(No Model.)

C. TAYLOR.

APPARATUS FOR SEPARATING AND AMALGAMATING GOLD.

No. 253,785. Patented Feb. 14, 1882.

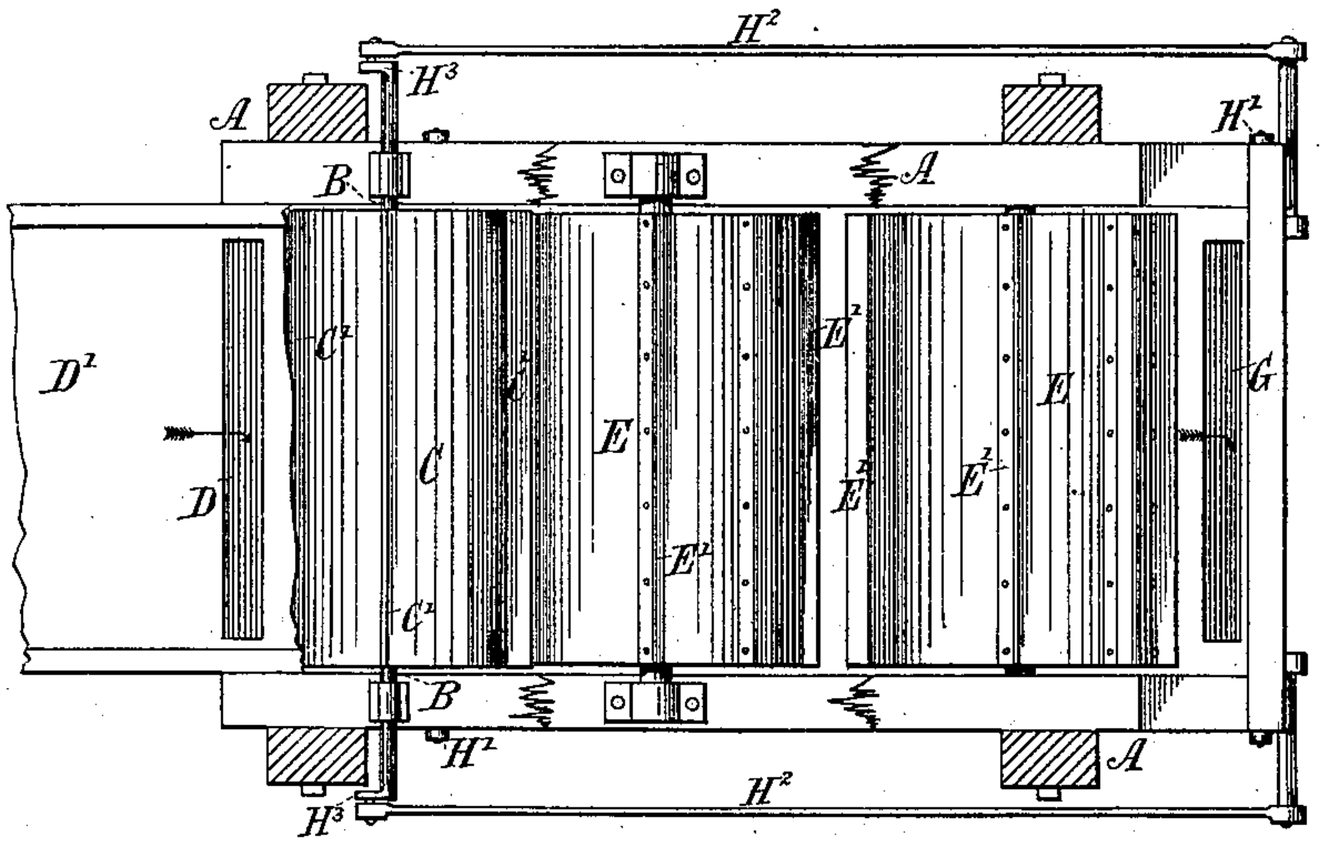

Fig. 1

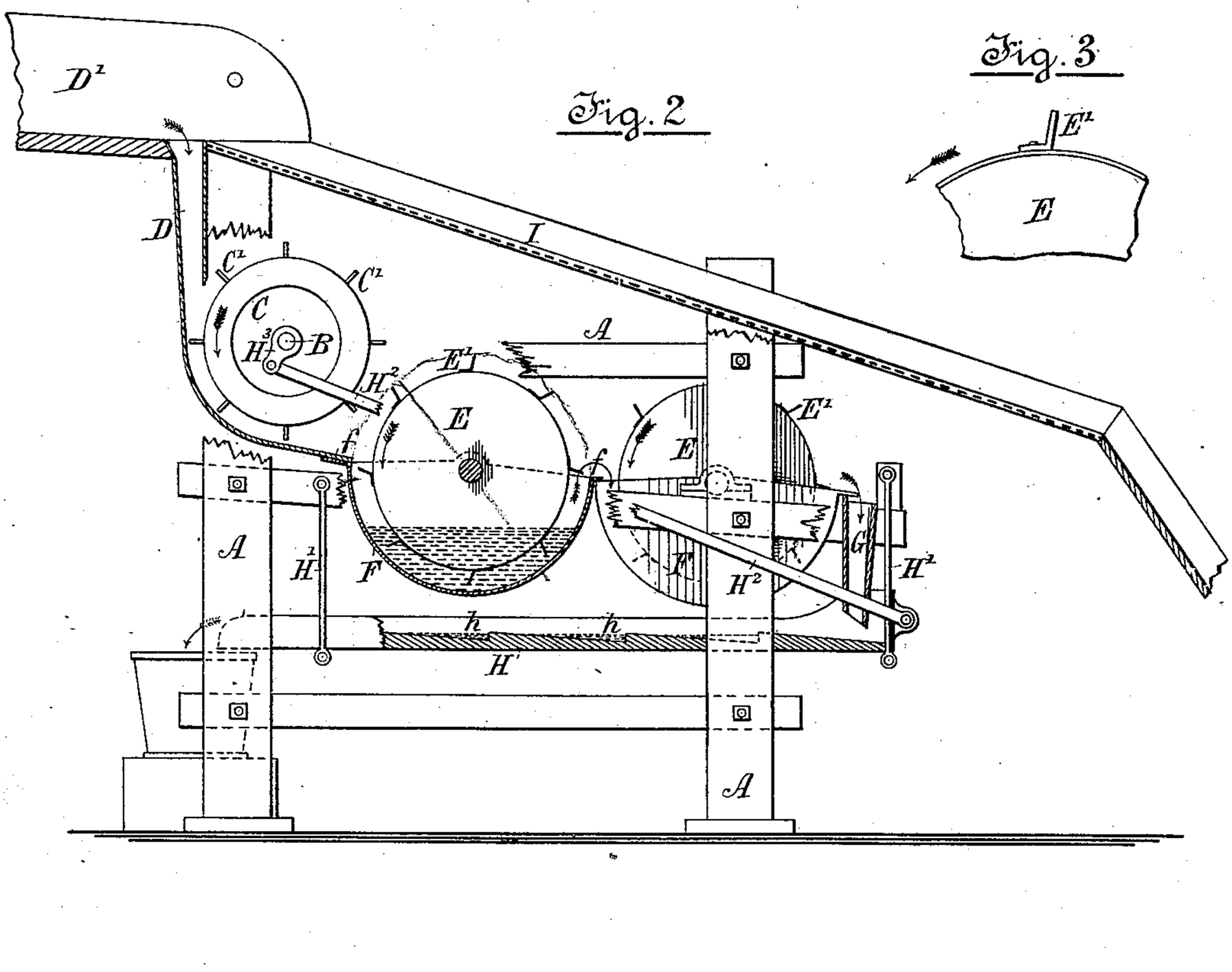

Fig. 2

Fig. 3

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APPARATUS FOR SEPARATING AND AMALGAMATING GOLD.

SPECIFICATION forming part of Letters Patent No. 253,785, dated February 14, 1882.

Application filed April 30, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES TAYLOR, of the city of Montreal, in the District of Montreal and Province of Quebec, in the Dominion of Canada, have invented certain new and useful Improvements in Apparatus for Separating and Amalgamating Gold and other Precious Metals; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention has for its object to provide an apparatus or machine for separating gold and other precious metals from the sand and gravel in which they are contained and converting same into amalgam, ready for the retort, which apparatus shall be at once simple in construction, cheap in first cost, and specially adapted for the greater saving of the precious metals which are at present lost in the tailings, and at the same time insure the passage of every particle through the mercury which is used to amalgamate the same.

The invention may be thus briefly described: In a frame suitably constructed for the purpose I mount a water-wheel, which is rotated by the stream flowing from the sluice, which stream also carries with it the sand and gravel containing the gold or other precious metals, and passes down through a water-way or channel underneath the wheel, thus rotating it in the direction of the flow. On the same frame, and in close juxtaposition to the water-wheel, I mount one or more drums, which revolve by the action of the stream in pans or dishes containing mercury, which pans or dishes are connected with each other and with the water-way in such a manner as to make a continuous channel from the sluice to the discharge-pipe, which is placed at the opposite end of the frame. This discharge-pipe leads onto a shaking-table hung from and extending underneath the frame, and the amalgam, after having passed over this shaking-table and having had the surplus mercury removed in the ordinary manner, is ready for the retort. An inclined grating is extended over the machine from the sluice to a point beyond the frame, to afford a passage for the non-yielding stones and gravel.

