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J. R. BROWN.

AUTOMATIC GOLD COLLECTING APPARATUS.

No. 568,657. Patented Sept. 29, 1896.

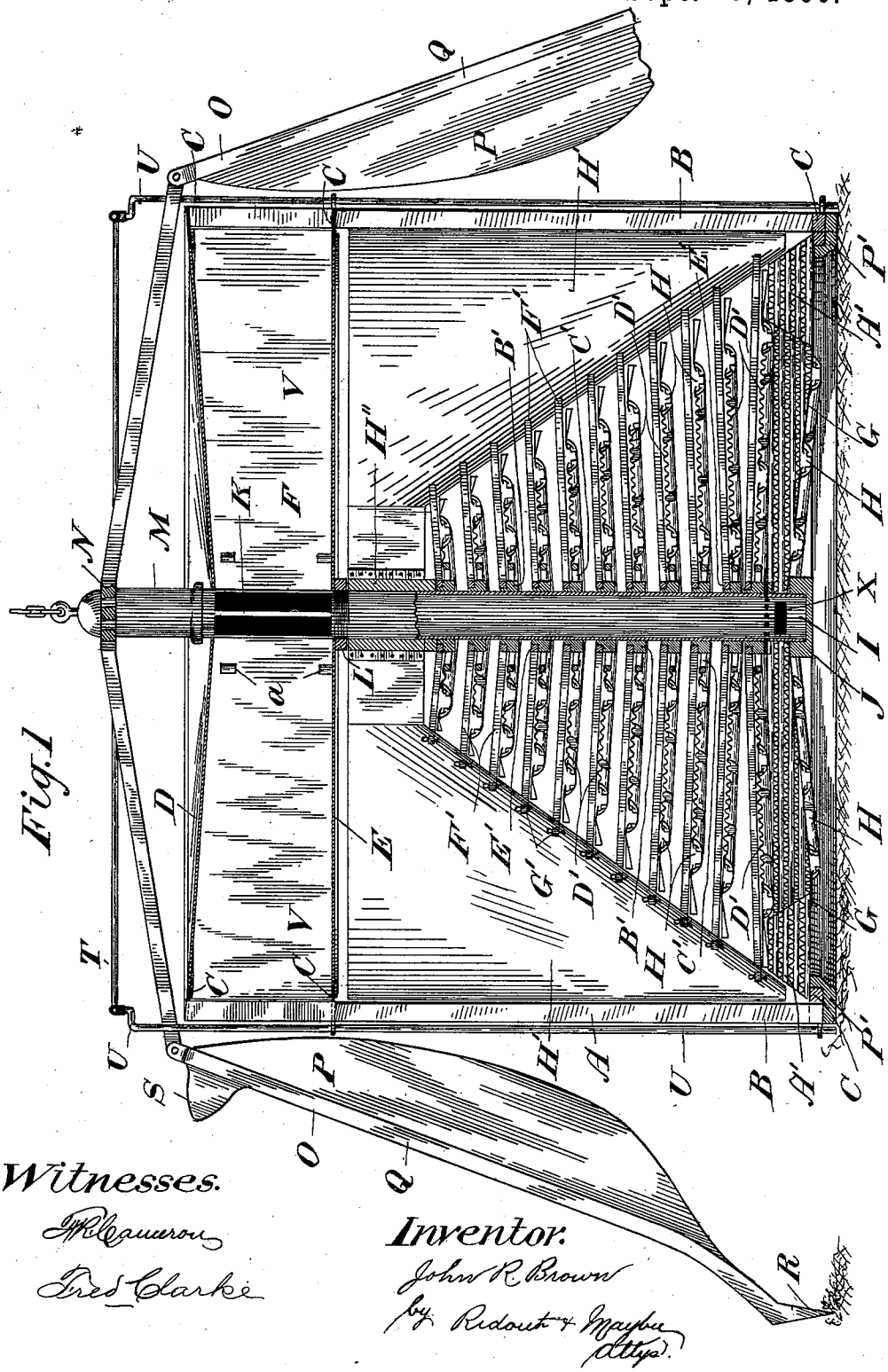

Fig. 1

Witnesses.

