No. 682,545. Patented Sept. 10, 1901.

W. L. HARRAMAN, F. O. CHAPMAN, C. SEVERIN & D. H. BROWN.

COMBINED GOLD WASHER AND AMALGAMATOR FOR PLACER MINING.

(Application filed May 5, 1900.)

(No Model.) 2 Sheets—Sheet 1.

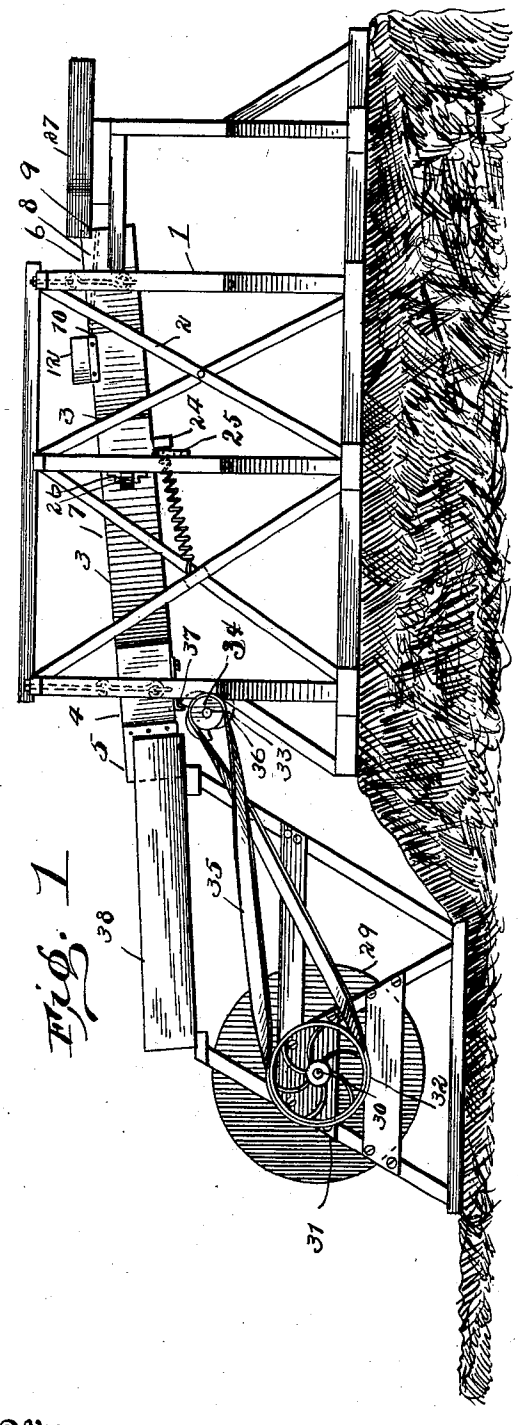


Fig. 1

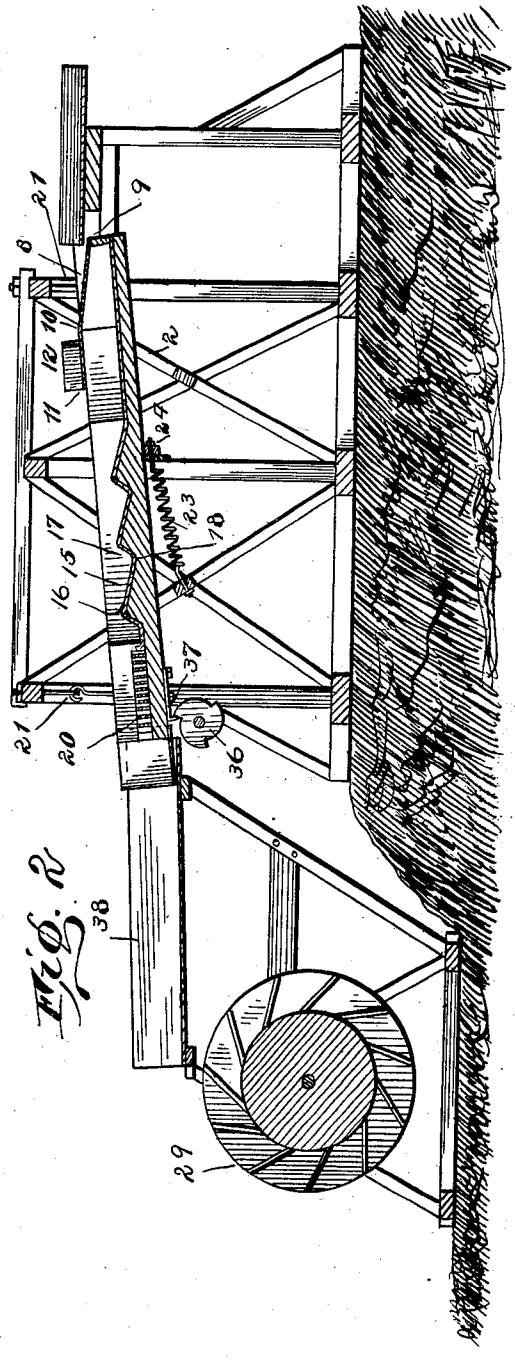


Fig. 2

Witnesses:
E. W. Hart.
E. H. Merillat

Inventors:
William L. Harraman
Fred O. Chapman
Charles Severin
David H. Brown
by Geo. A. Hamlin
their Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 682,545. Patented Sept. 10, 1901.

W. L. HARRAMAN, F. O. CHAPMAN, C. SEVERIN & D. H. BROWN.

COMBINED GOLD WASHER AND AMALGAMATOR FOR PLACER MINING.

(Application filed May 5, 1900.)

(No Model.) 2 Sheets—Sheet 2.

