April 3, 1934. H. A. MANTZ 1,953,358

VALVE

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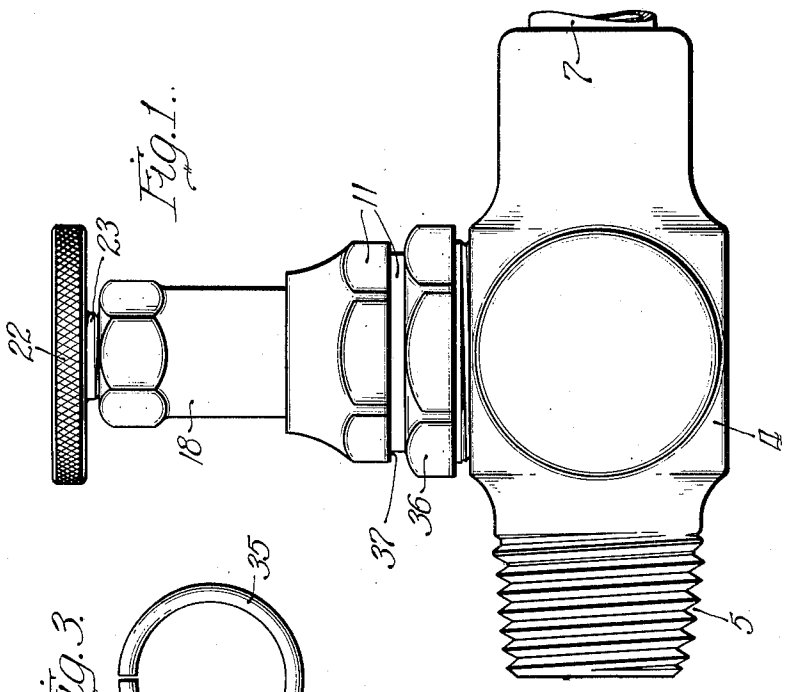


Fig. 1.

Fig. 3.

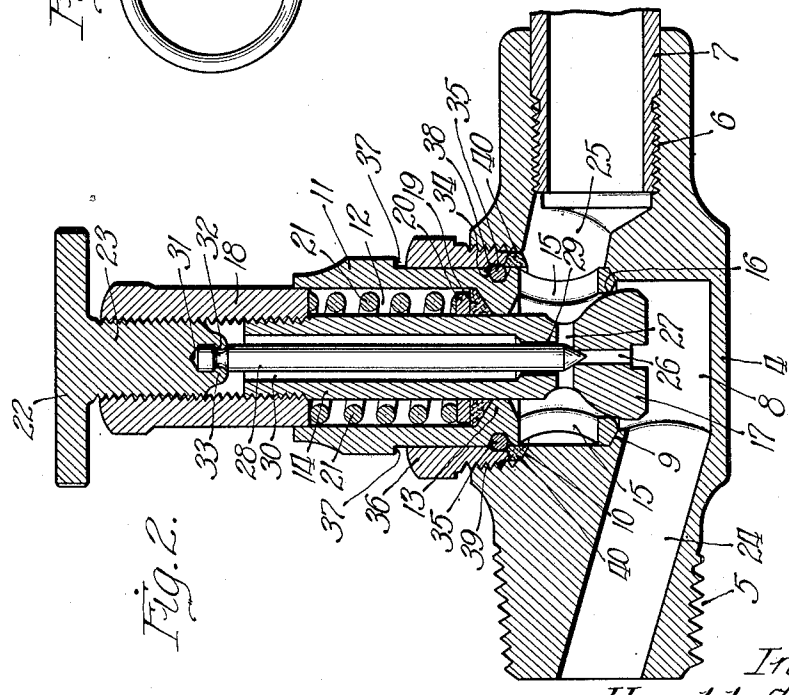


Fig. 2.

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VALVE

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11 Claims. (Cl. 277—29)

My invention relates to valves, particularly of the type in which the valve element is operated by manual depression against a spring and contemplates an improved construction wherein the operating parts are sub-assembled in a unit inserted, as such, in the housing.

More particularly, my invention relates to the type of valve employed in connection with flash igniters for gas burners, in which a restricted by-pass for the gas maintains a small pilot flame and in which depression of an external button, manually, effects the flow of a considerably increased amount of gas in order to project the flame over the burner which it is intended to ignite.

My invention is illustrated in the accompanying drawing in which

Figure 1 is an elevational view of the valve of my invention;

Figure 2 is an axial vertical sectional view thereof; and

Figure 3 is a view of a clamping ring which is employed.

The valve housing is illustrated at 4. It is extended on both sides of a central body portion, the extension on one side being provided with the tapered screw thread 5, to take an appropriate receiving opening in the gas manifold of the gas range. The other extension is internally screw threaded at 6 for the reception of the end of the pipe 7 which leads to the torch head.

The central body portion of the housing 4 is provided with a well bore 8, the axis of which is at right angles to the axis of the two extensions. It is this well bore into which the sub-assembly of operating parts, now to be described, is inserted. The well bore has portions of three diameters, to effect the formation of two shoulders, 9 and 10. The sleeve 11 fits within the intermediate diameter portion of the bore, and it is this sleeve which forms the main carrying member of the sub-assembly. The shoulder 9 is oblique, as shown, to fit the chamfer at the lower end of the sleeve 11.