F. R. Cameron

Fred Clarke

Inventor.

John R. Brown

by Ridout & Maybee

Attys.

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J. R. BROWN.

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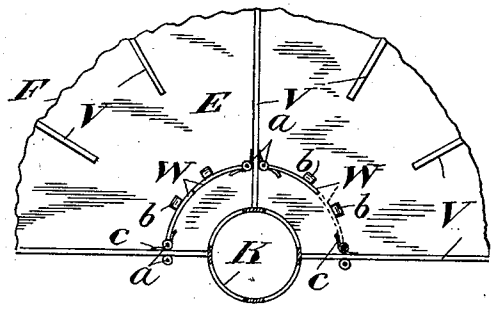

Fig. 3

Fig. 2

Witnesses.

F. R. Cameron

Fred Clarke

Inventor.

John R. Brown

by Ridout & Maybee

Attys.

(No Model.) 4 Sheets—Sheet 3.

J. R. BROWN.

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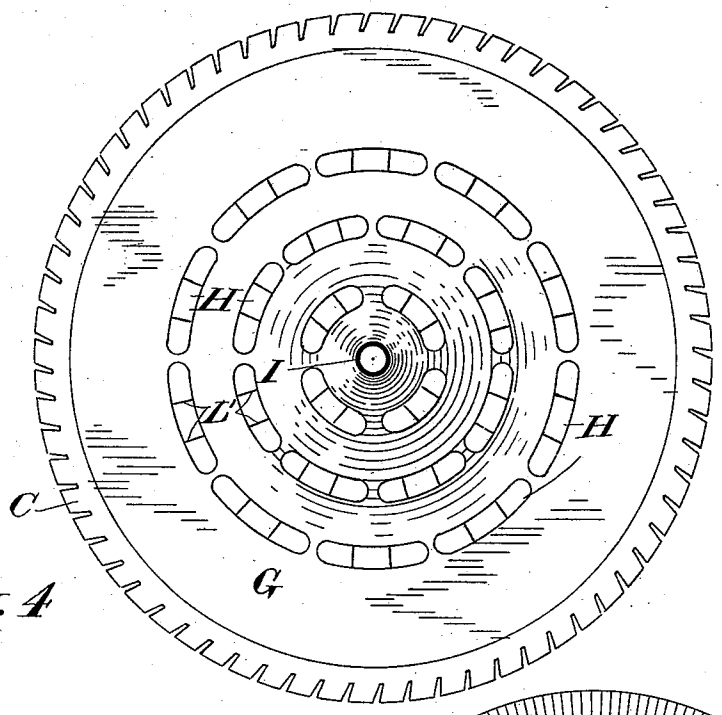

