

(No Model.)

T. A. MASTERS.  
PRESSURE GAGE.

No. 464,576.

Patented Dec. 8, 1891.

Fig. 1.

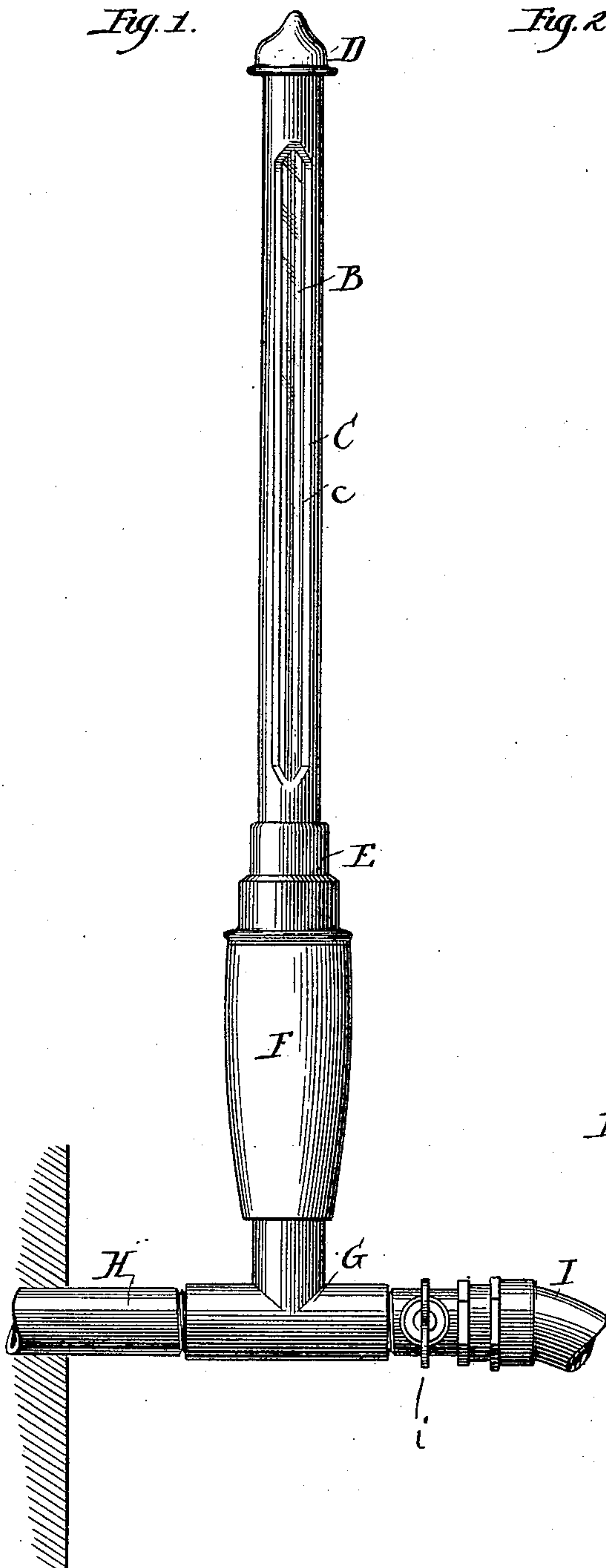


Fig. 2.