The sleeve 11 is provided with the axial bore 12 which is reduced at 13 for the reception of the valve sleeve 14. Below the portion 13 of the sleeve 11 the transverse bore 15 is provided and the bottom of the sleeve 11 is in the form of an annulus forming a valve seat 16. The valve member 17, adapted to engage the seat 16 from below, is formed on the lower end of the valve sleeve 14.

At its upper end the valve sleeve 14 is screw threaded into the internally screw threaded sleeve 18 which fits, for reciprocation, in bore 12. At the bottom of the bore 12 packing 19 is provided and washer 20, surrounding the valve sleeve 14, is laid upon this packing. A compression spring 21 surrounds the valve sleeve 14, within the bore 12, rests upon the washer 20, and extends up to the sleeve 18.

An operating button 22 has the screw threaded stem 23 threaded into the upper end of the internally screw threaded sleeve 18.

It will now be clear that the spring 21 normally maintains the valve member 17 closed against the seat 16. This normally separates the lower portion of the well bore 8, which forms an inlet valve chamber, and which is connected by passageway 24 with the gas manifold, from the valve outlet chamber which comprises the transverse bore 15 in sleeve 11, and which, by way of the passageway 25 and the pipe 7, communicates with the torch head of the igniter. When the valve member 17 is depressed, by depression of the button 22, manually, gas from the manifold flows around the valve member 17, into the transverse bore 15 and then on to the torch head.

However, as before indicated, means is provided for by-passing a small amount of gas to maintain a pilot flame at the torch head. This is done by means of the axial bore 26 and the transverse bore 27 in the valve member 17, the bore 26 being controlled by a needle valve 28 which extends upwardly through the enlarged bores 29 and 30 in valve sleeve 14 and which is carried by the lower end of the stem 23 on the button 22.

Obviously, rotation of the button 22 will adjust the point of the needle valve 28 relative to the seat at the top of the bore 26 so that the amount of gas by-passed may be adjusted.

The top of the needle valve 28 is lodged in the bottom of the stem 23 as follows:—The stem 23 is provided at its bottom with the axial socket 31, in which the upper end of the needle valve fits, and the needle valve is provided, near its upper end, with the annular groove 32. After the upper end of the needle valve 28 is inserted in the socket 31, the lower end of the stem 23 is spun over, into the groove 32 as indicated at 33.

A short distance above the transverse bore 15, the sleeve 11 is provided with the external groove 34, and a split spring clamping ring 35, shown in Figure 3, is inserted in this groove. The groove 34 is of such depth, and the clamping ring 35 is made of wire of such diameter that, when the clamping ring is in the groove, tightly embracing the bottom thereof, the external diameter of the ring is greater than the external diameter of the sleeve 11 at that point. A clamp-

ing nut 36 fits tightly around the sleeve 11, below the shoulder 37 thereon, this clamping nut having its internal diameter slightly enlarged to form a shoulder 38 resting on the protruding margin of the ring 35, as shown. The clamping nut 36 is screw threaded at 39 to thread into the internally screw threaded greatest diameter portion of the bore 8, and a packing ring 40 is disposed between the shoulder 10 and the bottom of the clamping nut 36.

It will now be clear that the sleeve 11, valve sleeve 14, sleeve 18, packing 19, washer 20, spring 21, needle valve 28, and button 22 may be subassembled independently of the housing. These parts include all the operating parts. The valve sleeve 14 is inserted into the sleeve 11 from below, the packing, washer and spring put in place, and the sleeve 18 then is threaded into the upper end of the valve sleeve 14, this bringing the lower end of the sleeve 18 into the bore 12. In this assembly, obviously, the spring 21 holds the valve member 17 against the seat 16. The button 22, carrying the needle valve 28, is then screwed into the upper end of the sleeve 18, this bringing the lower end of the needle valve 28 into proper position relative to the seat at the top of the bore 26, the button 22 being turned to the proper position to maintain the proper by-pass.

The clamping nut 36 is then slipped upon the sleeve 11 from below, up to the shoulder 37, and the split spring ring 35 is then slipped over the lower end of the sleeve 11 upwardly until it snaps into the groove 34. This sub-assembly is then ready for insertion into the housing 4. The packing ring 40 is placed upon the shoulder 10, the sleeve 11 is inserted downwardly therethrough until the lower end of the sleeve engages the shoulder 9, the clamping nut 36 being brought down onto the top of the bore 8 and being screw threaded therein.

The clamping nut 36 is then tightened against the clamping ring 35, compressing the packing ring 40 to make a gas-tight fit. This assembles the entire structure. With the needle valve properly adjusted, a restricted amount of gas passes from the manifold, past the needle valve 28, and on through the pipe 17 to the torch head. This maintains a small pilot flame at the torch head. When a burner is to be ignited, the button 22 is depressed which permits the flow of a greatly increased amount of gas past valve 17, whereby the flame at the torch head is projected over the burner to be ignited.

