

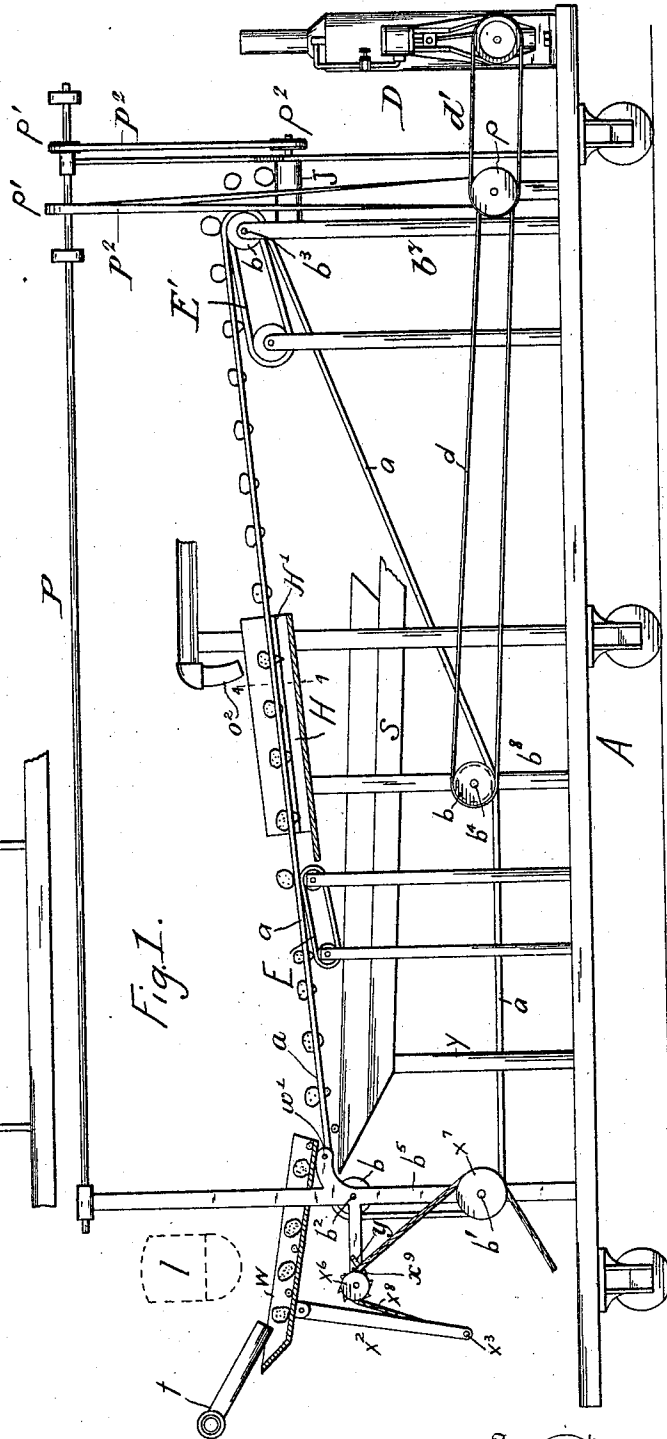
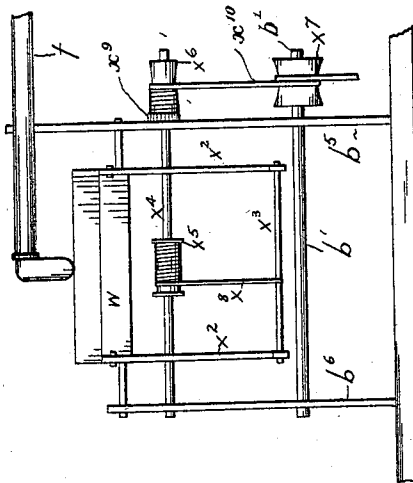
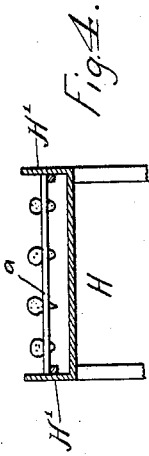
(No Model.)

2 Sheets—Sheet 1.

C. F. PIKE.
ORE WASHER.

No. 581,428.

Patented Apr. 27, 1897.



