

J. A. SERRELL & M. P. OSBOURN.

VALVE.

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935,329.

Patented Sept. 28, 1909.

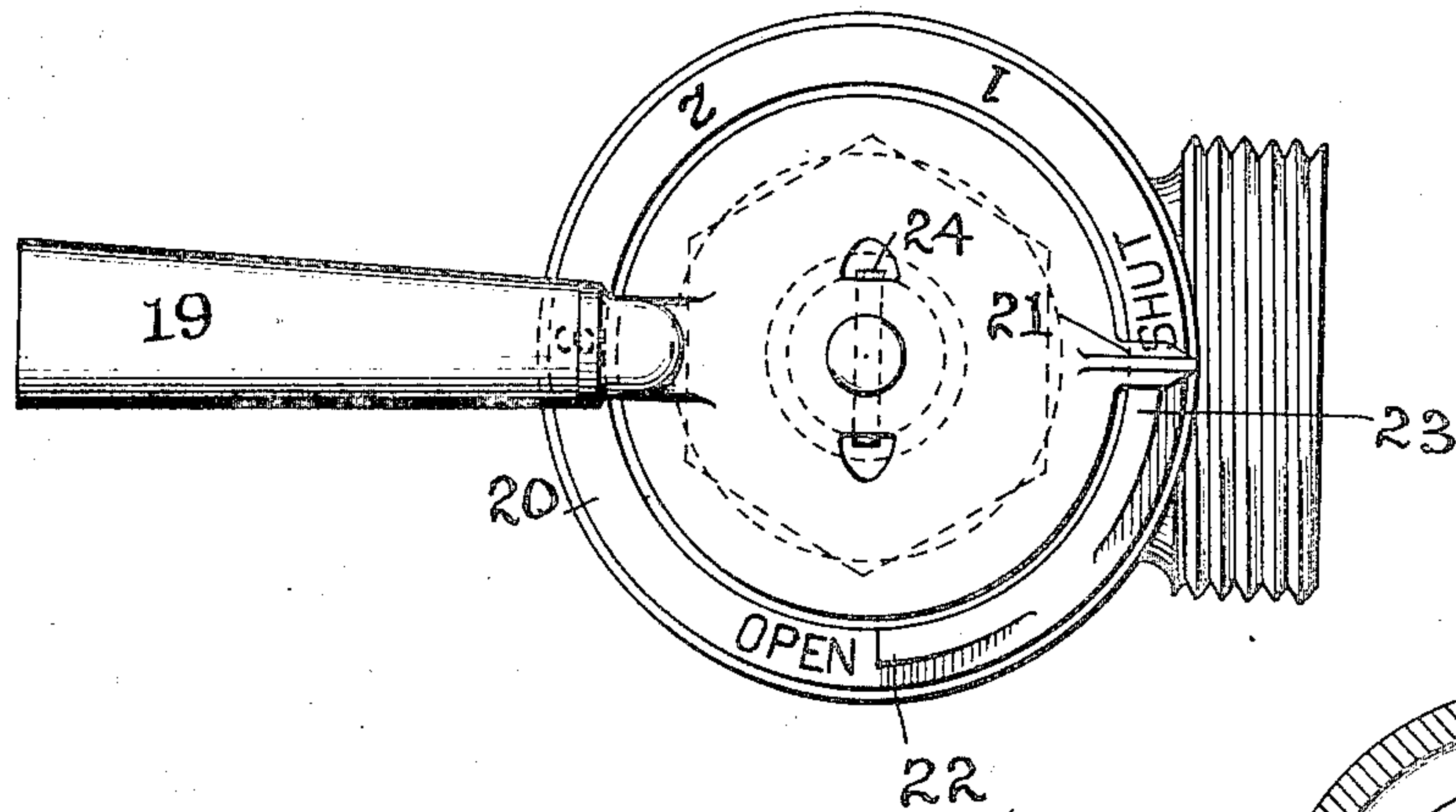


FIG. 1

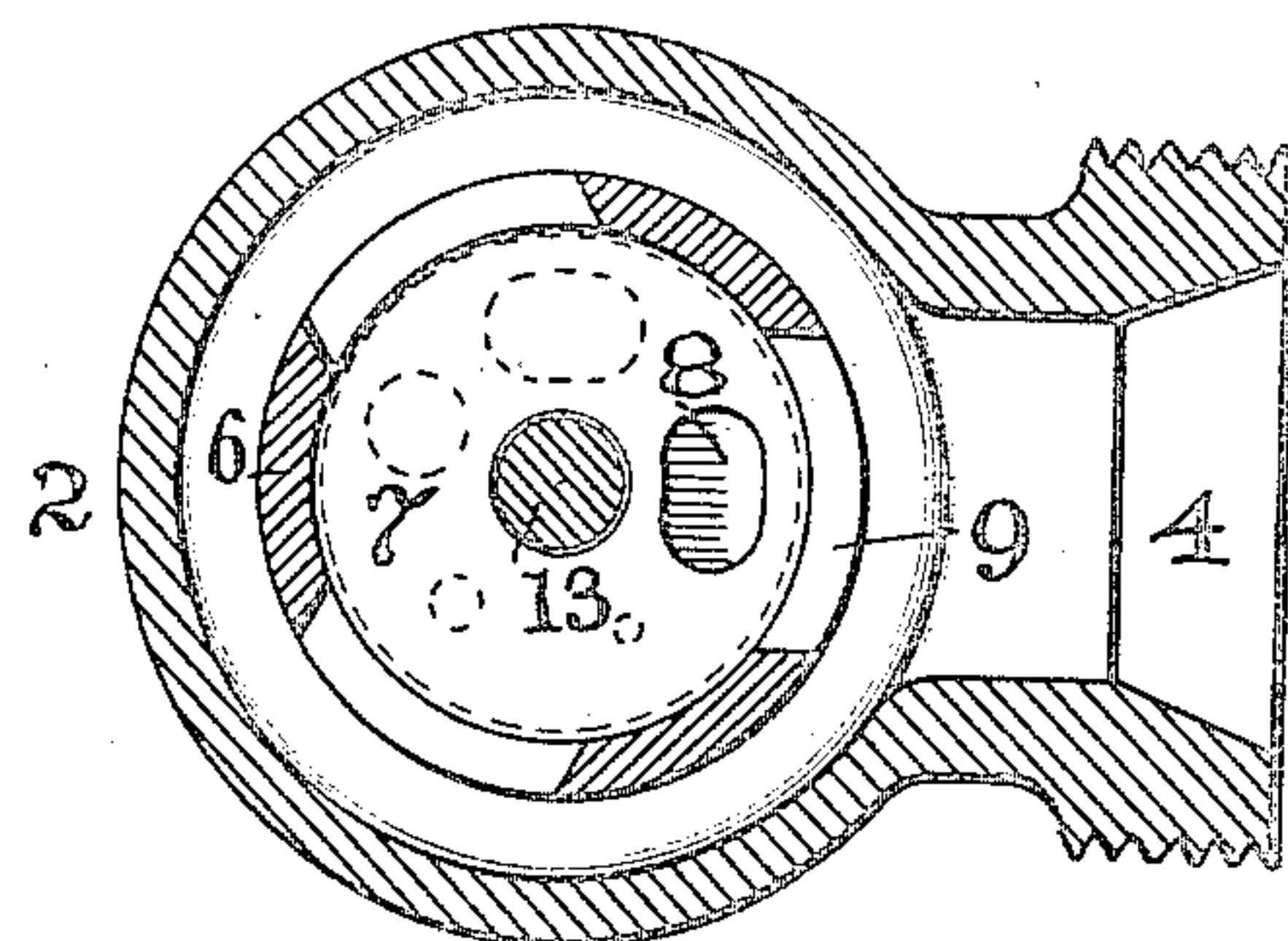


FIG. 3

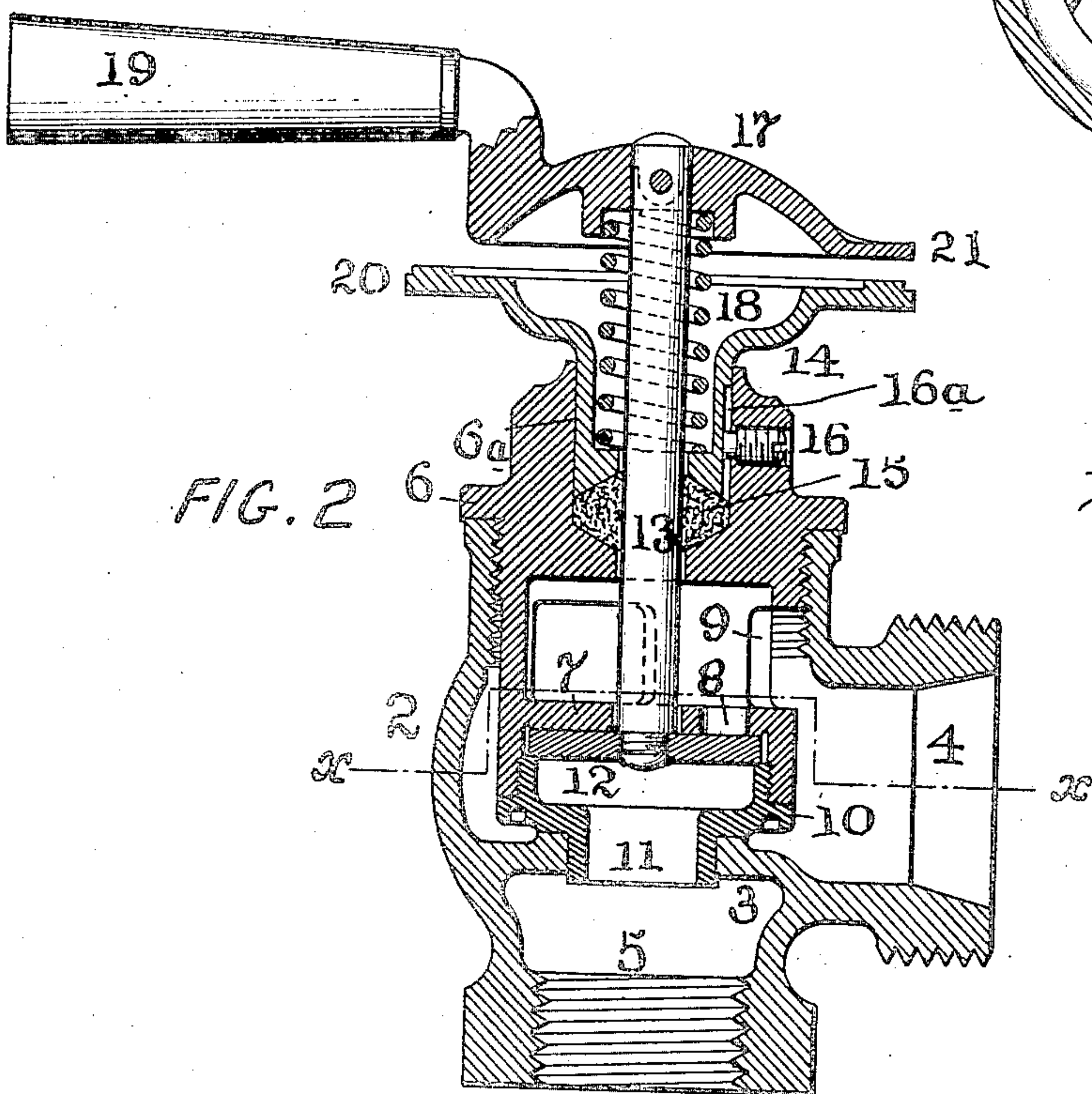


FIG. 2

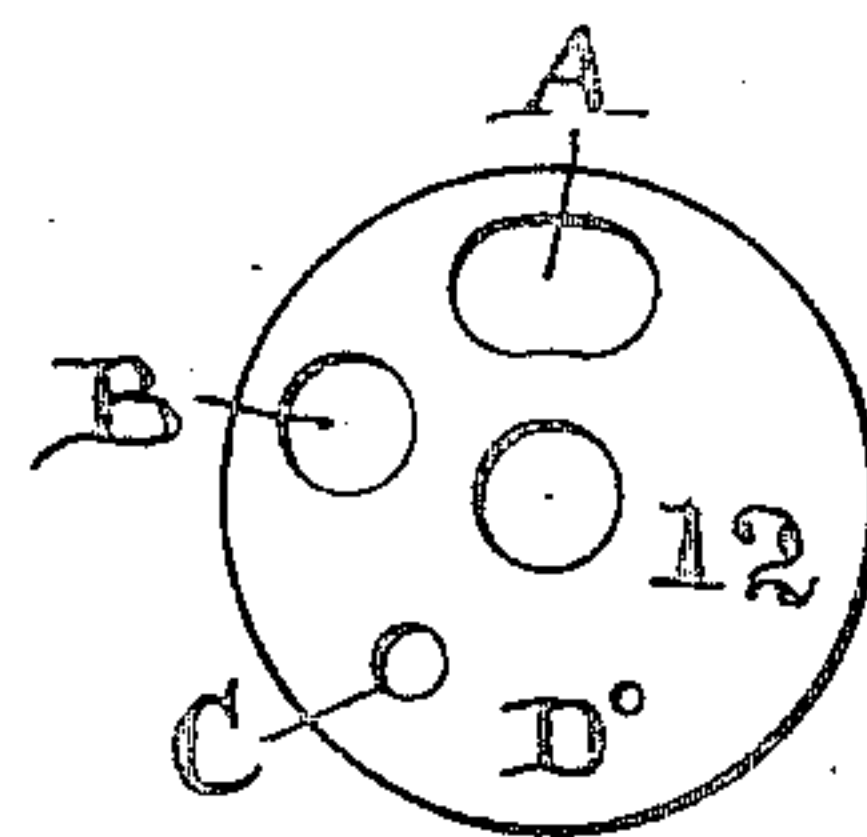


FIG. 4

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN A. SERRELL, OF NORTH PLAINFIELD, AND MILLARD P. OSBOURN, OF MERCHANTVILLE, NEW JERSEY, ASSIGNORS TO WARREN WEBSTER & COMPANY, A CORPORATION OF NEW JERSEY.

VALVE.

935,329.

Specification of Letters Patent. Patented Sept. 28, 1909.

