

(No Model.)

2 Sheets—Sheet 1.

# H. RUPPEL. AIR VALVE FOR GAS BURNERS.

No. 528,344.

Patented Oct. 30, 1894.

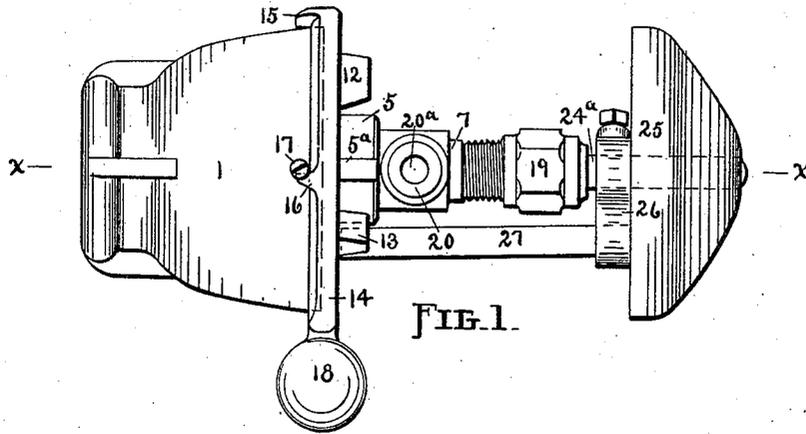


FIG. 1.

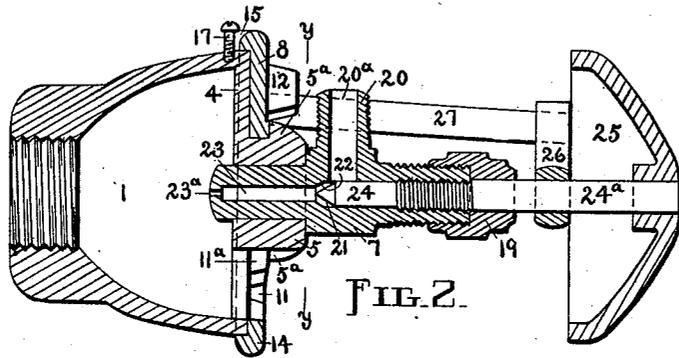


FIG. 2.

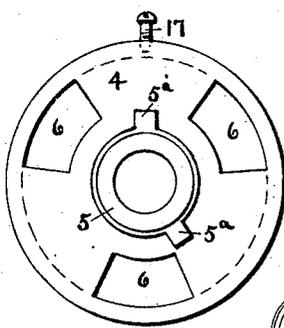


FIG. 3.

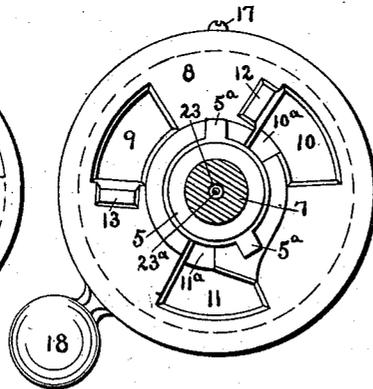


FIG. 4.

WITNESSES:

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*by Burridge & Cutter,*  
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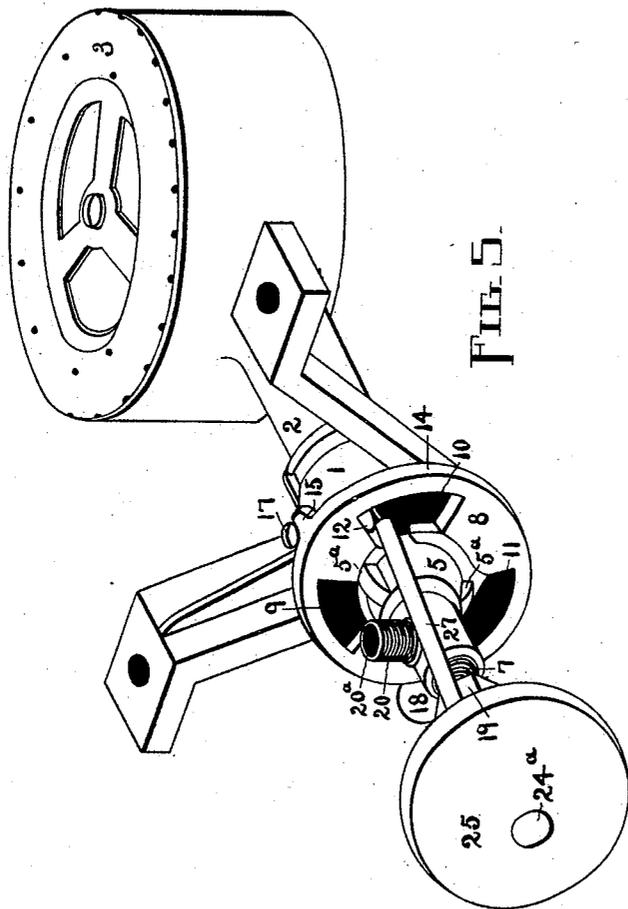
(No Model.)

