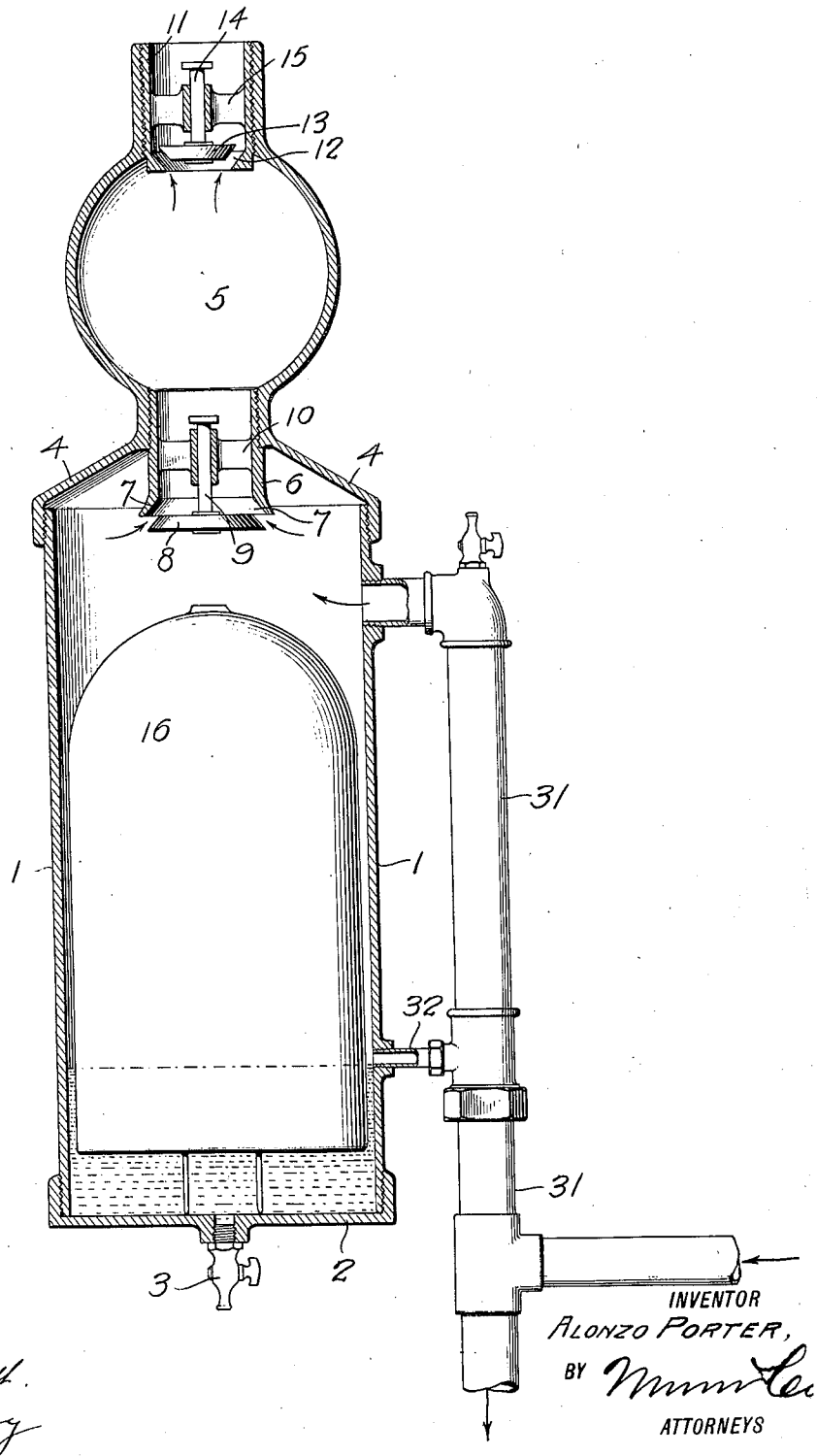
A. PORTER.

VALVE FOR VACUUM HEATING SYSTEMS.

APPLICATION FILED MAY 17, 1913.

1,086,215.

Patented Feb. 3, 1914.



WITNESSES

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ALONZO PORTER, OF MAQUOKETA, IOWA.

VALVE FOR VACUUM HEATING SYSTEMS.

1,086,215. Specification of Letters Patent. Patented Feb. 3, 1914.

Application filed May 17, 1913. Serial No. 768,257.

