

No. 611,657.

Patented Oct. 4, 1898.

T. THOMSON.
PRESSURE GAGE.

(Application filed Aug. 28, 1897.)

(No Model.)

Fig. 2.

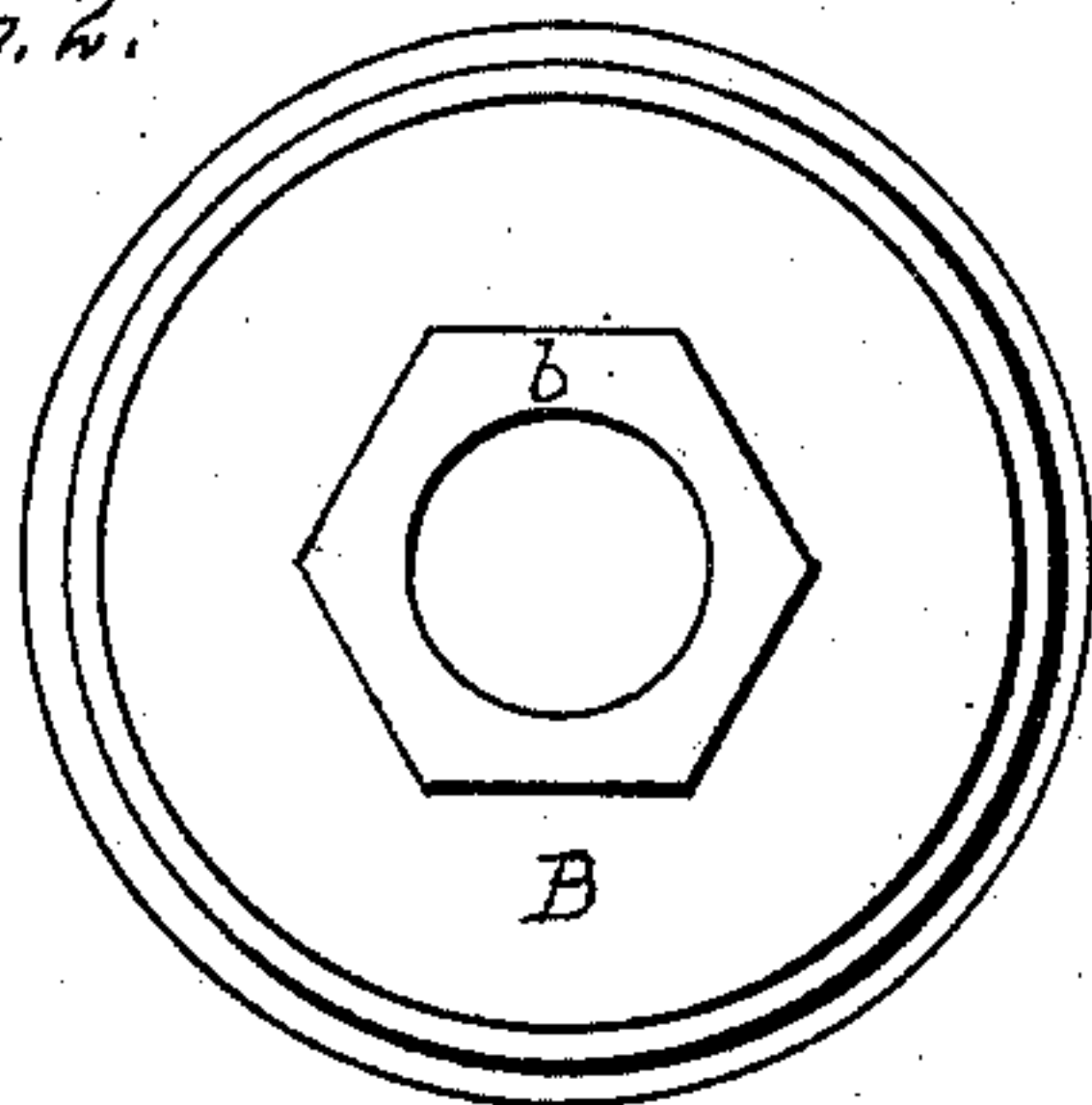


Fig. 5.

