Nov. 10, 1925. 1,560,771

J. FEICHTER

COMBINATION VALVE

Filed June 25, 1924

Fig. 1.

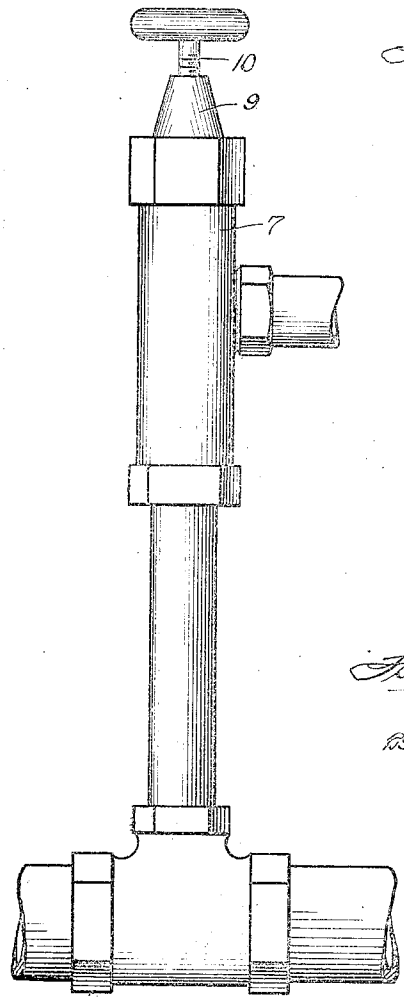


Fig. 3.

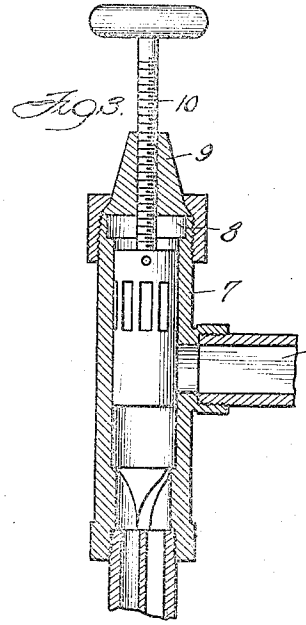


Fig. 4.

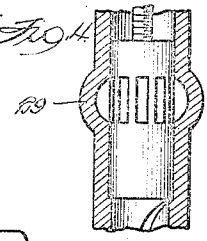


Fig. 2.

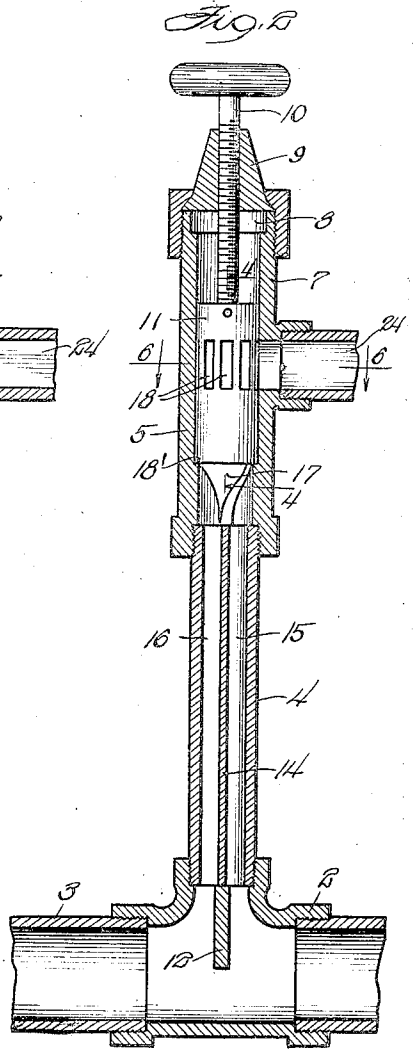


Fig. 5.

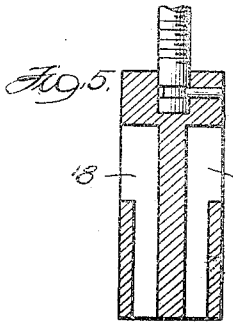
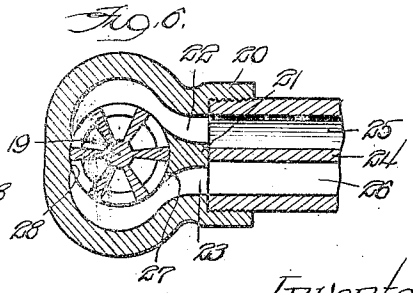


Fig. 6.



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Attys

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UNITED STATES PATENT OFFICE.

JOHN FEICHTER, OF CHICAGO, ILLINOIS.

COMBINATION VALVE.

Application filed June 25, 1924. Serial No. 722,233.

