

June 1, 1926.

1,587,176

H. OLSEN

AUTOMATIC WATER CONTROL VALVE

Filed Sept. 20, 1924

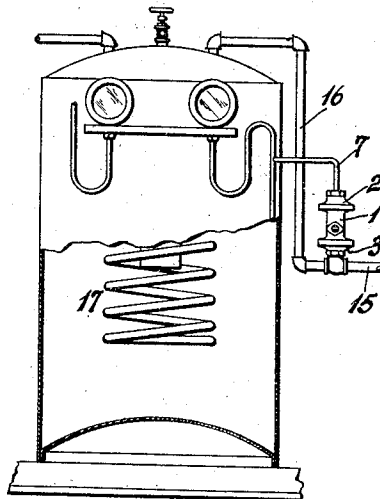


Fig. 1.

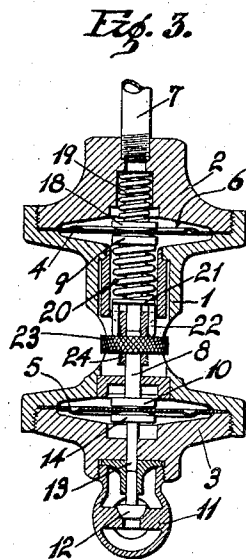


Fig. 3.

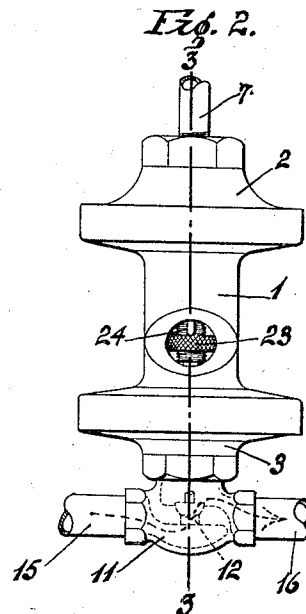


Fig. 2.

INVENTOR  
HENNING OLSEN.

BY  
*Hans Schneider*  
ATTORNEY

Patented June 1, 1926.

1,587,176

# UNITED STATES PATENT OFFICE.

HENNING OLSEN, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO CALIFORNIA REFRIGERATION MFG. CO., OF LOS ANGELES, CALIFORNIA, A CORPORATION.

## AUTOMATIC WATER-CONTROL VALVE.

Application filed September 20, 1924. Serial No. 738,957.

My invention is an improved automatic liquid control valve, particularly applicable to refrigeration systems.

The object of my invention is to provide a control valve, which will automatically stop the water flow to the condenser when the pump stops, and the refrigerator plant shuts down, thus relieving the operator of the necessity of shutting off the water supply, and resulting in a saving of water.

In my construction of valve I provide a main body structure of somewhat dumb-bell shape having upper and lower heads with diaphragms held between the ends of the body portion and the heads, a pipe extends into the upper head from the vacuum line of the condenser and the stem of the water control valve extends through the lower head and bears against the lower diaphragm. The upper and lower diaphragms are exposed to the air by passages through the central portion of the body so that they are subject to air pressure and a rod is positioned between the two diaphragms, springs are mounted on both sides of the upper diaphragm, one being in a vacuum chamber and the other in the central portion of the body, this latter spring is adjustable by means of a thumb adjusting nut to readily adjust the tension against which the upper diaphragm operates.

In the annexed drawing I have shown the preferred form of my invention, but it may also be embodied in other forms, and in this application I desire to cover my invention in whatever form it may be embodied.

Figure 1 is a side elevation of a condenser with my valve in position thereon.

Figure 2 is a side elevation of my valve.

Figure 3 is a sectional view taken on the line 3-3 of Figure 2.

Referring more particularly to the drawing, my valve consists of a main body 1, an upper head 2 threaded to one end of said body, and a lower head 3 threaded to the other end thereof.

A diaphragm 4 is positioned between the body 1 and head 2 and a second diaphragm 5 is positioned between the body 1 and head 3. A chamber 6 is formed in the head 2 above the diaphragm 4 and a pipe 7 extends into said chamber and to the vacuum line of the condenser. Thus, while the machine is running a vacuum is created in the chamber 6 tending to urge the diaphragm 4 upwardly.