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To all whom it may concern:

Be it known that we, JOHN A. SERRELL and MILLARD P. OSBOURN, both citizens of the United States, and residents of North Plainfield, Somerset county, State of New Jersey, and Merchantville, Camden county, State of New Jersey, respectively, have invented an Improvement in Valves, of which the following is a specification.

Our invention has reference to valves and consists of certain improvements which are set out in the following specification and shown in the accompanying drawings which form a part thereof.

The object of our invention is to provide a simple and inexpensive form of valve especially adapted for regulating the supply of steam to a steam radiator of a heating apparatus, whereby the temperature of the radiator may be modulated to suit the requirements of the room.

Our invention consists in a valve having a body provided with a valve seat having a port of maximum area located to one side of the center of the seat, combined with a valve piece adapted to the seat and having a series of ports of different areas adapted to be successively brought into alinement with the port in the seat, a valve stem extending from the valve piece through the top of the valve body and provided with a handle to rotate it, a spring outside of the steam space of the valve body pressing outward upon the valve stem to hold the valve piece to its seat, and a dial plate surrounding the spring to indicate the positions of the valve piece which brings each of the several ports thereof into alinement with the port in the valve seat; further in providing the above valve with a removable bonnet for the valve body in which the valve seat is formed and to which the dial plate is adjustably secured, and a packing carried in the bonnet and compressed by the spring aforesaid for making a steam tight joint about the valve stem.

