949,635.

J. ROTHCHILD.

VALVE.

APPLICATION FILED OCT. 7, 1908.

Patented Feb. 15, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

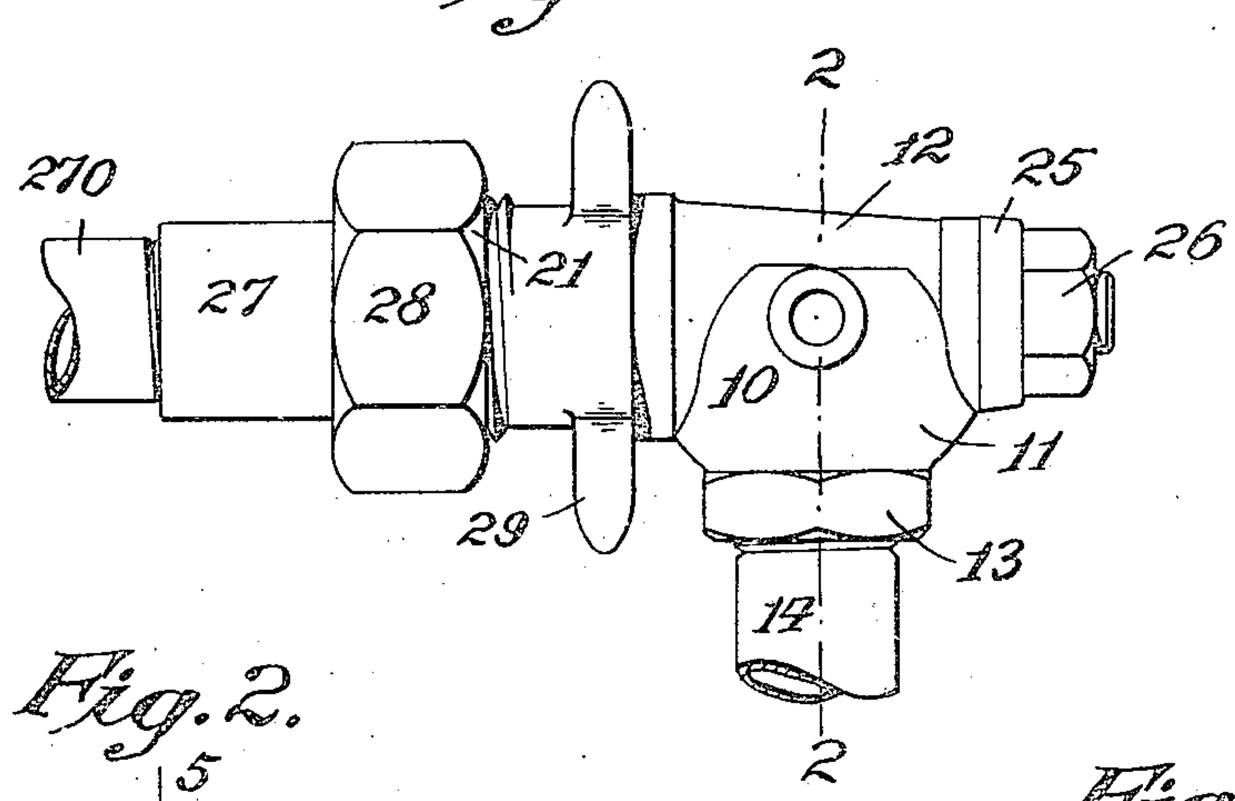


Fig. 2.

