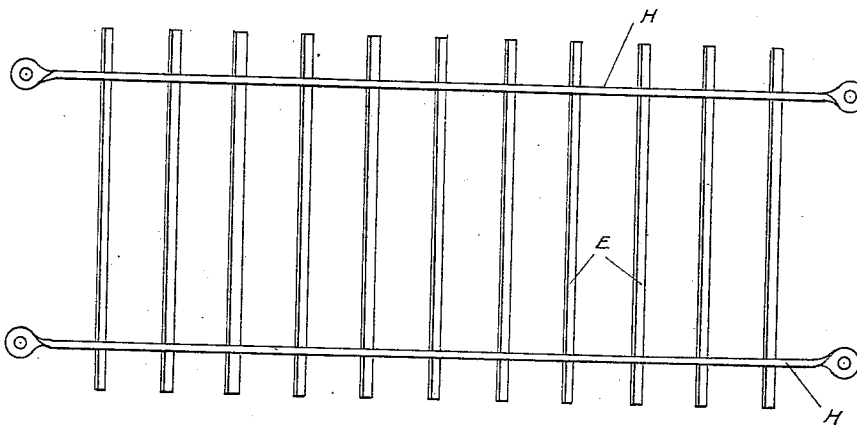


963,005.

FIG. 1.



·FIG. 3·

WITNESSES

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EZRA S. HOYT, OF SAN LUIS OBISPO, CALIFORNIA, ASSIGNOR TO BLACK SAND MINING COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF ARIZONA TERRITORY.

AMALGAMATING-RIFFLE.

963,005.

Specification of Letters Patent. Patented June 28, 1910.

Application filed July 22, 1905. Serial No. 270,799.

To all whom it may concern:

Be it known that I, EZRA S. HOYT, residing at San Luis Obispo, in the county of San Luis Obispo and State of California, a citizen of the United States, have invented certain new and useful Improvements in Amalgamating-Riffles, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to improvements in amalgamating riffles, and consists in the construction of such a riffle comprising a sluiceway with a series of wells therein of peculiar construction, combined with a baffle plate for each well which causes the material flowing therethrough to pass into the well and then out beneath the baffle plate, compelling the amalgamation of the gold contained therein.

This device is particularly adapted for use in amalgamating the gold found in sand or in amalgamating the free milling ores. In practice it has been used in connection with the flour gold found on sea-beaches, and in actual use has demonstrated that it will take out ninety eight per cent. or more of such gold, and without the clogging or mixing of the sand or magnetic iron or small garnets found in such sand with the quicksilver.

In the drawings, Figure 1 is a vertical central longitudinal section through an amalgamating riffle embodying my invention, and drawn substantially to a scale from the device which is actually in use; Fig. 2 is a sectional perspective view of a portion of the riffle; Fig. 3 is a plan view of the baffle plate frame.

A is an upright frame, upon which is secured the inclined sluiceway B. I preferably make this of metal (preferably of copper) and I find that the best pitch at which to set it is with an incline of three inches to the foot.

C is the sluiceway which acts as a feed to the riffle, and which is supplied with the sand and water by any desired means, not shown.

The material is usually screened, so that the larger particles, pieces of shell and things of that kind, cannot be fed across the riffle. At the lower end I have shown a discharge chute D.

In the bottom of the sluiceway I provide a series of wells, which are preferably alike and therefore a description of one will suf-

fice for all. This well has the inclined upper wall *a*, and the lower wall *b* substantially vertical, these two walls being connected by a bottom *c*, which is preferably arranged substantially horizontally. The wall *b* may be very slightly inclined forwardly or rearwardly, but any material forward inclination will tend to obstruct free passage of the material, and I prefer to make this wall *b* vertical. In the bottom of the well I place a small amount of quicksilver, as shown at *d*.