Our invention also comprehends details of construction which, together with the features above specified, will be better understood by reference to the drawings, in which;

Figure 1 is a plan view of our improved valve; Fig. 2 is a sectional elevation of the same; Fig. 3 is a cross section of the same on

line $x-x$ of Fig. 2; and Fig. 4 is a plan view of the valve piece.

2 is the valve body and may be made of any shape desired, but in the particular illustration it is of the angle type, having the inlet 3 and outlet 4, the former being adapted for connection with the steam main and the latter, with the radiator. This body part 2 is also provided with a diaphragm 3 having a turned seat to receive the tubular part 11 of a bushing 10 connected to the bonnet 6.

6 is the bonnet and is screwed down into the body 2 and has its lower part extended to form a cage 9 having a valve seat 7 provided with a port 8 of maximum area located to one side of its center. Screwed to the bottom of the bonnet below the seat is a tubular bushing 10 having a downwardly extending neck 11, which snugly fits the aperture in the diaphragm 3 of the body. The under part of the bushing 10 may seat tightly upon the diaphragm 3 so as to be steam tight and require all circulation of steam to be upward through the bushing and port 8, thence by cage 9 to the outlet 4.

12 is a valve piece in the form of a flat disk working against the under face of the valve seat 7 and having a series of ports A, B, C, and D, more or less, of different areas which may be brought successively into alinement with the port 8 in the valve seat. The areas of the ports B, C and D are each smaller than the port A and port 8 of the valve seat. By rotating the valve piece 12 either port may be made to control the steam passing through the valve, or by another adjustment of the valve piece the port 8 may be sealed and the passage of steam shut off.

The upper edge of the bushing 10 terminates at a short distance below the valve seat 7 so as to form an annular channel in which the perimeter of the valve piece 12 travels, whereby, at all times, the valve piece is held up into approximate adjustment with the seat and thereby sustains the valve stem in position in assembling the valve or when dismantling it during repacking of the stuffing box.

13 is the valve stem and is rigidly secured to the valve piece 12, so that they move as a unit. The stem passes upward through an aperture in the valve seat 7 which it very

loosely fits, thence upward through the stuffing box of the bonnet and is connected at the top to a disk shaped hub 17 having a handle 19 projecting to one side. The handle may be formed in any other suitable manner, and the hub 17 is made detachable by a pin 24 which also insures the hub always maintaining the same relative position to the valve piece and its ports. The hub 17 is provided with a pointer or index 21 which coöperates with a dial 20 of a cup shaped gland 14. The gland 14 is made cylindrical at its lower end and fits a stuffing box 6^a of the bonnet 6. A packing 15 is arranged within the stuffing box and compressed by the gland 14. A spring 18 surrounds the valve stem 13 and is arranged between the gland and hub 17 so that it forces the stem upward to bring the valve piece 12 against its seat 7 and the gland downward so as to compress the packing. The gland has a vertical groove 16^a into which the end of a guide screw 16 extends to prevent the gland rotating on the bonnet and thereby insure the dial always maintaining the proper relative position with respect to the port 8 of the valve seat. By making the slot 16^a long, the gland 14 may move longitudinally of the valve stem to compress the packing 15 automatically under the action of the spring 18.

The dial 20 has upon its face the numerals "1", "2", "3" and words "open" and "shut" and is further provided with stops 22 and 23 against which the pointer or index 21 respectively rests when the valve is "open" and "shut". When the pointer 21 is over the mark "1" of the dial, the small port D is in alinement with the port 8 of the valve seat and the smallest quantity of steam is thus permitted to flow; when the pointer is over the mark "2" of the dial, then the port C of larger area is in alinement with the port 8 to increase the flow of steam; when the pointer is over the mark "3", the port B will be in alinement with port 8 to increase the flow of steam still further and finally, when the pointer is brought to the stop 22 and over the word "open" on the dial, the port A is in alinement with the port 8 and the greatest flow of steam is permitted. By these various adjustments, the supply of steam may be quickly varied and accurately regulated to suit the requirements.

