May 24, 1927.

1,629,545

J. A. SHERMAN ET AL

BALL COCK

Filed Nov. 3, 1925

3 Sheets-Sheet 1

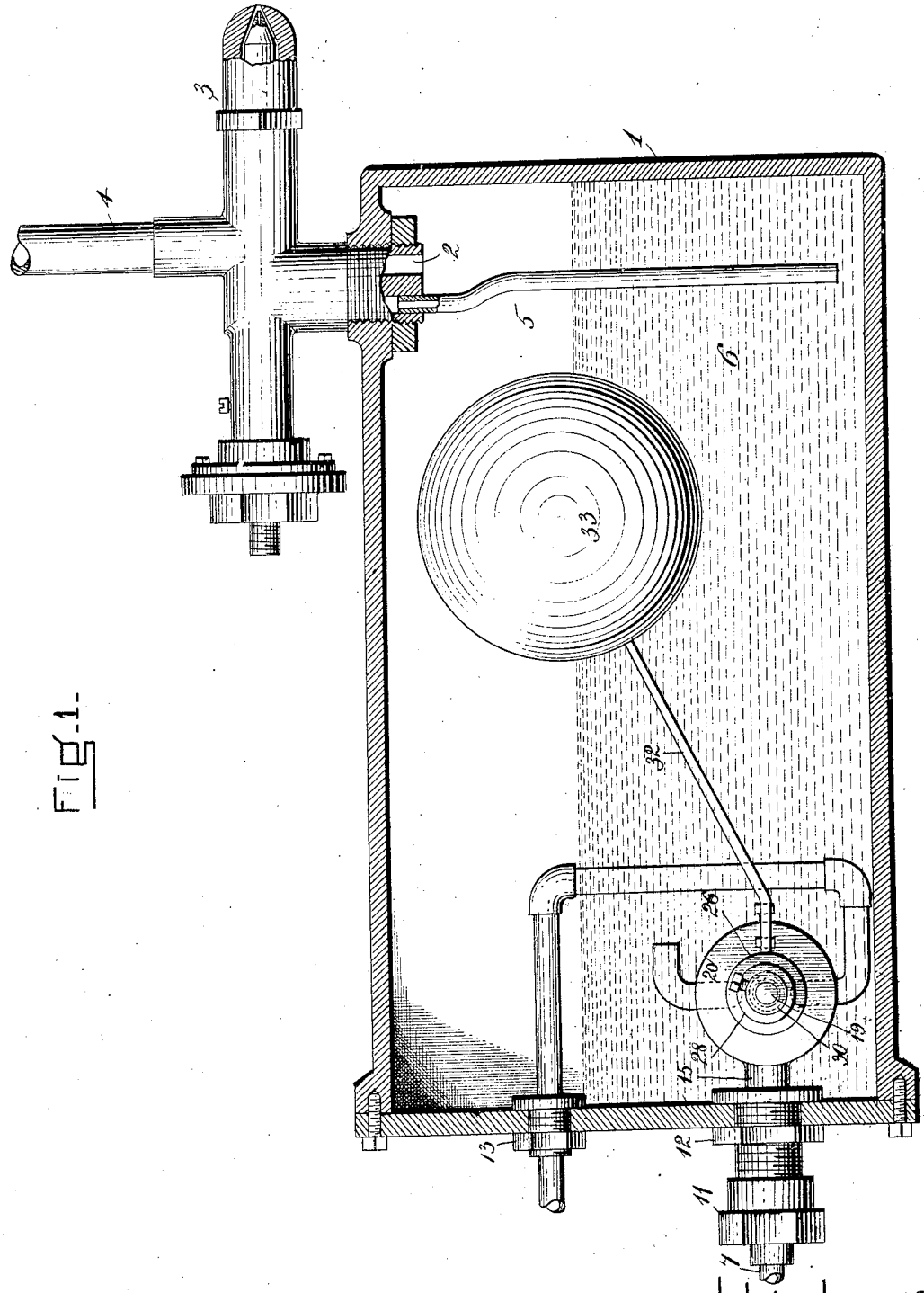


Fig. 1.

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Fig. 2.

