E. W. DISCHER.

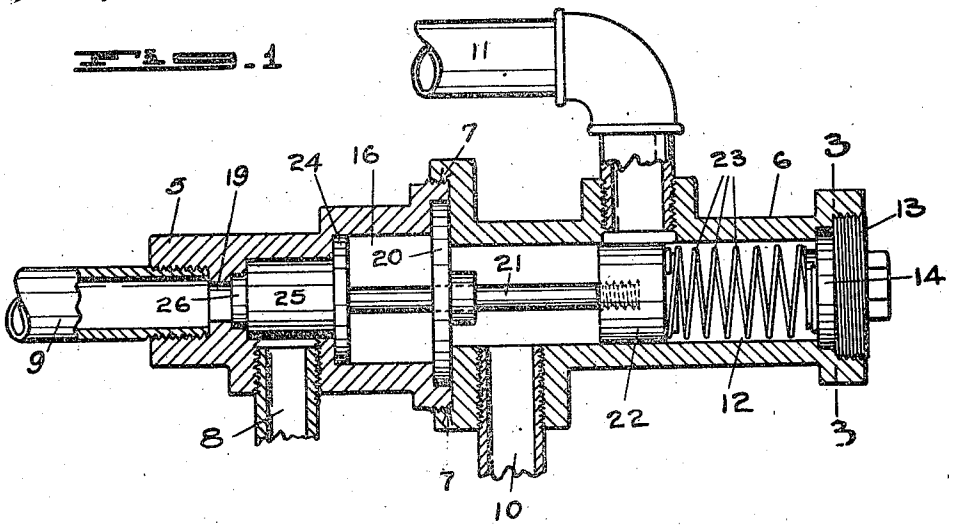
AUTOMATIC VALVE,

APPLICATION FILED APR. 7, 1917.

1,257,070.

Patented Feb. 19, 1918

Fig. 1.



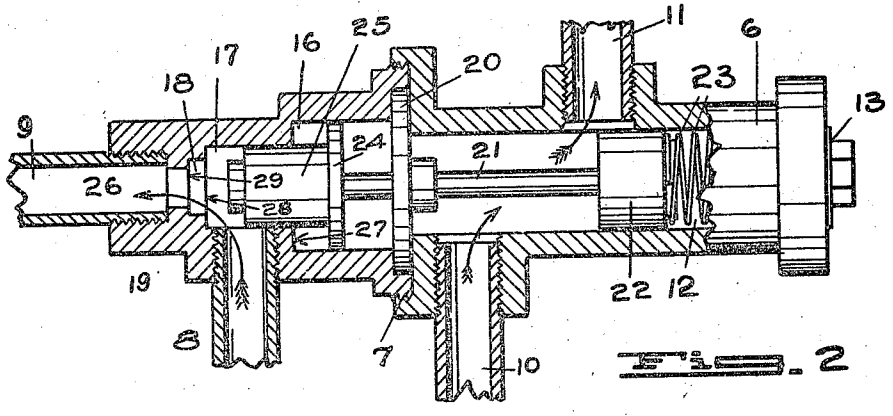
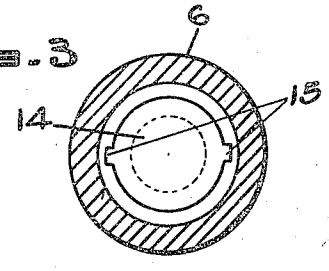


Fig. 2.

Fig. 3.



WITNESSES:

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AUTOMATIC VALVE.

1,257,070. Specification of Letters Patent. Patented Feb. 19, 1918.

Application filed April 7, 1917. Serial No. 160,874.

To all whom it may concern:

Be it known that I, EDWARD WILLIAM DISCHER, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented a new and useful Improvement in Automatic Valves, of which the following is a specification.

This invention relates to improvements in automatic valves and the object of this improvement is to provide a simple and efficient valve that may be placed in the fuel and air supply line of an oil burner and that is adapted to be opened by the pressure of the air and automatically closed by the pressure of a spring when the air pressure drops below a certain predetermined minimum.

In the type of oil burners commonly used in connection with furnaces the oil is sprayed into the combustion chamber of the furnace by means of air under pressure and the flame from the burner will go out or be extinguished if the pressure of the air drops below a certain minimum usually about three pounds. This air pressure is generally maintained by an air compressor which must run constantly in order to insure a steady flame.

If the air compressor should be stopped owing to an accident during the absence of an attendant and the air pressure drop below the minimum necessary to maintain the flame, such flame will be extinguished but the oil will continue to feed and will run out into the hot fire box, and there be gasified, and perhaps produce an explosion that will start a destructive fire, or wreck the furnace in the basement of a building.

This valve is so designed that when the air pressure falls below a certain predetermined minimum the oil or fuel feed will be automatically shut off.

The invention consists in the novel construction, adaptation and combination of parts of a valve by which the above objects are attained.

In the accompanying drawings, Figure 1 is a view in the longitudinal section of a valve constructed in accordance with this invention certain parts being shown in elevation and the valves being closed; Fig. 2 is a similar view showing the valves open, and Fig. 3 is a sectional view on broken line 3, 3 of Fig. 1.

Referring to the drawings throughout, in which like reference numerals indicate like parts, the numerals 5 and 6 indicate two valve casing members that are adapted to be screwed together as at 7 to form a valve casing.

The member 5 is provided with fuel or oil inlet and outlet pipes 8 and 9 respectively, and the member 6 is provided with air inlet and outlet pipes 10 and 11 respectively.

