

B. TYSON.
Amalgamators.

No.156,448.

Patented Nov. 3, 1874.

Fig. 1.

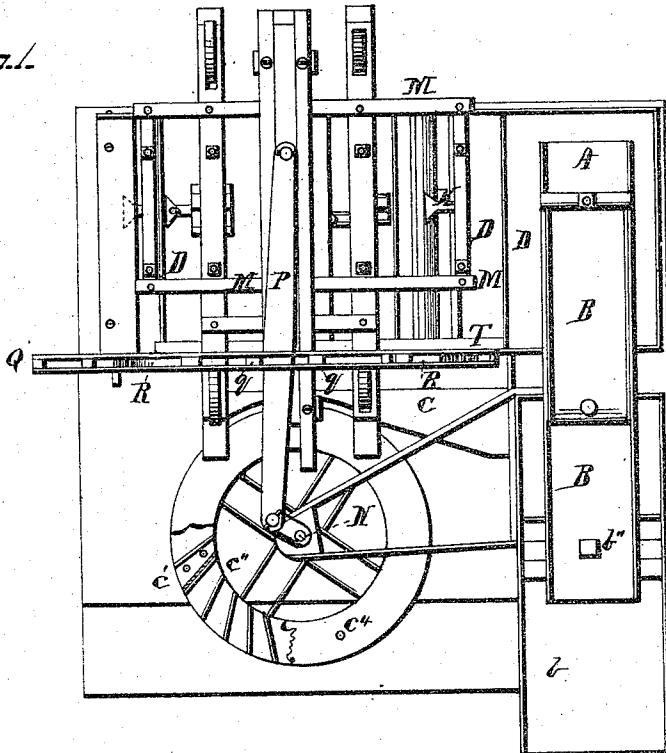
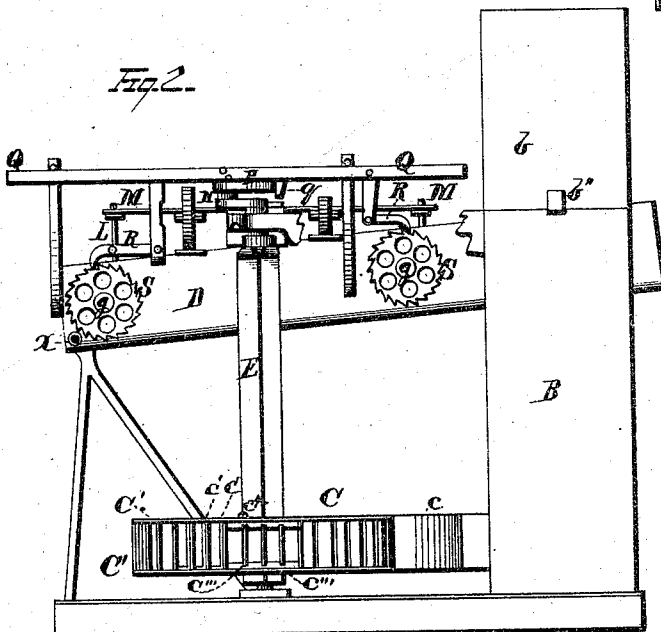


Fig. 2.



WITNESSES

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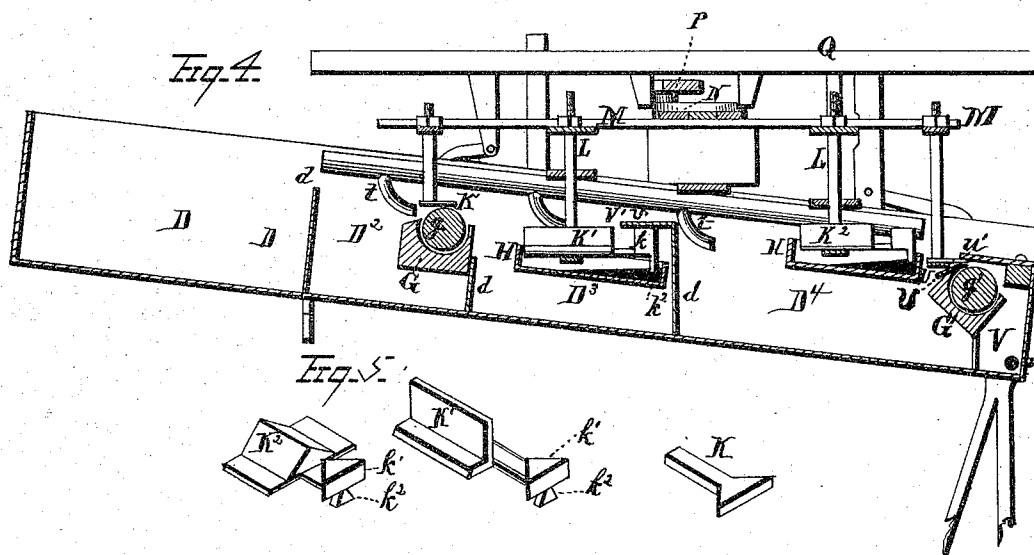
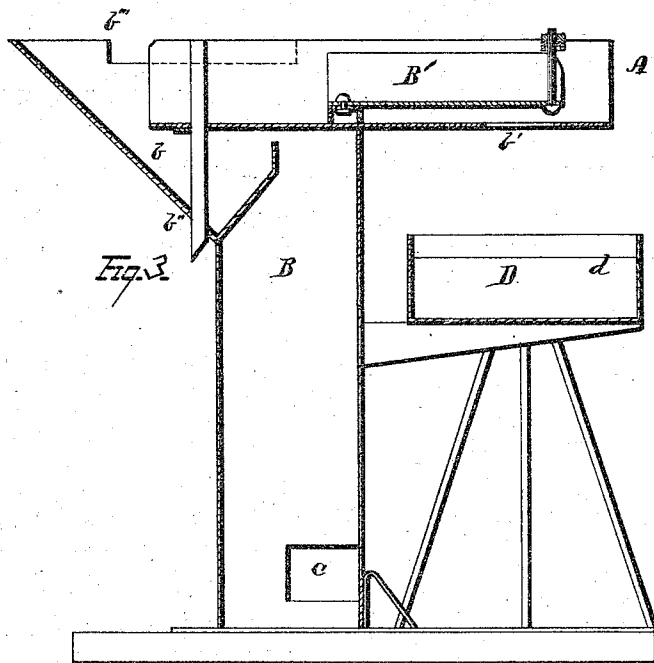
Leggett & Leggett, Attorneys.