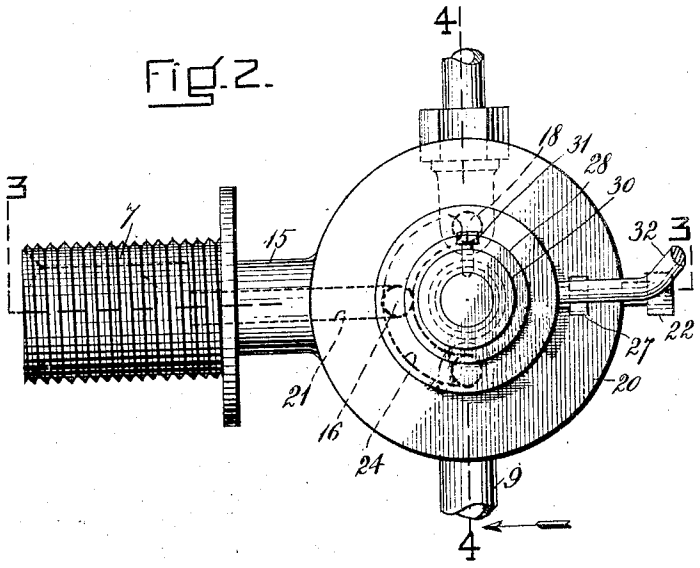


Fig. 5.

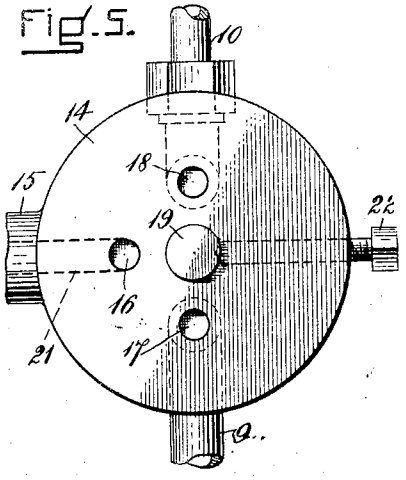


Fig. 3.

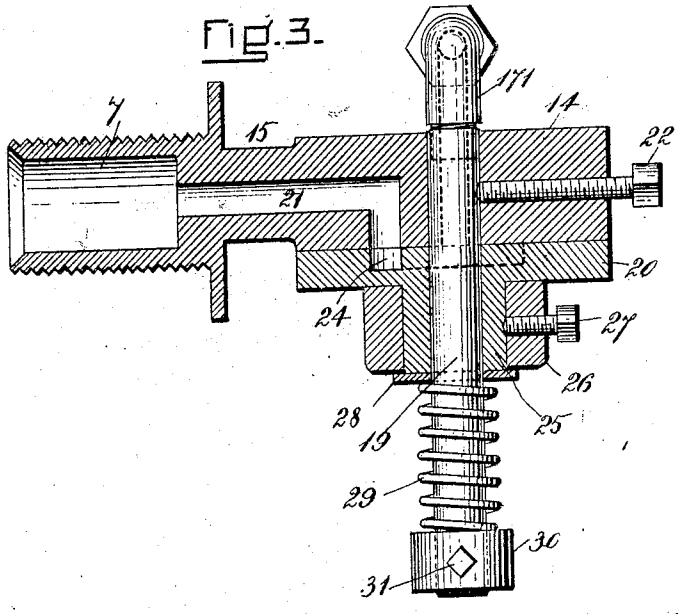


Fig. 6.

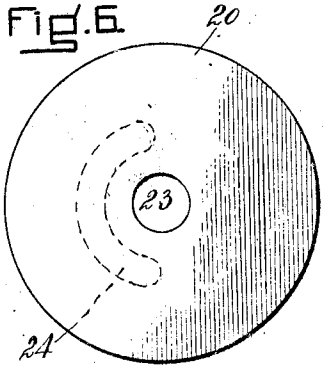
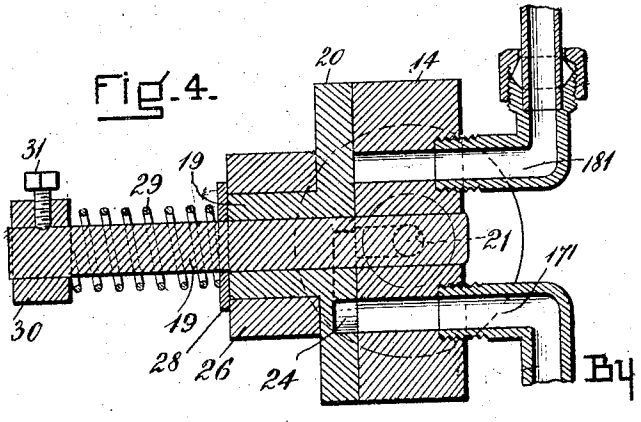


Fig. 4.



