(No Model.)

C. F. ESCHWEILER.

ORE SEPARATOR.

No. 247,549 Patented Sept. 27, 1881.

Fig. 2.

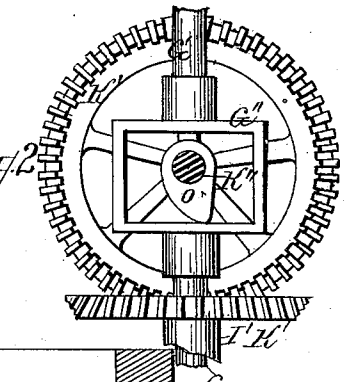
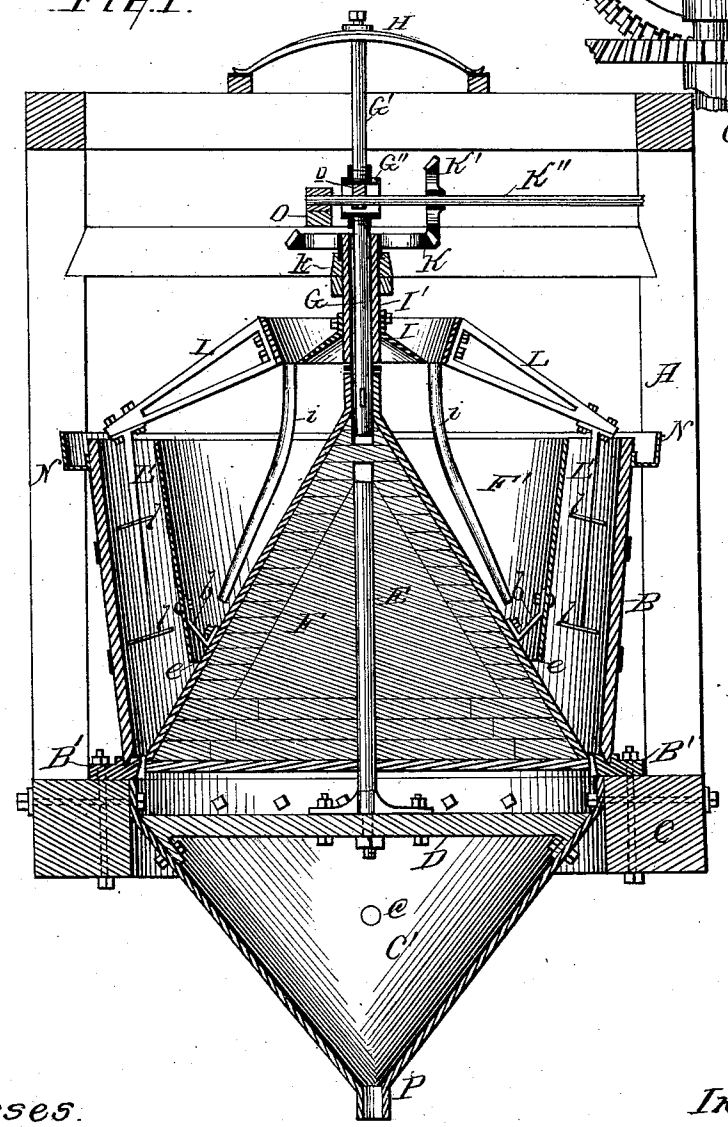


Fig. 1.



Witnesses.
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UNITED STATES PATENT OFFICE.

CHARLES F. ESCHWEILER, OF HOUGHTON, MICHIGAN.

ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 247,549, dated September 27, 1881.

Application filed May 16, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. ESCHWEILER, of Houghton, in the county of Houghton, and in the State of Michigan, have invented certain new and useful Improvements in Ore-Separators; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to devices for separating metalliferous matters from slime in mining, and will be fully described hereinafter.

In the drawings, Figure 1 is a central vertical section of my invention, and Fig. 2 is a detail.

A is the frame that supports my apparatus, which is composed of a keeve, B, resting in a flange, B′, which is secured to a circular sill, C, and to this sill I attach a funnel, C′, braced near its mouth by a bar, D, which also serves as a support for an upright rod, E, upon which I slip a cone, F, and to which I attach by brackets *b* a circular apron, F′, a space being left between the lower edge of the cone and apron to permit the slime to pass into the space between the apron F′ and the side of the keeve B.

The diameter of the cone at its base is one thirty-second of an inch less than that of the circle formed by the flange B′, so that when suspended in the keeve the cone may have free play up and down, and there will be a circular passage between the base of the cone and keeve.

The cone is suspended from a spring, H, by rods G and G′, which have secured to and between them a housing, G″. The rod G is keyed to the cone at its apex, and the rod E, that extends up from bar D, passes into the center of the cone and serves to steady it.

