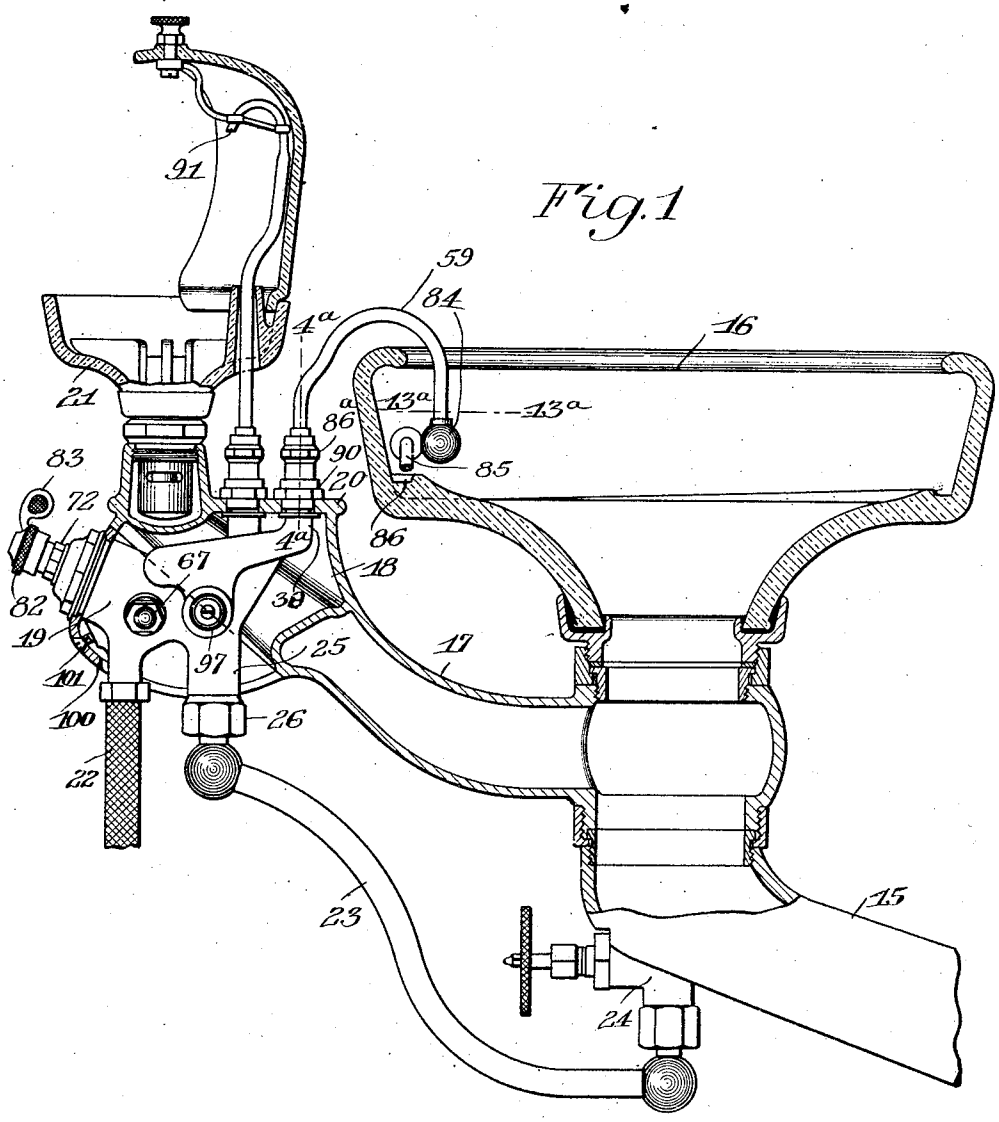
Feb. 16, 1926. 1,573,786

A. F. PIEPER

VALVE

Original Filed Sept. 20, 1923 4 Sheets-Sheet 1

Fig. 1



