

(No Model.)

H. H. BOURNE.  
METHOD OF BLASTING EARTH.

No. 371,298.

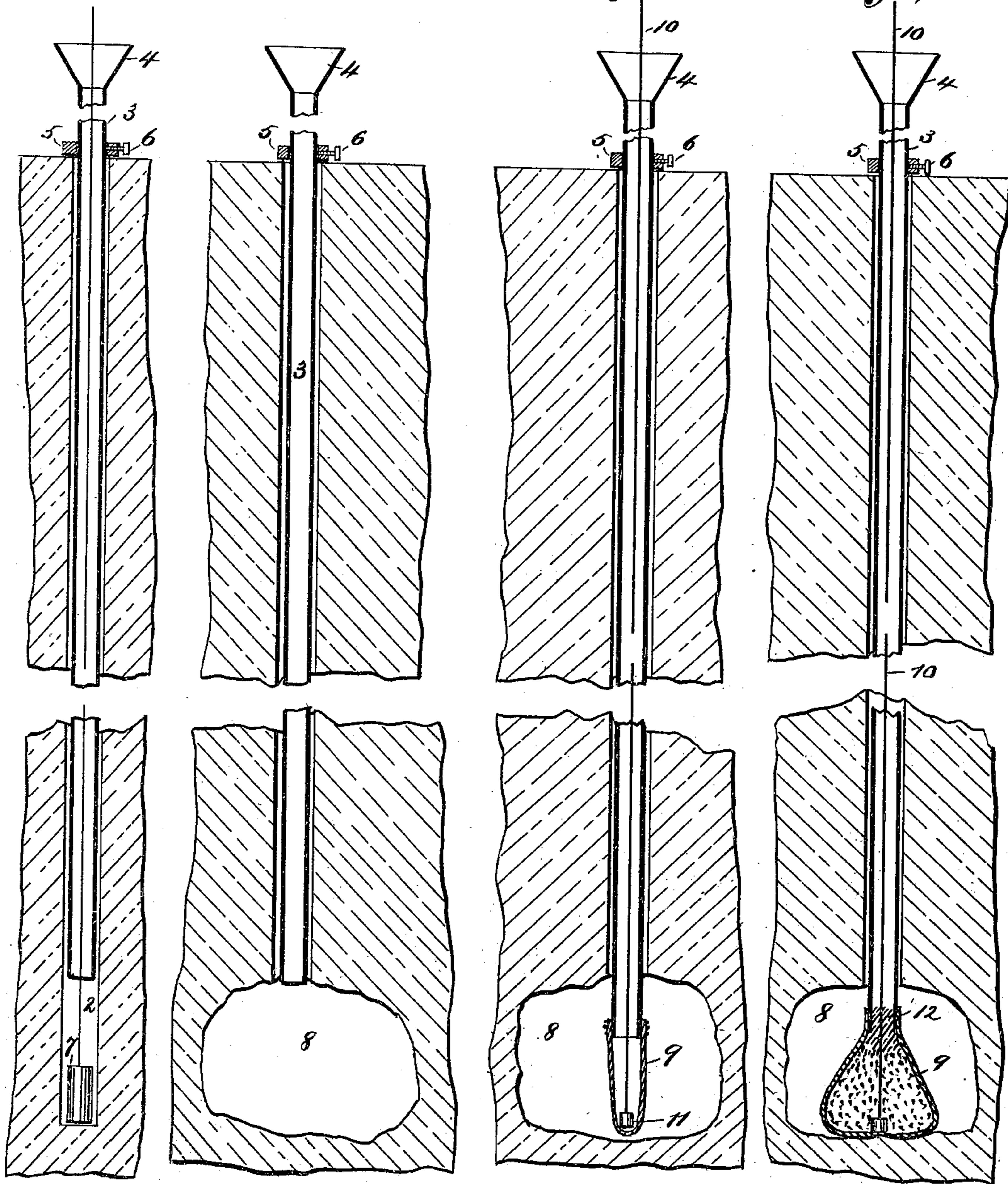
Patented Oct. 11, 1887.

