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P. SOMERVILLE.
QUICKSILVER TRAP.

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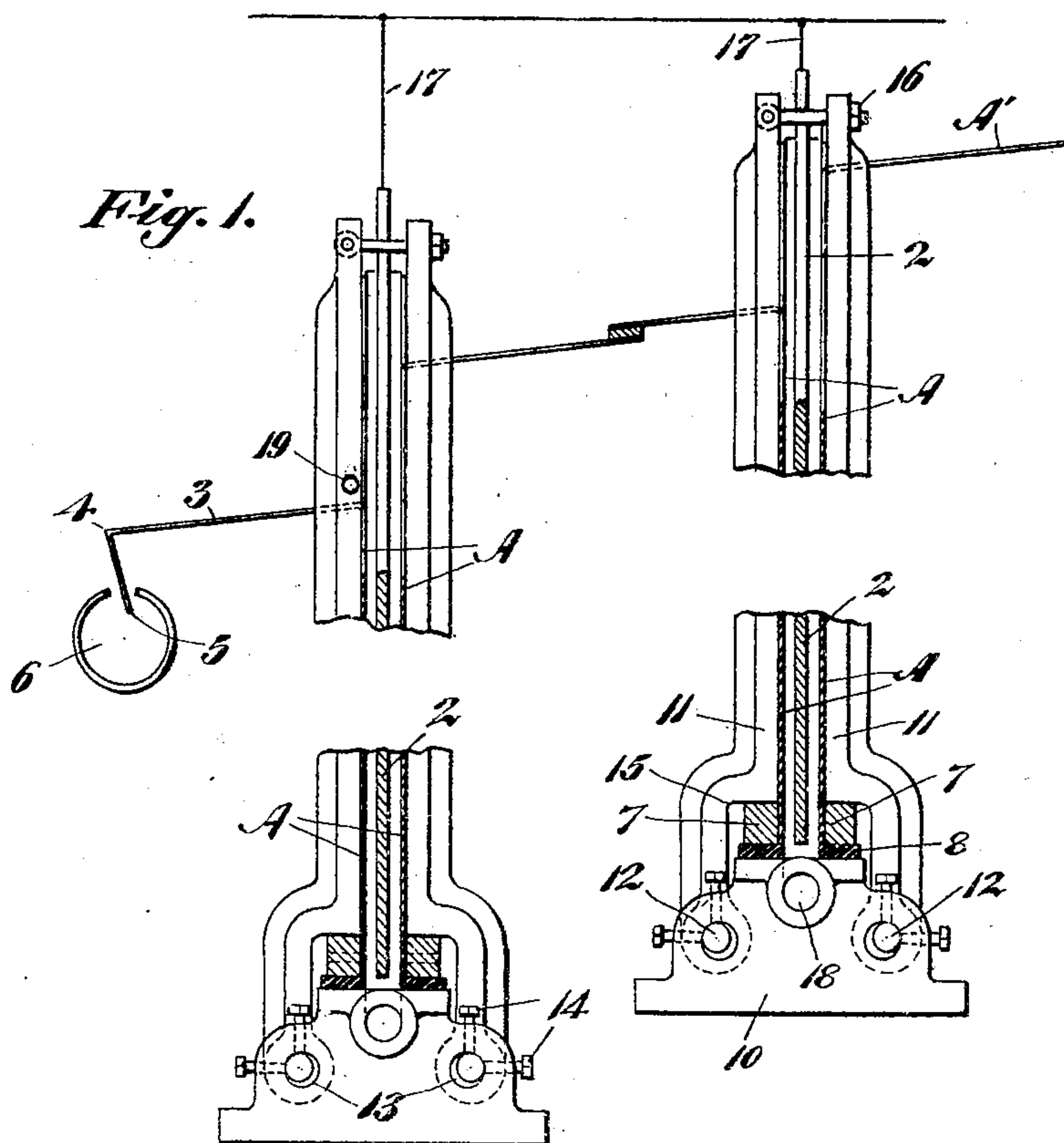


Fig. 2.

