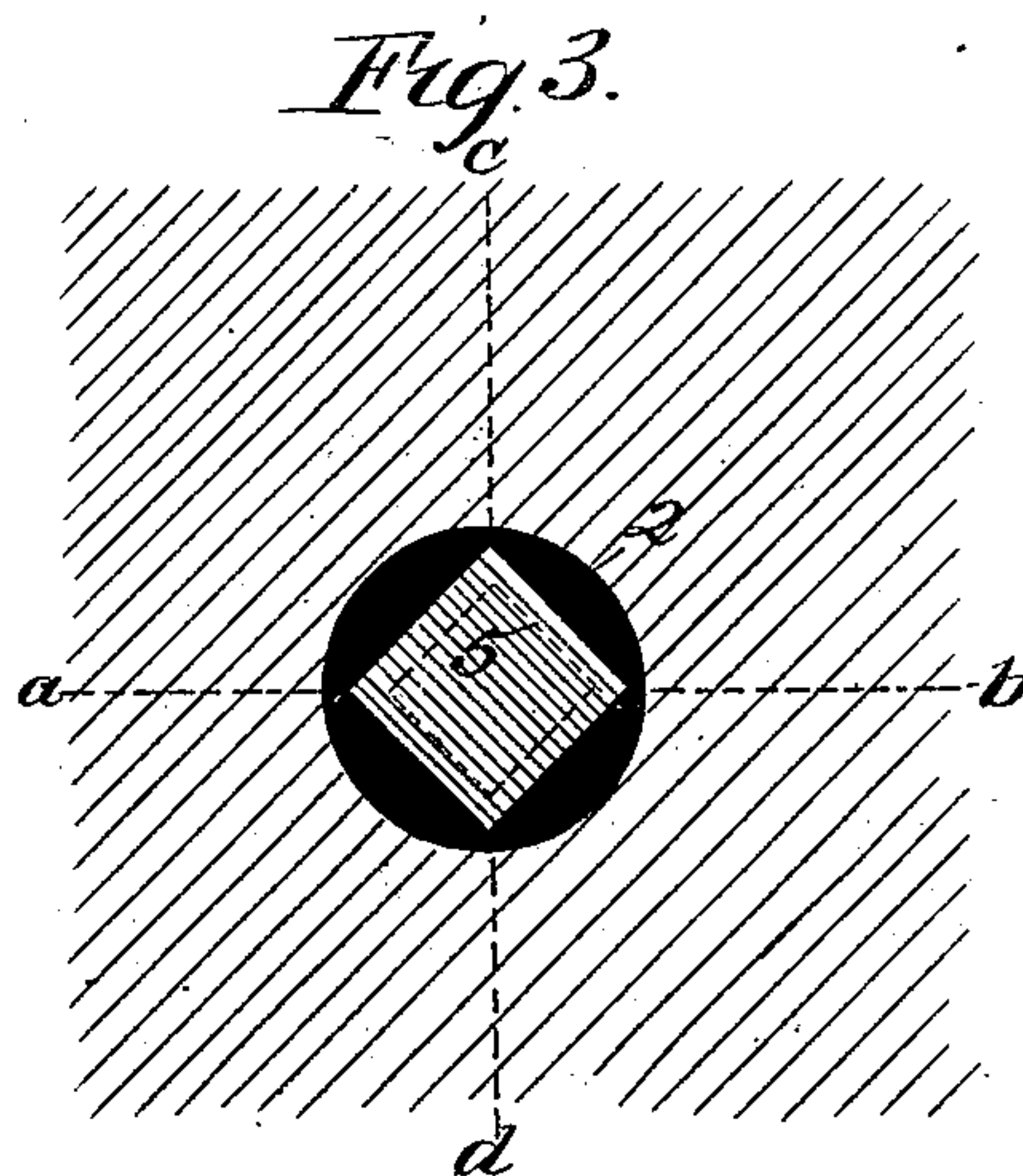