*Fig. 1*

*Fig. 2*

*Fig. 3*

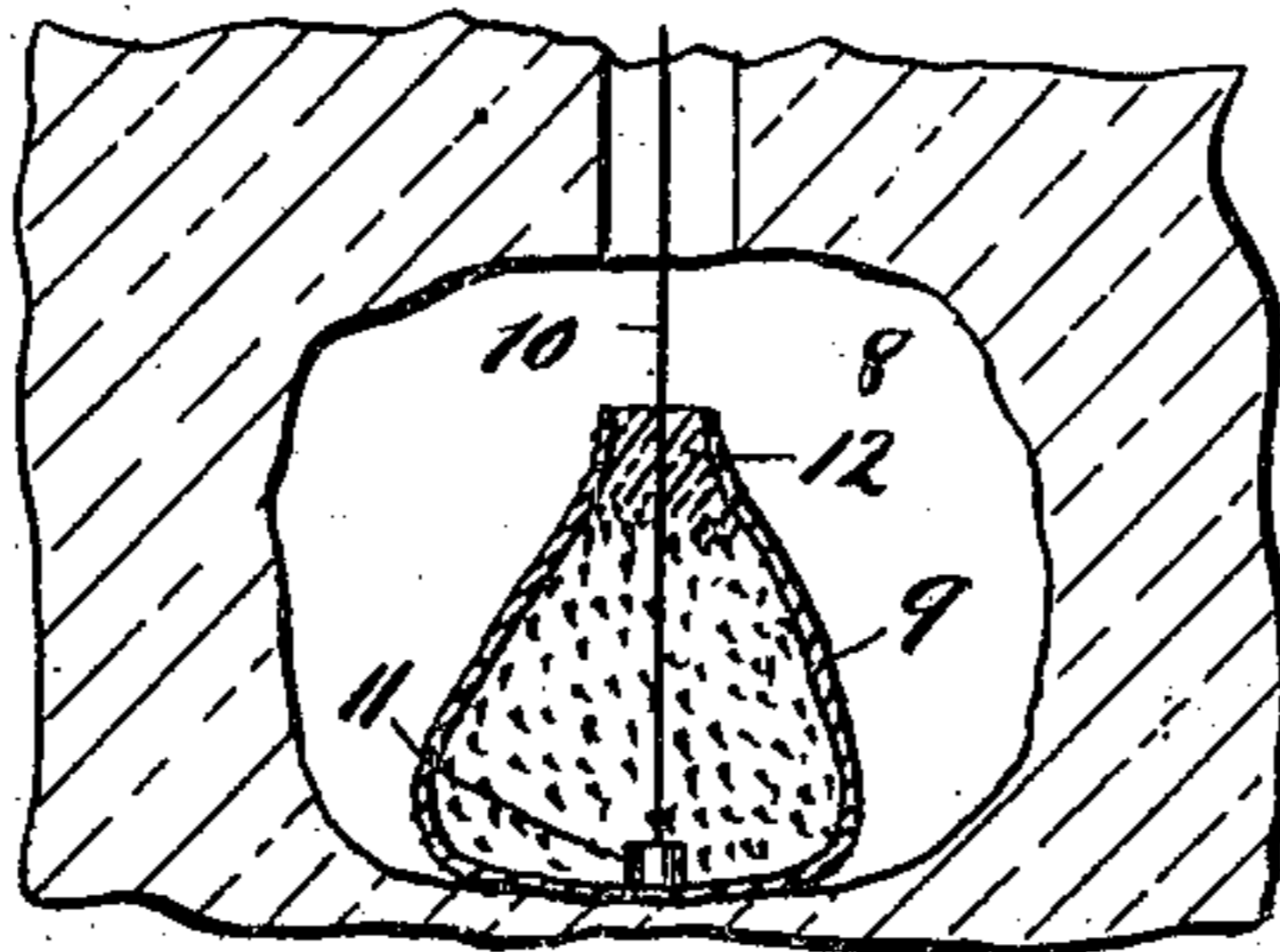
*Fig. 4.*



*Fig. 5*

WITNESSES:

*J. M. Ordle*  
*E. Sedgwick*



INVENTOR:

*H. H. Bourne*

BY

*Munn & Co*

ATTORNEYS.

# UNITED STATES PATENT OFFICE.

HENRY H. BOURNE, OF MANHATTAN, KANSAS.

## METHOD OF BLASTING EARTH.

SPECIFICATION forming part of Letters Patent No. 371,298, dated October 11, 1887.

