

(No Model.)

J. L. L. KNOX.

METHOD OF TAMPING BLAST HOLES.

No. 314,585.

Patented Mar. 31, 1885.

Fig. 1.

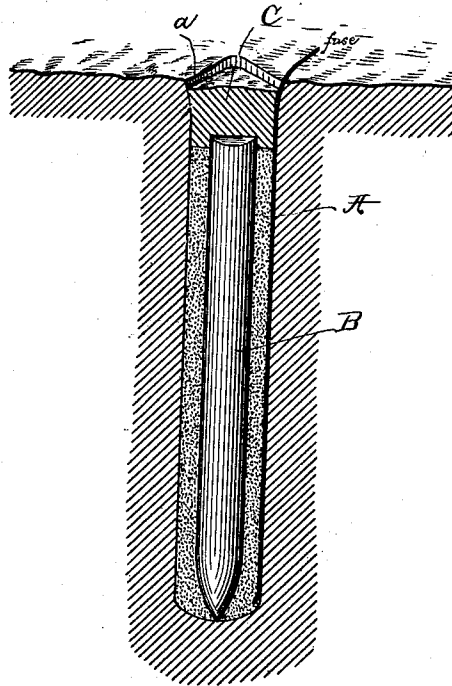


Fig. 2.

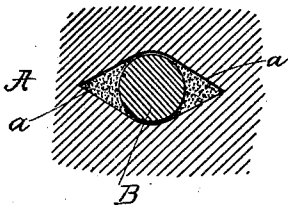
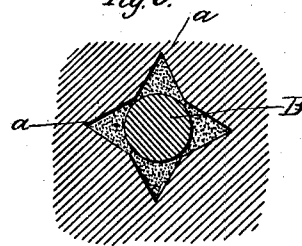


Fig. 3.



Witnesses:

Chas. W. Williams  
Jas. A. Henderson

Inventor.  
John L. L. Knox  
per Knox, Simpson & Co.

# UNITED STATES PATENT OFFICE.

JOHN L. L. KNOX, OF ALLEGHENY, ASSIGNOR TO THE KNOX ROCK BLAST-  
ING COMPANY, OF PITTSBURG, PENNSYLVANIA.

## METHOD OF TAMPING BLAST-HOLES.

SPECIFICATION forming part of Letters Patent No. 314,585, dated March 31, 1885.

Application filed April 7, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN L. L. KNOX, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in the Method of Charging and Tamping Blast-Holes, of which the following is a full, clear, and exact description.

10 The ordinary method of charging and tamping a blast-hole is to place a charge of the required size at the bottom of the hole and the tamping directly upon the top of the charge. Another method has been to place the charge  
15 at the bottom of the hole and the tamping some distance above the charge, thus leaving a greater or less unoccupied space between the charge and the tamping. The first method is subject to the objection that almost the whole  
20 force of the explosion is confined to the immediate vicinity of the bottom of the hole, and the rock is thereby torn to pieces in the latter place, while only affected to a slight degree near the top of said hole. In consequence,  
25 also, of this a proportionately heavy charge is required to effect a given result. The second method spoken of is of no practical benefit, because the substance used in tamping has nothing to rest upon, and must consequently  
30 be of such depth as that the friction of its lower part against the sides of the hole may be sufficient to sustain it in place under the heavy blows of the hammer necessary to complete the operation. The result of this is that  
35 a large portion of the hole is filled with the tamping, and all this portion is practically unaffected when the charge is exploded.

The practical effect and the disadvantages, therefore, of the two methods of charging and  
40 tamping are to a great extent the same.

The general object of this invention is to so charge and tamp the blast-hole as to expose the sides of the blast-hole throughout their length (as near as practicable) to the direct  
45 action of the explodent.

The particular object of the invention is to effect this general object where the charge is very small in proportion to the depth and area of the hole.

50 The particular application of the invention

is to the improved method of blasting described in Letters Patent issued to me January 8, 1884, No. 291,606. In said patent a blast-hole is described having oppositely-located longitudinal equilateral two sided grooves, and the  
55 force of the explodent is spent in the direction of a plane bisecting the grooves. In this method of blasting comparatively small charges of explodent are used in relatively large blast-holes. It is necessary to make these small  
60 charges do duty as near as possible throughout the whole length of the blast-hole grooves. To accomplish this I charge and tamp the holes in the manner hereinafter described and  
65 shown.

In the accompanying drawings, Figure 1 represents a longitudinal median section of the blast-hole, showing the position of the charge and tamping; Fig. 2, a cross-section of the  
70 same, and Fig. 3 a cross-section of a hole having four longitudinal grooves.

Similar letters of reference indicate corresponding parts throughout the different views.

A is a blast-hole of any required depth or size, provided with oppositely-located two-sided equilateral longitudinal grooves *a*. B  
75 is a rod in diameter somewhat less than the short diameter of the blast-hole, preferably sharpened at one end, and in length equal to that of the blast-hole less the required space  
80 for tamping.

The charge of powder or other explodent may be placed in position in any of three ways, to wit: first, a portion of the powder may be placed in the hole, the sharpened end of the  
85 rod driven to the bottom of said hole, and the remainder of the charge dropped down the grooves; or, second, the whole charge may be placed in the hole and the rod then forced to the bottom; or, third, the rod may be first  
90 placed in position and the powder dropped in place through the grooves. The charge is thus distributed throughout the grooves and placed in the most advantageous position for action when exploded. The tamping C is then done  
95 directly upon the top of the rod, the latter offering an effective resistance to the encroachment of the tamping while said tamping is being driven into place. The tamping thus  
100 accomplished occupies but a very small space

at the top of the hole. It will thus be seen that by this method of charging and tamping the following combined advantages accrue: first, all unnecessary space in the blast-hole is disposed of; second, the explodent is so distributed as to act with equal force and simultaneously throughout the length of the blast-hole; and, third, the space necessary for tamping is reduced to a minimum. It may also be added that in the method of blasting hereinbefore referred to, and described in said Letters Patent issued to me, the present improvement in charging and tamping is the only way known to me in which said method may be used with proper and invariable success.

Having thus described my invention, what I claim is—

1. The within-described method of charging and tamping blast-holes, which consists in filling the central portion of the hole with a

rod extending to within a short distance of its top, distributing the explodent between the rod and the sides of the hole, and tamping at the top of the hole and upon the upper extremity of said rod, as and for the purposes described.

2. The within-described method of charging and tamping a blast-hole having oppositely-located two-sided equilateral grooves throughout its length, which consists in inserting in the hole a rod somewhat less in thickness than the short diameter of the hole and somewhat less in length than said hole, distributing the explodent throughout the grooves, and tamping upon the top of said rod, substantially as and for the purposes set forth.

JNO. L. L. KNOX.

Witnesses:

B. McKENNA,  
JOHN TETLEY.