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Fig. 3

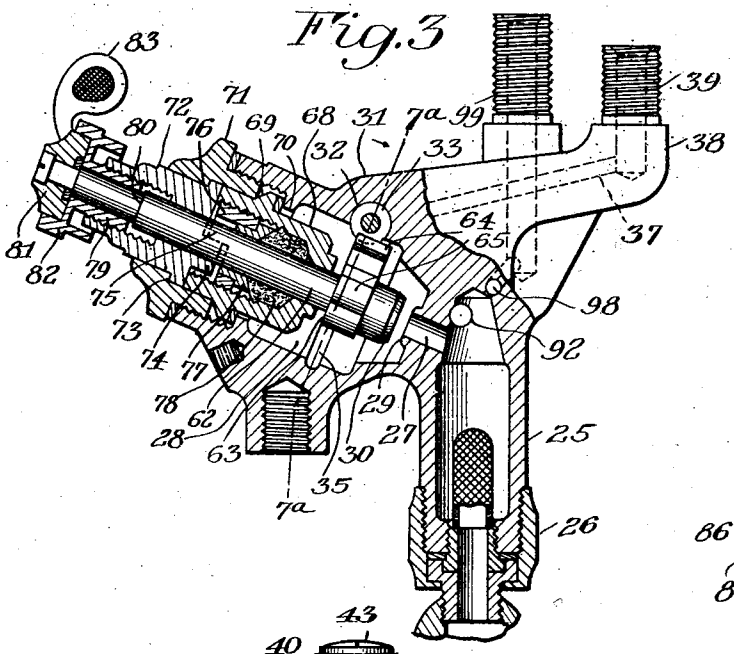


Fig. 4

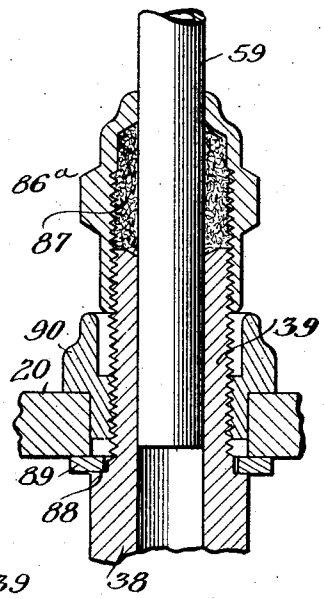
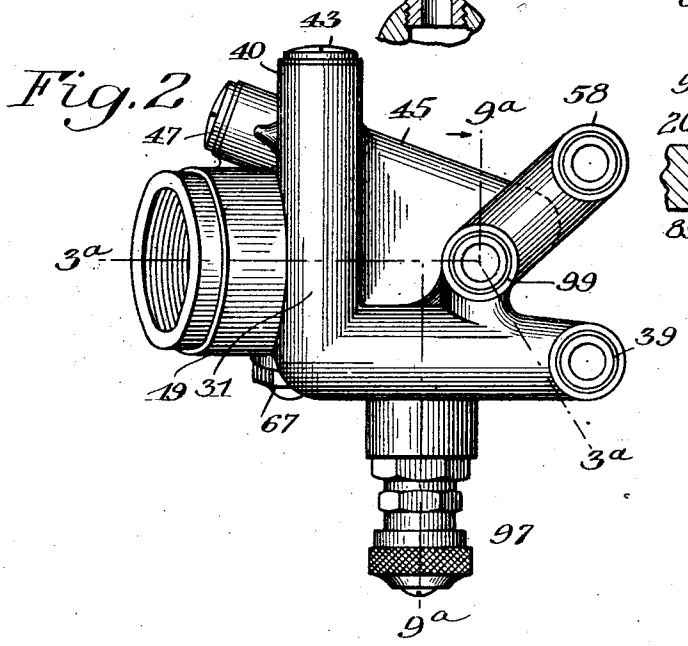


