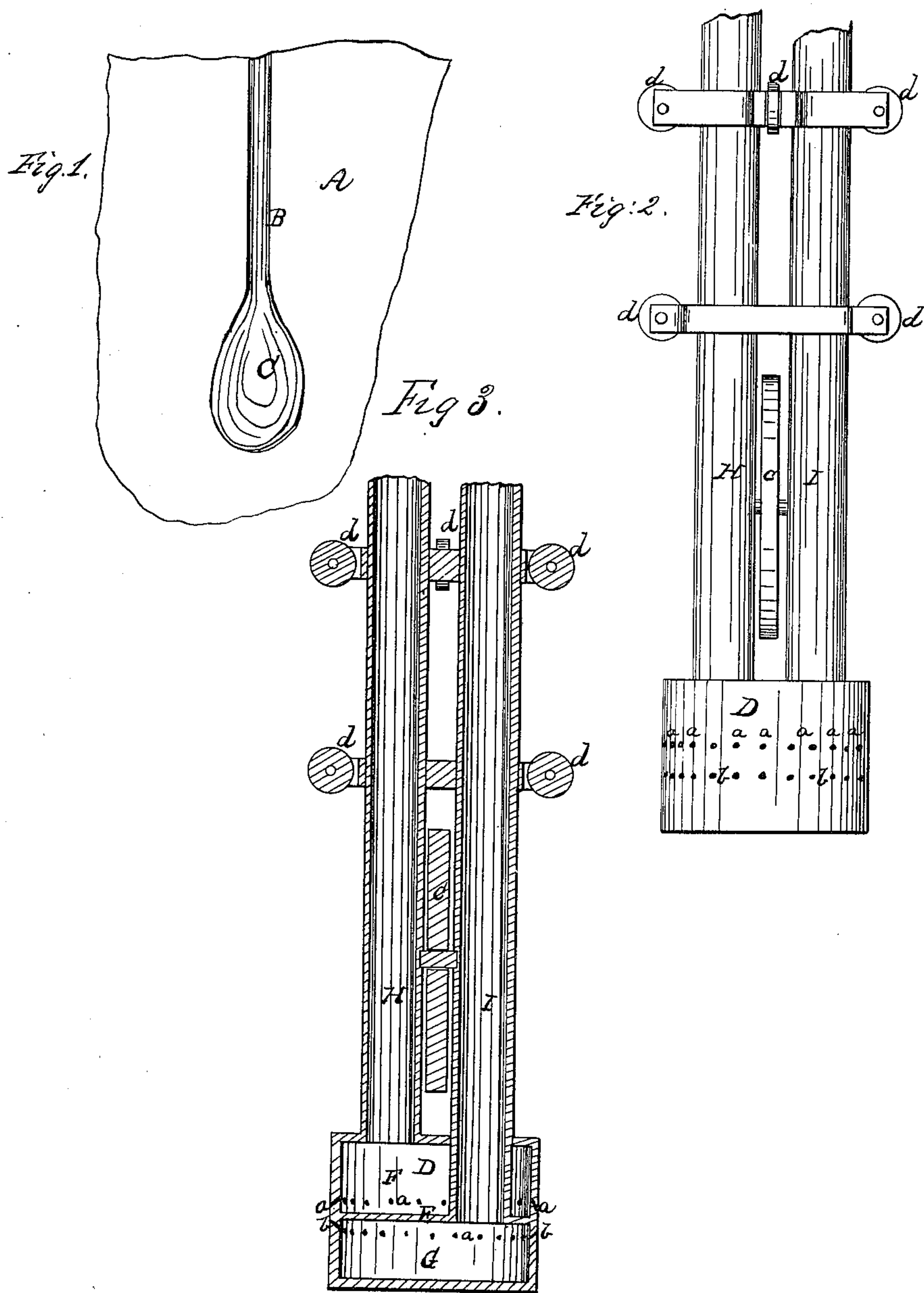


No. 10,040.

PATENTED SEPT. 20, 1853.

A. STICKNEY.

COMPOUND BLOWPIPE FOR ENLARGING BLASTING CAVITIES.



# UNITED STATES PATENT OFFICE.

ANCIL STICKNEY, OF NORWICH, VERMONT.

## IMPROVEMENT IN COMPOUND BLOW-PIPES FOR ENLARGING BLASTING-CAVITIES.

Specification forming part of Letters Patent No. 10,040, dated September 20, 1853; antedated June 11, 1853.

