

(No Model.)

H. M. COPLAND.  
ORE SEPARATOR.

No. 570,843.

Patented Nov. 3, 1896.

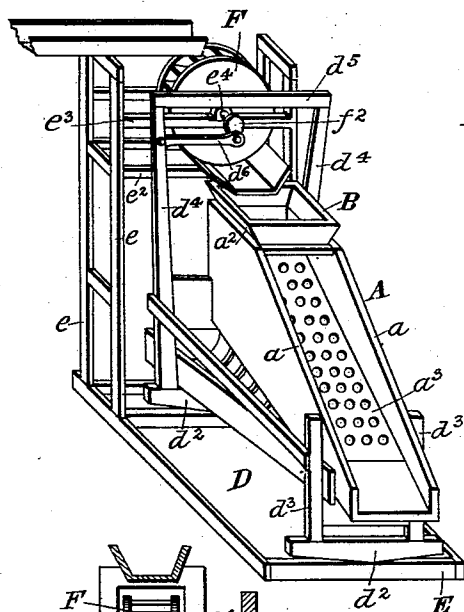


Fig. 1.

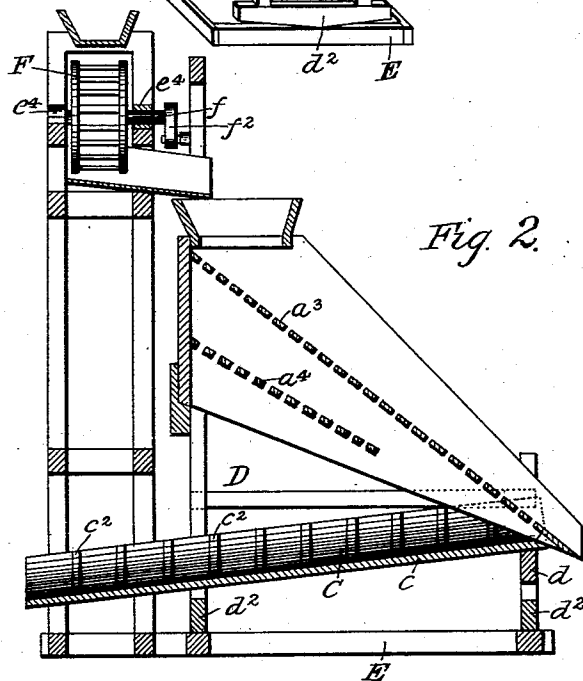


Fig. 2.

Witnesses:

James M. Stewart

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Inventor:

Henry M. Copland,

by - A. S. Newforth,  
his Attorney.

# UNITED STATES PATENT OFFICE.

HENRY M. COPLAND, OF SCOTTSBURG, OREGON.

## ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 570,843, dated November 3, 1896.

Application filed January 8, 1896. Serial No. 574,740. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY M. COPLAND, a citizen of the United States, residing at Scottsburg, in the county of Douglas and State of Oregon, have invented certain new and useful Improvements in Ore-Separators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to ore-separators.

The object is to produce an apparatus that will effect the rapid separation and saving of the fine or "flour" gold contained in gold-bearing sand, together with any large or small nuggets that might be held thereby; furthermore, to produce an apparatus in the nature of a "knockdown" structure that may readily be taken apart for shipment and put together again by a person of ordinary ability; furthermore, to produce an apparatus that will be simple of construction, efficient and durable in use, and one that may be constructed at but a slight cost.

With these objects in view the invention consists in the novel construction and combination of parts of an ore-separator, as will be hereinafter fully described, and pointed out in the claim.

In the accompanying drawings, forming a part of this specification, and in which like letters of reference indicate corresponding parts, I have illustrated an embodiment of my invention, although other embodiments thereof may be employed without departing from the spirit of the same, and in these drawings—

Figure 1 is a view in perspective, showing the separator as it appears when ready for use. Fig. 2 is a longitudinal vertical sectional view showing the interior arrangement of the riddle-frame and the riffle-frame.

