

No. 773,794.

PATENTED NOV. 1, 1904.

C. E. HUXLEY.
STEAM TRAP.

APPLICATION FILED FEB. 29, 1904.

NO MODEL.

Fig. 1.

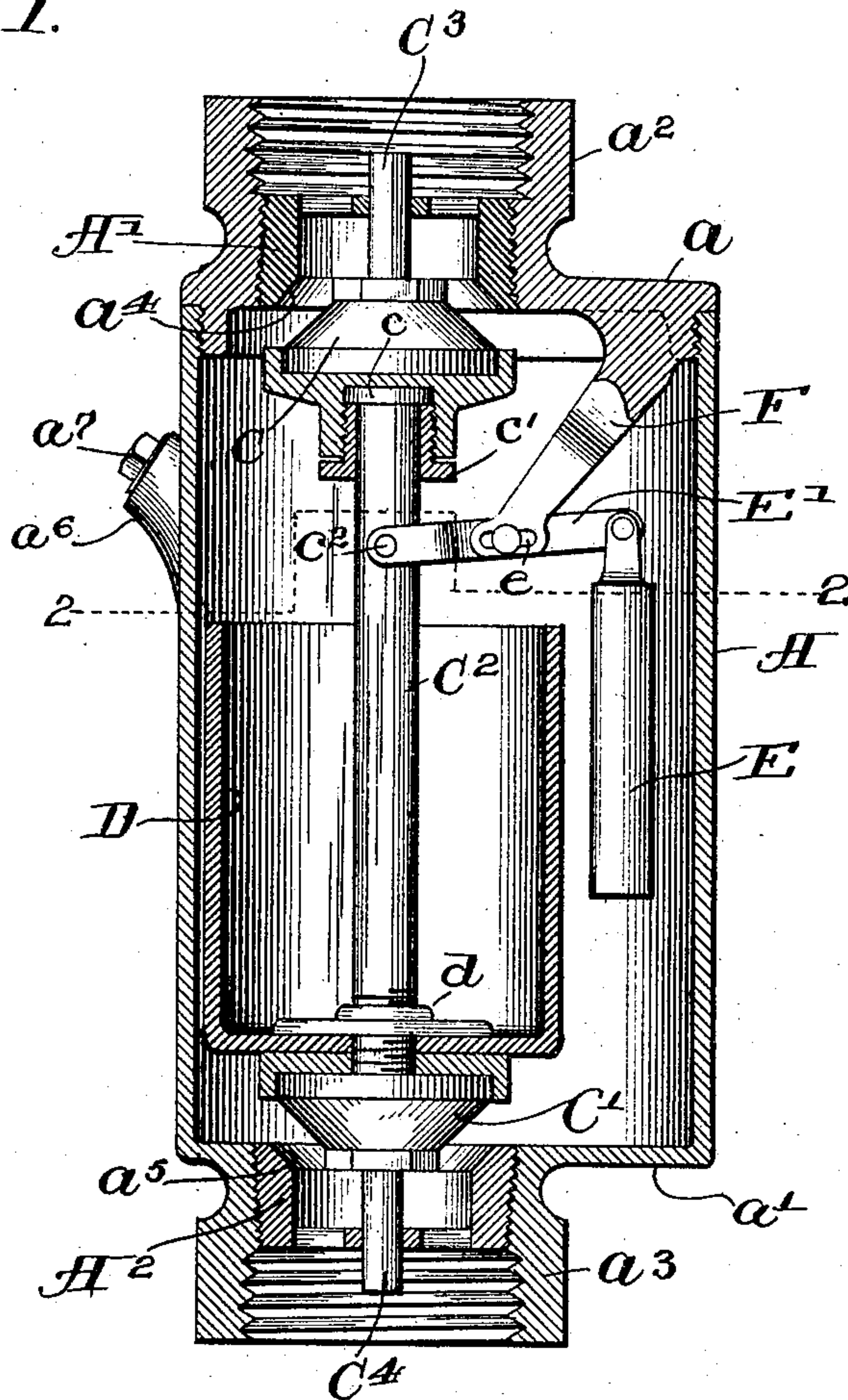
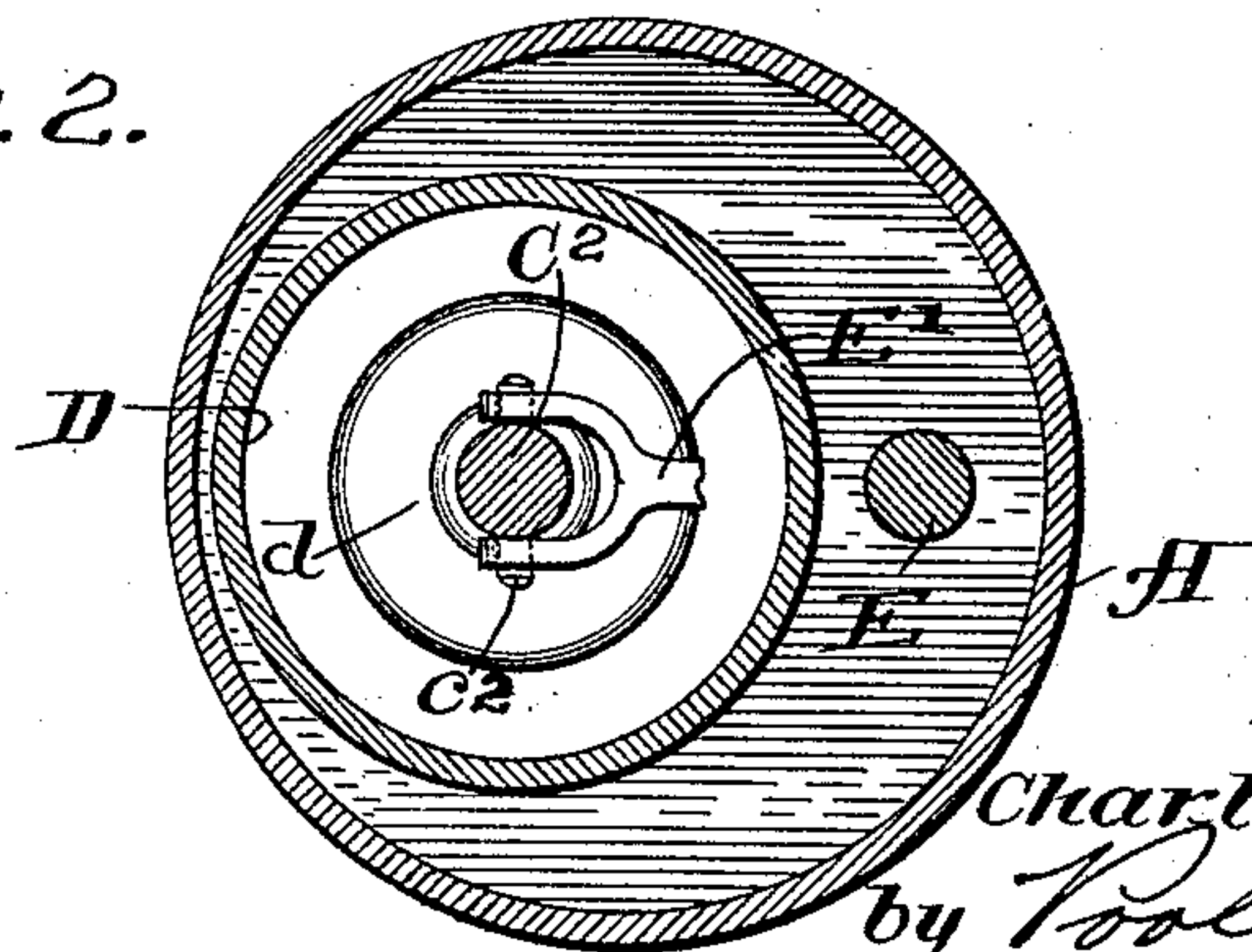