E is a baffle plate, preferably a flat plate, of sheet metal, such as copper, projecting into the well substantially in the middle thereof, and to a point slightly above the quicksilver therein and projecting above the bottom of the sluiceway a sufficient distance to prevent the water from passing over the top. This baffle plate is preferably arranged at a slight angle, that is, from the bottom up it inclines forwardly, or toward the direction from which the material is fed. This baffle plate divides the well into an inclined inlet passage *e*, a horizontal passage *h* beneath the same, and an outlet passage *i*. The inlet passage is widest at the upper end, that is, it narrows toward the bottom, while the outlet passage slightly enlarges toward the top, or these passages may be described as the inlet passage tapering downwardly and the outlet passage enlarging slightly, upwardly.

The baffle plates E are preferably secured together by the bars H, which at their ends are supported by the adjusting screws I, so that they may be adjusted to the desired vertical position in relation to the quicksilver in the wells. The proportion and angles of the well and the amalgamating plates shown in the drawing I have found to be the best to obtain most satisfactory results. I have shown in the full and dotted line J substantially the action and the level of the water at the various points in the riffle.

The frame A, I preferably support on a hinge O at its upper end, and at the lower end support it upon the adjusting screws N', so that slight variations in the angle may be had if desired and so that in setting it or moving it about the desired pitch may be quickly obtained.

N represents the frame upon which the riffle is supported.

In practice, the gold-containing sand, together with a proper amount of water (this mixture being commonly called the "solution"), is fed into the sluiceway C and flows 5 into the sluiceway B until it reaches one of the wells, when the flow is temporarily obstructed by a baffle plate E, which will direct the current of sand and water downward and against the mercury *d* in the bottom 10 of the well. The head of water back of the pocket will project the water out through the discharge passage *i*, and it will flow to the next well.

In practice, it has been found that an 15 amalgamating riffle thus constructed will work satisfactorily without clogging and without the depositing in the pocket of the sand, magnetic iron particles or the garnet fragments, but that all or practically all of 20 the gold, even the flour gold, will be caught by the quicksilver.

I find in practice that the distance between the lower end of the baffle plate and the amalgam should be approximately one- 25 eighth to a quarter of an inch, for the best results.

The course of the solution through the trough and into and out of the wells I have referred to in the claims as being in a continuous downward and forward direction, 30 which is intended to make clear that when the solution rises from the bottom of a well the mass does not rise in a backward direction.

35 What I claim as my invention is:—

1. An amalgamating riffle comprising an inclined flat-bottomed trough, a series of separated quicksilver-containing wells 40 therein, each well having an inclined upper wall, and a substantially vertical lower wall, stationary plates projecting into the wells to a point near the bottom thereof, and projecting into the sluiceway sufficiently to form a dam, the sluiceway and 45 wells being otherwise unobstructed, the parts being constructed and combined so as to permit the "solution" to pass in a down-

ward and continuously forward direction, for the purpose described.

2. An amalgamating riffle, comprising a 50 continuous flat-bottomed trough; a series of deflecting dams across the trough, against which the entire solution successively impacts; and a well at each dam and into 55 which it projects intermediate the side walls to near the bottom, each well containing quicksilver, the wells having an inclined upper wall and a substantially vertical lower wall, the dam forming in the well a downwardly-tapering inlet passage and an up- 60 wardly-tapering outlet passage.

3. An amalgamating riffle, comprising an inclined flat-bottomed trough; a series of separated dams therein, arranged across the line of flow of the solution; a well at each 65 dam into which the wall of the dam projects, each well containing quicksilver and having an inclined upper wall, a substantially vertical lower wall, and a bottom, and being divided by the dam into a down- 70 wardly-contracting inlet and an upwardly-expanding outlet passage, the dams projecting above the horizontal plane of the discharge passage of the next-above well.

4. An apparatus for saving fine gold comprising a trough having therein a series of 75 amalgamating pockets or recesses, baffle plates extending downward into the respective pockets, and means for varying in unison the angle of inclination of the baffle 80 plates, substantially as described.

5. An apparatus for saving fine gold comprising a trough having therein a series of 85 amalgamating pockets or recesses, baffle plates extending downward into the respective pockets, and means for raising or lowering in unison said baffle plates in said pockets, substantially as described.

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

EZRA S. HOYT.

Witnesses:

AMELIA WILLIAMS,
EDWARD D. GALT.