Fig. 2



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VALVE

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Fig. 5

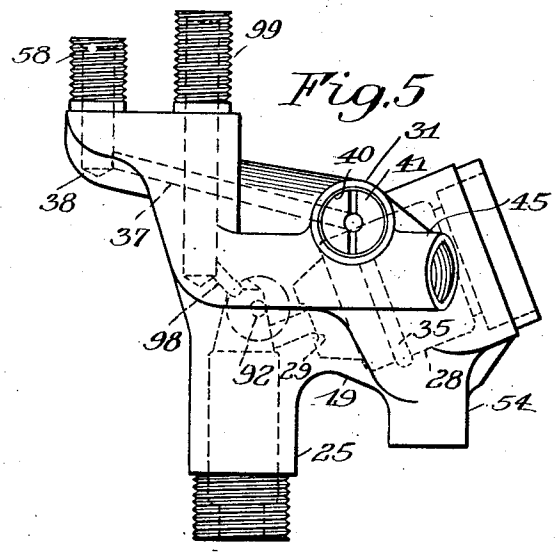


Fig. 7

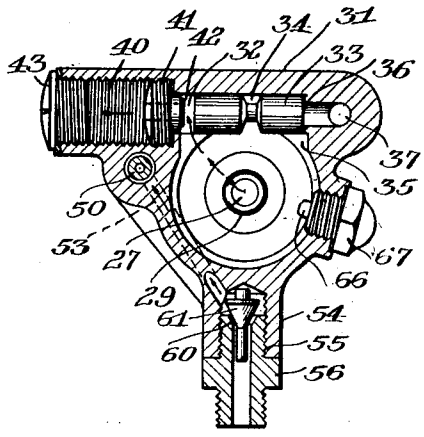


Fig. 6

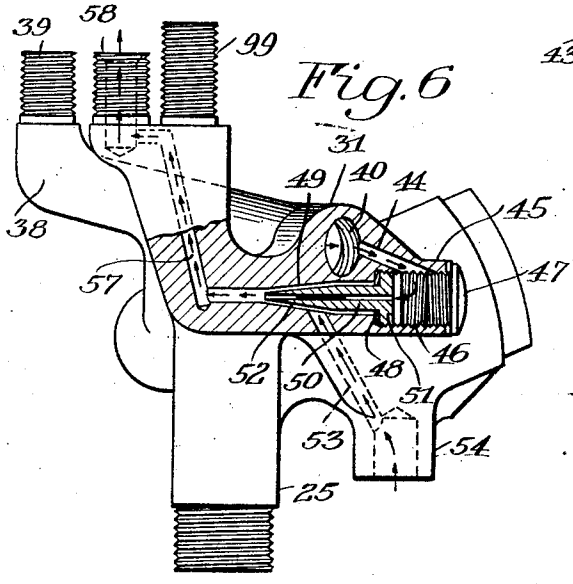
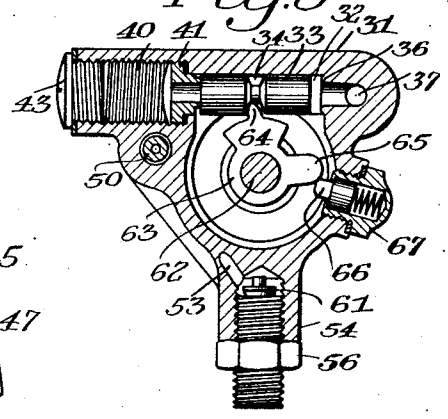