Witnesses
J. H. Parker

By his Attorney *Charles F. Pike*
Wm. A. Pike ^{Inventor}

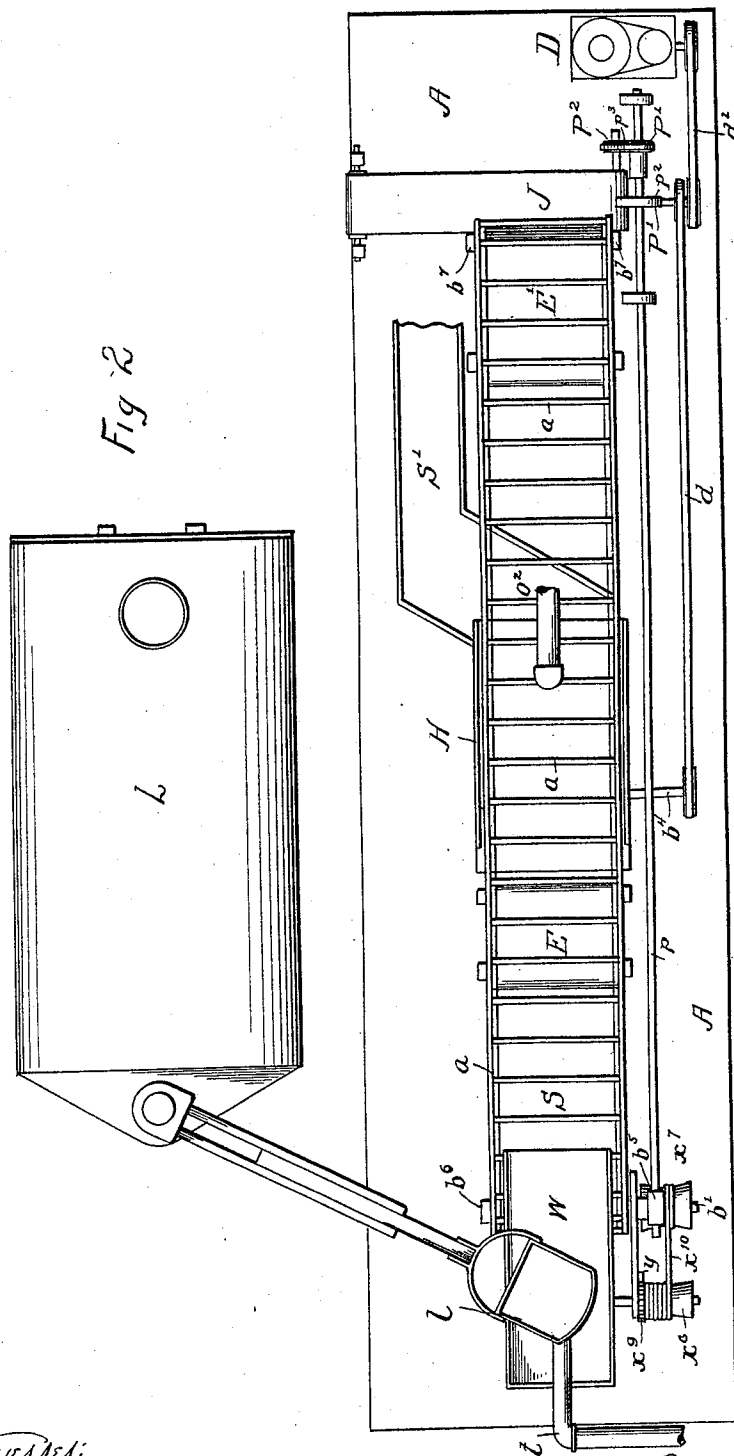
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Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES F. PIKE, OF PHILADELPHIA, PENNSYLVANIA.

ORE-WASHER.

SPECIFICATION forming part of Letters Patent No. 581,428, dated April 27, 1897.

Application filed May 2, 1896. Serial No. 589,959. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. PIKE, a citizen of the United States, and a resident of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Ore-Washers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to certain improvements in the construction of apparatus for the separation of fine dirt and metal from placer-gravel, its object being to so operate upon the placer-gravel that all of the heavy rocks and larger stones will be thoroughly and completely washed by the use of a minimum quantity of water and freed from soil and clay, the coarse matter being then thrown away and the finer portions saved to be subsequently treated for the recovery of the contained precious metal.

