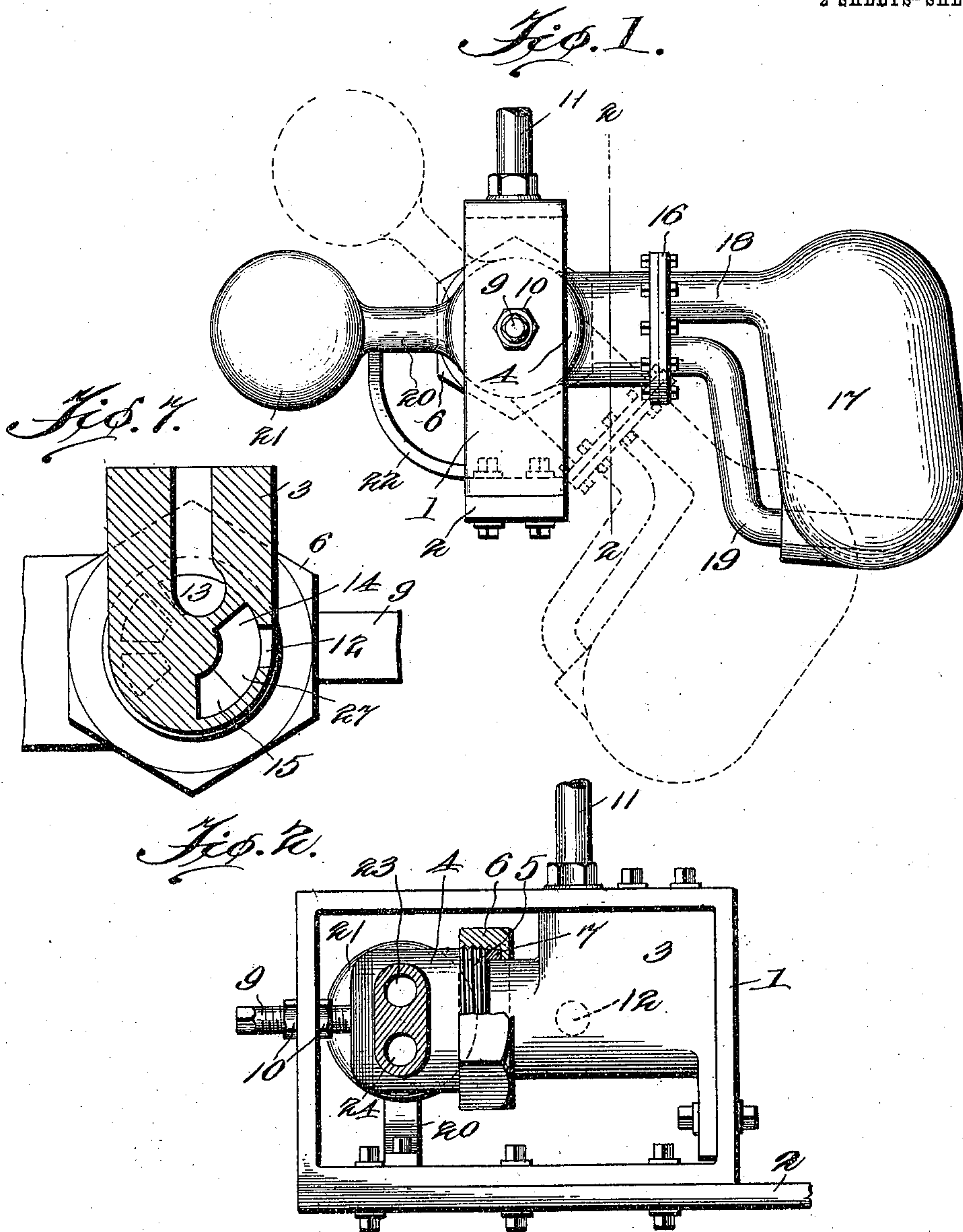


J. J. HARPAIN.  
STEAM TRAP.  
APPLICATION FILED APR. 5, 1910.

975,357.

Patented Nov. 8, 1910.

