No. 745,357. PATENTED DEC. 1, 1903.

C. B. LANHAM.

TESTER FOR BLAST CAVITIES.

APPLICATION FILED AUG. 21, 1902.

NO MODEL.

Fig. 1.

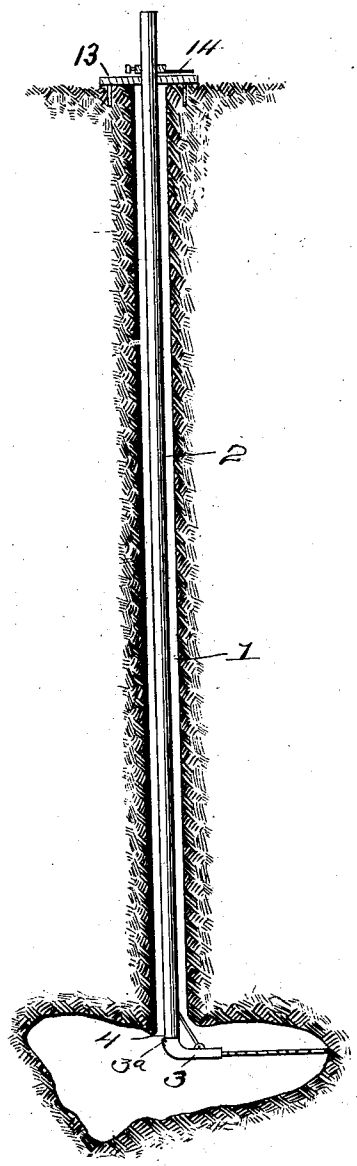

Fig. 2.

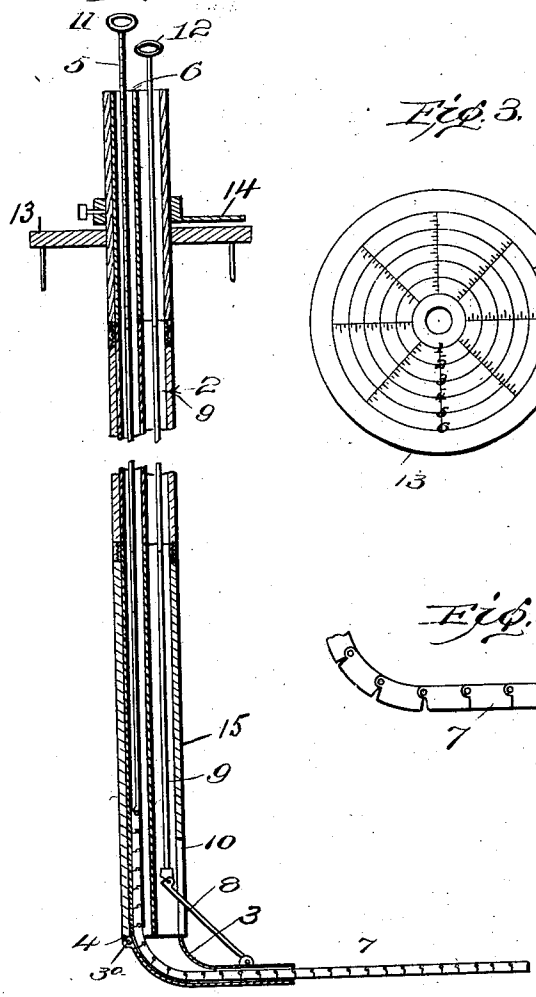

Fig. 3.

Fig. 4.

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No. 745,357. Patented December 1, 1903.

UNITED STATES PATENT OFFICE.

CALBREITH B. LANHAM, OF PITTSBURG, PENNSYLVANIA.

TESTER FOR BLAST-CAVITIES.

SPECIFICATION forming part of Letters Patent No. 745,357, dated December 1, 1903.

Application filed August 21, 1902. Serial No. 120,568. (No model.)

To all whom it may concern:

Be it known that I, CALBREITH B. LANHAM, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Testers for Blast-Cavities, of which the following is a specification.

My invention relates to testers for blast-cavities, the object of the same being to ascertain the size of the blast-cavity made by the cartridge at the bottom of the drilled hole preparatory to inserting the powder in the same for the purpose of blasting.