One of the great difficulties to be met with in placer-mining districts is the scarcity of water. One of the principal objects of my invention is to provide an apparatus for subjecting the gold-bearing material to the most complete washing with a minimum quantity of water, thus securing the greatest possible results from a given quantity of water.

In the material which I more particularly desire to act upon the gold is found in the form of fine metallic particles adhering with the soil and clay to gravel and larger rocks and stones, and it requires a very thorough and violent washing to disintegrate the clay and soil and free the particles of gold.

I have found in practice that the ordinary washing of this gold-bearing material by directing a jet or stream or a series of jets or streams of water against it is not sufficient to effect the thorough washing necessary to work upon a commercial basis. I have, however, found that the desired result may be accomplished by subjecting the material to constant contact with a stream of running water in such manner that the water will be agitated and continually thrown against the rocks and stones from all sides, the series of contacts with the partly-divided streams of water gradually disintegrating or wearing

away the adhering soil and clay from the stones until the washing is complete.

My invention further consists in the general construction of the apparatus employed, as more fully set forth hereinafter.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of an apparatus constructed in accordance with my invention. Fig. 2 is a plan view of the same. Fig. 3 is an end elevation of the apparatus, and Fig. 4 is a transverse sectional elevation of the washing-trough on the line 4-4, Fig. 1.

In carrying out my invention I place the separating and washing apparatus on a wheeled platform A, which together with a steam-shovel L may be traveled toward and through the bank of placer-gravel to be operated upon. The scoop of the steam-shovel or other equivalent digging or ditching device gradually digs its way into or through the bank, lifting the dirt and depositing it on a platform or on a conveyer, to be subsequently washed. The larger stones or rocks after being washed are thrown to one side or to the rear of the platform on which the washing mechanism is mounted, so as not to interfere with the advancement of the work, while the finer material is saved to be subsequently treated for the recovery of its contained precious metal.

Referring to the drawings, A represents a platform mounted on carrying-wheels and supporting the various parts of the apparatus.

a represents an endless open carrier formed of a series of transverse bars secured at intervals to link belts or chains and mounted upon and guided by a series of wheels b on shafts b¹ b² b³ b⁴, the shafts being journaled in suitable bearings on uprights b⁵ b⁶ b⁷ b⁸. Motion is imparted to the conveyer a through belts d d' from an engine or other operating device on the platform A. The upper lap of the conveyer passes through a washing-trough H, which may be of any desired length and is provided on its inner side walls with guides or supports H' to support the carrier within the trough and hold the same slightly above and out of contact with the bottom of the trough in its passage therethrough. The wash-trough is inclined and at its upper end is provided with a water-supply pipe o²,

through which a stream or streams of water is discharged into the wash-trough to effect the washing of the material carried by the conveyer, the water running down the inclined trough toward its lower discharge end in a direction opposite to the direction of travel of the conveyer, so that the larger rocks or stones will be brought into violent contact with the outwardly-moving stream of water and will be thoroughly and completely washed, the disintegrated soil and clay and the metallic gold falling to the bottom of the trough and being washed down the same by the water and discharged with the water into a sluice-box S, arranged immediately under the wash-trough and the upper lap of the conveyer.

The sluice-box S has an offset or is connected to a supplemental sluice-box S', arranged in a different horizontal plane to permit the conveyer to travel around the first section S of such sluice-box.

The larger stones and rocks after being passed through the washing-trough are carried by the conveyer to a point slightly above a second conveyer J, onto which they fall and are conveyed away to the side or to the rear of the platform A. The conveyer J is operated from the engine through the medium of belt d' , pulley P, belt p^2 , pulleys P', and shaft p , belt p^3 , and pulley P³, as illustrated in Fig. 1, or it may be driven in any other suitable or convenient manner which may be found necessary or desired.

