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 WATER SEALED VACUUM AND PRESSURE TRAP.
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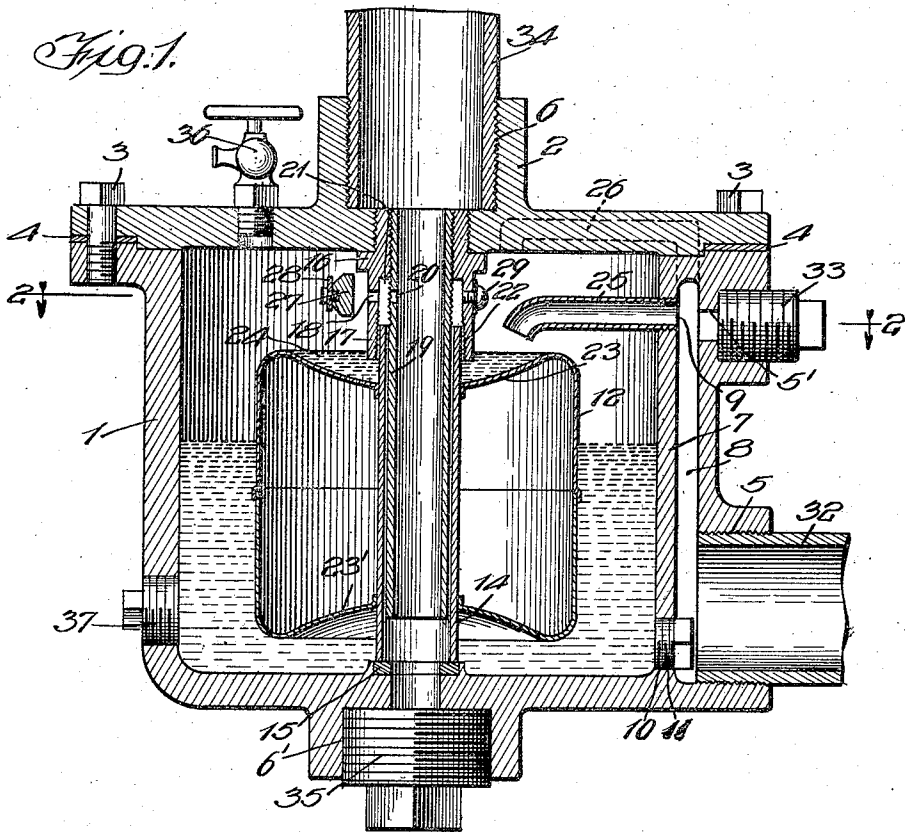
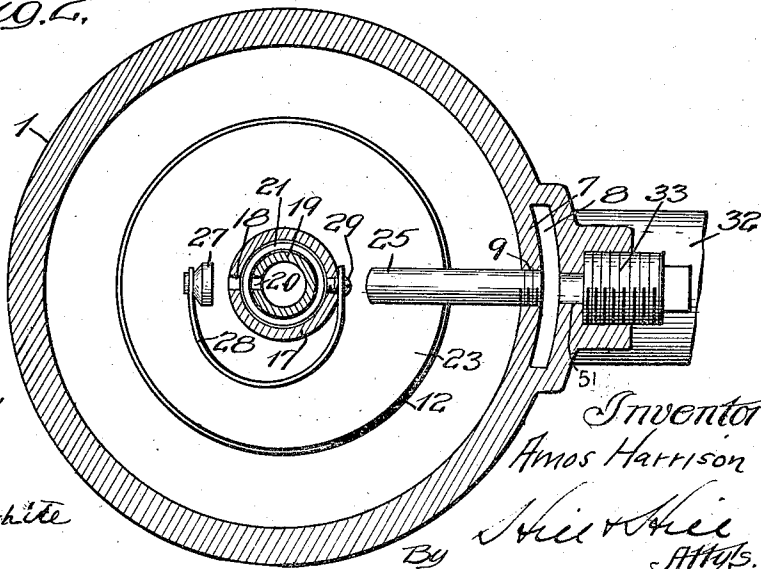


Fig. 2.