*To all whom it may concern:*

Be it known that I, ANCIL STICKNEY, of Norwich, in the county of Windsor and State of Vermont, have invented a new and useful Improvement in Apparatus for Enlarging Blasting-Cavities in Rocks for the Reception of any Explosive Charge; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, letters, figures, and references thereof.

The common mode of making a blast-hole consists in boring or drilling by a drill or other tool a hole in the rock to or about to the depth required for the charge, this being accomplished in the manner as usually practiced—that is to say, suppose A, Figure 1 of the drawings, denotes a rock. We drill or make a hole, B, into it. Next, or secondly, we put into this hole some dilute nitric or chemical acid or agent capable of decomposing or destroying the rock, and fill the hole with it to such height as may be deemed proper. Next, suffer this agent to act on the rock until it has so decomposed that part of it in immediate contact with it as to form a chamber, C, or enlargement of the lower part of the hole. When this chamber has been made large enough, remove the chemical agent and whatever else there may be within the chamber, and the chamber, after being dried, will be ready to receive a charge of gunpowder. By such a process of making a hole in a rock a much greater quantity of powder can be used for a blast and with greater effect than when the hole is made in the ordinary way—that is to say, as a drill-hole of equal size or breadth throughout its length. I have with great success employed another method of enlarging the drill-hole at its lower part—that is to say, I have put charcoal or some other proper combustible substance into the hole and set fire to it, and by means of a bellows or other suitable contrivance caused a powerful blast of air or oxygen gas to pass down into the hole and impinge on the charcoal or its substitute in combustion. By the agency of the powerful heat thus created I have been able, in the course of a very short time, to decompose the rock, and enlarge the hole or produce a chamber at its lower part sufficiently large to hold the charge. It is surprising how

soon the rock at the lower part of the hole can be decomposed or burned away into the shape of a large chamber.

Instead of producing an intense flame or heat by the mode described, I have resorted to another, which constitutes my invention, and is as follows: Fig. 2 denotes a side view, and Fig. 3 a section, of the apparatus used. In the said figures, D is a cylindrical box somewhat less in diameter than the drill-hole to be enlarged. This box is to be divided by a partition, E, into two chambers, F G. A long tube, H, opens out of and extends upward from the chamber F. Another such tube, I, is also made to pass through the chamber F and open into the chamber G. Through the periphery of each of these chambers I bore or make a series of minute orifices or holes, (seen at *a a*, &c., *b b*, &c.,) those of one series being inclined or directed toward those of the other in such manner as to cause any stream or streams of gas passing out of one set to come in contact with any stream or streams of gas which may be made to pass out of the other set.

The instrument so made may be provided with guide friction-rollers, as seen at *c d d*, for the purpose of directing it into the blast-hole in the rock, and when it is placed in the said hole I force a stream of hydrogen gas down one of the pipes H I, and at the same time a stream of oxygen gas down the other of the said pipes, the said gases being by such means conveyed or forced into the two chambers F G and out of their orifices. On being fired or inflamed they will burn with an intense flame, so as to decompose that part of the rock against which the flame is made to impinge. By such means the lower part of the drill-hole may be easily enlarged into a chamber.

The instrument should be made of some material capable of withstanding the great heat produced. For this purpose I employ platina metal, and I also make of the same that part of the blast-pipe which I introduce into the drill-holes when I create heat by means of charcoal or some other combustible material and blast of air, as hereinbefore described.

By my improved process of or instrument for making a blast-hole in rock, I not only effect a great saving of labor in enlarging the



drill-hole, but produce greater results from the explosion of a charge than are obtained by the ordinary process of blasting.

I lay no claim to the use of a blast of air or gas in connection with coal or fuel, and for the purpose of supplying such with oxygen; but

What I do claim is—

The instrument represented in Figs. 2 and 3 for enlarging the drill-hole by the employment of gases, as specified, meaning to claim the combination of the two jet-chambers FG, the perforations or orifices *a a*, &c., *b b*, &c.,

and supply-tubes HI, as arranged, substantially in manner and for commingling the gases and disseminating flame therefrom entirely around and against the sides of the drill-hole, whereby the enlargement of it into a suitable charge-chamber may be speedily effected.

In testimony whereof I have hereto set my signature this 8th day of June, A. D. 1853.

AÑCIL STICKNEY.

Witnesses:

R. H. EDDY,

FRANCIS GOULD.