The spring 18 is placed outside of the case and hence out of influence of the heat of the steam; and moreover it performs the dual function of holding the valve piece to its seat and the gland to the packing. The spring is shielded from view by the gland 14 and hub 17. The valve stem is made to fit the bonnet and gland loosely so as to be free, under the pressure of the spring 18, to draw the valve piece 12 flat against the valve seat 7 even though the valve piece's face was

not, mathematically, in a plane at right angles to the axial line of the stem.

The construction as a whole is simple and inexpensive; and is automatic in adjusting itself to compensate for wear or slight defects in structure, should the latter occur.

We have shown our invention in the form which is adapted for commercial use and while we prefer the construction shown, we do not limit ourselves to the details, as these may be modified without departing from the spirit of the invention.

Having now described our invention what we claim as new and desire to secure by Letters Patent, is:

1. In a valve, the combination of a body, a removable bonnet having a cage provided with a seat having an eccentrically located port, a rotary valve piece having a series of ports of different areas located on the pressure side of said seat, a longitudinally adjustable gland in said bonnet, a stem carrying said valve-piece and extending through said gland, a packing between said gland and bonnet, and a spring between said gland and stem acting to hold the valve-piece in contact with the seat of the body.

2. In a valve, the combination of a valve body, a removable bonnet therefor having a valve seat provided with a port to one side of its center, a valve stem carried by the bonnet and provided with a valve piece having a series of ports of different areas and seating on the pressure side of the valve seat, a handle secured to the top of the valve stem and having a pointer, a gland surrounding the valve stem and adjustable relatively to the bonnet and provided with a dial, means for preventing rotary adjustment of the gland and dial while permitting longitudinal adjustment, a packing between the gland and bonnet, and a spring simultaneously acting to press the valve stem outward and the gland inward.

3. In a valve, the combination of a valve body, a removable bonnet therefor having a valve seat provided with a port to one side of its center, a bushing secured to the bottom of the bonnet and forming an annular channel below the valve seat and a steam tight passageway to the inlet of the valve body, a valve stem carried by the bonnet and provided with a valve piece having a series of ports of different areas and seating on the pressure side of the valve seat and having its perimeter engaging the annular channel, a handle secured to the top of the valve stem, a gland surrounding the valve stem and adjustable relatively to the bonnet, a packing between the gland and bonnet, and a spring simultaneously acting to press the valve stem outward and the gland inward.

4. In a valve, the combination of a body, a removable bonnet, a cage carried by said bonnet and having a diaphragm-seat portion

provided with an eccentrically located port, a perforated bushing carried by the cage below said seat portion and fitting the opening in the aperture of the diaphragm of the body, a valve-piece consisting of a rotary plate arranged in contact with the seat portion of the cage on the pressure side and provided with a series of ports of different areas, a stem carrying said rotary valve-piece and extending through the bonnet, and a spring between the bonnet and stem acting to maintain the valve-piece in contact with the seat portion of the cage.

5. In a valve, the combination of the body, a bonnet fitting the body and providing a valve seat therefor, a valve piece arranged to rotate against the valve seat and vary the area of the steam ports formed through them available for the steam, a valve stem extending from the valve piece outward through the bonnet, a bushing secured to the bottom of the bonnet below the valve seat to form an annular channel for holding the valve piece normally adjacent to its seat, and a spring arranged above the bonnet for forcing the valve stem outward and the valve piece upon its seat.

6. In a valve, the combination of the body, a bonnet fitting the body and providing a valve seat therefor, a valve piece arranged to rotate against the valve seat and vary the area of the steam ports formed through them available for the steam, a valve stem extending from the valve piece outward through the bonnet, a bushing secured to the bottom of the bonnet below the valve seat to form an annular channel for holding the valve piece normally adjacent to its seat, and also having a lower tubular extension forming a steam tight joint with the supply side of the valve body, and a spring arranged above the bonnet for forcing the valve stem outward and the valve piece upon its seat.

In testimony of which invention, we have hereunto set our hands.

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