

(No Model.)

W. E. H. WILLIAMS.  
GAS REGULATOR.

No. 563,436.

Patented July 7, 1896.

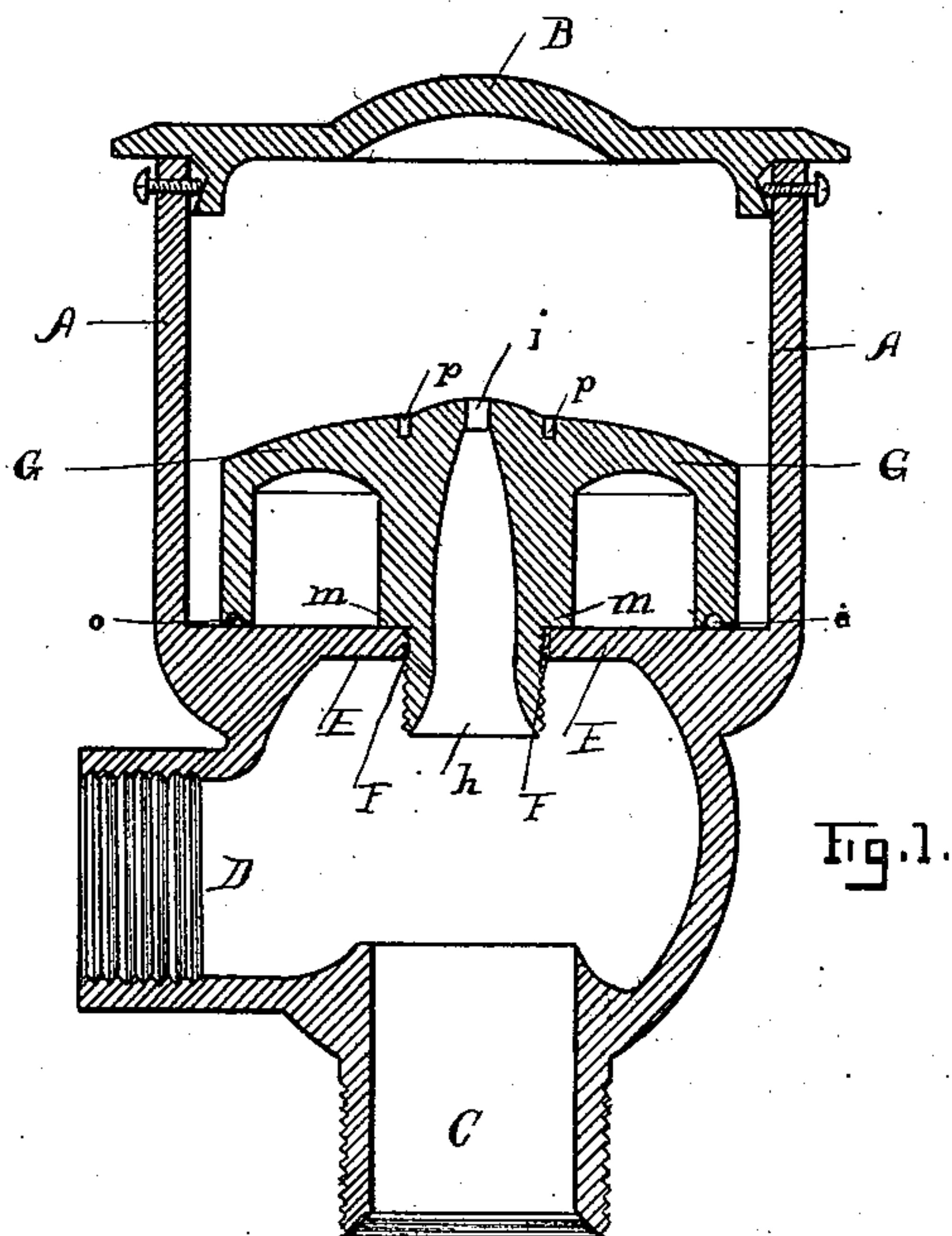


Fig. 1.

