

J. O. KINNEY.
 RIFFLE FOR AMALGAMATION OF GOLD.
 APPLICATION FILED OCT. 15, 1909.

1,006,953.

Patented Oct. 24, 1911.

Fig 1

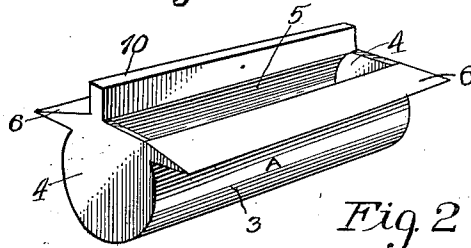


Fig. 2

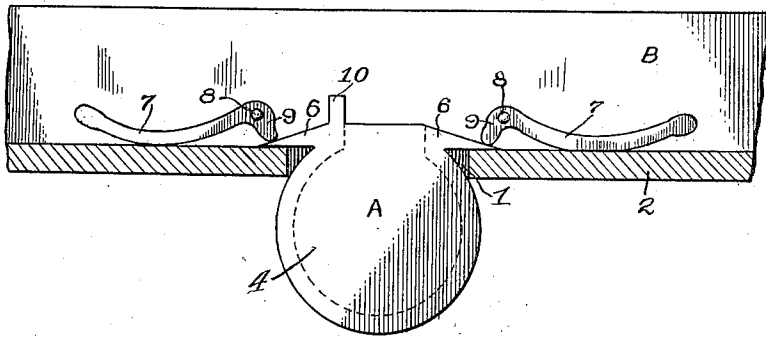


Fig. 3

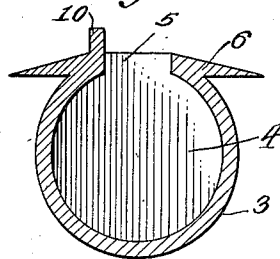
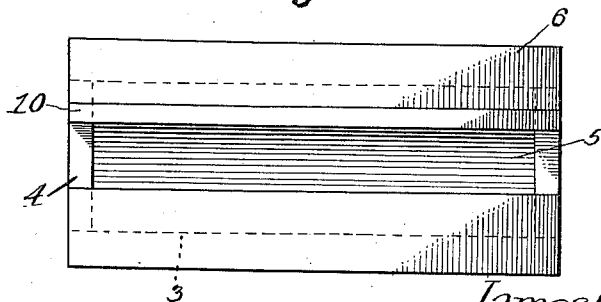


Fig. 4



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RIFFLE FOR AMALGAMATION OF GOLD.

1,006,953.

Specification of Letters Patent.

Patented Oct. 24, 1911.

Application filed October 15, 1909. Serial No. 522,884.

To all whom it may concern:

Be it known that I, JAMES O. KINNEY, a citizen of the United States, residing at Grand Junction, in the county of Mesa and State of Colorado, have invented new and useful Improvements in Riffles for Amalgamation of Gold, of which the following is a specification.

This invention relates to riffles for amalgamators, and the principal object of the invention is to provide a riffle which contains a body of mercury, which is automatically revolved by the passage of the water flowing through the sluice box so that the mercury is ever presenting a new surface to the slime to effect an efficient amalgamation of the gold that passes over and in contact with the mercury.

Another object of the invention is the provision of a riffle of this character especially adapted for use either in placer or mill operations to effect removal by amalgamation of the gold particles from the discharge of batteries or the flow through placer sluices, the riffle being in the form of a cylinder extending transversely to and set in the bottom of the sluice box and having a longitudinal slot in its top through which the mercury is exposed to the flowing stream so as to be rotated by the stream impinging on the top of the body of mercury for effecting a continuous rotation of such body, and below the slot is arranged an upwardly extending flange, which tends to arrest the slime at the mercury to cause the gold to amalgamate therewith.

With these objects in view, and others as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a perspective view of the riffle detached from its sluice box. Fig. 2 is a longitudinal sectional view of a portion of the sluice box, showing the riffle therein. Fig. 3 is a vertical transverse section of the riffle. Fig. 4 is a plan view of the riffle.

Similar reference characters are employed to designate corresponding parts through the several views.

