J. BRODIE & S. H. WHEELER.

Improvement in Method of Blasting Rock.

No. 131,995. Patented Oct. 8, 1872.

Fig. 1

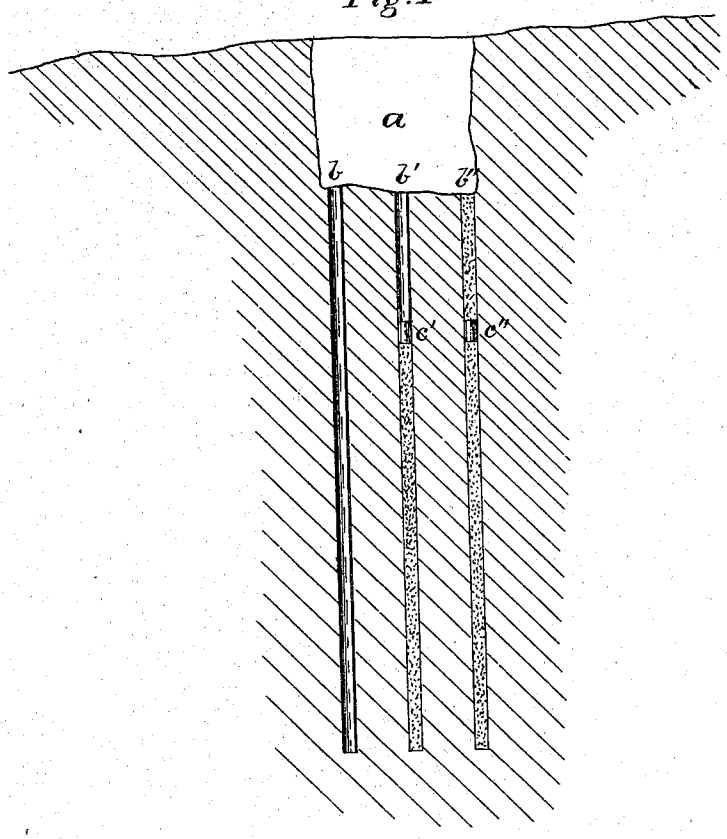
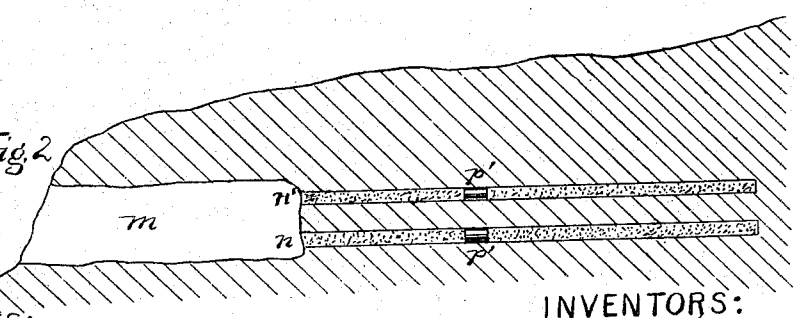


Fig. 2



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UNITED STATES PATENT OFFICE.

JAMES BRODIE AND SAMUEL H. WHEELER, OF SAN FRANCISCO, CAL.

IMPROVEMENT IN METHODS OF BLASTING ROCK.

Specification forming part of Letters Patent No. **131,995**, dated October 8, 1872.

To all whom it may concern:

Be it known that we, JAMES BRODIE and SAMUEL H. WHEELER, of the city of San Francisco, county of San Francisco, and State of California, have invented an Improved Method of Operating in the Blasting of Rock, of which the following is a specification:

The usual practice in the blasting of rock is to drill holes to some convenient depth and to insert the charges of explosive material, placing them at the bottom of the holes. The charges are then exploded, and, after clearing away the rock which has been detached by the explosion, other holes are drilled and charged as before. This style of operation is continued until the required distance from the original face of the rock is reached. This plan is expensive, in consequence of the time spent in removing and replacing the drilling apparatus and the excavating incident to each step of the work. It has, hence, been proposed to drill the hole at the outset to the depth of a hundred feet or more, or to the whole depth to which it is proposed to excavate, and to fill it with iron bolts or plugs up to the point where it is proposed to locate the first charge. For the second charge the plugs are removed to a certain additional depth, and so on until the work of blasting is complete, the débris or broken rock being removed subsequent to each explosion. But serious objections lie against this method, so that, as far as we are aware, its practicability has not been established. Our invention obviates these objections; and to this end it consists mainly in the employment of sand, or equivalent loose material, to constitute a filling for the drill-hole.

In practice we drill holes in a shaft to a depth of one hundred feet from the face of the rock and fill them up to within three feet from the face with loose sand, and place the charges of explosive material in the holes on the top of the sand. After the charges have been exploded and the detached rock cleared away we remove the sand from the holes to a depth of three feet and insert other charges, which we explode, and continue thus until the rock has been excavated to the bottom of the holes. We then make other holes to a depth of one hundred feet and proceed as before, and so on to any depth required, until we have excavated to the bottom of the shaft.

The use of sand is highly advantageous, mainly for the following reasons: First, it is readily accessible in nearly all localities, and costs little more than the labor involved in digging it; second, it forms a solid, impenetrable bed upon which to rest the charge, so that the explosive force of the latter may be expended at the desired point with the greatest effect; third, it is easily placed in or removed from the drill-hole by simple means, or without the aid of tongs, grappling-irons, or any other peculiar apparatus.

We claim as our as invention—

The method of blasting rock by means of sand as a filling material for the drill-hole, said hole being first bored to a depth requisite for insertion and explosion of several charges, and the sand, or other equivalent material, being removed therefrom subsequent to each explosion to enable the succeeding charge to be placed in the hole to the depth required for the next explosion, the sand in every instance forming a bed for the charge, as specified.

JAMES BRODIE.
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Witnesses:
WILLIAM MOODY,
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