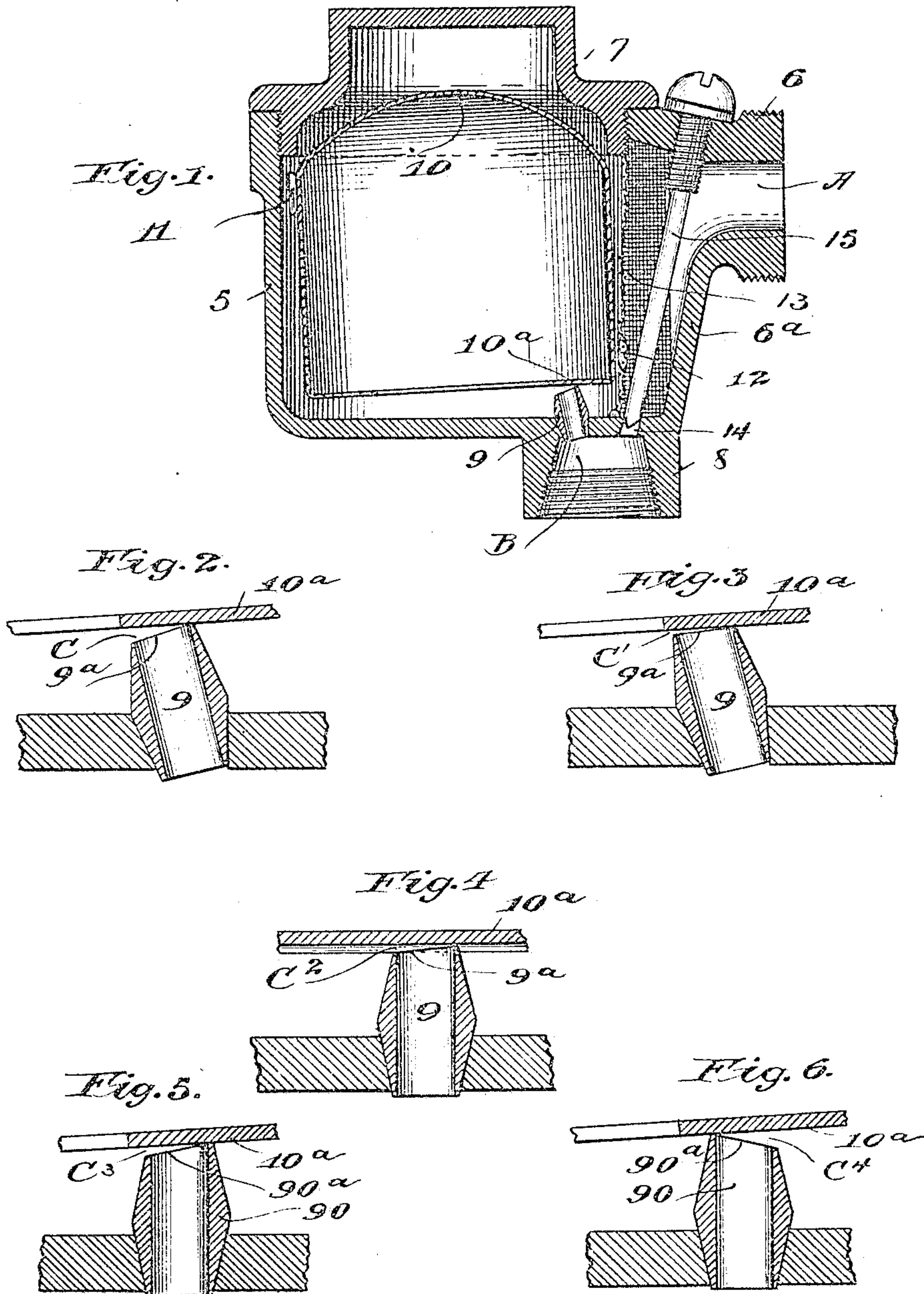


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DRAIN ATTACHMENT FOR STEAM HEATING SYSTEMS, &c.
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UNITED STATES PATENT OFFICE.

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DRAIN ATTACHMENT FOR STEAM-HEATING SYSTEMS, &c.

SPECIFICATION forming part of Letters Patent No. 787,094, dated April 11, 1905.