2 Sheets—Sheet 2.

H. RUPPEL.  
AIR VALVE FOR GAS BURNERS.

No. 528,344.

Patented Oct. 30, 1894.



WITNESSES:

*N. P. Bailey*

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INVENTOR:

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# UNITED STATES PATENT OFFICE.

HENRY RUPPEL, OF CLEVELAND, OHIO, ASSIGNOR TO THE DANGLER STOVE AND MANUFACTURING COMPANY, OF SAME PLACE.

## AIR-VALVE FOR GAS-BURNERS.

SPECIFICATION forming part of Letters Patent No. 528,344, dated October 30, 1894.

Application filed April 21, 1894. Serial No. 508,537. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY RUPPEL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Air-Valves for Gas-Burners, of which the following is a full, clear, and exact description.

My invention relates to improvements in air valves for gas burners in which a weighted, perforated shutter having lugs thereon is used and an arm rigidly attached to the needle-valve stem, to assist in operating said shutter.

The object of my improvement is to provide a device for shutting off the supply of air, from the mixing-chamber of a gas burner, at the time that the gas is turned off and thus prevent an explosion in said chamber.

In an ordinary gas burner, after the supply of fuel is cut off, the gas remaining in the mixing-chamber and the pipe between said chamber and the burner explodes and bursts forth in a sheet of flame, from the open front end of the chamber, with considerable violence, instead of burning out at the opposite terminus of the device. By closing the front end of the mixing-chamber, in the manner hereinafter fully described, the gas and air contained in the connections between the needle-valve and the burner, after said valve is closed, is entirely consumed at said burner and no explosion whatever results from the interruption of the gas supply.

Another advantage of my invention lies in the arrangement of the parts whereby the air supply is decreased with the gas supply; that is to say, when the needle-valve is turned in so as to admit but little gas, for a small flame, the air valve is also partially closed thus admitting only enough air to burn well with the diminished amount of gas, which is a desideratum where the best results are desired.

That my invention may be seen and fully understood by those skilled in the art, reference will be had to the following specification and annexed drawings forming a part thereof, in which—

Figure 1 is a top view of my invention, the gas and air valves being closed; Fig. 2, a longitudinal section on line  $x, x$ , Fig. 1, said

valves being open; Fig. 3, a front end view of the mixing-chamber; Fig. 4, a cross-section on lines  $y, y$ , Fig. 2, the air valve open, and Fig. 5, a perspective view of said invention showing it connected to a burner, the air valve and needle-valve being wide open.

Similar figures of reference designate like parts in the drawings and specification.

The mixing-chamber 1 is open and interiorly screw-threaded at the rear end to receive the pipe 2 which connects said chamber with the burner 3. The front end of the mixing-chamber 1 is provided with the partition 4 and the hub 5. The partition 4 has the perforations or openings 6 therein and projecting beyond the periphery of the hub 5 are the lugs 5<sup>a</sup>. One end of the plug 7 is inserted in the hub 5. The shutter 8 having the perforations or openings 9, 10 and 11, the lateral lugs 12 and 13 and a central opening to receive the hub 5 is capable of being rotated thereon. The slots 10<sup>a</sup> and 11<sup>a</sup> connect the openings 10 and 11 respectively, with the hub opening and are for the purpose of accommodating the lugs 5<sup>a</sup> in order to enable the shutter 8 to be placed in position on the hub 5, as hereinafter explained. The shutter 8 has the flange 14 which circumscribes the end of the mixing-chamber 1 and said flange is provided with the lugs 15 and 16. The movement of the shutter 8 is limited by the lugs 15 and 16 and the stop-screw 17 projecting from the top of the chamber 1 between said lugs. Before the stop-screw 17 is inserted in the chamber 1 the shutter 8 is placed on the hub 5 by first bringing said shutter into position for the slots 10<sup>a</sup> and 11<sup>a</sup> to register with the lugs 5<sup>a</sup> and then slipping the same into place. The shutter 8 is now turned so that the stop-screw 17 can be inserted, in the chamber 1, between the lugs 15 and 16 and the lugs 5<sup>a</sup> retain said shutter in place. The weight 18 extends from one side of the shutter flange 14 and is integral therewith. The location of the weight 18 is such as to nominally hold the shutter 8 open, with the lug 15 against the stop-screw 17.

