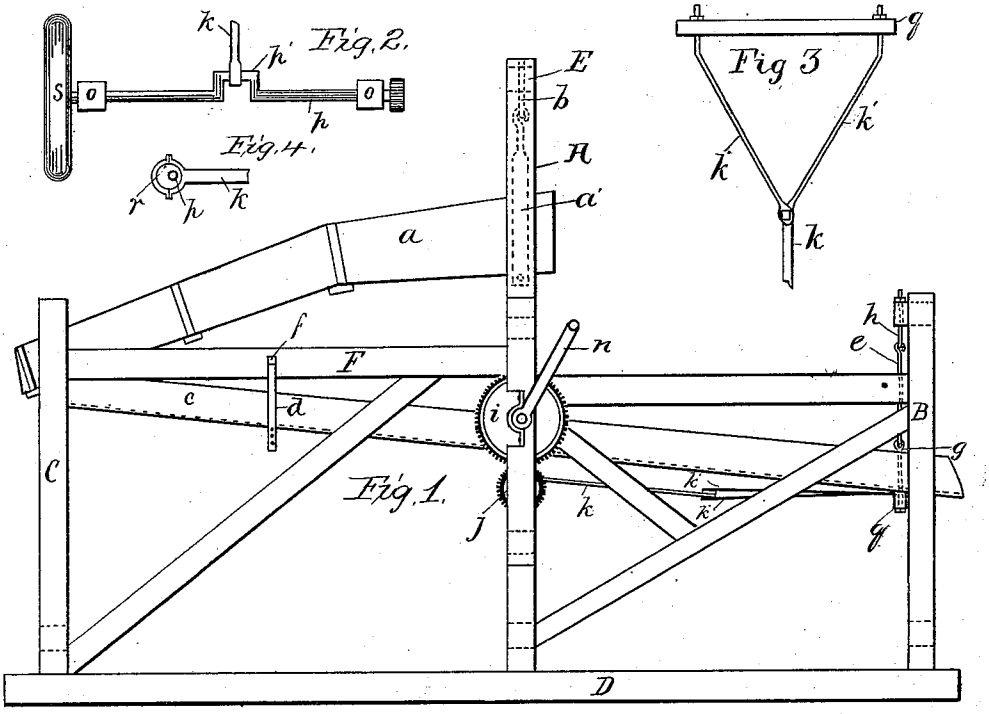
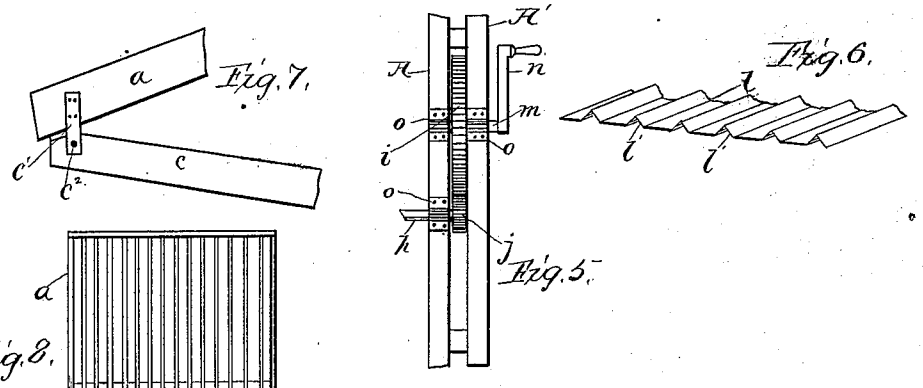
(No Model.)

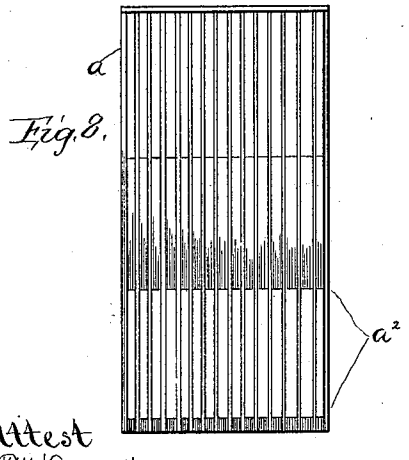
J. N. RANDEL.

CONCENTRATOR.

No. 332,831. Patented Dec. 22, 1885.







Attest
W. C. Dermott
Joseph L. Putman

Inventor
John N. Randel
by O'Brien & Co
his Attorneys.

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN N. RANDEL, OF CASTLE ROCK, COLORADO.

CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 332,831, dated December 22, 1885.

Application filed August 20, 1885. Serial No. 174,912. (No model.)

To all whom it may concern:

Be it known that I, JOHN N. RANDEL, a citizen of the United States, residing at Castle Rock, in the county of Douglass and State of Colorado, have invented a new and useful Concentrator, of which the following is a specification, reference being had to the accompanying drawings, in which the same letters refer to the same or corresponding parts.

My invention relates to improvements in concentrators for treating auriferous or argentiferous sand in placer-mining; and the object of my improvements is to provide a simple and effective means for separating the particles of precious metal from the crude material with which they are found mingled in placer-mines, all of which is hereinafter fully described and claimed.

In the drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a top view of a propelling-shaft and its attachments. Fig. 3 is a top view of a portion of a branched rod by means of which motion is communicated to the concentrating-box. Fig. 4 is an eccentric. Fig. 5 shows the gearing, shafting, crank, &c., by means of which motion is communicated to the machine. Fig. 6 is a perspective view of a portion of the riffled plate in the bottom of the concentrating-box. Fig. 7 shows the manner of attaching the hopper to the concentrating-box. Fig. 8 is a top view of the hopper.

