

No. 801,289.

PATENTED OCT. 10, 1905.

J. F. WISWELL.
PANNING SLUICE BOX.
APPLICATION FILED DEC. 13, 1904.

2 SHEETS—SHEET 1.

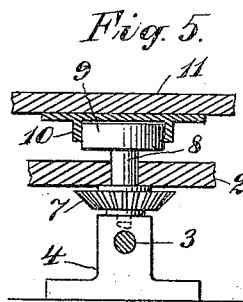
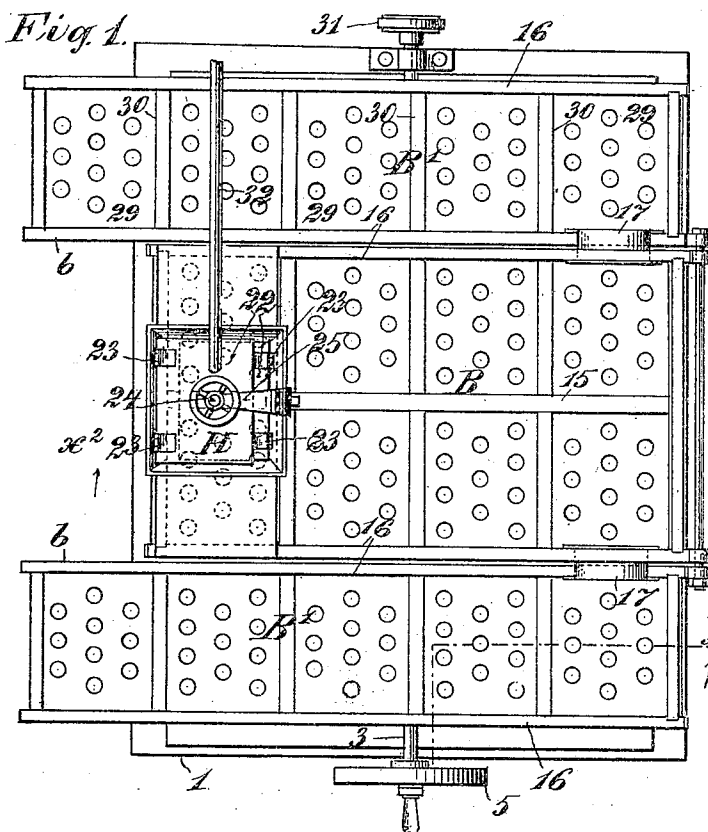
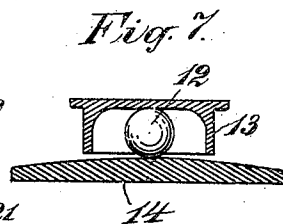
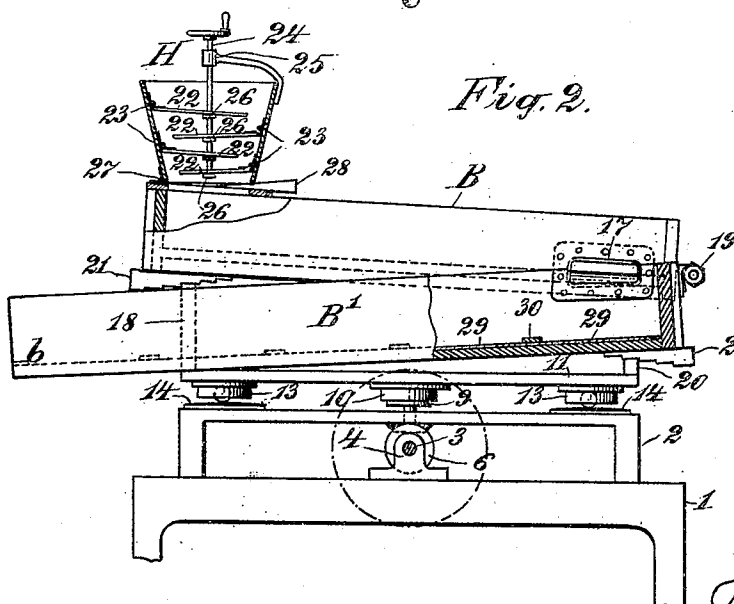
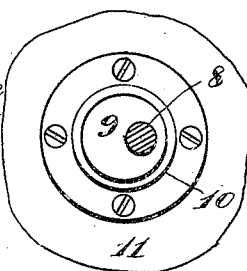


Fig. 6.



