No. 717,688. PATENTED JAN. 6, 1903.

E. E. KERNS.

GAS AND AIR REGULATING VALVE.

APPLICATION FILED MAY 19, 1902.

NO MODEL.

Fig. 1.

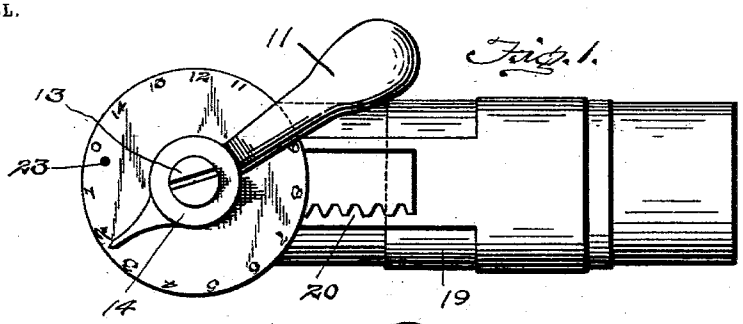


Fig. 2.

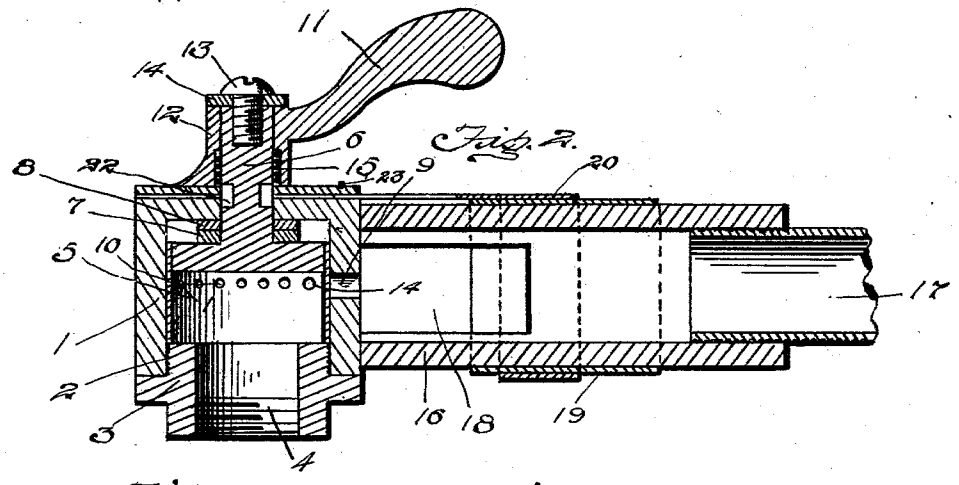


Fig. 3.

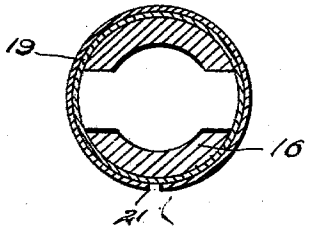


Fig. 4.

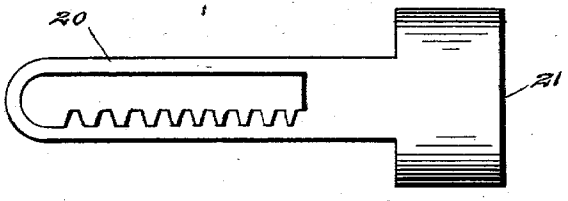
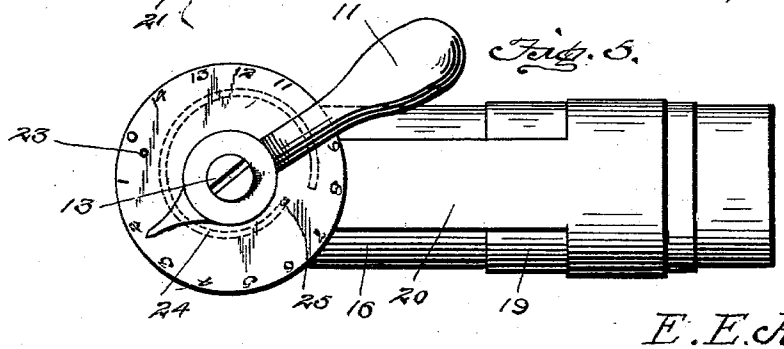


Fig. 5.



Witnesses
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GAS AND AIR REGULATING VALVE.

SPECIFICATION forming part of Letters Patent No. 717,688, dated January 6, 1903.

Application filed May 19, 1902. Serial No. 107,992. (No model.)

To all whom it may concern:

Be it known that I, ELMER E. KERNS, a citizen of the United States, residing at Bradford, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Gas and Air Regulating Valves; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to a gas and air regulating valve more particularly designed for use in connection with gas-burners used on cooking and heating stoves.

The object of the invention is to provide a valve of this character which shall be simple of construction, durable in use, comparatively inexpensive of production, and one in which the flow of gas may be varied according to the pressure, quality, and kind of gas used, and the supply of air to the mixing-chamber automatically regulated, thus insuring the mixing of proper proportions of gas and air.

