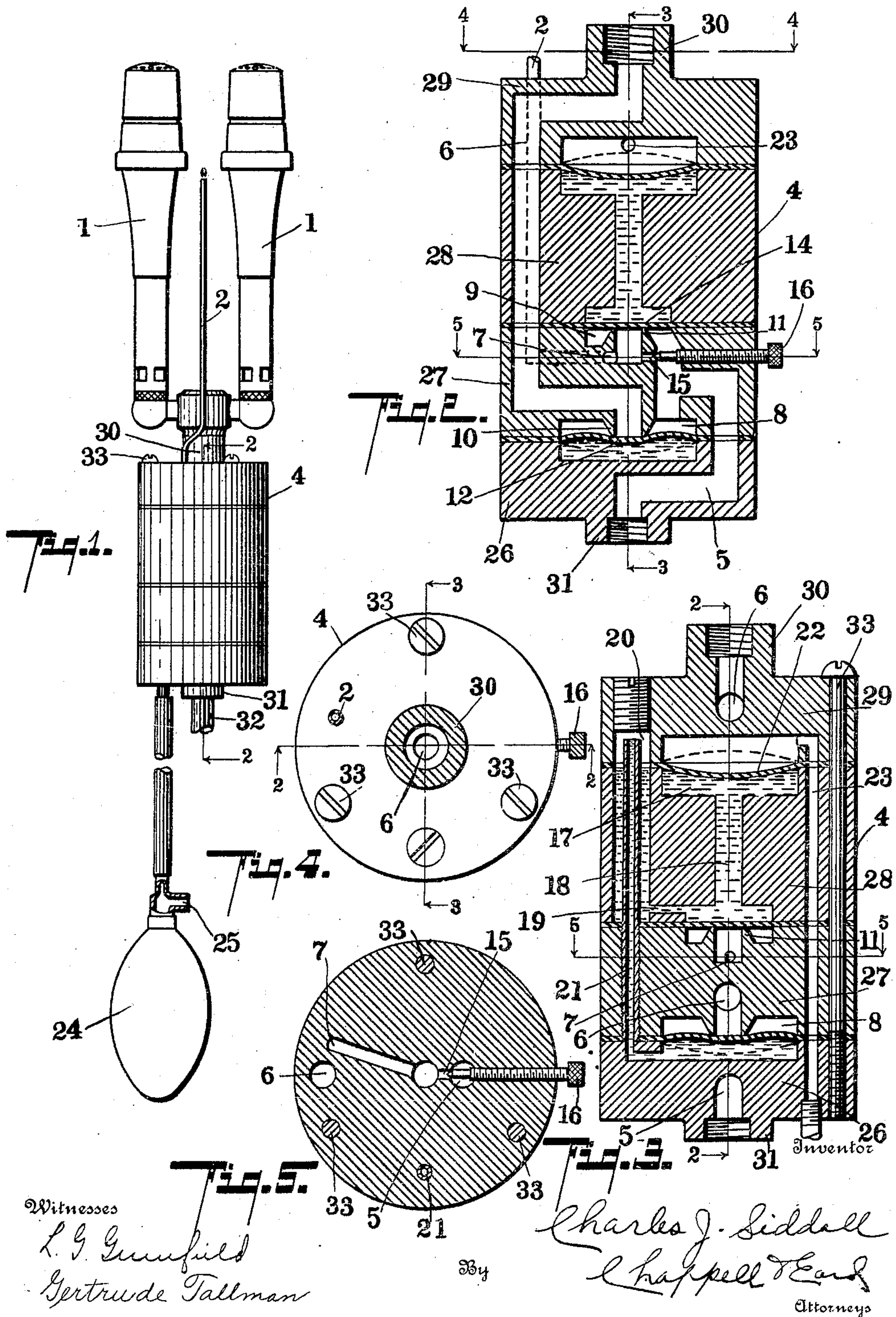


VALVE.

APPLICATION FILED MAR. 31, 1908.

917,498.

Patented Apr. 6, 1909.



UNITED STATES PATENT OFFICE.

CHARLES J. SIDDALL, OF KALAMAZOO, MICHIGAN.

VALVE.

No. 917,498.

Specification of Letters Patent.

Patented April 6, 1909.

Application filed March 31, 1908. Serial No. 424,303.

To all whom it may concern:

Be it known that I, CHARLES J. SIDDALL, a citizen of the United States, residing at Kalamazoo, Michigan, have invented certain new and useful Improvements in Valves, of which the following is a specification.

This invention relates to improvements in valves.

My improved valve is particularly adapted and is illustrated and described by me herein as a valve for gas burners. My invention, however, is applicable and desirable for various other uses.

