

No. 780,301.

PATENTED JAN. 17, 1905.

G. W. NISTLE.
FLOAT FOR VALVE MECHANISMS.
APPLICATION FILED SEPT. 15, 1902.

Fig. 1.

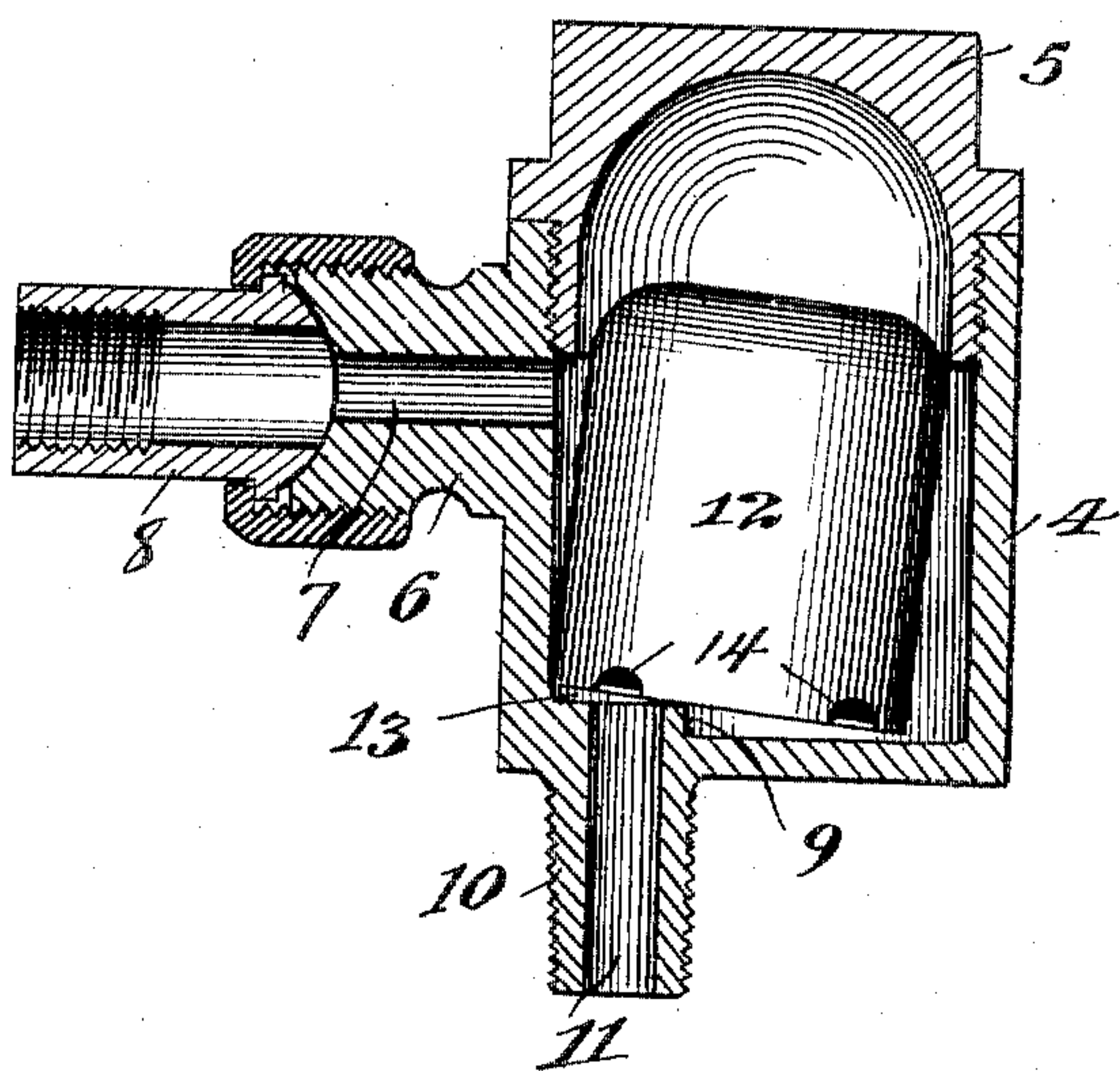


Fig. 2.

