

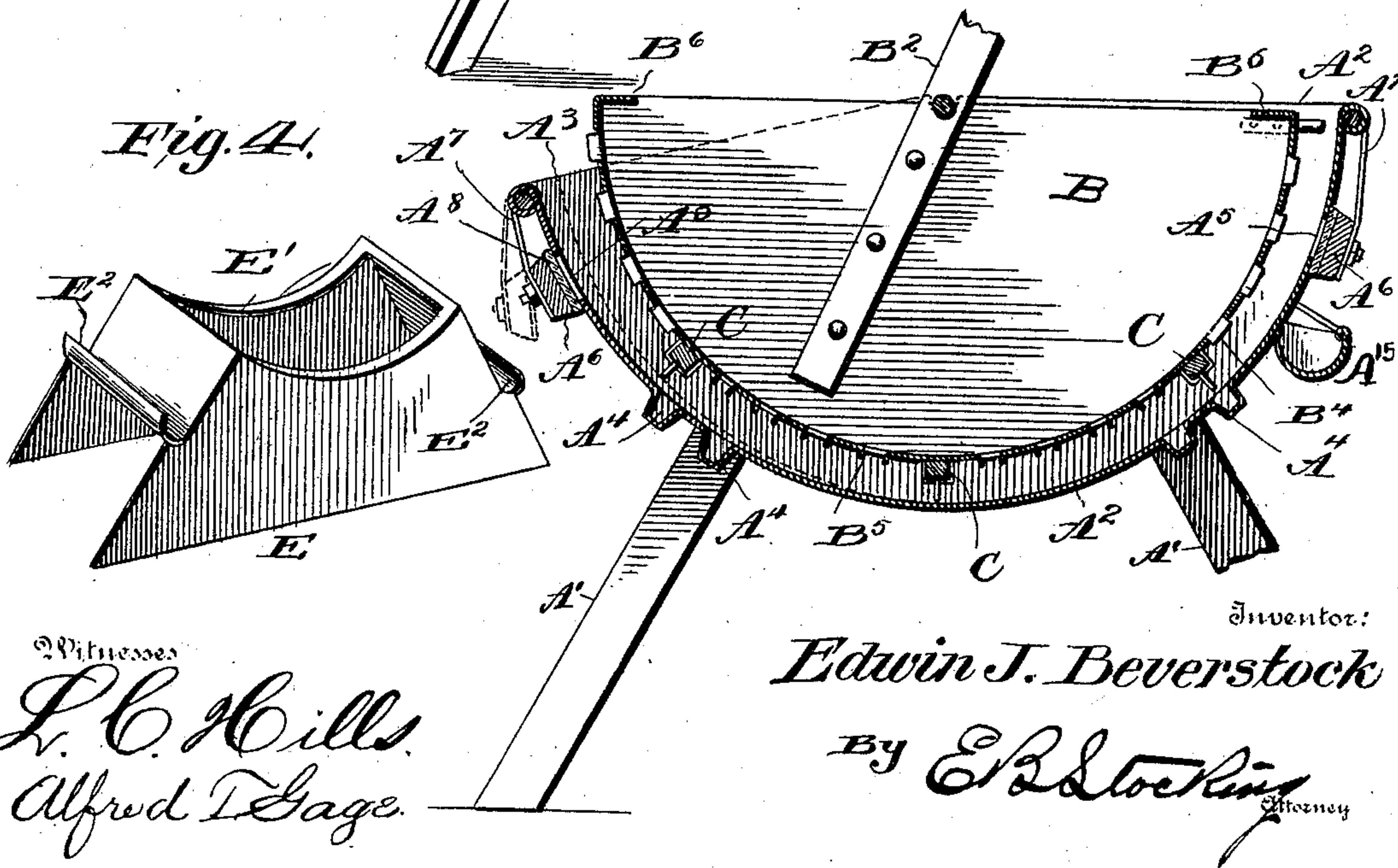
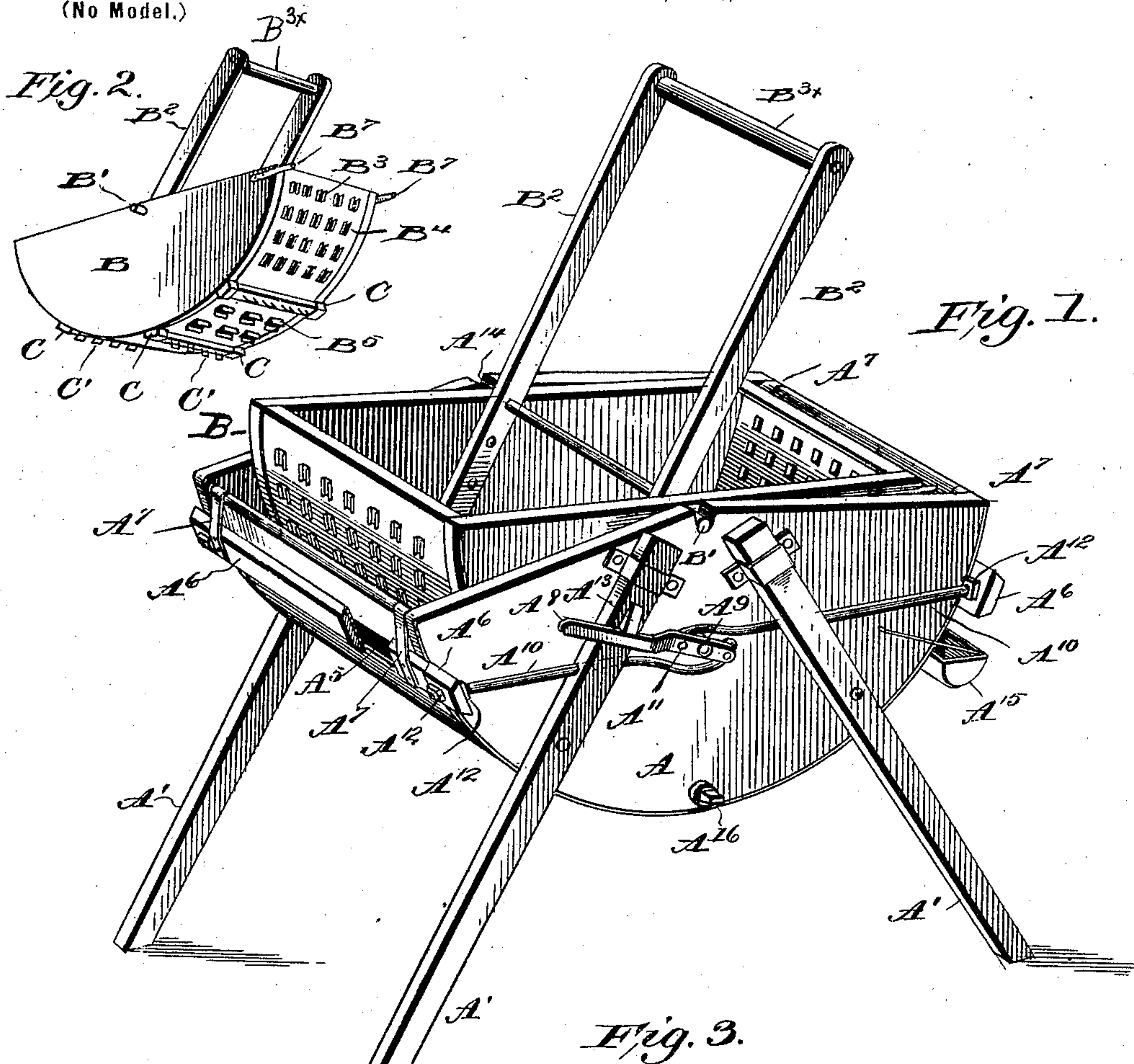
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Patented Aug. 1, 1899.