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Fig-7-

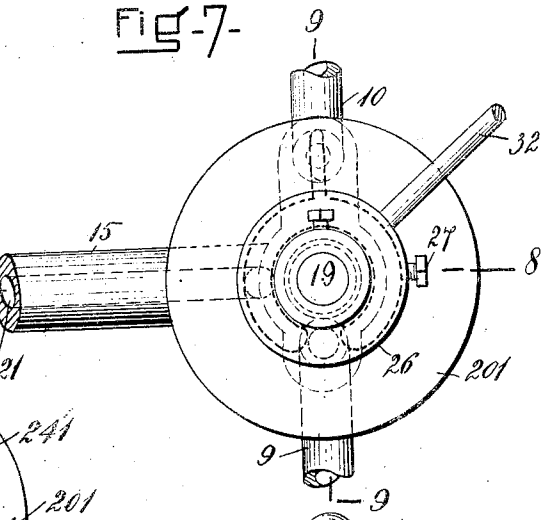
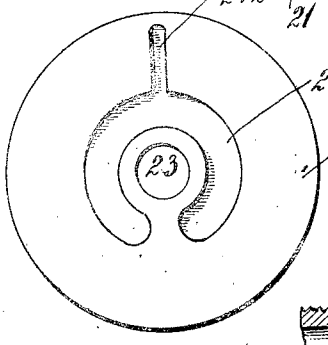


Fig-11-



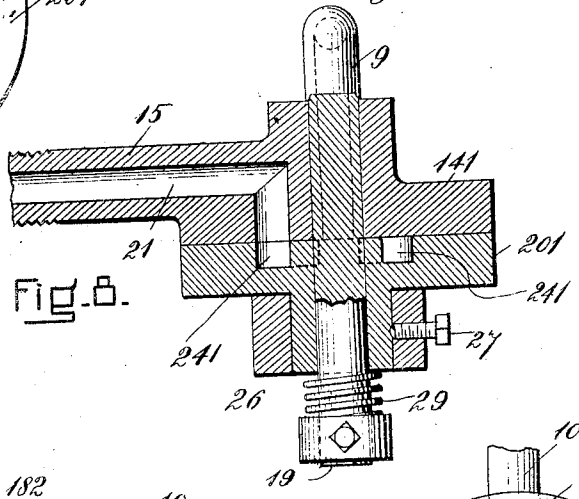


Fig-8-

Fig-9-

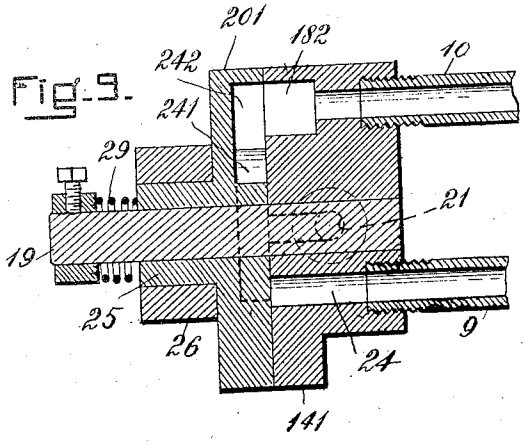
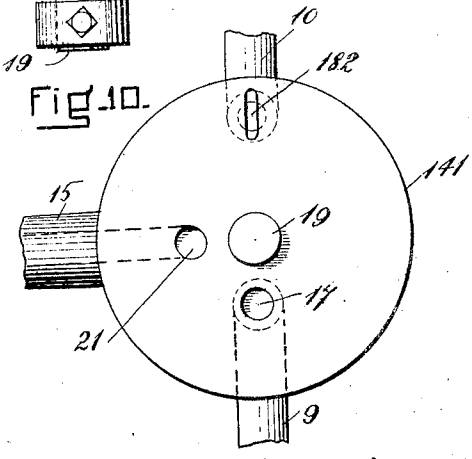


Fig-10-



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Patented May 24, 1927. 1,629,545

UNITED STATES PATENT OFFICE.

