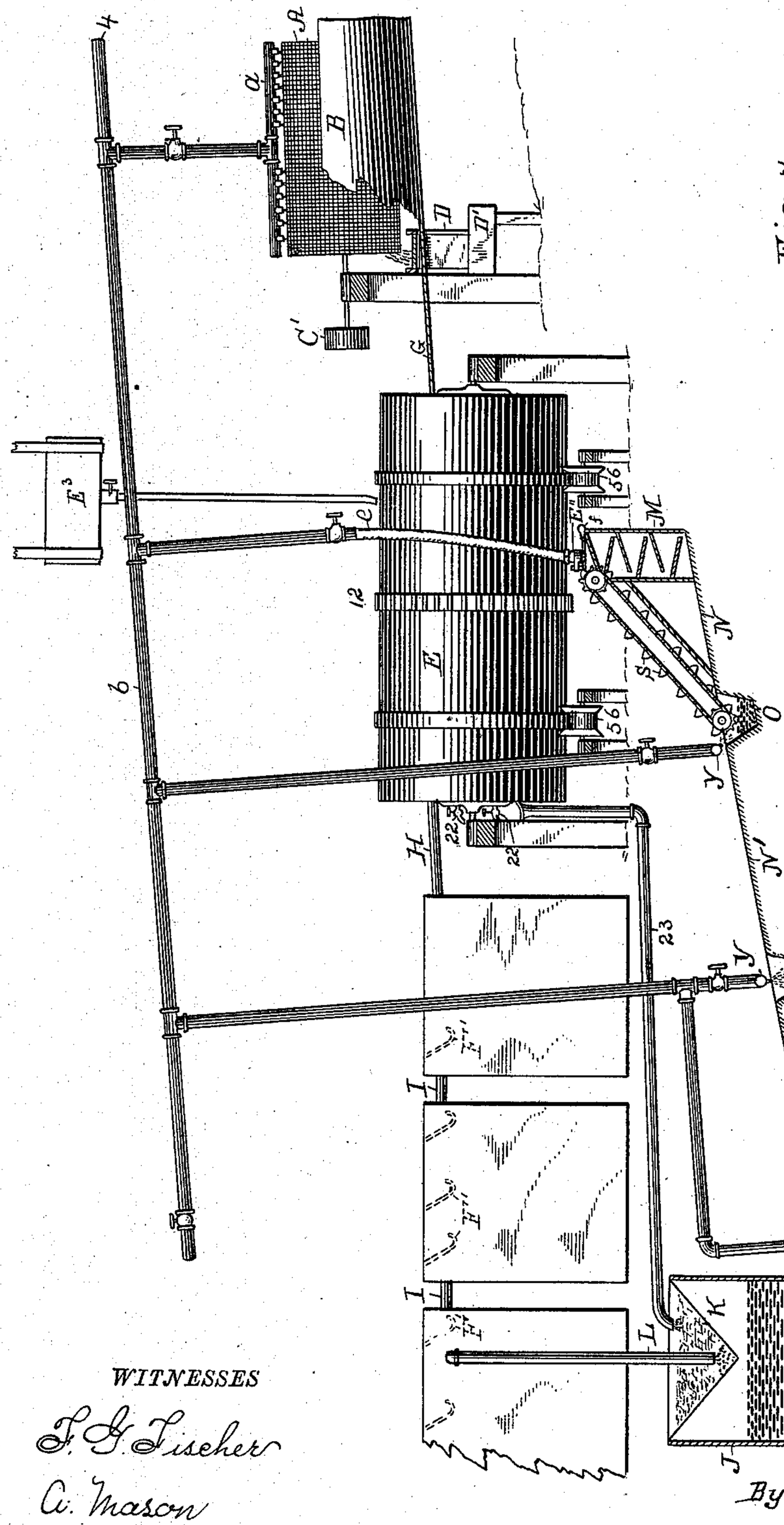

Fig. 2.

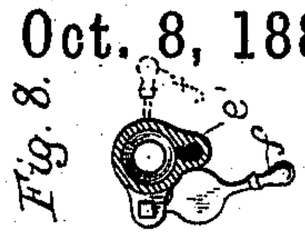

Fig. 8.

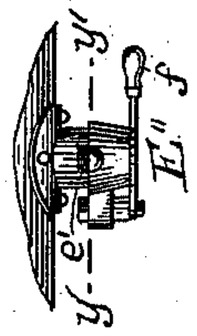

Fig. 7.

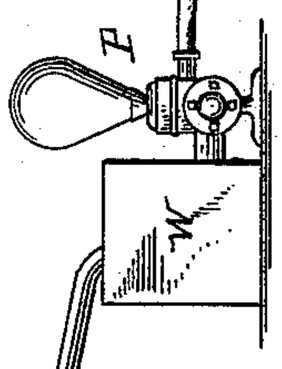

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Fig. 3.