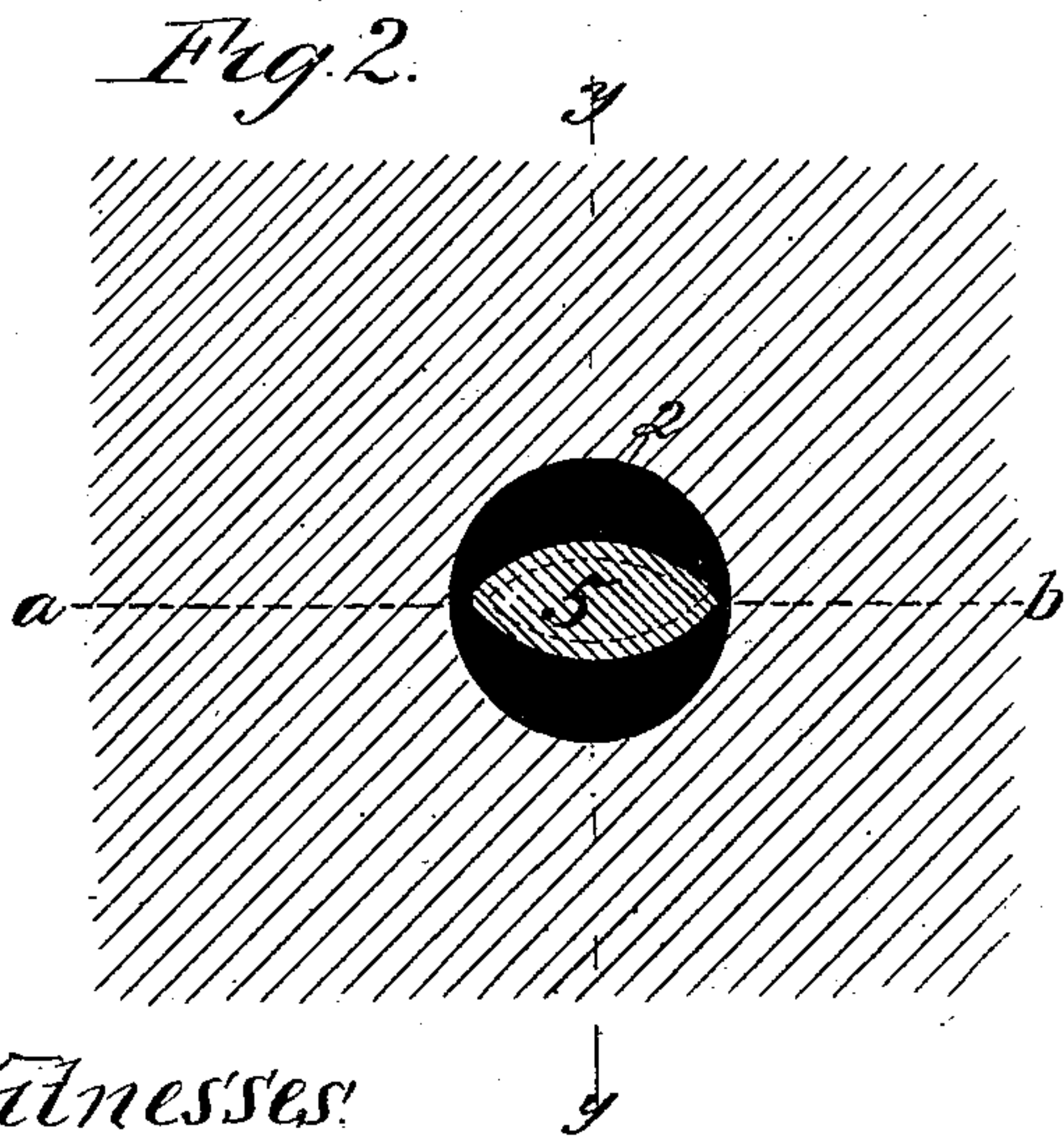
