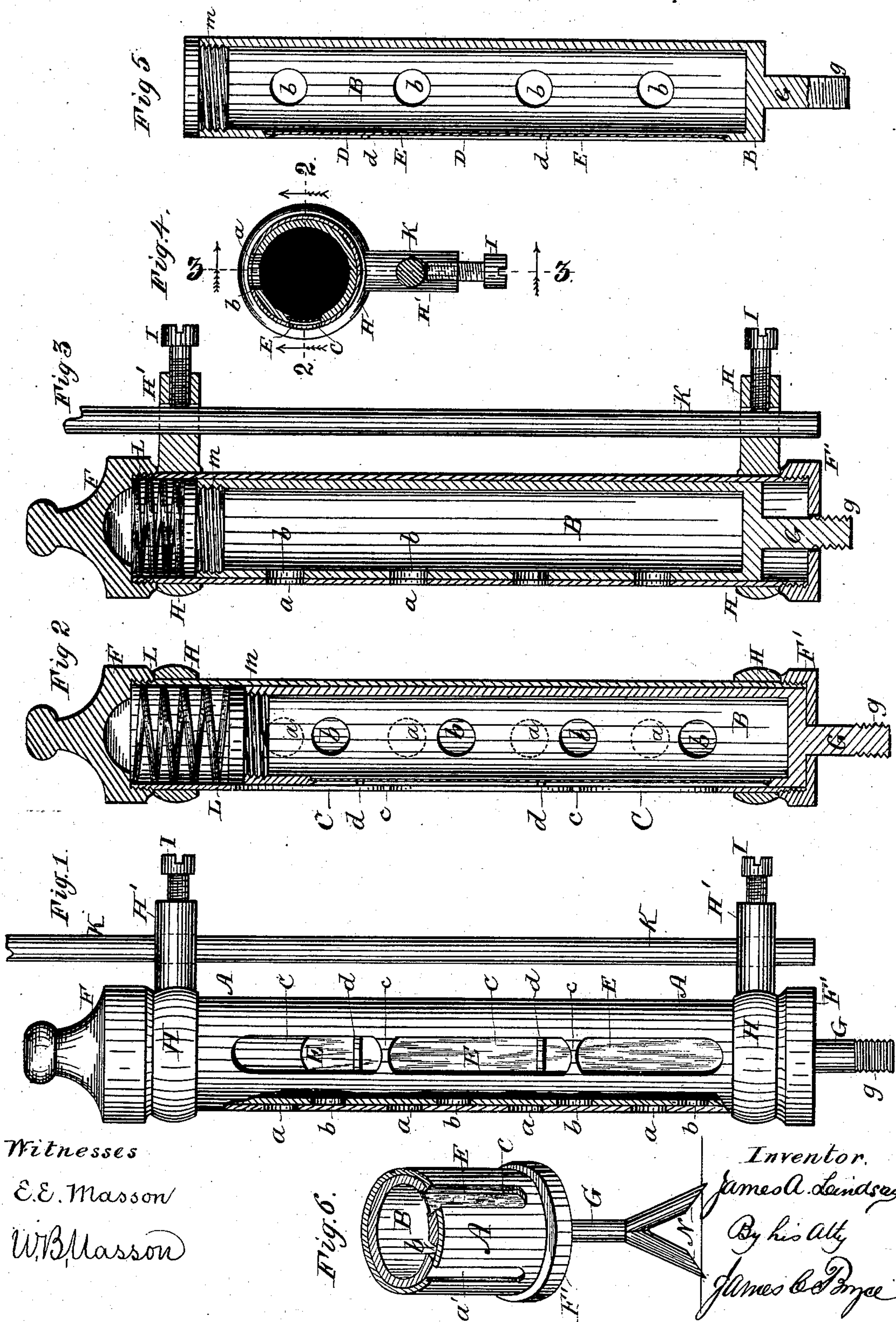


(No Model.)

J. A. LINDSAY.
Liquid Tester.

No. 232,519.

Patented Sept. 21, 1880.



Witnesses

E.E. Masson

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UNITED STATES PATENT OFFICE.

JAMES A. LINDSAY, OF KENDALL, ASSIGNOR OF TWO-THIRDS OF HIS RIGHT TO J. J. VANDERGRIFF, OF OIL CITY, AND W. A. SPRING, OF KENDALL, PENNSYLVANIA, ONE-THIRD TO EACH.

LIQUID-TESTER.

SPECIFICATION forming part of Letters Patent No. 232,519, dated September 21, 1880.

Application filed April 7, 1880. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. LINDSAY, of the borough of Kendall, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Liquid Testers or Thieves; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in what are ordinarily called oil "thieves" or "testers," which are used to ascertain the condition of liquids at various depths, and more particularly whether there is any water underlying the oil in a tank, barrel, or other vessel.

