

**No. 622,925.**

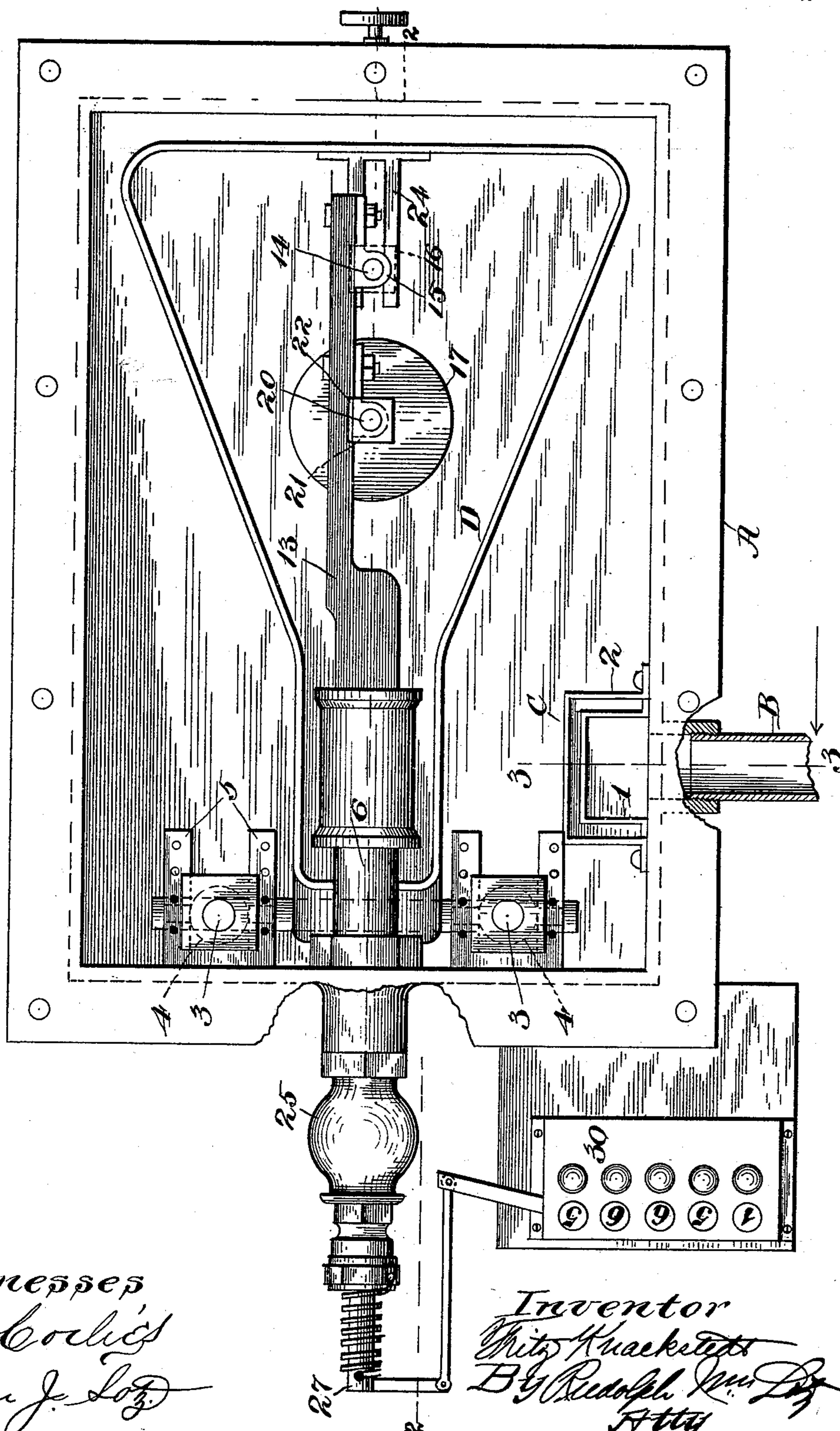
**Patented Apr. 11, 1899.**

**F. KNACKSTEDT.**  
**STEAM TRAP.**

(Application filed June 22, 1898.)

(No Model.)