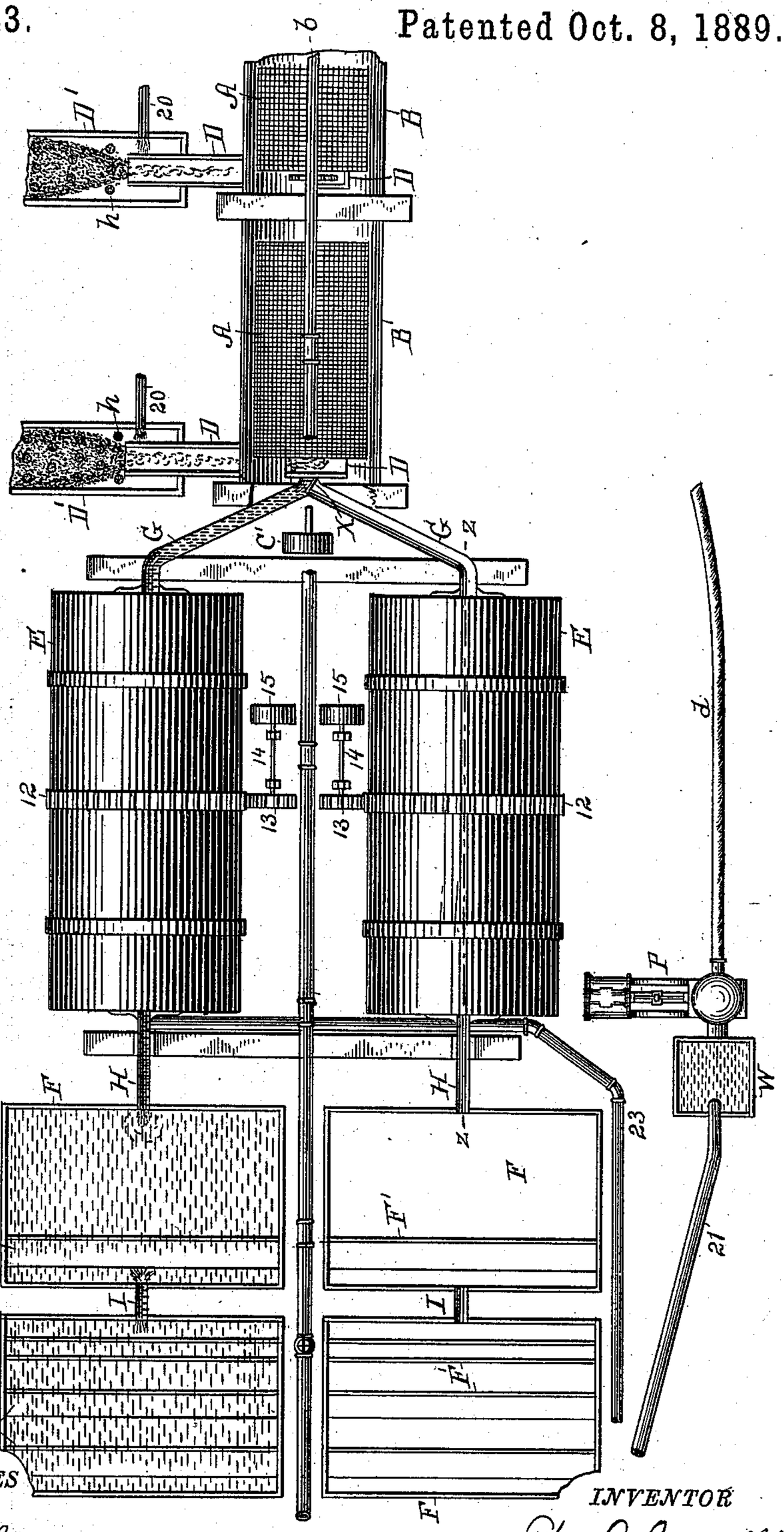

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Fig. 4.