Witnesses
F. H. Wimmer
William J. Firth

John F. Wiswell
Inventor.

By his Attorney Henry Connelley

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2 SHEETS—SHEET 2.

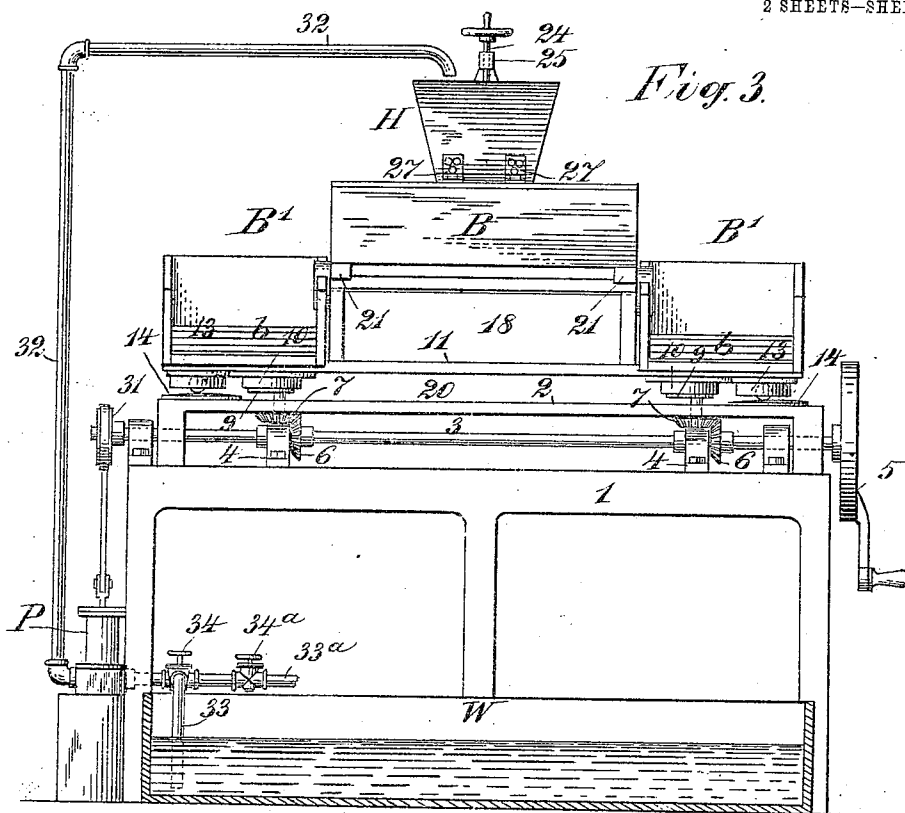


Fig. 3.

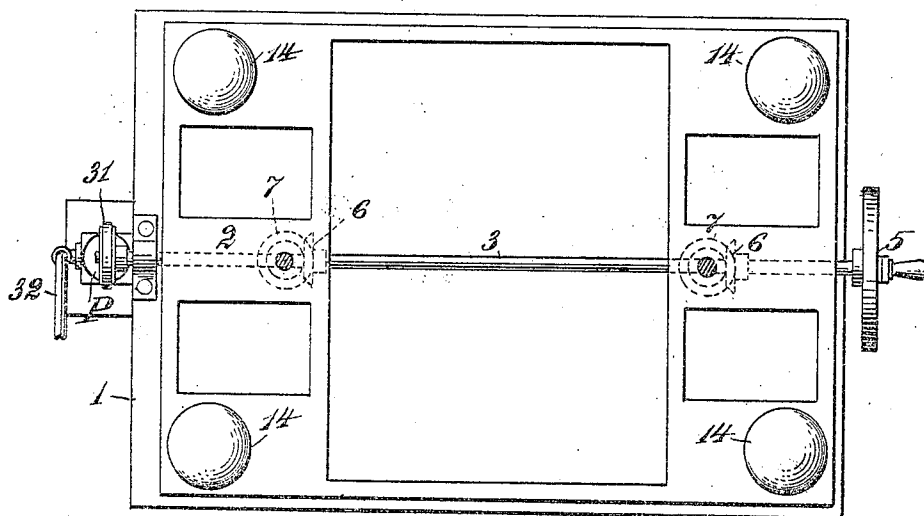


Fig. 4.

