No. 846,947. PATENTED MAR. 12, 1907.

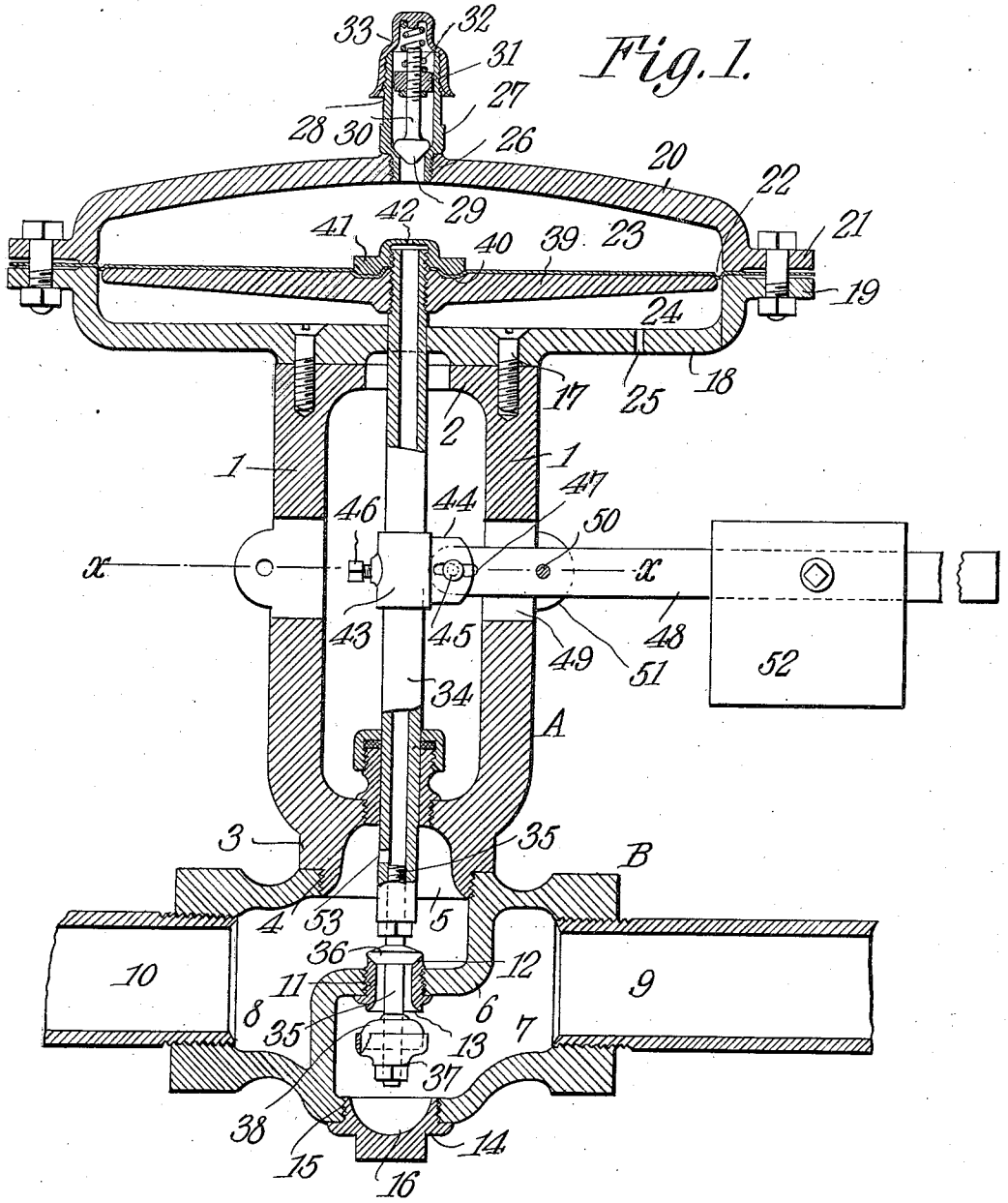
A. D. PURTLE & I. E. ROWLAND.

AUTOMATIC GAS REGULATOR AND CUT-OFF.