Fig. 4

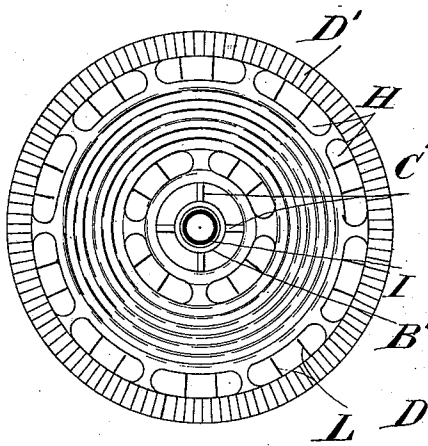

Fig. 6

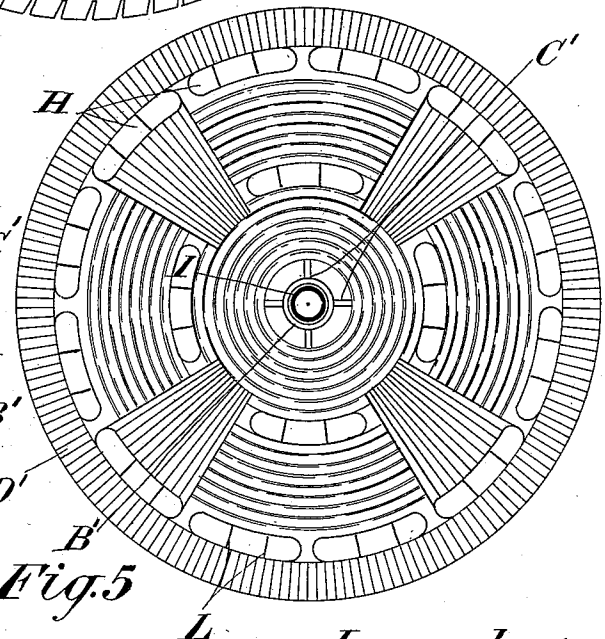

Fig. 5

Witnesses.

H. R. Cameron

Fred Clarke

Inventor.

John R. Brown

by Ridout & Maybee

Attys.

(No Model.) 4 Sheets—Sheet 4.

J. R. BROWN.

AUTOMATIC GOLD COLLECTING APPARATUS.

No. 568,657. Patented Sept. 29, 1896.

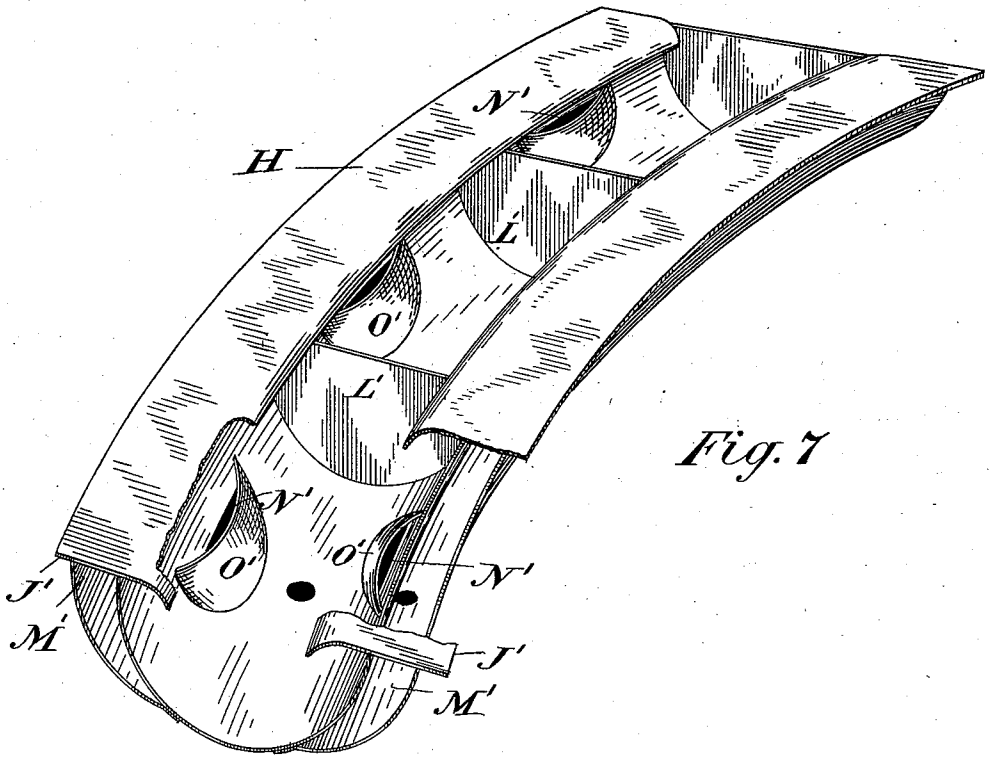

Fig. 7

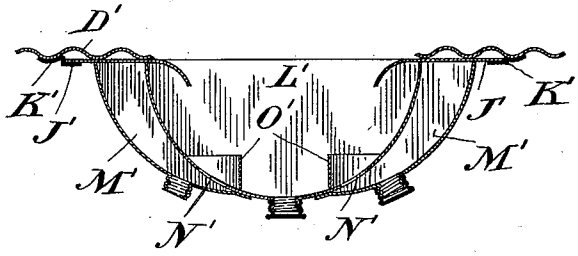

Fig. 8

Witnesses.