At a point slightly above the forward end of the conveyer is mounted a platform W, pivoted at w' to the fixed frame and provided with depending side arms x^2 , connected by a cross-bar x^3 , to which latter is secured a cord or chain x^8 , the opposite end of the cord or chain being secured to and adapted to be wound upon a drum x^5 , keyed or otherwise rigidly fastened to a transverse shaft x^4 , adapted to suitable bearings in the fixed frame. The shaft x^4 also carries a drum x^6 and a toothed ratchet-wheel x^9 , a suitable pawl y engaging with the latter and normally preventing the rotation of the shaft in such direction as would permit the lowering of the platform. To the drum x^6 is secured one end of a rope or chain x^{10} , the opposite end of which passes around a winch-head secured to the shaft b' . Normally the rope or chain passes loosely around the winch-head or is entirely free from the same, but when it is desired to raise the platform W to a different angle the rope or chain is tightened on the winch-head, and the revolving of the latter by the shaft b' causes the drums x^6 and x^5 to revolve, winding up the rope or chain x^8 . This raises the cross-bar x^3 and the platform W, and when the latter has reached the desired angle the rope or chain x^{10} is released, and the platform is kept in its adjusted position by the pawl y .

The material to be treated may be dumped upon the platform W and partially washed by means of a stream of water issuing from

a supply-pipe t , the larger rocks and stones being caught by the transverse bars of the conveyer and carried to and through the wash-trough II, while the finer particles will pass between the bars and fall directly into the sluice-box. The separation may, however, be accomplished by placing the material directly upon the conveyer and discarding the platform, the water from the supply-pipe t being then arranged to wash the material on the conveyer and loosen the smaller particles, so that they may fall between the bars of the conveyer into the sluice-box.

At points under the upper lap of the conveyer and preferably immediately in advance of the lower end of the wash-trough and at the discharge end of the conveyer are rock-lifters E E', formed of small belts so guided on pulleys or rolls as to run at a slight angle to the angle of the upper lap of the conveyer, and thus present a gradually-approaching surface to the conveyer, so that any rocks or stones carried by the latter and depending between the bars will be gradually raised and turned, so that they may be more readily washed and more conveniently introduced into the wash-trough, while at the discharge end of the conveyer the washed rocks and stones are positively pushed from between the bars and fall upon the second conveyer J.

With a device constructed in accordance with my invention the material is thoroughly washed in a single passage through the apparatus, and the amount of water employed is much less in proportion to the amount of material treated than in any of the ore-washing apparatus with which I am familiar.

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

1. The combination in an ore-washer, of an inclined sluice-box for the treatment of the ore, an inclined wash-trough, an endless open carrier adapted to travel through the same and to support the material to be treated above and out of contact with the bottom of the wash-trough so as to allow of a free, unobstructed passage of the water below and above said carrier, and guides provided between the lower part of the carrier and the bottom of the wash-trough to positively support the carrier above the bottom of the trough in its passage therethrough, substantially as described.

2. The combination in an ore-washer, of an inclined vessel or sluice for containing a body of running water, a water-supply at the top of said vessel, an endless conveyer adapted to travel the material to be washed through said vessel in a direction opposite to the direction of flow of the water, and means for guiding and holding such conveyer above and out of contact with the bottom of the vessel in such manner as to afford a free passage for the water and disintegrated material below the bottom of the conveyer, substantially as specified.

3. In an ore-treating apparatus, a sluice-box, S, an endless traveling grizzly, *a*, a wash-trough, H, and fixed guides, H', attached to the wash-trough to guide and support the
5 grizzly above and out of contact with the bottom of the wash-trough, substantially as described.

4. The combination of the inclined sluice-box, S, a grizzly, *a*, traveling above the same,
10 a water-supply for washing the ore carried by the grizzly, and an inclined belt, E, under the grizzly to gradually raise the rocks and stones depending between the slats or bars of the grizzly.

15 5. The combination with a sluice-box and a slatted grizzly, of a belt, devices for traveling said belt at approximately the speed of travel of the grizzly, and for guiding said belt in such manner that a gradually-inclined sur-

face is presented below the grizzly to raise 20 the rocks and stones depending between the slats or bars of the grizzly.

6. In an ore-treating apparatus, an endless grizzly, a wash-trough provided in the line of travel of the grizzly and through which said
25 grizzly is adapted to travel, a water-supply at the upper end of said wash-trough, a sluice-box below the wash-trough and grizzly and adapted to receive the material discharged from the trough, and an endless, inclined,
30 belt, E, under the grizzly to gradually raise the rocks and stones pending between the slatted bars of the grizzly.

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Witnesses:

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