Referring to the drawings, A designates the riffle which is adapted to be set into a

transverse slot or opening 1 in the bottom 2 of a sluice box B. The riffle is preferably a unitary structure of iron or steel and consists of a cylinder 3, disposed with its axis horizontal and closed at its ends by heads 4, and at the top of the cylinder is a longitudinal slot 5, that opens into the sluice box. The cylinder is formed with oppositely extending supporting flanges 6, which taper outwardly to a knife edge and these flanges bear on the bottom 2 of the sluice box to support the riffle in place in such a manner that it can be lifted vertically out of the opening 1. The riffle is removably supported in the box by clamping dogs 7, that are pivoted at 8 so that the projections 9 can bear on the top of the flanges 6 and clamp the same against the bottom 2 of the sluice box. The opening 5 is considerably narrower than the diameter of the cylinder so that when the same is filled with mercury, the latter will be in the form of a cylindrical body, a portion of which is exposed through the opening 5 to the water which passes tangentially over and in contact with the mercury and causes the latter to revolve in the cylinder on an axis concentric with the axis of the latter. On the lower side of the slot or opening 5, which extends from one head of the cylinder to the other, is an upwardly projecting flange 10, co-extensive with the riffle to form means for retarding the slime at a point directly over the mercury so that the gold will amalgamate with the mercury.

By confining a body of mercury in a cylindrical holder in a manner set forth, the rotary motion imparted to the mercury is highly advantageous in that a new surface of mercury is continuously presented to the slime that is arrested directly over the opening in the riffle and as long as the flow continues, the tangential contact of water with the mercury will keep the latter rotated. In order to facilitate the rotating, it is necessary that the cylinder is filled to its capacity, and the rotation of the mercury prevents the grinding and hence the flowering thereof, and by the rotary motion of the mercury, slime is prevented from packing over the riffle. The gold that is removed by the mercury gradually works to the center of the revolving body and leaves the superficial portion of the mercury clear and clean to come into contact with new slime for removing the gold therefrom. After the mer-

cury has taken up all the gold that it is capable of amalgamating, the riffle is removed and its contents discharged so that the riffle can be replaced to continue the operation.

5 From the foregoing description taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which
10 the invention relates, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that
15 the apparatus shown is merely illustrative and that such changes may be made when desired as are within the scope of the invention.

What I claim as new and desire to secure
20 by Letters Patent is:

1. As a new article of manufacture, an amalgamator riffle comprising a unitary single piece structure consisting of a hollow cylinder closed at its ends and having in its
25 top a longitudinal slot of less width than the radius of the cylinder, an upstanding flange extending the full length of the slot and contiguous with one longitudinal edge thereof, and laterally-extending flanges dis-
30 posed in a common plane and projecting from the cylinder at opposite sides of the slot.

2. As a new article of manufacture, an amalgamator riffle consisting of a unitary
35 single piece structure in the form of a hollow horizontal cylinder closed at its ends and having in its top a longitudinal slot of less width than the radius of the cylinder, and an upstanding flange extending the full
40 length of the slot and contiguous with one of the longitudinal edges thereof.

3. The combination of a sluice box having a transverse opening, and a hollow cylindrical riffle set into the opening and pro-

vided with a slot at its top and adapted to
45 contain a body of mercury of substantially circular cross-section, the surface of the mercury being exposed through the slot of the cylinder to receive a continuous rotary motion from the material flowing down the box
50 while a continuous amalgamation takes place, an upstanding flange extending transversely of the sluice box at the tail side of the said slot, and laterally extending downwardly-tapering flanges on the cylinder for
55 supporting the same in the opening of the sluice box, the said opening being of less width than the diameter of the mercury-holding chamber of the riffle and of sufficient width to permit the top of the body of mer-
60 cury to be exposed to the water passing over the riffle to receive a rotary movement from the water.

4. The combination of a sluice box having a transverse opening, a hollow cylindrical
65 riffle set into the opening and provided with a slot at its top and adapted to contain a body of mercury of substantially circular cross-section, the surface of the mercury being exposed through the slot of the cylinder
70 to receive a continuous rotary motion from the material flowing down the box while a continuous amalgamation takes place, an upstanding flange extending transversely of the sluice box at the tail side of the said slot,
75 laterally extending downwardly-tapering flanges on the cylinder for supporting the same in the opening of the sluice box, and dogs engaging the last mentioned flanges for clamping the cylinder removably in the
80 sluice box.

Signed at Austin, in the county of Lander, State of Nevada, this 21st day of April, A. D. 1909.

JAMES OLIVER KINNEY.

Witnesses:

JOHN HARDEN INGRAM,
CHARLES ABRAHAM CANTWELL.