The main objects of my invention are: first, to provide means for lighting and extinguishing simultaneously a plurality of gas burners; second, to provide an improved valve mechanism adapted to be operated at a distance; third, to provide an improved valve mechanism for gas burners which is adapted to flash the pilot and maintain the same in its flashed condition as long as desired; and, fourth, to provide an improved valve mechanism embodying these advantages which is very simple and economical in structure and one which is not likely to get out of repair when in use.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure 1 is a detail elevation of a structure embodying the features of my invention; Fig. 2 is an enlarged vertical section taken on a line corresponding to line 2—2 of Figs. 1, 3 and 4; Fig. 3 is a vertical section taken on a line corresponding to line 3—3 of Figs. 2 and 4; Fig. 4 is a horizontal section taken on a line corresponding to line 4—4 of Fig. 2; and Fig. 5 is a horizontal section taken on a line corresponding to line 5—5 of Figs. 2 and 3.

In the drawings, similar characters of reference refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, I have shown my improved valve in connection with the gas

burners 1. The pilot burner 2 is of the flash pilot type. The valve casing 4 is provided with an inlet passage 5, a main burner discharge passage 6 and a pilot burner passage 7. The inlet passage is connected to the main burner passage by a chamber 8 and with the pilot valve passage by the chamber 9. The valve seats 10 and 11 project into these chambers 8 and 9 respectively. The valves 12 and 14 are disk-like or are in the form of diaphragms, forming partitions across the chambers 8 and 9 and closing against the valve seats, thereby controlling the delivery of the gas through these passages. A by-pass passage 15 is provided for connecting the inlet and the pilot valve passage 7 to maintain the constant pilot flame. A suitable valve as the needle valve 16, is provided for adjusting this by-pass.

The chambers 8 and 9 on the outside of the valve are adapted to contain fluid. In the upper part of the casing I provide a fluid chamber or reservoir 17. This is connected with the pilot valve chamber 9 by means of the passage 18, the two chambers forming in effect one chamber. The fluid chamber is connected through the passage 19 to what I have herein designated as a "trap" and which, as illustrated, consists of the trap passage 20, opening into which is a fluid passage 21. The passage 21 opens into the trap passage above the level of the liquid in the liquid chamber and is connected at its lower end with the main valve chamber below its valve or diaphragm. The passage 21 is preferably a tube and projects up through the trap passage, as illustrated. This fluid passage serves as a fluid column for operating the valve.

The fluid chamber is preferably provided with a diaphragm 22. The air passage 23 is connected to the fluid chamber on the outside of the diaphragm, or, when the diaphragm is omitted, above the level of the fluid therein. To the air passage 23, I connect a device for producing suction or pressure, a bulb 24 being illustrated for this purpose. In practice, a bulb may be used, but where a large number of valves are to be controlled, a suitable operating mechanism would be provided. The operating device 24 is provided with a vent opening 25, through which the fluid chamber may be connected with the atmosphere, the object of which will clearly appear from the statement of the operation of the device.

For convenience in manufacture, I prefer-

ably form my improved valve casing of horizontal sections 26, 27, 28 and 29, as is clearly illustrated in the drawing. By this means I can easily form the passages and chambers
 5 by means of coring the parts in casting, turning or drilling the same. The section 29 is provided with a nipple portion 30, into which the gas burners 1 may be threaded and the section 26 with a nipple portion 31 into
 10 which the gas supply pipe, as 32, may be threaded. The valves or diaphragms are preferably of leather and are supported and clamped in position by bolts, as 33, passing through the valve casing sections, this not
 15 only forming suitable packings for the joints of the sections, but effectively supporting the valves in place. I preferably use for this purpose leather, although other materials would undoubtedly be found satisfactory.
 20 With the parts assembled and connected in the normal position,—that is, with the valve closed, the operation of my improved valve is as follows: When it is desired to light the burners, suction is created in the
 25 fluid chamber, which draws the fluid, or a portion thereof from the pressure chamber and the main valve chamber through the trap into the reservoir chamber, relieving the pressure on the valve 12, so that it opens to
 30 admit gas to the main burner. This also opens the pilot valve 11 so that the gas passes through the valve to flash the pilot. On account of the trap connection between the main burner valve chamber and the fluid
 35 chamber, the fluid drawn from the main burner valve chamber cannot return. When the suction is broken in the fluid chamber, as by opening the vent 25, the pilot valve 11 closes so that the length of time which the
 40 pilot valve is open may be gaged by maintaining the suction. When it is desired to close the main burner valve, pressure is produced in the fluid or reservoir chamber, which forces fluid into the main valve chamber or fluid column to close the main valve.
 45 It will be obvious that the valves are under complete control and will be maintained in their adjusted position. I preferably use mercury as the fluid, as that possesses such
 50 weight that a comparatively small amount is all that is necessary to produce a column of sufficient height to overcome any gas pressure against the valve.

