

(No Model.)

D. CHAMBERS.

GAS REGULATOR.

No. 299,620.

Patented June 3, 1884.

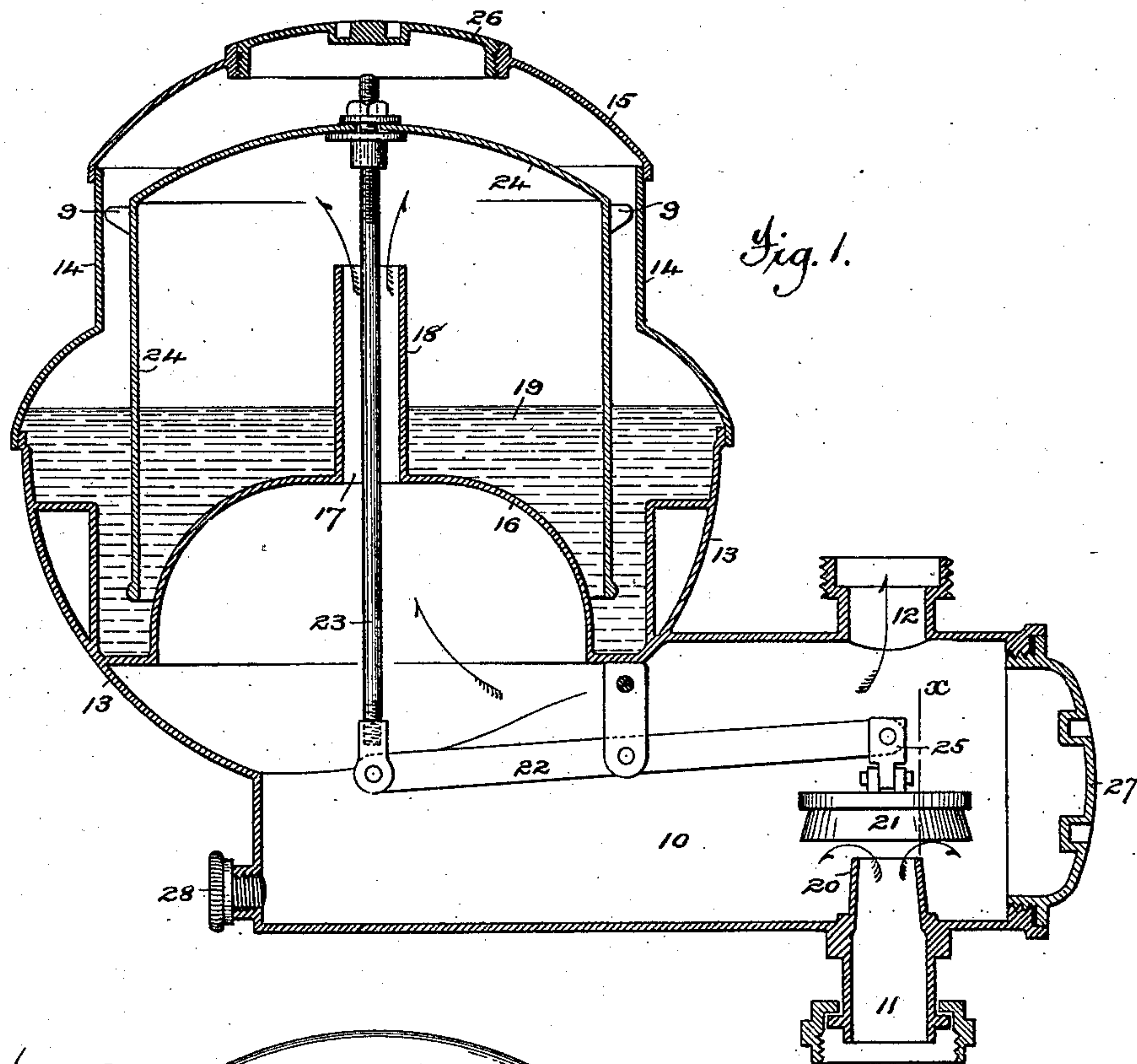


Fig. 1.