For more complete comprehension of my invention reference must be had to the annexed drawings, forming part of this specification, in which similar letters of reference denote like parts, and where—

Figure 1 is a plan view of my apparatus; Fig. 2, a sectional elevation of same, and Fig. 3 a detail of beater enlarged.

A represents the frame-work, of any suitable strength and construction, in which are formed bearings for a shaft, B, upon which revolves a water-wheel, C, provided with any desired number of floats, C′, on its periphery.

D is the water-way or channel down which the water from the sluice D′ brings the sand and small gravel containing the gold or other precious metal.

E E are drums or cylinders rotating on shafts carried in journals resting in the frame A. Where more than one drum are used their journals will be set on an incline extending downward from the water-wheel to facilitate the flow. These drums are formed preferably of wood sheeted with copper or other material of analogous properties, and have attached to their peripheries any desired number of beaters, E′, in the form of strips of copper fastened longitudinally to the drums. The outer edges of said beaters are not radial, but incline somewhat in the opposite direction to which the drums revolve.

F F are semicircular pans or dishes containing mercury, as indicated by the dotted lines in Fig. 2, and resting in the frame A in such position that they will be directly underneath the drums E E, their bottoms not being, however, close up to the edges of the beaters, a space being required for the purpose hereinafter mentioned. The flanges or lips of these pans, as shown at *f f*, are fitted to each other and to the lining of the water-way D, so as to make close joints and form a continuous channel from the sluice to the point of discharge, which is placed where shown at G, and leads onto a shaking-table, H, extending underneath the frame and swinging on a hanger, H′, the motive power being communicated through connecting-rods H^2, attached to said table and to cranks H^3, mounted on the shaft B. This shaking-table H is constructed with a series

of inclines or steps, the lower ends of each incline being covered with mercury, as shown at *h h*.

I is a grating, inclined and extending from the end of the sluice D′ to a point beyond the opposite end of the frame A, over which the larger and non-yielding stones and gravel will pass clear of the machine.

It will be seen that as the water from the sluice descends it brings with it into the water-way D the finer gravel and sand, which contains the gold or other precious metal sought to be saved. This, striking the floats C′ on the water-wheel C, causes it to revolve in the direction of the flow, and, passing under the wheel, the stream falls successively into the pans or dishes F F, causing the drums E E to revolve in the same direction, and the action of the beaters E′ serves to draw the particles containing the precious metal through the mercury placed in the pans, thus amalgamating the same. The mercury is not scraped over the edges of the pans, but is allowed by the inclined surfaces of the beaters E′ to slip back into its original position. Some of the amalgamated particles remain in the bottoms of the pans, out of reach of the beaters, and the rest pass over into the next receptacle, to be again driven through the mercury and out and down through the discharge-pipe G onto one end of the shaking-table H, whence they are shaken and propelled by the power communicated, as described, from one mercurial bath, *h*, to another until the amalgamation is completed and the particles fall into a receptacle provided for the purpose or are removed in any desired manner.

The amalgam which remains in the pans or dishes F after the operation is finished may be removed by rotating the semicircular dishes upon the drum-shafts and emptying their contents upon the shaking-table, a new supply of mercury being furnished when work is again commenced.

The above operation, as will be understood, precludes the possibility of even the smallest percentage of gold, &c., being lost, as it is obvious that every particle holding metal is obliged to pass through the mercury contained in some one of the vessels, for even should some of the lighter particles be washed over instead of under the drums they would fall down onto the shaking-table through the discharge-pipe; or, should the stream in the sluice be so strong as to force any of the valuable particles beyond the channel leading to the water-wheel, they would fall through the grating I into one of the pans underneath; and, furthermore, the mercurial baths on the shaking-table cannot fail to have the effect of thoroughly amalgamating all particles of metal which may have been imperfectly treated in the pans above.

Although I have herein described and shown two revolving drums, it must be understood that in some cases one will be sufficient, and in others it may be found desirable to use three or more. Again, my improved revolving drum may be used to good purpose when simply placed with its pan in the ordinary sluice, since the water-power is all that is relied upon to rotate same, and is very effective when used without any other apparatus whatever.

The peculiar properties of the copper when used for the beaters and sheeting of the drums are that it will not oxidize in the water, and it will speedily become coated with mercury, and thus serve to hold all the finer particles of gold, &c., which may come in contact therewith, thus materially aiding the process of amalgamation.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is as follows:

1. In an amalgamator, the combination, substantially as before set forth, of the rotating drums and the lipped pans pivoted to the shafts of said drums.

2. In an amalgamator, the combination, substantially as before set forth, of the drums, the lipped pans pivoted to the shafts of said drums, and the shaking-table beneath the pans.

3. In combination with a water-wheel, C, the drums E E, revolving in pans F F, and shaking-table H, substantially as and for the purposes described.

4. In combination with the revolving drums E E and pans F F, the grating I, shaking-table H, and means for shaking said table, as and for the purpose described.

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