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UNITED STATES PATENT OFFICE.

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WATER-SEALED VACUUM AND PRESSURE TRAP.

1,425,857.

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To all whom it may concern:

Be it known that I, AMOS HARRISON, 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 Water-Sealed Vacuum and Pressure Traps, of which the following is a description.

My invention belongs to that general class of devices known as traps, and relates particularly to an improved trap for use on steam systems, the same being suitable for use on either pressure or vacuum systems. The invention has among its objects the production of a device of the kind described that is simple, convenient, durable, reliable, efficient and satisfactory for use wherever found applicable. It has particularly as an object the production of a device of the kind described that will prevent the escape or waste of steam under any and all conditions when operating as a vacuum or pressure trap. Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein made.

To this end my invention consists in the novel construction, arrangement, and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts.

Figure 1 is a sectional view through one form of my device; and

Figure 2 is a cross sectional view taken substantially on line 2—2 of Figure 1.

Referring to the drawings, 1 represents a casing of suitable size, shape and material, which in the construction shown is provided with a removable top or closure 2, which may be normally secured in place by bolts 3, or their equivalents for the purpose. In the construction shown, I prefer to provide a gasket or packing 4 between the closure and casing. As shown, I also preferably form the casing and closure so that the closure is partially set in at the top so that it is always accurately centered and a tight joint secured. The casing is provided with one or more inlets, 5 and 5' being shown, and with one or more outlets, all but one, however,

being preferably closed when the device is installed. In the construction shown, there is provided an outlet 6 in the top or closure and an outlet 6' in the bottom, so that the desired outlet may be used. In the trap illustrated, the same is arranged with the open outlet at the top, and the inlet 5' closed. I have shown the casing provided with a wall or baffle 7 spaced from the outer wall of the casing so as to provide a chamber 8, which is shown provided with ports 9 and 10. Ordinarily one or the other of the ports as desired, (as shown port 10) is closed. The additional inlet 5' referred to is preferably arranged adjacent the top of the casing. In the drawings I have shown the inlet 5' closed by a plug 33, it being understood that when this inlet is open or used, the inlet 5 is preferably plugged up.

Arranged within the casing is a float 12 of suitable size, shape and material, which I have mounted on a tubular body or stem 14 which forms a stem for the float, and also cooperating with the seat 15, or its equivalent, on the casing, serves as a valve. The valve seat 15 may be formed as part of the casing, or as shown, may be a separable seat which may be renewed and which may be of any material suitable for the purpose. In the construction illustrated, I have provided a depending part 16, which may be formed integral with the top or separable therewith, as shown, the same having a depending portion 17 of a size to receive the stem 14. There is also provided a port 18, or the equivalent, in the same. Part 16 also carries a depending part 19 which is tubular and is of a size to project down into the stem or tubular valve 14, the same having a port 20 communicating with the chamber 21 formed between the part 19 and the part 17, which chamber communicates with the port 18 previously described. It will be noted by referring to Figure 1 that the space 21 is of sufficient size to permit the stem 14 to freely move thereinto when the float is raised, the part 17 being preferably internally threaded, however, as indicated at 22 thus allowing the water to come between the stem 14 and the part 17 and form substantially a water packing or seal without permitting a large amount of lateral play between said parts. The float is constructed with its top 23 de-

pressed so as to form a receptacle in the top for water or other fluid 24, which forms a seal about the lower end of the portion 17 and between the valve or stem 14. I also
 5 prefer to form the bottom of the float, as shown, so as to provide an air space which forms substantially an air cushion, causing the float to rise and fall easily and prevent noise as well as injury to the seat or disk of
 10 the valve. A pipe 25, or its equivalent, preferably extends from the port 9 communicating with the chamber 8, and is arranged to discharge all fluid or water onto the float so as to maintain the water seal thereon. However, if desired, the closure may be provided
 15 with a duct as indicated in the dotted lines at 26 for the same purpose.