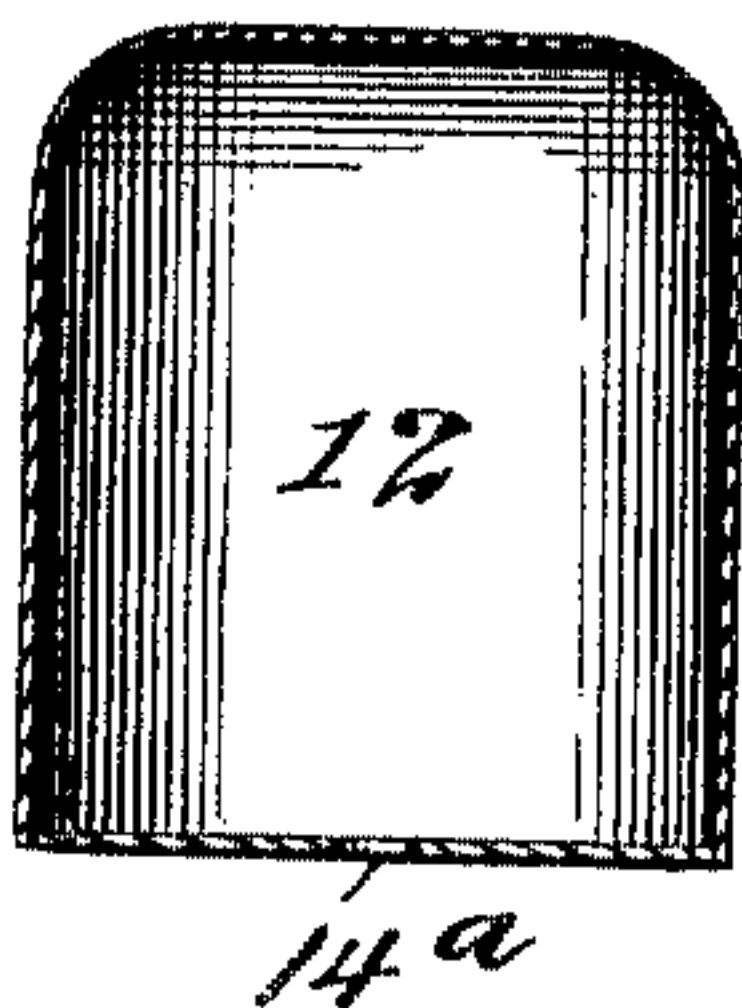


Fig. 3.



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UNITED STATES PATENT OFFICE.

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FLOAT FOR VALVE MECHANISMS.

SPECIFICATION forming part of Letters Patent No. 780,301, dated January 17, 1905.

Application filed September 15, 1902. Serial No. 123,479.

To all whom it may concern:

Be it known that I, GEORGE W. NISTLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Floats for Valve Mechanisms, of which the following is a specification.

My invention relates to a novel construction of float used in connection with valve mechanisms, my invention in the application thereof principally contemplated by me constituting an improvement in steam-radiator attachments of the type illustrated in my former patent, No. 691,796, granted January 28, 1902, but being capable of use with equal advantage in connection with floats constituting constituent parts of other types of valve mechanisms.

The attachment disclosed in my former patent above referred to consists, essentially, of a casing having an inlet-passage thereto which communicates with the radiator and an outlet-passage through the base thereof which communicates with the suction-pipe of the vacuum system, the outlet-passage terminating within the casing in a nozzle slightly elevated above the base of the casing and eccentrically disposed relatively to the latter, the orifice of which outlet-passage is normally restricted, but not entirely closed, by the base of a hollow metal float contained within the casing, the float itself constituting, in effect, a valve which when resting upon the nozzle of the outlet-passage partially closes the latter, but when buoyed up by the presence of a sufficient volume of water in the casing leaves the outlet-passage free for the unrestricted outlet of water therethrough. Where a hollow metal float is employed as constituting this valve, the base or bottom of the float is commonly united to the body portion thereof by means of a soldered joint, which of course leaves the finished float with a body of air imprisoned therein. The changes of temperature to which the float is subjected in use creates expansions and contractions of this imprisoned body of air, which sooner or later results in the production of small cracks or breaks in

the soldered joint, thus permitting the water to seep into the float and the latter to thus become water-logged. When the float reaches this latter condition, it is of course useless for its intended purpose.

The object of my invention is to obviate the above-recited objection through such a modification in the construction of the float as will prevent its becoming water-logged without impairing the buoyant capacity thereof constituting the essential feature of its efficiency and utility; and to this end my invention in its broadest aspect consists of a hollow float having one or more apertures formed there-through in such relation to the bottom wall or lowest point of the float as to effect the complete drainage of the float when the water is drawn off and render the float buoyant through the compression of the air confined between the top surface of the water therein and the walls of the float above the aperture or apertures.