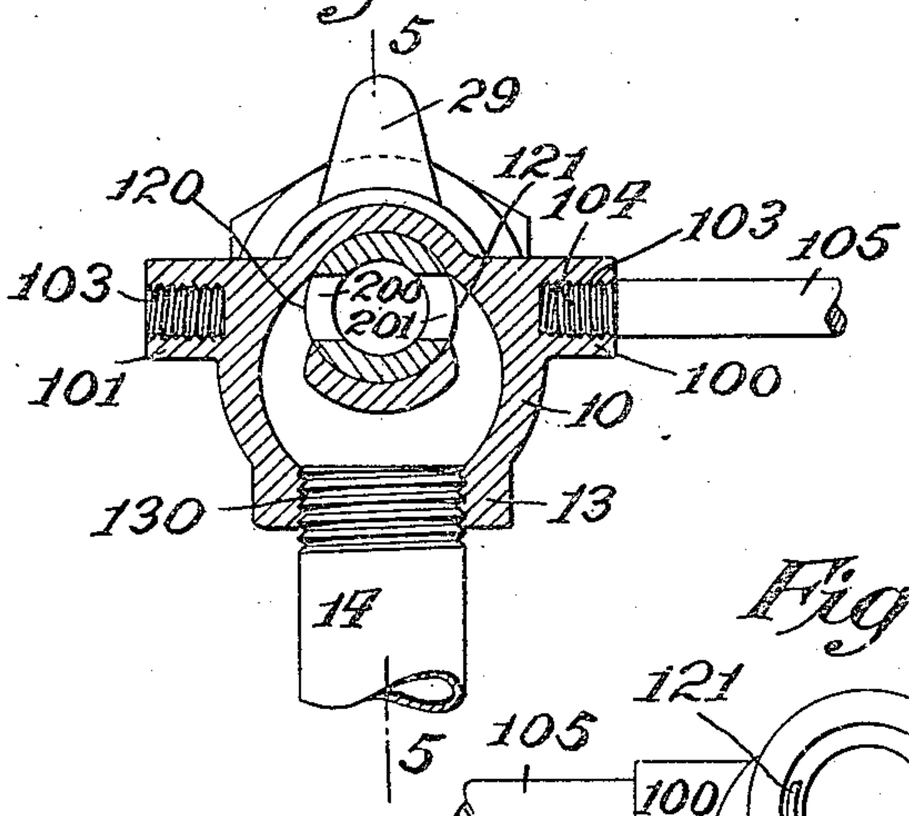


Fig. 3.

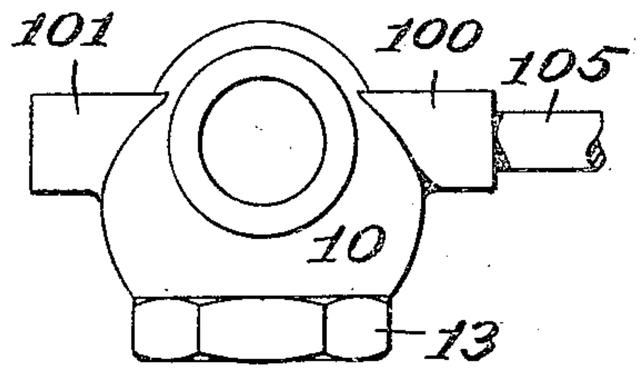


Fig. 4.

