(No Model.)

I. W. HEILIG.

PULVERIZER AND CONCENTRATOR.

No. 418,514. Patented Dec. 31, 1889.

Fig. 1

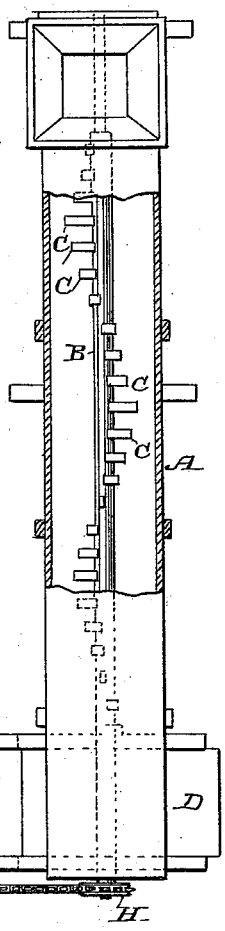


Fig. 3.

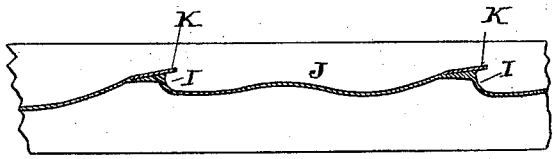


Fig. 4

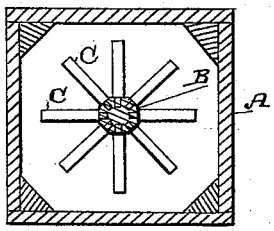
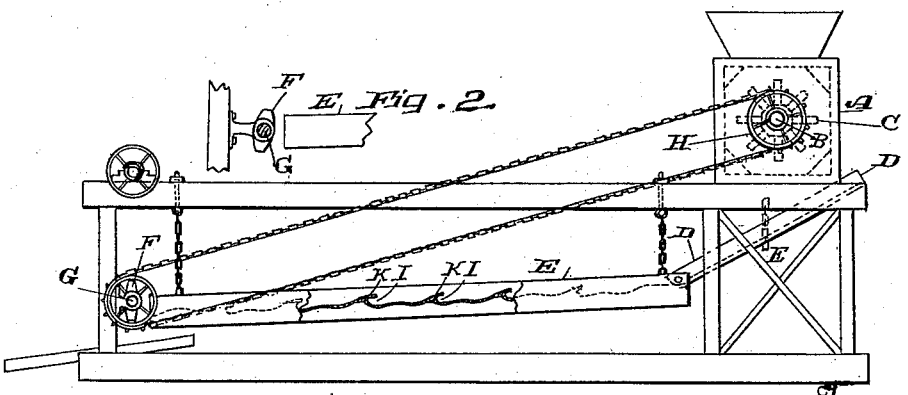


Fig. 2.



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UNITED STATES PATENT OFFICE.

IRWIN W. HEILIG, OF POTTSTOWN, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO SAMUEL K. SNODGRASS, OF DELAWARE, OHIO.

PULVERIZER AND CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 418,514, dated December 31, 1889.

Application filed April 3, 1889. Serial No. 305,893. (No model.)

To all whom it may concern:

Be it known that I, IRWIN W. HEILIG, of the city of Pottstown, county of Montgomery, State of Pennsylvania, have invented an Improvement in Pulverizers and Concentrators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device for pulverizing and concentrating gravel, earth, or material containing valuable or precious metals, and is especially adapted for use in placer mines, where the earthy material needs to be broken and pulverized in order to separate it from the more valuable gold which is contained therein; and my invention consists of the constructions and combinations of devices which I shall hereinafter fully describe and claim.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a plan view of my apparatus with a part of the conveyer-box broken away to show the construction of the pulverizer and carrier. Fig. 2 is a side view, a part of the side of the concentrator being broken away. Fig. 3 is a vertical section of a part of the concentrator. Fig. 4 is a transverse section of the conveyer-box.

A is a box or casing, which is made of considerable length, properly supported in the horizontal position and having a flat hopper at or near one end. This casing may be made in various ways. I have found a very suitable way to make it of heavy planking, rectangular in form, but having the inner angles filled, so that its interior presents an octagonal form. Within this box is journaled a shaft B, extending from end to end through the center, and this shaft has fixed in it radial projecting arms C, which are preferably composed of iron about five-eighths of an inch thick by one and one-half inch wide and of such a length as to project about six inches from the outside of the shaft, which may be made of timber or other material and is about six inches in diameter, thus giving sufficient hold for the arms, which are driven into holes made in the sides of the shaft. These holes are bored so as to form a spiral around the shaft.

By means of a pulley upon one end of the shaft, which projects beyond this inclosing-case, the shaft and arms are caused to rotate with any desired speed, being preferably from two hundred revolutions a minute upward. The angular faces of the projecting arms C strike the material which is delivered into the casing from the hopper, so as to beat and pulverize it, separating it also from any material which may cling to it, and the angular arrangement of the faces of these arms enables them to gradually advance the material from the feed end toward the discharge end of the casing, which casing may be upward of twenty feet in length, if desired. This pulverizing may take place in a dry condition, or water may be admitted with the material, so that it will form a pulp of greater or less consistency, and the mass when it reaches the discharge end of the casing falls upon an inclined chute D. This chute extends from the shaking-table E and discharges upon it. The table and the chute are suspended by ropes or chains from a convenient point above, and are caused to shake or oscillate endwise by means of a cam F, mounted upon a transverse shaft G, which has a chain or sprocket wheel keyed to it, so that it may be caused to rotate directly by means of a chain passing over the wheel H upon the end of the pulverizing-shaft.

The bottom of the shaking-table is made of sheet metal fixed between sides sufficiently above its level to prevent the escape of the material over the sides, and this bottom is provided with depressions I at intervals from one end to the other, and between the depressions undulating or wave-like surfaces, as shown at J, which greatly assist the separation of the valuable material from the lighter waste material. At the lower or discharge edge of each of these depressions is formed or fitted a projecting ledge K, which extends across the table at this point, and, projecting over the depression I, forms a sort of pocket, within which the heavier gold or valuable material will be settled by the constant shaking motion of the table and will be prevented from escaping down the sluice. The lighter materials will be carried down by the water

which is delivered upon the table or sluice until it is discharged at the lower end and escapes through a wasteway.

The apparatus being set in motion, it will be manifest that the concentrator will be oscillated in proportion to the speed of the pulverizer, so that the material which is delivered into and operated upon by the pulverizer will be discharged upon the incline, and from thence to the concentrating-table, the operation of which will be proportionate to the speed of the pulverizer, thus enabling it to take care of all the material which is supplied to it.

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

1. The combination, with a pulverizer and its operating mechanism, of a vibrating concentrator having its bottom formed with wave-like surfaces and depressions, and having ledges K projecting over the pockets, substantially as described.

2. The combination, with a pulverizer and its operating mechanism, of a vibrating concentrator having its bottom formed of wave-like surfaces and depressions and having ledges overhanging the pockets, means for vibrating the concentrator, and an inclined chute between the pulverizer and concentrator, substantially as described.

In witness whereof I have hereunto set my hand.

IRWIN W. HEILIG.

Witnesses:
T. L. RIDDLE,
S. K. SNODGRASS.