To all whom it may concern:

Be it known that I, JOHN FEICHTER, a citizen of Austria, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Combination Valves, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to combination valves and more particularly to a radiator valve adapted to be interposed in a pipe connection between a heat supply line and a radiator for controlling the supply and return flow through the radiator.

An object of my invention is to provide a valve of this type which is simple, inexpensive and efficient in operation.

Further objects will appear from the specification when taken in connection with the accompanying drawings which form a part hereof.

In the drawings:

Figure 1 is a side elevational view of a valve embodying my invention;

Fig. 2 is a vertical cross-sectional view of the same, illustrating the valve in operable position;

Fig. 3 is a detailed view illustrating the valve in operative or in closed position;

Fig. 4 is another detailed view taken on line 4—4 of Fig. 2;

Fig. 5 is a vertical sectional view of the valve gate; and

Fig. 6 is a cross-sectional view taken on line 6—6 of Fig. 2.

A valve embodying my invention may include a T 2 inserted in a heat supply line 3, a divided pipe connection 4, a valve 5, and a radiator connection 6.

Valve 5 comprises a casing 7 having its lower end open to receive one end of the pipe connection 4. The opposite end is provided with a packing gland 8, a cap 9, and a nut 10′ threading over the cap onto the upper end of casing 7. A valve stem 10 extends in threaded relation through the cap 9 and is adapted to have movement for operating valve gate 11 disposed within casing 7.

T 2 is provided with an integral baffle plate 12 extending downwardly into the path of the flow in the heat supply line 3 a distance sufficient to intercept the flow and divert a part thereof upwardly through the pipe section 4. The latter is provided with a partition wall 14, preferably in alignment with the baffle plate 12, and dividing the pipe section into two passages 15 and 16.

The lower end of the valve casing 7 is furnished with a spiral 17, which also divides this lower end of the casing into two parts, one for receiving the flow which is diverted upwardly by the baffle plate 12 through the passage 15, and the other for receiving the return flow after passing through a radiator.

A seat 18′ is provided in the casing 7, adjacent the point where the spiral 17 terminates. Valve gate 11 is adapted to be brought against this seat when moved in operable or on position. This permits the upper edge of spiral 17 to meet the bottom of the valve gate 11.

Valve gate 11 is preferably provided with a plurality of radial slots 18 which extend part way into the valve gate for communication with cooperating slots 19 extending axially toward the lower end of the valve gate.

As illustrated in Fig. 6, radiator connection 6 is adapted to thread into an opening provided in an enlarged portion 20 formed on the casing 7 at one side. Adjacent this opening, the casing 7 is provided with an integral wall 21 which divides this opening into two distinct passages 22 and 23. Radiator connection 6 is provided with a partition wall 24 in a manner to permit the resulting passages 25 and 26 to cooperate with the passages 22 and 23. The integral wall 21 is flared outwardly at each side, as indicated at 27, so as to increase its engaging surface with the valve gate 11. I prefer that the width of this surface be greater than the width of the radial slots 10, so that at no time will the passages 22 and 23 be in communication with each other as the result of the integral wall not being covered by the valve gate.

Diametrically opposite the integral wall 21 the casing 7 is likewise flared outwardly at 28 so that the valve gate 11 may close off the passages 22 and 23 from communication with each other. Passages 22 and 23 are formed in the casing 7 by bulging the latter slightly outwardly at its opposite sides, as indicated at 29, see Fig. 4.

The operation of the valve will now be described. If the heat is to be turned on in

the radiator (not shown) the gate valve is moved downwardly against the seat 18'. This puts passage 25 in the radiator connection 6 in communication with the passage 15 in the pipe connection 4. The flow ascending in the passage 15 by virtue of the extending baffle 12 in the T 2, passes through a certain number of the vertical openings 19 in the gate valve 18. From these openings 19 the flow passes radially outwardly into the passage 22 which is in communication with the passage 25. Upon returning from the radiator the flow enters the valve by way of the passages 26 and 23, passing through the remaining slots 18 and 19 and returning through the passage 16 to the heat supply line 3.

It will, therefore, be noted that the supply line and return pipe may be one and the same pipe, and that but one valve may be required to control the flow when entering and when leaving the radiator. To shut off the radiator, the gate valve is moved upwardly so as to bring the slots 18 out of registration with the passages 22 and 23. This allows the flow ascending in the passage 15 to enter the space below the valve gate in the casing 7 and return downwardly through the passage 16 into the heat supply line 3.

By this arrangement, steam, hot water, or whatever heat fluid that is employed, cannot enter the radiator but may continuously flow through the pipe connection, and will be returned immediately into the supply line by the passage 16.

It will be noted that the circulation through the valve will be assisted by a suction pressure forming directly behind the baffle plate 12 and tending to draw the fluid downwardly out of the passage 16.

