

(No Model.)

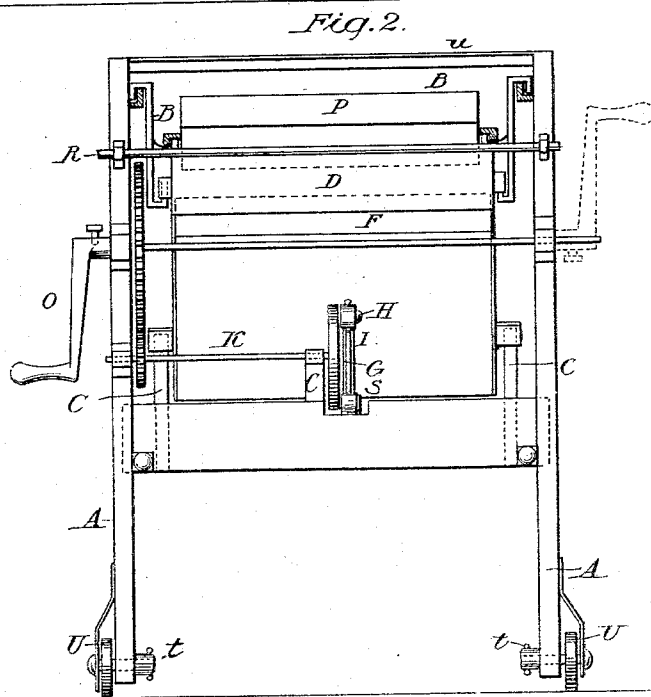
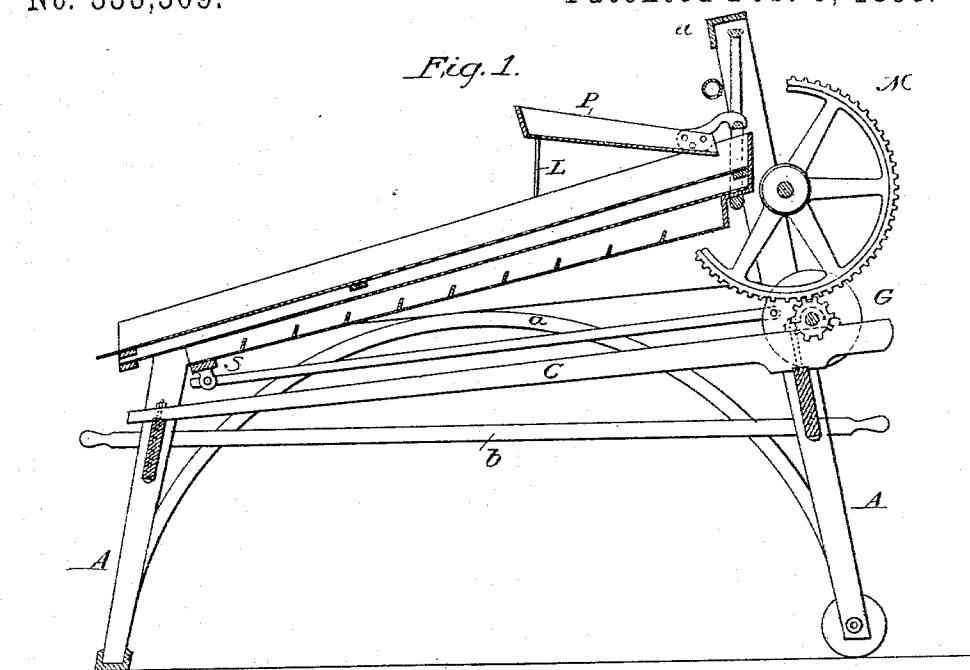
2 Sheets—Sheet 1.

T. F. UPSON.

SEPARATING AND AMALGAMATING MACHINE FOR GOLD, &c.

No. 533,509.

Patented Feb. 5, 1895.



Witnesses:

C. H. Murray,
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Inventor: _____

Theodore F Eppson

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Fig. 3.