E. J. BEVERSTOCK.
ORE WASHER.

(Application filed Jan. 8, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

EDWIN J. BEVERSTOCK, OF WASHINGTON, DISTRICT OF COLUMBIA.

ORE-WASHER.

SPECIFICATION forming part of Letters Patent No. 629,947, dated August 1, 1899.

Application filed January 8, 1898. Serial No. 666,072. (No model.)

To all whom it may concern:

Be it known that I, EDWIN J. BEVERSTOCK, a citizen of the United States, residing at Washington, in the District of Columbia, have
5 invented certain new and useful Improvements in Ore-Washers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to ore-washers or
10 separators intended for the purpose of separating gold from gravel or sand as practiced in what is known as "placer-mining," although the invention may be employed in the other arts for the separation of matter
15 comprising constituents of varying specific gravity.

Among several objects in view are the provision of a cheap, simple, and serviceable apparatus which shall rapidly separate particles
20 of gold from gold-bearing earth or gravel and which can be operated for the purpose in view with a minimum quantity of water, and, furthermore, if necessary—as, for example, when used in the winter season or in very
25 cold climates—provision is made for heating the contents of the machine to prevent the same from freezing and facilitate the separation of the gold therefrom.

Another object of the invention is to thoroughly agitate the material to be operated
30 upon with the least expenditure of power and, in addition to simply moving such material over a screening-surface, to produce by the action of the machine a rolling motion or
35 inversion of the earth or other material being washed, so as to constantly present new portions thereof to the screening-surface of the machine. In this inversion of the material there is also secured a constant collection
40 at the top of the larger stones and coarser gravel contained therein, which facilitates the access of the finer portions of the earth to the screening-surface.

A still further object of the invention is to
45 produce a machine which shall agitate the screened portions of the earth being acted upon in such a manner that the lighter constituents are separated from the bottom of the compartment in which such screened material is collected and are mechanically forced
50 along and out of said compartment, while the heaviest or most precious portions of the

screened matter, such as particles or grains of gold, by their superior specific gravity are retained within and upon the bottom of the
55 machine.

Other objects and advantages of the invention will be mentioned hereinafter in the following description, and the novel features thereof will be particularly pointed out in the
60 appended claims.

Referring to the drawings, Figure 1 is a perspective of a machine embodying my invention, portions of the same being broken away to show a detail otherwise undiscernible.
65 Fig. 2 is a perspective of the screening member of the machine. Fig. 3 is a vertical central longitudinal section of the machine, and Fig. 4 is a fire-box constructed and adapted for use in connection with the machine.
70

Like letters of reference indicate like parts throughout the several figure of the drawings.

A represents a tank which may be supported by any suitable means—as, for example, legs A'—and which comprises in its make-up a curved bottom A². The bottom of the tank may be continuously curved on a true circle, as indicated by dotted lines A³, or at one or both ends the said tank may be formed
80 on a circle of greater radius than the curvature of its central portion, as shown by full lines at the left of Fig. 3. The object of this diversion from a true circular curving of the bottom of the tank will be explained herein-
85 after.

The tank A is herein shown as provided with certain appurtenances which render the machine capable of more convenient use, but which appurtenances are not essential to the
90 main or principal objects of the invention, and they may therefore be omitted, as will be hereinafter further explained.

A⁴ A⁴ represent ribs, grooves, pockets, or riffles formed crosswise of the bottom of the
95 tank, and they may be in number increased or decreased in practice and may extend over a greater or less portion of the bottom.

A⁵ A⁵ represent openings which are extended across the ends of the tank and are
100 closed by means of doors A⁶ A⁶, supported from the ends of the tank by hinges A⁷. These doors may be or may not be faced with any suitable packing A⁸ for insuring a water-

tight closure of the openings A⁵. To facilitate the manipulation of the doors A⁶, there are provided at each side of the tank levers A⁸, pivoted to the side of the tank at A⁹ and having pivotally-connected rods A¹⁰, connected with the lever at A¹¹, at points upon each side of the pivot A⁹. The rods A¹⁰ are connected with the doors A⁶ by passing through the same, and said connection is rendered adjustable by means of nuts A¹², one upon each side of the door. A catch or stop A¹³ may be employed to retain the doors in a closed position by swinging the lever A⁸ against the end of the stop. Now it will be seen that by rotating the lever A⁸ upon its pivot in one direction the door at each end of the tank is swung outwardly, so as to permit the escape of water or other material from the opening A⁵, while the opposite movement of the lever to the position shown in Fig. 1 closes the doors over said openings. It is readily seen that by changing the position of the nuts upon the rods the tightness with which the doors may be drawn toward each other may be varied, so as to take up wear and to insure a water-tight closure of said openings.

The screening member of the machine consists of a basket B, having journals B', adapted to be operatively supported in bearings A¹⁴ in the sides of the tank A. The bottom of the screening member B is curved in a substantially true semicircular form, but of a radius somewhat less than that of the tank at its mid-length, so that when suspended within the tank there is a space D between the bottom of the screening member and that of the tank. Handles B^{3x} are secured to the basket in any suitable manner and are the means employed for oscillating the basket upon its journals. The bottom B³ of the basket is perforated over a greater or less portion thereof, and the perforations B⁴ may be either plain or may have depending flanges B⁵, as shown. If flanged, they may be disposed either longitudinally or transversely of the bottom. In this instance the flanges B⁵ at the mid-portion of the bottom of the basket are shown as transverse, while those at the end portions are disposed longitudinally of the bottom. The transverse disposition of the flanges aids materially in the operation of separating the screened matter, as hereinafter described.