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2 Sheets--Sheet 2.

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UNITED STATES PATENT OFFICE.

BRYAN TYSON, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN AMALGAMATORS.

Specification forming part of Letters Patent No. 156,448, dated November 3, 1874; application filed September 7, 1874.

To all whom it may concern:

Be it known that I, BRYAN TYSON, of Washington, District of Columbia, have invented certain new and useful Improvements in Machine for Saving Gold; and I 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to a machine for saving gold; and consists in an improved mechanism, whereby it is believed that all or very nearly all the gold usually found in sand, gravel, or other substances can be saved; and consists, first, in a novel mechanism, whereby the grit and gold-bearing sands are separated from the water, rendering the water thus taken out fit for propelling a water-wheel; second, in a novel wheel adapted for using this water, containing, perhaps, a small amount of grit for motive power; third, the novel mechanism for arresting and collecting the gold, all as hereinafter more fully set forth and claimed.

In the accompanying drawings, Figure 1 is a plan view of my machine. Fig. 2 is an elevation of same upon that side adjacent to the water-wheel. Fig. 3 is a section, by vertical plane, passed longitudinally through the flume. Fig. 4 is a longitudinal section of a portion of my invention, showing the trough, amalgamators, &c. Fig. 5 is a view in section, by vertical plane, passed longitudinally through the receiving-box. Fig. 6 is a separate view of the agitators.

In describing the first part of my invention, A is the flume that conveys the materials to the machine. B is the fore-bay that furnishes the head of water for operating the wheel C. c is a chute leading from the fore-bay to direct the water against the buckets of the wheel. B' is a skimmer, rendered adjustable at its rear end by means of an adjusting-screw or other equivalent means. It is designed to catch the upper portion of the water in the flume A, and permit the sand, gravel, &c., to pass beneath it and out of an opening, b', into the receiving-box D. b is a chamber, into which the water from the flume A is

emptied, where any remaining sediment is permitted to settle before the water pours down the fore-bay B to the wheel C. At the bottom of the chamber b is a gate, b'', and the sediment that may here accumulate is removed. b''' is a waste-weir to permit the escape of surplus water, so that the head of water may be maintained at a uniform height.

In describing the second part of my invention, C is a wheel formed of two plates, C', of iron or wood lined with iron. c' c' are buckets, of cast-iron or other suitable material, that are made to slip into the opening between the partitions c'', so that when they are worn out by the grit that may possibly remain in the water they can be readily replaced. c''' is another style of bucket, made to slip into grooves in the upper and lower plates. It is retained in place by a suitable set-screw, c'', as indicated, and can be readily removed. The top of the vertical shaft E of this wheel is geared directly to the operative machine of the agitators.

In describing the third part of my invention, D is the receiving-box, into which the gold-bearing sand, gravel, &c., the larger gravel and stones having been previously thrown out by an apparatus not necessary to describe, are poured from the flume A. I propose to divide the box D into four or more compartments, D¹ D² D³, &c., separated by partitions d that extend within a few inches of the top. These partitions, with accompanying adjuncts, facilitate the more effectual settling and separation of the gold. The chamber D beneath the flume should be lined with stones, or other suitable substance, to prevent wear by the falling grit and water.

In the chamber D², adjacent to its lower partitions, is a trough, G, containing mercury, in which a roller having its outward surface of copper, is made to revolve. The copper, presenting an amalgamated surface, will catch and amalgamate any gold that may pass over it.