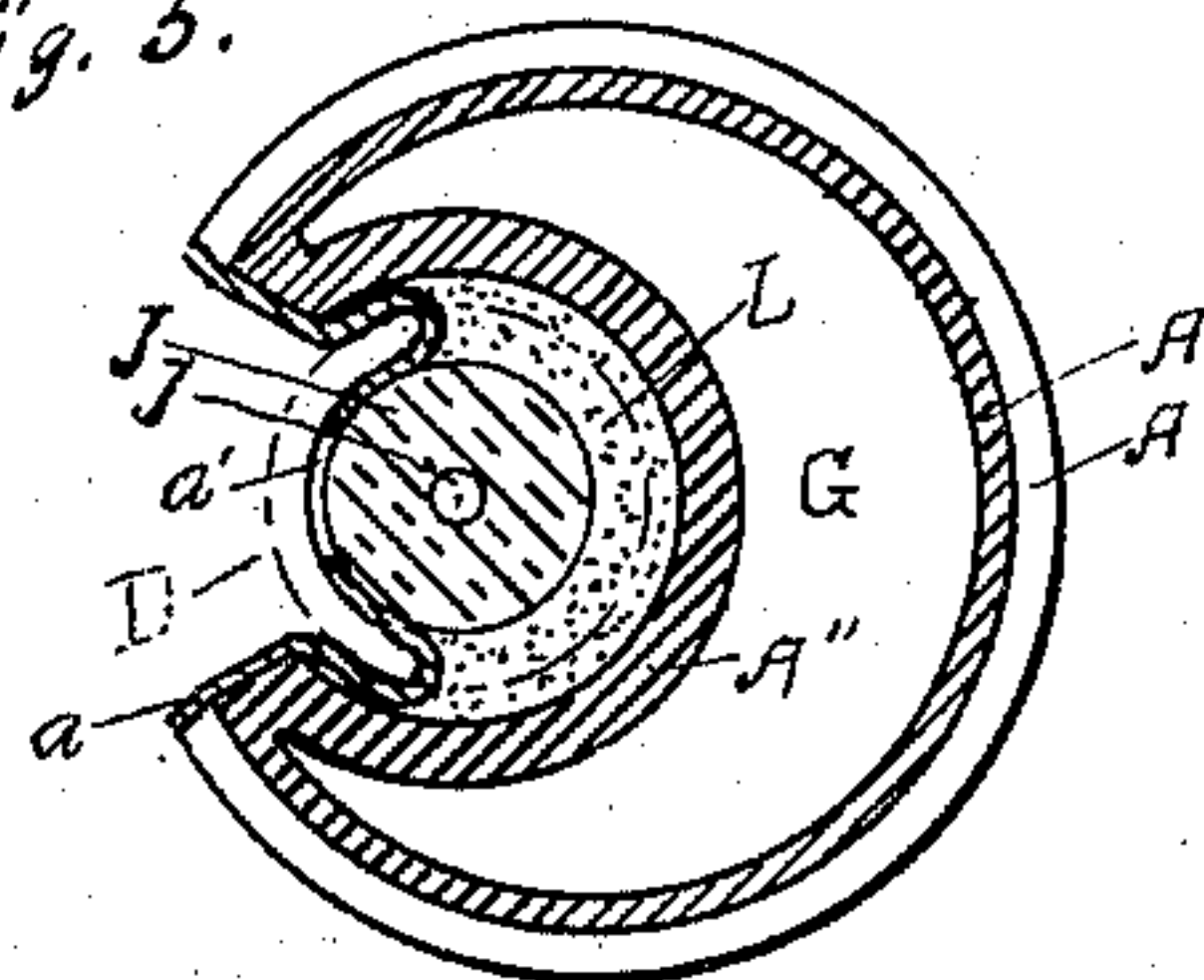


Fig. 6.