Fig. 8



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VALVE

Original Filed Sept. 20, 1923 4 Sheets-Sheet 4

Fig. 9

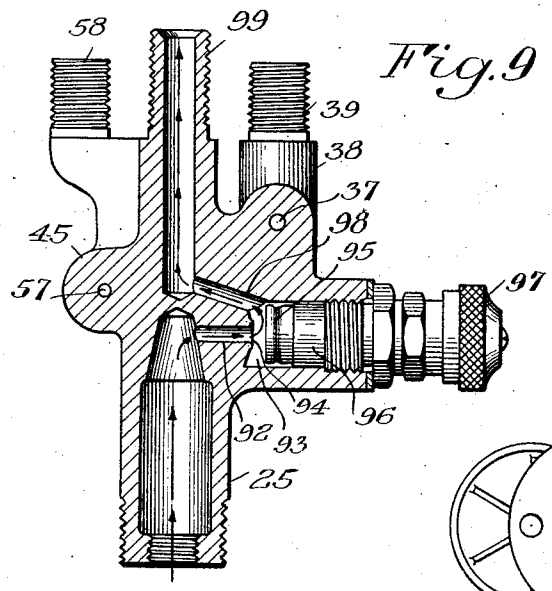


Fig. 12

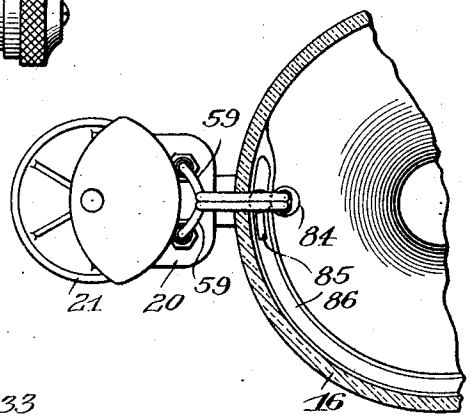


Fig. 10

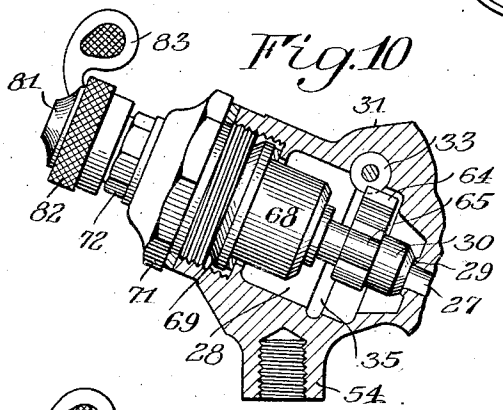


Fig. 13

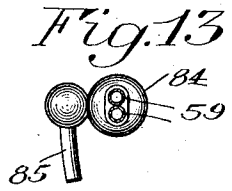
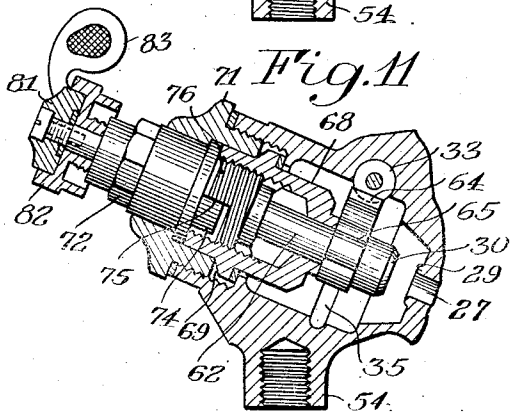


Fig. 11



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Patented Feb. 16, 1926. 1,573,786

UNITED STATES PATENT OFFICE.

ALPHONSE F. PIEPER, OF ROCHESTER, NEW YORK.

VALVE.

Original application filed September 20, 1923, Serial No. 663,892. Divided and this application filed April 18, 1924. Serial No. 707,496.

To all whom it may concern:

Be it known that I, ALPHONSE F. PIEPER, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Valves; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference numerals marked thereon.

This invention relates to valves, and more particularly to those of the multiple type, one object of the invention being to provide an efficient, self-contained and conveniently operated valve of this variety for controlling a plurality of fluid lines.

Another object is the provision of a single, compact valve head of the above character, adapted, for example, for controlling the supply of water to dental equipment stands for the various uses thereof such as flushing the cuspidor bowl, operating the saliva ejecting means, supplying the drinking glass stand, and the like.

A further purpose is to afford such a valve for conveniently controlling the flow of water to flush the cuspidor bowl either directly from the supply line or alternatively and indirectly through an aspirator device, so that the water employed to operate the latter device may be employed also to flush the cuspidor, for example, and thereby conserve the quantity used.

To these and other ends the invention resides in certain improvements and combinations of parts all as will be hereinafter more fully described; the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Figure 1 is a sectional elevation of a portion of a dental equipment stand showing a valve embodying the present invention applied thereto;

Figure 2 is an enlarged top plan view of the valve detached and with portions thereof removed;

Figure 3 is a sectional elevation substantially on the line 3^a—3^a in Figure 2;

Figure 4 is an enlarged sectional view on the line 4^a—4^a in Figure 1;

Figure 5 is a side elevation of the valve substantially as viewed from the top of the sheet in Figure 2;

Figure 6 is a similar view partly in section but at a slightly different angle;

Figures 7 and 8 are sectional views on the line 7^a—7^a in Figure 3, with parts in different operating positions;

Figure 9 is a sectional view on the line 9^a—9^a in Figure 2;

Figures 10 and 11 are sectional views on the line 3^a—3^a in Figure 2, partly broken away and showing the parts in different operating positions;

Figure 12 is a top plan view of a portion of the apparatus shown in Figure 1 to further illustrate the application of the invention, and

Figure 13 is an enlarged sectional detail on the line 13^a—13^a in Figure 1.

Similar reference numerals throughout the several views indicate the same parts.