H. R. Cameron

Fred Clarke

Inventor.

John R. Brown.

by Ridout & Maybee

Attys.

UNITED STATES PATENT OFFICE.

JOHN R. BROWN, OF HARRISON HOT SPRINGS, CANADA.

AUTOMATIC GOLD-COLLECTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 568,657, dated September 29, 1896.

Application filed November 11, 1895. Serial No. 568,624. (No model.)

To all whom it may concern:

Be it known that I, JOHN REITTER BROWN, mine-operator, of Harrison Hot Springs, in the Province of British Columbia, Canada, have invented a certain new and Improved Automatic Gold-Collecting Apparatus, of which the following is a specification.

The object of my invention is to devise an automatic apparatus for collecting gold from the moving sand and gravel in auriferous streams and for securing any fine float and flour gold which may be held in suspension in such waters; and it consists, essentially, of an apparatus to be sunk in the river, comprising amalgamated plates and mercury-pockets for collecting the gold, means for directing the water, sand, and gravel into the machine, and means for keeping the plates clear and expelling from the apparatus the sand and gravel from which the gold has been extracted, the whole being constructed in detail, substantially as hereinafter more particularly described and then definitely claimed.

Figure 1 is a cross-section of the apparatus. Fig. 2 is a perspective view of the same with parts broken away. Fig. 3 is a detail of the gates of the funnel-cylinder. Fig. 4 is a plan view of the top of the convex bottom of the apparatus. Figs. 5 and 6 are plan views of the amalgamated plates. Figs. 7 and 8 are details of the mercury-pockets.

In the drawings like letters of reference indicate corresponding parts in the different figures.

In Figs. 1 and 2, A is a cylindrical cage built up of flat iron bars B, set in rings C, located either, as shown in the drawings, at the bottom of the cylinder and on a level with the upper and lower ends D and E of the funnel-cylinder F or at any other suitable point. The rings C rest, as shown, on the ring P′ and the ends of the funnel-cylinder, respectively, though any other detachable form of construction would suit the purposes of my invention. At the circumference of the funnel-cylinder these bars B are set to direct the water entering the cylinder toward the center; but in the lower part of the cage they are twisted, so as to direct the current obliquely inward, while guarding against the entry of coarse gravel into the interior of the cage.

G is the convex bottom of the cage, resting on the ring P′ and provided with mercury-pockets H, as hereinafter described.

I is a vertical tube, having a nut J screwed on its lower end, on which the convex bottom G rests. This tube extends up to the lower end E of the funnel-cylinder, where it is connected with a skeleton tube K by means of a threaded sleeve L. M is an extension connected to the upper end of the skeleton tube K. On the upper end of this extension is fitted a spider N, the arms of which extend to the outer circumference of the cylindrical cage. On the ends of these arms are pivoted the wings O. These wings comprise the sheet-metal portion P, connected to the bar Q, having pointed ends R to engage with the soil at the bottom of the stream. On the back of each bar Q, close to the pivot, is a lug S, adapted, when the wings are in the position shown in Fig. 2, to rest on a ring T. To this ring T are connected suitably-supported vertical rods U, which extend below the bottom of the cylindrical cage A. When the cage is lowered in position in the stream, these rods are pressed upward, thus raising the ring and throwing downward the wings O, so that their points enter the bed of the stream and steady the cage. These wings serve also to direct the flow of the stream through the cylindrical cage.

The funnel-cylinder F is divided by radial partitions V, so that water entering the cylinder is directed to the center and its flow concentrated and intensified. At the center of the funnel-cylinder are located the gates W, hinged at *a* and opening inward. Their outward motion is limited by the stops *b*, against which they are held by means of light springs *c* on the hinges.

