

(No Model.)

C. E. SEYMOUR.
ORE CONCENTRATOR.

No. 461,893.

Patented Oct. 27, 1891.

Fig. 1.

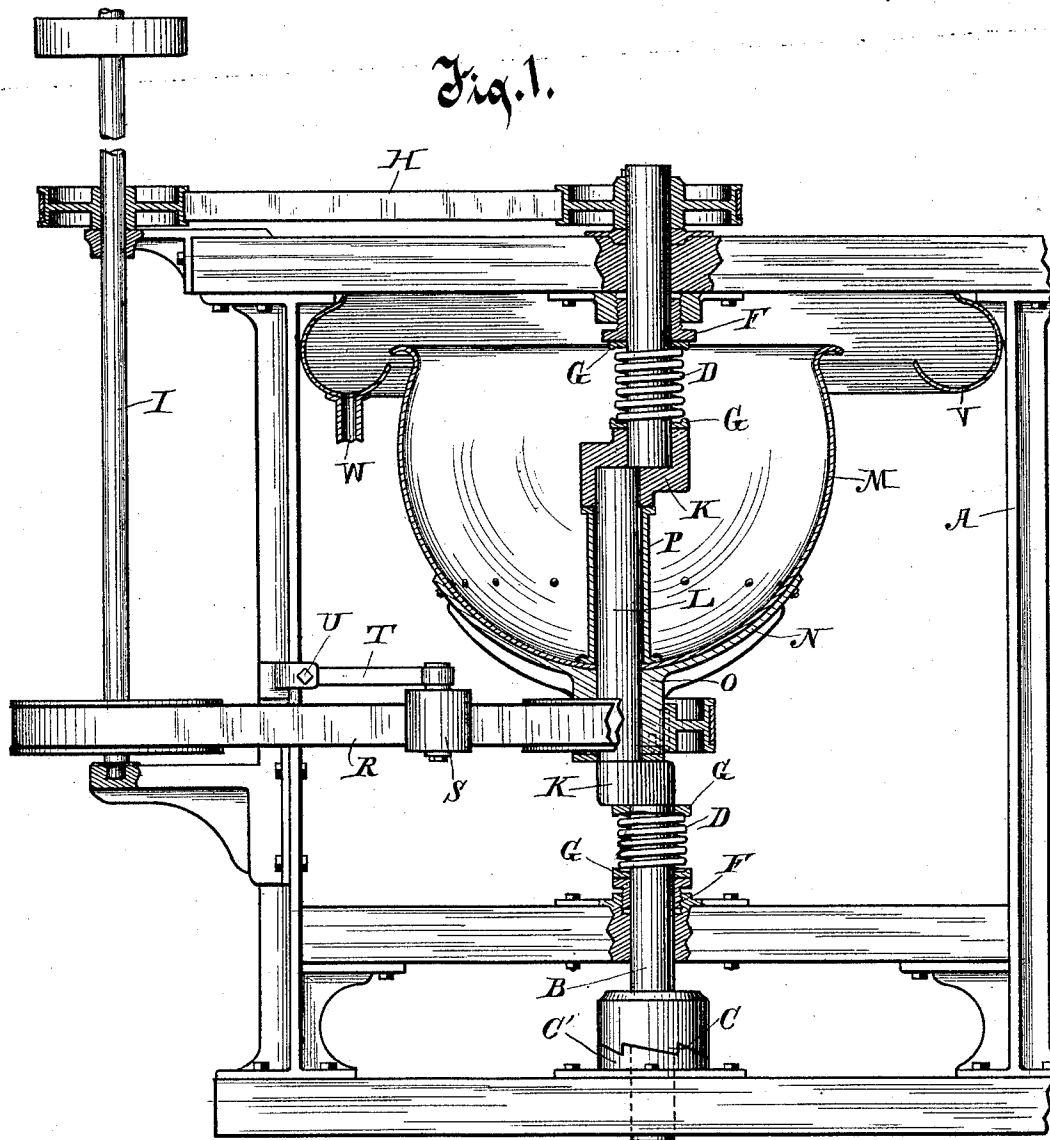
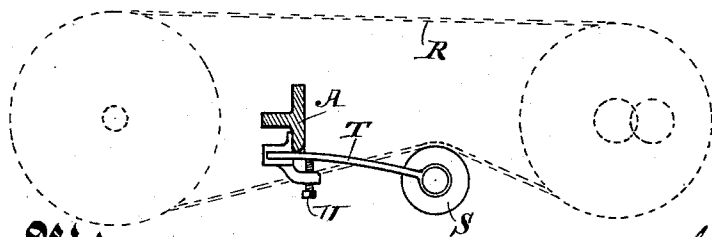


Fig. 2.



Witnesses.

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CHARLES E. SEYMOUR, OF HURLEY, WISCONSIN.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 461,893, dated October 27, 1891.