The invention is disclosed herein, by way of illustration, as applied to use with a dental apparatus more fully disclosed in my co-pending application for patent, Serial No. 663,892, filed September 20, 1923, for dental apparatus, of which the present application is a division. Such apparatus comprises, generally, a hollow arm 15, Figure 1, projecting from a suitable pedestal or base and having mounted thereon and discharging thereinto a cuspidor bowl 16, in accordance with a construction and arrangement well known in the art. Branching from and discharging into arm 15 is a secondary arm 17 having at its upper end an enlarged portion 18 providing a support and housing for the valve 19 embodying the present invention. Carried on the horizontal top 20 of this housing is a drinking glass holder 21 of hollow construction, the waste from which is discharged through a passage into arms 17 and 15 from which the waste and also that from the cuspidor bowl are discharged within the supporting pedestal with which a waste pipe is connected. The valve of the present invention is used to control the supply of water for flushing the cuspidor bowl, filling the drinking glass, and operating the saliva ejecting means comprising the flexible tube 22, the other end of which is equipped with suitable terminal for insertion in the mouth of the patient. The water supply for the valve

is transmitted through a pipe 23 connected with a branch of the valve head as shown and with a valve 24 carried by arm 15 and connected in the latter with a suitable water supply line carried through the supporting base.

The valve comprises preferably an integral head which may be readily manufactured as a casting, having an inlet or supply extension or branch 25, Figure 3, adjustably connected with the supply pipe 23 by means of a union connection 26. Valve branch 25 has at 27 a branch passage communicating centrally with the lower end of an inclined chamber 28 formed centrally in the valve body. The end of passage 27 is provided in the chamber with a valve seat 29 with which cooperates a valve 30 to be later described for controlling the supply of water to the chamber. The top of the head is formed with a substantially cylindrical transverse enlargement 31, Figures 2, 3 and 7, having therein a cylindrical bore 32 in which slides longitudinally a valve body 33 having intermediate its ends a recessed portion 34. Chamber 28 has in its walls an annular enlargement or passage 35 in the plane of bore 32 and cut laterally into the same to provide communication between the chamber and valve bore as shown. Each end of the bore is formed with a valve seat for cooperation with the corresponding end of the valve body 33 and through one of these seats 36 is a passageway 37, Figures 5 and 7, leading through the head and through a nozzle extension 38 having an upwardly projecting threaded end 39. To this connection is attached a nozzle affording a direct supply of water for flushing the cuspidor. The opposite end of valve bore 32 communicates with an internally threaded extension 40, Figures 2 and 7, in which is detachably screwed a plug 41 having an end projecting into bore 32 and provided with a valve seat 42 for cooperation with the other end of the valve body 33. The outer end of the extension 40 is closed by a threaded plug 43 for access to the bore. Communicating with the extension 40 is a passage 44, Figure 6, leading through the head to saliva ejecting means in the latter which will now be described.

The saliva ejecting means comprises preferably a substantially cylindrical, lateral enlargement 45 on the head, Figures 2 and 6, formed centrally with a bore having an internally threaded end 46 opening externally and with a side of which the supply passage 44 communicates. Bore 46 is closed at its outer end by a detachable plug 47 and its inner portion is shouldered as at 48 and reduced conically to form a throat 49 as shown. A plug 50 has its head 51 screwed into bore 46 against the shoulder 48, the plug having a reduced tapered portion 52 extending through the throat 49 in spaced relation with the sides thereof. Plug 50 has a central passage therethrough for the supply of water from chamber 28 by the means described to the center of the throat. Communicating laterally with the throat is a passage 53 leading from a downward extension 54 internally threaded as at 55 for the reception of a nipple 56 to which is attached the flexible conductor 22 previously described carrying the terminal for insertion in the patient's mouth for withdrawing the saliva. Bore 49 communicates with a passage 57 leading through an upwardly extending threaded nozzle connection 58 having attached thereto a nozzle tube 59 discharging into the cuspidor in such an arrangement as to flush the latter. It is apparent that this construction affords an efficient aspirator saliva ejector means in the valve head, the parts of which may be conveniently reached by removal of plug 47. It is also apparent that by shifting valve body 33 longitudinally against one or the other of its cooperating seats, either the direct water supply or the saliva ejecting means may be brought into operation, thereby flushing the cuspidor bowl, these parts being adapted for operation alternately so that but one is in use at a time and the direct supply of water cut off when the ejector is in operation, to conserve the quantity of water necessary for continuously flushing the cuspidor. For the purpose of preventing the outward flow of water to the ejector connection, nipple 56 has formed in its inner end a valve seat 60, Figures 7 and 8, with which cooperates a check valve 61 which opens automatically when the ejector is brought into use by manipulation of the valve.