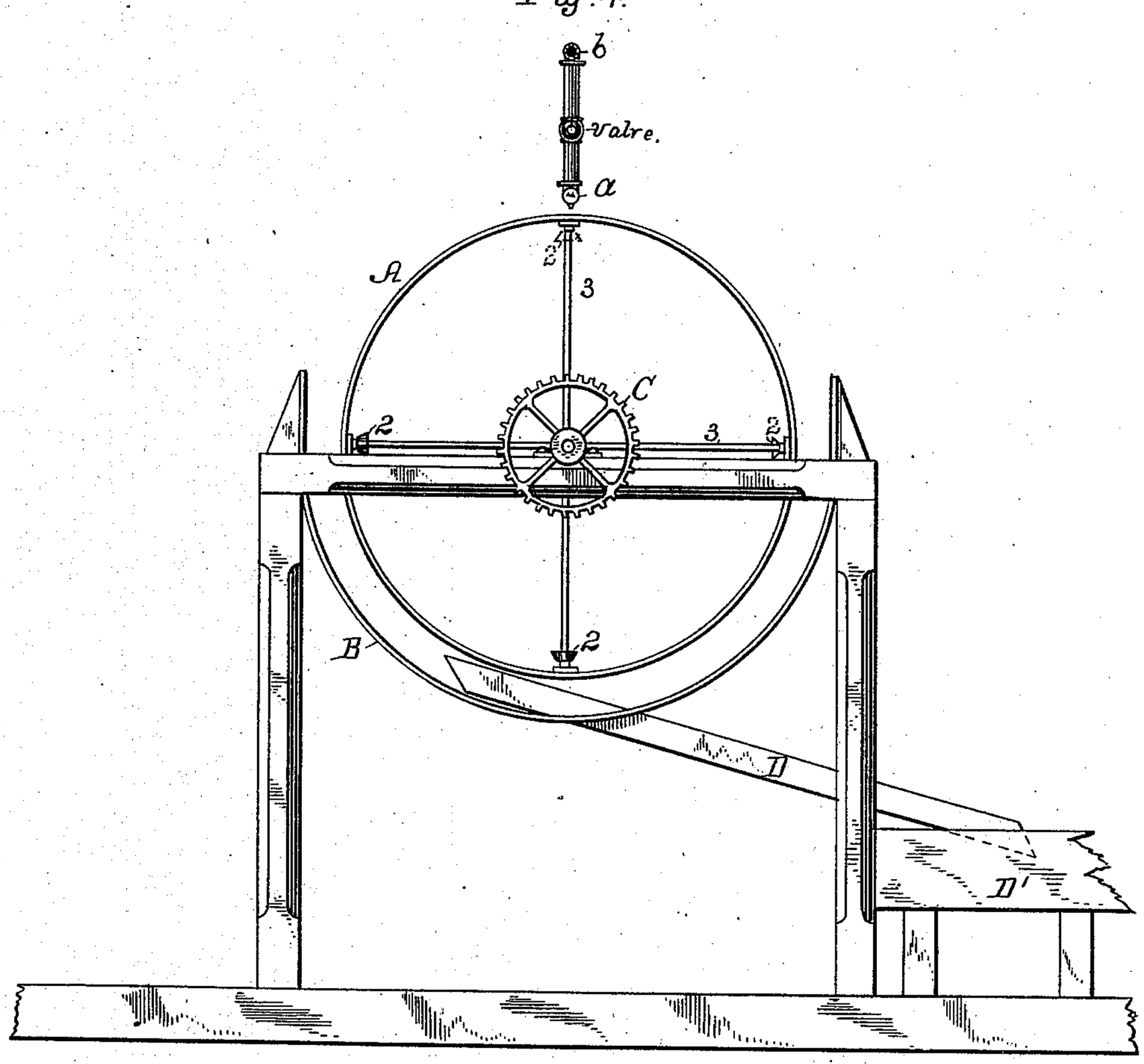

Fig. 9.

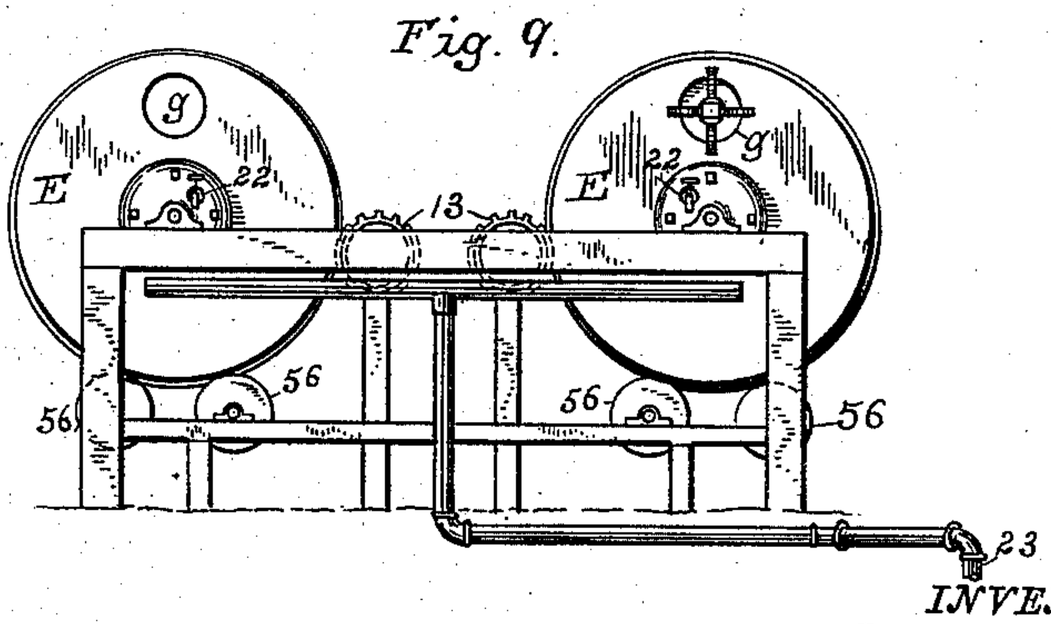

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Fig. 5.

