H. K. DRAKE.

ORE-MILL.

No. 192,747. Patented July 3, 1877.

Fig. 2.

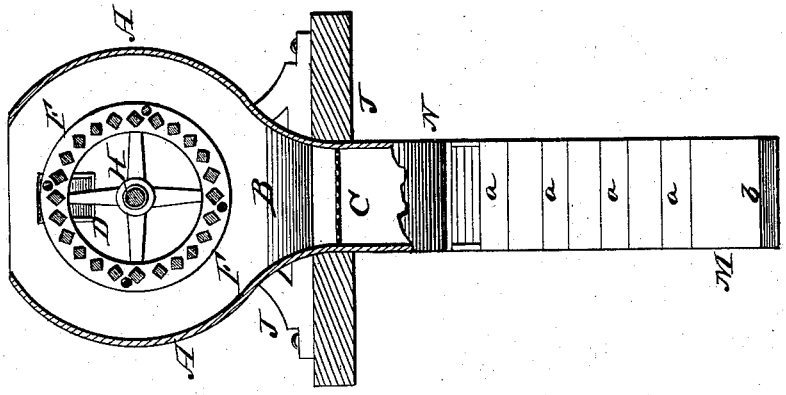
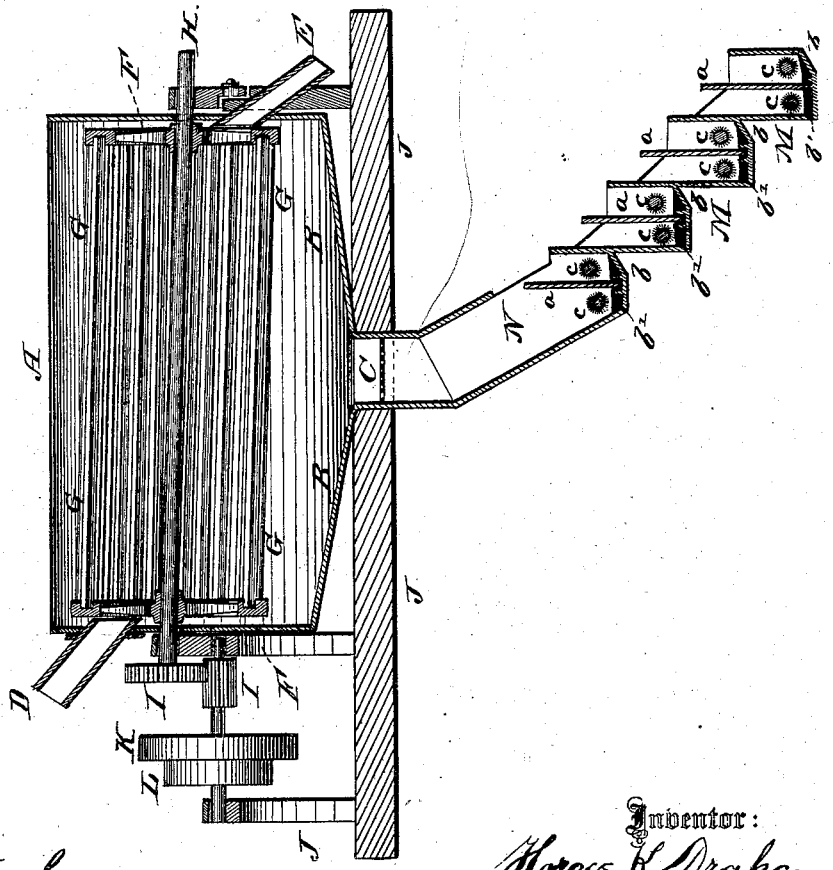


Fig. 1.



Witnesses:

P. C. Dieterich

Wm. B. Upperman.

Inventor:

Horace K. Drake.

Per C. H. Watson & Co. Attorneys.

UNITED STATES PATENT OFFICE.

HORACE K. DRAKE, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN ORE-MILLS.

Specification forming part of Letters Patent No. **192,747**, dated July 3, 1877; application filed May 7, 1877.