In order to control the port 18, I provide what may be termed a thermostatic valve 27,
 20 which, as shown, is mounted on the thermostatic member 28, which may be secured by a screw 29 or the equivalent to the depending portion 17. I have an inlet pipe 32 extending to the casing, it being understood, as
 25 previously mentioned, that the plug 33 may be removed and a pipe extended to the port 5', pipe 32 in this case being removed and a plug arranged at the port 5. As before mentioned, port 10 is shown closed by a plug
 30 11, it being understood that the plug may be employed or not, as desired. I have also shown the discharge or return pipe 34 connected to the outlet 6, outlet 6' being closed by a plug or the equivalent. If desired, a
 35 pet-cock 36 or its equivalent may be provided and the casing may also be provided with a drain opening, which I have shown closed with a plug 37.

The operation of the device may be briefly
 40 described, assuming that the same is connected up as shown and described, as follows: Normally there is water in the casing sealing the lower end of the valve 14, and water on the float sealing the lower end of
 45 the depending part 17. Air in the system may escape through the port 18, but any steam admitted to the trap will affect the thermostatic valve, and valve member 27 will be moved to close the port 18. When
 50 the water of condensation reaches a level sufficient to cause the float to rise, the water of condensation is carried up through and out the outlet 6, being carried off by pipe 34. If the outlet 6' is used, outlet 6 being
 55 plugged, the same passes downwardly through the port 6. All water of condensation entering the casing when plug 11 is in place is discharged on the float and may overflow into the casing, the same maintaining the seal previously described. The partition 7 prevents the sudden entrance of the
 60 water of condensation and consequent disturbing of the working parts. In some cases it is found desirable to use both the
 65 ports 9 and 10, and in some cases it is also

found desirable to use port 5' in preference to port 5. It will be noted that the free escape of steam is at all times prevented, except when the valve is opened, when possibly some small amount may pass up with
 70 the water of condensation, but immediately the valve returns to its closed position, the escape of steam is prevented. The device is continually sealed against the leakage of steam when in operation. It will be noted
 75 that in case the discharge takes place at the bottom of the casing, the escape of air through the tubular valve is the same as where the discharge is at the top.

Having thus described my invention, it is
 80 obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as
 85 limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

What I claim as new and desire to secure
 90 by Letters Patent is:

1. In a device of the kind described and in combination, a casing provided with an inlet and having a plurality of outlets, means for normally closing one of said outlets,
 95 a tubular valve arranged to control either outlet, a float mounted on said valve for controlling said valve, and means for discharging water about the valve above the float to maintain a water seal thereat.

2. In a device of the kind described and in combination, a casing provided with an inlet and having a plurality of vertically aligned outlets, means for normally closing
 100 one of said outlets, a tubular valve arranged to control either outlet, and a float for controlling said valve.

3. In a device of the kind described and in combination, a casing provided with an inlet and having a plurality of outlets, means for normally closing one of said outlets, a
 110 tubular valve arranged to control either outlet, a float for controlling said valve, and means for maintaining a water seal at the top of the float.

4. In a device of the kind described and in combination, a casing provided with an inlet and with an outlet, and having an air port communicating with said outlet, thermostatic means for preventing the escape of
 115 steam through said air port, a valve for controlling the discharge of fluid through said outlet, a float mounted on said valve, and means for providing a water seal at the top of the float and preventing the escape of vapor through the outlet port from the casing
 120 when the valve is in its closed position.

5. In a device of the kind described and in combination, a casing provided with a plurality of inlet ports and with a plurality
 125 of outlet ports, means for normally closing

one inlet port and means for normally closing one outlet port, a valve for controlling the discharge of fluid through the open outlet, a float connected with said valve, and means for providing a water seal and preventing the escape of vapor from the casing when the valve is in its closed position.