Above the cone I suspend a hopper, I, by a hollow shaft, I′. This shaft I′ turns in bearings *k*, and revolves about an axis formed by rod G, and gets its motion from a bevel-gear, K K′, and horizontal shaft K″. The shaft K″ projects beyond the wheel K′, through housing G″, to a bearing in beam O, having keyed to it between the wheel K′ and beam a cam, *o*, which operates in the housing as shaft K″ turns to depress rod G and the cone against the lifting force of the spring.

To the bottom of the hopper I, I attach metal tubes *i i*, that project down into the space between the apron F′ and the cone for feeding the slime, and to the outside of the hopper I attach two or more brackets, L L, that carry rods L′ L′, upon which I secure squares or disks of metal *l l*, preferably inclined, as shown. These rods depend into the space between the apron F′ and keeve B, so that during the revolution of the hopper I they are carried around through the slime and tend to throw the lighter particles toward the surface.

The apparatus, as before stated, gets its motion from shaft K″, (which may be revolved by steam or any other power,) the bevel-gear turning the hollow shaft I′ of the hopper, and the cam *o* depressing the cone-rod G slowly, to be quickly lifted by spring H.

Before the machine is started a stream of "slime"—*i. e.*, mud obtained from wet grinding or stamping ores—is let into the hopper I, from whence it passes into the space between the cone F and apron F′, and thence through opening *e* to the keeve B. A stream of clear water is now admitted to the funnel C′ through opening *c* and the machine started. While the hopper revolves, distributing the slime through pipes *i i* to the space between the cone and apron and carrying the rods L′ L′ about through the slime, the cone will be slowly depressed by each revolution of shaft K, displacing the water in the mouth of the funnel and forcing it up about its sides into the slime in keeve B, and this upward current, acting more readily on the lighter particles of the slime, will carry them toward the surface, leaving the heavier particles at the bottom. The cam, having spent its force, now releases the cone, and the spring suddenly raises it, causing a vacuum in the mouth of the funnel, and drawing the lower stratum of slime from the keeve into the funnel, whence it drops through spout P to a concentrator. (Not shown.) The lighter matter which flows over the sides of the keeve falls into a trough, N, from whence it may be conveyed off in any convenient manner.

Parts of my device may be variously modified without any departure from the spirit of my invention. For instance, for the brackets L L and rods L′ L′, I may substitute merely

bent rods. Instead of placing the brackets *b*, which connect the apron and cone together, in the space between the apron and cone, I may attach one arm of the brackets to the outside of the apron and the other arm to the cone at a point below the lower edge of the apron.

The cone F, as shown in the drawings, is built up or formed of several layers of wood, and then turned down to the proper size and taper, after which it is faced with metal; but I contemplate at times dispensing with the facing, and, under some circumstances, I may turn it from an entire block.

The circular opening that admits the rod E into the cone F extends far enough to permit the necessary up and down play of the cone.

Instead of securing the funnel C′ to the inside of the sill C by a vertical flange, I may form a horizontal rim upon it, and, half-grooving the inner edge of the sill, drop the rim of the funnel into the groove, place the flange B′ upon it, and secure both in place by the same bolts.

What I claim as my invention is—

1. In an ore-separator, the combination of a cone suspended from an elastic support and a device for depressing it intermittingly with a keeve, B, as set forth.

2. In an ore-separator, the combination of a cone, having apron F′, with a keeve and mechanism for lifting and depressing the cone, as set forth.

3. In an ore-separator, the combination, with a keeve, B, and funnel C′, of the cone F and mechanism for lifting and depressing the cone, as described.

4. In an ore-separator, the combination of the revolving hopper I, having arms L′ L′, bearing fans *l l*, and feeding-tubes *i i*, depending therefrom, with a cone, F, apron F′, and keeve B, and mechanism for lifting and depressing the cone, as shown and described.

5. The combination of a cone and mechanism for lifting and depressing it with a hopper placed above the cone and mechanism to revolve the hopper, as set forth.

6. The combination of cone F, revolving hopper I, rod G, gear-wheels K K′, shaft K″, housing G″, spring H, and cam *o*, as set forth.

7. The combination of hopper I, hollow shaft I′, gear-wheels K K′, shaft K″, housing G″, rod G, spring H, and cam *o*, and a depending cone, as set forth.

8. The combination of cone F, rods G G′, housing G″, and spring H with shaft K″, carrying cam *o*, as set forth.

9. The combination, with cone F, of its steadying-rod E and operating mechanism, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 15th day of April, 1881.

CHAS. F. ESCHWEILER.

Witnesses:

STANLEY S. STOUT,

HAROLD G. UNDERWOOD.