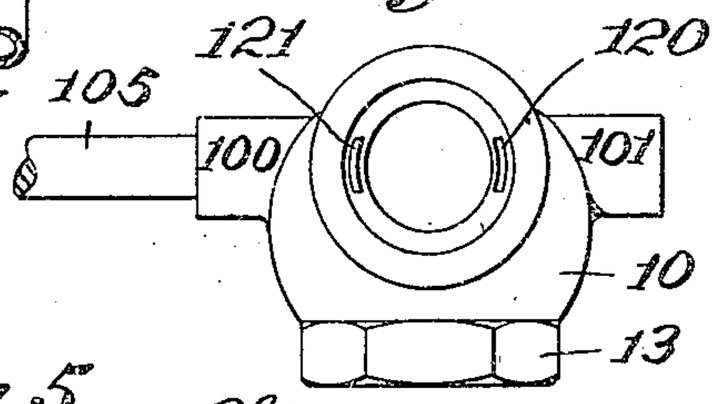


Fig. 5.ª

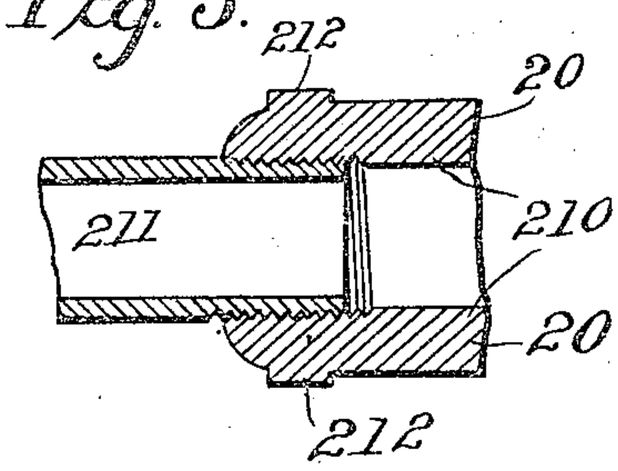
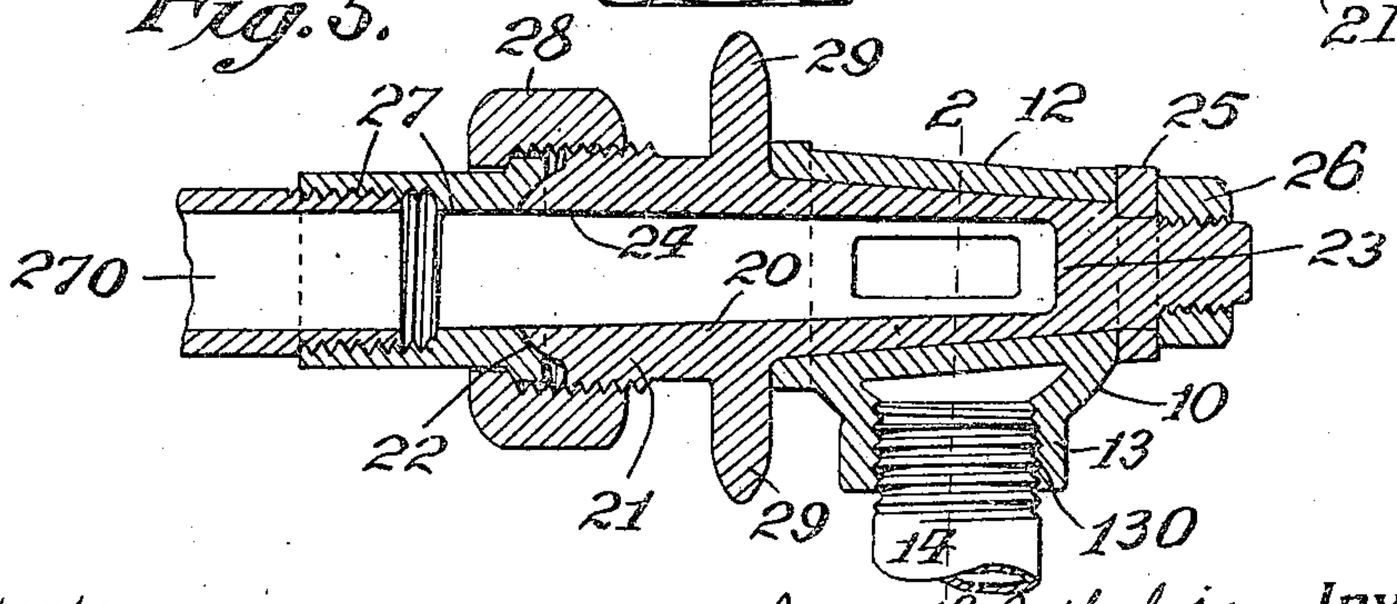


Fig. 5.



Attest:

P. O. Springmeyer

Alan C. McDonnell.

Joseph Rothchild Inventor:

by William R. Baird

his Atty.

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2 SHEETS—SHEET 2.