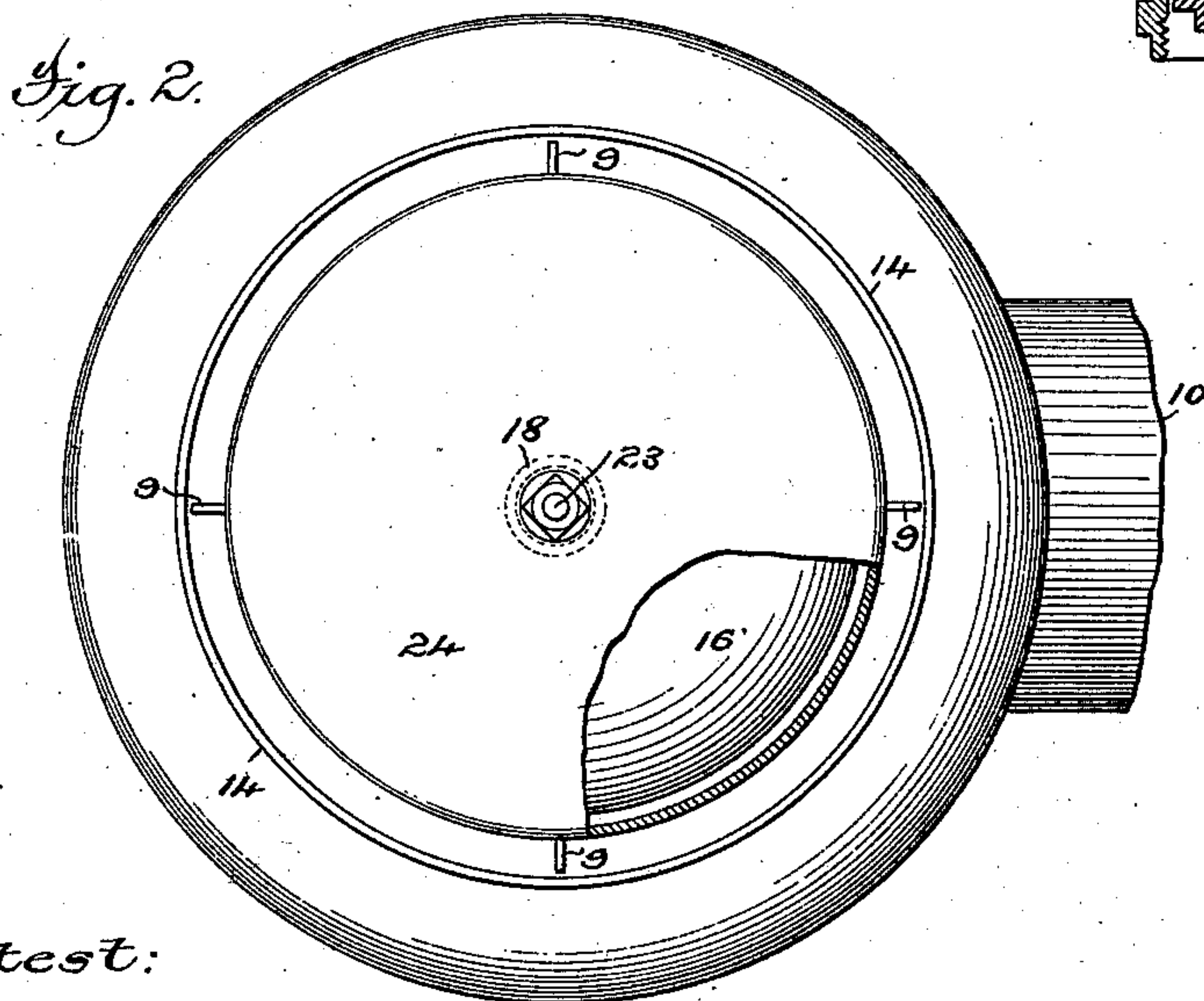


Fig. 2.

