

J. O'FARRELL.
HYDRAULIC MINING.

No. 172,157.

Patented Jan. 11, 1876.

Fig. 1.

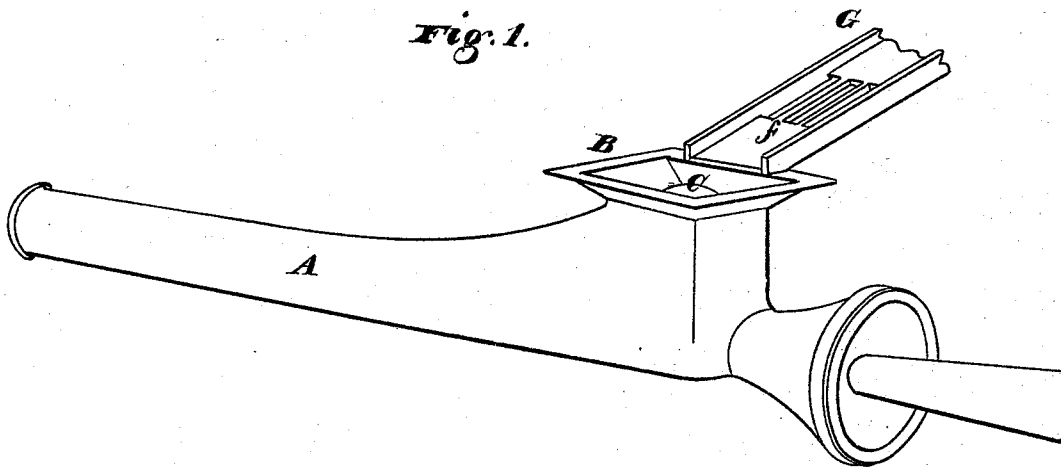
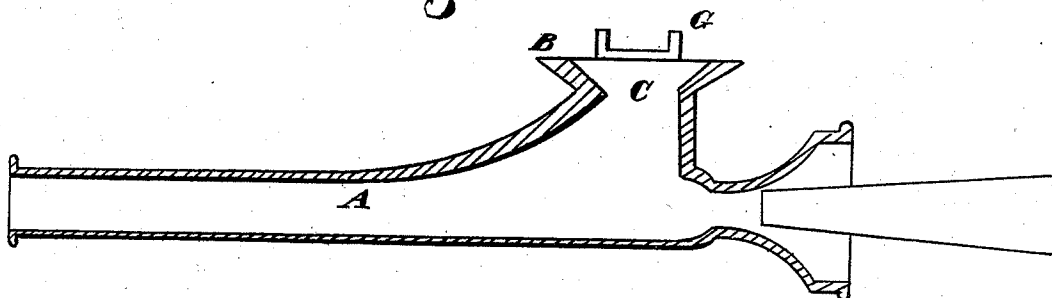


Fig. 2.



Witnesses

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JASPER O'FARRELL, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN HYDRAULIC MINING.

Specification forming part of Letters Patent No. **172,157**, dated January 11, 1876; application filed June 29, 1875.

To all whom it may concern:

Be it known that I, JASPER O'FARRELL, of San Francisco city and county, State of California, have invented an Improvement in Hydraulic Mining; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention, without further invention or experiment.

My invention consists conjointly of an apparatus and process for increasing the effectiveness of the streams of water which are forced through nozzles against banks of earth, cement, or gravel in hydraulic mining for the purpose of tearing away the bank and washing the dissolved material through sluices, in order to secure and save the gold contained therein.

My improved process consists in introducing into the stream of water, either before or after it issues from the nozzle, stones, gravel, sand, or other foreign bodies or substances, which, by their superior density and solidity will assist the erosive action of the water, and more effectively pulverize the dislodged particles of gravel or cement, so that the operation of disintegration is accelerated, and the particles of gold more effectually liberated from large pieces of cement, which would otherwise be carried down the sluice without being crushed or pulverized.

The device by which I accomplish this object I call a hydraulic motor, and its construction and operation are illustrated and explained in the following description, in which reference is had to the accompanying drawings.

Figure 1 is a perspective view of my motor.

Let A represent a tube or pipe, which may be of any desired length, although a length of ten or fifteen feet will usually be sufficient. The rear end of this tube or pipe I have represented as flaring; but this need not necessarily be the case. This pipe I mount in a horizontal position directly in front of the hydraulic nozzle from which the stream of water issues, so that the stream will enter the rear end of the pipe A and pass through it. At some point in the length of this pipe, preferably near its rear end, I construct a hopper, B, upon it, and this hopper B I connect with the in-

terior of the pipe by a throat, C, so that stones, gravel, sand, or other substance, can be dumped into the hopper, and pass through the throat into the passing stream, and be carried by it against the bank of earth, gravel, or cement which it is desired to wash down. The throat C gradually widens from the bottom of the hopper toward the front of the pipe, so that the gravel or other substance will have sufficient room to descend freely without choking the passage. The stones, sand, or gravel can be dumped into the hopper by any convenient means; but as a stream of water such as is used in hydraulic mining is capable of carrying a vast amount of foreign substances with it, and in order to render the operation complete, it should be quite strongly charged with stones or gravel. I shall usually construct a screen or sluice section, G, which has a perforated bottom, and which is known to miners as a "grizzly," upon the side of the hopper. I then lead a trough or sluice from the bank which is being washed to this grizzly, so that a portion of the stones and gravel which are dislodged by the stream will be caught by the sluice and conveyed into the hopper, thus automatically feeding the stream with missiles. The grizzly serves to draw off the water and sand, or a portion of them, as desired, before they enter the hopper. The bottom *f* of the grizzly is constructed to operate as a slide, so that the amount of water and sand to be drawn off can be regulated by opening or closing the slide, thus increasing or diminishing the waste. The pipe A should be larger in diameter than the nozzle from which the stream issues, so as to avoid any impingement of the stream against its sides, as this would to a certain extent impair its effective quality in washing down the bank.

When I use this hydraulic motor with a movable nozzle I attach it to the nozzle, so that the two will move together, thus permitting it to be directed simultaneously with the nozzle to any point.

If desired, the stones or other missiles could be fed into the pipe which carries the stream of water at its opposite end; but in this case the friction of the stones in moving through the pipe would soon destroy it. By loading the stream of water with missiles, as above de-

scribed, the efficiency of the stream is largely increased. The stones serve to break up the pieces of cement or earth that are detached by the stream, and thus the particles of gold that would otherwise be carried away in unbroken lumps of earth or cement are freed, so that they may be caught in the riffles in the flume.

The missiles which I use are not large enough to impede the flow of water through the sluice. They will, therefore, be a benefit, as they will keep up an agitation of the material in the sluice, and provide numerous eddies of comparatively still water, which will favor the concentration or settling of the heavy particles.

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

1. The improvement in the art of hydraulic mining, which consists in loading the stream of water, which issues from hydraulic nozzles, with stones, gravel, sand, or other missiles, substantially as and for the purpose described.

2. The pipe or tube A, having the hopper B connected with its interior by the throat C, in combination with a hydraulic nozzle, substantially as and for the purpose described.

3. In combination with the hopper B connected with the pipe or tube by the throat C, the grizzly G with its sliding bottom *f*, substantially as and for the purpose described.

JASPER O'FARRELL.

Witnesses:

JNO. L. BOONE,

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