Referring to the drawings, A designates the riddle-frame, comprising two sides  $a$ , having their upper edges straight for a portion of their length, as at  $a^2$ , to support a hopper B, and thence inclined downward toward the discharge end of the frame, and two inclined riddles  $a^3$  and  $a^4$ , secured within the frame. The upper riddle  $a^3$  inclines downward from a point under the hopper to the lower end of the frame, and the lower riddle  $a^4$  from the rear

portion of the frame to a point about midway of the length of the upper riddle, the incline of the lower riddle being less than that of the upper riddle in order to retard the escape of the sand falling upon it, and also to check the flow of water, and thus prevent the sand and fine gold from being washed out of the riffles C, to be described farther on.

The riddle-frame is supported in an inclined position on a rocking frame D, the lower cross-pieces  $d$  of this frame serving as a support for the riffle-frame C. The rocking frame D comprises a cross-piece  $d$ , two rockers  $d^2$ , front and rear uprights  $d^3$  and  $d^4$ , respectively, and a cross top piece  $d^5$ , which holds the uprights  $d^4$  from spreading and also renders the frame rigid. The rockers  $d^2$  bear upon a base E, to the rear portion of which uprights  $e$  are secured, these uprights being connected by two pairs of cross-pieces  $e^2$  and  $e^3$ , respectively. Upon the cross-pieces  $e^3$  are arranged suitable journal-boxes  $e^4$ , in which is journaled the shaft  $f$  of a water-wheel F, preferably, in this instance, of the overshot type, and connecting the crank  $f^2$  of this wheel and the rocking frame D is a pitman  $d^6$ , by which, when the wheel F is revolved, a rocking motion is imparted to the frame B.

The riffle C consists of an open-ended trough, the head of which is located under the lower end of the upper riddle  $a^3$  and is reversely inclined with relation thereto. The bottom  $c$  of the riffle is approximately semi-circular in cross-section, and upon this bottom are secured, at suitable distances apart, riffle-bars  $c^2$ , which may be triangular in cross-section or rectangular, half-round, or any other desired configuration, the function of these riffle-bars being to retard the escape of the water as it falls through the riddle and thereby form a plurality of dead-water spaces, in which the flour-gold and small nuggets will sink, to be removed subsequently by quicksilver, or, if preferred, amalgam plates may, in some instances, be used.

All of the parts of this separator are to be held together by means of ordinary screws or bolts, so that it may readily be taken apart and put together again by a person of ordinary ability.

In operation the gold-bearing earth is shov-

cled into the hopper B, into which, also, the  
 waste water from the wheel F runs. The  
 rocking motion of the frame D disintegrates  
 the earth and causes it to spread over the up-  
 5 per riddle  $a^3$  and escape therethrough, a part  
 of the sand falling upon the lower riddle,  
 down which it slowly escapes to the riffles,  
 the remainder gradually escaping as it passes  
 10 down the upper riddle until all of the sand  
 finally drops into the riffles, the gravel, stones,  
 and other debris escaping at the lower end of  
 the upper riddle to the ground. The lower  
 riddle subserves a function in addition to that  
 already mentioned, viz: As the hopper is ar-  
 15 ranged directly over the escape end of the  
 riffle-frame, it follows that, as the force of the  
 water is greatest at this point, the sand that  
 escapes through the upper riddle will imme-  
 20 diately be washed away on falling into the  
 riffle if there is nothing to break the force of  
 the water and retard the fall of the sand to  
 the riffle. By the employment of the riddle  
 $a^4$  and its angular adjustment with relation  
 25 of sand to the riffles and the checking of the

flow of water thereto are accomplished, there-  
 by preventing the loss of any gold, particu-  
 larly the flour-gold.

Having thus described my invention, what  
 I claim, and desire to secure by Letters Pat- 30  
 ent, is—

In an ore-separator, the combination with  
 a rocking frame supporting a hopper, of two  
 riddles, the upper one of which inclines down- 35  
 ward from the head of the frame to the lower  
 end thereof, and the other from the head of  
 the frame to a point about midway of the  
 length of the upper riddle and at a less angle  
 than the same, and operating to retard or  
 check the flow of water and sand escaping 40  
 from the upper riddle, and a riffle having its  
 head located under the lower end of the up-  
 per riddle and reversely inclined with rela-  
 tion thereto, substantially as described.

In testimony whereof I affix my signature 45  
 in presence of two witnesses.

HENRY M. COPLAND.

Witnesses:

J. H. DAVIS,

JOB HATFIELD.