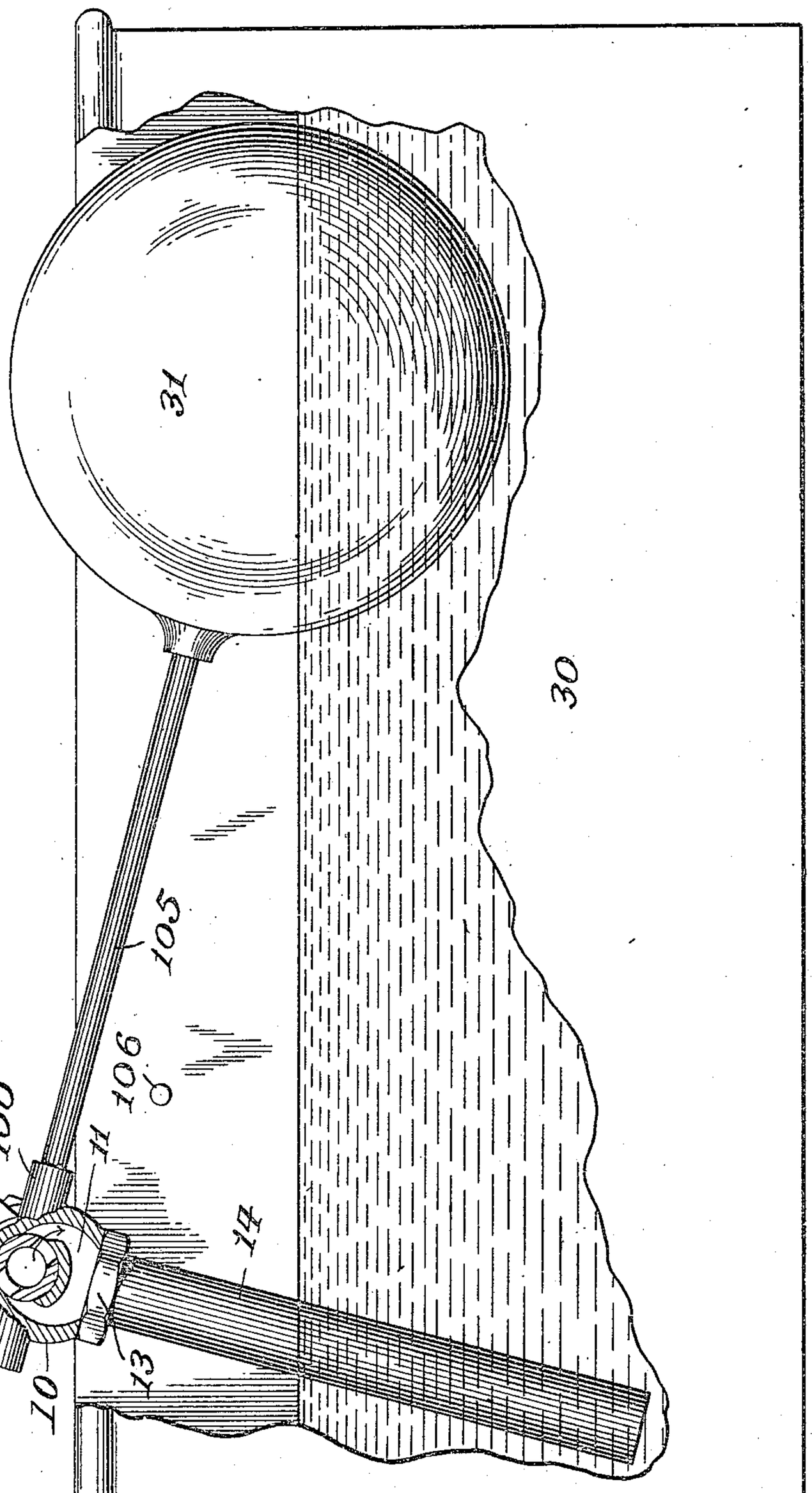

Fig. 6.

Attest:

Theo. Springmeyer.