APPLICATION FILED DEC. 20, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

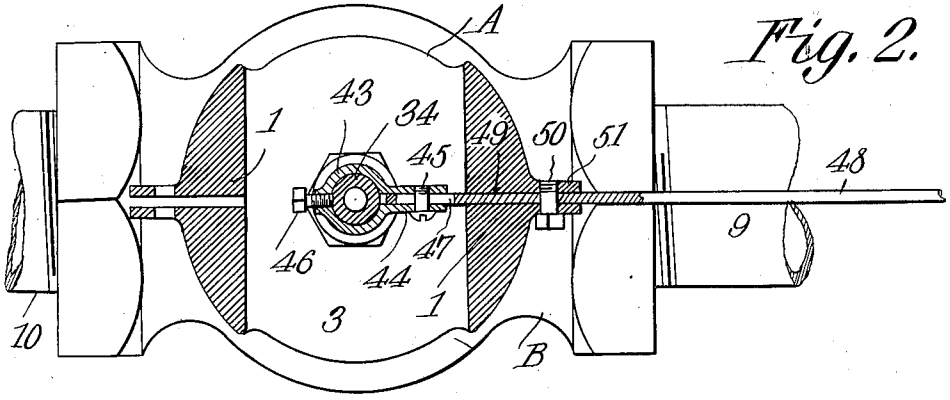
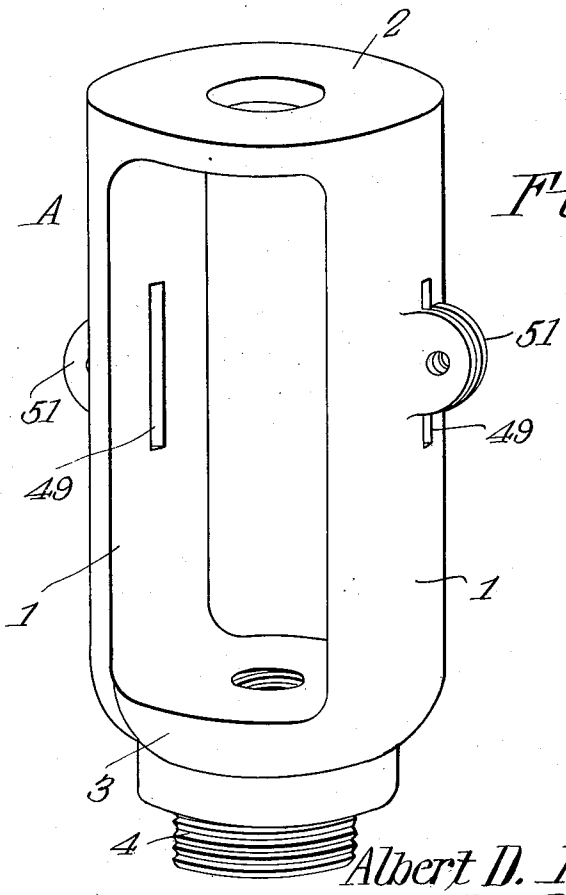


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALBERT D. PURTLE AND IRVEN E. ROWLAND, OF SALEM, WEST VIRGINIA.

AUTOMATIC GAS-REGULATOR AND CUT-OFF.

No. 846,947. Specification of Letters Patent. Patented March 12, 1907.

Application filed December 20, 1906. Serial No. 348,786.

To all whom it may concern:

Be it known that we, ALBERT D. PURTLE and IRVEN E. ROWLAND, citizens of the United States, residing at Salem, in the county of Harrison and State of West Virginia, have invented new and useful Automatic Gas-Regulators and Cut-Offs, of which the following is a specification.

This invention relates to automatic gas-regulators and cut-offs, and is more especially designed for use in residences and other places where danger results from the inadvertent stoppage of the flow of gas and the subsequent starting of the flow.

The object of the invention is to provide a simple form of regulator which can be adjusted to maintain the gas-pressure at a desired degree and which in the event of the stoppage of the flow of gas will automatically cut off any subsequent flow which may occur.

With these and other objects in view the invention consists of certain novel features of construction and combinations of parts, which will be hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings, Figure 1 is a vertical section through the complete device. Fig. 2 is a section on line *x x*, Fig. 1; and Fig. 3 is a perspective view of the intermediate or body portion of the device.

Referring to the figures by characters of reference, A is the body or the intermediate portion of the device, the same consisting of longitudinal arms 1, formed with circular heads 2, the lower one of which has a circular flange 3 outstanding therefrom and provided with a reduced externally-screw-threaded extension 4. This extension projects into engagement with the wall of an opening 5, formed in the upper face of a valve-casing B. This casing has a partition 6 therein, subdividing it into an inlet-compartment 7 and an outlet-compartment 8, and an inlet-pipe 9 opens into compartment 7, while a gas-outlet pipe 10 extends from the compartment 8. A tube 11 is screwed into an opening formed within the partition 6, and both ends of this tube are flared to form seats 12 and 13. A screw-plug 14 serves to close an opening 15, which is formed in the bottom of the casing B, the upper or inner face of this plug being recessed, as shown at 16.

