

(No Model.)

2 Sheets—Sheet 1.

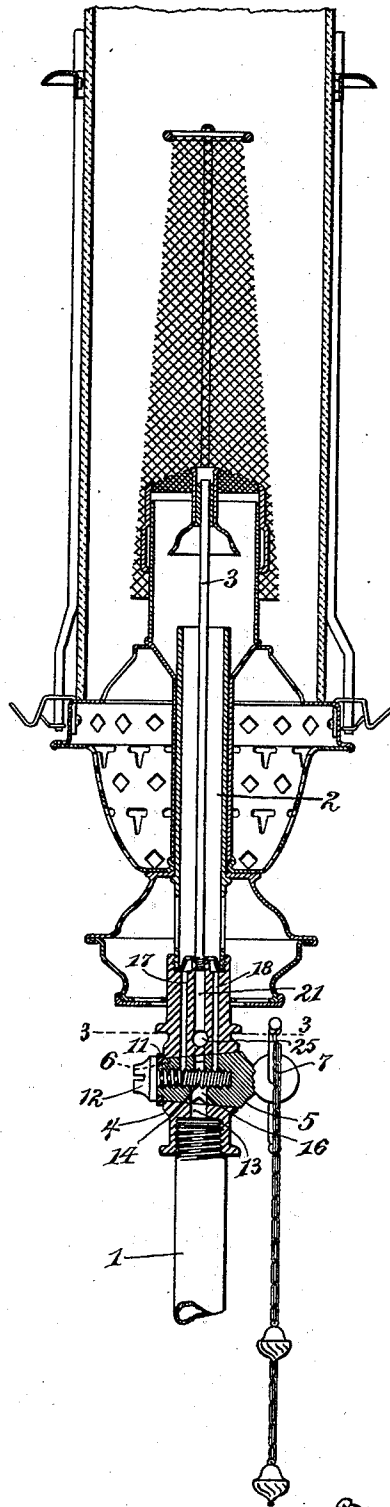
G. S. BARROWS.

BY-PASS VALVE FOR WELSBACH OR OTHER INCANDESCENT GAS BURNERS.

No. 578,711.

Patented Mar. 16, 1897.

Fig. 1



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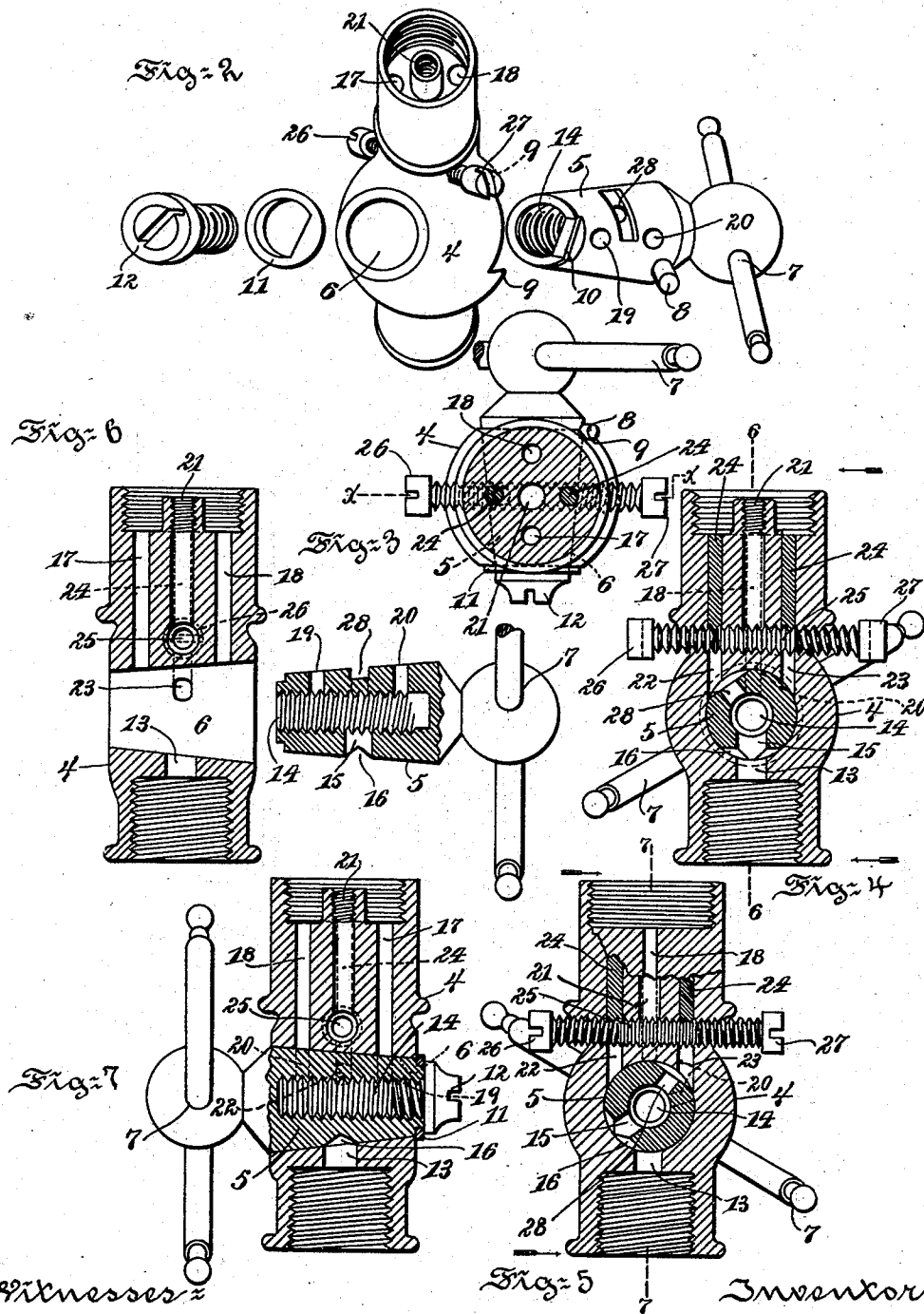
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# UNITED STATES PATENT OFFICE.