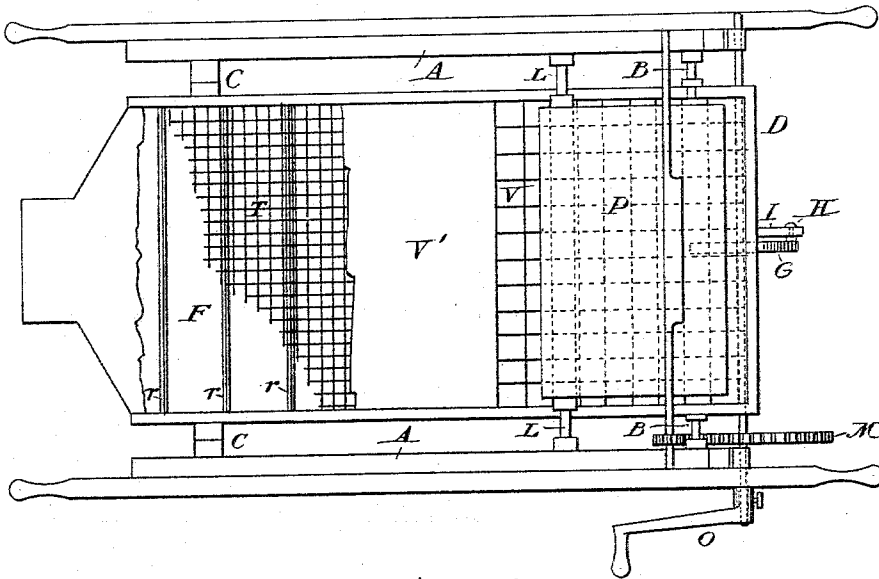


Fig. 4.

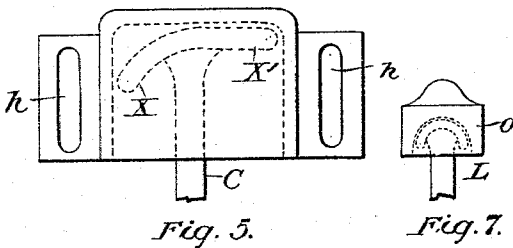
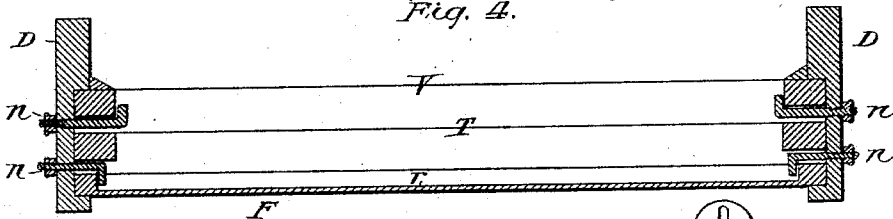


Fig. 5.

Fig. 7.

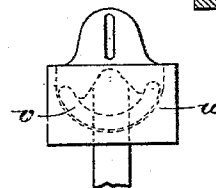
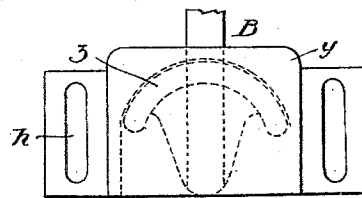
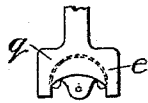
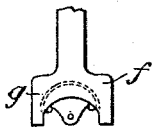


Fig. 6.



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UNITED STATES PATENT OFFICE.

THEODORE F. UPSON, OF ELKHART, INDIANA.

SEPARATING AND AMALGAMATING MACHINE FOR GOLD, &c.

SPECIFICATION forming part of Letters Patent No. 533,509, dated February 5, 1895.

Application filed March 3, 1894. Serial No. 502,293. (No model.)

To all whom it may concern:

Be it known that I, THEODORE F. UPSON, a citizen of the United States, residing at Elkhart, in the county of Elkhart and State of Indiana, have invented a new and useful machine for separating gold from worthless material and amalgamating the gold or for separating different grades of sand and gravel, of which the following is a specification.