**2 Sheets—Sheet 1.**



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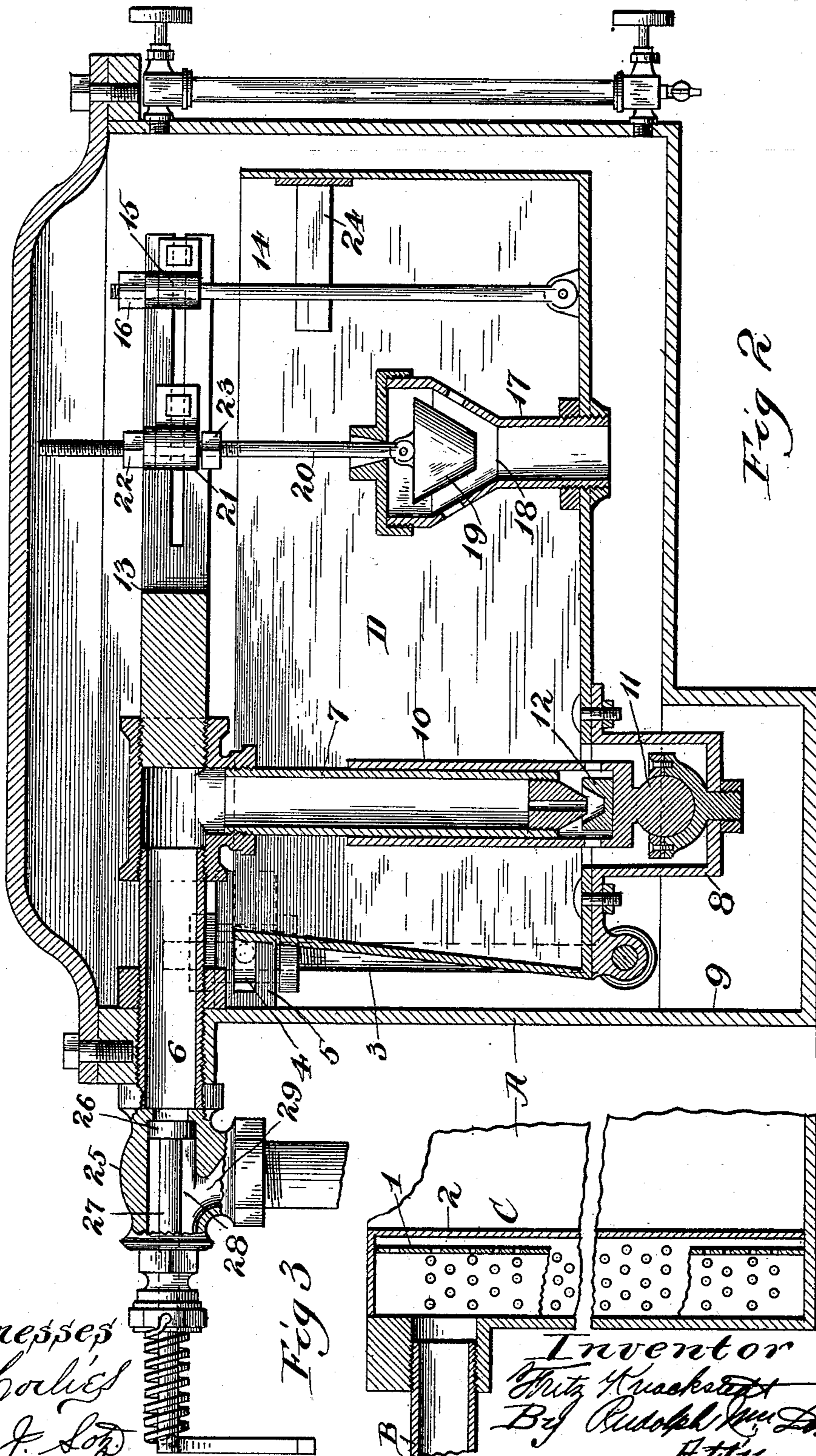
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Fig 3

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# UNITED STATES PATENT OFFICE.

FRITZ KNACKSTEDT, OF CHICAGO, ILLINOIS.

## STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 622,925, dated April 11, 1899.

Application filed June 22, 1898. Serial No. 684,199. (No model.)

*To all whom it may concern:*

Be it known that I, FRITZ KNACKSTEDT, 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 Steam-Traps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a novel construction in a steam-trap; the object being to provide a device of this description which will automatically drain itself of water, but will not permit the escape of any steam; and it consists in the features of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a top plan view of a steam-trap constructed in accordance with my invention, the cover being removed. Fig. 2 is a vertical longitudinal section of same on the line 2 2 of Fig. 1. Fig. 3 is a fragmentary detail sectional view on the line 3 3 of Fig. 1.

The most essential feature of my invention consists in providing means for causing the water to rise in the trap to a certain height and then overflowing into a float, which consequently sinks and thereby uncovers the drain-pipe through which the water is forced, and as the water is drained from said float causing the latter to rise slowly until the drain-pipe is again covered, this position being reached when said float has been almost entirely drained.

Other features of my invention consist in the detailed construction and arrangement of parts whereby the operation is accomplished.