Application filed July 1, 1904. Serial No. 214,957.

To all whom it may concern:

Be it known that we, ROBERT L. GIFFORD and GEORGE W. NISTLE, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Drain Attachments for Steam-Heating Systems and the Like, of which the following is a specification.

This invention relates to valves or traps employed for the purpose of automatically collecting and discharging air and water of condensation which accumulate in steam-heating systems and other apparatus; and the invention has for its general object to provide a simple and improved automatic drain attachment for use in connection with vacuum systems of heating, more particularly with reference to securing a finer adjustment of the operating parts and greater sensitiveness and reliability in operation.

A drain attachment of the general class or type to which our invention relates is shown in Letters Patent to George W. Nistle, No. 691,796, granted January 28, 1902. The distinguishing feature of this patent resides in the combination, with a cylindrical valve-casing provided with a raised outlet-nozzle in its base eccentrically disposed, of a float-valve therein the base of which rests upon said outlet-nozzle, contracting the discharge-orifice therethrough, but not quite closing the same, owing to the slightly tipped or inclined position of the float within the casing. The contracted opening or passage thus created between the base of the float and the top of the nozzle is of constant and uniform dimensions when the float is at rest on the nozzle, and such construction gives entirely satisfactory results in many cases, especially with comparatively small attachments; but in some cases where drain attachments of considerable size are employed it has been found desirable to provide means for varying and nicely adjusting the dimensions of this opening to secure the best results under any given conditions or circumstances; and the particular object of the present invention, therefore, is

to provide a practical means for effecting such adjustment in devices of this character, and this we have found may be attained by employing a removable nipple containing a drain-passage, which nipple is provided with an oblique or inclined upper end to be engaged by the base of the float and is capable of being rotatably adjusted to vary the size of the opening or passage-way existing between the bottom of the float and the upper end of the nipple. We have also found that greater variations between the minimum and maximum extent of such openings may be secured by inserting said removable nipple obliquely in the base of the casing.

Our invention in the best forms in which we have as yet embodied the same is illustrated in the accompanying drawings, wherein—

Figure 1 is a central vertical sectional view of the device in a plane centrally of the inlet and outlet passages. Fig. 2 is an enlarged detail view of the drain-nipple and its immediately-coöperating parts viewed in the same plane and position as in Fig. 1. Fig. 3 is a view similar to Fig. 2, with the nipple turned on its longitudinal axis through a half-circle. Fig. 4 is a similar view showing the drain-nipple turned through an arc of ninety degrees and viewed in the direction of the arrow indicated in Fig. 1; and Figs. 5 and 6 are detail views similar to Figs. 2 and 3, respectively, showing a vertical nipple employed in connection with a tipping or inclined float.

Referring to the drawings, 5 designates the generally cup-shaped casing, having on one side near its upper end an inlet-nozzle 6, by which it is attached to the radiator. The upper end of the casing is internally threaded to receive a closure in the form of a cap or bonnet 7. The inlet-nozzle 6 has a downward extension 6^a, forming an integral laterally-projecting part of the wall of the casing and conducting the inlet-passage A downwardly to the base of the casing.

8 designates the outlet-nozzle, depending from the base of the casing and containing the upper end of the main drain-passage B.

9 designates a nipple that is inserted in an

aperture in the base of the casing directly above and in free communication with the main drain-channel B, and 10 designates a cylindrical hollow float substantially filling the chamber of the casing and provided with a centrally-apertured flat base 10^a. The nipple 9 is so situated with reference to the float 10 that the solid portion of the base 10^a always rests upon and partially covers the upper orifice of the nipple in the lowest position of the float. The float is guided in its vertical movements by one or more inwardly-projecting lugs 11, located on the inner wall of the casing near its upper end, coöperating with one or more diametrically and diagonally opposite lugs 12 on the inner wall of the casing near the lower end of the latter.

13 designates a screen located at the entrance of the inlet-passage A and guarding the entire opening of the latter into the casing, the function of this screen being to arrest any dirt and sediment that may be carried by the incoming fluid and deposit the same on the bottom of the casing back of the screen. For the purpose of getting rid of this sediment as it accumulates there is provided a discharge-aperture 14 in the base of the casing directly back of the screen, which aperture leads directly into the main drain-channel B and is controlled by a screw-threaded plug-valve 15.