In the accompanying drawings, Figure 1 shows in central vertical section the casing and inlet and discharge nozzles of a radiator attachment containing therein a valve in the form of a hollow float constructed in accordance with my invention; and Figs. 2 and 3 are central vertical sectional bottom plan views, respectively, of a slightly-modified form of float also embodying the principle of my invention.

In the drawings, 4 designates a cylindrical casing constituting the body of the attachment, the upper end of which may be closed by a threaded cap 5. The casing 4 is provided at one side thereof near its upper end with a threaded boss or nipple 6, the bore 7 of which constitutes an inlet-passage communicating with a short pipe-section 8, attached to and leading from the interior of the radiator. The base or bottom wall of the casing 4 has formed eccentrically therein a nozzle 9, constituting the upper or inner end of a threaded nipple 10, the bore 11 of which constitutes the discharge-passage of the casing designed for communication with the suction-pipe of a vacuum system such as is commonly employed

in connection with steam-radiators to draw off air and water of condensation.

Within the casing 4 is located a valve designed to regulate the discharge of water through the outlet-passage 11, and this valve is in the form of a hollow cylindrical metal float, (indicated by 12.) This float is of such dimensions relatively to its containing-casing that it may rise and fall therein to a limited extent and when in its lowest position, with its base resting upon the top of the nozzle 9, will lean or tilt slightly, sufficiently to create a restricted passage-way 13 at the orifice of the discharge passage-way 11 for the gradual withdrawal of the water of condensation as fast as it is formed and discharged from the radiator into the casing.

Referring now to those constructional features which embody the gist of my invention, I form through a wall of the float in or opposite and communicating with the bottom thereof one or more apertures sufficient to permit the free and unrestricted inflow and outflow of water relatively to the interior of the float. In the form of my invention shown in Fig. 1 I locate these apertures (designated by 14) in the bottom margin of the cylindrical body of the float opposite and on a level with the bottom wall of the float. In the form of the invention shown in Figs. 2 and 3 I provide an aperture 14^a through the bottom wall of the float, preferably centrally thereof. In both cases it will be observed that when the water is drawn off it will drain freely from the interior of the float, leaving the latter entirely emptied thereof.

It will be observed from the foregoing that the apertures of the float may be located at any point in or communicating with the base thereof, so long as they will effect the function of completely draining and emptying the float without affecting the capacity of the base of the float to act as a partial closure of the orifice of the outlet-passage 11.

In operation when steam is on in the radiator water of condensation is constantly formed in small quantities, and this trickles into the casing 4 through the inlet-passage 7 and is drawn off by the suction maintained through the discharge-passage 11. When the float 12 is at rest, as shown in Fig. 1, the orifice of the outlet-passage 11 is restricted to such an extent that the water will enter the casing slightly faster than it is drawn off. The surplus water thus rises in the annular chamber surrounding the float, forming a seal against the escape of steam, and at the same time enters the float through the apertures therein and rising to a height above the tops of the

apertures immediately thereafter exercises a buoyant effect on the float through the body of air imprisoned thereby within the float, and when the water has thus accumulated in a quantity sufficient to raise the float off the nozzle 9 the enlargement of the discharge-orifice thus created results in a more rapid discharge of the water, by which the float again settles to its lowermost position, this operation continuing automatically and indefinitely so long as the moisture condenses and accumulates in the radiator. When, however, steam is cut off from the radiator, the vacuum acting through the discharge-passage 11 drains off all the water within the casing that is above the level of the outlet-orifice, including all the water contained within the hollow float, thus leaving the latter in its original condition and with unimpaired capacity for performing its intended function. It will also be seen that my invention obviates the effects of the expansion and contraction of an imprisoned body of air within a hermetically-sealed float, and thus relieves the float from the injury above referred to resulting from such action of the heat upon the imprisoned air.

I claim—

1. The combination with a cylindrical casing having an inlet-passage communicating with the interior thereof near its upper end and a discharge-passage extending through its base eccentrically thereof, the orifice of said discharge-passage being slightly elevated above the level of the base, of a cylindrical hollow float-valve having a flat bottom wall and provided with one or more drain-apertures communicating with the interior at the level of said bottom wall, that portion of the float above said aperture or apertures being air-tight, substantially as described.

2. The combination with a cylindrical casing having an inlet-passage communicating laterally with the interior thereof and a discharge-passage extending through its base eccentrically thereof, the orifice of said discharge-passage being slightly elevated above the level of the base, of a cylindrical hollow float-valve having a flat bottom wall and provided around the lower end of its cylindrical body with a series of lateral drain-apertures communicating with the interior at the level of said bottom wall, that portion of the float above said apertures being air-tight, substantially as described.

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