The valve body 33 for selectively operating either the direct supply of water for the cuspidor or the ejector, and the valve 30 are operated by a single valve spindle 62, Figure 3, rotatably and slidably supported in chamber 28. Valve 30 is fixed on the inner end of the spindle, so that a longitudinal sliding movement of the latter moves this valve toward and from its seat for the purpose described. The spindle has fixed thereon also a hub 63 carrying a finger 64 engaging in the recess 34 of valve body 33 for shifting the latter as described by partial rotation of the spindle. Means are also provided for urging the latter toward one or the other of its extreme positions of rotation, with the valve body against one or the other of its seats, comprising a shoulder 65 on the hub cooperating with a spring pressed plunger 66 carried by a plug 67 screwed into the head.

The valve spindle 62 is rotatably supported in the head by means comprising preferably a gland cup 68 in which the spindle rotates and which has a shoulder 69

bearing on an internal shoulder 70 in chamber 28. The gland cup is held in position by means of a sleeve 71 threadedly engaged in the externally opening end of chamber 28 and bearing against the shoulder 69 of the cup 68. Sleeve 71 supports a tubular part 72 rotating therein and on the spindle. Part 72 bears at its inner end on the outer end of the gland cup 68 and is held against longitudinal movement by inter-engaging shoulders 73 on the part and on sleeve 71. Part 72 is thus free to rotate but has no longitudinal movement and at its inner end carries a lug 74 slidably engaging a longitudinal shoulder 75 on a sleeve 76 threadedly engaged in the other end of the gland cup. Sleeve 76 bears at its other end against a beveled ring 77 for compressing the packing 78, and it is apparent from this construction that part 72 may be conveniently rotated whenever necessary for rendering the bearing of the spindle thoroughly water tight. The outer end of part 72 is enlarged internally and is threaded to receive a threaded sleeve 79 rotatably carried between a shoulder 80 and a head 81 secured to the outer end of the latter, and the sleeve carries a finger piece or ring 82 by means of which it may be continuously rotated to thereby shift the spindle longitudinally independently of any rotary motion of the same for operating valve 30. Head 81 carries a finger piece or wing 83 by means of which the spindle may be rotated independently of the longitudinal motion thereof for shifting valve body 33. Spindle 62 thus affords a single device having one movement in a longitudinal direction for controlling the supply of water to chamber 28 and having another or rotary movement for controlling the supply of water from the chamber to the cuspidor directly or through the ejector alternatively and selectively.

The nozzle extensions 39 and 58 for discharging water into the cuspidor directly or through the ejector, are each provided with nozzle tubes 59 curved into parallelism with each other and over the cuspidor side and united in a joint 84, Figure 13, carrying a common discharge nozzle 85 positioned above the beginning of a conducting and distributing water-way 86 extending circumferentially about the bowl 16. These nozzle tubes 59 are connected with their respective head extensions 39 and 58 by the insertion of their lower ends into the head extensions, as shown in Figure 4. A gland nut 86[a] containing packing 87 is provided for making these points water tight. These valve head extensions are also utilized, together with the extension for the glass holder nozzle hereafter described, for detachably securing the valve head to the apparatus arm 17. To this end each extension is formed below the threaded extremity thereof with a shoulder 88 carrying a washer 89 for engagement with the under side of the horizontal top portion 20 of the arm 17 and a nut 90 threadedly engaged with the extension detachably clamps the same and the valve to the arm. As shown nut 90 is recessed at its upper end to avoid interference with gland nut 86. The supply of water for the glass holder nozzle 91 is conducted from the supply connection 25 of the valve head through a lateral passage 92, Figure 9, into a chamber 93 in which it terminates with a valve seat 94. Cooperating with the latter is a valve 95 operated by a spindle 96 threadedly engaged with the walls of the valve and operated by a finger piece or knob 97. Comunicating laterally with chamber 93 is a passage 98 extending through the valve head and a threaded nozzle extension 99 clamped to the end 20 of arm 17 and connected with the drinking glass nozzle 91 as described above in connection with the nozzles for the cuspidor.