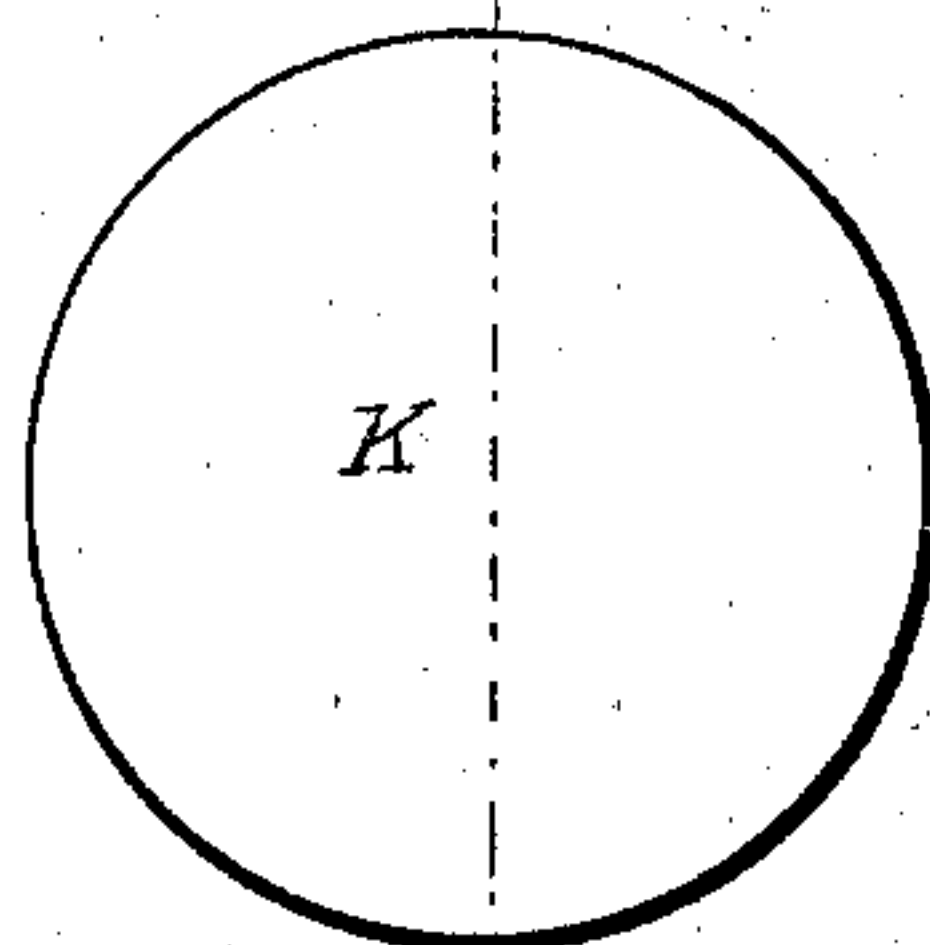


Fig. 1.