A rod 8 extends through the body 1 and has a cap 9 formed on the end thereof, which bears against the diaphragm 4, and a cap 10 formed in the other end thereof which bears against the diaphragm 5.

A valve cage 11 is threaded into the head 3 and a valve 12 is seated therein. The valve 12 has a stem 13 formed with a cap 14 which bears against the diaphragm 5 and is juxtapositioned to the cap 10. The water intake 15 extends into the cage 11, and a line 16 extends out of it to the condenser coil 17.

A cap 18 is juxtapositioned to the cap 9 against the diaphragm 4, and a spring 19 bears against said cap. Thus, as the chamber 6 is evacuated from the pipe 7, the diaphragm 4 will raise against the tension of the spring 19. This permits the rod 8 to rise and relieves the diaphragm 5, and the water pressure back of the valve 12 raises said valve and the water flows into the condenser. When the vacuum ceases the spring 19 urges the rod 8 downwardly, which closes the valve 12 through the stem 13.

The tension of the spring 19 may be adjusted through a counter spring 20 which encircles the rod 8 between the cap 9 and a plate 21, which encircles said rod. Fingers 22 depend from the plate 21 and bear against an adjusting nut 23, which is threaded on a sleeve 24, through which the rod 8 extends, and which is secured to the body 1.

The body portion of my valve being somewhat of a dumb-bell shape has a reduced central portion through which the adjusting nut 23 may be readily grasped by the fingers. The rod 8 in passing through the portion of the body to the cap 10 would necessarily have a free movement thereby allowing sufficient passage around the rod to allow the air pressure on the upper side of the lower diaphragm to be the same as atmospheric pressure. Similarly on account of the passages of the spring 20, fingers 22, and the rod 8, through the upper portion of the body the lower face of the diaphragm 4 would be at atmospheric pressure.

Having described my invention, I claim:

1. An automatic control valve comprising in combination a body having upper and lower ends connected by a reduced central portion, upper and lower heads having a screw threaded connection with the respective ends of the body, diaphragms posi-

tioned between said heads and the body, a pipe connected to the upper head and leading into a chamber above the upper diaphragm, a valve cage having a valve connected to the lower head and having a stem extending through the lower head to the lower diaphragm, a rod slidably mounted in the central portion of the body and bearing against both diaphragms, a spring mounted in the upper head and bearing against the upper diaphragm, a lower spring mounted in the central body portion and bearing against the upper diaphragm, a sleeve in the central body portion, a thumb nut threaded thereon, a plate at the lower end of the lower spring, and fingers between the thumb nut and the said plate whereby the tension on the upper diaphragm may be adjusted, the lower surface of the upper diaphragm and the upper surface of the lower diaphragm being exposed to atmospheric air.

2. A control valve comprising a hollow cylindrical body, caps on each end of said body, forming therewith an upper and a lower chamber, a diaphragm positioned in each of said chambers, means connecting the upper face of the upper diaphragm to a vacuum line, a spring adapted to bear against said face, a rod extending through said body engaging both said diaphragms,

a valve positioned below the lower diaphragm, the stem of said valve bearing against the lower diaphragm, and an adjustable spring bearing against the lower face of the upper diaphragm.

3. A control valve comprising a body formed with enlarged ends and a restricted central portion, upper and lower heads secured to the body, diaphragms between each head and the body, the upper diaphragm and the upper head forming a gas chamber, a pipe leading thereto, a valve cage secured to the lower head having a valve therein, a valve stem extending through the lower head to the lower diaphragm, a rod connected between the two diaphragms through the central portion of the body, the lower surface of the upper diaphragm and the upper surface of the lower diaphragm being open to atmospheric air, a spring mounted in the upper head bearing on the upper surface of the upper diaphragm and a lower spring surrounding the rod bearing against the lower surface of the upper diaphragm, and a thumb nut mounted in the reduced central portion of the body and operatively connected to the lower spring to adjust the tension in the upper diaphragm.

In testimony whereof I affix my signature.  
HENNING OLSEN.