Referring now to said drawings, A indicates a casing or trap having an inlet B and a perforated chamber C, adapted to receive and break the force of the influx of water. The said chamber C has an inner partition 1, perforated on all sides, and an outer partition or wall 2, perforated on two sides, but having an unbroken wall opposite the inlet. A float D is pivotally mounted within said casing A at the lower ends of two rods 3, carrying collars 4 at their upper ends, which are pivotally mounted between bifurcated lugs 5 on a wall

of said casing A. In this manner said float D is permitted a compound pivotal movement. A drain-pipe 6 enters said casing A adjacent its upper end and is provided with a downwardly-extending branch 7, projecting into said casing and terminating in a small downward extension 8 of said float C and below the bottom thereof. Said casing A is provided with an extension 9 to receive said extension 8 of said float. Said branch 7 of said drain-pipe 6 fits telescopically into a tube or cylinder 10, pivoted universally in said extension 8 of said float, as indicated at 11. Said cylinder 10 is perforated adjacent its lower end and is provided interiorly with a socket-piece 12, adapted to receive and close a conical nipple fitted into said branch 7 at its lower end. Said pipe 6 carries a bifurcated arm 13, which extends over said float and is connected therewith by means of a rod 14, passing through a collar 15 on said arm 13 and pivoted at its lower end to a lug on the bottom of said float. Said rod 14 carries a lock-nut 16 at its upper end, which is adapted to engage said collar 15 to limit the downward movement of said float. A valve-casing 17 is mounted within said float, passing through the bottom thereof, and is secured thereto in any suitable manner. A valve-seat 18 is formed in said valve-casing 17 above the bottom of said float, and above said valve-seat said casing 17 is enlarged and perforated. A valve 19, adapted to fit said valve-seat 18, is mounted upon the lower end of a rod 20, passing through a collar 21 on said arm 13, and which is adjusted so as to cause said valve 19 to fit said valve-seat 18 to close said valve at the same time that said branch 7 of said drain-pipe 6 is closed by means of the nuts 22 and 23, which are so placed as to allow said rod 20 slight play. The said valve 19 and rod 20 limit the upward movement of said float C. Arms 24, engaging said rod 14, serve to guide said float in its movements. At the outlet end of said drain-pipe 6 a piston-valve 25 is mounted, which is provided with a plunger or piston 26, mounted upon a spring-actuated piston-rod 27 and closely fitting the cylindrical passage 28. The outlet-opening 29 of said valve is located adjacent its rear end, so that before any water can pass through said valve said piston 26 must pass and uncover said

opening 29. Thus said piston is caused to move sufficiently to operate a register 30, which is connected with the rod 27 and is adapted to register the number of times said trap was drained.

The operation of my device is as follows: As said casing A gradually fills with water the float C rises before the water reaches the level of the perforations in the valve-casing 17 until the valve-seat 18 is closed by means of the valve 19 and the branch 7 is closed by the socket-piece 12. The float then stops and the water continues to rise around same until it overflows into said float, which then drops, thus permitting water to enter from the bottom through said valve-casing 17 and the perforations therein, and also uncovering the branch 7. The water is then forced by the steam-pressure through the perforation in cylinder 10 and into said drain-pipe to the valve 25, which it opens, and thence passes out to any desired vessel. The casing is thus drained until the water therein is reduced to the level of the perforations in the valve-casing 17, but the float continues to drain and gradually rises as it is drained until the valve-seat 18 again comes into contact with and is closed by the valve 19 and the socket-piece 12 simultaneously closes the branch 7. Drainage then ceases until the water in casing A again overflows into said float C. A practically given quantity of water is thus drained from said trap at intervals and each such quantity is registered by the register 30.

I claim as my invention—

1. In a steam-trap, a casing having an inlet, a float pivotally mounted within said casing, an outlet-pipe communicating with the interior of said float, devices carried by said float for closing said outlet-pipe as said float rises, a valve in said float establishing communication between the same and said casing below the upper end of said float, and means for closing said valve as said float rises to prevent entrance of water into said float before the water in said casing overflows into said float, substantially as described.

2. In a steam-trap, a casing having an inlet, a float in said casing open at its upper end and provided with an extension below its bot-

tom, an outlet-pipe projecting into said float and terminating in said extension thereof below its bottom, devices carried by said float for closing said outlet-pipe as said float rises, devices for establishing communication between said float and said casing below the upper end of said float, and devices for interrupting said communication before the water in said casing reaches the said point of communication, whereby said water will be compelled to rise until it overflows into said float, substantially as described.

3. In a steam-trap, a casing having an inlet and an outlet, devices within said casing for controlling said outlet, a piston-valve interposed in said outlet and adapted to be operated by the flow of water from said casing, and a register adapted to be operated by said valve, substantially as described.

4. In a steam-trap, a casing having an inlet, a float pivotally mounted within said casing at the lower ends of rods pivoted at their upper ends to lugs on said casing, a cylinder pivotally mounted in said float by means of a universal joint, an outlet-pipe projecting into said float and fitting telescopically within said cylinder, perforations adjacent the lower end of said cylinder, a device in the lower end of said cylinder adapted to fit against and close said outlet-pipe as said float rises, a valve-casing in said float establishing communication between the latter and the casing below the upper end of said float, an arm mounted on the casing and projecting over said float, a rod on said arm, a valve carried on said rod and adapted to control said communication and interrupt it as said float rises, a rod pivotally connected with said float and movably connected with said arm for limiting the downward movement of said float, a valve interposed in said outlet-pipe, and connection between said valve and a register adapted to be operated thereby, substantially as described.

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

FRITZ KNACKSTEDT.

Witnesses:

RUDOLPH WM. LOTZ,  
W. F. KNACKSTEDT.