In the chamber D³, is a pan, H, containing mercury, which, owing to the slight inclination, collects on the lower edge of the pan. The gold is made, by a process hereafter described, to settle in this mercury. The pass-

ing gold is subjected to similar processes at three or four other points before leaving the box D. It is believed that but little gold that is susceptible of being arrested by any process whatever will thus pass the whole without becoming arrested and amalgamated. At the lower extremity of the box the sand, &c., pass over another roller, g' , in a trough, G' , similar to that already described.

There may be as many chambers D^1 D^2 , &c., as may be deemed necessary; but it is believed that four, as shown, will effect a satisfactory separation of the gold.

I do not desire to limit myself to any particular amalgamating device, inasmuch as any known or proper amalgamators may be applied without affecting the spirit of my invention.

In order that the gravel and sand may be kept agitated and permit the gold to settle, I employ a system of agitators that are operated by the water-wheel.

Immediately above the lower side of the pan H is another steel plate, N' . The agitator K^1 so agitates the sand as to afford the gold facilities for settling, by reason of its greater weight. K is a continuation of this agitator, and works directly under the plate U' , so as to continually keep the sand under the plate in a loose condition. On the lower side of K^1 is a small projection, K^2 , that extends down and dips into the mercury. The action of this will cause the gold to settle into the mercury.

The agitator K^2 K is of a shape to lift the sand, as well as drive it back and forth, and thus probably effect a better agitation. Either kind or both may be employed, or any other shapes that will effect the desired purpose.

In the drawings are shown but a single agitator of each kind. In the machine, however, I propose to employ them in gangs, placed side by side. These agitators are attached to bars L , or are otherwise suspended to the sliding or rolling frame M . The frame M is attached to the crank N of the water-wheel C by a pitman, P , which gives to the frame and to the agitators a reciprocating motion.

Motion is given to the rollers g and g' by the following means:

Q is a sliding frame that embraces the pitman P . To this frame is suitably attached pawls R that engage with ratchets S on the wheels on the ends of the rollers g in one direction, and ride over the ratchets in the return motion. The motion of the pitman gives to the frame Q a reciprocal motion, and the stroke can be made longer or shorter, and the motion of the rollers proportionately faster or slower, by altering the distances between the projections q q that embrace the pitman P .

The action of the agitators will have a tendency to cause an accumulation of sand at the

sides of the box D. To prevent this, I employ water-pipes T , (one on either side of the box,) with a smaller pipe for a jet of water for each agitator on both sides of the box. These jets, with as good a head of water as may be convenient, will prevent any inconvenient accumulation of sand, and may not be needed at all.

At the lower extremity of box D is a small box, V , for receiving the sands, &c., that may wash over the roller g' . At W is a small pipe that may be connected with the forebay B. X is an opening for the passage of water out of said box. A current of water through the box will prevent any accumulation of sand. This sand can be caught at X in a suitable receptacle, and thrown back at the head of box D, or otherwise dealt with, as its value may indicate.

At suitable intervals the boxes and sands should be removed from the box D, and washed in a "long Tom," or other suitable apparatus, for collecting the gold that may have been settled, letting the tailings from the long Tom run into the box D, so as to again arrest any gold that may be lost, and at the next washing again put through the long Tom, and so on.

What I claim as new, and desire to secure by Letters Patent, is—

1. The flume A, which conveys water to the fore-bay B, and provided with a sand-and-gravel-discharge port, b' , in combination with an apron, B' , constructed to separate the upper portion of the water in the flume from that containing the sand and gravel, and convey it to the wheel, substantially as set forth and shown.

2. The combination, with the fore-bay B, of the flume A, skimmer B' , and sediment-chamber b , substantially as specified.

3. The combination, with the receiving-box D, of the mercury-troughs G G' , rollers g g' , and mechanism for propelling said rollers, substantially as and for the purpose specified.

4. The combination, with roller g , of an agitator, K , situated over the same and close to the roller, constructed and operating substantially as specified.

5. The combination, with rollers g' and mercury-trough G' , of metallic plates U and u , situated over the same, in the manner and for the purposes specified.

6. The combination, with the agitators, of a sliding or rolling frame, M , the wheel C , and suitable connecting intermediate mechanism, substantially as described, whereby the wheel communicates reciprocating motion to the agitators, substantially as set forth.

7. The combination, with the receiving-box D and agitators, of the side pipes T , with jets for driving away the material accumulated by the said agitators, substantially as specified.

8. In combination with the tail of the box D, a small box, V , and orifice for removing its

contents, substantially as and for the purposes specified.

9. The combination of the flume A B', fore-bay B b, wheel C, receiving-box D, pans H, agitators K K', &c., and agitating mechanism operated by said wheel, and with or without the troughs G and rollers g, substantially as specified.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of September, 1874.

BRYAN TYSON.

Witnesses:

WELLS W. LEGGETT,
A. G. HALL.