The parts as hereinabove described, with the exception of the particular form and arrangement of the inserted nipple 9, are disclosed in and constitute the subject-matter of an application filed by us concurrently herewith, Serial No. 214,956.

Coming now to the main feature of the present invention, it will be observed that the insertible nipple 9 has an oblique or inclined upper end 9^a, the base of the float resting at only one point (the highest) of the flat face of such upper end. This creates a horizontal V-shaped water-discharge aperture, the size and dimensions of which are variable by loosening the nipple in its seat, turning the same on its longitudinal axis to varying positions in the base, and driving it again to its seat, or by removing it entirely, adjusting its relative position, and replacing it. Preferably, and as shown in Figs. 1 to 4, inclusive; the nipple is set in the base so that its longitudinal axis is slightly inclined from the vertical position. This affords a wider range of angular variation of the V-shaped discharge-passage than where the nipple is set vertically in the base, as shown in Figs. 5 and 6. It also provides a construction which is operative to effect the described adjustments whether the base of the float is horizontal or slightly inclined, while with a vertical nipple dependent for the formation of the V-shaped opening upon the oblique or inclined character of its upper end it is necessary for the purposes of adjustment that the float be slightly tipped or canted. To illustrate, Fig. 2 shows the inclined nipple

9 so positioned relatively to the base 10^a of the float as to provide the maximum V-shaped opening, (designated by C,) while Fig. 3 shows the nipple turned through an angle of one hundred and eighty degrees, thereby creating a minimum V-shaped opening C'. Fig. 4, which is viewed in a plane at right angles to the plane of Figs. 2 and 3 or in the direction indicated by the arrow in Fig. 1, shows the same nipple turned half-way between the positions indicated by Figs. 2 and 3, respectively, whereby there is created a V-shaped opening C² of intermediate size. In these cases, where the rotatable nipple is set in the base in a position more or less inclined from the vertical, it is obviously immaterial whether the float be slightly tipped or canted, as shown, or be guided to move vertically with its base horizontal, the variations and adjustments being securable in either case. Figs. 5 and 6 illustrate the same principle in an arrangement wherein the nipple 90 is set vertically in the base, being provided with an oblique upper end 90^a. In this case in order to secure adjustments between the minimum and maximum V-shaped openings (represented by C³ and C⁴, respectively) it is essential to employ a tipped or inclined float, or at least a float having a base slightly inclined from the horizontal.

The described adjustments of the nipple 9 may easily be effected by withdrawing the bonnet 7 and the float and applying a spanner-wrench or analogous tool to the nipple to turn the latter to the desired extent, after which the nipple may be tapped securely to its seat in its adjusted position. We have found in practice that very fine adjustments may be secured by this device, resulting in a capability of maintaining the attachment always at its highest efficiency and in its best working order.

We claim—

1. The combination with a casing having inlet and discharge passages, and a float in said casing, of a longitudinally-bored nipple inserted in the base of the casing in communication with the discharge-passage of the latter, said nipple having an oblique upper end coöperating with the base of the float and being capable of adjustment in its seat around its longitudinal axis, substantially as described.

2. The combination with a casing having inlet and discharge passages, a float in said casing, and means for guiding and supporting said float in a slightly inclined or canted position, of a longitudinally-bored nipple inserted in the base of the casing in communication with the discharge-passage of the latter, said nipple having an oblique upper end coöperating with the base of the float and being capable of adjustment in its seat around its longitudinal axis, substantially as described.

3. The combination with a casing having

inlet and discharge passages, and a float in said casing, of a longitudinally-bored nipple inserted in the base of the casing in communication with the discharge-passage of the latter, said nipple being slightly inclined from the vertical and having an oblique upper end cooperating with the base of the float and being capable of adjustment in its seat around its longitudinal axis, substantially as described.

4. The combination with a casing having inlet and discharge passages, a float in said casing, and means for guiding and supporting said float in a slightly inclined or canted po-

sition, of a longitudinally-bored nipple inserted in the base of the casing in communication with the discharge-passage of the latter, said nipple being slightly inclined from the vertical and having an oblique upper end cooperating with the base of the float and being capable of adjustment in its seat around its longitudinal axis, substantially as described.

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