My improved valve, while it is particularly adapted and illustrated herein in connection with gas burners, is adapted for use in other relations. By the use of these valves, a lighting system may be operated to simultaneously light or close all of the valves,
 60 even though some of the lamps may be at a distance. The pilot can be maintained a sufficient length of time to insure the lighting of the burners,—that is, it can be held flashed until the air has been driven out of the pipes
 65 and gas supplied to the burners to insure their

igniting. As the pilot is automatically closed on the breaking of the suction, it is also under perfect control.

I have illustrated and described my improved valve mechanism in detail in the form preferred by me on account of structural simplicity and economy. I am, however, aware that it is capable of very great variation in structural details without departing from my invention, and I desire to be understood as claiming the same specifically, as illustrated, as well as broadly.

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

1. The combination with a valve casing containing an inlet passage; a main burner passage; a pilot burner passage; main and pilot burner valve chambers connecting said inlet with said main burner and pilot burner passages; disk-like valves forming partitions across said valve chambers; a by-pass passage connecting said inlet and pilot burner passages; an adjusting valve therefor; a fluid chamber connected to said pilot valve chamber on the outer side of its said valve; a trap passage connected to said fluid chamber; a fluid passage opening into said trap passage above the level of the fluid in said fluid chamber and connected to said main valve chamber on the outer side of its said valve; a diaphragm forming a partition across said fluid chamber; an air passage opening into said fluid chamber on the outer side; and means for creating suction, pressure, or admitting atmospheric pressure, connected to said air passage.

2. The combination with a valve casing containing an inlet passage; a main burner passage; a pilot burner passage; main and pilot burner valve chambers connecting said inlet with said main burner and pilot burner passages; disk-like valves forming partitions across said valve chambers; a by-pass passage connecting said inlet and pilot burner passages; a fluid chamber connected to said pilot valve chamber on the outer side of its said valve; a trap passage connected to said fluid chamber; a fluid passage opening into said trap passage above the level of the fluid in said fluid chamber and connected to said main valve chamber on the outer side of its said valve; a diaphragm forming a partition across said fluid chamber; an air passage opening into said fluid chamber on the outer side of said diaphragm; and means for creating suction, pressure or admitting atmospheric pressure, connected to said air passage.

3. The combination with a valve casing containing an inlet passage; a main burner passage; a pilot burner passage; main and pilot burner valve chambers connecting said inlet with said main burner and pilot burner passages; disk-like valves forming partitions across said valve chambers; a fluid chamber

connected to said pilot valve chamber on the outer side of its said valve; a trap passage connected to said fluid chamber; a fluid passage opening into said trap passage
 5 above the level of the fluid in said fluid chamber and connected to said main valve chamber on the outer side of its said valve; a diaphragm forming a partition across said fluid chamber; an air passage opening into
 10 said fluid chamber on the outer side of said diaphragm; and means for creating suction, pressure or admitting atmospheric pressure, connected to said air passage.

4. The combination with a valve casing
 15 containing an inlet passage; a main burner passage; a pilot burner passage; main and pilot burner valve chambers connecting said inlet with said main burner and pilot burner passages; disk-like valves forming partitions
 20 across said valve chambers; a by-pass passage connecting said inlet and pilot burner passages; an adjusting valve therefor; a fluid chamber connected to said pilot valve chamber on the outer side of its said valve; a trap
 25 interposed between said fluid and main valve chambers; a diaphragm forming a partition across said fluid chamber; an air passage opening into said fluid chamber on the outer side of said diaphragm; and means for creat-
 30 ing suction, pressure or admitting atmospheric pressure, connected to said air passage.

5. The combination with a valve casing containing an inlet passage; a main burner passage; a pilot burner passage; main and
 35 pilot burner valve chambers connecting said inlet with said main burner and pilot burner passages; disk-like valve-forming partitions across said valve chambers; a by-pass passage connecting said inlet and pilot burner
 40 passages; a fluid chamber connected to said pilot valve chamber on the outer side of its said valve; a trap interposed between said fluid and main valve chambers; a diaphragm forming a partition across said fluid chamber;
 45 an air passage opening into said fluid chamber on the outer side; and means for creating suction, pressure or admitting atmospheric pressure, connected to said air passage.

