Oct. 24, 1939. N. MARCUS 2,177,354

VALVE

Filed Jan. 5, 1938

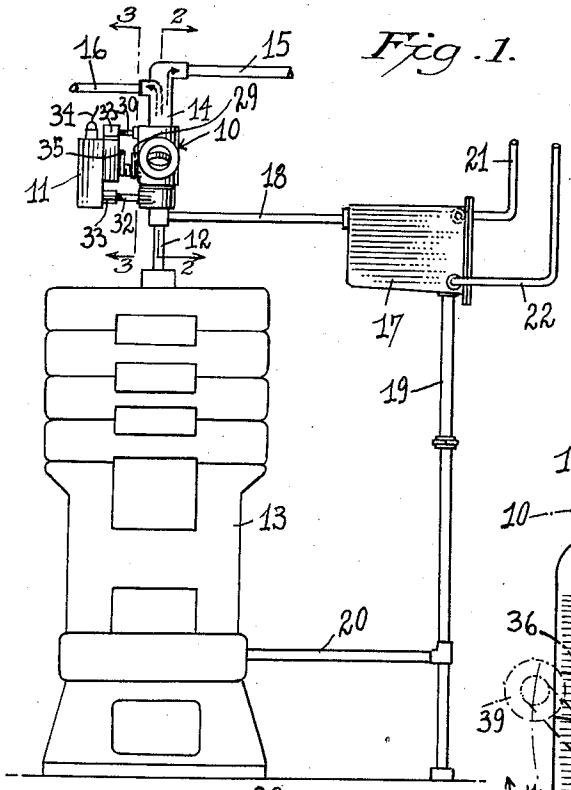


Fig. 1.

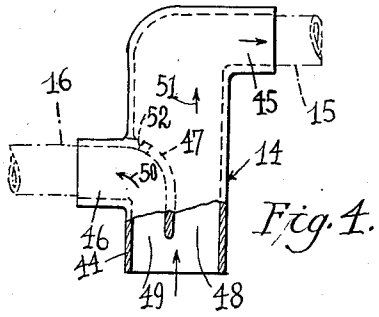


Fig. 4.

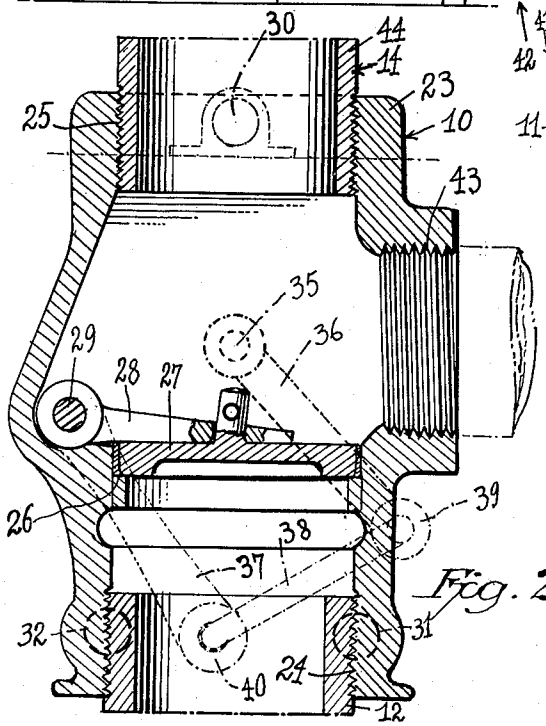


Fig. 2.