From this construction it follows that the water entering the funnel-cylinder at one side is directed to the center, opens the gates on that side, and passes down the skeleton tube K and vertical tube I, the gates opposite the points of entrance being held closed by the internal pressure of the water. There is in consequence a strong current directed down the tube I, which passes out through the openings X at the lower end thereof. This current, flowing over the bottom G, keeps it clear of all accumulations of sand and gravel.

Around the outer edge of this bottom are located, one above the other, a series of corrugated copper rings A′, gradually lessening in width toward the tube. As the rings are made alternately with the corrugations lengthwise and crosswise, the water and sand will freely percolate through them.

To the tube I a series of collars B′ are connected, which have arms C′ extending therefrom, on which are supported a series of corrugated amalgamated plates D′. The lower plate D′ is slightly convex and has its outer edge resting on top of the rings A′. The other plates are all slightly concave. Each plate is provided with a series of mercury-pockets H, hereinafter described. These plates may be corrugated in different ways, but in Figs. 5 and 6 I show preferable arrangements, Fig. 5 being the lowest plate, and Fig. 6 one of the upper plates.

E′ are a series of rings resting on shoulders on the collars B′. From these rings ribbons F′ extend, having loops G′ formed on their outer ends.

Surrounding the upper part of the tube I is a sleeve H″, having flanges around its circumference, to which are attached a series of concave steel wings H′. The outer edge of each wing extends to the inside of the cylindrical cage, while the inner edge is shaped to fit the outer edge of the cone formed by the plates D′. It will be seen that these wings are not set in a plane radiating from the center of the cylinder, but that the lower edge of each is set forward to give the wings a slanting position. I′ are a series of perforations formed in these wings, through which are passed the loops G′ on the ribbons F′, where they are secured by suitable pins. From this construction it follows that the water entering the cage will rotate the wings, thus sweeping the ribbons F′ over the surfaces of the plates D′ and working any sand or light gravel which may be resting upon them gradually toward the center, from which it drops through between the arms C′ to the bottom of the cylinder and is thence swept outward by the central current from the tube I. The shape and position of the wings H′ also serve to create an eddy in the water and distribute it between the various plates.

The mercury-pockets, hereinbefore referred to, are constructed substantially as shown in Figs. 7 and 8.

J′ are flanges formed around the edges of the pockets which engage with clips K′, riveted or otherwise connected to the lower sides of the various plates. The pockets are preferably provided with partitions L to prevent spilling of the mercury when the apparatus is tipped. To further provide against this contingency, each pocket H is provided with overflow-pockets M′, communicating by openings N′ with the main pocket. These openings are preferably protected by shields O′ to prevent foreign matter entering the overflow-pockets.

It should be mentioned that the convex bottom G, the rings A′, and the plates D′ are made of copper, while the rest of the apparatus is preferably constructed of iron or steel.

When the machine is lowered in position in the stream, the wings O, as already described, act as braces to support the cage, through which the water, sand, and lighter gravel pass, as already described, the latter emerging from the machine completely deprived of the gold. A buoy will of course be attached to the apparatus to indicate its position in the river.

When it is considered necessary to remove the amalgamated gold from the machine, it is raised from its position and the wings O and their connections removed. The cage is lifted from its position and the rest of the machine may then be readily taken apart and the plates scraped and reamalgamated. The machine may then be put together and again lowered in position in the river.

Instead of corrugated amalgamated plates, blankets or other woolly surfaces might be substituted.

Many other changes in the construction might also be made without departing from the spirit of my invention.

What I claim as my invention is—

1. In an apparatus of the class described, a series of amalgamated plates connected to a central shaft by means of which they may be suspended in the bed of a stream, in combination with a series of wings adapted to revolve on the shaft, and provided with ribbons to move over the plates and prevent accumulations of sand and light gravel, substantially as and for the purpose specified.

2. In an apparatus of the class described, a series of amalgamated plates connected to a central shaft by means of which they may be suspended in the bed of a stream, in combination with a series of wings adapted to revolve on the shaft, and provided with ribbons to move over the plates and prevent accumulations of sand and light gravel, and a surrounding cage of flat iron bars turned to direct the current obliquely against the wings, substantially as and for the purpose specified.