I claim:

1. In a valve of the type described adapted to be interposed in a pipe connection between a heat supply line and a radiator comprising a casing, a valve gate movable in said casing and adapted to be in operable position when moved between the connecting points of said pipe connection, and means for establishing an independent two-way circulation of the heating fluid through said radiator and said valve gate.

2. In a valve of the type described adapted to be interposed in a pipe connection extending from a heat supply line for controlling the flow to and from a point of heat radiation comprising a casing and a valve gate movable axially in said casing and provided with a plurality of passages through which the flow moves in opposite directions.

3. In a valve of the type described adapted to be interposed in a pipe connection extending from a heat supply line for controlling the flow to and from a point of heat radiation comprising a casing, and a valve gate movable axially in said casing and provided with a plurality of radial and longitudinal passages through which the flow moves in opposite directions.

4. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat between said open end and said port, a valve adapted for movement axially against said seat to provide communication between said open end and said port, and means cooperating with said valve when seated to provide simultaneous flow in opposite directions through said valve.

5. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat therein below said port, a valve having passages therein adapted for axial movement against said valve seat to provide communication between said open end and said port, and a plurality of dividing walls cooperating with said passages when said valve is seated between said open end and said port whereby fluid may simultaneously flow in opposite directions through said valve.

6. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat therein, a valve having passages therein, means for moving said valve axially against said valve seat for establishing communication between said open end and said port, and means disposed in said open end and said port providing a return flow through said valve, said valve moving means adapted to withdraw axially said valve from said seat a distance sufficient to close off said port.

7. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat between said open end and said port, a valve adapted for axial movement against said seat and provided with a plurality of passages for affording communication between said open end and said port, and means provided within said open end and said port for permitting simultaneous flow in opposite directions.

8. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat between said open end and said port, a valve adapted for axial movement against said seat and providing communication between said open end and said port, and means cooperating with said valve for permitting simultaneous flow in opposite directions through said valve.

9. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat between said open end and said

port, and a valve adapted for axial movement against said seat to provide communication between said open end and said port.

10. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat therein, a valve adapted for axial movement against said seat for establishing communication between said open end and said port, said valve being provided with a plurality of axial passages terminating in radial passages at one end for communication with said port, and means for dividing said open end and said port into a plurality of separate passages having communication with each other through the passages in said valve whereby fluid may flow through said valve in opposite directions.

11. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat therein below said port, a valve adapted for axial movement against said seat for establishing communication between said open end and said port, pipe connections for said open end and said port and being divided interiorly to furnish a plurality of passages for cooperating with a plurality of passages in said open end and in said port, said valve having passages therein adapted to register with the last said passages whereby said valve may control the supply and return of fluid flowing therethrough.

12. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat therein below said port, a valve having passages therein adapted for axial movement against said valve seat to provide communication between said open end and said port, a plurality of dividing walls cooperating with said passages when said valve is seated between said open end and said port, a spiral on the lower end of the valve casing for directing the upward flow from the pipe into the correct passages in the valve and for directing the return flow from the valve into the cooperating passage in the pipe, substantially as described.

13. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat therein below said port, a valve adapted for axial movement against said seat for establishing communication between said open end and said port, said valve being provided with a plurality of axial passages terminating in radial passages at one end for communication with said ports, a spiral on the lower end of the valve casing for directing the upward flow from the pipe into the correct passages in the valve and for directing the return flow from the valve into the cooperating passage in the pipe, substantially as described.

14. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat therein below said port, a valve adapted for axial movement against said seat for establishing communication between said open end and said port, said valve being provided with a plurality of axial passages terminating in radial passages at one end for communication with said port, said axial passages in combination with a spiral on lower end of the valve casing, said spiral directing the upward flow from the pipe into correct aforementioned axial passages and directing the downward flow from said axial passages into the return passage in the pipe.

15. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat therein below said port, a valve adapted for axial movement against said seat for establishing communication between said open end and said port, said valve being provided with a plurality of axial passages terminating in radial passages at one end for communication with said port, a plurality of said axial passages terminating in radial passages being used to direct the upward flow from the inlet pipe, and a plurality of said axial passages terminating in radial passages being used to direct the downward flow from said passages into the return passage in the pipe.

16. In a valve of the type described, a casing providing a valve chamber open at one end with a port at one side, and having a valve seat therein below said port, a valve adapted for axial movement against said seat for establishing communication between said open end and said port, said valve being provided with a plurality of inlet passages and a plurality of outlet passages, a spirally formed partitional wall comprising the seat of said valve so positioned as to direct the upward flow from the inlet pipe into said inlet passages of valve and to direct the downward flow from the outlet passages of said valve into the outlet pipe.

In witness whereof, I have hereunto subscribed my name.

JOHN FEICHTER.