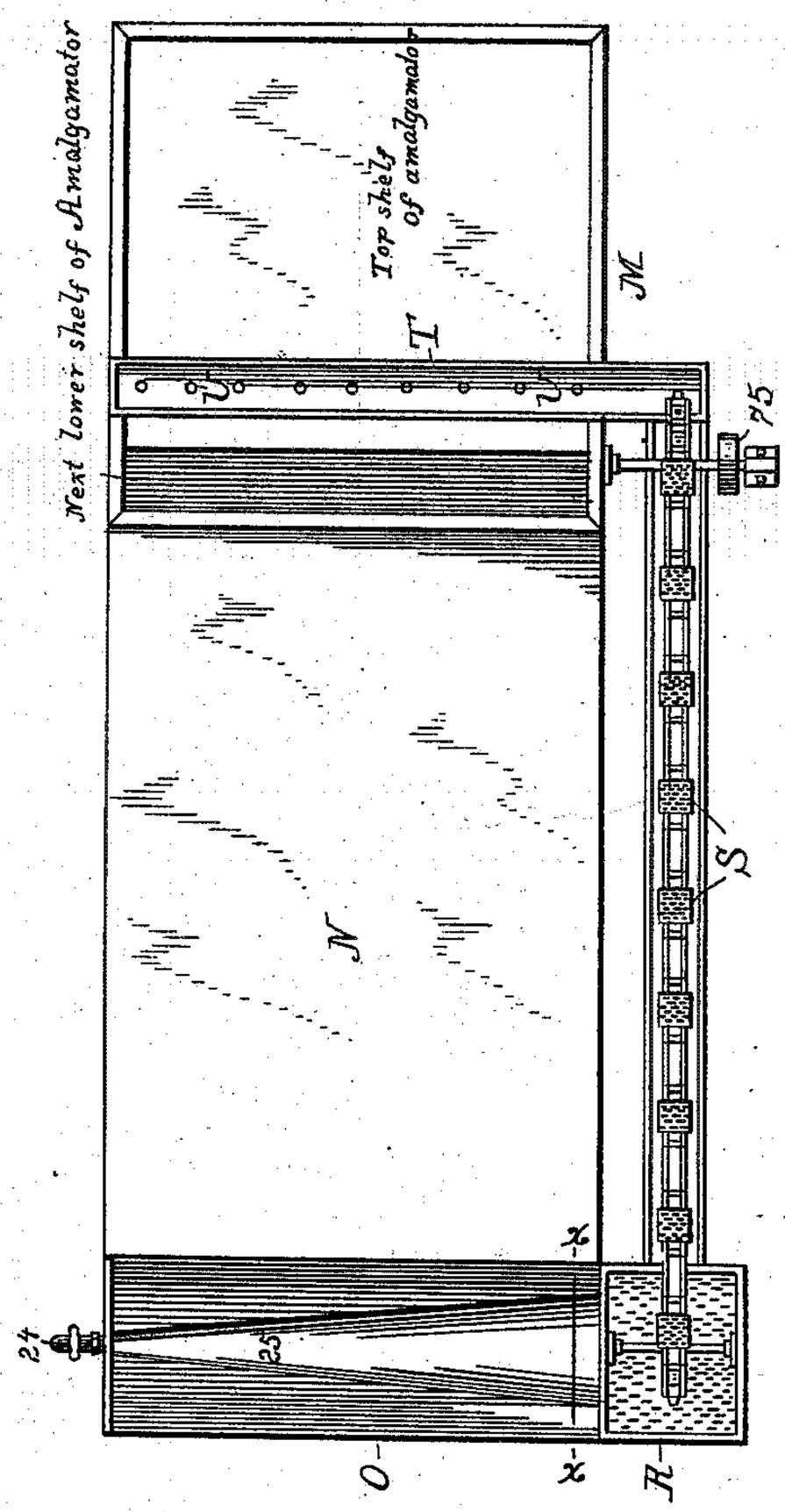
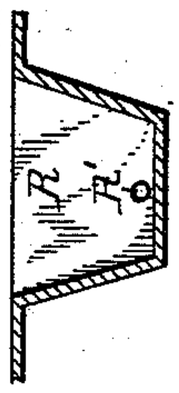


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM A. MERRALLS, OF KANSAS CITY, MISSOURI.

METHOD OF AND APPARATUS FOR EXTRACTING GOLD.

SPECIFICATION forming part of Letters Patent No. 412,643, dated October 8, 1889.

Application filed November 5, 1887. Serial No. 254,447. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. MERRALLS, of Kansas City, Jackson county, Missouri, have invented a new and Improved Method of and Apparatus for Extracting Gold, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention consists in an improved combined mechanical and chemical method or process of and apparatus for extracting free or loose gold from substances with which it is found deposited or mingled in placer mines or deposits, and removing from it oxides and surface coatings and covering it with a film of mercury, the method or process and apparatus, as well as the substances acted upon, being such, as will be hereinafter described, that such gold as is loose or free to flow on water with a current, and sometimes without a current, and which, by reason of its nature or lightness, has become separated from its native ores by natural causes and is found deposited in its native pure condition (save having become surface-coated with oxides or other foreign substances) amid bowlders or pebbles, gravel, sand, and like substances in mines or deposits such as above named, can be expeditiously and economically separated from said foreign substances, relieved from oxides or other surface coatings, and amalgamated without requiring to be subjected to a treatment which involves a reduction operation, such as practiced with gold ores—for instance, a grinding process—and such other successive operations as are necessary in the treatment of ores wherein the gold is found embedded as a fixed constituent element of the rock or other solid mass.

In the accompanying drawings, Figure 1 is a broken side elevation and partial section showing a series of rotary screens with lateral sluiceways and inclined aprons, the same being a rear portion of my machine. Fig. 2 is a broken side view and section, the same showing a rotary settling and deoxidizing cylinder and a series of settling-boxes, an amalgamator, filter, pump, &c., in connection with the screens, sluiceways, and aprons. Fig. 3 is a broken plan view of the apparatus without the amalgamator, filter, &c. Fig. 4 is an end view looking toward the right-hand end of the apparatus, showing one of the rotary screens, gears, sluiceways, aprons, and the supporting-frame, and also water-supply distributing or sprinkling pipe. Fig. 5 is a plan view of a portion of the amalgamator shown in Fig. 2, the same being on an enlarged scale. Fig. 6 is a transverse section of the first mercury-trap on the line $x\,x$ of Fig. 5, showing its mercury-well. Fig. 7 is a detail elevation view showing a discharge faucet or cock as applied upon the rotary settling and deoxidizing cylinder or cylinders, a portion of the cylinder being also shown. Fig. 8 is a section of the said faucet or cock on the line $y'\,y'$ of Fig. 7. Fig. 9 is an end view of the two rotary settling and deoxidizing cylinders as seen from the left-hand end of said cylinders, as in Fig. 3; and Fig. 10 is a longitudinal section through one of said settling and deoxidizing cylinders.

