June 19, 1951 R. J. OTT 2,557,460

SLIDE VALVE

Filed Oct. 16, 1946

FIG. 1.

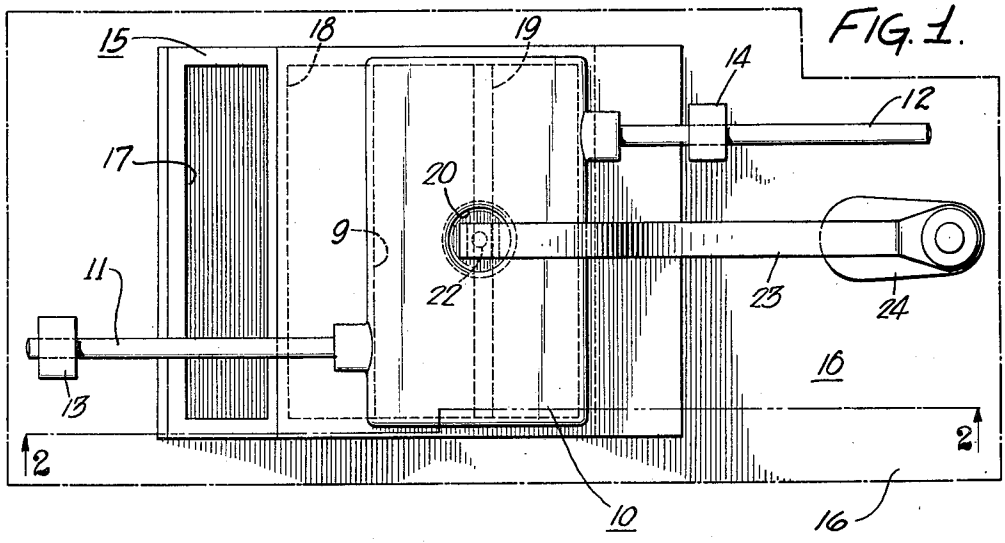


FIG. 2.

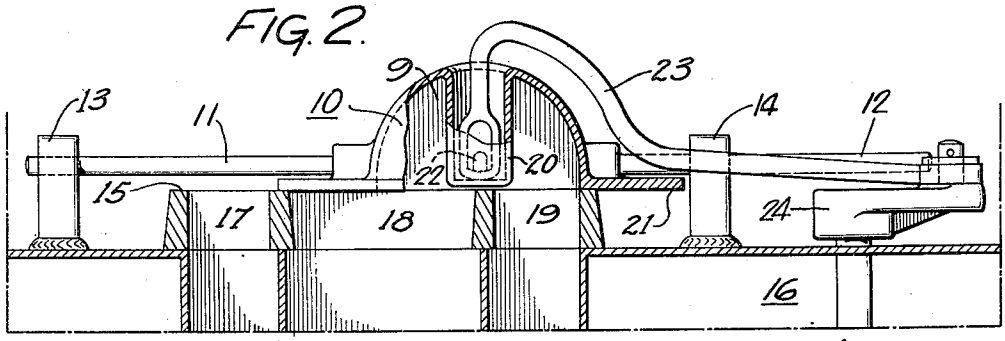


FIG. 4.

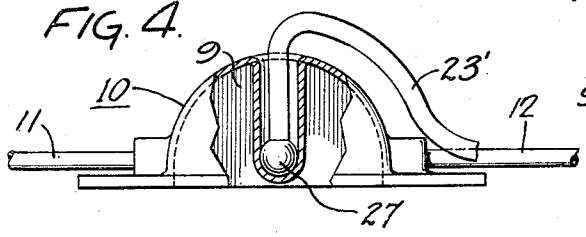


FIG. 5.

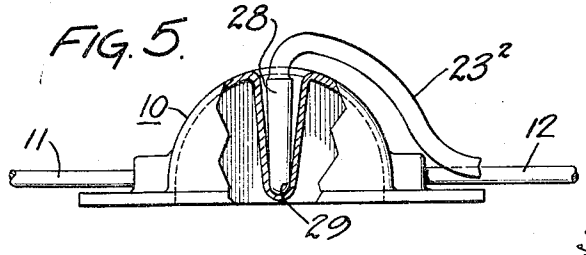
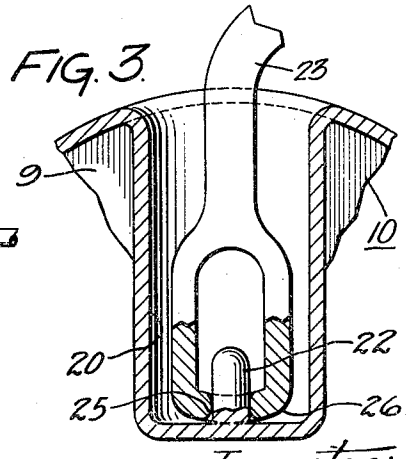


FIG. 3.



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SLIDE VALVE

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3 Claims. (Cl. 251—73)

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My invention relates to slide valves and more particularly to valves employed in the actuating mechanism of gas meters.

The valve construction heretofore employed in gas meters has resulted in undue chatter after the meter has been in use sufficiently long for gum and impurities in the gas to accumulate on the valve surface. I have found that when the valve actuating rod is attached to the valve at a point in proximity to the plane of the valve seat or seating surface of the valve and approximately on a line normal to said plane and intersecting the center of mass of the valve body, valve seat chatter is entirely eliminated even after long periods of use.

An object of my invention, therefore, is to provide a slide valve having its point of attachment with the actuating rod as close as possible to the plane of the seating surface of the valve and either at the center of mass of the valve body or at least on or closely adjacent to the line normal to said plane which intersects said center.

A further object of my invention is to provide a slide valve constructed so that access is afforded for attachment of the valve rod to the valve body at or near said desirable point.