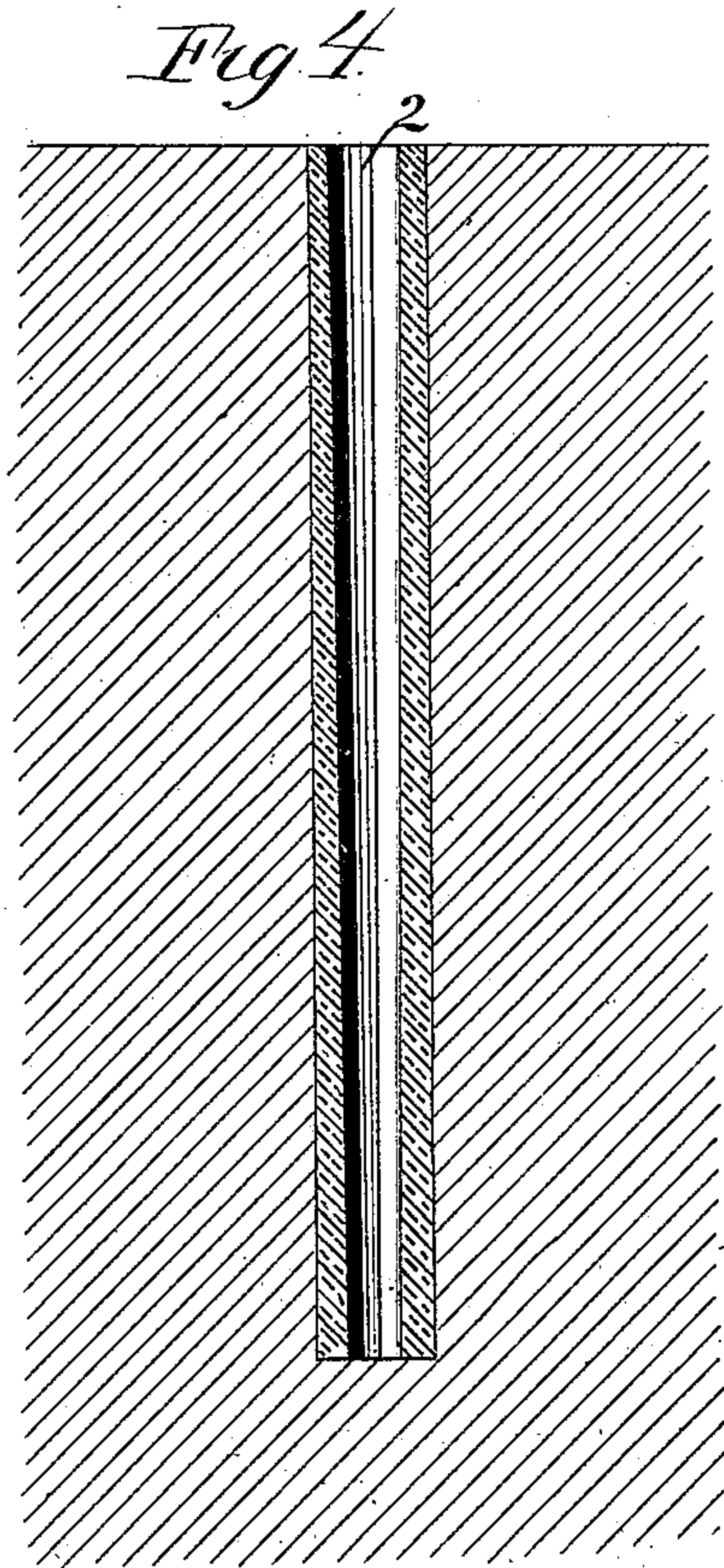
