

UNITED STATES PATENT OFFICE.

CORNELIUS H. SMITH, OF ROCK ISLAND, ILLINOIS.

IMPROVEMENT IN PLACER-MINING.

Specification forming part of Letters Patent No. 47,046, dated March 23, 1865.

To all whom it may concern:

Be it known that I, CORNELIUS H. SMITH, of Rock Island, in the county of Rock Island and State of Illinois, have invented a new and useful Improvement in Placer-Mining; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to fully understand and make use of the same.

This invention consists in an improvement in the process of mining commonly called "placer-mining," or, in other words, that mode of mining for precious metals, in the earlier stages of which auriferous or other earths are washed and the precious metals separated by means of water. This method of mining has hitherto been successfully pursued only where water is abundant, or has been abundantly supplied by flumes, canals, and other hydraulic works. Where metalliferous earths are rich in quality and abundant, hydraulic works of great magnitude and length and at vast expense are made in order to bring an abundant supply of water to the place of mining, the said water, after having been once used, being then allowed to run off at waste to the country below. In all such works, previous to my invention, the source or sources of water-supply were required to be above the level of the mine, so that a fall of water could be obtained and the earth be disintegrated by the mechanical force of the falling stream or streams. Such sources of water-supply are not always to be found, and many of those which are available are not ever-running, being in some cases derived from rainy seasons or from melting snow. This is very extensively the case in large mining districts in the United States, as in California, the territory of Idaho, and other regions. The rich placer-mines of Idaho, for this reason, can only be worked about three months in a year.

My invention is designed to enable miners to work mines of this character throughout the whole year without any interruption, save from inclement weather of such severity as would freeze up water-courses and make outdoor operations impossible.

My process and method of procedure are as follows: A mining locality having been secured, I search for a water-course, or a natural reservoir of water which may be above, or

on a level with, or below the mining-ground. If I cannot find a constant stream, or a constant natural reservoir, I proceed to construct an artificial reservoir, in which will be gathered the surface-water of the surrounding upper country and the water of any inconstant streams which can be directed into it. Having thus secured a supply of water as near as possible to the mining locality, and as near as possible to its level, I lay a train or trains of water-pipe of any suitable material—metal, wood, leather, rubber, or any convenient substitute for those materials—from the reservoir or other water-supply to the mine, connecting the said pipe or pipes to a force-pump or other forcing-engine of suitable power to take the water from the reservoir and force it through the pipes to the mine, where it is to be discharged from the butt of the hose or pipe directly against the face of metalliferous earth which will be thereby loosened and disintegrated, and gradually washed away by the water into channels provided below for that purpose, and which are divided by partitions at successively lower levels in the manner usually practiced in placer-mining. The said channels, however, in my process are led by such a course as will cause the water to return to its reservoir, if a reservoir below the mine is used. Where the water-supply is abundant the water need not be led back, unless it is convenient so to do; and where the water-supply is about at the level of the mine, and not abundant, it may be gathered in a lower reservoir, and a second train of hose laid from thence. The channels or troughs through which the retiring water and the earth, held in suspension by it and carried along by it moves, are so constructed as to arrest at different stages of its course the heavier particles of the precious metals which are disintegrated and separated from the earth by the action of the water, some of the divisions being supplied with quicksilver, for the purpose of securing such metals by amalgamation; but as these channels or troughs are familiar to those engaged in placer-mining, it is not necessary to explain their construction in detail. The water-channels, as used in my process, only differ in this, that I lead them so as to return the water to the fountain or reservoir whence it was derived, and thereby secure a

constant supply of water for the mine, and enable the miners to continue at work without any interruption from the failure of the supply of water. As the bank or deposit of earth becomes disintegrated and worn away the overlying portion caves in after the manner of a land-slide, and fresh earth is thus continually exposed to the action of the water.

I use any kind of pump or apparatus, automatic or hydraulic, or driven by steam or other power, which will enable me to force water under pressure up to and discharge it against the face of the mine, and thereby wash away and loosen the metalliferous deposits and disintegrate and separate the earthy part from the metals sought after.

By means of my process miners will be enabled to work with great advantage and profit many metalliferous deposits and mines which have hitherto been almost valueless.

I do not claim, broadly, the repeated use of a body of water in separating metallic ores, as I am aware that this has been practiced, under a mode of operation essentially different from mine, in an apparatus patented January 12, 1864, by Whelpley & Stover, of Boston, Massachusetts. Neither do I claim, broadly, the disintegration of metalliferous earths by forced currents of water, as I am aware that water has before been forced for this purpose by hydrostatic power. In my invention the water is forced by a steam-pump or other mechanical power, which enables me to use the water at any altitude or locality without requiring a

head of water proceeding from a greater altitude than the point at which the water is used. The water, by being forced against the face of the mine, is made to perform the labor of disintegrating the earth, which has hitherto been done by picking and shoveling, and to wash the ore at the same time. By my mode of operation I am enabled with four men to accomplish as much as could be done by fifty men in the ordinary way of mining, thus saving a great amount of labor and expense. My mode of mining also permits the working of many mines at a fair profit, which cannot be profitably worked under the ordinary system.

My invention is applicable to the separation of crushed quartz and to ore-washing of every kind.

Having thus described my invention, what I claim therein as new, and for which I desire Letters Patent, is—

1. Washing metalliferous earths and ores by currents of water forced by steam-pumps or other mechanical power and delivered in jets in contact with the earth or ores.

2. Forcing water, by pumps or other mechanical means for washing earths and ores, under such a system of water-pipes and return-channels that the water is returned to its reservoir for repeated use, substantially as set forth.

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Witnesses:

WM. F. McNAMARA,
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