Secured upon the upper end of the body 1 in any desired manner, as by means of screws 17, is a bottom plate 18, surrounded by an annular flange 19, and arranged above this plate is a cap 20, which is also surrounded by an annular flange 21. The two flanges are adapted to be bolted together and to clamp upon the margin of a flexible diaphragm 22, which serves to subdivide the space between the bottom plate 18 and cap 20 into an upper compartment 23 and a lower compartment 24. A vent 25 is formed in the plate 18, and an outlet 26 is formed within the cap 20. Secured within this outlet is a tubular casing 27, having a vent 28 therein. The inner or reduced end of this casing is normally closed by a valve 29, having a stem 30, which is screw-threaded and on which is adjustably mounted a combined nut and guide 31. A coiled spring 32 bears at one end on this nut and at its other end against a cap 33, which is screwed upon the casing 27. By means of this cap and the nut 31 the tension of the spring 32 can be increased or diminished, so that the valve 29 will be held to its seat with any desired pressure.

Extending longitudinally through the body A and movably mounted therein is a tube 34, within the lower end of which is secured a stem 35, which extends through tube 11, and a valve 36, adapted to bear upon the upper seat 12. Secured to the lower end of the stem 35 is a cup 37, in which is secured a substantially semispherical valve 38, preferably formed of soft rubber. This valve is adapted when the stem 35 is raised to bear upon the seat 13. The upper end of the tube 34 is threaded through the center of a disk 39, which extends under the greater portion of the diaphragm 22, and has a circular groove 40 adjacent the center thereof, into which the diaphragm is pressed by means of a cap 41, which is secured onto the end of the tube 34. This cap has a small opening 42 therein, disposed directly above the passage within the tube 34. A clip 43 embraces the central portion of tube 34 and has outstanding ears 44, connected by a pivot-pin 45. The clip is secured to the tube by means of a set-screw 46. Pivot-pin 45 extends through a slot 47, formed within one end of a lever 48, which extends through a slot 49 in one of the arms 1 and is fulcrumed upon a pin 50, disposed between ears 51, outstanding from said arm. A weight 52 is adjustably mounted on the le-

ver 48. It will be noted that both of the arms 1 are provided with slots 49 and ears 51, so that the levers 45 can be extended through either of them to suit various conditions and tastes. It is of course understood that the weight 52, bearing downward on the outer end of lever 48, serves to hold the valve 38 normally upon its seat 13. The flow of gas from pipe 9 to pipe 10 is therefore cut off. When it is desired to start the flow of gas, the weight 52 is raised so as to cause the tube 34 to move downward. As soon as the valve 38 leaves its seat gas will rush through the tube 11 and into the compartment 8, from which a portion will escape into the tube 34 through an inlet 53. From this tube the gas will pass into the upper compartment 23, located above the diaphragm 22, and will bear downward on said diaphragm with sufficient pressure to keep the valve 38 away from its seat. If the pressure within the compartment 23 becomes too great and overbalances the weighted lever 48, the valve 38 will be moved downward toward its seat 12, so as to partly cut off the flow of gas. Should the pressure within the compartment 23 become too great, the valve 29 will be forced open and permit a portion of the gas to escape through the vent 28. Obviously by adjusting the weight 52 toward the fulcrum of lever 48 the pressure of the gas may be reduced, because less pressure will be required to keep the valve 38 away from its seat 12. However, by moving the weight 52 further away from the fulcrum 50 the pressure required to maintain the valve 38 will be increased. If for any reason the flow of gas within the pipe 9 should be cut off or stopped, the downward pressure of the gas upon the diaphragm 22 would cease, and therefore the weighted lever 48 would promptly throw the valve 38 against seat 13. Should the flow of gas within pipe 9 be reëstablished, it will be impossible for it to pass into the outlet-pipe 10, because the valve 38 will remain seated. The only way to restart the flow would be to first raise the lever 48 so as to move valve 38 downward. It will be seen that this device is a very simple and inexpensive construction, and by incorporating it in gas-distributing systems there will be absolutely no danger of asphyxiation resulting from the inadvertent stoppage and the subsequent starting of the flow of gas. The pressure of the gas can be automatically maintained at a desired degree to suit the wishes of the consumer.

The preferred form of the invention has been set forth in the foregoing description; but we do not limit ourselves thereto, as we are aware that modifications may be made therein without departing from the spirit or sacrificing the advantages thereof, and we therefore reserve the right to make such changes as fairly fall within the scope of the claims.

What is claimed is—

1. A device of the character described comprising a valve-casing, a tube slidably mounted therein and opening thereinto, a valve immovably connected to and movable with said tube, a diaphragm connected to the tube, yielding means for holding the valve normally removed from its seat, and means for directing fluid under pressure through the tube and onto the diaphragm to move the valve toward its seat and against the pressure of said yielding means.