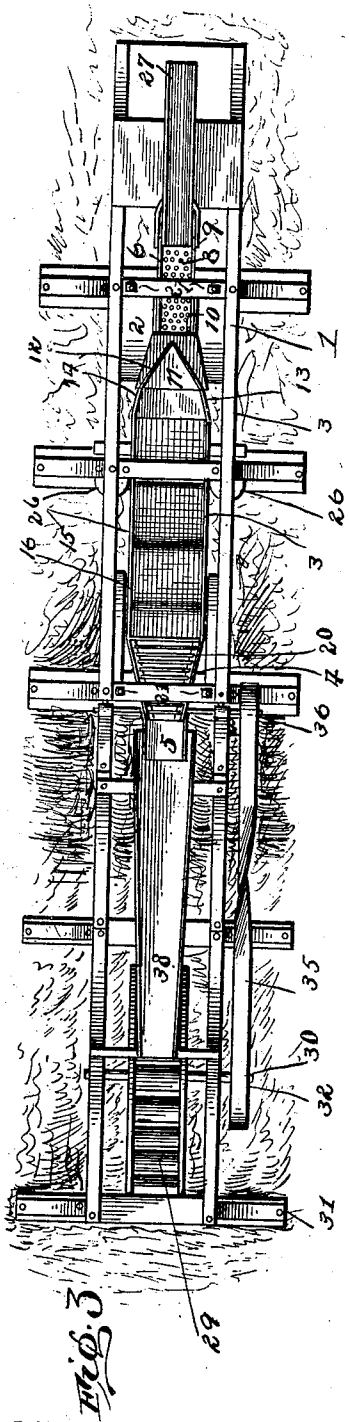


Fig. 3

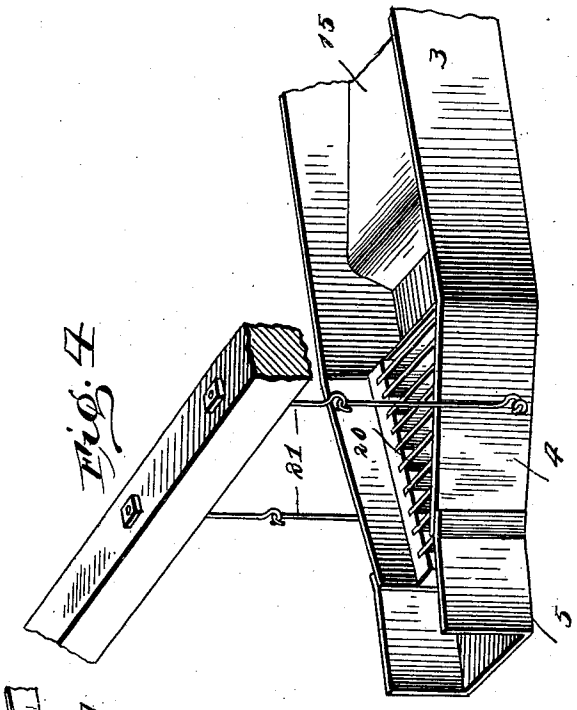


Fig. 4

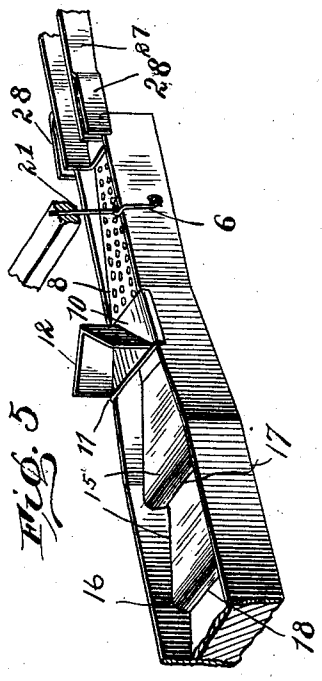


Fig. 5

Witnesses:
E. W. Hart
E. H. Merillat

Inventors:
William L. Harraman
Fred O. Chapman
Charles Severin
David H. Brown
by Geo. H. Hamlin
their Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM L. HARRAMAN, FRED O. CHAPMAN, CHARLES SEVERIN, AND DAVID H. BROWN, OF GRAND JUNCTION, COLORADO.

COMBINED GOLD WASHER AND AMALGAMATOR FOR PLACER-MINING.

SPECIFICATION forming part of Letters Patent No. 682,545, dated September 10, 1901.

Application filed May 5, 1900. Serial No. 15,604. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM L. HARRAMAN, FRED O. CHAPMAN, CHARLES SEVERIN, and DAVID H. BROWN, citizens of the United States, residing at Grand Junction, in the county of Mesa and State of Colorado, have invented certain new and useful Improvements in a Combined Gold Washer and Amalgamator for Placer-Mining; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to combined gold washers and amalgamators for placer-mining.

One object of the invention is the provision of a machine which will automatically separate and throw aside or divert the coarse rock from the sand and fine rock and wash out the gold from the material in an improved manner.

Another object of the invention is the provision of an improved automatic machine which will both wash the sand and fine rock and amalgamate the gold while passing therethrough.

Our invention contemplates the provision of an improved automatically-acting machine which will utilize the water to operate itself and will be adapted to catch and amalgamate and save all of the gold and allow the free and uninterrupted discharge of the fine rock or gravel and the sand after the gold has been freed therefrom.

The foregoing objects are accomplished by the provision of a machine comprising a novel arrangement and combination of improved features, all of which are set forth in detail hereinafter, and recited in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation; Fig. 2, a longitudinal section; Fig. 3, a plan view; Fig. 4, a detail view of the lower end of the swinging flume; Fig. 5, a detail view of the upper end of the vibratory or swinging flume, showing its connection with the stationary flume.