In carrying out my invention I employ a series of rotary screens A, which are slightly inclined and arranged one below the other and some distance apart, but connected by aprons B, as shown, so that the material which is only partially screened in one will be discharged into the next succeeding one, and so on throughout the series, the successive screens being placed on successively lower inclined planes and their mesh being successively finer. Said screens are all arranged on a common supporting-frame, and each is provided with a driving-shaft, which extends longitudinally through it and has bearings at either end. The screens also have radial arms 3, which carry the woven screening material on their outer ends. One screen is connected with another throughout the series by means of gear-wheels C, and all are driven through a belt-pulley C′, located on the shaft of the lower screen. The aprons B are semi-cylindrical and one surrounds the lower half of each screen, and all prevent the water and material from passing off sidewise. These aprons are inclined and each acts as a conductor from one screen to another by extending beyond the screen which it partially surrounds into a succeeding screen, as shown. The last apron of the series does not enter into a screen, but discharges its contents into connecting-gutters G G of settling-cylinders E E, as will be hereinafter described. On the

arms 3 of the screens sliding weights or knockers 2 (see Fig. 4) are applied so as to fall by the action of gravity during the revolution of the screens, and thereby jar the screen so as to dislodge adhering clogging substances from their mesh. Between the ends of each pair of screens lateral inclined troughs D and sluice-boxes D′ are provided, as shown, for conducting off bowlders or pebbles, gravel, and sand at the end of each screen. The screens may consist of a series—say five; but the number may be varied according to the nature of the material from the mine or deposit being operated upon. Below and considerably forward of the last screen one or more revolving settling and deoxidizing cylinders E E are arranged and connected by gutters G G to the last conducting-apron B. These cylinders are for settling and deoxidizing the screened material, they aiding mechanically while the process of removing oxides from the gold's surface by chemical means, as presently described, is being performed. The capacity of the cylinders depends upon the size of the plant to be erected—as, for instance, a plant that is to handle one thousand yards of placer-dirt in twenty-four hours would require the cylinders to be respectively ten feet in diameter and thirty feet in length, while in a plant to handle five thousand cubic yards in the same time the cylinders, respectively, would have to be twelve feet in diameter and fifty feet in length; so it will be seen by this that the cylinders are of different sizes—say from five to twelve feet in diameter and from twenty to fifty feet in length—and the capacity of the cylinders will be according to their sizes. A one-thousand-yard cylinder, or one which goes with a plant requiring that size, would hold about forty cubic yards of pulp or of the fine material which passes through the last screen and settles in the cylinder; or, in other words, it will be seen that a cylinder may be of a size to hold from about ten to eighty yards of pulp, as the plant may require. In this connection it is proper to state that for every cubic yard of pulp in the cylinder about two gallons of a chemical solution hereinafter described will be required, or for a cylinder that contains forty yards of pulp about eighty gallons of the said solution will be used. Man-holes, as *g g′*, are provided in opposite ends of said cylinders, through which, respectively, the cylinders are filled and an overflow permitted. A series of cocks or faucets 22 are also located on the rear end of each of said cylinders, the same being placed at different altitudes and serving for draining off the surplus water after the substances have become settled or whenever desired, and at the bottom of each of the cylinders a cock or faucet E″ is provided, through which the settled sand and cleaned and prepared gold are discharged, as will be presently described. The cylinders E E are supported upon friction-rollers 56, which are arranged beneath them in suitable bearings, and in which the journals 55 of the cylinders revolve. The means for supporting the cylinders may be varied, and if desired the journals may be dispensed with and the cylinders rest entirely upon the rollers or on their journals. The cylinders may be revolved by pulleys 15, mounted on shafts 14, carrying-pinions 13, which mesh with toothed racks 12, encircling said cylinders about midway of their length, as shown.

F F represent a series of stationary settling-boxes for receiving from the cylinders through troughs H such gold slimes as may pass off with the overflow from said cylinders. These boxes have arranged in them near their top a series of skimmers F′, of nearly U shape, said skimmers being removable, and their office is to skim off from the surface of the water all light floating particles of gold for return into the settling and deoxidizing cylinders. The series of stationary settling-boxes are connected by overflow-troughs I, as shown, so that the liquid may overflow from one to the other.

L is an overflow-pipe from the last of the boxes F, leading to a filter J, and 23 is a drain-pipe connected to a gutter leading from the drain-cocks 22 of the settling and deoxidizing cylinders E, as shown. The filter J may be provided with a filtering material K—as, for instance, a lining of canvas and a mass of hay or straw.

P is a water-supply pump of ordinary construction, provided with a hose *d* and adapted to be attached to the end 4 of a main water-distributing pipe *b*, and thereby supply water to the revolving screens and the several parts of the apparatus in spray or otherwise suitably by means of branch pipes provided with cocks and rosettes, as illustrated in the drawings.

W is a well connected with the pump P and with the filter J by means of a pipe 21. Into this well all the water used in carrying on the operation of the apparatus empties in a filtered condition, and therefrom returns to the pump for reuse.

