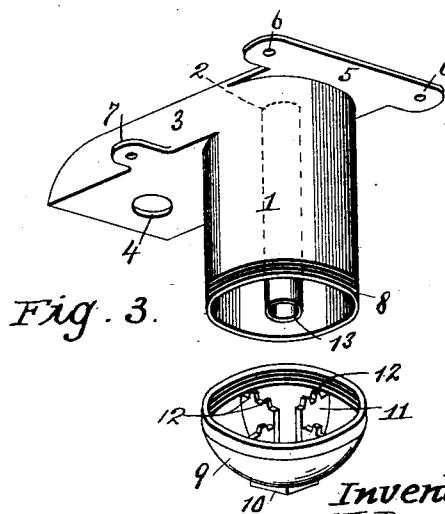
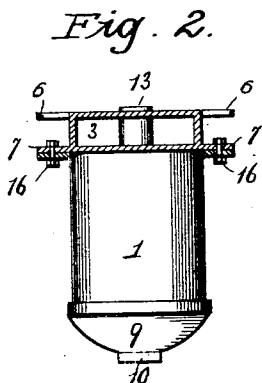
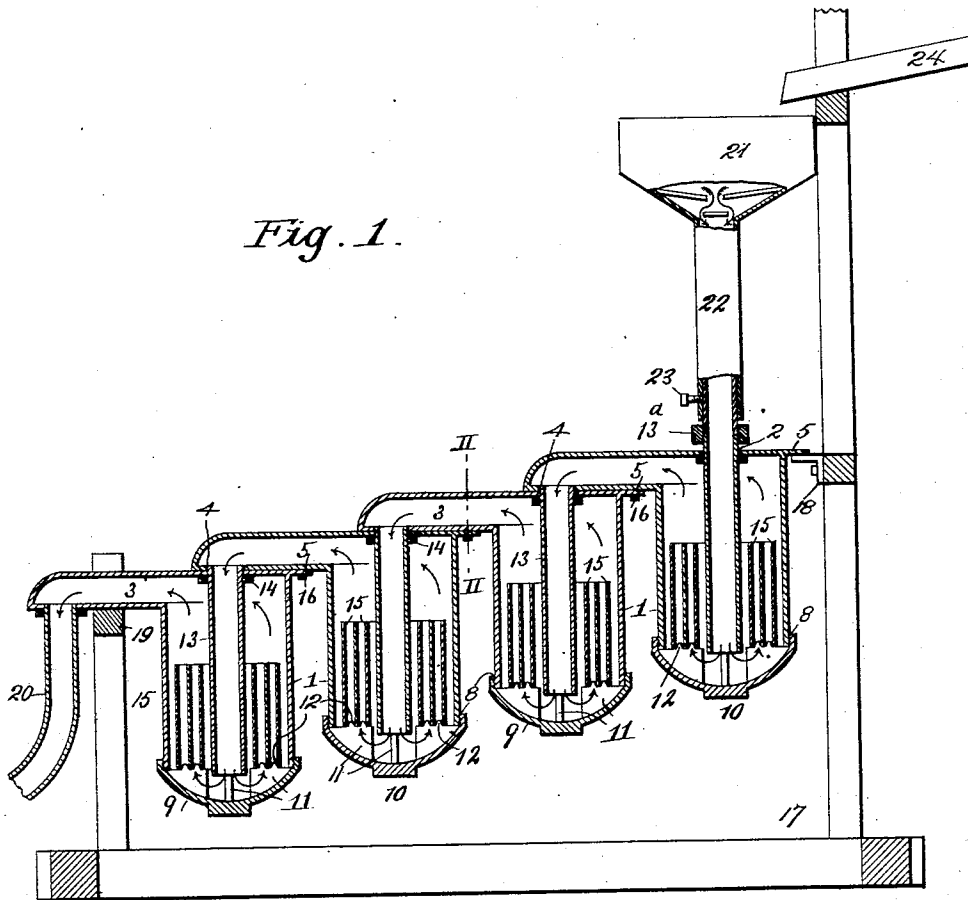


(No Model.)

J. H. BARR & J. F. JOHNSON.
HYDRAULIC GOLD SEPARATOR.

No. 587,780.

Patented Aug. 10, 1897.



Witnesses:
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By *Higdon & Higdon,* Attys.

UNITED STATES PATENT OFFICE.

JOHN H. BARR AND JAMES F. JOHNSON, OF KANSAS CITY, KANSAS, ASSIGN-
ORS OF ONE-THIRD TO WILLIAM E. HARVEY, OF ROSEDALE, KANSAS.

HYDRAULIC GOLD-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 587,780, dated August 10, 1897.

Application filed October 27, 1896. Serial No. 610,247. (No model.)

To all whom it may concern:

Be it known that we, JOHN H. BARR and JAMES F. JOHNSON, of Kansas City, Wyandotte county, Kansas, have invented certain
5 new and useful Improvements in Hydraulic Gold-Separators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part thereof.