2. A device of the character described comprising a valve-casing, a tube slidably mounted therein and opening thereinto, a valve outside of and immovably connected to and movable with said tube, a diaphragm connected to the tube, yielding means for holding the valve normally removed from its seat, means for directing fluid under pressure through the tube and onto the diaphragm to move the valve toward its seat and against the pressure of said yielding means, and a cut-off valve movable with the first-mentioned valve for automatically stopping the flow of fluid through the casing when pressure is removed from the diaphragm.

3. In a device of the character described the combination with a valve-casing and a valve therein; of a tube extending from and immovably connected to the valve and opening into the casing, a disk secured around the tube, a diaphragm secured to and partly supported by the disk, yielding means for holding the valve normally unseated, and means for directing fluid under pressure upon the diaphragm when the valve is open to move said valve against the pressure of said yielding means.

4. In a device of the character described the combination with a valve-casing and a valve therein; of a tube extending from and immovably connected to the valve and opening into the casing, a disk secured around the tube, a diaphragm secured to and partly supported by the disk, yielding means for holding the valve normally unseated, means for directing fluid under pressure upon the diaphragm when the valve is open to move said valve against the pressure of said yielding means, and means for automatically relieving the diaphragm of excessive pressure.

5. In a device of the character described the combination with a valve-casing and a valve therein; of a tube extending from and immovably connected to the valve and opening into the casing, a disk secured around the tube, a diaphragm secured to and partly supported by the disk, yielding means for holding the valve normally unseated, means for directing fluid under pressure upon the diaphragm when the valve is open to move said valve against the pressure of said yielding means, and adjustable means for relieving the diaphragm of excessive pressure.

6. In a device of the character described the combination with a valve-casing and a valve therein; of a tube extending from the valve and opening into the casing, a disk secured around the tube, a diaphragm secured to and partly supported by the disk, yielding means for holding the valve normally unseated, means for directing fluid under pressure upon the diaphragm when the valve is open to move said valve against the pressure of said yielding means, and means movable with the valve for stopping the passage of fluid through the casing when the diaphragm is relieved of pressure.

7. In a device of the character described the combination with a valve-casing and a tube slidably mounted therein and opening thereinto; of a valve, gravity-operated means for holding the valve normally unseated, a cup movable with said valve, a flexible valve carried by the cup and normally seated by said gravity-operated means, a diaphragm, and means for directing fluid under pressure upon the diaphragm when the valves are open to hold the valves unseated.

8. In a device of the character described the combination with a valve-casing and a tube slidably mounted therein and opening thereinto; of a valve, gravity-operated means for holding the valve normally unseated, a cup movable with said valve, a flexible valve carried by the cup and normally seated by said gravity-operated means, a diaphragm, means for directing fluid under pressure upon the diaphragm when the valves are open to hold the valves unseated, and means for relieving the diaphragm of excessive pressure.

9. A device of the character described comprising a valve-casing, a tube slidably mounted therein and opening thereinto, oppositely-disposed valves movable with and immovably connected to the tube, a gravity-operated lever connected to the tube for holding one of the valves seated, a diaphragm connected to the tube, and means for directing fluid under pressure against the diaphragm when the valves are open to hold said valves from their seats.

10. In a device of the character described the combination with a casing and a tube movably mounted therein and opening thereinto; of oppositely-disposed regulating and cut-off valves movable with the tube and within the casing, a weighted lever connected to the tube for holding the cut-off valve normally seated, a diaphragm connected to the tube, a casing inclosing the diaphragm, said tube adapted to conduct fluid under pressure from the valve-casing to the diaphragm-casing.

11. In a device of the character described the combination with a casing and a tube movably mounted therein and opening thereinto; of oppositely-disposed regulating cut-off valves movable with the tube and within the casing, a weighted lever connected to the tube for holding the cut-off valve normally seated, a disk secured to the tube, a casing inclosing the disk, a flexible diaphragm secured within the casing and extending over the disk, and means upon the tube for clamping the diaphragm upon the disk, said tube adapted to conduct fluid under pressure from the valve-casing to the diaphragm-casing.

12. In a device of the character described the combination with a casing and a tube movably mounted therein and opening thereinto; of oppositely-disposed regulating cut-off valves movable with the tube and within the casing, a weighted lever connected to the tube for holding the cut-off valve normally seated, a disk secured to the tube, a casing inclosing the disk, a flexible diaphragm, means upon the tube for clamping the diaphragm upon the disk, said tube adapted to conduct fluid under pressure from the valve-casing to the diaphragm-casing, and means for relieving the diaphragm of excessive pressure.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

ALBERT D. PURTLE.
IRVE E. ROWLAND.

Witnesses:
A. A. LASHER,
J. MURE.