M is an amalgamator situated beneath or at one side of the revolving settling-cylinder E and of the following construction: A number of oppositely-inclined or zigzag shelves having a drop of a few inches from one to the other are arranged between the vertical walls of the amalgamator M. Beneath these shelves inclined amalgamated copper plates N N′ N², connected by mercury-traps O O′ O², are arranged as shown. The highest mercury-trap O is extended laterally beyond the plate N some distance, so as to form a mercury holding and supplying well R, the trap and well being separated by a vertical partition, through which, near its bottom, an aperture R′ is provided, so that the mercury, which is at the start placed in the trap O, can flow from said trap O into the well R, and therefrom be elevated for reuse over and over

again by means of a sprocket-chain S, provided with suitable buckets and arranged to run over pulleys, one of which is located in the well R and the other above the top shelf of the amalgamator M, as shown. The mercury in trap O is kept so supplied that it stands on about a level with the amalgamated copper plate N, and during the filling of the trap O the mercury passes into the mercury-well R through the aperture R′ and rises therein to the same level as that remaining in the said trap O.

T is a mercury-distributing trough arranged above the top of the amalgamator and extended laterally, so as to receive the mercury, which is elevated by the buckets of the chain S from the well R. This trough is provided with a series of perforations U, through which the mercury drops upon the top shelf of the amalgamator M. The mercury-elevator has a belt-pulley 75 upon the shaft of one of its sprocket-driving wheels, or it may be run in any other suitable manner. Over each of the mercury-traps at *y* branch pipes from the main water-pipe 4 are provided, as shown.

E^3 represents a chemical-solution chamber which is to be provided with suitable filling and discharging passages and with a connecting hose-pipe, whereby it can be connected with the cock E″ of the cylinder E, for a purpose presently described.

From the main distributing-pipe 4 a branch pipe, with cock and a hose-connection *e*, is extended for the purpose of introducing water through the cock E″ by means of a passage *e′*, Fig. 7, for aiding in the discharge of the pulp upon the amalgamator M, as will be presently described.

X is a gate provided at the junction of the troughs G G, and which, when opened in one direction, allows the water and screened substances, as gold and fine sand, to flow into the left-hand settling-cylinder and excludes the same from the right-hand cylinder, and when opened in an opposite direction allows the water and screened substances to pass into the right-hand cylinder and excludes them from the left-hand cylinder, and thus, after one cylinder is charged, and while the mixture within it is being prepared for the amalgamation process hereinafter described, the other cylinder can be brought into use and charged and time thereby saved, or a larger amount of work performed in a given time by the apparatus.

Operation: The water, gravel, sand, &c., coming from the placer ground or mine is brought to the first screen of the series through sluice-box V, and the material which is fine enough, together with the water, passes through the mesh of the first screen, and whatever gold is in the water passes through this mesh and drops upon the highest apron B and therefrom to the next screen, while bowlders or pebbles, &c., which are not fine enough to pass vertically through the mesh of the first screen, travel longitudinally through this screen and drop upon trough D into sluice-box D′, and are washed away by a stream of water flowing from water-pipe 20, or they may be dumped into a car and run off as worthless stuff, and so the operation continues through the entire series of successively finer screens, and the sluice-boxes D′ being provided with riffles—such as *h*—any gold passing through them is intercepted and saved from being lost with the waste material. This arrangement of rotary screens serves to hold back as much of the sand as possible and allows only the water and fine gold with a small proportion of gold to pass on for further treatment. The screened material drops from the apron of the last screen upon one of the troughs G and is conducted through one of the man-holes *g* into one of the rotary settling and deoxidizing cylinders E, which for the time being is kept stationary, and, as this cylinder is filled with water and sand and fine gold, the sand settles at the bottom of the cylinder and the water and the fine gold slimes it may carry pass on through the cylinder and out through the overflow man-hole *g′* at its opposite end and along the trough H into the first of the series of stationary settling-boxes F, wherein it is allowed further time to settle. From the first settling-box the water and gold slime pass to another through trough I, and so on until they overflow from the first box of the series into a pipe L, connected with the filter J, and are filtered; and should any fine gold pass into the pipe L it will be caught in the filter. The filtered water passes from the filter into the well W, from whence it is pumped up to the head of the sluice by pump P, through hose *d*, for reuse. The settling-boxes being nearly full of water, and there being some fine gold—so fine as to float on the surface—this gold is caught by the skimmers F′, and periodically these skimmers are lifted out of their places and their contents emptied into one of the cylinders E during the charging of said cylinder for the amalgamation process. As soon as sufficient material for a charge has settled—say forty cubic yards in one of the cylinders E—the gate or valve X is changed, so as to direct the material flowing from the aprons into the other cylinder and settling-boxes, the same as before described with respect to the first cylinder E. The fine gold and sand, &c., which have settled in the cylinder being ready for the treatment preparatory to amalgamation, the man-holes in the end of the cylinder are closed water-tight, and the cylinder is allowed to make one or more revolutions for the purpose of leveling the pulp inside, whereupon it is stopped and the surplus water drained off through the faucets or cocks 22, whence it flows into the gutter and through pipe 23 to the filter J, thus saving anything of value that may pass off with the water.