To all whom it may concern:

Be it known that I, ALONZO PORTER, a citizen of the United States, and a resident of Maquoketa, in the county of Jackson and State of Iowa, have made certain new and useful Improvements in Valves for Vacuum Heating Systems, of which the following is a specification.

My invention relates to improvements in valves for vacuum heating systems, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of my invention is to provide a steam heating system in which a vacuum is obtained by the condensation of steam, air being prevented from entering the pipes by an air valve of special construction.

A further object of my invention is to provide means for permitting the escape of air when the steam pressure rises above atmospheric pressure.

Other objects and advantages will appear in the following specification and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming part of this application in which a sectional view through the valve casing is shown.

Referring now particularly to the drawing I have shown therein a valve casing consisting of a cylindrical portion 1 having a bottom 2 which is screwed on the casing and which is provided with a drain cock 3. At the opposite end of the cylinder 1 is a top portion 4 which is screwed to the cylinder as shown in the drawing and which contains an air chamber 5. Screwed in the opening between the air chamber 5 and the interior of the cylinder 1 is a cylinder 6 having a valve seat 7 for a valve 8. The latter is provided with a stem 9 arranged to pass through the central portion of a spider 10. At the upper end of the chamber 5 is a similar cylinder 11 provided with a valve seat 12 for a valve 13, the latter having a stem 14 passing through a spider 15. Within the cylinder 1 is a float 16 preferably made of copper which is designed to operate the valve 8.

From the foregoing description of the device the operation thereof may be readily understood. When the boiler is started the steam drives the air through the pipe 31 which is connected with the boiler and past the valve 8 which is open, and the valve 13. As the steam condenses within the cylinder 1 the water of condensation will accumulate since it can only run out slowly through the comparatively small pipe 32, and will cause the float 16 to rise so that the top of the float will eventually come in contact with the valve 8 and cause the closing of the latter. When the valve 8 is closed water escapes from the cylinder 1 through the drain 32 which is of relatively small diameter. The float 16 then falls and permits the valve 8 to open. One vacuum valve such as that described is designed to be used on each heating system. It will be apparent from the statement of the action of the valve that a vacuum is created in the heating plant, since, as above stated, the air is driven out by the steam which then condenses, but when condensation takes place the valve 13 will close. The pressure on the interior of the pipes will therefore be less than the ordinary atmospheric pressure. In other words, there will be a partial vacuum in the pipes and radiators. The water in the boiler therefore being under less than atmospheric pressure vaporizes at a lower temperature than 212° and by reason of the vacuum in the pipes and radiators the heated vapor is drawn through the plant. When these appliances are used no other air or escape valves are necessary and all danger of escape of air, steam, or water throughout the building is eliminated.

I claim:

1. In a valve mechanism, a float chamber, a float therein, an inlet carried by said float chamber on one side thereof near the top, a drain in the side of the float chamber near the bottom, a pipe communicating with said inlet and with said drain, said drain being of smaller diameter than said inlet, a screw cap arranged to be screwed to the top of said float chamber, said screw cap being hollow to form an air chamber and having an interiorly threaded reduced portion between the float chamber and the air chamber, an interiorly threaded extension at one end of said air chamber, a cylinder threaded externally to engage the interiorly threaded reduced portion between the float chamber and the air chamber, said cylinder being provided with a spider and being flared at its lower end to provide a valve seat, a valve slidably carried by said spider and arranged to engage said valve seat, and a check valve

disposed in said extension and adapted to close under excess pressure of the outside atmosphere.

2. In a valve mechanism, a float chamber, a float therein, an inlet carried by said float chamber on one side thereof near the top, a drain in the side of the float chamber near the bottom, a pipe communicating with said inlet and with said drain, said drain being of smaller diameter than said inlet, a screw cap arranged to be screwed to the top of said float chamber, said screw cap being hollow to form an air chamber and having an interiorly threaded reduced portion between the float chamber and the air chamber, an interiorly threaded extension at one end of said air chamber, a cylinder threaded externally to engage the interiorly threaded reduced portion between the float chamber and the air chamber, said cylinder being provided with a spider and being flared at its lower end to provide a valve seat, a valve slidably carried by said spider arranged to engage said valve seat, and a second cylinder arranged to engage the interiorly threaded extension of the air chamber and having a valve seat on its interior, and a valve carried by said last named cylinder and arranged to engage said last named valve seat when the exterior atmosphere pressure is in excess of that in the air chamber.

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Witnesses:
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