To all whom it may concern:

Be it known that I, HORACE K. DRAKE, of Brooklyn, county of Kings and State of New York, have invented a certain new and useful Improvement in Gold-Extracting Process; and I do hereby declare that the following is a full, clear, and exact description thereof, that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention has for its object to separate from what is termed cement, which is composed of stones, gravel, sand, and a certain lava which combines and holds the parts in one hard conglomerate mass, the gold that is contained therein; and it consists in a process of separating and scouring the gold—that is to say, the sulphur or rust upon the gold is removed at the same time, leaving the same susceptible to the action of quicksilver, or any other known process by which the same is gathered or collected, when being exposed to the action of such ingredient or ingredients.

Heretofore this cement has been worthless, in a financial point of view, owing to the small quantity of gold therein contained, and the inability of any device heretofore used to practically work the same in such quantities and in such time as that the mineral thus extracted will be sufficient compensation for the labor and machinery necessary to obtain the same. While there are untold quantities of this material on the Pacific coast, it has proven before this invention to be worthless, owing to the facts above stated.

In order to carry out my invention I use a cylinder composed on its outer periphery of a series of parallel bars extending the entire length of said cylinder, the whole being slightly inclined from the end where the material is fed to the opposite end, where the stones, after being subjected to the process, are delivered. This cement, after being blasted or otherwise broken, is fed into one end of the cylinder in large quantities, and the cylinder, being rotated, breaks up and separates the sand, gravel, gold, and stones. The gold, sand, and finer portions of gravel fall downward between the bars, while the larger portions of material pass to the lower portion of the cylinder and are discharged.

Owing to the immense weight of the cement contained within the cylinder, the central part of the bars in the lower part of the cylinder are caused to spring downward and outward, which assists in grinding and crushing that part of the cement coming between the same.

This process of rotating the cylinder, composed of parallel bars, and mixing, grinding, and tumbling this cement within the cylinder, causes an entire separation of the stones, sand, gravel, and gold, thus separating the gold, sand, and fine gravel, and at the same time scouring or cleaning the rust or sulphur from the gold, leaving the same free to be further collected in any known or desired manner.

By this means it will be observed that a large quantity of material now entirely worthless can be worked up and used at a great profit to the owners of the material, the operator, and the country.

It will be understood that the device used must be made unusually strong, as in use, to make the operation successful, there would be a continual feed and continual discharge, and the machine would necessarily support ten tons, more or less, of the cement all the time when in use. The device in use in carrying this into effect is hereinafter more fully described.

In the annexed drawing, Figure 1 represents a longitudinal vertical section, and Fig. 2 a transverse vertical section of a device used in carrying out my invention.

Like letters of reference indicate like parts.

A represents the outer case or shell; B, the inclined bottom, with a lower central discharge-opening, C. D represents the hopper or feed-spout at the upper elevated end of the cylinder; and E the discharge-spout at the lower or depressed end of the cylinder. The cylinder is composed of two heads, F F, in which is inclosed a series of parallel bars, G, so that the bars are firmly clamped and held between the heads.

H represents a central shaft, having upon one end a band-rim or gear, I, and suitably connected to a proper frame-work, J, and driving mechanism K L.

The lower portion of the discharge-seat ter-

minates in a gold-saver, M. This is composed of an inclined conveyer, N, provided with a series of upright partitions, *a*. On the inside lower portion of the cross-partitions *b* is placed a bed of quicksilver, *b'*, while above the same is arranged a series of agitators, *c*.

In use, while the sand, gravel, and gold fall from the cylinder on the inclined bottom B, and pass down into the gold-saver, through which a current of water is passing, the entire mass falls down upon the lower side of the partition *a*, is agitated by the device *c*; all or nearly all of the gold is retained by the quicksilver, while the force of the water carries the sand, &c., over the partition *a* into the next compartment, where the operation is repeated, until all the gold is collected and the other matter discharged.

It will thus be seen that this invention saves a vast amount of valuable metal which, owing to the state of the cement in which it has been inclosed, has been heretofore of little or no value.

I am aware that revolving cylinders for separating ore, screening coal, &c., have heretofore been used, and I do not therefore claim such as my invention; but

What I claim is—

The process of utilizing cement by rendering the gold mingled therewith capable of amalgamating with mercury, which consists in removing the "rust" from the gold and separating it from other impurities, by disintegrating the mass and causing a mutual attrition of the particles against themselves by revolving the mass, as described.

HORACE KINGMAN DRAKE.

Witnesses:

MARSTON NILES,

S. J. CULLEN.