Alan C. McDonnell.

Joseph Rothchild, Inventor:

by William R. Baird

his Atty.

UNITED STATES PATENT OFFICE.

JOSEPH ROTHCHILD, OF BAYONNE, NEW JERSEY, ASSIGNOR TO THE JOHN SIMMONS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

VALVE.

949,635. Specification of Letters Patent. Patented Feb. 15, 1910.

Application filed October 7, 1908. Serial No. 456,591.

To all whom it may concern:

Be it known that I, JOSEPH ROTHCHILD, a citizen of the United States, and resident of Bayonne, Hudson county, New Jersey, have invented certain new and useful Improvements in Valves, of which the following is a specification.

My invention relates to valves and its novelty consists in the construction and adaptation of the parts as will be more fully hereinafter pointed out.

The object of the invention is to provide a valve and casing relatively movable in which the pressure of the incoming column of fluid against the walls of the valve shall, to a great extent, be neutralized and shall have little or no effect upon the ease of its operation. I also in accomplishing the desired object secure simplicity in construction and economy in manufacture.

In the drawings, Figure 1 represents a side elevation of the valve and casing as assembled and with portions of the supply and discharge pipe; Fig. 2 is a transverse section on the plane of the line 2—2 in Fig. 1; Fig. 3 is an end view of the casing looking toward its larger conical extremity; Fig. 4 is a similar end view looking in the opposite direction; Fig. 5 is a longitudinal section on the plane of the line 5—5 in Fig. 2; Fig. 5ª is a partial section, on the same plane, of a slight modification, and Fig. 6 is an illustration of the application of the device to a water closet tank, the valve and casing being shown in section similar to Fig. 2.

In the drawings, 10 is a valve casing made of peculiar form, geometrically speaking, consisting of the intersection of a spherical body 11 by the frustum of a cone 12 in one direction and of a hexagonal prism 13 in another. The conical portion is bored out to form a smooth interior surface, while the prismatic body is internally threaded at 130 to engage with a coupling, fitting or pipe 14 similarly threaded and which may thus be secured therein. The conical body is provided with a plurality of longitudinal apertures 120 and 121 constituting ports adapted to be opened and closed by the valve hereinafter referrred to. Secured to or made integral with the casing 10, are externally projecting lugs 100 and 101 preferably arranged in line with each other and each bored and internally threaded for a small portion of its length as at 103 to receive the externally threaded end 104 of a rotating rod 105 in either bore as may be desired.

20 is a valve made preferably in the general form of the frustum of a cone and fitting within the conical portion 12 of the valve casing 10. The valve is hollow, being bored out from its larger end, and is provided with longitudinal openings 200 and 201 adapted to register with the ports 120 and 121 of the casing. At its larger end, the valve is provided with an externally threaded body 21 terminating in a spherical nipple 22. A thimble 27 is adapted to fit over the nipple 22 against which it is held by a circumferential nut 28 the thimble being internally threaded to receive a supply pipe 270, as shown in Fig. 6. In the modified form, shown in Fig. 5ª, the valve 20 may be internally threaded as at 210 to receive a supply pipe 211 and may also be made angular on its outer surface, as at 212, to receive a wrench or other tool for turning it. Projecting from the valve 20 are indicators or pointers 29, either secured to the body of the valve by any suitable means or made integral therewith and arranged diametrically opposite each other. In the drawings, I have shown only two lateral passages 200 and 201 in the valve wall and two similar ports 120 and 121 in the valve casing. These are merely illustrative. Any number of passages and ports may be employed but it is essential that the passages should be of equal discharge area on each side of the plane line 5—5 in Fig. 2 and that the corresponding ports should also be of equal receptive area on each side of the same plane line, although it is not strictly necessary that the total area of the valve passages and that of the casing ports should be equal.