The draining off of the water is effected as follows: The highest of the series of cocks 22 is

opened and all the water above it allowed to run out of the cylinder. The next cock 22 of the series is now opened and all water above it allowed to run out, and so on through the whole series. These cocks are important, as the pulp is required to be as free as possible from water before the chemical agents (hereinafter described) are introduced for removing the oxides from the gold and coating the gold with a film of mercury. After the water is drained off the settling and deoxidizing cylinder is turned until the large faucet or cock E^2 at its bottom comes up on top. Then a chemical mixture or solution is introduced for the purpose of removing the oxide from the gold and insuring the amalgamation of the gold in its subsequent treatment in the amalgamator M. This solution may be of any suitable nature; but it is best when it consists of twenty parts of chloride of sodium, two parts of cyanide of potassium, and one part of chloride of mercury (corrosive sublimate of commerce) dissolved in five hundred parts of warm water as pure as possible without distillation. Said solution is placed in the chamber E^3, and, said chamber being connected with cock or faucet E'', the solution is allowed to flow upon the pulp in the cylinder, and when enough—say eighty gallons—of the same has been run in (which will vary slightly, according to the different kinds or richness of pulp) the supply-pipe is disconnected and the faucet or cock E'' closed. The cylinder is now revolved for about thirty minutes and then stopped, and the faucet or cock E'' opened and a number of pieces of clean iron (preferably iron balls or chains) are introduced into the cylinder, and then the faucet E'' is closed and the cylinder again revolved for about twenty or thirty minutes and then stopped, with the faucet E'' standing on top, for the purpose of ascertaining whether the pulp has had the coating of oxides removed and is coated with a thin film of mercury. This is done as follows: The faucet E'' is opened and a sample of the pulp taken out with a long-handled spoon, and if on examination all the fine gold of the pulp does not appear to be coated with the mercury of the solution and the oxides not fully removed, then the solution-chamber E^3 is again connected with the cylinder and more—say twenty gallons—of the solution allowed to run into the cylinder E for the purpose of completing the removal of the oxides and coating the gold with a film of the mercury. This done, the supply-pipe is disconnected, cock E'' closed, and the cylinder revolved twenty or more minutes and stopped. Then by opening the faucet E'' and lifting out a portion of the pulp, as before, another test is made, and if not satisfactory the operation is repeated with an addition of, say, ten gallons of the solution, more or less, until the desired end is attained. In only rare instances does the process require any addition to the first eighty gallons. When the pulp throughout appears to be coated and the oxides removed, the iron balls or chains are taken out and the cylinder turned around so as to bring the faucet E'' down over the amalgamator M. It should be stated that the solution of the proportions named above will not answer for all kinds of pulp without slight variation, and that it will have to be varied to suit special pulps under treatment—for instance, the solution will be made stronger or weaker by changing the proportion of water. Again, if there is much oxide coating on the gold, more of the chloride of sodium and cyanide of potassium will have to be used; and, again, in treating pulp which has a large amount of iron oxide with other oxide it may be advantageous to wash the pulp after coating the gold with a film of mercury, and if that is found desirable the following procedure may be adopted: After the gold has been coated with mercury, and while the faucet is on top of the cylinder, run a stream of water into the cylinder through the faucet E'' until the cylinder is full. Then close the cock E'', revolve the cylinder twenty or thirty minutes, then stop it and drain all the water out through the series of faucets 22, and, if necessary, repeat the washing and revolving of the cylinder and draining off of the water. The chemical treatment having been completed, a hose is attached to a suitable coupling formed upon the body of the faucet E'' around the passage *e'*, and a small stream of water, enough to make the pulp flow freely down the inclined shelves of the amalgamator M, is allowed to enter the cylinder through the said faucet. The faucet E'' is now opened by means of a handle *f*, the amount of opening being regulated according to circumstances, and as the water and pulp flow from the mouth of the faucet they fall upon the top shelf of the amalgamator, where they are met by and mixed with circulating mercury which is being lifted and distributed, as before described, and the mercury and pulp thus mixed flow down upon the shelves of the amalgamator M upon the first and highest of the amalgamated copper plates N N' N^2, and a portion of the mercury is retained on said amalgamated copper plate, and what is not retained runs down into the first mercury-trap O, to be re-elevated by the sprocket-chain and used over again. The pulp and substances pass with mercury over the other amalgamated plates N' N^2 into mercury-traps O' O^2, as illustrated. Water is sprinkled upon the pulp by means of the pipes *y* at the mercury-traps, so as to keep it loose and light as it passes from the amalgamated copper plates into the traps. The mercury sinks down through the soft pulp into a trap, and the pulp passes on to the next plate, and so on until the operation is completed. At periods during this amalgamation process the mercury which runs down the amalgamated copper plates N N' N^2 into the mercury-traps O O' O^2 and the gold

which has become amalgamated with it are removed from the traps, and after straining it through a buckskin, so as to secure the hard amalgam—namely, gold and a very small per cent. of mercury—the mercury which passes through the buckskin is returned to the trap to be used over again. In economical practice the mercury will not get into the traps O′ O², they being only employed for the purpose of retaining any mercury which should by accident pass beyond the first trap O and be liable to become lost. All excess of mercury may be taken out by means of stop-cocks 24, or through passages closed by suitable plugs, and the same returned to the well R. The mixture of gold and mercury thus removed from the traps and strained is retorted in the ordinary way, and the amalgamated plates N N′ N² cleaned off as often as necessary. It should be stated that about eighty per cent. of the gold which passes from the last screen settles in the cylinders E, and that about twenty per cent. in condition of fine-gold slimes passes into the stationary settling-chamber F and into the filter J, and that it is necessary in order to save the gold held in these boxes and the filter-chamber after a run, say, of three months to empty said boxes and chambers. This is done in the case of the settling-boxes by removing the water and shoveling out the solid matter from the boxes and placing it in one or the other of the cylinders which is ready for the amalgamation process and passing it therefrom upon the amalgamator; and in the case of the filter the straw is taken out of the filter-chamber and burned, and the ashes put into one of the cylinders for the purpose of passing it into the amalgamator.