JOHN A. SHERMAN AND WILLIAM H. SHEPPARD, OF WORCESTER, MASSACHUSETTS.

BALL COCK.

Application filed November 3, 1925. Serial No. 66,549.

In U. S. Patent No. 1,382,391 there is shown a heating system including a tank from which fluid oil is drawn up into the burner to be ignited in the firebox. These burners sometimes do not shut off the oil entirely so that the tank is flooded and the oil overflows into the burner choking the flame and flooding the firebox. When this occurs, it often results from the fact that for some reason or other the valve in the ball cock which controls the supply of fuel to the tank has not closed entirely owing perhaps to a collection of sediment in the valve itself so that the valve leaks.

Our present invention provides a new type of valve operable by a ball cock which may be mounted on an airtight or other tank of the same character as that shown in the said patent. It will be evident to anyone skilled in the art, however, that the type of valve may be equally well used with the ordinary plumber's tank.

Our invention will be understood by reference to the drawings, in which—

Figure 1 is a section through the oil tank of the character described in said patent.

Fig. 2 is an enlarged view of the valve shown in Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 2.

Fig. 4 is a section on line 4—4 of Fig. 2.

Fig. 5 is a plan of the face of one of the members of the valve.

Fig. 6 is a plan of the face of the other member of the valve.

Fig. 7 is an elevation showing a modification of the valve.

Fig. 8 is a section on line 8—8 of Fig. 7.

Fig. 9 is a section on line 9—9 of Fig. 7.

Figs. 10 and 11 are plans of the opposing faces of the members of the valve.

1 is the tank which preferably is airtight as shown and described in said patent, except for the air inlet 2 which connects with the air supply in the burner 3, the burner being fed by pipe 4 with a supply of compressed air which by suction in the burner and pressure through the inlet 2 delivers oil from the tank. 5 is the pipe extending down into the oil 6 in the tank 1 through which oil is drawn up into the burner. These parts and their operation are not further described as they are fully referred to in said patent. 7 is the oil inlet pipe connecting with the oil supply or reservoir and which is controlled by the valve 8, 10 being the feed pipe from the valve into the tank and 9 being an overflow pipe from the valve running preferably back to the reservoir. The pipe 7 is provided with the usual coupling 11 and also with means 12 to attach it firmly and non-leakably to the wall of the tank 1 through which it passes. The pipe 9 also is tightly attached by suitable means 13 to the wall of the tank 1 through which it passes to a suitable receiver.

The valve 8 is a rotary valve comprising two members shown in detail in Figs. 2 to 6, one member 14 (see Fig. 5) being a stationary member mounted on the inlet pipe 7 and into which the pipe 7 leads terminating in the port 16, the face of the other member 20 having a groove 24 which is located to register with the ports 16, 17 and 18 in the faces of the member 14. The member 14 is provided with a central stud 19 on which fits the wall of the opening 23 in the other member 20, thus serving as an axis on which the member 20 may turn. The opening 16 is connected with the inlet pipe 7 by means of the passage 21, and in like manner the openings 17 and 18 are connectible by similar passages 171 and 181 with the overflow pipe 9 and discharge outlet 10, respectively. The stud 19 and member 20 are preferably made of hard metal such as steel while the member 14 of the valve may be made of brass. The stud 19 is driven into the centre of the member 14 and is held in place therein by a set screw 22. The passage 24 is of proper shape to register with the ports 16, 17 and 18. It must be sufficiently long to connect the inlet port 16 with either the port 17 or the port 18. Preferably and as shown in Figs. 2 and 6, it is somewhat longer so that as in Fig. 2 the port 16 will always supply oil when in an automatic system as shown in said patent and the pump is working or oil is otherwise being supplied to the port 16, and the oil will pass through the passage 24 either in full stream to the port 18 and thence to the tank or to the port 17 and back to the reservoir. In the latter case it is desirable that there shall be a slight leakage into the tank to compensate for the slight draft of oil therefrom by the burner, and for this purpose the passage 24 is long enough to slightly overlap the port 18 as shown in Fig. 2. Thus when the oil is substantially shut off from the tank there will be a slight leakage into the tank for this purpose through the port 18. This member 20 has a hub 25 and about it a collar 26