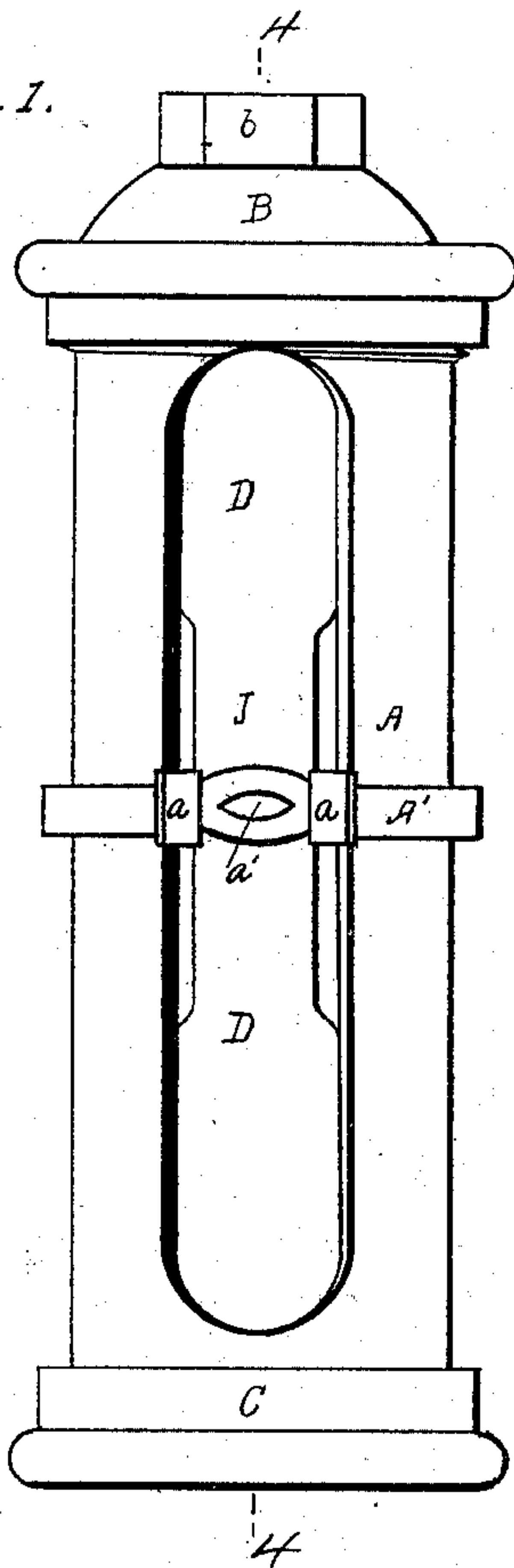


Fig. 4.

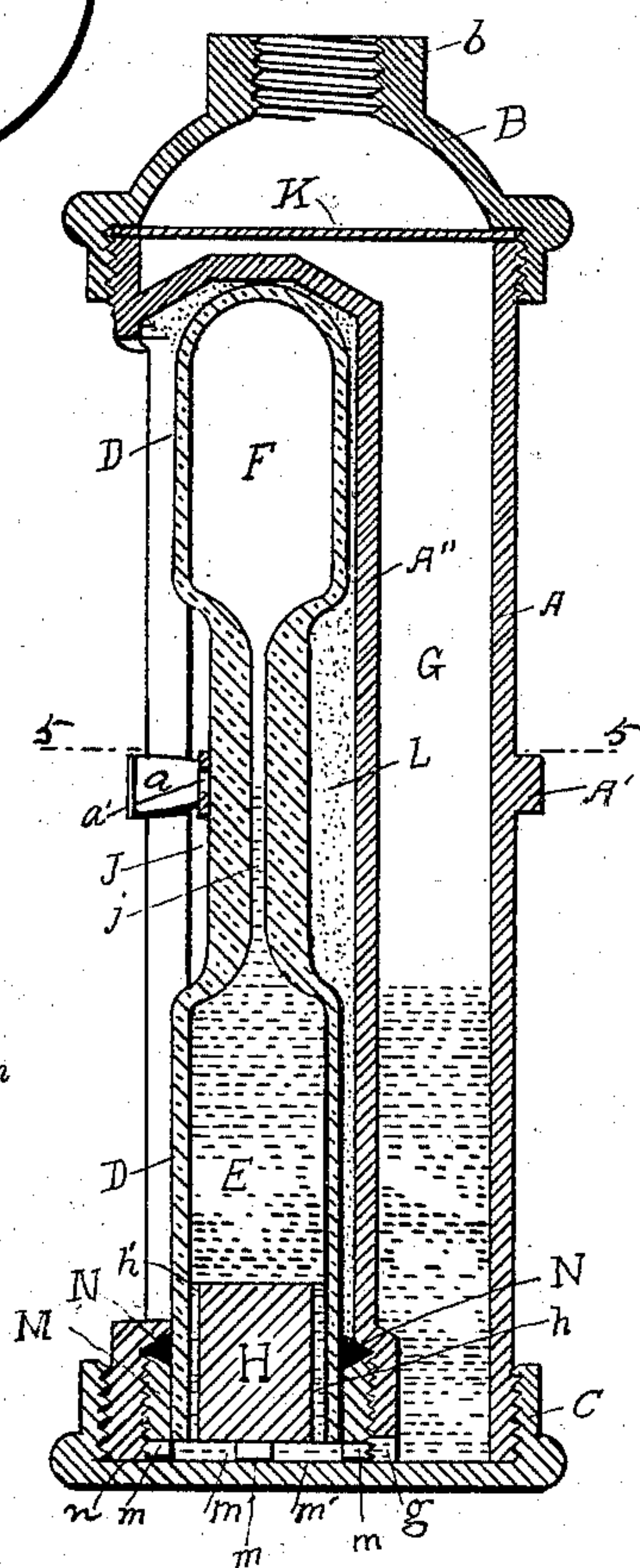
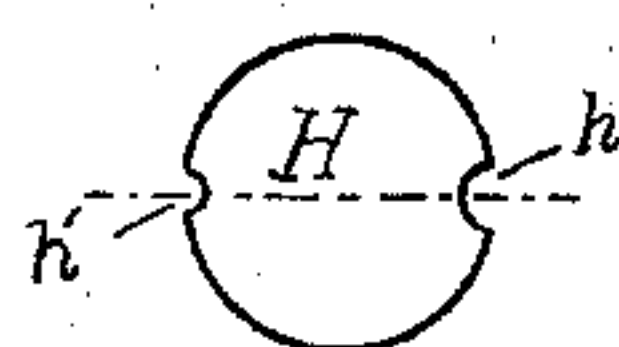