In use a supply pipe 270 is secured to the thimble 27 and a discharge pipe 14 to the prism 13. The indicators 29 are preferably arranged diametrically opposite to each other and with their center lines coincident with the plane line 5—5 in Fig. 2 and at right angles to a line passing diametrically through the centers of the openings. When so arranged with respect to the position of the openings 200 and 201 they serve to indicate from the outside whether such openings register with the ports 120 and 121 of the casing 10, in which case the through passage-ways to the discharge pipe 14 are open.

If the indicators are out of such position with relation to the casing, as in Fig. 6, the operator can see from the outside that the passage is closed. Limiting the movement of the actuating rod 105 by a suitable stop 106 serves partially to throttle the valve and prevent its full opening. The actuating rod may be secured to either lug 100 or 101. It will be noticed that in effect the valve is stationary and the casing is movable.

The valve is readily made. It has no parts to get out of order. It is quickly assembled and disassembled and it is very efficient in use. When the water enters the supply pipe 270 it rushes into the interior of the valve and against the end wall 23 where its movement is stopped. If the casing is so turned that the passages 200 and 201 register with the ports 120 and 121, the water moves sidewise with respect to the longitudinal axis of the valve, and because of the equal area of the openings 200 and 201 on each side it moves with equal pressure against the opposing walls of the casing and so far as the walls of the valve are concerned its pressure is neutralized. This not only insures a quiet and steady flow into the spherical portion 11 of the casing but it makes it easy to rotate the valve casing.

In order to illustrate the use of the valve I show in Fig. 6 its application to the control of a tank adapted to contain fluid to be drawn therefrom and with a float automatically operating the movable casing 10 upon the stationary valve 20 during the filling or emptying of the tank. In this construction, 30 is the tank, and 31 is the float secured to the end of the rotating rod 105. This rod can be secured at either side of the casing 10 by means of the lugs 100 or 101. The float, therefore, may be placed at either end of the tank to accommodate the position of the discharge or supply pipe. When the water is drawn off, the float 31 sinks by gravity, rotating the casing 10 through the rod 105 until the valve is fully opened. The water then enters through the appropriate supply pipe and as it is discharged into the tank the float rises and the valve is gradually closed. But the pressure of the incoming column of fluid having been equally distributed within the valve the water flows quietly into the discharge pipe. The adjustment of the position in which the valve is to remain stationary, which adjustment will be indicated by the lugs 29, as for instance is shown in Fig. 6, will determine the position of the openings 200 and 201, and consequently will also determine when the movement of the float 31 will open or close the passage from the supply pipe into the tank, thereby determining the height to which the water may be permitted to rise in the tank.

My valve, as hereinbefore described, is perfectly balanced; it is made exclusively of metal; it is adaptable to a top or bottom supply through the discharge pipe, or to either right or left end connections with the float; it has a shearing movement in opening and closing rather than a seating movement; the indicators are conveniently located to serve as guides in adjusting the ports for any height of water desired.

What I claim as new is:

1. A valve casing having a longitudinal bore, a discharge orifice at an angle thereto, a diaphragm intermediate the bore and the orifice, ports on each side of the diaphragm leading to the discharge orifice, a hollow valve fitting the bore, a supply orifice at one end of the valve, openings in the valve registering with the ports of the valve casing and means for moving the casing.

2. A valve casing having a longitudinal bore, a discharge orifice at an angle thereto, a diaphragm intermediate the bore and the orifice, ports on each side of the diaphragm leading to the discharge orifice, a hollow valve fitting the bore, a supply orifice at one end of the valve, openings in the valve registering with the ports of the valve casing and means for moving the casing, comprising one or more external lugs and a detachable device secured thereto.

3. A valve casing having a longitudinal bore, a discharge orifice at an angle thereto, a diaphragm intermediate the bore and the orifice, ports on each side of the diaphragm leading to the discharge orifice, a hollow valve fitting the bore, a supply orifice at one end of the valve, openings in the valve registering with the ports of the valve casing and means for moving the casing, in combination with means for indicating from the outside the extent of such movement necessary to open and close the valve, including a pointer secured to the valve.