Application filed December 11, 1886. Serial No. 221,322. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY H. BOURNE, of Manhattan, in the county of Riley and State of Kansas, have invented a new and Improved Method of Blasting Earth, of which the following is a full, clear, and exact description.

This invention relates to an improvement upon the method of blasting earth forming the subject-matter of Letters Patent No. 351,959, granted to me on the 2d day of November, A. D. 1886. The object of the present invention is to improve the said method, as will be hereinafter described, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a vertical sectional view of a bank, representing the same as it appears after the first step of my improved method of blasting earth has been taken—that is, after the dynamite-cartridge has been lowered to place. Fig. 2 is a similar view representing the bank as it appears after the second step has been taken. Fig. 3 is a view representing the parts as they appear after the tube carrying the rubber pouch has been lowered to place and the fuse has been adjusted to position. Fig. 4 represents the pouch as it appears after having been filled with the explosive; and Fig. 5 represents the charge within the lower cavity, the filling-tube having been withdrawn.

In carrying out my invention I bore or drill a hole, 2, in the bank at a proper distance from the edge. In the hole so formed I insert a filling-tube, 3, which is formed with a funnel shaped mouth, 4, and provided with a collar, 5, which is arranged to be clamped to the tube by means of a set-screw, 6. After the tube has been lowered to the bottom of the hole 2 it is drawn upward a short distance, and the collar 5 is clamped to the tube in order that said tube may be held in its raised position. A dynamite-cartridge, 7, is then lowered to the bottom of the hole 2 and exploded, thereby forming a chamber, as 8. The tube 2 is then withdrawn, and a rubber pouch, 9, is secured to its lower end, after

which the pouch and the tube are returned to the position in which they are shown in Fig. 3.

The fuse that is to be employed to explode the material which is to be placed within the pouch 9 is shown at 10, the lower end of the said fuse being attached to a weight, 11, that is lowered so as to carry the fuse within the pouch 9. After the fuse has been lowered to place, an explosive material, preferably gun-powder, is poured in the funnel-shaped mouth 4 of the tube 3, passing downward into the pouch 9, and after a proper charge of powder has been so delivered to the pouch a packing or filling of hydraulic cement, 12, is forced downward into the tube 3, which tube is then withdrawn, thereby permitting the mouth of the rubber pouch to close about the cement and prevent the entrance of any water which may be contained within the cavity 8.

When the parts have been arranged as described, the fuse 10 is ignited and the contents of the pouch exploded.

This method of blasting earth may be employed for the purpose of forming cisterns or storage-receptacles.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The herein-described method of blasting earth, which consists in boring a hole of proper depth, exploding a cartridge at the lower end of the hole, inserting a tube carrying a water-proof pouch through the tube upon its lower end, filling said pouch with a proper explosive, withdrawing the tube, and exploding the explosive, substantially as described.

2. The herein-described method of blasting, which consists in boring a hole and enlarging it at its inner end, then inserting a tube having a detachable water-proof pouch on its end into the hole until the pouch is within the enlargement, then passing an explosive through the tube into the pouch, then filling the pouch through the tube above the explosive with a packing, then withdrawing the tube from the pouch and hole and exploding the charge, substantially as set forth.

3. The herein-described method of blasting, which consists in boring a hole and en-

larging it at its inner end, then inserting a tube having a detachable elastic water-proof pouch on its end into the hole until the pouch is within the enlargement, then passing the  
5 explosive through the tube into the pouch, passing a packing through the tube into the end of the pouch above the explosive, then withdrawing the tube from the pouch and hole, the mouth of the pouch closing about  
10 the packing, and finally exploding the charge, substantially as set forth.

4. The method of blasting, which consists in boring a hole and enlarging its lower end, then passing a tube having a detachable elastic water-proof pouch on its end into the hole  
15

until the pouch is within the enlargement, then filling the pouch through the tube with explosive until the pouch has expanded to a greater diameter than the bore of the hole, then inserting a packing of hydraulic cement  
20 through the tube upon the explosive, then withdrawing the tube to allow the open end of the pouch to close upon the cement by contracting, and finally exploding the charge, substantially as set forth.

HENRY H. BOURNE.

Witnesses:

F. R. SPOUSLER,  
AUG. BEACHAM.