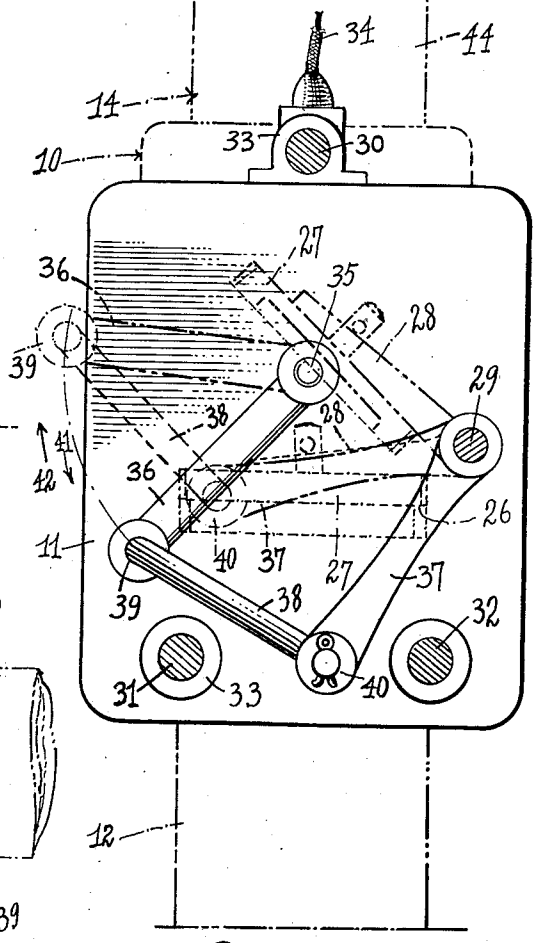


Fig. 3.

INVENTOR:
Nathan Marcus,
BY Julius J. Wittal,
His ATTORNEY.

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VALVE

Nathan Marcus, Union City, N. J.

Application January 5, 1938, Serial No. 183,412

1 Claim. (Cl. 137—139)

This invention relates to an automatic electrically controlled valve for hot water, steam, and other heating installations, and has for its main object to provide a valve of this character, which will have improved, simplified construction and operation, and in which the electric motor, operating the valve, will be directly built thereon, leading to a more efficient operation than is the case with such valves now in use.

Another object of this invention is to provide a valve as characterized hereinbefore which will occupy less room and will have less parts and will be cheaper to manufacture than the valves now used for such purposes.

Still another object of my invention is to provide a pipe fitting for a hot water heating system, in combination with my improved valve, which will insure that the hot water passing through the valve will be distributed evenly, or in a predetermined proportion, in the branches of the pipe lines going to various groups of radiators.

Still further objects of this invention will be apparent as the specification of the same proceeds.

In the drawing, forming a part of this specification, and accompanying the same:

Fig. 1 is a diagram showing the assembly of a boiler with my novel valve, and fitting thereon;

Fig. 2 is a sectional elevation of one embodiment of the valve, the section being taken on the line 2—2 of Fig. 1, and a link mechanism connecting the valve and the motor being shown by dot and dash lines in an imaginary manner;

Fig. 3 is a sectional elevation on line 3—3 of Fig. 1, showing the link mechanism connecting the motor to the valve, and showing by dot and dash lines, in an imaginary manner, the valve itself when closed, and its position, with the link mechanism, when the valve is open;

Fig. 4 is an elevation, partly in section, of the pipe fitting applied when my novel valve is used in a hot water heating system.

Referring now to the drawing more in detail, by characters of reference, the numeral 10 indicates my valve in general having an electric motor 11 directly secured thereon, as will be explained hereinafter.

The valve is secured into a hot water pipe line 12, originating from a boiler 13, and my novel fitting 14 is secured to the valve, distributing the hot water into the branch pipes 15 and 16, for two groups of radiators. A hot water heater 17 is also attached to the boiler 13, getting the heating water from the pipe line 12 below the valve 10, as at 18, the cool water leaving said hot water heater at 19 and returning to the boiler as at 20. The cold water to be heated by the heater 17 will enter through the pipe line 21, and will leave the heater 17, in a heated condition ready to be used, at 22.

My electrical motor controlled valve 10 mainly consists in a cast housing 23, into the lower opening 24 of which is secured the hot water intake pipe 12, while into the upper opening 25 thereof is secured an exit pipe, or, in the present case, the dividing fitting 14.

A valve seat 26 is provided in the casting 10, on which may rest the valve disk 27 secured in a loose manner with a moderate play on the arm 28, as shown, said arm being rotatable with the valve shaft or rocking pin 29.

Three poles or posts 30, 31 and 32 are secured in appropriate positions in the valve casting 10 and may have sockets 33 for them on the motor housing to secure the motor on the valve casting.