10 This application relates to gold-separating apparatus, and more particularly to an improvement in the gold-separating machine for which we made application on July 11, 1896, Serial No. 598,875. Our primary object in
15 this connection is a structural improvement whereby the capacity of the machine is increased, its operation facilitated, and the examination or manipulation of any one or more of the jars made possible without affecting
20 the position or arrangement of the remainder. In other words, by our improved construction the contents of any jar may be removed for purposes of examination or otherwise without disturbing any of the remaining jars.

25 To this end the invention consists in certain novel and peculiar features of construction and combinations of parts, as will be hereinafter described and claimed.

Referring to the drawings, Figure 1 represents a longitudinal section of an apparatus
30 embodying our invention. Fig. 2 represents a cross-section taken on the line II II of Fig. 1. Fig. 3 represents a detail perspective view of one of the jars, its parts being disconnected
35 in order to expose its interior.

Like numerals designate corresponding parts in the several views.

The apparatus is composed of a suitable number of jars or separators connected to-
40 gether, and as all of said jars are of the same construction an individual description will suffice for all. The jar preferably is in the form of a cylinder 1 and is provided centrally in its upper end with a hole or perforation 2,
45 preferably screw-threaded. It is also provided with a hollow extension 3, communicating with its upper end and projecting forwardly therefrom, and said extension in its lower side is provided with a hole or perfo-
50 ration 4 of the same diameter as the hole or perforation 2. At its rear side and upper

end a flange 5 projects, and said flange at its opposite sides is provided with the laterally-projecting perforated ears 6. The extension 3 in the plane of its lower side is also provided with the laterally-projecting perforated
55 ears 7.

The cylindrical body portion 1 is externally screw-threaded at its lower end, as shown at 8, and is adapted to engage the internal
60 threads formed upon the segmental cap 9, said screw-cap being provided at its under side with an angular head or projection 10, whereby it may be engaged with a wrench, if desired, to screw it firmly upon the lower
65 end of the cylinder 1, and thereby form for said cylinder a removable hollow or hemispherical bottom. Said removable bottom is provided internally with the radially-arranged ribs 11, provided at their upper edges
70 with lugs 12, arranged, preferably, in concentric series with reference to the center or axis of the cylinder. Said lugs, however, preferably terminate short of the horizontal plane of the upper margin of the removable bottom
75 in order that they may be completely submerged in the mercury which the jar is to contain without causing the removable bottom to be filled to overflowing.

13 designates a vertically-pendent pipe
80 which is screwed into the hole or aperture 2 of the jar and has its upper end projecting slightly above the upper end of the jar. This joint is made liquid-tight by employing a packing-nut 14, which is mounted upon said
85 pipe and screwed up against the top of the jar, as shown clearly. The lower end of said pendent pipe is preferably submerged in mercury and is disposed centrally between the ribs 11 of the hemispherical bottom 9. Con-
90 centrically surrounding said pipe are a number of cylindrical amalgam plates 15, which plates rest upon the ribs 11 and are maintained at a suitable distance apart by means of the spacing-lugs 12, as shown clearly in
95 Fig. 1. By this arrangement it is obvious that when the bottom of the jar is removed the amalgam plates are removed also.

In practice a number of jars of the construction shown and described are arranged
100 in different horizontal planes, so that the perforated ears or lugs 7 of the second jar over-

lap and register with the perforated lateral extension 6 of the flange 5 of the first jar and is in turn overlapped in the same manner by the third jar, and so on throughout the entire series, the relation thus established being maintained by means of bolts or their equivalents 16, which extend through the registering perforations of the ears and flanges 6 and 7. These jars are of such construction that when so secured together each with its hollow extension 3 overlapping the upper end of the jar proper next in advance their openings 4 register with and fit upon the upwardly-projecting ends of the pipes 13, in order that the liquid and any matter it may contain escaping or overflowing from one jar must positively and reliably pass down through the pendent pipe 13 of the jar next in advance. The jars thus secured together in different horizontal planes so as to form practically a single rigid structure are suspended in a framework 17 and form a bridge, which rests upon the angle-iron 18 at one end and at its opposite or lower end upon the cross-timber 19 of said framework, or it may be supported in any other suitable manner, it being desirable, however, that it be arranged with the extensions 3 horizontal or step-like, in order to facilitate the operation and thereby increase the capacity of the machine, because when so arranged the gravitative tendency of the liquid will be to pass from the rearmost or first jar successively through the others and escape through the discharge-pipe 20, secured at its upper end in the hole or aperture 4 of the foremost or lowest jar of the series. By this arrangement; therefore, the head-pressure necessary to force the liquid to flow rapidly through said series of jars receives much assistance.

The pipe 13 of the rear or uppermost jar preferably will be extended upwardly a greater distance than the remaining pipes or may be coupled by a union with the lower end of the vertical pipe 13^a, as shown.