2 SHEETS—SHEET 1.



Witnesses

W. Max Dwall.  
K. L. Byrne.

Inventor

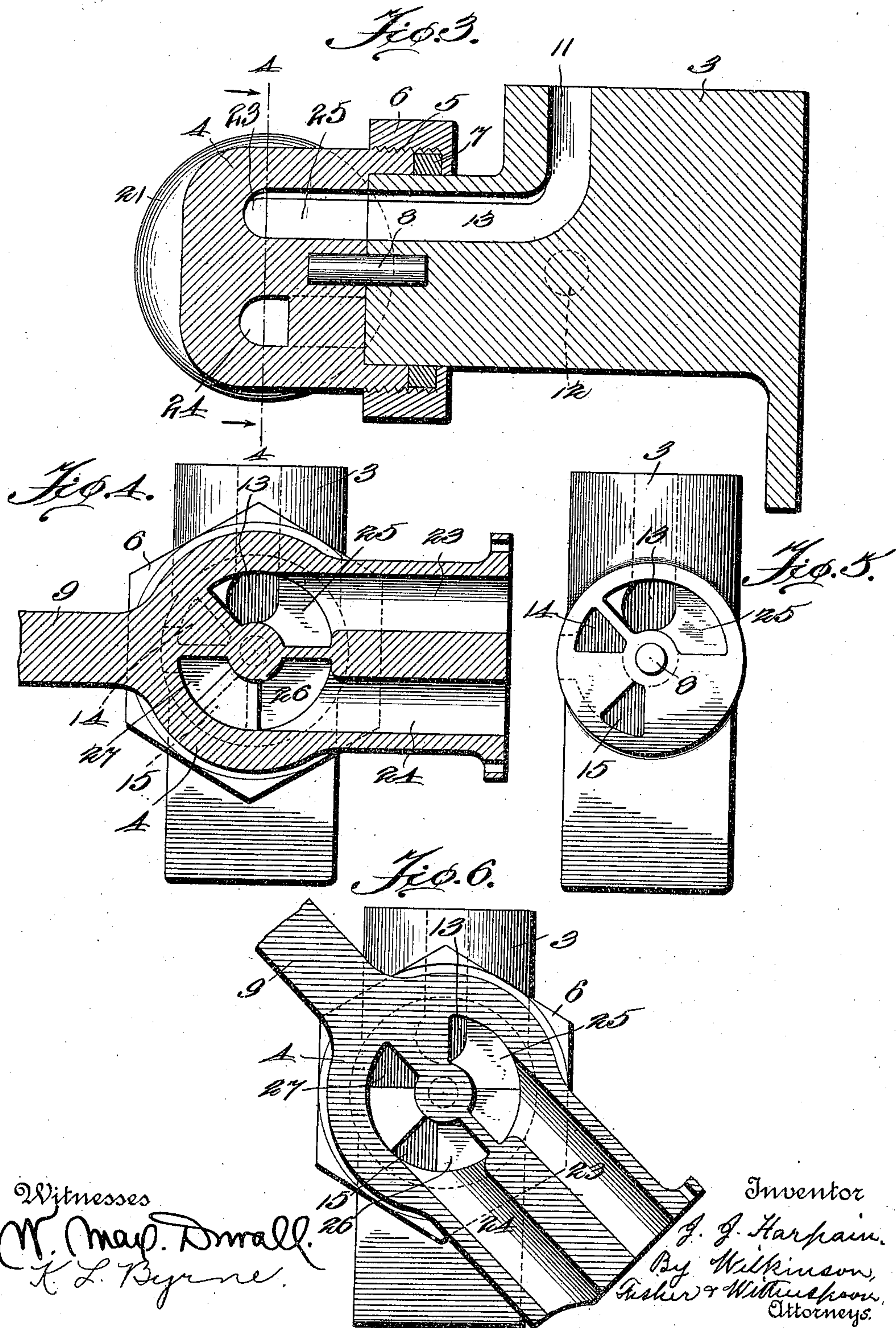
J. J. Harpain.

By Wilkinson, Fisher & Wilkerson,  
Attorneys.

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W. May. Dmally.  
K. L. Byrne.

Inventor  
J. J. Harpain.  
By Wilkinson,  
Fisher & Witherspoon,  
Attorneys.



# UNITED STATES PATENT OFFICE.

JOHANN J. HARPAIN, OF THE UNITED STATES NAVY.

## STEAM-TRAP.

975,357.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed April 5, 1910. Serial No. 553,540.