through which passes a set screw 27 by which the collar and hub are fastened together. On the stud 19 is a washer 28 against which rests a spring 29 which is more or less compressed by a collar 30 held in position on the stud by a screw 31. By this means the member 20 is held in close and liquidtight but sliding engagement with the member 14. Into the collar 26 is screwed the arm 32 which at its outer end carries the ball float 33. It will be seen that the rising and falling of the ball 33 will turn the member 20 according to the depth of the fuel or liquid in the tank 1. As the level of the fuel 6 drops in the tank, the ball drops accordingly and turns the valve member 20 on its axis until the groove 24 in 20 registers with the port 18 so as to allow a free passage of fuel from the pipe 7 through the passage 21, port 16, passage 24, opening 18, passage 181 and pipe 10 into the tank. As the tank fills the ball rises turning the member 20 on its axis and gradually closing the connection between pipe 7 and pipe 10. If for any reason there is any leakage so that the ball still rises the oil is delivered from pipe 7 through the port 16, passage 24 and port 17 to the pipe 9 which leads it off back into the original reservoir from which it came or to any other waste collector.

We have shown in Figs. 7 to 11 a modification of this valve constructed to cut off the oil stream to the tank more suddenly. In this case the groove 241 in the rotary valve member 201, which corresponds to the groove 24 in the rotary member 20, has a narrow slot-shaped groove 242 projecting therefrom into the arc of the outlet to the tank and in like manner the port 182, which connects with the pipe 10 leading into the tank, is narrow so that a very slight turn of the valve will close this opening. In order to secure the proper co-operation of the parts the port 182 is nearer the periphery of the stationary member 141 than the corresponding port 18 in the member 14 in Figs. 2 to 6. The ball float is set and the groove 242 is of small area so that under normal conditions,—when the oil in the tank is at its normal height and the ball is at its proper level, the groove 242 and the port 182 will be in substantial register and will feed oil to the tank fast enough only to compensate for the draft upon it of the burner. As will be apparent, a very slight movement of the ball float will change the registration of the groove 242 and the port 182 and hence the control of the flow of oil is very delicate. By these means the level of the oil in the tank will at all times, after the tank has been properly filled, be maintained at a constant level and the surplus of oil in the valve will be driven through pipe 9 back into the reservoir.

It will be seen that this application of a rotary valve to a float control is of importance because the valve is always in contact with its seat and if the oil contains any sediment it is carried through into the tank instead of lodging in the valve seat where it is liable to prevent the valve from closing, thus allowing considerable leakage and moreover requiring the expenditure of considerable time and labor to clear the seat.

We do not mean to limit our invention to the precise forms above described as it may be otherwise embodied.

What we claim as our invention is:—

1. The float valve above described comprising a stationary member adapted to be mounted on a tank and a rotary member mounted to turn on said stationary member and means comprising a float for turning it, said stationary member having a fluid inlet port and outlet ports, said rotary member having a port in communication with said inlet port and connectible to either of said outlet ports, one of said outlet ports leading into said tank and the other to a point outside the tank.

2. A float valve comprising a stationary member and a rotary member mounted to turn thereon, said stationary member having a fluid inlet port and two fluid outlet ports, and said rotary member having a passage therein in communication with said inlet port and connectible with either of said outlet ports, and a float arm connected with said rotary member whereby it may be turned.

3. In combination with a tank, a valve of the kind described comprising a stationary member having an inlet port and two outlet ports, one leading to said tank and the other connected to a point outside the tank, and a rotary member mounted on said stationary member and having a curved passage in communication with said inlet port and connectible to the port leading outside the tank, the port in the stationary member leading into said tank being narrow and radial and said curved passage having a corresponding narrow radial passage adapted to register with said port in said stationary member whereby a slight movement of said rotary member in either direction will close the passage to the tank, and means whereby said rotary member may be rotated.

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