

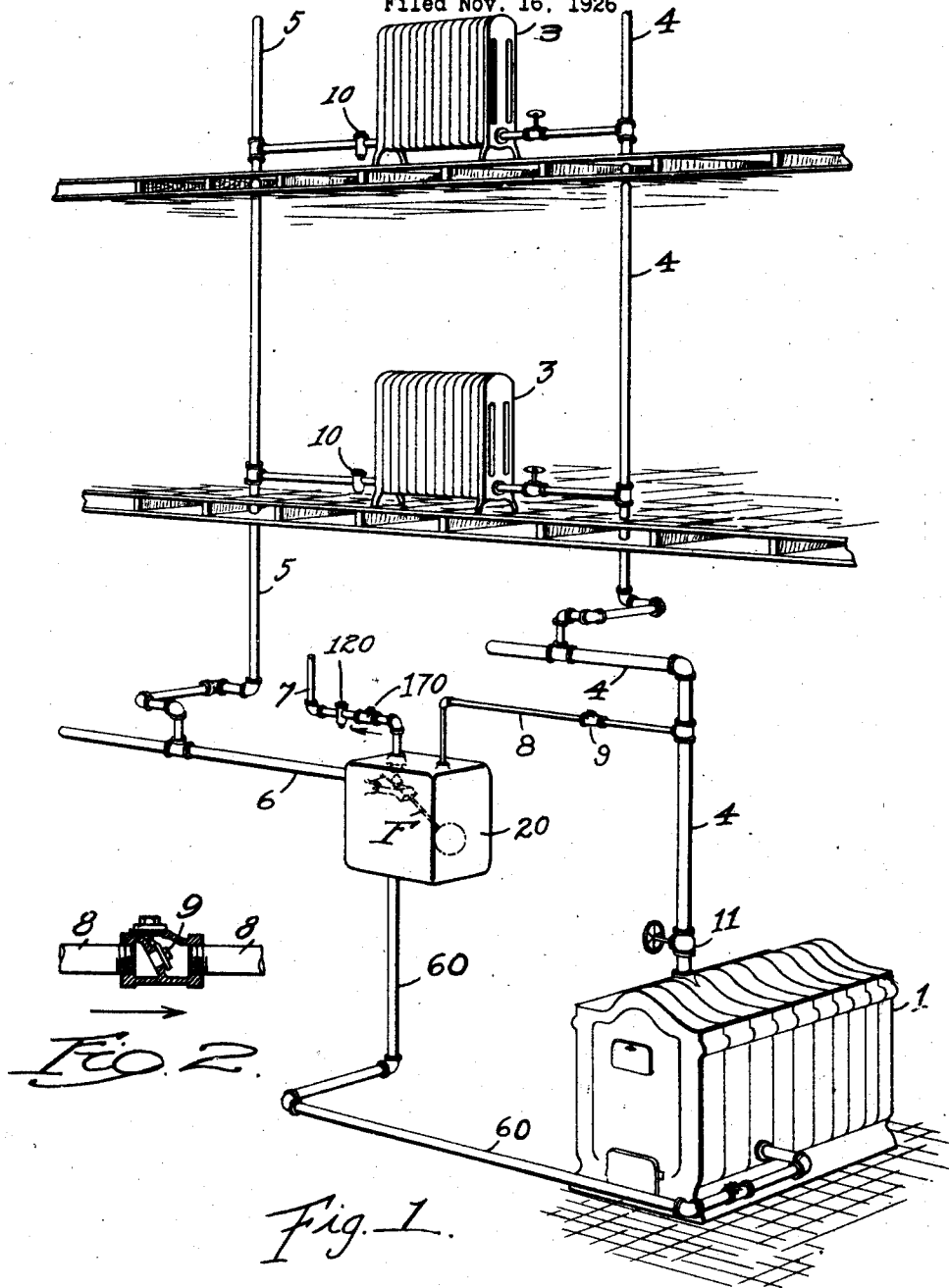
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I. C. JENNINGS

VAPOR HEATING DEVICE

Filed Nov. 16, 1926



INVENTOR
Irving C. Jennings.
BY *Southgate Farg & Hawley*
ATTORNEYS

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UNITED STATES PATENT OFFICE.