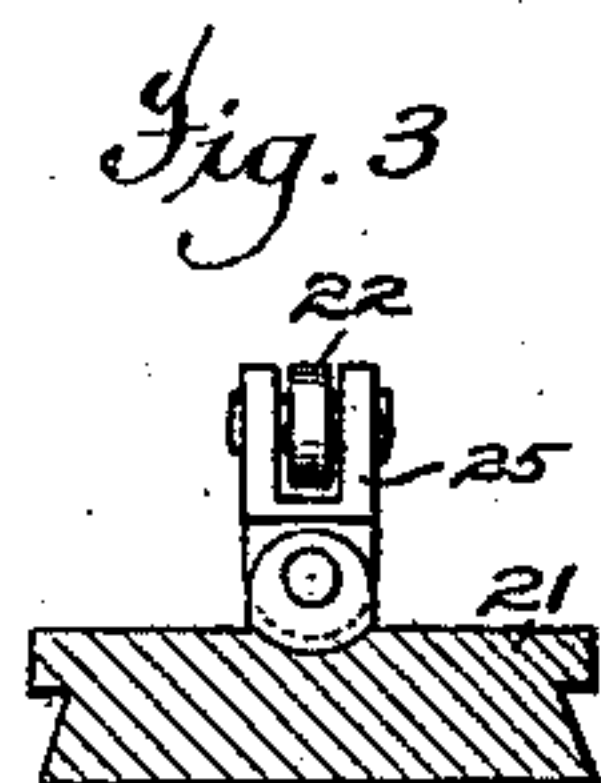


Fig. 3.

Attest:

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# UNITED STATES PATENT OFFICE.

DAVID CHAMBERS, OF NEW YORK, N. Y., ASSIGNOR TO WILLIAM C. HOWARD,  
OF SAME PLACE.

## GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 299,620, dated June 3, 1884.

Application filed November 12, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID CHAMBERS, a citizen of the United States, residing in the city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Gas-Regulators, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates, generally, to that class of gas-regulators which are applied to the service-pipe of a building, for the purpose of so regulating the flow of the gas as to deliver it to the burners at a uniform pressure, there-  
15 by avoiding the annoyance of insufficient light when the pressure in the main is low, and the waste of gas when the pressure in the main is too great.

20 The invention relates more particularly to that class of these regulators in which the valve for controlling the amount of gas which shall be allowed to pass to the burners is operated by the pressure of the gas exerted upon the under side of an inverted cup the rim of  
25 which rests in a reservoir of glycerine or other suitable sealing-fluid.

It is the object of the invention to provide a regulator of this general construction which shall be accurate and reliable in its operation,  
30 not liable to get out of order, and which can be produced at a small cost. To these ends the invention consists in various details of construction and combinations of parts, all of which will be hereinafter so fully explained  
35 and particularly pointed out as to render a further preliminary description unnecessary to proper understanding of the invention.

In the accompanying drawings, Figure 1 shows in sectional elevation a gas-regulator  
40 embodying the present invention. Fig. 2 is a partial plan view of the same, showing the top plate removed and a portion of the inverted cup broken away; and Fig. 3 is a vertical section of the valve, taken upon the line  
45  $x$  of Fig. 1.

Referring to said figures, it will be seen that the body of the regulator, which contains the operating mechanisms, consists of a horizontally-arranged cylindrical chamber, 10, which  
50 communicates at or near one end with a pipe,

11, leading from the gas-main, and with a pipe, 12, leading directly or through branches to the burner or burners which it is desired to regulate, and is provided upon its upper side at its opposite end with a semi-spherical casing, 55 13, from the upper side of which rises a short cylindrical portion, 14, the top of which is closed by a convex plate, 15. The bottom of the casing 13 is provided with a dome-shaped plate, 16, which rises a considerable 60 distance into the casing, the summit of which is provided with an aperture, 17, which is surrounded by a tubular extension, 18, of considerable length. The space thus provided between the casing 13 and the portion 14, and the plate 65 16 and extension 18, forms a chamber or well for the reception of a sealing-fluid, 19. By reason of the dome-shaped plate 16, this well is made of sufficient depth to permit the cup or valve to be immersed a sufficient distance 70 in the sealing-fluid to provide a very reliable seal without necessitating the use of a large quantity of the fluid, while, by reason of the tubular extension 18, the fluid is prevented from escaping through the aperture 17, even 75 if the regulator is turned upon its side or inverted in being handled.