Fig. 3.



WITNESSES,
Lyonel Roddt
Edith Schweirs

INVENTOR,
Thomas Thomson
Per D. B. Repley
Attorney

UNITED STATES PATENT OFFICE.

THOMAS THOMSON, OF SCRANTON, PENNSYLVANIA.

PRESSURE-GAGE.

SPECIFICATION forming part of Letters Patent No. 611,657, dated October 4, 1898.

Application filed August 28, 1897. Serial No. 649,824. (No model.)

To all whom it may concern:

Be it known that I, THOMAS THOMSON, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Pressure-Gages; and I declare the following to be a full, clear, and exact description of the invention, such as 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 the letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of pressure-gages which are used to determine the pressure of liquids or gases, and also for the purpose of testing pipes or boilers for leakage. Its object is to simplify the construction of such gages, to render them more accurate and more easily handled.

To this end the invention consists of the construction, combination, and arrangement of the several parts, as herein set forth, and illustrated in the accompanying drawings, in which—

Figure 1 shows a front view of my device complete. Fig. 2 is a top view of the device. Fig. 3 is a top view of the plug used to fix the zero-point in the closed tube. Fig. 4 shows a cross-section of the gage complete, taken on the line 4 4 of Fig. 1. Fig. 5 is a cross-section of the same, taken on the line *y y* of Fig. 4. Fig. 6 is the leather diaphragm used to retain the liquid when gage is not attached.

Referring to the drawings, A designates the main or barrel portion of the device, strengthened at the middle by the rib A' and provided with a recess formed by the inwardly-curved part of the surface A'' and adapted to contain the transparent-glass tube D, which is embedded in a suitable cement or paste, (designated L,) but has one side exposed to sight for inspection. The tube D has an upper chamber F and a lower chamber E, the two being connected by the narrow passage *j*, extending through a contracted portion J of the tube.

The ends of the barrel or main portion of the device are externally screw-threaded and adapted to be fitted with the internally-screw-threaded caps B and C, forming, respectively,

the top and base pieces of the device, the top piece B being provided with the internally-screw-threaded nipple *b*, by means of which the device is adapted to be attached to the pipes to be tested.

Within the curved walls of the main portion is the crescent-shaped receptacle G, which serves to contain the mercury or other liquid to be used. Disposed between the outward opening and this crescent-shaped space is a porous diaphragm, circular in form, preferably constructed of strong leather. This diaphragm is securely held in place by having its edges clamped between the upper rim of the barrel A and an annular flat surface of the cap B, as shown in Fig. 4, and should be sufficiently porous to allow gas or air to pass through it, thus allowing pressure on the liquid below; but it should not be so porous as to allow the liquid to escape when the device is momentarily inverted. A passage *g* connects the chamber G with the open end of the tube D, which is partially closed by a plug H, having a larger groove *h* and a smaller groove *h'*, through which grooves the liquid may communicate with the chambers of the tube D. This plug H may be made of such a length as to render the chambers E and F of the same size, so that when all of the air is pressed from the lower chamber E into the upper chamber F the upper chamber contains exactly two atmospheres, thus indicating a pressure of fifteen pounds. The plug H may be made longer, so as to make the lower chamber E of the tube smaller, so that when the remaining air from E is pressed into the chamber F a pressure of ten pounds is indicated, or any other adjustment within the limits of the main construction may be effected by varying the length of the said plug H. This adjustment is important in the manufacture of the device for the reason that in preparing the tubes it is difficult to get uniformity in the size of the chambers E and F, and the tests should be made before permanently inserting said tubes to the plug H, and sawed off to the length required for the proper adjustment of the instrument in which it is used. The tube D is inserted into its place before the base-cap C is screwed on and before the externally-screw-threaded ring M is inserted in the following manner: The cavity formed by the