C C represent transverse splasher-bars, which are secured on the bottom of the basket in any suitable manner and which are provided with stirring pins or staples C'. At each end of the basket there is a transverse flange B⁶, the purpose of which is to prevent the falling of material from the basket into the tank when the basket is oscillated upon its bearings. Projecting from one end of the basket and at each side thereof are pins or lugs B⁷, the purpose of which is to support the basket upon the end of the tank during the operation of dumping material from the

basket. Below the opening A⁵, at the front end of the machine, there is a trough A¹⁵, which is intended to collect the water passing through the openings A⁵ when the doors A⁶ are open and to conduct the same off at one side of the machine, and thus protect the operator when using the machine.

E, Fig. 4, represents a fire-box, the sides of which are intended to close the space between the legs at the ends and sides of the machine and the top of which is cut away, as at E', to fit the lower surface of the tank A. Troughs E² are formed upon the fire-box to prevent access of water to any fire therein by conducting said water sidewise away from the machine. In using the machine in cold weather it is set over the fire-box, which serves to confine the heat upon the bottom of the tank and to protect the sides and the legs of the machine when constructed of wood from the fire.

The operation of the machine is as follows: Water is supplied by any suitable means and in any suitable manner to keep the tank filled, and while the earth to be washed is being shoveled or otherwise placed into the basket the basket is swung upon its pivots, it being readily seen that while the earth is washed it and the basket are submerged in the water in the tank. As the basket is swung the earth or the coarser gravel and stones in the earth roll downwardly upon the finer portions within the basket at each extreme throw of the basket, so that by continuously oscillating the basket (which having the weight of its load below its center of support enables the operator to work upon large masses of earth, thereby requiring the exertion of much less power than in machines where the point of support is below the load) there is not only a continuous sliding motion upon the screening-surface, but a rolling or inverted motion of the earth within the basket, and the whole being constantly submerged the result is a very rapid reduction of the earth within the basket and also a rapid passage of the finer particles through the screening-perforations B⁴ of the basket down into the space D between it and the bottom of the tank. As such finer particles collect in the bottom of the tank they are first stirred up and agitated by the pins or staples C', and when thus agitated are thrown by the splasher-bars C forward and backward and out of the machine over the delivery end of the tank and when present and not closed out through the opening A⁵. As illustrated, the tank is shown with a delivery end lower than the opposite end. If desired, both ends of the tank may be depressed from a horizontal line instead of one, as shown; but for the better protection of the operator against overflowing water and dirt the front end of the machine is not herein shown so depressed. It is found by experience that the splasher-bars C during their movement from the front to the rear of the machine effectually perform the function of discharging the water

carrying the lighter particles of the screened material, so that the depression of the front end of the machine while advancing that operation is not an essential, and hence the elevation of one end of the machine for the protection of the operator. The operation above described—swinging the basket, supplying the water in proportion as it is thrown out with the finer particles of the screened material, and the feeding of material to be washed—having been continued for a suitable time, the doors A⁶ are opened for the purpose of finally cleaning up. Before describing this portion of the operation it is proper to state that in accordance with the richness of the dirt in gold and with the size of the machine employed the operation of oscillating the basket and feeding the dirt thereto may be continued from one hour, more or less, to one-half a day or to a whole day before opening the doors A⁶ and conducting the final operation of cleaning up. From the above it will be seen that by my invention it is possible to wash a large mass of pay-dirt without the necessity of a final cleaning up. During this prolonged process of washing, however, the accumulated coarser gravel or rocks are dumped from the machine by lifting the basket B by means of the handle B⁸ until the journals ride upon the edges of the sides of the tank, when the basket is drawn toward the front end and the lugs B⁷ rested thereupon, thus forming a center upon which the basket may be tilted until all of the contents thereof may be dumped upon the ground. The basket is then returned to its bearings and the washing process continued.