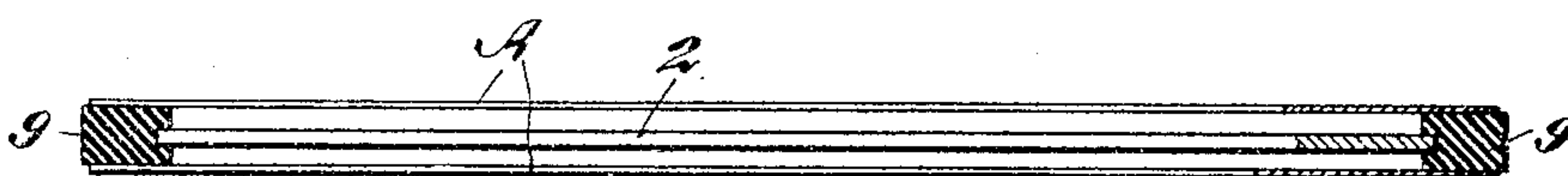
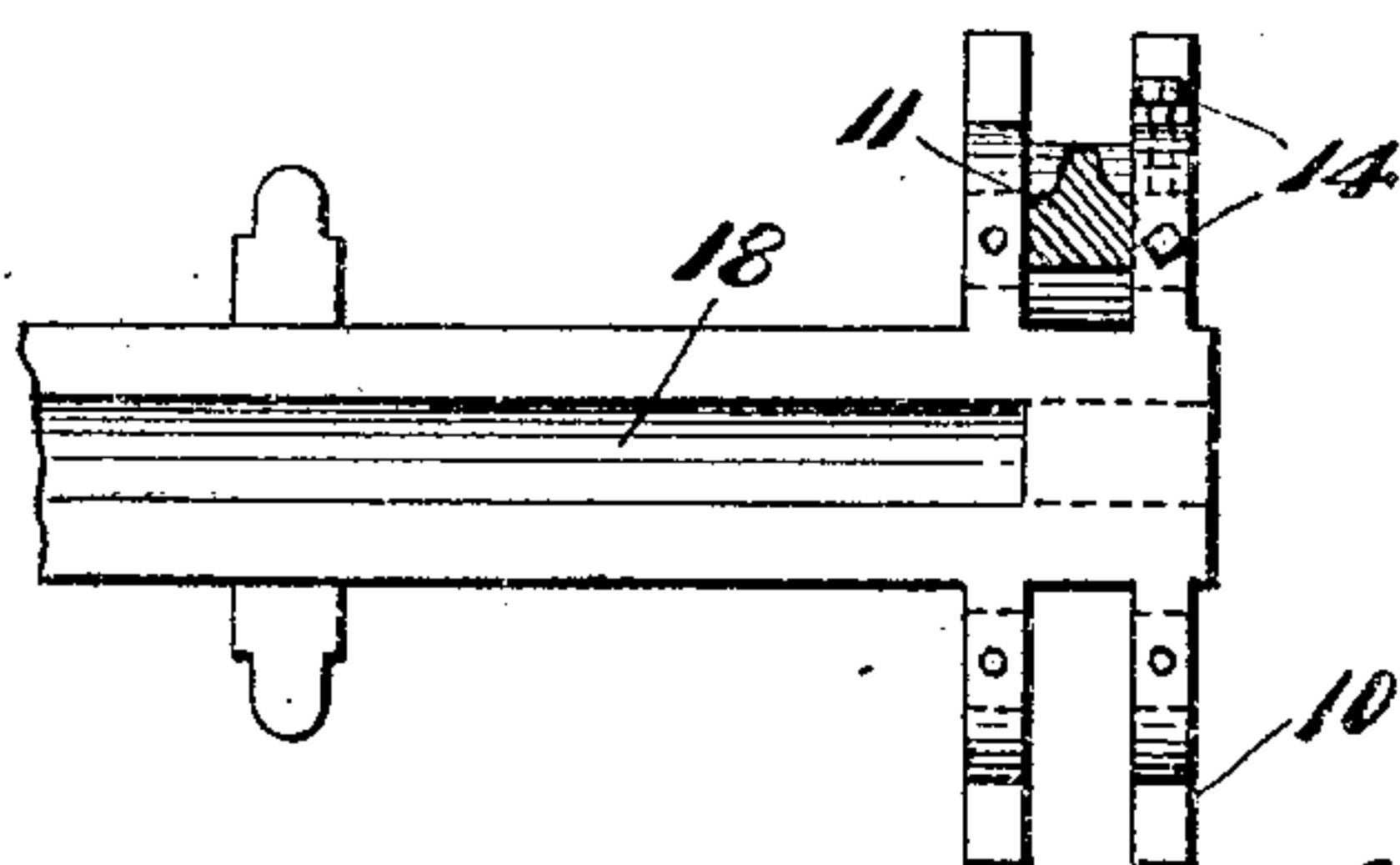


Fig. 3.



Witnesses,
Chas. E. Chapin.
J. A. Moore

Inventor,
Philip Somerville
By Geo. H. Strong

UNITED STATES PATENT OFFICE.

PHILIP SOMERVILLE, OF BISHOP, CALIFORNIA.

QUICKSILVER-TRAP.

No. 803,934.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PHILIP SOMERVILLE, a citizen of the United States, residing at Bishop, in the county of Inyo and State of California, have invented new and useful Improvements in Quicksilver-Traps, of which the following is a specification.

My invention relates to a trap which is designed to separate quicksilver from slimes, tailings, and other material with which it may be associated and to allow worthless material to pass off while the quicksilver is diverted and saved.