6. The combination with a valve casing
 50 containing an inlet passage; a main burner passage; a pilot burner passage; main and pilot burner valve chambers connecting said inlet with said main burner and pilot burner passages; disk-like valves forming partitions
 55 across said valve chambers; a fluid chamber connected to said pilot valve chamber on the outer side of its said valve; a trap interposed between said fluid and main valve chambers; a diaphragm forming a partition across said
 60 fluid chamber; an air passage opening into said fluid chamber on the outer side of said diaphragm; and means for creating suction, pressure or admitting atmospheric pressure, connected to said air passage.

65 7. The combination with a valve casing

containing an inlet passage; a main burner passage; a pilot burner passage; main and pilot burner valve chambers connecting said inlet with said main burner and pilot burner passages; disk-like valves forming partitions
 70 across said valve chambers; a by-pass passage connecting said inlet and pilot burner passages; an adjusting valve therefor; a fluid chamber connected to said pilot valve chamber on the outer side of its said valve; a trap
 75 passage connected to said fluid chamber; a fluid passage opening into said trap passage above the level of the fluid in said fluid chamber and connected to said main valve chamber on the outer side of its said valve;
 80 and means for creating suction, or pressure, connected to said fluid chamber.

8. The combination with a valve casing containing an inlet passage; a main burner passage; a pilot burner passage; main and
 85 pilot burner valve chambers connecting said inlet with said main burner and pilot burner passages; disk-like valves forming partitions across said valve chambers; a by-pass passage connecting said inlet and pilot burner
 90 passages; a fluid chamber connected to said pilot valve chamber on the outer side of its said valve; a trap passage connected to said fluid chamber; a fluid passage opening into said trap passage extending above the level
 95 of the mercury in said fluid chamber and connected to said main valve chamber on the outer side of its said valve; and means for creating suction or pressure, connected to said fluid chamber.
 100

9. The combination with a valve casing, containing an inlet passage; a main burner passage; a pilot burner passage; main and pilot burner valve chambers connecting said
 105 inlet with said main burner and pilot burner passages; disk-like valves forming partitions across said valve chambers; a fluid chamber connected to said pilot valve chamber on the outer side of its said valve; a trap passage
 110 chamber connected to said fluid chamber; a fluid passage opening into said trap passage above the level of the fluid in said fluid chamber and connected to said main valve chamber on the outer side of its said valve; and
 115 means for creating suction or pressure, connected to said fluid chamber.

10. The combination with a valve casing containing an inlet passage; a main burner passage; a pilot burner passage; main and pilot burner valve chambers connecting said
 120 inlet with said main burner and pilot burner passages; disk-like valves forming partitions across said valve chambers; a by-pass passage connecting said inlet and pilot burner passages; an adjusting valve therefor; a fluid
 125 chamber connected to said pilot valve chamber on the outer side of its said valve; a trap interposed between said fluid and main valve chambers; and means for creating suction or pressure, connected to said fluid chamber.
 130

11. The combination with a valve casing containing an inlet passage; a main burner passage; a pilot burner passage; main and pilot burner valve chambers connecting said inlet with said main burner and pilot burner passages; disk-like valves forming partitions across said valve chambers; a by-pass passage connecting said inlet and pilot burner passages; a fluid chamber connected to said pilot valve on the outer side of its said valve; a trap interposed between said fluid and main valve chambers; and means for creating suction or pressure, connected to said fluid chamber.

12. The combination with a valve casing containing an inlet passage; a main burner passage; a pilot burner passage; main and pilot burner valve chambers connecting said inlet with said main burner and pilot burner passages; disk-like valves forming partitions across said valve chambers; a fluid chamber connected to said pilot valve chamber on the outer side of its said valve; a trap interposed between said fluid and main valve chambers; and means for creating suction or pressure, connected to said fluid chamber.

13. The combination with a valve chamber; a disk-like valve forming a partition across said valve chamber; a fluid chamber; a trap passage connected to said fluid chamber; a fluid tube opening into said trap passage above the level of the fluid in said fluid chamber and connected to said valve chamber on the outer side of its said valve; a diaphragm forming a partition across said fluid chamber; an air passage opening into said fluid chamber on the outer side of said diaphragm; and means for creating suction or pressure, connected to said air passage.

14. The combination with a valve chamber; a disk-like valve forming a partition across said valve chamber; a fluid chamber; a trap interposed between said fluid and valve chamber; a diaphragm forming a partition across said fluid chamber; an air passage opening into said fluid chamber on the outer side of said diaphragm; and means for creating suction or pressure, connected to said air passage.

15. The combination with a valve chamber; a disk-like valve forming a partition across said valve chamber; a fluid chamber; a fluid trap passage connected to said fluid chamber; a fluid tube projecting into said trap passage above the level of the fluid in said fluid chamber and connected to said valve chamber on the outer side of its said valve; and means for creating suction or pressure, connected to said fluid chamber.