The invention resides further in certain structural details contributing to the aforesaid primary ends, said details being hereinafter described and illustrated in the attached drawings, in which:

Fig. 1 is a plan view of a preferred form of my invention;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary sectional view showing details of the valve socket and valve rod attachment, and

Figs. 4 and 5 are sectional elevational views showing modified forms of valve socket construction.

Like reference characters denote like parts in the several figures of the drawings.

While certain novel features of the invention are disclosed herein in considerable detail with respect to certain particular forms of the invention, it is not desired that the invention be limited to such details since many changes and modifications may well be made without departure from the spirit of the invention in its broader aspects.

Referring now to the drawings, valve body 10 with its semi-cylindrical chamber 9 opening to the seating face of the valve is generally similar to slide valves commonly used in gas meters.

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The valve assembly includes guide rods 11 and 12 which operate in guide posts 13 and 14 to retain the valve body 10 in alignment with the valve seat 15 of the gas meter 16. Valve seat 15 has a plurality of ports 17, 18 and 19 arranged in conventional manner. Guides 11 and 12 as well as aligning posts 13 and 14 may be positioned diagonally opposite each other as illustrated in Fig. 1 or centrally opposite or in any other manner which may be preferred.

In operation, the valve is reciprocated on the seat 15 through the medium of a valve rod 23, this rod being actuated in turn from a crank arm 24. As stated above, tendency of the valve to chatter may be eliminated by attaching the rod to the valve body at a point having specified relation to the seating surface and the center of mass of said body.

The point of attachment should if possible lie in the plane of the seating surface of the valve and at the center of mass of the valve body, and otherwise as close as possible to said plane and at least on or near a line normal to the plane and intersecting said center. In the conventional construction, however, a point having the required relation both to the seating surface and to the center of mass is contained within the chamber 9 and is not accessible for attachment of the external actuating rod. The present invention provides a valve construction affording such access.

In accordance with the invention, valve body 10 is provided with a central pocket or recess 20 which extends downwardly through the chamber 9 substantially to the valve seat 15 there being sufficient clearance to prevent scuffing in the event of wear on the seating surface 21 of valve member 10. The pocket is located so as to contain the center of mass of the valve body. Located on the inside of the pocket 20 is pin 22 securely attached to the base of the pocket and either containing or in substantial alignment vertically with the said center of mass. In assembly recess 20 receives one terminal end, 26, of a valve rod 23 which is connected at the other end to a crank arm 24. The end 26 is bifurcated and is provided at the extremity with an aperture 25 for reception of the pin 22, said aperture being in alignment with the longitudinal center line of the said terminal end portion of the rod which occupies the recess 20. Valve rod 23 has a goose neck configuration to provide clearance with the valve body, the only contact between rod and valve body being through pin 22 and the end surface of the rod. The portion

of the rod **23** which adjoins the crank arm **24** and extends to the base of the goose neck is in substantial alignment with the pin **22**. It will be noted that the said end surface of rod **23** which rests on the bottom pocket **20** is rounded and that the inner face of aperture **25** may also be rounded if desired and is fitted to the pin in a manner to preclude any substantial lost motion. It is apparent that with this construction the point of attachment of the rod **23** with the valve body is in close proximity to the seating surface of the valve and is either at the center of mass of the valve body or on the aforesaid normal line intersecting the center. It is to be noted that loss of volumetric capacity in the chamber **9** resulting from the intersection thereof by the pocket **20** may be compensated by correspondingly enlarging the chamber.

Fig. 4 illustrates a modified form of pocket in the valve wherein the sides of the pocket are substantially parallel as in Fig. 3 but the bottom of pocket is rounded to receive the ball end **27** of arm **23'**.

Fig. 5 shows a still further modification in the shape of the pocket in that it is constructed with tapered sides and a rounded bottom. Arm **23²** in this construction terminates in a generally cylindrical portion **28** with a rounded end **29** which fits the rounded bottom of the pocket.

It will be apparent that in all of the aforedescribed embodiments the attachment between the rod **23** and of the valve **13** is in the nature of a ball and socket joint affording the valve entire freedom for self adjustment to the seat **15** without lost motion between the rod and the valve. In each case the point of attachment at which the force is applied to the valve body through the valve rod is at or near the center of mass of the valve and also closely adjacent to valve seat **15**.

Having thus described my invention, I claim:

1. In a mechanically actuated, horizontally movable slide valve of the gas meter type comprising a chamber arranged for selective registration with a plurality of ports on a horizontally disposed seat for directing a flow of fluid between said ports and wherein contact between the slide valve element and said horizontally disposed seat upon which said element slides is maintained primarily by gravity, an actuating member, and means for connecting said member to the valve element at a point substantially within the plane of the seating surface of the element on said seat and approximately on a line normal to said seating surface and intersecting the center of mass of said element.

2. A slide valve according to claim 1 wherein the said valve element is provided with a pocket in the top thereof extending downwardly toward the seating surface and terminating in a plane substantially within the plane of said seating surface, said pocket embracing the center of mass of said element, the actuating member extending downwardly into said pocket and being connected to the element at the bottom of said pocket and approximately on a line intersecting the center of mass of said element and normal to the plane of said seating surface.

3. A slide valve according to claim 1 wherein the said valve element is provided with a pocket in the top thereof extending downwardly toward the seating surface and terminating in a bottom portion located in a plane substantially within the plane of said seating surface, and wherein further the actuating member takes the form of a longitudinally reciprocatory rod extending in major part substantially parallel and in proximity to the plane of the seating surface of the valve, said rod having an offset portion extending upwardly over the top of the valve element and downwardly into said pocket, and having a driving connection with said element at a point in the bottom of said pocket in a plane substantially within the plane of said seating surface.

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