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BY-PASS VALVE FOR WELSBACH OR OTHER INCANDESCENT GAS-BURNERS.

SPECIFICATION forming part of Letters Patent No. 578,711, dated March 16, 1897.

Application filed March 26, 1896. Serial No. 584,904. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE S. BARROWS, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in By-Pass Valves for Welsbach or other Incandescent Gas-Burners, of which the following is a specification.

The object of my invention is to provide an efficient, durable, and comparatively inexpensive by-pass valve combined, constructed, and arranged for application to a Welsbach or other incandescent gas-burner in such manner that when the supply of gas to the main burner is on the supply of gas to the pilot-burner is comparatively restricted, and when the supply of gas to the main burner is off the supply of gas to the pilot-tube is increased; and to this end my invention consists of the improvements hereinafter described and claimed.

The nature, characteristic features, and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a central sectional view of a Welsbach incandescent gas-burner, showing a by-pass valve embodying features of my invention in application thereto. Fig. 2 is a perspective view drawn to an enlarged scale and showing the parts of the by-pass valve detached. Fig. 3 is a sectional view taken on the line 3 3 of Fig. 1. Figs. 4 and 5 are central sectional views taken on the line  $x x$  of Fig. 3 and illustrating two positions of the plug of the by-pass valve, corresponding with burning and extinguishment of the main burner. Fig. 6 is a sectional view taken on the line 6 6 of Fig. 4, looking in the direction of the arrows, and showing the plug of the valve detached; and Fig. 7 is a sectional view taken on the line 7 7 of Fig. 5, looking in the direction of the arrows.

In the drawings, 1 is the gas-supply pipe, 2 the Bunsen tube of the main burner, and 3 the tube of the pilot-burner or pilot-tube.

4 is a valve-casing, and it is adapted for connection at one end with the supply-pipe and at the other end with the Bunsen and

pilot tubes 2 and 3. The plug 5 is adapted to a corresponding seat 6 in the casing 4 and is or may be provided at one end with means, as 7, for turning it, and with a stop-pin 8, adapted to limit its range of motion by contact with ears 9 on the casing, so as to arrest it in position for lighting and extinguishing the main burner. The other end of this taper-plug 5 is or may be squared or faced, as at 10, for the accommodation of a corresponding washer 11, and tapped out or internally threaded for the reception of a binding or set screw 12. The casing 4 is provided with an inlet opening, channel, or passage 13, through which gas is supplied at all times to the chamber 14 in the plug 5 by way of the radial opening, channel, or passage 15 in the wall of the plug. In this connection it may be remarked that the channel, opening, or inlet 15 is provided at the periphery of the plug with a flaring mouth 16, that is wide enough to afford ingress of gas in all positions of the plug within the limits of its stops 9.

The upper portion of the casing 4 is provided with two openings, channels, or passages 17 and 18, that range longitudinally and extend clear through it and supply gas under conditions hereinafter mentioned to the base of the Bunsen tube 2, and consequently to the main burner.