The construction of the machine is shown in the accompanying drawings, of which—

Figure 1 is a side elevation. Fig. 2 is a front end view. Fig. 3 is a plan view with portions cut away to show parts below. Fig. 4 is a transverse cross section through the screen D, and amalgamating pan F; while the other three figures are views of subordinate parts of the machine as will be hereinafter explained.

Like letters indicate similar parts of the machine throughout the drawings.

The novelty in this machine is in the construction of some of its parts and the method of combining the same so as to produce a machine that is simple, durable, and easily operated.

One of the chief difficulties heretofore with machines for a similar purpose has been that they are so made that the various kinds of bumpers or vibrating attachments soon rack the machine apart, the frame becomes loosened, and the further operation of the machine is impracticable. By the peculiar construction of the frame in this machine and the novel method of securing the motion of the screens and amalgamator pan, this objection is removed; while the motion to effect the separation of the material has a special value.

The following is such a detailed description of the invention as will enable any one skilled in the art to which it appertains to construct and apply the same.

Referring to Fig. 1 D is a screen box hung in the frame A, and supported at its upper end by the swinging arm B, and at its lower end by the vertical rocking arm C. It is supplied with the coarser screen V above and the finer screen T below—indicated by the dotted lines. Under these is located the amalgamating pan F, provided with the cross riffles *r, r, r*.

Above the screen box D, at its upper end is the feed trough or shoe P into which the material is fed. It is hung on the vertical rock-

ing arm L and has its lower end attached to the swinging arm B, by the pivot H. At its lower edge there is a slotted water pipe R, or a trough of suitable character, for furnishing a supply of water to the material as it is fed in.

M is a gear wheel engaging the cog wheel N.

G is a balance wheel provided with a crank pin H, Fig. 2, connecting with the pitman I, the other end of which is attached to the lower end of the screen box D at s.

The cross bar *b* of the machine's frame extends beyond the frame at its ends and these extensions are turned for hand holds to aid in shifting the machine.

U is a wheel or caster on the leg of the frame to facilitate the movement of the machine from one place to another. These wheels have a tightening nut as shown at *t* in Fig. 2, to prevent the wheel from turning when the machine is located. The bottom ends of the opposite legs are furnished with a cast iron shoe *m* to prevent wear or splitting of the legs. The longitudinal curved brace *a* is made of bentwood.

The longitudinal brace *c* extends through nearly the center of the machine and is attached to the main end cross pieces of the frame A, and supports a bearing at its front end for the shaft K. It aids materially in strengthening the machine and in preventing racking.

N is a toothed gear wheel connecting with the power wheel M, and propelling the shaft K.

O is a crank for turning the power wheel M.

u is a lateral cross brace of the main frame.

w, v, and y, z, of the swinging arm B; and *o, and q, e*, of the bar L; and also *x z* and *f, g*, of the rocking arm C, can be best considered in their corresponding relations in Figs. 5, 6, and 7, where they are shown enlarged.

Both sides of the machine are alike and a representation of one answers for both.

The relation of the different parts in the end view, Fig. 2, is obvious and does not require a detailed description.

The coarse screen V is not continuous to the lower end of the machine but is connected with a metallic sheet V' which carries the coarser material to the lower end of the machine where it is shunted aside by any convenient method. The finer screen T extends throughout over the amalgamating pan F. The bottom of the pan F, is made of sheet cop-

per and the riffles r, r, r , are also strips of copper fastened securely to the bottom sheet.

In Fig. 4 is shown means of tightening the screens and amalgamating pan by the thumb screws n . These are provided with a catch on the inner ends that engages the frame of the screen and by screwing up the nut n the screen is made tight. These tightening nuts are placed opposite each other on both sides of the frames, and at any needful distance apart along the frames.