Witnesses
F. H. Almon
William J. Ford

Inventor
John F. Wiswell
By his Attorney
Henry Bannett

UNITED STATES PATENT OFFICE.

JOHN F. WISWELL, OF MEDFORD, MASSACHUSETTS, ASSIGNOR TO SOLAR MOTION GOLD SAVER COMPANY, A CORPORATION OF MAINE.

PANNING SLUICE-BOX.

No. 801,289.

Specification of Letters Patent.

Patented Oct. 10, 1905.

Application filed December 13, 1904. Serial No. 236,692.

To all whom it may concern:

Be it known that I, JOHN F. WISWELL, a citizen of the United States, residing at Medford, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Panning Sluice-Boxes, of which the following is a specification.

This invention relates to the class of devices employed for separating and recovering gold in placer and quartz mining. It is well known by mining engineers and experts that a large percentage of the gold in alluvial deposits exists in such minute particles, sometimes so fine and impalpable as to be invisible to the unassisted eye, that such gold floats on the water and is carried off in the sluice to the waste or tailings. The loss in this way is sometimes as high as sixty per cent. of this entire class of float-gold in the alluvium. It is also known to mining engineers that one pound of mercury will amalgamate one ounce of gold and that the loss of mercury from flouring is from one-sixth to one-third of a pound to each ton of ore crushed. This loss of floured mercury which goes into the tailings is in itself considerable; but this loss is immensely increased when the loss of gold carried off by it is considered.

The object of the present invention is to provide a sluice-box or series of boxes having a peculiar horizontal gyratory motion which will by combining the operations of panning and sluicing recover practically all of the float-gold and also the floured mercury when the apparatus is operated in connection with stamp-mills and amalgamating-plates.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is a plan of the apparatus. Fig. 2 is a side elevation of the same with a part in section at line $x-x$ in Fig. 1. Fig. 3 is a front elevation. Fig. 4 is a plan of the bed-frame of the apparatus. Fig. 5 is a sectional detail view of the eccentric-bearing and its adjacent parts. Fig. 6 is an under side view of the eccentric and its bearing. Fig. 7 is a sectional detail view of one of the four ball-supports of the sluice-box.

1 designates a foundation of any kind, and 2 a bed-frame fixed thereon. On the foundation is rotatively mounted a shaft 3 in bearings 4, said shaft being furnished with a crank wheel or pulley 5 for driving it. On the shaft 3 are secured two bevel-wheels 6,

which gear, respectively, with similar bevel-wheels 7 on upright shafts 8, which have step-bearings below in the blocks of bearings 4, as seen in Fig. 5, and above in the bed-frame 2. On the upper ends of the two upright shafts 8 are secured, respectively, eccentrics 9, and these have, respectively, rotative bearings in yokes 10, secured to the under side of a movable platform 11, which carries the sluice-boxes. When the shafts 8 are rotated, the eccentrics 9 thereon, which fit like journals in their bearings in the yokes 10, carry the platform around bodily in a circular path; but the platform does not rotate, as there are two driving-eccentrics placed at a considerable distance apart, and if a line on the platform be parallel with the shaft 3 at starting it will always remain parallel with said shaft. In other words, the mechanism described imparts to each and every point in the platform a movement in a circular path, and all of said circular paths are of the same diameter.

The platform is not supported on the eccentrics 9, but on balls 12, one at each corner of the platform and each caged in an inverted cup 13, secured to the under side of the platform. The ball rolls about on a bearing-plate 14, fixed to the bed-frame 2 and having a slightly-convex upper face. The object in giving these plates a convex face is to keep them clean from debris which may drip or fall from the boxes above. The diameter of the ball is considerably less than that of the cup which bears on it, so that the ball though caged may roll freely without frictional contact with the rim of the cup.

Mounted on the platform 11 are the sluice-boxes B and B', placed side by side. The middle or receiving box B is wide and is divided longitudinally by a low partition 15—that is to say, the sides 16 of the sluice-boxes may, for example, be six inches high and the partition 15 be one inch high. In Fig. 2 the receiving end of the box B is at the left, and it inclines toward the right—that is, the liquid bearing the precious metal is admitted at a hopper H to the higher end of the box B and flows down toward the lower end thereof. The stream is divided by the partition 15, one portion finally flowing through a flexible connecting-spout 17 into one of the side boxes B' and the other flowing through a similar connecting-spout into the other side box. These lateral or side boxes B' incline in an opposite

direction to that in which the box B inclines, and the liquid enters them at their higher ends and flows through them and out at their delivery ends, (designated by *b*.)