It comprises a combination of devices and details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of my trap. Fig. 2 is a plan view, partly in section, of plate. Fig. 3 is a plan view of lower casting, partly broken away.

A A are amalgamated copper or silver plates standing approximately vertical and having between them an iron plate, as at 2, there being a space between the copper plates and the iron plate upon each side and also at the bottom, so that material being introduced into the open channel at the top between one copper plate, and the iron plate will pass down through the said channel, thence beneath the bottom and the iron plate and the other copper plate to a point where it passes over an inclined amalgamated copper or silver plate, as at 3. This plate at the lower end is bent at a more or less acute angle, as shown at 4, and the surface below the bend extends downwardly a short distance. The lower edge 5 of this portion of the device enters an open slot in a tube 6, this tube extending transversely and being open at one end.

The quicksilver with which the table 3 is supplied is constantly moving down the incline of the table along with the material with which it is associated, and any gold or silver which may be free to amalgamate will unite with the mercury. At the lower edge of the table the current is sufficient to carry the waste material which is sufficiently fluid over the edge 4 of the plate and to project it beyond the tube 6, where it may be caught in any suitable receiver.

The mercury on account of its adherence to the plate will simply pass over the angular edge 4 and, still adhering to the plate, will pass down to the lower edge 5, whence it will drop into the interior of the tube 6 as fast as

it accumulates sufficiently to become detached by gravity, and the tube 6 being properly inclined transversely the mercury will flow out and may be collected at the end. Thus little or no mercury will be carried off with the waste material, and a great saving will be accomplished.

The copper plates A are secured at the lower ends of ribs or bars 7, which extend transversely along the lower edges of these plates, and these bars rest upon elastic-rubber or equivalent gaskets 8, which thus form a tight joint at the bottom and prevent the escape of material at this point. The edges of these plates have fitted between them insulating-blocks 9, which may be of rubber or equivalent material, preferably sufficiently elastic to form a tight joint between the vertical ends of the plates A.

Vertical channels are made along the inner edges of the insulating-blocks 9, and within these channels the vertical edges of the iron plate 2 are fitted. Thus with the gasket 8 at the bottom and the vertical insulations 9 fitting closely between the vertical edges of the plates a tight joint is formed against leakage, and the plate 2 is insulated from the plates A.

10 represents bases of any suitable or desired description located at each end and forming supports in which the lower ends of the vertical bars or plates 11 are turnable. These bars or plates are diverted or arched outwardly at the lower end and have pivots 12, which enter holes 13 in the ends 10. The holes 13 are of larger diameter than the shafts or pivot-pins 12, and by means of adjusting-screws 14 at right angles with the shafts and openings the shafts may be moved within the openings and adjusted for the following purpose: The upper part of the arched portion of the plates 11 being bent inwardly form shoulders, as at 15, which are so located that when the plates 11 are brought to a nearly vertical position, being turned about the pivots 12, these shoulders will engage and press upon the bar 7 and force these bars, and with them the lower edges of the copper plates A, downwardly, thus compressing the gasket 8 and insuring a tight joint at this point. The upper ends of the plates 11 are connected together by a screw or pivoted latch.

As shown in the drawings, the latch is pivoted to one of the plates 11 and may drop into a notch in the other plate and then by means of a nut 16 the two can be drawn together, so

that the plates A will be pressed against the insulation-bars 9 sufficiently to make tight the vertical joints between these parts.

When it is desired to open the apparatus to
5 clean the plates or otherwise inspect the interior, it is only necessary to disengage the latch at 16, when the plates 11 may be turned outwardly about their hinge-pins 12, and this will withdraw the copper plates from the end
10 pieces 9 and will also raise the shoulders 15 from the bars 7, thus releasing the plates from the gaskets 8, and the whole device is open for inspection and cleaning.

Electrical connections 17 are made with
15 some source of electric energy, so that a current entering the iron plate 4 will pass thence through the pulp which lies between the plate 4 and the copper plates 3, which are located on each side of the iron plate, and as the copper plates are amalgamated the gold or silver
20 precipitated thereon by the action of the electric current will be amalgamated and retained.

The material flowing down between the plates passes, as before described, beneath
25 the iron plate, thence upwardly, and may be discharged over an amalgamated plate 3 either directly to the first portion of the trap here described, or it may be delivered into an intermediate apparatus similar to that just described, and through as many of these as may
30 be desired before finally being discharged over the lip 4.

This device is especially useful in the treatment of ores and tailings by the cyanid-of-potassium or other processes and for the extraction or deposition or precipitating of metals from their solutions onto flowing mercury by the well-known action of electrolysis.