The sealing-fluid 19 may consist of any of the substances commonly employed for such purposes, but will preferably consist of glycerine, 80 as the substance is not liable to freeze, and also possesses other characteristics which render it suitable for this purpose.

The inlet-pipe 11 is provided with an extension, 20, which rises some distance above the 85 bottom of the chamber 10 and forms a seat for a flat valve, 21, which is connected to the end of a lever, 22, which is pivoted at or near its center upon a fixed bearing, and is pivotally connected at its opposite end to a rod, 23, which 90 extends upward through the aperture 17 and tube 18, and is secured to the bottom of an inverted cup, 24, the edge of which is immersed in the sealing-fluid 19, all as clearly shown in Fig. 1.

95 The operation of the apparatus thus constructed is as follows: When the gas is turned on so as to pass from the main into the pipe 11, it will enter and fill the chamber 10 and the pipe 12 and its various branches leading 100



to the several burners. The gas will also pass freely through the aperture 17 and pipe 18, so as to fill the space between the bottom of the cup 24 and the sealing-fluid 19. It will thus be readily seen that as soon as the pressure in the chamber 10 rises above a certain point the cup 24 will be raised, so as to carry the valve 21 onto its seat and shut off the further admission of gas into the chamber 10, and also that by reason of the great difference in area between the pipe 11 and the bottom of the cup 24, the valve when once closed will remain so until the pressure in the chamber 10 becomes reduced. As soon, however, as the cock or cocks of any one or more of the burners communicating with the pipe 12 is or are opened, the pressure in the chamber 10 will become reduced, so as to allow the cup 24 to fall and the valve 21 to open slightly to admit more gas, and so the operation will go on, the valve 21 being opened more or less, according to the rapidity with which the gas is drawn from the chamber 10.

It will readily be seen that the relative weights of the cup 24 and the valve 21 may be adjusted so that the latter will be closed when any desired pressure is reached in the chamber 10, and that when so adjusted the pressure in said chamber will never be permitted to fall materially below or rise materially above said point, thus making the pressure of the gas supplied to the pipe 12 and the burners practically uniform, no matter how great the pressure or the variations in pressure in the main.

In order that the cup 24 may move freely up and down without undue friction, it is made considerably smaller than the cylindrical part 14 of the casing. It is, however, provided with several projections or guides, 9, which, by coming into contact with the portion 14, serve to prevent the cup from moving to one side, so as to cause the rod 23 to bind against the tube 18 and prevent the free and easy working of the valve.

The valve 21, instead of being attached to the lever 22 by a rigid connection or by a sim-

ple hinge-joint, as has heretofore been customary in regulators of this class, is in the present case attached to the lever by a universal joint, 25, from which it results that the valve will always be permitted to seat itself accurately upon the projecting end 20 of the pipe 11, so as to entirely shut off the flow of gas when the desired pressure is reached in the chamber 10, even if the apparatus is not set in a level position.

The plate 15 is provided with an aperture closed by a screw cap or plug, 26, through which access can be had to the interior of the casing for the purpose of adjusting the cup 24, and introducing or removing the sealing-fluid; and the end of the chamber 10 is provided with a similar aperture closed by a screw-cap, 27, through which access can be had to the valve 21 when necessary. The opposite end of the chamber 10 is provided with a small aperture closed by a screw-plug, 28, through which the liquid resulting from the condensation of the gas can be withdrawn.

What I claim is—

1. The combination, with the casing 13 14, of the dome-shaped plate 16, having an aperture, 17, at its summit, and surmounted by the tubular extension 18, of the sealing-fluid 19, cup 24, rod 23, passing through said aperture and tubular extension, and the horizontal pivoted lever 22, attached at one end to the rod 23 and carrying at its other the regulating-valve 21, secured thereto by a universal joint, substantially as described.

2. In a gas-regulator, the combination, with the cup 24, rod 23, and horizontal lever 22, of the valve-seat 20 and the flat valve 21, connected to said lever by a universal joint, 25, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

DAVID CHAMBERS.

Witnesses:

J. A. HOVEY,  
T. H. PALMER.