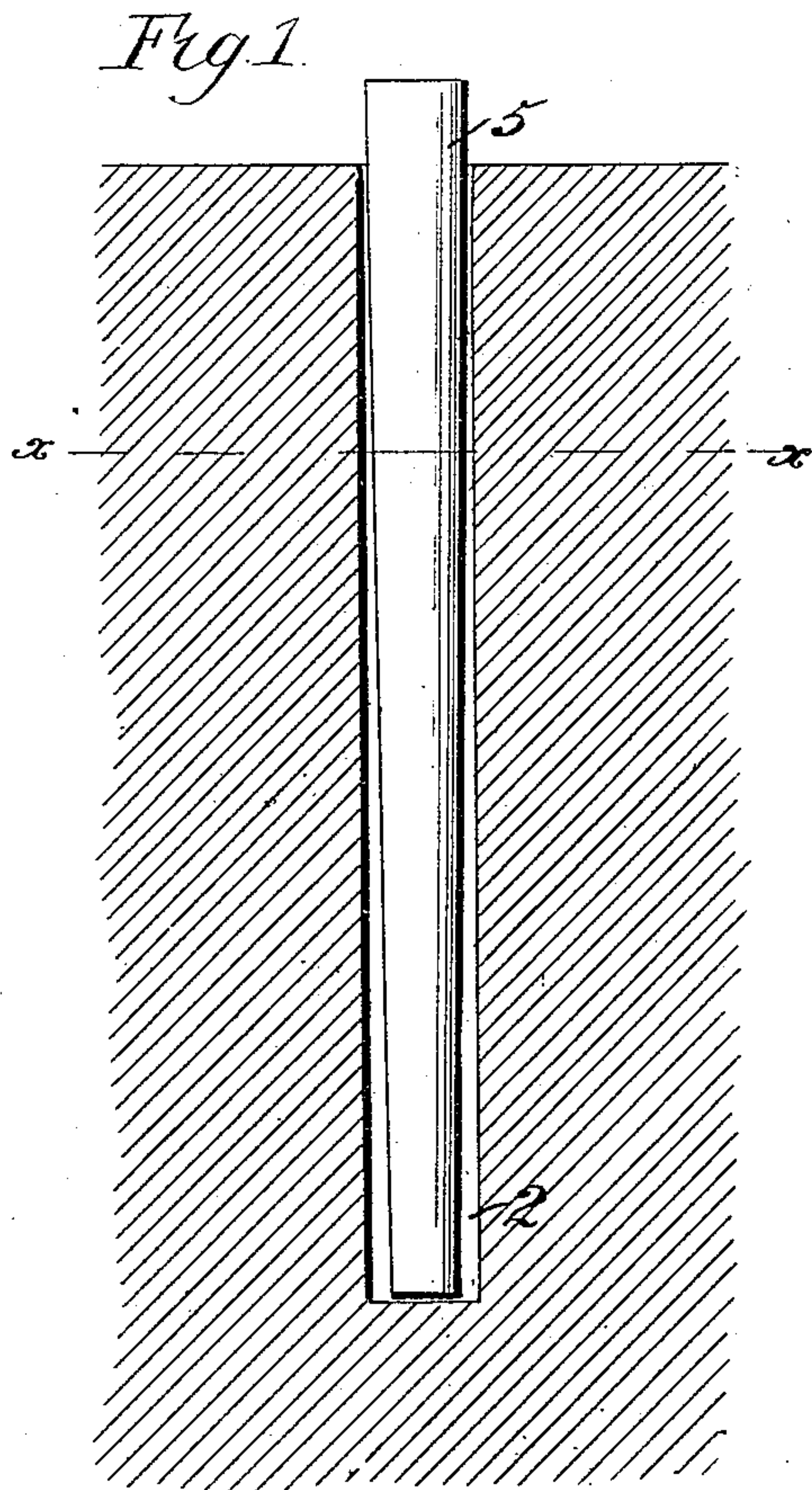