- 5 The box B is supported at its higher or more elevated end on a bolster 18 and is hinged at its lower end (at the right in Figs. 1 and 2) to the lateral boxes B' by any suitable form of hinge device 19. The boxes B' 10 are supported at their more elevated ends on a bolster 20 and at their delivery ends on the platform 11. The bolsters 18 and 20 are on and form substantial parts of the platform, and the inclination of the boxes is attained by 15 means of stepped wedges 21. The wedges for the box B are clearly shown at the left in Fig. 2, and those for the lateral boxes B' are seen at the right in the same figure. The wedges are stepped or shouldered, as shown, so that 20 each step elevates the box to a certain predetermined extent. It may be stated that these wedges are employed in preference to screws for the reason that the dampness and gritty substance which accumulate on screws so situated soon destroy them.

The hopper H (seen in section in Fig. 2) is rectangular in plan and has in it baffles 22, hinged to the respective opposite sides of the hopper at 23, so that those of one side alternate with and overlap those of the other side. 30 To vary the inclination of these baffles, there is a screw 24, which screws through a fixed nut 25 and extends down loosely through holes in the baffles. This screw has on it collars 26, 35 which take under and elevate the respective baffles when the screw is run upward, and when it is run downward the baffles descend by gravity. The hopper H is hinged at 27 to the box B, and it may be kept level at all 40 times by means of a wedge or wedges 28, which take under its free rear edge.

In the bottom of each sluice-box are fitted apertured metal plates 29, held in place by transverse strips or riffles 30. These plates 45 and riffles may be made removable by any convenient means—as by securing-screws, for example. These plates may in some cases be amalgamated copper plates. As herein shown, the apertures and the riffles serve to catch the 50 gold and retain it.

In the operation of the apparatus the liquid bearing the gold is admitted to the hopper H and the boxes set in motion. The circular or orbital motion imparted to the boxes sets up 55 circular or eddy-like movements in the flowing liquid and causes the particles of gold to collect and sink to the bottom. Where the liquid contains floured mercury, the particles thereof will be brought together and globules 60 formed. These globules will coalesce and form masses which will sink to the bottom

and may be recovered. The particles of float-gold also tend by the motion to adhere to each other and form lumps or masses. The baffles in the hopper serve to distribute the 65 inflowing liquid and deliver it properly to the box B. The liquid flowing from the boxes may enter a well or receptacle W, formed in any convenient manner, and if the collected liquid still contains gold it may be passed 70 through the apparatus a second time. A convenient means of effecting this, as well as for supplying the gold-bearing liquid primarily to the hopper, is clearly shown in Fig. 3. On the shaft 3 is an eccentric 31, which actuates 75 the piston of a pump P, which takes the liquid from the well W at its induction side and discharges it through a pipe 32 into the hopper H. The suction-pipe 33, provided with a stop-valve 34, takes the liquid from the well; but a 80 branch suction-pipe 33^a, provided with a stop-valve 34^a, may be extended to any point to take up the gold-bearing liquid. The operation of the pump will be obvious.

Having thus described my invention, I 85 claim—

1. An apparatus for the purpose specified, having a platform, means for imparting an orbital motion to said platform, an inclined sluice-box mounted on said platform, two 90 sluice-boxes mounted on the platform at the respective sides of the first-named sluice-box and inclined in an opposite direction thereto, the upper ends of the two last-named boxes being hinged to the lower end of the first-named box, means for varying the inclina- 95 tions of the boxes, and flexible spouts which connect the middle box near its lower end with the respective outer boxes near their upper ends. 100

2. An apparatus for the purpose specified, having a platform, means for imparting an orbital motion to said platform, a broad middle sluice-box mounted in an inclined position on said platform and having in it a low partition which divides it longitudinally, a hopper 105 at the upper end of said middle box, said hopper provided with inclined baffles, two side sluice-boxes, situated at the respective sides of the middle box and inclined in the opposite direction, the higher ends of said sluice-boxes being hinged to the lower end of said middle sluice-box, means for varying the inclination 110 of the respective boxes, and spouts connecting the side boxes with the middle box. 115

In witness whereof I have hereunto signed my name, this 8th day of December, 1904, in the presence of two subscribing witnesses.

JOHN F. WISWELL.

Witnesses:

JAMES C. LAUGHTON,
DANIEL F. RILEY.