16. The combination with a valve chamber; a disk-like valve forming a partition across said valve chamber; a fluid chamber; a trap interposed between said fluid and valve chamber; and means for creating suc-

tion or pressure as desired, connected to said fluid chamber, for the purpose specified.

17. The combination of a valve chamber; a valve, said valve chamber being adapted to contain a fluid which is adapted to normally hold the valve on its seat; a fluid chamber connected to said valve chamber; and a trap interposed between said fluid and valve chambers, for the purpose specified.

18. The combination of a valve chamber; a valve, said valve chamber being adapted to contain a fluid; a fluid chamber connected to said valve chamber; and a trap interposed between said fluid and valve chambers, for the purpose specified.

19. The combination with a valve chamber having an inlet and an outlet passage; a flexible diaphragm valve forming a partition across said chamber adapted, when closed, to rest against the valve seat, the pressure of the fluid controlled by the valve tending to open the same, said chamber on the outer side of said valve containing a valve controlling fluid; and means for regulating the valve controlling fluid for opening and closing the valve and retaining it in either its open or its closed position.

20. The combination with a valve chamber; a valve forming a partition across said valve chamber, said valve chamber on the outside of said valve being adapted to contain a fluid; a fluid chamber connected to said valve chamber; a trap interposed in said connection between said fluid and valve chambers; and means for shifting the fluid from one of said chambers to the other through said trap, for the purpose specified.

21. The combination with a valve chamber; a valve forming a partition across said valve chamber, said valve chamber on the outside of said valve being adapted to contain a fluid; a fluid chamber connected to said valve chamber; and means for shifting the fluid from one of said chambers to the other, for the purpose specified.

22. The combination with a valve chamber; a valve; said valve chamber being adapted to contain a fluid; a fluid chamber connected to said valve chamber; and means for shifting the fluid from one chamber to the other, for the purpose specified.

23. The combination with a fluid controlled valve; a fluid supply; a connection for passing the fluid to and from the valve; and a trap in said connection, for the purpose specified.

24. The combination with a valve chamber; a fluid operated valve; a fluid column; a trap passage to which said fluid column is connected; a fluid chamber connected to said trap passage; and means for causing the fluid to pass from said column to said chamber or vice versa, for the purpose specified.

25. The combination with a valve cham-

ber; a fluid operated valve; a fluid column; a trap connected thereto; and means for causing the fluid to pass to and from said column through said trap, for the purpose specified.

26. The combination with a fluid operated valve; a fluid supply; a connection for passing fluid to and from said valve for operating the same; and a trap interposed in said connection, for the purpose specified.

27. The combination with a valve casing; an inlet and outlet passage therefor; a valve chamber; a valve seat projecting into said chamber; and a diaphragm valve arranged across said chamber to close against said valve seat, said inlet and outlet passages opening into said valve chamber on the same side of said valve.

28. The combination with a valve casing made up of sections, said sections having passages therein adapted to register when the parts are assembled and having valve chamber sections formed in their meeting faces adapted to register when the parts are assembled, one of the sections having a valve seat thereon and a diaphragm valve between said sections adapted to coact with said valve seat; and means for securing said sections together, said valve being adapted to serve as a packing for the joints of the said section casing.

29. The combination with a valve casing made up of sections, said sections having passages therein adapted to register when the parts are assembled and having valve chamber sections formed in their meeting faces adapted to register when the parts are assembled, one of the sections having a valve

seat thereon and a diaphragm valve between said sections adapted to coact with said valve seat; and means for securing said sections together.

30. The combination with a valve casing having a valve chamber therein, with inlet and outlet passages at one side thereof; a diaphragm valve arranged to form a partition across said chamber adapted to close against the valve seat, said inlet and outlet passages opening into said valve chamber on the same side of the valve, the valve chamber on the other side of the valve being adapted to receive the fluid for controlling the valve; and a fluid supply connected to said fluid chamber whereby the valve may be moved to and from its seat, the valve being adapted to close against the pressure of the fluid controlled thereby.

31. The combination with a gas burner, of a gas supply; a valve casing having a chamber connected to said burner and gas supply; a diaphragm valve forming a partition across said valve chamber, the inlet and outlet passages of said valve chamber being on the same side of said valve, the chamber on the other side of said valve containing a fluid; and means for controlling the fluid in said valve chamber independently of said gas burner.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

CHARLES J. SIDDALL. [L. s.]

Witnesses:

L. G. GREENFIELD.

GERTRUDE TALLMAN,