3. In an apparatus of the class described, a series of amalgamated plates connected to a central shaft by means of which they may be suspended in the bed of a stream, in combination with a series of wings adapted to revolve on the shaft, and provided with ribbons to move over the plates and prevent accumulations of sand and light gravel, and a surrounding cage of flat iron bars turned to direct the current obliquely against the wings and to keep out the coarse gravel, and supporting-braces provided with wings set in planes radiating from the center of the apparatus, substantially as and for the purpose specified.

4. In an apparatus of the class described, a series of amalgamated plates connected to a central shaft by means of which they may be

suspended in the bed of a stream, and a surrounding cage of flat iron bars turned to direct the current obliquely against the plates, substantially as and for the purpose specified.

5. In an apparatus of the class described, a series of amalgamated plates connected to a central shaft by means of which they may be suspended in the bed of a stream, and a surrounding cage of flat iron bars turned to direct the current obliquely against the plates, and supporting-braces provided with wings set in planes radiating from the center of the apparatus, substantially as and for the purpose specified.

6. In an apparatus of the class described, a series of slightly concave amalgamated plates connected to central hollow shaft, openings being provided in the plates around the said shaft, in combination with a chamber having radial partitions therein adapted to direct the flow of water in the stream into openings in the central hollow shaft on the upstream side of the same; and a bottom plate fitted closely to the hollow shaft below openings formed in the same, substantially as and for the purpose specified.

7. In an apparatus of the class described, a series of slightly concave amalgamated plates connected to central hollow shaft, openings being provided in the plates around the said shaft, in combination with a chamber having radial partitions therein, adapted to direct the flow of water in the stream into openings in the central hollow shaft on the upstream side of the same; and a slightly convex bottom plate fitted closely to the hollow shaft below openings formed in the same, substantially as and for the purpose specified.

8. In an apparatus of the class described, a series of slightly concave amalgamated plates connected to central hollow shaft, openings being provided in the plates around the said shaft, in combination with a chamber having radial partitions therein adapted to direct the flow of water in the stream into openings in the central hollow shaft on the upstream side of the same; and a bottom plate fitted closely to the hollow shaft below openings formed in the same, and a series of amalgamated rings arranged between the bottom plate and the next above, the rings being corrugated alternately longitudinally and transversely, substantially as and for the purpose specified.

9. In an apparatus of the class described, a series of slightly concave amalgamated plates connected to central hollow shaft, openings being provided in the plates around the said shaft, in combination with a chamber having radial partitions therein adapted to direct the flow of water in the stream into openings in the central hollow shaft on the upstream side of the same; a bottom plate fitted closely to the hollow shaft below openings formed in the same; a series of wings adapted to revolve on the central shaft; and ribbons carried by the said wings just above the surface of each of the upper plates, substantially as and for the purpose specified.

10. In an apparatus of the class described, a series of slightly concave amalgamated plates connected to central hollow shaft, openings being provided in the plates around the said shaft, in combination with a chamber having radial partitions therein adapted to direct the flow of water in the stream into openings in the central hollow shaft on the upstream side of the same; a bottom plate fitted closely to the hollow shaft below openings formed in the same; a series of wings adapted to revolve on the central shaft; ribbons carried by the said wings just above the surface of each of the upper plates; and a surrounding cage of flat iron bars turned to direct the current of the river obliquely against the wings, substantially as and for the purpose specified.

11. In an apparatus of the class described, a series of slightly concave amalgamated plates connected to central hollow shaft, openings being provided in the plates around the said shaft, in combination with a chamber having radial partitions therein adapted to direct the flow of water in the stream into openings in the central hollow shaft on the upstream side of the same; a bottom plate fitted closely to the hollow shaft below openings formed in the same; a series of wings adapted to revolve on the central shaft; ribbons carried by the said wings just above the surface of each of the upper plates; a surrounding cage of flat iron bars turned to direct the current of the river obliquely against the wings; and braces adapted to support the apparatus and provided with wings set in planes radiating from the center of the apparatus, substantially as and for the purpose specified.

