

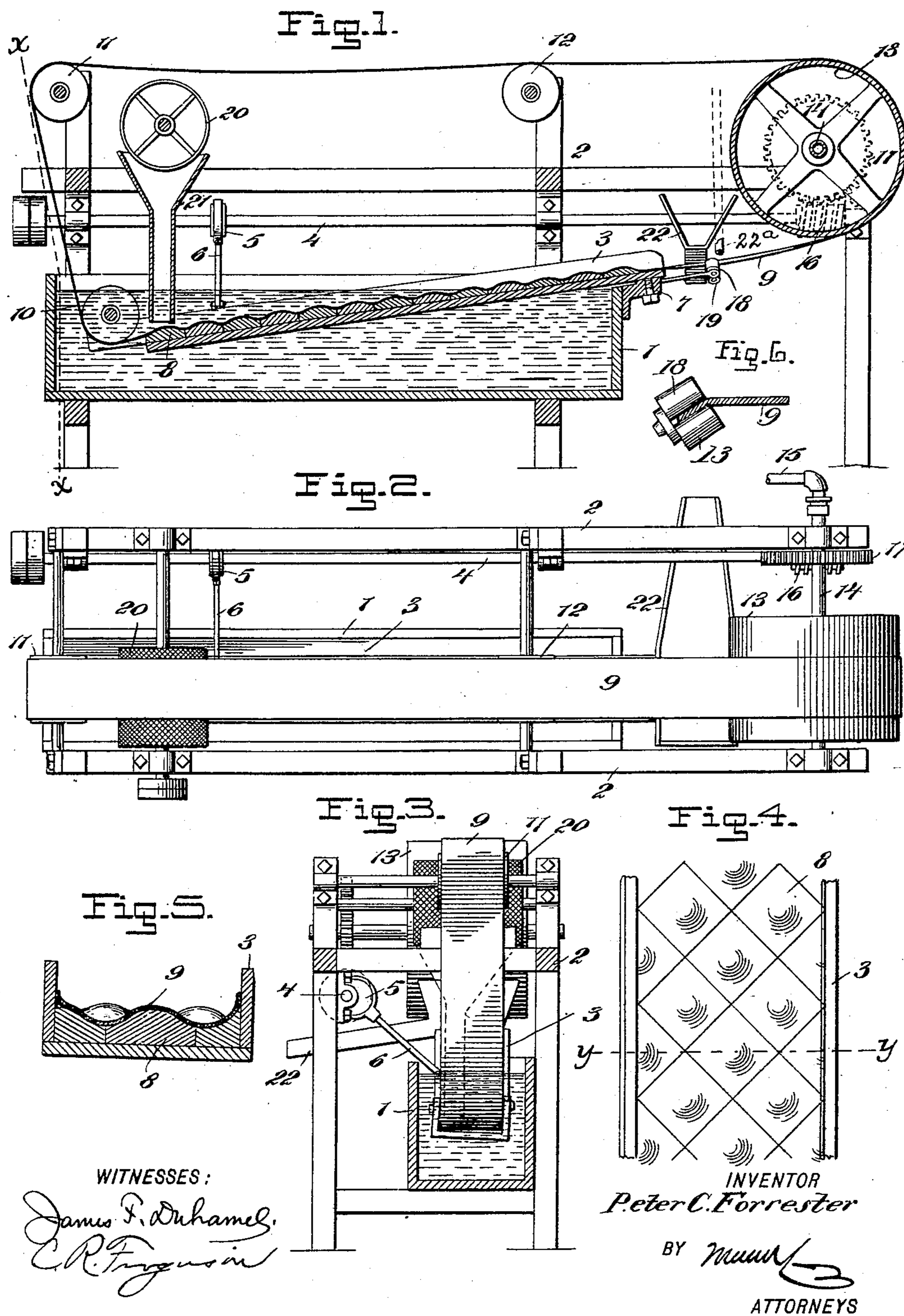
No. 682,053.

Patented Sept. 3, 1901.

P. C. FORRESTER.  
CONCENTRATOR.

(Application filed Mar. 15, 1901.)

(No Model.)



# UNITED STATES PATENT OFFICE.

PETER C. FORRESTER, OF SPRINGVALLEY, ILLINOIS.

## CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 682,053, dated September 3, 1901.

Application filed March 15, 1901. Serial No. 51,306. (No model.)

*To all whom it may concern:*

Be it known that I, PETER C. FORRESTER, a citizen of the United States, and a resident of Springvalley, in the county of Bureau and State of Illinois, have invented a new and Improved Concentrator, of which the following is a full, clear, and exact description.