When the valve is in use, the pipe 8 is connected with a source of supply of fuel, the pipe 10 is connected with a source of supply of compressed air and the pipes 9 and 11 extend to and are connected with an oil burner that may be disposed within the combustion chamber of a furnace.

The valve member 6 is provided with an axial bore, 12, and is adapted to be closed at its outer end by a plug, 13, that screws tightly against a disk 14.

The disk 14 is provided with peripheral lugs, 15, that fit within suitable recesses, and prevent the disk from turning when the plug 13 is screwed against it.

The valve member 5 is provided near its inner end with a large axial bore 16, and toward its smaller end with successive smaller bores 17, 18 and 19 respectively.

20 is a disk that is inserted between the two ends of the members 5 and 6 where they are screwed together and serves as a partition wall between the air and oil compartments, and as a bearing for an axially disposed valve stem 21, the valve stem 21 being ground so that it will make an air tight fit in the bearing in the partition disk 20.

The valve stem 21 is provided on one end with a cylindrical valve piston 22, disposed within the bore 12, and adapted to be moved lengthwise, thereof to open and close the passageway to the air outlet pipe 11.

23 is a compression spring that is interposed between the disk 14 and the end of the valve piston 22 to normally urge the valve piston into a closed position.

The end of the valve stem 21, within the valve casing 5, is provided with a valve piston consisting of a cylindrical portion, 24, that fits within the bore 16, another smaller cylindrical portion 25 that fits within the bore 17, and another still smaller cylindrical portion 26 that fits within the bore 18.

The ends of the valve elements 24, 25 and 26 are adapted to engage with shoulders 27, 28 and 29 respectively at the ends of the

bores 16, 17 and 18 when the valve piston is closed thereby shutting off the oil completely and preventing any leakage thereof.

When the several parts are in the position shown in Fig. 1 the oil and air are both shut off, but if air under pressure is admitted through the pipe 10, it will force the valve piston 22 to the right into a position as shown in Fig. 2 against the pressure of the spring 23, and will open both the air passage formed by the pipes 10 and 11, and the oil passage formed by the pipes 8 and 9, thereby permitting oil to flow through the valve to the pipe 9, as indicated by arrows.

As soon as the pressure of the air drops so that it is less than the pressure of the spring 23, the spring will close the valve piston, thus shutting off the fuel supply when there is not enough air to maintain a flame.

The position of the pipe 10 is offset with respect to the position of the pipe 11, so that when the piston valve member 22 is in such a position as to close the air outlet to the pipe 11, the air inlet will be open to admit air in front of the piston valve 22.

The spring may be made relatively light so that it will be operated by a low pressure of air; for instance if the flame of the burner will go out when the air pressure falls below three pounds per square inch then the spring 23 may be made just strong enough to close the valves against a three pound air pressure.

It is obvious that changes in the precise form of construction of this device may be resorted to within the scope of the appended claims.

What I claim and desire to protect by Letters Patent is:

1. The combination with a conduit for liquid fuel and a conduit for air under pressure of a two part valve casing adapted to be connected with both of said conduits, valve pistons within said valve casing, and movable simultaneously, said valve pistons being adapted to be moved into an open position by the pressure of air from said air conduit to permit fuel and air to pass therethrough, and a spring to close said valve pistons when the pressure of said air drops below a predetermined minimum.

2. A valve of the class described comprising a casing having an internal recess divided into two cylindrical compartments by a partition wall, a valve stem slidable through said partition wall, a valve piston secured on each end of said valve stem, fuel inlet and outlet pipes connected with one of said compartments, air inlet and outlet pipes connected with the other of said compartments at points offset with respect to each other, and a spring to normally close said valve pistons and prevent the passage of fuel when the air pressure is low, said valve pistons being adapted to be moved into an open position by the pressure of said air when said pressure reaches a certain predetermined amount.

3. A valve of the class described comprising a valve casing having a partition wall that divides it into two compartments one of said compartments being of constant cylindrical diameter and the other of said compartments comprising a plurality of cylindrical bores of successively reduced diameters from inner to outer end thereof, a valve piston of constant diameter movable within said first named compartment, a valve piston of successively reduced diameters movable within said last named compartment, means connecting said two valve pistons, a spring to urge said valve pistons into a closed position, fuel inlet and outlet pipes connected with said last named compartment, and air inlet and outlet pipes connected at points offset with respect to each other with said first named compartment.

4. A valve of the class described comprising a two part valve casing one of said parts having a cylindrical bore of constant diameter and the other of said parts having a plurality of cylindrical bores of successively reduced diameters from inner to outer end thereof, a partition plate interposed between the two parts of said valve casing to divide said valve casing into two separate compartments, air inlet and outlet pipes connected with said bore of constant diameter at points offset with respect to each other, fuel inlet and outlet pipes connected with said bores of successively reduced diameters, an axially disposed valve stem slidable in a bearing in said partition plate, a cylindrical valve on one end of said valve stem and adapted to fit said cylindrical bore of constant diameter, a valve of successively different cylindrical diameters on the opposite end of said valve stem and adapted to fit within said cylindrical bores of successively reduced diameters and a spring for normally holding said valves in a closed position said valves being adapted to be opened by the pressure of air from said air conduit when said pressure reaches a predetermined minimum.

Signed by me at Seattle, Washington, this 31 day of March, 1917.

EDWARD WILLIAM DISCHER.

Witnesses:

E. B. HERALD,

F. C. MATHENY.