Application filed January 10, 1891. Serial No. 377,328. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SEYMOUR, of Hurley, in the county of Ashland and State of Wisconsin, have invented a new and useful Improvement in Ore-Concentrators, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention relates to improvements in the means for supporting and rotating the bowl of an ore-concentrator of the class adapted to separating heavy ores from earthy and pulverized refuse by the use of water in connection with centrifugal force and gravitation.

In the drawings, Figure 1 is an elevation of my complete device, parts being broken away and other parts being shown in section to exhibit the construction most advantageously. Fig. 2 is a plan detail of the belt-tightening device shown in Fig. 1 and adapted for use with the bowl-rotating belt.

A is the frame of proper form for supporting the operative mechanism. A vertical shaft B is journaled in the frame and is provided with a crown-cam C, bearing against the corresponding cam C', fixed on the frame, whereby as the shaft revolves it is jumped up and down. Springs D D, coiled about the shaft, bear inwardly toward each other against crank-arms K on the shaft B and outwardly in reverse directions against the adjustable screw-threaded boxes F F, turning by their screw-threads into journal-blocks fixed in the frame. Washers G G are interposed between the springs D D and the boxes F F and crank-arms K K. The concentrator-shaft B is driven by the belt H, running on a pulley thereon and on the driving-shaft I. The shaft B is provided medially with a double crank K, having a wrist L. A concave concentrator-bowl M is pierced centrally by and is supported on the wrist L. The bowl M is fitted into and is fixed upon a cup-shaped plate or flange N, provided with a hub O, also pierced by the wrist L. The hub O rests on the lower crank K and with the bowl is revoluble on the wrist. A sleeve P about the wrist L is secured water-tight at its lower end to the bowl M and at its upper end bears movably water-tight against the upper crank K. By this construction the bowl is made water-tight about the wrist L. A belt R, running

on a pulley fixed on the hub O and on a pulley on the shaft I, is adapted to rotate the bowl on the wrist L independently of the revolving or whirling of the bowl with the crank on the shaft B. For taking up the slack of the belt R occurring at each revolution of the shaft B, an idle-pulley S is used, which is held yieldingly against the belt R, conveniently by an elastic arm T, fixed to and supported on the frame, and in the free end of which the pulley S is journaled. I have shown the elastic arm T as fixed to the frame removably by means of a holding-screw U, turning through a bracket fixed on the frame against the arm, the end of the arm being inserted in a socket therefor in the bracket. Any other equivalent form of holding the idle-pulley S yieldingly against the belt R could be used without departing from the spirit of my invention. An annular trough V, supported on the frame, is located just below and outside the line of motion of the top of the bowl to catch the overflow of water therefrom and discharge it through the pipe W.

By means of the mechanism described the bowl when in use is given three independent motions concurrently in point of time. The revolving of the shaft B carries the bowl around on the wrist L in a circle and jumps it up and down on the cam C, while the belt R, running on the pulley on the hub O, rotates the bowl on the wrist L.

In use the bowl is supplied with water and with pulverized rock and mineral, and by the motion of the bowl the refuse is separated from the mineral, the heavier particles of ore settling to the bottom of the bowl, while the pulverized rock or earthy parts rise with the portion of the water that is carried upwardly by centrifugal force and is carried over the edge of the bowl into the trough V with that portion of the water that is thrown off by the motion of the bowl. The pulleys on which the belts H and R respectively run are at their corresponding ends respectively different in size and may be varied as necessary to secure the differential motion desired.

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

1. In an ore-concentrator, a vertical shaft, a double crank forming a medial part thereof,

and a concentrator-bowl supported revolvably on the wrist of the crank, combined substantially as described.

2. In an ore-concentrator, a vertical revolving shaft, a crank fixed on the shaft, a bowl supported rotatably on the wrist of the crank and revolving therewith, and means for rotating the bowl on the wrist, all combined substantially as described.

3. In an ore-concentrator, a vertical revolving shaft, a crank fixed on the shaft, a bowl supported rotatably on the wrist of the crank, a belt running from a power-supply on a pulley fixed on the hub of the bowl, and an idle-pulley held yieldingly against the belt running on the hub of the bowl, adapted to take up the slack of the belt caused by its revolution of the crank, substantially as described.

4. In an ore-concentrator, a vertical shaft, springs thereabout supporting the shafts yieldingly vertically, a cam on the shaft adapted to reciprocate the shaft endwise, a medial

crank formed in the shaft, a bowl supported water-tight and revolvably on the wrist of the crank, means for rotating the concentrator-shaft, a belt running from a power-supply on a pulley fixed on the hub of the bowl, and an idle-pulley held yieldingly against the belt running on the hub of the bowl, adapted to take up the slack of the belt caused by its revolution with the crank, all combined substantially as described.

5. In an ore-concentrator, a vertical revolving cranked shaft, a bowl supported rotatably on the wrist of the crank, registering-cams on the shaft and on the frame for jumping the shaft up and down, and means for rotating the shaft, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES E. SEYMOUR.

Witnesses:

C. T. BENEDICT,
ANNA V. FAUST.