4. A valve casing having a longitudinal bore, a discharge orifice at an angle thereto, a diaphragm intermediate the bore and the orifice, ports on each side of the diaphragm leading to the discharge orifice, a hollow valve fitting the bore, a supply orifice at one end of the valve, openings in the valve registering with the ports of the valve casing and means moving the casing, in combination with means for indicating from the outside the extent of such movement necessary to open and close the valve, comprising a plurality of pointers secured to the valve.

5. A valve casing having a longitudinal bore, a discharge orifice at an angle thereto, a diaphragm intermediate the bore and the orifice, ports on each side of the diaphragm leading to the discharge orifice, a hollow valve fitting the bore, a supply orifice at one end of the valve, openings in the valve registering with the ports of the valve casing and means for moving the casing, in combi-

nation with means for indicating from the outside the extent of such movement necessary to open and close the valve, comprising two oppositely arranged pointers secured to the valve.

6. A valve casing having a longitudinal bore, a discharge orifice at an angle thereto, internal threads at said orifice adapted to engage the similar threads of a connected pipe or fitting, a diaphragm intermediate the bore and the orifice, ports on each side of the diaphragm leading to the discharge orifice, a hollow valve fitting the bore, a supply orifice at one end of the valve, external threads at said orifice, a convex flange surrounding the orifice, a thimble provided with a concave flange adapted to engage with said convex flange, means for uniting the thimble and valve flange, and openings in the valve registering with the ports of the casing.

7. A valve casing having a longitudinal bore, a discharge orifice at an angle thereto, internal threads at said orifice adapted to engage the similar threads of a connected pipe or fitting, a diaphragm intermediate the bore and the orifice, ports on each side of the diaphragm leading to the discharge orifice, a hollow valve fitting the bore, a supply orifice at one end of the valve, external threads at said orifice, a convex flange surrounding the orifice, a thimble provided with a concave flange adapted to engage with said convex flange, means for uniting the thimble and valve flange, consisting of a circumferential nut engaging the external threads of the valve flange and the flange of the thimble.

8. A fixed valve having a hollow interior, an orifice at one end leading to a supply pipe, an impervious wall at the opposite end, a plurality of lateral passages leading from the hollow interior, a rotatable casing surrounding the valve and provided with ports registering with the openings therein, and means adapted to indicate the extent of movement of the casing, comprising one or more indicators fixed to the valve.

9. A fixed valve having a hollow interior, an orifice at one end leading to a supply pipe, an impervious wall at the opposite end, a plurality of lateral passages leading from the hollow interior, a rotatable casing surrounding the valve and provided with ports registering with the openings therein, means for rotating the casing comprising one or more lugs, and a separable rod adapted to engage with any of said lugs to rotate the casing in any direction.

10. A fixed valve having a hollow interior, one end of which communicates with a supply pipe, a rotatable casing surrounding the valve, a plurality of lateral openings in the valve arranged symmetrically with respect to its longitudinal axis and a plurality of ports in the casing equal in number to the lateral openings in the valve and registering therewith, in combination with means for moving the casing in a plane at right angles to the longitudinal axis of the valve, comprising a separable operating rod and means for detachably securing it at different points on the casing.

11. A fixed valve having a hollow interior, one end of which communicates with a supply pipe, a rotatable casing surrounding the valve, a plurality of lateral openings in the valve arranged symmetrically with respect to its longitudinal axis and a plurality of ports in the casing equal in number to the lateral openings in the valve and registering therewith, in combination with means for moving the casing in a plane at right angles to the longitudinal axis of the valve, comprising a separable operating rod and means for detachably securing it at different points on the casing, consisting of a series of threaded lugs to engage a threaded end of the rod.

12. A fixed valve having a hollow interior, one end of which communicates with a supply pipe, a rotatable casing surrounding the valve, a plurality of lateral openings in the valve arranged symmetrically with respect to its longitudinal axis whereby the effective area of the openings is substantially the same on each side of the valve and a plurality of openings equal in number to the lateral openings in the valve and registering therewith, in combination with means for moving the casing in a plane at right angles to the longitudinal axis of the valve, comprising a separable operating rod and means for detachably securing it at different points on the casing.