My invention consists in a liquid-tester made of two concentric closely-fitting tubes, movable as to each other, each tube provided with a series of openings or slots in its side extending nearly the whole length thereof, and so arranged that communication of the interior of the inner tube with a surrounding liquid can be opened and closed and inspection of the interior be allowed through a transparent plate secured to the inner tube.

Figure 1 is a side view of my apparatus. Fig. 2 is a vertical section taken on the line 2 2 of Fig. 4, with the interior tube thrown down by the force of the spring. Fig. 3 is a vertical section on the line 3 3 of Fig. 4, but the interior tube is pushed up and the spring compressed. Fig. 4 is a horizontal section. Fig. 5 is a vertical section of the inner tube, and Fig. 6 is a partial view of the lower portion of a different way of making the apparatus.

The apparatus is made of two concentric tubes, A and B, made to fit so closely to each other as to be practically water-tight. The inner tube, B, is closed at both ends, either by a screw-plug, as at *m*, or in any other way. The lower end has the pin *G*, which projects through the lower cap, *F'*, of the outer tube, A. The tube B is pierced with the perforations *b*, and also with a slot, *E*, or a series of long slots

divided by the bars *d*. In this slot *E* is placed some thin and transparent substance, like glass or mica.

The outer tube, A, is somewhat longer than the inner tube, B, so as to give space for the spring *L*. The outer tube, A, is closed at each end by a screw-cap, the upper one, *F*, being solid and the lower one, *F'*, being pierced with a hole to allow the passage of the pin *G*. A is also pierced with the holes *a* to correspond with those in B, and so arranged that when B is pressed up the holes *a* and *b* correspond with each other, as shown in Fig. 3; but when the tube B is pressed down in the tube A by the spring *L* the holes no longer correspond, and consequently no liquid can pass into B. This position is shown in Fig. 2. The slots *C* in tube A are open, and need not be filled with mica or glass.

K is the rod by which the instrument is handled, and may be of any convenient length. It is fastened to the tester or thief by the set-screws *I*, fastening it in the stems *H'* of the collars *H*.

The mode of operation of the apparatus is as follows: Suppose the liquid to be tested is oil contained in a tank, and that several inches of water have settled to the bottom. It is desired to ascertain the depth of such water. The rod *K* should be a few feet longer than the depth of the liquid, and the apparatus, being fastened to its lower end, is lowered vertically to the bottom of the tank, and is pushed down with sufficient force to cause the tube B to slide up in the tube A until the respective openings *b* and *c* correspond. The surrounding liquid then rushes into the interior of B and fills it with water and oil, and the water-level will be the same in B that it is in the tank. When the downward pressure on the rod is removed the spring *L* immediately pushes the tube B downward, closing the apertures *b*, and thus preserving in the instrument the same height of water that is in the tank. When the instrument is removed the depth of water will be shown through the transparent plate *E* and slots *C*.

The tube may be graduated or marked with inches and fractions, so that the exact depth

may be seen at a glance, or the distance from the water-line to the point of G may be measured. The depth of the water being known, its quantity can be ascertained by calculation, and thus the quantity of oil in the tank can be determined.

The pin G is provided with a screw-thread, *g*, that extra length of standard may be attached in case the water should be deeper than the length of the tube B.

In Fig. 6 I show a modification of the instrument. In this I make the tubes so that the inner one, B, reaches from cap to cap of the tube A, and use no spring.

In the outer case, A, I show two long slots, *a'* and C; but only one is necessary. In the tube B, I would make a long slot, *b'*, and a slot with the transparent plate E.

The pin G should be made with the fork N. The rod K may be fastened in the top cap. Pressing the fork N upon the bottom with sufficient force, the tube A can be turned on the tube B so as first to open the slots and then close them, and bring the transparent plate E opposite slot *a'*, or opposite a slot cut for the purpose of allowing inspection of said transparent plate E. Suitable pins can be inserted to properly limit the motion; but this is of but slight importance, as it is necessary only to close the slots below the liquid, and after the instrument is taken out the tubes

can be turned sufficiently to expose the transparent plate E at the slot *a'*.

Instead of slots to allow the passage of the liquid, holes may be made through both tubes, similar to those shown in Fig. 3, in such positions that they may be opened and closed by the rotary movement.

I claim—

1. A liquid-tester made of two concentric closely-fitting tubes, movable as to each other, each tube provided with a series of openings or slots in its sides extending nearly the whole length thereof, and so arranged that communication of the interior of the inner tube with a surrounding liquid can be opened and closed as described, and inspection of the interior be allowed through a transparent plate secured to the inner tube, substantially as shown and specified.

2. In an oil tester or thief, the combination of the tube A, provided with slots C and apertures *a*, of the tube B, provided with apertures *b* and transparent plate E, and of the spring L, substantially as shown and described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JAMES A. LINDSAY.

Witnesses:

JAMES C. BOYCE,
KENTON SAULNIER.