With the above and other objects in view, which will readily appear as the nature of the invention is better understood, said invention consists in certain novel features of construction and combination and arrangement of parts which will be hereinafter fully described, defined in the appended claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of my improved valve. Fig. 2 is a longitudinal vertical sectional view. Fig. 3 is a cross-sectional view through the mixing-chamber, valve, and the clasp connected thereto. Fig. 4 is a top plan view of the rack-bar and clasp. Fig. 5 is a modified form illustrating the clasp as provided with a pin to project into the slot of a cam.

In the drawings, 1 denotes a valve-casing, the lower end of which is provided with internal screw-threads 2 to receive a screw-threaded collar 3, having a gas-inlet nipple 4, to which is adapted to be attached the gas-supply pipe.

5 denotes the valve-plug, which is hollow and is provided with a stem 6, that projects through an aperture in the top of the valve-casing, and with an annular collar 7, between which and the under side of the top of the valve-casing is confined a washer 8.

The valve-casing is provided with a gas-outlet 9, and the hollow valve-plug is provided with one or more openings 10, arranged annularly around the same and adapted to be brought into register with the gas-outlet 9. These openings are graduated in size, and thereby control the amount of gas passing through the valve-casing and out through the outlet 9.

11 denotes the handle, having a chamber 12 and secured to the plug-stem by a screw 13 and washer 14. Arranged within this chamber is a coil-spring 15, which exerts its energy to elevate the handle and its stem, and thus firmly clamp the collar against the washer 14, thus effecting a gas-tight joint of the parts at this point.

16 denotes the mixing-chamber, which is in the form of a tube and is connected to or formed integral with the valve-casing and communicates with the outlet 9 of said casing and is adapted to be connected to a pipe 17, leading direct to the burner.

The mixing-chamber is formed with diametrically opposite inlet-openings 18, which are adapted to be covered by a valve 19. This valve is shown in the accompanying drawings in the form of a sleeve; but any other suitable form of valve may be employed.

In order to secure an automatic adjustment of the valve 19 to automatically vary the admission of air to the mixing-chamber to correspond to the escape of gas from the outlet 9 into said chamber, and thus secure the proper relative proportions of gas and air, any suitable means operated by the movement of the valve-plug may be provided; but those shown in the accompanying drawings are preferred and consist of a rack-bar 20, having a spring-clasp 21 frictionally engaging the valve.

The rack-bar is preferably made by slotting the bar and forming one wall thereof with rack-teeth. The stem of the valve above the valve-casing projects through this slot

and is provided with a rack-wheel 22, which is adapted to mesh with the teeth of the rack-bar.

The handle is provided with a pointer, and the top of the casing is provided with an annular row of indicating-marks, in the present instance being numerals arranged in regular rotation and each numeral representing one of the openings in the valve-plug—for instance, 1 denoting the smallest opening and 14 the largest opening. It will thus be seen that by turning the handle to bring its pointer opposite a certain number or indicating-mark it will be known exactly how much gas is being supplied to the burner. This movement of the handle also slides the valve upon the mixing-chamber and exposes a greater or lesser area of the inlet-openings of the mixing-chamber, according to the direction of movement of the handle.

If desired, a stop-lug 23 may be provided to limit the movement of the pointer, it being located directly in the path of the pointer and preventing the pointer making a complete revolution. When the pointer is swung in contact with the stop-lug, it is over and the flow of gas entirely cut off.

In Fig. 5 I have shown a modified form of my invention, in which instead of employing a pinion to engage the rack-bar, as shown in Figs. 2 and 4, I fix the cam 24 to the stem of the valve-plug and provide the bar of the clasp with a pin 25 to project into the cam-slot. The movement of the handle will be imparted to the bar to reciprocate it to vary the exposure of the air-inlet openings of the mixing-chamber in a manner similar to the rack-wheel and rack construction, as hereinbefore described.

From the foregoing description, taken in connection with the accompanying drawings, it is thought that the construction, mode of operation, and advantages of my improved gas and air regulating valve will be readily apparent without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. The combination with a valve-casing provided with an inlet and an outlet opening, and a valve-plug rotatably mounted within said casing and provided with graduated openings adapted to be brought into register with the outlet-opening of the valve-casing; of a mixing-chamber communicating with the outlet-opening of the valve-casing and provided with an air-inlet opening, an air-regulating valve for said mixing-chamber, and a connection between the air-regulating valve and the valve-plug, whereby when the latter is operated to regulate the flow of gas through the outlet-opening, the air-regulating valve will also be operated to control the admission of air to the mixing-chamber, substantially as set forth.

2. The combination with a valve-casing having an inlet and outlet and provided with indicating marks or characters, a valve-plug rotatably mounted in said casing and provided with graduated openings adapted to be successively exposed to the outlet-opening of the valve-casing and provided with a stem that projects through the top of the valve-casing, a handle fixed to said stem and provided with a pointer adapted to coact with the indicating-marks; of a mixing-chamber communicating with the valve-outlet opening of the valve-casing and provided with an air-inlet, a valve for said air-inlet, and a connection between the air-controlling valve and the valve-plug, substantially as and for the purpose set forth.

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

ELMER E. KERNS.

Witnesses:
EDNA E. URQUHART,
MARY S. KERNS.