Figs. 5, 6, and 7 show the character of the bearings of the swinging and rocking arms by which the screen box D and the feed trough P are suspended and worked. In Fig. 6 the swinging arm B is hung at its top in the bearing w on the semicircular collar bearing v ; and at the bottom in the boxing y having a curved surface to fit the semicircular bearing of the collar z ,—as indicated by the dotted lines. The lower ends of the arms L and C, Figs. 7 and 5, consist of a curved boxing working upon the semicircular bearings e and g ; and the upper end of the arm L is curved to work in the semicircular bearing o as clearly indicated. The boxing Z in which the arm C rocks, is peculiar,—being almost square shaped inside; and the upper bearing of C has a special conformation; the collars X and X' being projected as shown. In this boxing and that of y , Fig. 6, the ends of the boxing are provided with the slots h, h, h, h . Through these slots the fastening bolts pass that secure the boxing to the frame. They are so made that the boxing can be set higher or lower or at different angles of inclination to vary the effect. The constructing of the bearings in the forms shown—with the exception of Z in Fig. 5,—gives them a greater wearing surface and very much steadies the action of the machine, causing it to run smoother and firmer and greatly increases its lasting qualities.

Experience shows that any material simply shaken across a screen, or back and forth over it and lying its full weight unvaried on the screen, will be disposed to clog and will work through very slowly; but if there is at the same time an upward relieving motion the work will be greatly expedited. It is also well known to miners that material with which small particles of gold are mixed, simply washed forward over plates supplied with riffles will not settle the fine gold to the extent that occurs when the material has a pulsing movement such as is obtained in the manipulation of a prospector's gold pan. These effects are fully obtained by the peculiar working of the rocking arm C in the boxing Z; for in the upward stroke of the screen box D, the curved collar projection X—Fig. 5,—operating upon the plane surface bearing of the boxing Z, imparts an easy rocking motion causing the upper part to describe the arc of a circle; but on the downward stroke or

movement of the box D, after it passes the perpendicular position of the arm C, the plane bearing surface of the box Z coming in contact with the right angular collar projection X', of the arm C, produces a slightly lifting motion of the screen box D, and these lifting or upward movements occurring in quick succession are extremely effective, not only in separating the material on the screens, but also in settling the gold from the crude material and lodging it in the riffles on the amalgamating pan F. This effect can be increased or diminished by the relative setting of the box Z, as provided for by the slotted bolt holes h, h .

The operating of the machine is simple and apparent. When the power wheel M is revolved it sets in motion through the attachments the pitman I giving it a backward and forward throw which causes the screen box D to oscillate on its supports securing the constant downward movement of any material that may be upon the screens or amalgamating pan, and by the peculiar motion above mentioned settling the gold into the riffles where it comes in contact with the quicksilver that,—as is customary, is provided in the riffles to amalgamate the gold and hold it. The water supplied washes over the riffles and carries away all the waste material. As the screen box D moves back and forth it causes the feed trough P attached to the swinging arm B to have a forward shoving motion that supplies the feed in a constant and regular manner.

Having thus fully described my invention, what I claim as new and useful, and desire to secure by Letters Patent, is—

1. In an amalgamator and separator a screen box D, provided with an amalgamator pan F beneath; suspended at one end by the rocking arms C, C; said arms having at their upper end the curved projecting shoulder X on one side and the right angular projection X' on their opposite side and designed to operate on the plane surface of the boxing Z substantially as and for the purpose set forth.

2. In an amalgamator and separator a screen box D in combination with an amalgamator pan F, synchronously operated, and suspended at one end by the swinging arms B, B, and at the other end by the rocking arms C, C, constructed to give a smooth motion in their upward swing, and an upward impulse from the arms C, C, in their reverse motion, all substantially as and for the purpose set forth.

3. In an amalgamator and separator the rocking arms C, C, constructed at their lower end with a concave surface f operating on the semicircular surface g ; and provided at their upper end with a curved surface on the shoulder X in combination with a right angular projection X', specifically for the purpose set forth.

4. In an amalgamator and separator the rocking arms C, C, with their lower concave

end *f* working upon the curved bearing *g*, and
their upper end provided with a curved
shoulder *X* and a right angular shoulder *X'*
operating in the box *Z*; in combination with
5 the swinging arms *B, B*, constructed with a
semicircular collar *z* operating in the boxing
y on their lower end; and with the semicircu-

lar collar *v*, operating in the box *w* on their
upper end; substantially as set forth and for
the purpose indicated.

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Witnesses:

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WALTER L. UPSON.