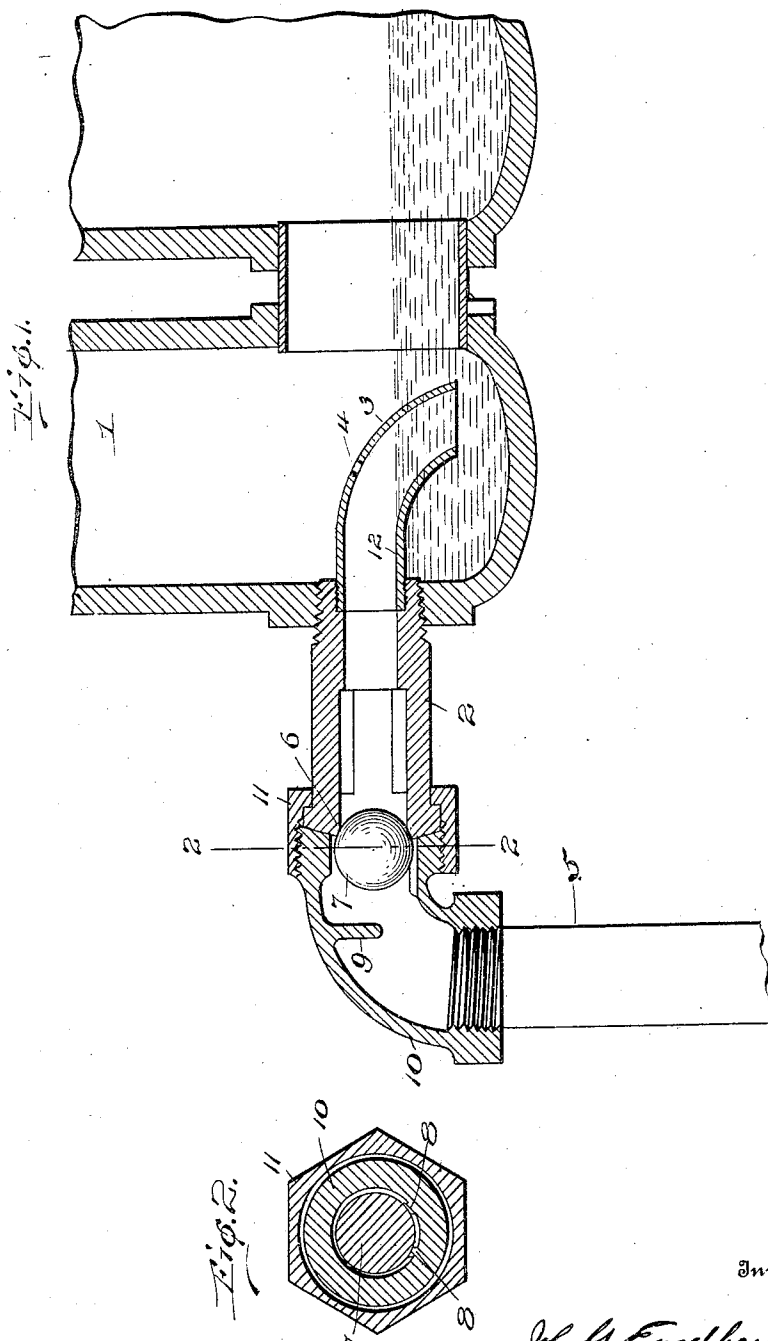


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J. G. ENGELHART.
COMBINATION CHECK VALVE AND WATER SEAL.
APPLICATION FILED OCT. 22, 1908.

934,297.

Patented Sept. 14, 1909



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN G. ENGELHART, OF ATLANTA, GEORGIA

COMBINATION CHECK-VALVE AND WATER SEAL.

934,297.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed October 22, 1908. Serial No. 459,021.

To all whom it may concern:

Be it known that I, JOHN G. ENGELHART, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Combination Check-Valves and Water Seals; of which the following is a specification.

This invention relates to improvements in combination water seals and check valves and has for an object the provision of improved means that will permit the escape of air and the condensed water, but not the escape of the heating steam or vapor.

Another object of the invention is the provision of an improved ball check valve used in connection with an elbow which forms a water seal when used in connection with a radiator so that a check valve and water seal is presented in a single device.

These and other objects in view, the invention comprises certain novel constructions, combinations and arrangement of parts that will be hereinafter more fully described and claimed.

In the accompanying drawing: Figure 1 is a vertical longitudinal section through part of the radiator and my improved device. Fig. 2 is a section through Fig. 1 on line 2, 2.

In steam heating the steam or vapor is forced into the radiator and after condensation, is removed. In forcing steam in the radiator, it is necessary at the same time to force out the air contained therein. Various means have been provided for assisting in removing the air contained in the radiator and also in removing the condensation of steam with varying success. It is to this class of devices that the present invention relates.

Referring more particularly to the drawing, 1 indicates a radiator of any desired construction into which is tapped a short length of pipe constituting a conduit. Secured to the conduit 2 is an elbow 3, which projects into radiator 1, as clearly seen in Fig. 1, and together with the radiator forms a trap or water seal. The elbow 3 is formed with an aperture 4 constituting a vent through which air and some of the steam and vapor in the radiator passes outward through conduit 2 to the return pipe 5. The conduit 2 is formed with a seat 6, into which is fitted a ball 7 that closes the passage way between the return pipe 5 and the radiator 1.

The ball 7 is mounted upon a pair of runways 8, which is adapted to keep the ball centered with its seat 6, and to also form a smooth path, so that the ball will move easily. A lug 9 is also provided in the elbow 10, for limiting the movement of ball 7 and for preventing it from passing into the return pipe 5. The elbow 10 is held in place by suitable union 11 to the main body portion of the conduit 2.

In operation when steam or vapor is turned on the radiator 1, it will gradually condense and form water in the lower part of the radiator and at the same time it will drive out the air through opening 4 and will force the ball 7 along its runways until it strikes the lug 9. The air, then will pass freely from the radiator into the return pipe 5. As the steam or vapor continues to condense and forms water in the bottom of the radiator, it will rise until the same is above the level of the straight portion 12 of the elbow 3. After the water has reached this height, that formed by condensation thereafter will run into the return pipe 5. The water remaining in the radiator will cover the lower end of elbow 3 and prevent the escape of steam and vapor through the return pipe. While the condensation is going on the air and some of the vapor and steam escapes through the hole or aperture 4, so as to cause substantially an even pressure on each side of the water seal and thus, prevent the water seal from being forced out into the return pipe. When the supply valve for admitting steam or vapor is shut off, the steam in the radiator condenses. This lowers the pressure in the radiator until it is lower than the pressure in the return pipe 5. This will cause the ball 7 to move over and seat itself and prevent any steam, vapor or water of condensation from backing into the radiator from the return pipe and incidentally, it will be observed, that no air will be permitted to back into the radiator, so that when the radiator finally cools off, the same will have formed therein a vacuum or partial vacuum, so that on the admission of steam into the radiator the same will not be compelled to drive out any air.

What I claim is:

The combination with a radiator having a chamber at its lower portion for trapping the water of condensation, of a conduit provided at one end with a valve seat, a curved elbow secured to said conduit and extending

down into the chamber and provided in its upper side with a vent, a second elbow secured to the conduit at the end opposite to said first mentioned elbow and communicating with the return pipe and provided with a lug, and a ball valve arranged within said second mentioned elbow and engaging the seat in said conduit, said ball valve being limited in its movement in one direction by

the lug and operating to prevent return of air or water to the radiator.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN G. ENGELHART.

Witnesses:

DE LANA LUNQUEST,
J. H. DEERING.