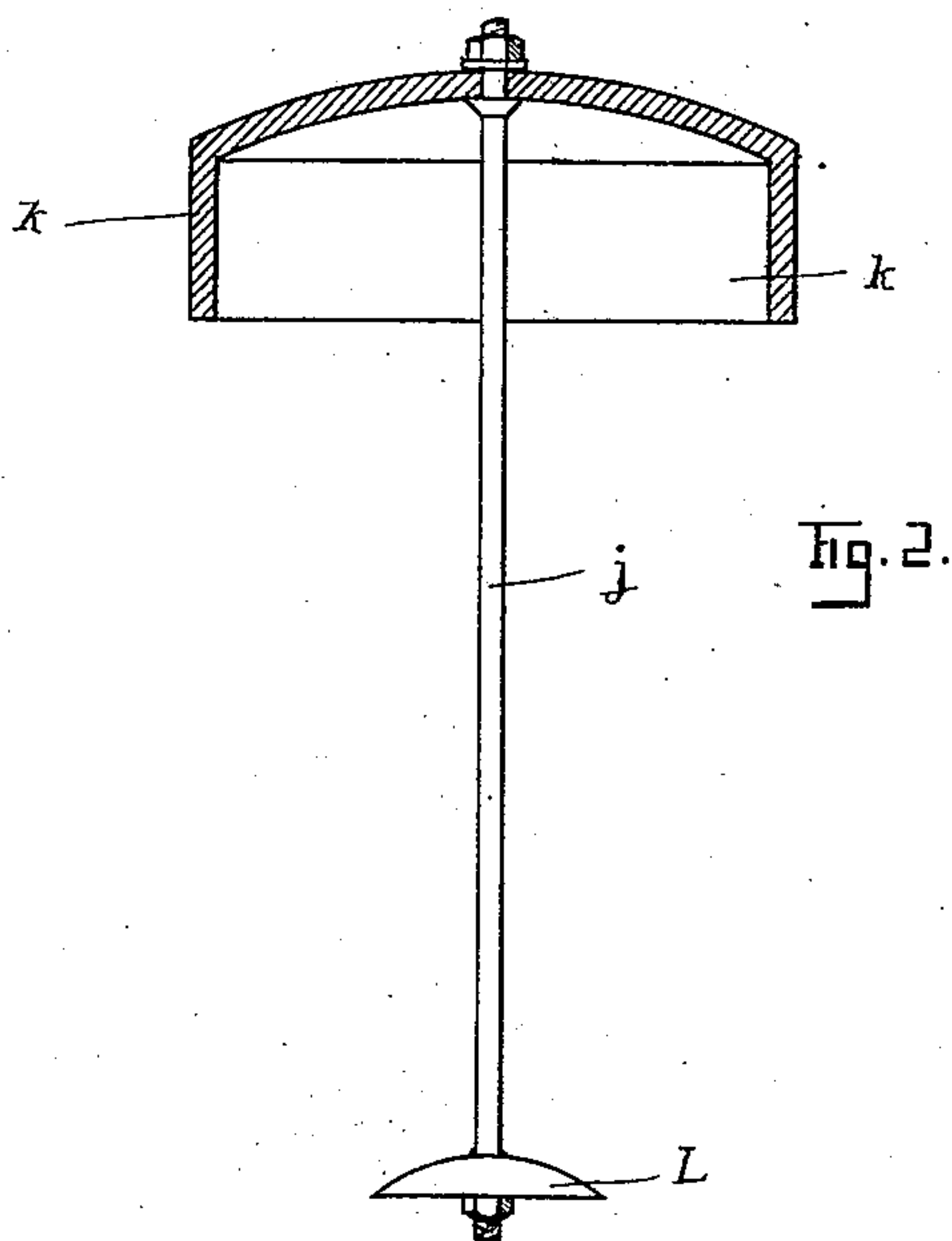


Fig. 2.

WITNESSES:

*Baldwin Talb.*  
*Jno. D. Richards*

INVENTOR

*William E. H. Williams*

BY

*Boone W. Mendenhall*

ATTORNEYS

# UNITED STATES PATENT OFFICE.

WILLIAM E. H. WILLIAMS, OF SAN FRANCISCO, CALIFORNIA.

## GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 563,436, dated July 7, 1896.

Application filed January 30, 1896. Serial No. 577,471. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. H. WILLIAMS, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Gas-Regulators; and I do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

My invention relates to that class of gas-regulators in which mercury is used for sealing the lower edge of an inverted cup or vessel contained within an outer inclosing vessel.