The upper portion of the plug 5 is provided with openings, channels, or passages 19 and 20, adapted to be brought by properly positioning the plug into alinement with the openings, channels, or passages 17 and 18, Fig. 6, so as to supply gas to the main or Bunsen burner, and adapted to be brought out of alinement with the passages, openings, or channels 17 and 18, Fig. 7, by turning the plug so as to cut off the supply of gas to the main or Bunsen burner. The opening, channel, or passage 21 in the casing that communicates at its upper end with the pilot-tube 3 is at its lower end branched, Fig. 4, so as to form two separate branch passages to the seat of the plug 5. For this purpose two openings, channels, or passages 22 and 23, disposed diametrically at right angles, Fig. 3, to the openings, channels, or passages 17 and 18, may be drilled through the casing and their upper portions plugged or otherwise stopped, as at

24, and a transversely-ranging internally-threaded opening, channel, or passage 25 may also be drilled, so as to intersect the passages 22 and 23, and its ends are closed by screws 26 and 27. The plug 5 is provided at its upper intermediate portion with a radially-disposed opening, channel, or passage 28, which is or may be provided with a flaring mouth, as shown, and which is in communication with either one or the other of the openings, channels, or passages 22 and 23, and consequently with the pilot-tube, when the plug is in either of its extreme positions, so that when the main burner is turned off gas is supplied to the pilot-tube by way of the openings, channels, or passages 23, 25, and 21, Fig. 5, and when gas is turned onto the main burner it is also supplied to the pilot-tube by way of the openings, channels, or passages 22, 25, and 21, Fig. 4; and in this connection it may be again stated that gas is supplied to the interior of the plug at all times by way of the channel, opening, or passage 13.

The mode of operation of the above-described by-pass valve is as follows: When the plug 5 is in the position shown in Fig. 4, the inlet openings, channels, or passages 19 and 20 and 17 and 18 are in alinement, so that the Bunsen or main burner is supplied with gas. In this position of the plug gas is supplied to the pilot-tube 3 by way of the openings, channels, or passages 28, 22, 25, and 21. The screw 26 is screwed inward, so as to materially check the supply of gas to the pilot-tube by restricting its passage from the part 22 to the part 25. The object in restricting this supply is to prevent the discharge of any considerable amount of gas with which air has not been previously mixed beneath the mantle and in proximity with the Bunsen burner, because such a supply of gas would by reason of imperfect combustion cause a deposition upon or discoloration of the mantle. However, it is desirable to supply enough gas to the tube 3 to insure its being kept full of gas ready to supply the pilot-jet when the main burner shall be extinguished. If some gas were not supplied to it, the action of the flame of the Bunsen burner would be to, as it were, suck it empty of gas, so that the main burner might and probably would be extinguished before gas could be caused to escape from the top of the pilot-tube. When the parts are in the position shown in Figs. 5 and 7, the openings, channels, or passages 17, 18, 19, and 20 are out of alinement with each other and the supply of gas to the main burner is cut off, so that it is extinguished. In such position gas is supplied to the pilot-tube by way of the openings, channels, or passages 28, 23, 25, and 21, and the screw 27 is not screwed so far in as the screw 26, so that the supply of gas to the pilot-tube is comparatively large and is not restricted. By adjusting the screws 26 and 27 the amount of gas supplied to the pilot-tube when the main burner is lighted and when it is extinguished may be increased

or diminished, and by providing means for supplying a comparatively small and adjustable quantity of gas to the pilot-tube when the main burner is lighted it is possible to furnish just enough gas to insure burning of the pilot-light when the main burner is extinguished, to prevent gas from being exhausted from the pilot-tube when the main burner is lighted, and to obviate deposition upon and discoloration of the mantle such as would occur if too much gas were supplied to the pilot-tube while the main burner was burning. Moreover, the provision of a separate path for supplying a comparatively large quantity of gas to the pilot-burner when the main burner is extinguished insures proper burning of the pilot-light.

It will be obvious to those skilled in the art to which my invention relates that modifications may be made in details without departing from the spirit thereof. Hence I do not limit myself to the precise construction and arrangement of parts hereinabove set forth, and illustrated in the accompanying drawings; but,

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a by-pass valve for Welsbach and other incandescent gas-burners having a pilot-light concentric with the main burner, the combination of a casing having a seat and an inlet-opening thereto and having a transversely-ranging threaded opening 25, and having longitudinally-ranging openings, channels or passages whereof three communicate with the part 25 and lead one to the pilot-light and two to the seat and whereof the others do not communicate with the part 25 and lead from the seat directly to the main burner; screws applied to the part 25; and a plug to the interior of which gas is admitted and which is provided at its upper portion with an opening as 28 and with passages, openings or channels as 19 and 20, substantially as described.

2. In combination a casing having a seat and an inlet opening, passage or channel thereto, and having a transversely-ranging threaded opening, passage or channel 25, and having longitudinally-ranging openings, channels or passages whereof three intersect the part 25; parts as 24, for closing the upper portion of two of said channels, passages or openings, screws applied to the part 25, and a plug to the interior of which gas is admitted and which is provided at its upper portion with an opening, as 28, and with openings, channels, or passages as 19 and 20, substantially as described.

In testimony whereof I have hereunto signed my name in the presence of two witnesses.

GEORGE S. BARROWS.

Witnesses:

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F. H. MACMORRIS.