After the washing process has been continued for a desired period it will be found that there is within the bottom of the tank a depth of screened or washed matter practically equal to the length of the stirring pins or staples C'. This screened and washed matter extends across the bottom of the tank and contains all of the gold which was originally in the pay-dirt before washing, except that which may be caught and held by the riffles or pockets A⁴, which are intended to assist in the prevention of throwing out of the tank the gold with the water or dirt which is expelled by the splasher-bars. It will be seen that a transverse disposition of the flanges B⁵ assists the splasher-bars in expelling the agitated and mixed lighter portions of the screened material during the swinging of the basket. This comparatively small mass of screened or washed material with the gold therein is cleaned up in the following manner: The doors A⁶ are opened and the basket is swung upon its bearings backward and forward, and by means of the splasher-bars C and the pins or staples the matter in the tank is agitated and the lighter portions are thrown forward and backward to be expelled through the openings A⁵. In this operation the oscillations of the basket are less pronounced than when the doors are closed over said open-

ings, and any gold particles that are thrown toward said openings drop by their greater specific gravity into the pockets A⁴ and are saved. After a continuance of this operation for a reasonable time a plug A¹⁶ is withdrawn from the side of the tank, and the water passing through the same into a suitable receptacle carries with it the gold and the black sand, which are further separated by the use of an ordinary pan or in any other suitable manner.

As before stated, the important features of my invention may be secured without the employment of all or of the particular details of the construction herein shown, and the invention is therefore not limited to the same, and it is apparent that the proportions of the parts in some respects may be changed without a departure from the spirit of this invention. For example, the lateral dimensions of the tank and of the basket may be increased to any proper extent, thus increasing the capacity of the machine, and the same may be operated by artificial rather than manual power, if desired. It is also apparent that in order to secure a lower point of discharge which the openings A⁵ provide in cleaning up said openings may be omitted and the front end of the machine elevated to produce the same result, so that the invention is not dependent upon an apparatus provided with such openings and doors as shown. So, also, the splasher-bars may be omitted, because the action of the screening-basket upon the water and screened matter below it serves to discharge the same over the end of the tank, and this action occurs whether the bottom of the basket be curved or not, and hence the invention is not limited in these respects.

Having described my invention and set forth its merits, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the class described, a pivotally-suspended basket having a curved screening-bottom in combination with a stationary tank having an imperforate bottom of similar curvature; substantially as specified.

2. A machine of the class described comprising a pivotally-suspended screening-basket having a curved bottom and a tank having a bottom similarly curved at its lower portion and outwardly deflected at the discharge end thereof.

3. A machine of the class described comprising in its make-up a pivotally-suspended screening-basket having an open top and curved bottom with exterior transverse splasher-bars thereon.

4. In a machine of the class described, a pivotally-suspended screening-basket having a perforated bottom curved on a circle derived from the center of support of the basket whereby the load carried by the basket is supported below its center of motion in combination with a tank having a similarly-curved imperforate bottom.

5. In a machine of the class described, a basket pivotally supported for swinging and

having a curved bottom, in combination with a stationary tank having a bottom curved substantially parallel with the plane through which the bottom of the swinging basket moves; substantially as specified.

6. In a machine of the class described, a perforated pivotally-suspended basket provided with splasher-bars having sediment-agitating devices projecting therefrom.

7. The combination of a pivotally-suspended basket having a curved perforated bottom provided with splasher-bars and agitating devices projecting therefrom, and a tank having a similarly-curved bottom provided with riffles.

8. The combination with a swinging basket having a curved bottom provided with flanged perforations, of agitating devices secured to said bottom and projecting below said flanges; substantially as specified.

9. The combination of a pivotally-suspended basket having a curved perforated bottom, with a tank having a similarly-curved bottom provided with an opening at one end of said basket, and means for closing said opening; substantially as specified.

10. The combination with a swinging basket having a curved perforated bottom provided with agitators projecting therefrom, of a stationary tank having a curved bottom with openings therein at opposite sides, doors for closing said openings, and means for opening and closing the doors.

11. In a machine of the class described, a

pivotally-suspended basket having a curved perforated bottom, a stationary tank having a curved bottom, and a fire-box adapted to fit the bottom of the tank; substantially as specified.

12. The combination with a screening-basket, of a tank, and a fire-box adapted to fit the tank and provided with troughs.

13. The combination with a tank having openings, of doors for said openings, a pivoted lever, rods extending from the doors, directly to and connected at opposite sides of the pivot of said lever for operating said doors; substantially as specified.

14. The combination with a tank, of a pivotally-suspended basket mounted therein and provided with diametrically-projecting lugs projecting from the ends of the basket; substantially as specified.

15. The combination of a perforated pivotally-suspended screening-basket and a stationary imperforate tank, the same being arranged with a space between them whereby screened matter may be agitated and thrown from the tank by the movements of the basket; substantially as and for the purposes set forth.

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

EDWIN J. BEVERSTOCK.

Witnesses:

ALFRED T. GAGE,
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