inward-curved wall A'' is partially filled with a soft cement or plaster-of-paris and the tube is placed into it before it hardens. Then a gasket *n*, preferably made of rubber, is stripped
 5 over the lower end of the tube and the threaded ring M is then securely screwed in, compressing the gasket between the walls of the incasing part and the tube, the ring being turned by means of lugs *m m*, &c., which
 10 have spaces *m' m'*, &c., between them to allow communication of the liquid between the glass tube and the crescent-shaped chamber G. An indicator, consisting of a bent strip of metal *a*, having an eye or sight *a'*, is curved
 15 so as to conform with the section J of the tube and with the edges adjacent to the incased tube, which strip is adapted to slide upward and downward of the contracted part J of the tube, so as to mark the height of the column
 20 of mercury in the passage *j* for the purpose of making observation of minute changes of pressure. The chamber is partially filled with mercury or other suitable liquid and tested, so that at the pressure for which the instrument
 25 is built the column of mercury will stand at midway of the passage *j* of the glass tube.

The operation of the device is now readily explained. The instrument is attached by means of the nipple *b* to the pipe to be tested,
 30 and the instrument retained in the upright position, as shown. Before attaching it, however, all of the mercury is drained out of the glass tube and into the crescent-shaped chamber by holding the instrument in the hand
 35 with the tube upward, the liquid flowing out through the passage *h* and the air allowed to pass in by means of the passage *h'*. When the instrument is attached, the pressure is applied by the means at hand, and the mer-
 40 cury is pressed upward until the contracted passage *j* is reached. It is now evident that any slight change in pressure will affect a considerable distance of motion in the said passage, and if the slide A is adjusted to indi-
 45 cate the height at which the column stands under pressure any slight variation may readily be detected, the air compressed in the chamber F serving to permit of a high pressure without a very high column of mercury
 50 to indicate it.

It is evident that by this construction and the modifications indicated, without departing from the spirit of the invention, users are provided with a sensitive and perfect pres-

sure-gage in a most compact and convenient 55 form and that the invention represents a substantial advance in the art to which it relates.

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

1. In a gas-pressure gage the tube D having 60 the chamber F and the chamber E with a narrow passage connecting the same, one of said chambers being hermetically sealed and the other adapted to have its open end fitted with a plug for the purpose of adjusting the size of 65 the chamber and the said plugged end adapted to be immersed in a cup of liquid so that a given pressure of gas on the surface of said liquid will fill the plugged chamber of the glass tube and extend partially through the 70 narrow passage aforesaid, substantially as described.

2. In a gas-pressure gage the liquid-chamber G having in connection therewith the open 75 lower end of the tube D, the said tube D being provided with air-chambers E and F, the air of the chamber E when under sufficient pressure passing through a narrow passage in the glass tube to the chamber F thus indicating that a given pressure has been reached, 80 substantially as specified.

3. In a gas-pressure gage adapted to indicate pressure by the height of a column of liquid, the tube D containing an upper and a lower chamber with a narrow passage between 85 them, the said lower chamber adapted to be adjusted to the proper capacity by means of a plug H which is cut at such length as to create the proper proportional relation between the chambers for the purpose of indi- 90 cating a given pressure by raising the column of liquid so that it passes partially through the narrow passage aforesaid, substantially as specified.

4. In a gas-pressure gage of the kind de- 95 scribed the herein-described tube consisting of two chambers with a narrow passage between them, and an indicator adapted to be moved lengthwise of said passage for the purpose of detecting slight variations of pres- 100 sure, substantially as specified.

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

THOMAS THOMSON.

Witnesses:

EDITH SCHWEIRS,
 JOHN LUXEMBURGER.