The framework of the machine is shown at 1, and it is provided with an inclined smooth chute 2, down which the coarse material passes to the ground after it has been thrown from the swinging or vibratory flume. The swinging or vibratory flume is shown at 3, the sides of which are preferably constructed of wood and converged at their delivery end 4, where they are provided with a metallic mouth or spill 5 for delivering the water and material from which the gold has been taken. The upper or receiving end of the swinging flume is also converged and from this point on to the extreme end is made straight and narrow, as at 7, where it passes loosely and freely between the portions of the chute 2. This narrow receiving end is provided with a screen 8, which has its receiving end 9 disposed low down in the swinging flume and its forward end reaching to the tops of the sides of the flume at 10. This screen is so arranged that it is on a slight incline—that is to say, its end 10 is slightly higher than its receiving end 9—so that as the flume vibrates in the direction of its length the rock, gravel, and sand will be slightly retarded in their forward movement in order to give the sufficiently fine material ample time in which to pass down through the screen, while the coarser material, which is not intended to pass through the machine, is advanced until it reaches a covered part 11 on the flume, which is provided with a divider or separator 12, made with converged sides 13 and 14 and formed either from a hard-wood block or an angular piece of metal, where it is shaken off or diverted laterally on both sides of the flume and onto the chute. The bottom of the swinging flume is composed of an amalgamated-copper plate 15, formed into a plurality of upward inclines 16 and the abrupt downwardly-extending inclines 17, which provide the pans or pockets 18, in which liquid mercury 19 is held, thereby providing baths through or over which the material must pass, which insure the amalgamation of the gold. In the lower converged end of the swinging flume is a series of transversely-extending parallel wooden strips or slats 20, placed closely adjacent each other, which constitute riffles adapted to catch any amalgam which may escape the amalgamating device previously described.