This invention relates to improvements in concentrators for ores, and the object is to provide a device of novel construction for separating or grading ores, and especially for the gold sands in placer-diggings, where the fine gold has a tendency to float away by excess of water used for concentration.

I will describe a concentrator embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of a concentrator embodying my invention. Fig. 2 is a plan view. Fig. 3 is a section on the line *xx* of Fig. 1. Fig. 4 is a plan view of a portion of the sluice-box and concentrating-belt. Fig. 5 is a section on the line *yy* of Fig. 4, and Fig. 6 is a detail showing belt-flattening rollers employed.

Referring to the drawings, 1 designates a water-tank supported in a suitable frame 2. Arranged in this tank is a sluice-box 3, which is designed to have a reciprocating motion either lengthwise or transversely. I have here shown it as having transverse movement imparted to it from a driving-shaft 4, having an eccentric 5, from which an eccentric-rod 6 extends to the sluice-box. This sluice-box is arranged longitudinally of the water-tank and at an incline, and its upper end has a pivotal connection 7 with a bracket at the discharge end of the tank. Arranged within the sluice-box is a series of blocks 8. These blocks are of varying height and alternate one with another, the projections gradually diminishing from the feed end of the sluice to the outlet end. This is designed to give a wave-like action to the sand containing gold carried over the blocks by the concentrating-belt 9, the portion of the belt passing over the blocks being pressed into the depressions by the weight of the sand thereon. This end-

less belt 9 consists of canvas or other suitable material and passes around an idler 10 in the lower end of the sluice-box, thence over idlers 11 and 12 on uprights of the frame 2, and around a heating drum or roller 13. This heating drum or roller 13 is provided with a tubular shaft 14, into which a heating medium may pass from a pipe 15. The heating medium may consist of steam or hot air. Rotary motion is imparted to the heating-drum by means of a worm 16 on the driving-shaft 4 engaging with a gear 17 on the shaft of the roller. The belt 9 is arranged at a transverse incline in the sluice-box and is somewhat wider than the sluice-box, so that in passing through the same the edges of the belt will be turned upward, as clearly indicated in Fig. 5, preventing an overflow of material at the sides thereof. When passing from the sluice-box, however, the belt will be flattened out by means of rollers 18 and 19, engaging, respectively, with the top and bottom of said belt at the edges.

In operation the sand containing metal is fed into a rotating perforated cylinder 20, from which it falls through a chute 21 onto the belt 9 at the lower end of the sluice and at the higher side of the belt. The material as it is carried upward will be caused to separate by the vibrating motion of the sluice—that is, the heavy particles, such as gold, will remain at the higher side of the belt, while the lighter material will pass to the lower side and discharge with water from a pipe 22<sup>a</sup> at the upper end of the belt. The values will be carried with the belt around the heating-drum, which will thoroughly dry the values and also dry the belt for future operation, and these dry values will fall into the discharge-spout 22.

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

1. A concentrator, comprising a water-tank, a vibrating sluice arranged in said tank, blocks arranged in the bottom of the sluice and having varying height, the said projections diminishing toward the outlet end of the sluice, and an endless belt movable through said sluice and upon said blocks, substantially as specified.

2. A concentrator, comprising a water-tank,

a sluice-box arranged at an incline in said tank, means for causing a vibrating motion of said sluice-box, blocks of varying height arranged in said sluice-box, an endless band 5 movable through said sluice-box and over the blocks, and a heating-drum around which said band passes, substantially as specified.

3. A concentrator, comprising a tank, a sluice-box mounted to swing in said tank and 10 having a wave-like bottom, an endless belt or band movable over said wave-like bottom at a transverse incline, a heating-drum around which the band passes, idlers over which the band passes, and a receiver for values dis- 15 charged from the heating-drum, substantially as specified.

4. A concentrator, comprising a water-tank, a sluice arranged at a lengthwise incline in said tank, blocks of varying height arranged 20 in said sluice, an endless belt movable over said blocks at a transverse incline, a heating-drum around which the belt passes, a receiver

for the values discharged from the drum, and a feeding device at the lower end of the chute, substantially as specified. 25

5. A concentrator, comprising a fixed tank, a sluice arranged at an incline in said tank, an endless band of canvas movable through said sluice, a heating-drum around which the band passes, means for discharging a heat- 30 ing medium into said drum, a driving-shaft for the drum, an eccentric connection between said shaft and the sluice, a receiver for material discharged from the drum, a perforated feed-drum at the lower end of the sluice, and 35 a chute for receiving material therefrom, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

P. C. FORRESTER.

Witnesses:

R. B. CUMMING,  
C. P. McDONALD.