As before noted, one end of the plug 7 is inserted in the hub 5 and the opposite end of said plug is screw-threaded to receive the nut 19. The projection 20 extends from the top

of the plug 7 and is exteriorly screw-threaded to receive a gas-supply pipe connection, said projection having therein the passage 20<sup>a</sup>. The passage 21 extends from the outer end of the plug 7 to and a little beyond the passage 20<sup>a</sup>, where the valve-seat 22 is formed. The contracted passage 23 opens from the passage 21 into the mixing-chamber 1 through the orifice 23<sup>a</sup>. The outer terminal of the passage 21 is screw-threaded to accommodate the threaded portion of the needle-valve 24. The stem 24<sup>a</sup>, of the needle-valve 24, extends through the nut 19 and has the valve-wheel 25 fast to the outer end thereof. The dog 26 is secured to the valve-stem 24<sup>a</sup> by a nut and set-screw and has the arm 27 rigidly attached to one end thereof. The arm 27 extends from the dog 26 to within a short distance of the shutter 8 and engages the lugs 12 and 13 on said shutter.

To admit gas and air into the mixing-chamber 1, the operation is as follows:—Turn the valve 24, by means of the wheel 25, from right to left until the end of said valve is clear of the seat 22 and the gas will enter said chamber through the passages 20<sup>a</sup>, 21 and 23 and the orifice 23<sup>a</sup>. As the arm 27 moves away from the lug 13, carried by the dog 26 and the valve-stem 24<sup>a</sup>, the weight 18 causes the shutter 8 to rotate until the lug 15 strikes the stop-screw 17; thus bringing the shutter openings 9, 10 and 11 opposite the corresponding partition openings 6 and admitting air into the chamber 1 to commingle with the gas entering therein. The mixture of gas and air passes from the chamber 1, through the pipe 2, to the burner 3 where it is ignited. The wheel 25 is turned until the arm 27 comes in contact with the lug 12 on the shutter 8 as shown in Fig. 5, and said arm would open said shutter to its fullest extent should the weight 18 fail to do so. When the shutter 8 is wide open the lug 15 bears against the stop-screw 17, thus preventing further movement in that direction. Hence the lug 12 at that time serves as a check for the arm 27 and limits the extent to which the valve 24 can be opened.

To shut off the supply of gas and air from the mixing-chamber 1, turn the wheel 25 from left to right until the valve 24 is seated and the gas passage closed thereby. The rotation of the stem 24<sup>a</sup> in the direction above indicated carries the arm 27 around until it comes in contact with the lug 13 on the shutter 8, when said arm revolves said shutter until the lug 16 strikes the stop-screw 17; thus closing the openings 6 in the partition 4 and cutting off the air supply from the chamber 1. Since the front end of the chamber 1 is now closed the gas and air mixture remaining in said chamber, the pipe 2 and the burner 3 must continue to burn in the ordinary manner until consumed; thereby avoiding the unpleasant explosion from said chamber heretofore experienced.

When only a small flame is required at the burner 3 the valve-wheel 25 is turned so as to partially open the needle-valve 24, thus admitting but a small amount of gas to the mixing-chamber 1, and the lug 13, resting on and following the arm 27, allows the shutter 8 to open no more than is necessary for the admission of sufficient air to support combustion. Better results are obtained by the arrangement just described than where the air supply is not diminished with the gas supply.

The number of lugs 5<sup>a</sup>, partition openings 6 and corresponding shutter openings may be more or less than herein shown and described, without departing from the nature of my invention.

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

1. In an air valve for gas burners, a mixing-chamber having a perforated partition, a hub with lugs thereon, and an external stop-screw; in combination with a flanged and perforated shutter on said hub, said shutter provided with peripheral and lateral lugs and a weight on one side, and an arm extending from a dog on the valve-stem of the burner designed to engage said lateral lugs and operate said shutter, substantially as and for the purpose set forth.

2. In an air valve for gas burners, a mixing-chamber having a perforated partition, a hub with lugs thereon, and an external stop-screw; a weighted, flanged, and perforated shutter on said hub provided with peripheral and lateral lugs, the weight on one side of said shutter, in combination with a plug, a needle-valve having a stem projecting from said plug, an adjustable dog on said stem, and an arm extending from said dog to engage said lateral shutter lugs, whereby the air supply to said chamber is governed automatically by means of the gas supply controlling device and the shutter weight, substantially as and for the purpose set forth.

3. In an air valve for gas burners, a burner, a mixing-chamber having a perforated partition, a hub with lugs thereon, and an external stop-screw; a pipe connecting said burner with said chamber, a plug provided with a gas inlet and outlet and a valve-seat, a needle-valve in said plug having a projecting stem with a wheel fast thereon, a dog adjustably attached to said stem, and an arm secured to said dog, in combination with a weighted, flanged and perforated shutter on said hub provided with peripheral and lateral lugs, the weight on one side of said shutter, substantially as and for the purpose set forth.

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

HENRY RUPPEL.

Witnesses:

F. A. CUTTER,  
L. A. STRATTON.