The standards A, B, and C, one on each side of the machine, together with the horizontal bottom beams, D, one on each side of the machine, all being properly connected and braced, as shown in Fig. 1, constitute the frame-work of my machine.

a is a hopper occupying the oblique position shown in Fig. 1. Hopper *a* is supported between the standards A at one extremity by means of metal straps *a*, which are attached to the hopper *a* below, and hooked into the eyes of hangers *b* above, said hangers being attached to the cross-beam E, as shown by dotted lines in Fig. 1. The mouth of hopper *a* is attached to the rear extremity of concentrating-box *c* by means of metal straps *c'*, as shown in Fig. 7. Straps *c'* are attached to concentrating-box *c* by means of rod c^2, which extends across box *c*, passing through its sides. Straps *c'* are pivoted to rod c^2. The upper two-thirds of the bottom of hopper *a* consist of a board, on top of which are placed metal bars, which extend the entire length of the hopper, forming a screen, a^2, above the mouth of the same, for a distance of about one-third of its length, as shown in Fig. 8. The concentrating-box *c* is suspended between the standards A, B, and C by means of hangers *d* and rods *e*.

There is a hanger, *d*, on each side of the machine, only one being shown in the drawings. Each hanger *d* is pivoted at its lower extremity to the concentrating-box, and the upper extremity of each of said hangers is attached to a beam, F, by means of a bolt, *f*, which allows said hangers to turn readily upon the same as the box *c* moves back and forth when the machine is in operation.

There are two rods, *e*, exactly alike and on opposite sides of the machine, only one of said rods being shown. Each extremity of the rods *e* is hooked into the eye of a bolt, the lower extremity being attached to bolt *g* and the upper extremity to bolt *h*. Bar *q* is attached to the concentrating-box *c* by means of bolts *g*, one of said bolts being on each side of the machine, only one being shown in the drawings. Each bolt *h* (there being two) is attached to the frame-work of the machine, as shown in the drawings.

In the bottom of concentrating-box *c* and covering said bottom is placed a plate, *l*, constructed of any suitable sheet metal, in which plate are formed the riffles *l'*, as shown in Fig. 6. The riffled plate *l* may be fastened to the bottom of box *c* in any suitable manner.

Attached to the outside of one of the standards A is the short standard A', with sufficient space intervening for the reception of the cog-wheels *i* and *j*. Journaled to standards A and A', in suitable journal-boxes, *o*, is the shaft *m*, to which the crank *n* and the cog-wheel *i* are attached, said cog-wheel being between the standards A and A' and meshing with a smaller cog-wheel, *j*, upon the shaft *p*, said shaft being journaled to standard A, as shown. Shaft *p* extends beneath the riffled box, and is also journaled to the opposite standard A. The central portion of shaft *p* is formed into a crank, *p'*. (Shown in Fig. 2.) To crank *p'* is attached one extremity of rod *k*, the other extremity of said rod being attached to two short

rods, k', which branch outward as they extend backward, where they are fastened to bar q by means of nuts, as shown in Fig. 3.

In the place of crank p' an eccentric, r, may be used, said eccentric being attached to the center of shaft p. To one extremity of shaft p is attached the fly-wheel s, as shown in Fig. 2.

In the operation of my improved concentrator man-power may be used, in which case the power is applied by means of the crank n. A band-wheel or chain-wheel may be placed on shaft m in place of the crank, and the machine may then be run by steam-power, horse-power, or any other power, as may be desired. Power being applied to the shaft m, the cog-wheel i is made to revolve, which imparts motion to the shaft p. The motion of the shaft p moves the rod k back and forth, whether the crank p' or the eccentric r is used. The motion of the rod k imparts motion to the concentrating-box c by virtue of the mechanism herein described. The motion of the concentrating-box imparts a similar movement to hopper a. Power being applied to the machine, as aforesaid, the material to be treated is placed in the upper part of hopper a, and immediately precipitated upon the screen a^2 in the lower portion of the hopper, which screen rejects the coarse worthless material and throws it from the machine, the sand and valuable particles of metal passing through the screen into concentrating-box c. As the material passes over the riffled plate in box c it is deprived of its precious metal, the particles of which are retained by the riffles, which are especially adapted by their peculiar shape to save all the valuable metal contained in the material fed into the box c while the same is in motion, as before described. After being deprived of all that is valuable, the worthless material is discharged from the machine at the rear and lower extremity of box c.

The water required in operating the machine may be discharged into the hopper a by any suitable means.

Several of my improved machines may be placed side by side upon a single frame, with one shaft, p, extending through all, so that all may be operated by the same power applied to shaft m.

In "cleaning up" the riffled plate l may be removed from box c or not, as may be desired.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In a concentrator, the combination of a suitable frame, the concentrating-box c, provided with the riffled plate l, said concentrating-box being supported as described, and mechanism for operating box c, consisting of gear-wheels i and j, shaft p, provided with crank p', rod k, provided with branches k', and bar q, substantially as shown and described, and for the purpose set forth.

2. A concentrator comprising a suitable frame, the hopper a, supported as described, concentrating-box c, supported as described, and provided with riffled plate l, and mechanism for operating hopper a and box c, consisting of gear-wheels i and j, shaft p, provided with eccentric p' and fly-wheel s, rod k, provided with branches k', and bar q, substantially as shown and described, and for the purpose set forth.

This specification signed and witnessed this 10th day of August, A. D. 1885.

JOHN N. RANDEL.

In presence of—
R. M. McDERMOTT,
JOSEPH L. PUTNAM.