13. A fixed valve having a hollow interior, one end of which communicates with a supply pipe, a rotatable casing surrounding the valve, a plurality of lateral openings in the valve arranged symmetrically with respect to its longitudinal axis whereby the effective area of the openings is substantially the same on each side of the valve and a plurality of openings equal in number to the lateral openings in the valve and registering therewith, in combination with means for moving the casing in a plane at right angles to the longitudinal axis of the valve, comprising a separable operating rod and means for detachably securing it at different points on the casing, consisting of a series of threaded lugs adapted to engage a threaded end of the rod.

14. A fixed valve having a hollow interior, one end of which communicates with a supply pipe, a rotatable casing surrounding the valve, means on the valve adapted to indicate from the outside the extent of movement of the casing necessary to open or close the valve, comprising two diametrically arranged pointers projecting from

the valve, a plurality of lateral openings in the valve arranged symmetrically with respect to its longitudinal axis and equal in number on each side of the plane of the indicators, and a plurality of ports in the casing registering with the valve openings.

15. A fixed valve having a hollow interior, one end of which communicates with a supply pipe, a rotatable casing surrounding the valve, means on the valve adapted to indicate from the outside the extent of movement of the casing necessary to open or close the valve, comprising two diametrically arranged pointers projecting from the valve, a plurality of lateral openings in the valve arranged in equal number and size on each side of the plane of the indicators, and a plurality of ports in the casing registering with the valve openings.

16. A fixed valve having a hollow interior, one end of which communicates with a supply pipe, a rotatable case surrounding the valve, means on the valve adapted to indicate from the outside the extent of movement of the casing necessary to open or close the valve, comprising two diametrically arranged pointers projecting from the valve, a plurality of lateral openings in the valve arranged in equal number and size on each side of the plane of the indicators, and a plurality of ports in the casing registering with the valve openings, in combination with means for moving the casing.

17. A fixed valve having a hollow interior, one end of which communicates with a supply pipe, a rotatable casing surrounding the valve, means on the valve adapted to indicate from the outside the extent of movement of the casing necessary to open or close the valve, comprising two diametrically arranged pointers projecting from the valve, a plurality of lateral openings in the valve arranged in equal number and size on each side of the plane of the indicators, and a plurality of ports in the casing registering with the valve openings, in combination with means for moving the casing in a plane at right angles to the longitudinal axis of the valve.

18. A fixed valve having a hollow interior, one end of which communicates with a supply pipe, a rotatable casing surrounding the valve, means on the valve adapted to indicate from the outside the extent of movement of the casing necessary to open or close the valve, comprising two diametrically arranged pointers projecting from the valve, a plurality of lateral openings in the valve arranged in equal number and size on each side of the plane of the indicators, and a plurality of ports in the casing registering with the valve openings, in combination with means for moving the casing in a plane at right angles to the longitudinal axis of the valve, comprising a separable device and means detachably securing it at different points on the casing.

19. A fixed valve having a hollow interior, one end of which communicates with a supply pipe, a rotatable casing surrounding the valve, means on the valve adapted to indicate from the outside the extent of movement of the casing necessary to open or close the valve, comprising two diametrically arranged pointers projecting from the valve, a plurality of lateral openings in the valve arranged in equal number and size on each side of the plane of the indicators, and a plurality of ports in the casing registering with the valve openings, in combination with means for moving the casing in a plane at right angles to the longitudinal axis of the valve, comprising a separable device and means detachably securing it at different points on the casing, consisting of a series of threaded lugs adapted to engage a threaded member of the rotating device.

Witness my hand this 3rd day of October 1908, at New York, N. Y.

JOSEPH ROTHCHILD.

Witnesses:
T. W. SPRINGMEYER,
ALAN C. MCDONNELL.