The motor 11 may be of any appropriate make or design adapted for the purpose in view, as will be described hereinafter. A great number of such motors are well known in this art. These motors are controlled by a thermostat, as it is well known, the controlling wire, coming from the thermostat and entering into the motor, being shown at 34.

The motor shaft is indicated at 35, and it carries an arm 36 rockable therewith, which is connected to an arm 37, fast on and rockable with the valve shaft or rocking pin 29. A link member 38 connects the outer ends of the arms 36 and 37 by the pivoted joints 39 and 40. As it is well known in this art, when the radiators joined on the pipe lines 15 and 16 provide too much heat for the rooms in which they are located, the thermostat in said rooms will send an appropriate impulse to the motor 11 so that the motor shaft 35 will execute a downward rocking motion, as indicated by the arrow 41, thereby closing the valve disk 27 on its seat 26, as shown by full lines in Figs. 2 and 3, and the hot water supply, to the fitting 14 and to the pipe lines 15 and 16, will be closed.

On the other hand, if the temperature in the room served by the said radiators will drop below a certain desired level, the thermostat will send, through the wire 34, a reverse impulse to the motor 11, causing the shaft 35 to rock in an opposite direction, that is in the direction of arrow 42, thereby setting the link mechanism 36, 37 and 38 into the position shown by dot and dash lines in Fig. 3, and opening the valve 10 by lifting the

valve disk 27 from its seat 26 into the position shown by the dot and dash lines in Fig. 3.

The hot water now is allowed to pass from the boiler 13 through the valve 10, into the pipe lines 15 and 16, and to the radiators, until the temperature of the rooms is raised to the level at which the thermostat will again act but in the reverse direction.

A further opening 43 may also be provided for the valve 10 to branch off the hot water, if needed.

As it is known in this art, when two different groups of radiators are to be served from the boiler 13, as it is usual, two hot water exits 12 and two valves 10 must be provided, one for each group of radiators, since it is a well known fact that if one hot water pipe line is provided with one valve and then the pipe line is branched off beyond the valve, the hot water will not be distributed between the two branches in an even manner, or in a predetermined proportion, as necessitated by the groups of radiators joined on the two branches of the hot water pipes, but it will flow to the branches in an undetermined, erratic manner.

I, therefore, developed a new fitting, as indicated at 14, which may be applied to a single valve 10, and whereby a single exit line 12 may be used for the hot water and still both branches 15 and 16 provided with hot water in a desired predetermined manner.

My novel fitting simply consists of a wider pipe 44 secured into the exit opening 25 of the valve 10, said pipe being turned in a desired direction, as at 45, for one branch pipe line, in this case for the branch line 15. Below the turn 45 another outlet branch 46 is provided in the fitting 10 for the other branch pipe line, in this case for the branch line 16. A curved wall or partition 47 is built above the lower outlet 46, within the pipe 44, entirely crossing the width of same, said partition wall 47 being bent downwardly and dividing the inner space in the pipe line 44 into two portions, 48 and 49, in a desired proportion. That part of the hot water entering into the portion 49 will continue to the outlet 46, as indicated by the arrow 50, while that part of the hot water entering the portion 48 will continue upwardly, as indicated by the arrow 51, and will exit through the outlet 45.

A communicating hole or opening 52 may be provided in the wall 47, as shown.

What I claim as new, is:

In an electrically controlled valve, having a valve housing, a seat in said housing, a valve shaft, an arm on said shaft in said housing, a valve disc secured on said arm, movement of said arm to one position being adapted to close the valve, while movement of said arm to another position is adapted to open the valve, and also having an electric motor adapted to rock said valve shaft in one or in the other direction for opening or closing the valve, in combination, a motor housing secured on said valve housing and spaced therefrom, a motor shaft and said valve shaft projecting into the space between said motor and said valve housings in opposite directions and spaced apart from one another, an arm on the motor shaft, an arm on the valve shaft, and a link member at substantially right angles to said shafts connecting the ends of said two arms in said space between the two housings.

NATHAN MARCUS.