IRVING C. JENNINGS, OF SOUTH NORWALK, CONNECTICUT.

VAPOR HEATING DEVICE.

Application filed November 16, 1926. Serial No. 148,746.

The object of this invention is to improve the so-called "vapor" or low pressure steam heating system. The improvement is illustrated in the accompanying sheet of drawings, forming part of this application for patent, and in which

Fig. 1 is a diagram showing the application of my improvement; and

Fig. 2 is a detail hereinafter referred to.

Referring to the drawing in detail, 1 designates a steam boiler which supplies steam or vapor through supply pipes 4 to radiators 3 in the building or space to be heated. The main supply pipe 4 is usually provided with a shut-off valve 11. The radiators 3 are provided at their exhaust ends with steam traps 10 which connect to return pipes 5. The returns from the pipes 5 are received in a return pipe 6 which is connected to a receptacle or receiver 20. The receptacle or receiver 20 is connected by a pipe 60 to the bottom of the boiler 1. The receptacle 20 is provided with an air escape pipe 7 having a check valve 170 opening towards the atmosphere and a thermostatic valve 120. The receiver 20 is provided with a float control valve F which shuts off communication to the pipe 7 when the receptacle is filled with water. In operation, vapor or low pressure steam is generated in the boiler and passes through the radiators. When the radiators are filled with steam, the flow is cut off or controlled by the steam traps 10.

The condensate is collected and flows back through the pipe 6 into the receptacle 20 and from the receptacle 20 through the pipe 60 back to the boiler by gravity. Any air or gas in the system can flow out through the pipe 7, the check valve 170 preventing air from entering the system, and the thermostatic valve 120 preventing steam or hot vapor from flowing out through the escape pipe 7. If a large amount of water should come down to the receptacle 20 as by the opening of a cold radiator, the float F will momentarily shut the air escape pipe 7 until the water can work back to the boiler.

The advantages of this system are well understood and need not be described at length. I use the term "supply side of the system" to designate that part of the system extending from the boiler to and through the radiators, and I use the term "return side of the system" to designate that part thereof extending from the steam traps 10 back to the boiler.

In this system, considerable trouble has

been experienced in getting the condensate back to the boiler or hot-well when the steam pressure is allowed to drop due to banking of the fire, shutting down of an oil burner, or shutting off the main steam supply. Under these conditions a vacuum may be produced in the supply side of the system due to the condensation of the steam in the radiators and supply pipes and this vacuum may be high enough to hold a large amount of water in the system. Under these conditions so little water may be left in the boiler that the water line will be below a safe level and should the fire be again started quickly as when an automatic oil burner is turned on, damage may be caused to the boiler or even an explosion may be caused, when the boiler has built up a pressure sufficient to break the vacuum and allow all the water held in the system to be suddenly returned to the boiler.

To overcome this difficulty, I provide a shunt pipe line 8 between the return side of the system and the pressure side of the system and provide this return pipe with means for allowing flow from the return side of the system to the supply side of the system only. This means preferably is a check valve as 9 arranged as shown in Fig. 2 to open towards the boiler. This shunt pipe line is arranged between the receiving receptacle 20 and the main supply pipe 4. Under the conditions previously described, if a vacuum is created in the supply side of the system, the vacuum will be broken or balanced by a flow through the shunt pipe line 8, and the system will be balanced and any water trapped in the pipes or radiators can flow back through the return pipes and receptacle to the boiler. This provides an automatic means so that when the boiler is again started in operation there is enough water therein for proper operation and burning of the boiler and danger of explosion is eliminated.

The details and arrangements herein shown and described may be greatly varied by a skilled mechanic without departing from the scope of my invention as expressed in the claims.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. In a vapor or low pressure steam heating system, the combination of a boiler, radiators, supply pipes extending from the boiler to the radiators, return pipes extending from the radiators to the boiler so that the

water of condensation will circulate back to the boiler by gravity, an elevated receiver in the return side of the system, a shunt pipe line extending from the elevated receiver to the supply side of the system, and means
5 for allowing a flow through the shunt pipe line from the receiver to the supply side of the system only.

2. The combination expressed in claim 1 in which the specified means comprises a check valve opening towards the supply side of the system. 10

In testimony whereof I have hereunto affixed my signature.

IRVING C. JENNINGS.