6. In a device of the kind described and in combination, a casing provided with an inlet and having a plurality of outlets arranged one adjacent the top and one adjacent the bottom of the casing, means for normally closing one of said outlets, means for controlling either outlet comprising a tubular valve arranged between the outlets, and a float mounted on the valve for controlling said valve, said casing having a tubular sleeve depending from the top and surrounding the upper end of the valve, said sleeve having a port, a thermostatic valve for preventing the leakage through said port, said float formed with a depression in its top about the valve and sleeve, and said casing constructed to discharge water into said depression whereby a water seal is formed at the lower end of the sleeve between the sleeve and valve.

7. In a device of the kind described and in combination, a casing provided with an inlet and with an outlet at the top and an outlet port at the bottom, means for normally closing one outlet port, a sleeve depending from the top at said outlet port, a tubular valve arranged between said outlets and projecting into said sleeve, the second sleeve depending from said first mentioned sleeve to the interior of said valve, and a float member mounted on said valve and having a depression in its top, said first sleeve extending into said depression, means for discharging water entering the casing into said depression, said sleeve constructed with an air leakage port, and means for automatically preventing the escape of vapor through said leakage port.

8. In a device of the kind described and in combination, a casing provided with a plurality of inlets and having a baffle arranged at said inlets, said casing provided with an outlet port, a tubular valve arranged to control the passage of fluid through said outlet port, said casing having a valve seat arranged to cooperate with said valve, a sleeve carried by the casing adjacent the upper end of said valve, said valve projecting into the sleeve, a float mounted on said valve and provided with a depression in its top, said sleeve being of a length to project into said depression, and means for discharging water of condensation onto the float whereby a seal is formed between the sleeve and valve to prevent the escape of vapor therebetween.

9. In a device of the kind described and in combination, a casing provided with an

outlet in its top and with a valve seat at the bottom below said outlet port, a tubular valve arranged to cooperate at its lower end with said valve seat, a tubular sleeve depending into said valve stem to substantially adjacent the lower end thereof, and a sleeve arranged about the exterior of the valve stem and a float mounted on said valve stem and constructed to provide a water seal between said sleeve and valve.

10. In a device of the kind described and in combination, a casing having an inlet and an outlet and provided with depending sleeves arranged one within the other with a space therebetween, a tubular valve arranged on the inner sleeve with its upper end extended into the space between the sleeves and movable therein, a float arranged on said valve constructed with depressions at the top and bottom thereof, said outer sleeve being of a length to project into the depression at the top of the float, said sleeves provided with ports arranged to permit the admission of air from the interior of the casing to the interior of the inner sleeve, and means for automatically preventing the admission of steam to said inner sleeve through said port, and means for discharging water of condensation into the upper depression of the float whereby a water seal is formed between the outer sleeve and the valve and the escape of steam thereat prevented.

11. In a device of the kind described and in combination, a casing having an inlet and an outlet and provided with depending sleeves arranged one within the other with a space therebetween, a tubular valve arranged on the inner sleeve with its upper end extended into the space between the sleeves and movable therein, said outer sleeve being internally grooved and cooperating with said valve to form fluid baffles therebetween, a valve seat disposed below the lower end of the valve and arranged to cooperate therewith, a float arranged on said valve constructed with depressions at the top and bottom thereof, said outer sleeve being of a length to project into the depression at the top of the float, said sleeves provided with ports arranged to permit the admission of air from the interior of the casing to the interior of the inner sleeve, and means for automatically preventing the admission of steam to said inner sleeve through said port, and means for discharging water of condensation into the upper depression of the float whereby a water seal is formed between the outer sleeve and the valve and the escape of steam thereat prevented.

12. In a device of the kind described and in combination, a casing provided with an inlet and with an outlet and a port communicating with said outlet, a valve for controlling the discharge of fluid through said

outlet, a float connected with said valve, signed my name in the presence of two sub-
means for providing a water seal and pre- scribing witnesses.
venting the escape of vapor from the cas-
ing when the valve is in its closed position,
5 and thermostatic means for automatically
controlling leakage through said port.

In testimony whereof, I have hereunto

AMOS HARRISON.

Witnesses:

ROY W. HILL,
BERTHA HARTMANN.