The numerals 21 designate sets of hanger-rods, which are connected to the framework

and to eyes 22 on the sides of the vibratory flume, the arrangement of the rods being such that the flume is suspended in an inclined position from its receiving end to its delivery end, free to swing in the direction of its length. A coil-spring 23, connected to the swinging flume and the frame, is adapted to give the flume a quick reactionary movement after it has been moved rearwardly by the mechanism hereinafter described. There it a cross beam or bar 24 secured to the bottom of the flume and adapted to abut on elastic cusions 25 on the frame. The bar or beam by abruptly striking the cushions after the flume is pulled to normal position by the spring suddenly arrests the movement of the flume, thereby giving it a jar or jolt, which very materially assists and facilitates the forward and downward movement of the material on the flume. Journaled in suitable bearings on the frame and on opposite sides of the swinging flume are guide or antifriction rollers 26, against which the flume runs when it is in vibration.

The numeral 27 designates a stationary flume which conducts the water, gravel, sand, and rock to the swinging flume—that is, onto the screen at the upper end thereof. This stationary flume is provided with false sides 28, which loosely and freely receive the metallic sides at the upper end of the swinging flume between themselves and the sides of the stationary flume, thereby effecting a suitable connection between the swinging flume and the stationary flume which prevents the loss of the material or water and insures its delivery onto the screen, while at the same time permitting the free and uninterrupted vibrations or oscillations of the swinging flume. We employ an overshot water-wheel 29, carried by a shaft 30, mounted in suitable bearings on a supplemental frame 31 and provided with a belt-pulley 32.

The numeral 33 designates a cam-shaft journaled in bearings on the main frame and provided with a belt-pulley 34, which is belted to pulleys 32 by a crossed belt 35. The cam-shaft carries a wiper-cam 36—in the present instance a three-point one—which is located underneath the spill on the swinging flume and adapted to wipe against a trip-block 37, secured to the bottom of the flume.

The numeral 38 designates a stationary spill suitably supported by the framework, which receives the water from the flume and delivers it to the water-wheel.

The operation is as follows: The sand, gravel, rock, and water are directed into the stationary flume, from which they pass onto the screen in the swinging flume. The water flowing down through the swinging flume sets the water-wheel in revolution, whereupon the cam intermittently forces the swinging flume backward and abruptly releases it, whereupon the gravity of said flume, supplemented by the retractive action of the spring, causes the flume to return quickly to its normal position, and the cross-beam coming in contact with the cushioning devices on the frame abruptly stops the swinging action, thereby giving the flume a jolt or jar. This action being repeated continuously causes all material of proper size to pass through the screen and onto the amalgamated plate, while the coarse material is advanced by the action along the top of the screen until it reaches the divider, whereupon it is diverted laterally off of the flume and discharges down the chute to the ground. The material which has passed through the screen is washed down the amalgamated plate by the water and by the jolting and swinging action, and as it passes over the plate and through the mercury-baths the gold is amalgamated and the useless material passes on and out of the flume. The riffles catch and save any amalgam which may escape from the plate.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an ore washer and amalgamator, the combination of a longitudinally-vibrating flume having an amalgamating-bottom provided with mercury-holding pockets located at intervals along its length, said flume having its sides converged at its delivery end, a series of transverse, closely-juxtaposed, parallel slats constituting amalgam-catching riffles disposed between the converged sides of the flume, a screen carried by the flume at the upper or receiving end thereof, above the flume-bottom, and adapted to receive the material prior to entering the flume, said screen being inclined upwardly from its receiving to its opposite end, whereby the material is retarded in its forward motion on the screen, and an angular divider located at the higher end of the screen with its apex directed thereto, said divider being adapted to divert the coarse material laterally from the screen and over the sides of the flume.

2. In a device of the class described, the combination with a swinging or vibrating flume, of a stationary flume adapted to deliver the water and material to the swinging flume, said stationary flume having false sides which loosely and freely receive the sides of the end of the swinging flume between themselves and the sides of the stationary flume.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM L. HARRAMAN.
FRED O. CHAPMAN.
CHARLES SEVERIN.
DAVID H. BROWN.

Witnesses:
J. S. CARNAHAN,
F. L. RICH.