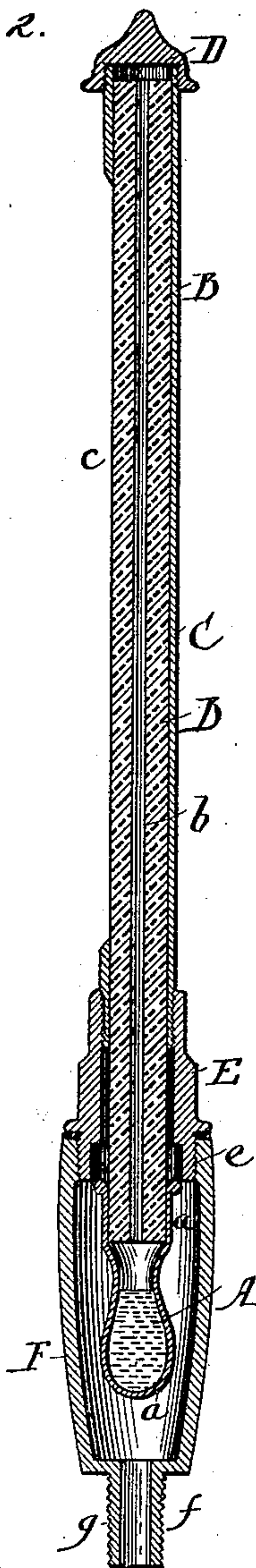
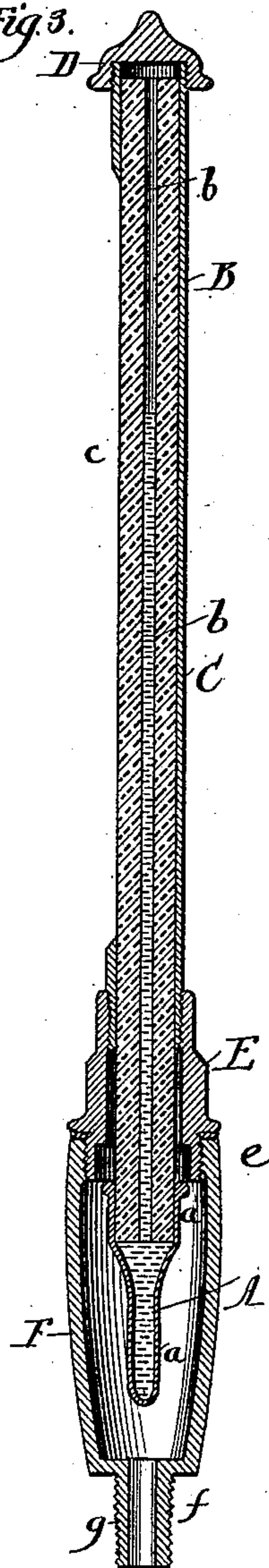


Fig. 3.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## PRESSURE-GAGE.

SPECIFICATION forming part of Letters Patent No. 464,576, dated December 8, 1891.

Application filed August 18, 1890. Serial No. 362,347. - (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS A. MASTERS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mercury-Gages; 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 10 which it pertains to make and use the same, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation showing the gage attached ready for use. Fig. 2 is a longitudinal section with the mercury lowered and not in use. Fig. 3 is a longitudinal section with the mercury raised as in use.

This invention relates to mercury-gages for testing as to leakage, and is especially designed for the use of gas-fitters in testing the pipes as to whether they are perfectly sealed, but can be used by others than gas-fitters, and for other uses and purposes.

The object of the invention is to construct 25 a mercury-gage which will be very sensitive and at the same time reliable and safe in use, and which will be always in condition for use, and will be light and strong and can be carried around without any liability of spilling or losing the mercury; and to this end it consists, essentially, of an elastic receptacle for the mercury, which will compress under pressure and raise the mercury and will return to its normal condition when the pressure is removed, allowing the mercury to drop.

The invention further consists in the combination of such elastic receptacle with a sight and inclosing casing, as hereinafter more particularly described, and pointed out in the 40 claims.

In the drawings, A represents the receptacle for the mercury, made of india-rubber or other elastic material possessing the nature or quality of being compressible under pressure and assuming its normal shape and condition when the pressure is removed. This receptacle is of a bulb shape shown, or other bulb shape, which will respond readily and quickly to pressure and will be equally as sensitive in 45 assuming its natural shape with the removal of the pressure, and will also show depreciation or reduction of the pressure. As shown,

the receptacle A has a pear-shaped bulb or body portion *a*, and a contracted neck *a'*; but the bulb shape of the body *a* and the shape 55 of the neck *a'* could be otherwise formed, so long as they furnished a bulb-body and a contracted neck operating to draw around and make an air-tight joint.

B is a glass tube, to the inner end of which 60 the receptacle A is attached by the end of the tube B entering the neck *a'* for the neck to tightly clasp around the tube, or in any other suitable manner, that will form an air-tight joint between the receptacle A and the tube 65 B, and this tube B has a central longitudinal hole *b* for the mercury from the receptacle A, which can enter the hole *b* from the interior of the receptacle A.

C is a casing inclosing the sight-glass B, and 70 having on one side a longitudinal opening *c* for the inspection of the sight-glass B, and may be made of brass or other material not easily broken or bent.

D is a cap or cover for the end of the casing C, screw-threaded or otherwise removably 75 attached to the casing.