12. In an apparatus of the class specified, a supporting frame or body, bars Q pivotally connected therewith, lugs projecting from said bars, a ring constructed and arranged to act on said lugs, and vertical operating-rods arranged to act on said ring, whereby when the vertical rods are operated the rings on the lugs actuate the bars Q, substantially as described.

13. In an apparatus of the class specified, a supporting frame or body, bars Q pivotally connected therewith, lugs projecting from said bars, a ring constructed and arranged to act on said lugs, and vertical operating-rods arranged to act on said ring, the said bars Q having sheet-metal portion P arranged to direct the flow of the stream into the apparatus, substantially as described.

14. In an apparatus of the class described, the vertical tube I, having openings X therein; and the bottom G, in combination with the funnel-cylinder F, communicating with the tube I; the radial partitions V; the hinged gates W; springs *c*, and stops *b*, substantially as and for the purpose specified.

15. In an apparatus of the class described,

the vertical tube I, and a series of amalgamated plates D′ connected thereto and decreasing in diameter toward the top so as to form a cone, in combination with the series of curved wings H′ connected to a sleeve loose on the tube I and suitably supported, the inner edges of the wings conforming to the shape of the cone of plates while the outer edges conform substantially to the shape of a cylinder, substantially as and for the purpose specified.

16. In an apparatus of the class described, the vertical tube I and a series of amalgamated plates D′ connected thereto and decreasing in diameter toward the top so as to form a cone, in combination with the series of curved wings H′ set at an angle to the vertical and connected to a sleeve loose on the tube I and suitably supported, the inner edges of the wings conforming to the shape of the cone of plates, while the outer edges conform substantially to the shape of a cylinder, substantially as and for the purpose specified.

17. In an apparatus of the class described, the combination of the amalgamated plates D′; collars B′; arms C′; the vertical tube I; the curved wings H′; the rings E′, and the ribbons F′ connected at their outer ends to the wings H′, substantially as and for the purpose specified.

18. In an apparatus of the class specified, an amalgamating-plate D′ having an opening therein, a mercury-pocket H supported below said opening and being divided by partitions, and overflow-pockets communicating with said pocket H through openings N′, substantially as described.

19. In an apparatus of the class specified, an amalgamating-plate D′ having an opening therein, a mercury-pocket H supported below said opening and being divided by partitions, overflow-pockets communicating with said pocket H through openings N′, and shields O′ covering and protecting said openings N′, substantially as described.

20. In an apparatus of the class described, a series of corrugated amalgamated plates provided with mercury-pockets, the said plates being connected to a central shaft and a frame or body arranged to support said plates and shaft by means of which they may be suspended in the bed of a stream, substantially as and for the purpose specified.

21. In an apparatus of the class described, the combination of the convex bottom G; the vertical tube having openings X therein; the nut J; the rings A′; the amalgamated corrugated plates D′; the collars B′; the arms C′; the sleeve H; the wings H′; the rings E′; ribbons F′; loops G′ connected to the wings H′; the skeleton tube K; the threaded sleeve L; the funnel-cylinder F; the radial partitions V; hinged gates W; springs *c*, and stops *b*, substantially as and for the purpose specified.

22. In an apparatus of the class described, the combination of the convex bottom G; the vertical tube having openings X therein; the nut J; the rings A′; the amalgamated corrugated plates D′; the collars B′; the arms C′; the sleeve H; the wings H′; the rings E′; ribbons F′; loops G′ connected to the wings H′; the skeleton tube K; the threaded sleeve L; the funnel-cylinder F; the radial partitions V; hinged gates W; springs *c;* stops *b*, and a cylindrical cage A comprising the rings C and the bars B radially arranged opposite the funnel-cylinder F and obliquely twisted opposite the plates D′, substantially as and for the purpose specified.

Harrison Hot Springs, October 30, 1895.

JOHN R. BROWN.

In presence of—
SIDNY ELLARD,
THOS. N. SCRIPTURE.