(No Model.)

W. HARTLEY.
METHOD OF BLASTING.

No. 442,678.

Patented Dec. 16, 1890.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM HARTLEY, OF HOUGHTON, WISCONSIN.

METHOD OF BLASTING.

SPECIFICATION forming part of Letters Patent No. 442,678, dated December 16, 1890.

Application filed May 3, 1890. Serial No. 350,418. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HARTLEY, of Houghton, in the county of Bayfield and State of Wisconsin, have invented a new and useful Method of Blasting, of which the following is a specification.

This invention relates to improvements in the method of blasting rock, tree, or other substances; and the objects I have in view are to provide for the fracture of the rock in any desired direction, to fill up and partially unite the seams in the rock, so that the walls of the hole present an unbroken and equal surface on all sides, and to accomplish these results independently of the original form of the hole and without making use of any specially-prepared cutting-tools.

To these ends my invention consists in the method hereinafter described, and particularly pointed out in the claim.

In the accompanying drawings, forming a part of this specification, Figure 1 is a section of a portion of rock, illustrating my improved method. Fig. 2 is a transverse section of the same on line *x x* of Fig. 1, on a larger scale. Fig. 3 is a view similar to Fig. 2, but showing a different-shaped core. Fig. 4 is a vertical section on line *y y* of Fig. 2, with the core withdrawn.

In carrying out my improved method I drill or form in any other usual manner a hole 2, of any form, usually cylindrical, or nearly so, this being the easiest form to make in the rock or substance 3 to be blasted. In this hole I place a core 5, of any suitable shape, and I fill the space between the core and the walls of the hole with a suitable plastic substance that will set or harden upon cooling or exposure. When it is desired to break the rock or other substance on a single line of fracture, as *a b*, Fig. 2, the core is preferably of elliptical form in cross-section, as shown in Fig. 2. When it is desired to have two lines of fracture, as *a b* and *c d* in Fig. 3, the core may be of substantially rectangular form. In either case at the points where the core approaches nearest to the walls of the hole there will be the least amount of material, and consequently the least resistance, and the line or lines through these points will constitute the line or lines of fracture, and the explosive substance, ex-

erting its force equally on both, or in the case of fracturing (shown in Fig. 3) on all four, sides of hole, causes material to be blasted to part at place of meeting or angle of such hole. The plastic material used may be of plaster-of-paris, cement, adamant, or other suitable material. After the plastic substance has set sufficiently the core is withdrawn, leaving a hole of the desired shape. When the substance has become sufficiently hard, the charge is put in and tamped in the ordinary way and the blast made in the usual manner. The plastic substance fills all the seams and covers the weak spots in the walls of the hole, and thus presents an unbroken surface at all points.

The core may first be put in place and the plastic substance poured around it, or the plastic substance may be put in first and then the core be inserted. The core is preferably made slightly tapering in form, and by rubbing it with oil or grease it will be withdrawn easier and leave the plastic substance intact. The core may also be made hollow, so that there will be no resistance from suction by forming a vacuum. This method is very inexpensive, the plastic substance costs but little, the same core may be used for an indefinite period of time, and the holes may be made without any special care and with ordinary tools. In effect by this method it is possible to make out of a round or other shaped hole a hole that is elliptical or of any other desired shape to suit the kind of fracture desired, and to do this at a very small expense and with very little trouble.

In the ordinary method of blasting it is necessary to drill the hole perfectly round and smooth and to cut grooves in the wall of rock or material to be blasted to direct the blast. This is slow and expensive work. With my method it is immaterial whether the holes be regular or not, as the plastic substance fills up all irregularities of bore and leaves the holes perfectly smooth for the reception of the powder or other explosives.

When it is necessary to make long cuts, a series of holes is bored in a direct line and fired simultaneously in the usual manner.

I claim as my invention—

The method of blasting, which consists in placing in a hole previously formed in the

usual manner in the substance to be blasted
a core of the form desired to determine the
lines of fracture, and a plastic substance that
fills the space between the core and the walls
5 of the hole, withdrawing the core after the
plastic substance has set sufficiently, and com-
pleting the blast in the usual manner, sub-
stantially as set forth.

In testimony whereof I have hereunto set
my hand this 25th day of April, 1890.

WILLIAM HARTLEY.

In presence of—

ALFRED HARTLEY,
P. CHRISTOPHERSON.