My method or process and apparatus differ from all others in that the operation is substantially a continuous one, and, being such, that no expense in the handling of the placer-mine substances after they have been collected and until the gold is amalgamated and ready for being retorted is incurred. This is accomplished by separating the bowlders, gravel, and nearly all the sand, (only the finest sand and flowing and floating gold remaining,) and in continuing to flow and float the residuum until it deposits into the settling, deoxidizing, draining, and cleaning cylinders, then removing the oxide or coating from the gold, then coating the same with a film of mercury, so as to insure its amalgamation after passing out of the cylinder upon the zigzag amalgamator-plates through flowing mercury and upon inclined amalgamating-plates and over mercury-traps.

What I claim as my invention is—

1. The within-described method or process of treating the concentrated placer mine or deposit gold intermediate its passage from the concentrating mechanism to the amalgamator proper, consisting in collecting the flowing gold along with any remaining fine sand and the water carrying the same, draining off the water and settling the pulp, mixing with the pulp a chemical solution consisting of chloride of sodium, cyanide of potassium, chloride of mercury, and water, and agitating by rotation the mixture until the gold is deoxidized or cleaned and becomes coated with a film of mercury, substantially as and for the purpose described.

2. The within-described method or process of treating the concentrated placer mine or deposit gold in its passage from the concentrators to the trap or traps of the amalgamator proper, consisting in collecting the flowing gold along with any remaining fine sand and the water carrying the same, draining off the water and settling the pulp, mixing with the pulp a chemical solution consisting of chloride of sodium, cyanide of potassium, chloride of mercury, and water, placing pieces of iron amidst the mixture, and agitating by rotating the whole until the gold is deoxidized or cleaned and becomes coated with a film of mercury, substantially as described.

3. The within-described method or process of treating the concentrated placer mine or deposit gold in its passage from the concentrators to the trap or traps of the amalgamator, consisting in collecting the flowing gold, fine sand, and the water carrying the same, draining off the water and settling the pulp, mixing with the pulp a chemical solution consisting of chloride of sodium, cyanide of potassium, chloride of mercury, and water, agitating by rotation the mixture until the gold is deoxidized or cleaned and becomes coated with a film of mercury, and then bringing the mixture in contact with mercury or mercury-covered surfaces for effecting complete amalgamation, substantially as described.

4. The within-described method or process of treating the concentrated placer mine or deposit gold on its passage from the concentrators to the amalgamator trap or traps, consisting in collecting the flowing gold, fine sand, overflowing gold slimes, and water carrying the same, draining off the water and settling the pulp, mixing with the pulp a chemical solution consisting of chloride of sodium, cyanide of potassium, chloride of mercury, and water, placing pieces of iron in the mixture, agitating the mixture until the gold is deoxidized or cleaned and becomes coated with a film of mercury, bringing the mixture containing the thus-prepared gold in contact with mercury or mercury-covered surfaces, bringing water in contact with the flowing mixture, and, finally, subjecting the water used to a filtering operation and returning it clean for reuse, substantially as described.

5. The combination of successively lower and finer revolving screens, stationary lateral sluiceways, inclined aprons, water-distributing pipes, connecting gutter at end of last apron, a revolving settling deoxidizing cylinder having a man-hole, one or more water-drain cocks or faucets, and a pulp-discharge cock or faucet, substantially as described.

6. The combination of successively lower and finer rotary screens, lateral sluiceways, stationary inclined aprons, water-supply distributing-pipes, connecting-gutter at end of last apron, a revolving settling deoxidizing cylinder having a man-hole, an overflow passage or man-hole, one or more water-drain cocks, a pulp-discharge faucet or cock, and an overflow stationary settling-box having a skimmer, substantially as described.

7. The combination of successively lower and finer revolving screens, lateral sluiceways, stationary inclined aprons, water-distributing pipes, connecting-gutter at end of last apron, a revolving settling deoxidizing cylinder having a man-hole, water-drain cocks and a pulp-discharge faucet or cock, a chemical-solution chamber, and an amalgamator consisting of a perforated trough, a vertical chamber having zigzag amalgamation-plates, inclined amalgamation-plates, one of which is formed with a side well for surplus mercury, and an endless-chain mercury-elevator, substantially as described.

8. The combination of successively lower and finer revolving screens, lateral sluiceways, stationary inclined aprons, water-supply distributing-pipes, connecting-gutter at end of last apron, a revolving cylinder having a man-hole, water-drain cocks on different horizontal planes, a pulp-discharge faucet or cock, an overflow passage or man-hole, drain-pipes from the settling deoxidizing cylinder, stationary settling-boxes, overflow-pipes, a filter, filtered-water return-pipes, and a pump, substantially as described.

9. The combination, with the revolving settling deoxidizing cylinder having a man-hole, drain-cocks, and a pulp-discharge cock, of water-distributing pipes and a chemical-solution chamber having a connecting-pipe, substantially as described.

10. The combination of the revolving settling deoxidizing cylinder having a supply man-hole and overflow passage or man-hole, drain-cocks, drain-gutter, stationary settling-boxes, overflow drain-gutters and pipes, water-filter, and return water-pipes, substantially as described.

11. The combination of successively lower and finer screens, lateral sluiceways, stationary inclined aprons, connecting-gutters at end of last apron, a gate for changing the course of the water and substances passed off from the aprons, two revolving settling deoxidizing cylinders, each having an inlet and an outlet man-hole, water-drain cocks, and a pulp-discharge cock or faucet, substantially as described.

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

WILLIAM A. MERRALLS.

Witnesses:
S. S. MOREHOUSE,
F. G. FISCHER.