In the drawings forming a part of this specification, and in which like symbols of reference represent corresponding parts in the several views, Figure 1 is a vertical sectional view of the drilled hole, showing the device in its operative position in the same. Fig. 2 is a vertical sectional view of the device, showing the various parts of the same. Fig. 3 is a view of the dial used in connection with the device, and Fig. 4 is a view of a portion of the measuring-chain.

1 represents the drilled hole; 2, the tube of the tester, in which the various parts of the device operate; 3, a hinged elbow or joint pivotally connected with the bottom of the tube, and 3^a a pin forming the hinge between the tube and elbow, the same having a shoulder 4 to prevent the elbow from opening further than at right angles to the tube.

5 is a graduated rod working within the tube 6, formed within the main tube 2, said rod having a pivotal connection with a butt-joint measuring-chain 7.

8 is a link connecting the elbow 3 with a rod 9, the object of the same being to control said elbow and when desired draw it within a recess 10, formed in the tube or casing 2.

11 and 12 are handholds for the rods 5 and 9 for operating the same.

13 is a dial, and 14 a pointer adapted to be placed on the tube 2 above the dial to indicate the position of the same. The dial is marked with concentric circles representing inches from one to six, which for convenience are intended to indicate feet.

16 is a space on dial to keep a record of depth of hole and the various changes of depths made by different springings.

The tube 2, which is designed to afford protection to the parts, is preferably formed in sections of about four feet in length, so as to be detachable, and thus adapted for various depths of holes, except the lower part 15, which is made six feet to conform to the measuring-chain 7, which is also six feet, it being unnecessary to ever have the device any shorter. The other parts—such as the rods, &c.—are also made in sections to agree with the tube. The chain 7 is bendable only in one direction and is what might be called a "rule" or "butt-chain"—that is, it has butt-joints, the object of the same being to make it feed regularly in the direction of the elbow 3. The rod 5 has the usual scale of inches and feet upon its edge, so as to show instantly how far the chain reached within the excavation.

The operation of the device is as follows: The hole having been drilled in the ground and the preliminary cartridge having been exploded to enlarge the bottom of the same, the dial is first placed at the top of the hole or tube and secured by spikes or the like connected with the same and the tube with its elbow closed inserted in the hole. The rod 5 is then manipulated to operate the chain 7. When the extent of the excavation in one direction is ascertained, the tube is turned in another, and so on until the entire size of the excavation is ascertained. As the rod is withdrawn the measurement is of course ascertained and marked on the dial, and so on until all the various measurements have been made, and the sum total can then easily be adduced. The dial is also marked "N" "S" "E" "W," so that with the aid of the pointer 14 the exact location of the various soundings may be known.

Of course any manner of marking on the dial may be used so long as it is on the line which would indicate the proper number of feet measured.

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

1. In a tester for blast-cavities, a main protecting-casing, a measuring-chain adapted to operate within the same, means for operating the chain, and means for directing the chain.

2. In a tester for blast-cavities, a main casing, a measuring-chain, means for operating the chain, and an elbow connected to the bottom of the casing to direct the chain.

3. In a device of the character described, the combination with the main casing, of a measuring device adapted to operate in the same, an elbow hinged to the bottom of the casing, a rod to control the elbow, and a link connecting the free end of the elbow with the rod.

4. In a device of the character described, a main protecting-casing, and a butt-joint measuring-chain adapted to operate in the same, the butt-joints permitting bending only in one direction.

5. In a tester for blast-cavities, the combination with the measuring device, of a dial upon which to record the soundings and a pointer working in conjunction with the dial.

6. In a device of the character described, the combination with the main casing formed with a cut-away portion at its base, of a measuring device adapted to operate in the same, an elbow connected to the main casing and adapted to be received within the cut-away portion of the casing, means for operating the elbow, and a partition within the main casing forming separate compartments for the measuring device and elbow-operating means.

In testimony whereof I affix my signature in presence of two witnesses.

CALBREITH B. LANHAM.

Witnesses:

STUART E. OBERLIN,

A. JOHNS.