E is a head or base for the inner end of the casing D, and this head or base can be formed with the case or be a separate piece screw-threaded or otherwise attached to the end of the case C. This head or base has a neck or annular flange *e*, screw-threaded, as shown, on its exterior, but which could be screw-threaded on its interior, and the inner end of 85 the sight-tube extends into or below the end of this neck *e*. This head or base can be made of brass or other suitable material.

F is a cup surrounding the mercury-receptacle A and attached to the head of the base 90 E, and, as shown, the cup at its inner end is screw-threaded to receive the exterior screw-thread of the neck or flange *e*; but if the neck or flange had an interior screw-thread the end of the cup would have a corresponding exterior screw-thread. This cup F can be made of brass or other suitable material and can be of the shape shown or other shape that will inclose and surround the receptacle A, and it has a stud or extension *f* with an 100 exterior screw-thread for the attachment of the gage, which stud has a longitudinal hole *g*, communicating with the interior of the receptacle A.



G is an ordinary T-coupling, to one end of which the gage is attached by the stud or extension *f*, as shown in Fig. 1.

H is the projecting or cap end of a gas-pipe to which another end of the T-coupling G is attached, as shown in Fig. 1.

I is a hose attached to the third end of the T-coupling and leading to an air-pump and having on its coupling end a shut-off valve or cock *i*.

The parts of the gage are assembled by screwing or otherwise securing together the casing C and head or base E. The receptacle A is attached to the sight-glass B by slipping its neck onto the end of the sight-glass and the sight-glass inserted in the casing C and head or base E and there secured. For the body *a* of the receptacle to lie below the neck or flange *e'* the cap D is placed on the end of the casing C, and the cup F, with its stud *f*, attached to the head or base E to surround and inclose the receptacle A, when the device is ready for use.

In use a T-coupling is screwed at one end onto the projecting end of a gas-tube when the gage is used by gas-fitters, so as to have the end of the T for the attachment of the gage vertical. The gage as a whole is attached to its T and by screwing the stud extension *f* into the end, and the tube I from the air-pump is attached to its end of the T, connecting the gas-pipe, the gage, and the air-pump together. The pump is then worked, forcing air into the gas-pipes and also to a corresponding pressure into the cup F around the receptacle, and such pressure will act on the receptacle and compress it, forcing the mercury out into the sight-tube B, in which it will gradually rise, and when the desired pressure is reached a stop-cock or other shut-off *i* is turned, closing the inlet of air from this air-pump and holding the pressure in the gas pipe and gage. The mercury in the sight-glass will remain at the same height if there is no leak in the gas-pipe; but if there is a leak in the pipes such leak is at once detected, as the air escaping from the pipes at the leak will reduce the pressure in the cup F around the receptacle A, and the receptacle will fill out, causing the mercury to descend,

thus indicating a leakage at some point in the pipes, and such leakage can be found and stopped and the air-pump again worked, and such operations can be repeated until the mercury holds steady, showing that the pipes are all right. The pressure in the pipes is then released, releasing the pressure in the cup F, and with such release of the pressure the receptacle A assumes its normal condition and the mercury descends into the receptacle, where it is held for the test of other pipes.

The gage is very simple in construction, can be readily attached and detached, can be easily carried, and in carrying will not become disarranged, as the mercury remains in its receptacle unless forced out by pressure, will always be ready for use, and will be found perfectly correct and reliable in use; and it is to be understood that the essential feature in carrying out the invention is the elastic receptacle A, by which the mercury is held and actuated by a differential pressure on the receptacle.

What I claim as new, and desire to secure by Letters Patent, is—

1. The elastic compressible receptacle A, having the pear-shaped body *a*, containing mercury, and neck *a'*, sight-glass B, tightly compressed by the neck *a'* to form an air-tight connection with the receptacle A, casing C, inclosing the sight-glass B, and cap D, in combination with the head E for the passage of the sight-glass B and attachment of the casing C, and cup F, surrounding and tightly inclosing the receptacle A and attached to the head E, substantially as and for the purposes specified.

2. The elastic compressible receptacle A, having the pear-shaped body *a*, containing mercury, neck *a'*, and sight-glass B, tightly compressed by the neck *a'*, in combination with the head E for the passage of the sight-glass B, and the cup F, surrounding and tightly inclosing the receptacle A and attached to the head E, substantially as and for the purposes specified.

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Witnesses:

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