21 designates a hopper, which is provided with a tubular extension 22, which fits telescopically upon the extension or pipe 13^a, in order that it may be adjusted higher or lower in order to increase or diminish at will the head-pressure of the liquid which is to pass through the series of separating-jars. The said hopper is secured at any point of adjustment by means of a set-screw 23 or its equivalent carried by said extension 21 and impinging upon the pipe 13^a.

The above means of connecting the hopper and the pipe 13 of the rearmost jar of course may be replaced by any other suitable means desired.

The hopper 21 is arranged to receive the discharge of the hydraulic sluice-box 24 or its equivalent, which also may be supported in any suitable or preferred manner.

In practical operation the sand and other gold-bearing particles are fed to the hopper through the sluice-box in the customary man-

ner and are discharged into the mass or body of mercury in the rearmost jar, the force by which they are precipitated therein being sufficient to cause said mercury to boil up and become thoroughly agitated, so that every particle of gold and gold-bearing material may come into intimate relation with the mercury and be affected thereby in the customary manner. The liquid of course, being lighter than the mercury, will rise through the same, and any particles of gold or gold-bearing material carried up with it must pass first up through the spaces between the amalgam plates, and by reason of the fact that the contents of the jar are in such turmoil or agitation it is obvious that they follow a tortuous course, and consequently nearly all of them come in contact with one or another of said amalgam plates and adhere to the same, leaving the liquid practically purified to pass up beyond the amalgam plates through the tubular extension 3 and down through the pendent pipe 13 into the mass of mercury in the next jar, where it is subjected again to the same operation as took place in the rearmost jar. Most of the particles of gold and gold-bearing material which escape from the previous jar are caught and retained in this second jar, and the liquid, more thoroughly purified, passes up and through the extension 3 of said second jar and is again discharged into the mercury of the third jar, where the operation previously described again takes place.

In practice we have found, under the microscope, that by the time the liquid or water has been passed through the third jar it is thoroughly purified of gold and gold-bearing material, but it is of course to be understood that the number of jars necessary will depend upon the richness of the material, which is subjected a plurality of times to a mercurial bath, and to other circumstances. We do not, therefore, confine ourselves to the use of any particular number of jars.

It is to be understood, of course, that the quantity of material passing through the separating-jars may be regulated by controlling valves or slides (not shown) of the sluice-box or in any other suitable or preferred manner.

When it is desired to examine the contents of any jar, the supply through the sluice-box must of course be first cut off. The bottom of the particular jar is then removed, and in case this cannot be done conveniently by hand the rectangular head 10 may be engaged by means of a wrench. As the bottom is removed the liquid in the jar of course escapes or is caught in a suitable receptacle, and the amalgam plates are removed from the jar also, as they rest upon and are supported solely by the ribs of said removable bottom. Owing to the fact that the mercury is contained entirely in said removable bottom it is not spilled or lost by such removal, and the gold and gold-bearing particles of course are saved, as they are either submerged in the mercury or adhere to the amalgam plates.

From the above description therefore it is obvious that we have produced a gold-separating apparatus which embodies the advantages enumerated in the statement of invention and which is simple, durable, and inexpensive to manufacture. It is also obvious that by the peculiar construction of the jars one or more may be added to or subtracted from the series quickly and easily and that the whole apparatus by reason of its knock-down construction may be easily packed and transported from place to place and be set up or taken down in a very short space of time.

Having thus described the invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a gold-separating apparatus, a jar comprising a body portion having a discharge-opening near its upper end and an inlet-opening, a removable bottom supporting one or more amalgam plates which project up into the body of the jar, and an inlet-pipe extending through said inlet-opening and surrounded by said amalgam plates, substantially as described.

2. In a gold-separating apparatus, a jar comprising a body portion having an inlet-opening and a discharge-opening near its upper end, a removable hollow or segmental bottom for said jar, containing mercury, amalgam plates carried thereby and projecting up into the body of the jar, and an inlet-pipe

extending through the inlet-opening and having its end arranged to discharge into the mercury in said hollow bottom.

3. In a gold-separating apparatus, a jar consisting of a body portion having an inlet-opening and a discharge-opening, a removable hollow bottom adapted to contain mercury and provided internally with ribs, amalgam plates supported upon said ribs and projecting upwardly into the body portion of the jar, and an inlet-pipe for said jar, having its lower end surrounded by said amalgam plates and adapted to discharge the gold-bearing material into the mass of mercury in the removable bottom, substantially as described.

4. In a gold-separating apparatus, the combination in a jar, of a body portion having at its top an inlet-opening, and a hollow communicating extension provided with an opening at its under side, a pipe depending from the inlet-opening, a removable hollow bottom containing mercury and provided with ribs, and an amalgam plate resting on said ribs and projecting up into the body portion, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN H. BARR.

JAMES F. JOHNSON.

Witnesses:

H. L. ISBELL,

A. G. NOTEMAN.