The supply connection for the valve head, as already stated, is connected by a union 26 with the pipe 23 and the other end of the latter connected by a union with valve 24 which is located concentrically with the vertical axis of the end of arm 15 and of the cuspidor bowl. Arm 17 is rotatably secured to arm 15 so that the arm 17 and the valve head and other parts carried thereby may be adjusted rotarily about the cuspidor bowl to the most convenient position. As stated also the valve body is housed within the enlarged portion 18 of the hollow arm 17, the half portion or cover plate 100 of which is detachable, being secured in place as by means of screws 101. Access may thus be had to the valve head which is detachably secured in the housing by the clamping of its nozzle extensions to the top 20 of the housing.

In operation, finger piece 82 may be conveniently rotated to shift spindle 62 longitudinally to control admission of water to chamber 28. By turning finger piece 83 in one direction the bowl may be flushed with a direct supply of water and the supply to the ejector cut off and whenever it is desired to use the ejector, the finger piece is swung in the opposite direction to admit water pressure thereto and automatically cut off the direct supply of water to the bowl, which is then flushed by the discharge from the ejector, to thereby conserve the quantity of water necessary for continuously flushing the bowl. By rotating finger piece 97 valve 95 may be seated or unseated to cut off or admit water for the drinking glass nozzle 91. The invention thus provides a compact, self-contained, multiple valve of a practical and efficient form of construction throughout, the parts of which are fully accessible for cleaning and repair and which conveniently requires the manipulation in normal use of but two operating parts to

control three supply lines, two of which are controlled alternatively by a single operating part.

I claim as my invention—

1. A valve head comprising an inlet, a plurality of outlets, valve means controlling said inlet, independent valve means selectively controlling said outlets, a single manipulative device for actuating both of said valve means and a part cooperating with said head and device and threadedly engaged with one thereof for actuating said device.

2. A valve head comprising an inlet, a plurality of outlets, valve means controlling said inlet, independent valve means selectively controlling said outlets, a single manipulative device having one movement for actuating one of said valve means and another and independent movement for actuating the other of said valve means, and a part cooperating with said head and device and threadedly engaged with one thereof for effecting one of said movements of said device.

3. A valve head comprising an inlet, a plurality of outlets, valve means controlling said inlet, independent valve means selectively controlling said outlets, and a single valve spindle having longitudinal movement for actuating one of said valve means and rotary movement for actuating the other thereof.

4. A valve head comprising an inlet, a plurality of outlets, valve means controlling said inlet, independent valve means selectively controlling said outlets, a valve spindle having a rotary movement for actuating one of said valve means, and a part in threaded engagement with said head and rotating on said spindle but held against longitudinal movement thereon for shifting said spindle longitudinally and actuating the other of said valve means.

5. A valve head comprising an inlet, a plurality of outlets, valve means controlling said inlet, independent valve means selectively controlling said outlets, a valve spindle having a rotary movement for actuating one of said valve means, spaced shoulders on said spindle, and a sleeve rotating on said spindle between said shoulders in threaded engagement externally with said head for shifting said spindle longitudinally and actuating the other of said valve means.

6. A valve head comprising an inlet having a valve seat, a pair of outlets having valve seats spaced from each other in opposed relation, a valve body shiftable between said opposed seats to selectively open one outlet and close the other, a spindle rotatable and longitudinally slidable in said head, a valve on said spindle cooperating by the sliding movement of the latter with said inlet valve seat, and means connecting said spindle and valve body for shifting the same by rotation of said spindle.

7. A valve head comprising an inlet having a valve seat, a pair of outlets having valve seats spaced from each other in opposed relation, a valve body shiftable between said opposed seats to selectively open one outlet and close the other, a spindle rotatable and longitudinally slidable in said head and provided with spaced shoulders, a sleeve rotating on said spindle between said shoulders in threaded engagement externally with said head for shifting said spindle longitudinally, a valve on said spindle end cooperating by the sliding movement thereof with said inlet seat, and a finger on said spindle engaging said valve body for shifting the same by rotation of the spindle.

8. A valve head having a chamber formed therein, an inlet provided with a valve seat communicating with said chamber, a bore communicating laterally with said chamber, a pair of outlets communicating respectively with the ends of said bore and provided in the latter with spaced opposing valve seats, a valve body shiftable in said bore between said opposed seats to selectively connect one of said outlets with said chamber and disconnect the other, injector means in one of said outlets, a spindle rotatable and longitudinally slidable in said head and having a valve cooperating by said sliding movement with said outlet seat, and a connection between said spindle and valve body for shifting the latter by rotation of said spindle.

ALPHONSE F. PIEPER.