*To all whom it may concern:*

Be it known that I, JOHANN J. HARPAIN, boiler-maker, United States Navy, and a citizen of the United States, stationed on board U. S. S. *Panther*, 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 improvements in steam traps and the object of my invention is to provide a simple trap operated by the weight of the condensed water, which is automatic in its action and cheap in its construction.

With this object in view, my invention consists in the construction and combinations of parts as hereinafter described and claimed.

In the accompanying drawing—Figure 1 is a front elevation of my improved trap. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a longitudinal section. Fig. 4 is a section on the line 4—4 of Fig. 3. Fig. 5 is an end view of one half of the device, the other half being removed, and Fig. 6 is a section similar to Fig. 4, but showing the bucket in the tilted position. Fig. 7 is a cross-section of the same taken through the inlet and outlet ports or passages.

1 represents a supporting frame, to which the trap is bolted, which frame is bolted to a bracket or other support 2. The trap consists of a stationary part 3, bolted to the frame 1, and a partially revoluble part 4, adapted to turn thereon. The revoluble part 4 is provided with a screw-thread 5, with a nut 6 engaging therewith, and having a packing 7, so that the revoluble part 4 may revolve freely on the stationary part 3, a guiding pin 8 being provided, which enters both the parts 3 and 4 centrally. On the other side, the revoluble part is provided with a stub shaft 9, which passes loosely through one side of the frame 1, being held in its proper position by jam nuts 10.

The stationary part 3 is provided with a steam inlet 11 and with an outlet 12. Connected with the steam inlet is a steam passage 13 considerably wider than the inlet pipe itself, and connected with the outlet are two passages 14 and 15, shown in dotted lines in Fig. 4.

By means of a joint 16, there is connected

to the movable part a bucket 17 for catching the condensed water. This is connected with the part 4 by an inlet pipe 18 and an outlet pipe 19. Connected to the other side of the movable part 4 by an arm 20, is a weight 21, the bucket and weight being so proportioned that the weight 21 is twice as heavy when empty, and half the weight of said parts when the bucket 17 is nearly full of condensed water. A curved brace 22 is carried by the frame, and the arm 20 is adapted to strike thereagainst, preventing the weight 21 from falling below a horizontal position.

The revoluble part 4 is provided with an inlet passage 23, connecting with the pipe 18, and an outlet passage 24 connecting with the pipe 19. At right angles to these passages are three other passages extending longitudinally of the part 4, namely, a passage 25 of about the same area as the passage 13, and two passages 26 and 27, the passage 27 being of about the same area as the passage 14 in the stationary part, and the passage 26 being a little larger than the passage 15. These passages 25 and 26 are connected together by a passage close to the division plate 14.

The operation is as follows:—Steam entering through the pipe 11 passes through the passages 13, 25, 23, and the pipe 18 into the bucket 17. When the bucket is nearly full of water of condensation, it tips, under the weight of said water, from the position shown in full lines in Fig. 1 to that shown in dotted lines, and as indicated in Fig. 6. The inlet passages into the bucket 17 not being entirely closed, as shown in Fig. 6, the steam coming in, when the bucket is tilted, forces the water of condensation out through the outlet 12 by the passages above described. After the water of condensation has been discharged, the weight 21 restores the parts to their original position, as shown in dotted lines in Fig. 1.

I claim:—

A steam trap, comprising a supporting frame, a fixed part firmly secured to said frame, a movable part revolubly supported on said fixed part, bearings, one in said frame and the other in said fixed and movable parts, for supporting said movable part, a weight secured to said movable part on one side, a bucket secured to said movable part on the opposite side, upper and lower pipes connecting said bucket with said movable



part, and a brace connected to said frame for preventing said weight from falling below a horizontal position, said fixed part being provided with inlet and outlet passages arranged at right angles to each other, and with a large inlet passage arranged at right angles to said inlet passage, and with two discharge passages arranged at right angles to said outlet passage, said two discharge passages being connected together near the point where they join the main outlet passage, and said movable part being provided with a large steam inlet passage and a passage at right angles thereto in communica-

tion with the upper pipe leading to said bucket, and with two outlet passages and a passage leading therefrom to the lower pipe connected to said bucket, said two last named passages being connected together at the end farthest from the stationary part, substantially as described.

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

JOHANN J. HARPAIN.

Witnesses:

EDW. G. SIMONS,  
F. E. WASSERMAN.