In order to provide a chamber to contain the mercury in which the lower edge of this inverted vessel or gasometer is immersed, the outer vessel has heretofore been cast in one integral piece with a very thick bottom, which forms what is called the "diaphragm" of the regulator, and a narrow annular channel or groove was made in this thick bottom or diaphragm in a line with and within the inner wall of the vessel, and in this groove or channel the mercury was placed and the lower edge of the inverted vessel or gasometer passed down into the mercury to form a seal as the gasometer rises and falls by the varying pressure of the gas admitted beneath it through an opening in the center of the diaphragm. This annular channel or groove has heretofore been formed in one of two ways. In some cases the cup and its thick bottom have been cast with the annular groove; but in these cases it is necessary to make a very wide and tapering groove, in order to draw the casting from the sand, and the sides of the groove are uneven and covered with asperities which cannot well be chiseled or ground off, owing to the inconvenient location of the groove in the vessel, and unless removed these asperities are apt to interfere with the free movement of the gasometer or inverted inside vessel. In other cases the annular groove or channel has been milled or planed out at great expense and trouble.

My invention consists in casting the outer vessel with a thin flat bottom to form the diaphragm and then securing centrally upon

this bottom inside the cup a separate block or casting which is smaller in diameter than the interior of the cup, so that the space between the outer wall of the block and the inner wall of the cup will form the mercury-containing annular groove or channel, all as hereinafter more fully described.

Referring to the accompanying drawings, Figure 1 is a vertical cross-section of my gas-regulator with the inner inverted vessel or gasometer with its rod and valve removed, and Fig. 2 shows the gasometer with its rod and valve.

Let A represent the outer vessel of my gas-regulator, which is provided with a cover B.

C is the inlet connection with the gas pipe or main, and D is the connection with the outlet or service pipes.

The vessel A, I cast with a thin flat bottom E, which forms the diaphragm of the regulator. This vessel may be cast in a single piece with the body of the regulator, or it may be cast as a separate piece and united to the body by screw-thread or otherwise.

In the center of the bottom E, I make a large hole F, the inner edge of which is tapped with screw-threads.

G is a separate block or casting, which is smaller in diameter than the interior of the vessel A. At the center of this casting, on its under side, is a tubular extension or projection *h*, the exterior of which is provided with screw-threads and fitted to screw down into the hole F in the diaphragm, so that the block G can thereby be secured to the bottom and form a projection into the cup. The annular space which is thus formed between the outer wall of block G and the inner wall of the cup will form a groove or channel to receive and contain the mercury.

An opening *i* is made through the center of the block G, through which the rod *j*, which connects the gasometer *k* and valve L, Fig. 2, passes. This opening is made just large enough to allow the valve-rod *j* to work freely in the upper part of the block, but is enlarged as it passes down through the remainder of the block and extension, as shown. In order to lighten this casting, I can core out its underside, so as to constitute it a shell, as shown, in which case I leave a shoulder *m* next to



the tubular extension  $h$  to form a seat around the central hole in the diaphragm, and I make a V-groove  $o$  in the foot of the outer rim, in which packing material can be placed to form a tight joint and insure against leakage of the mercury underneath the block. This block can be removed or replaced through the open top of the cup, and to enable me to readily and tightly screw it into place I make two small holes  $p$  in its top, in which a spanner can be placed for screwing it down and turning it out.

In all other respects the regulator can be constructed and operated in the same manner that other regulators of this class are constructed and operated.

By this construction I am enabled to manufacture the regulator more cheaply and at the same time provide a groove for containing the mercury with perfectly-smooth sides, as the parts can be easily turned in a lathe or otherwise put into shape without inconvenience or trouble. It also enables me to make a very narrow and true channel, and thereby save in the quantity of mercury required.

A gas-regulator constructed in this way will be much more reliable, because the action of the gasometer will be more sensitive and cer-

tain owing to the narrow channel and the complete smoothness of its walls. 30

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

In a gas-regulator, the combination of a globular body having inlet and outlet pipes, and an annular upturned flange to form a cup, and provided between the cup and globular body with a partition having a threaded perforation centered to line with the center of said inlet-pipe; with a perforated filling-block of smaller diameter than the interior of the said flange, provided with a central threaded projection to fit within the perforation in the said partition; a valve adapted to operate on a seat in the said inlet-pipe and provided with a stem, which carries an inverted cup-shaped float adapted to encompass the said filling-block; and a valve-seat formed in said inlet-pipe, substantially as described. 45

In testimony whereof I have hereunto set my hand this 7th day of January, 1896. 50

WILLIAM E. H. WILLIAMS.

Witnesses:

BALDWIN VALE,  
JNO. D. RICHARDS.