The electrical currents pass through the
40 plates, as here described. A proportion of hydrogen in the form of small bubbles will accumulate upon the iron plate, and this hydrogen being constantly brought into contact with the moving or oxidized particles will
45 unite with the oxygen, and thus free the surface of the metal from its coating, so that it may be precipitated and amalgamated by the quicksilver. The quicksilver, which has a
50 tendency to constantly move downward within this vertical portion of the apparatus, may be drawn off from time to time through a discharge opening or passage, as at 18, and the further cleaning up of the plates may be effected by opening the device, as previously described.
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The point of discharge from the space between the second copper plate and the iron plate is sufficiently below the top or point from which the material is delivered at the
60 opposite side to insure such pressure as will cause the material to constantly flow through the vertical channels or spaces described, and the discharge takes place over the amalgamated plate 3. In order to keep this plate
65 supplied with a sufficient quantity of mercury

to arrest and recover any metal which can be amalgamated and which is associated with the tailings, I have shown a supplemental mercury-supply pipe, as at 19, through which the proper amount of mercury may be discharged
70 upon the table 3 from time to time. By this construction I provide a large amalgamated surface over and in contact with which the material is carried and passed for a considerable length of time, and I am enabled to dispense with the large bodies of mercury which
75 must be employed in horizontally-disposed apparatus and to reduce the loss of mercury to a minimum.

The plate A is bent at an angle where it is
80 continued to form the sluice bottom or plate A', or it may be connected with another plate, the object being to provide an angle at this point over which the quicksilver will flow from the part A' to the part A and continue
85 to adhere to the plate.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a supply means including a pair of vertically-disposed spaced amalgamating-plates and a plate intermediate of the first-named plates and forming a tortuous passage for the pulp, of a mercury-trap comprising an inclined table leading from the
90 outlet of the passage and bent to form an acute angle at its lower edge, with the depending portion bent backwardly beneath the table and a receiver into which said edge dips.

2. The combination with vertically-disposed parallel plates arranged to form a tortuous passage for the pulp, and means whereby the pulp may be supplied to the inlet of the passage, of a mercury-trap comprising an inclined amalgamated table connecting with
100 the outlet of said passage and having the lower edge bent at an angle, a backwardly-turned downwardly-extending lip, a channeled tube extending transversely and within which said lip extends.
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3. A quicksilver-trap, an inclined amalgamated table having the lower edge bent at an acute angle forming a downwardly and backwardly extending lip, a tube having a channel on its upper edge into which said lip extends and means including spaced plates vertically disposed and forming a tortuous passage, for supplying pulp and mercury at the upper end of the table.
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4. A quicksilver-trap consisting of the inclined amalgamated table, with a depending lip forming an angle at its lower end, and a receiver into which the lower edge of said lip dips, a supply device for the table consisting of vertical channels, said channels having a
120 common inner side formed of an iron plate, and outer sides formed of copper plates, means for supplying said channels with material to flow through the channels in contact with the plates before being delivered upon the amal-
125 130

gamated table, and means for supplying quicksilver at the receiving end of said table.

5 In a quicksilver-trap, amalgamated plates, an iron plate supported between the amalgamated plates and insulated therefrom, the central plate being raised to form a space at the bottom for the flow of material, means for supplying pulp into the channel at one side of the central plate and an electrical circuit established through the central plate, the passing pulp and the amalgamated plates.

6. In a quicksilver-trap, amalgamated plates having gaskets upon which the lower edges rest, insulating-bars between the vertical edges of said plates, an iron plate, the edges of which fit in grooves in said insulating-bars whereby the iron plate is supported between the amalgamated plates and with its lower edge raised to form a continuous passage from one side to the other, bars hinged at the bottom and carrying the amalgamated plates, a locking device at the top by which said plates may be compressed upon the vertical insulations to form tight joints, and means for forming tight joints at the bottom of the plates.

7. In an apparatus of the character described, amalgamated plates, bars to which the lower edges of said plates are riveted, gaskets upon which the lower edges of the plates and the bars rest, vertical insulating-bars between the outer edges of the amalgamated plates, said bars having vertical channels in

their inner sides, an iron plate with its edges fitting said vertical channels, plates having the lower ends arched and pivoted in a base about which they are turnable, said plates forming shoulders which are adapted to engage the bars at the bottom of the amalgamated plates and compress them and the plates upon the gaskets, and a latching device at the top of the plates whereby they may be drawn together and compressed upon the vertical insulating-bars to form tight joints at the ends and bottom of the apparatus.

8. An apparatus of the character described comprising a pair of amalgamating and vertically-disposed plates and an intermediate iron plate with insulating-supports and gaskets to form joints at the bottom of the amalgamated plates and a yoke having shoulders by which the lower edges of the plates are forced into close contact with the gaskets, pivots about which the yokes are turnable and screws bearing upon the pivots whereby the yokes may be adjusted to regulate the pressure upon the gaskets.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

PHILIP SOMERVILLE.

Witnesses:

S. H. NOURSE,
HARRY J. LASK.