I claim:—

1. In a valve, a sleeve having an external groove formed therein, a valve housing, said sleeve having a valve seat, a valve carried by and operating in said sleeve toward and away from said seat, said sleeve being insertable into said housing, means for clamping said sleeve in abutting engagement with a shoulder formed within said housing, said clamping means being threaded into engagement with gas sealing means cooperating with a second shoulder formed in said housing, and a split ring member disposed in said external groove and engaged by said clamping means.

2. In a valve, a sleeve, a valve housing, said sleeve having a valve seat at one end, a valve member reciprocally mounted within said sleeve, said valve member being insertable into said sleeve through the valve seat end thereof and having a valve at its end cooperating with said valve seat, an operating member fitting into the other end of said sleeve and attached to said valve member, said sleeve being insertable into said housing, and means including a split clamping ring for clamping said sleeve in abutting engagement with a shoulder formed in said housing.

3. In a valve, a sleeve freely insertable into a valve housing and having abutting engagement with a shoulder formed within said valve housing, said sleeve having a valve seat at one end, a valve member reciprocally mounted within said sleeve, said valve member being insertable into said sleeve through the valve seat end thereof and having a valve at its end cooperating with said valve seat, an operating member fitting into the other end of said sleeve and attached to said valve member, a by-pass in said valve, and a needle valve carried by said operating member and controlling said by-pass.

4. In a valve, a sleeve for insertion in a valve housing, said sleeve having a valve seat at one end, a valve member mounted to reciprocate in said sleeve and having a valve cooperating with said valve seat, an internally threaded sleeve fitting into the other end of said sleeve and threading onto said valve member, a by-pass in said valve, a needle valve axially disposed in said valve member and controlling said by-pass, a stem screw-threaded into said last-named sleeve and carrying said needle valve, and an operating button integral with said stem.

5. In a valve, a sleeve for insertion in a valve housing, said sleeve having a valve seat at one end, a valve member mounted to reciprocate in said sleeve and having a valve cooperating with said valve seat, an internally threaded sleeve fitting into the other end of said sleeve and threading onto said valve member, a by-pass in said valve, a needle valve axially disposed in said valve member and controlling said by-pass, a stem screw-threaded into said last-named sleeve and carrying said needle valve, an operating button integral with said stem, a reduced diameter portion in said first-named sleeve guiding said valve member and forming a shoulder, packing on said shoulder, a washer on said packing, and a compression spring between said washer and said second-named sleeve.

6. In combination, a valve housing having a plurality of coaxial bores therein, the outer one of said bores being screw-threaded, a sleeve carrying valve mechanism disposed in said bores and having an external groove therein, a split spring clamping ring lodged in said groove and extending beyond the periphery of said sleeve, and a clamping nut surrounding said sleeve and threaded into said outer bore to engage said ring.

7. In combination, a valve housing having a triple diameter bore having two shoulders therein, said bore being screw-threaded outwardly of the outermost of said shoulders, a sleeve fitting into the intermediate diameter portion of said bore and resting upon the innermost of said shoulders, a valve seat at the bottom of said sleeve, a valve member operating in said sleeve and having a valve cooperating with said seat and arranged to enter the smallest diameter portion of said bore upon opening, a transverse bore in said sleeve above said valve seat and communicating with a communication chamber in said housing, said smallest diameter portion of said bore communicating with another communication chamber in said housing, a packing ring on said outermost shoulder, said sleeve having a groove therein in proximity to said packing ring, a split spring ring lodged in said groove and ex-

tending beyond the periphery of said sleeve, and a clamping nut surrounding said sleeve and engaging said ring.

8. In combination, a valve housing having a bore formed therein, a recessed sleeve mounted in said bore, an internally threaded plunger slidable in the recess in said sleeve, recessed valve closing means threaded into one end of said plunger, a cap member threaded into the other end of said plunger, and a needle valve rigidly locked in said cap member and extending through the recess in said valve closing means.

9. In combination, a valve housing having inlet and outlet openings, a recessed sleeve secured in said housing between said openings and having an inwardly extending flange, a plunger slidable in the recess in said sleeve, valve closing means carried by said plunger, needle valve means, a button carried by said plunger and having rigid locking means receiving said needle valve means, said valve closing means and said needle valve means being separately and independently adjustable with respect to said plunger, and means on said sleeve adjacent said flange for locking said sleeve in position with respect to said housing.

10. In combination, in a valve housing having a bore with a recessed sleeve locked therein, a plunger slidable within said recessed sleeve, valve closing means threaded into the lower end of said plunger, said valve closing means having an internal passageway therein, a button member threaded into the outer end of said plunger and having rigid metering means secured in fixed position on said member and extending into said internal passageway, said metering means being adjustable by adjusting said button member with respect to said plunger.

11. In combination, a valve housing having a pair of coaxial bores, the outer one of said bores being screw-threaded, valve carrying mechanism engaged in the inner one of said bores and having means extending partially into said outer bore, and means threaded into said outer bore for engaging said extending means to secure said valve carrying mechanism in position.

HAROLD A. MANTZ.