Fig. 2.



Witnesses
C. H. Crawford
W. L. Hall

Inventor:
Charles E. Huxley
by *Tooler Brown*
his Attorneys

UNITED STATES PATENT OFFICE.

CHARLES E. HUXLEY, OF CHICAGO, ILLINOIS.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 773,794, dated November 1, 1904.

Application filed February 29, 1904. Serial No. 195,852. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. HUXLEY, a citizen of the United States, and a resident of 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 that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in traps for periodically withdrawing water of condensation from steam-pipes, heating-radiators, and the like without loss of steam therefrom and may be employed for periodically withdrawing liquid from other receptacles operating under like general conditions.

The object of the invention is to produce a simple and economical device of this character, and one which may be made small and require but little room and which is efficient for the purpose designed.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a central longitudinal section of a steam-trap made in accordance with my invention. Fig. 2 is a transverse vertical section taken on line 2 2 of Fig. 1.

As shown in the drawings, A designates the shell or casing of the trap, having end walls a a' . The upper end wall a is provided with an inlet branch a^2 , and the lower end wall a' is provided with an outlet branch a^3 , located, preferably, in alinement with each other. Said lower end wall of the shell is made integral with the body thereof, while the upper end wall has screw-threaded connection therewith, and the parts are attached to and detached from each other by rotation of the body A. At the inner ends of said inlet and outlet branches are located seat-rings A' A^2 , respectively, said seat-rings being exteriorly tapered and having screw-threaded engagement with the inner ends of said branches.

C C' designate upper and lower valve-closures, the upper closure C engaging the upper seat-ring A' , while the lower closure C' en-

gages the lower seat-ring A^2 . Preferably said closures are provided with conical faces and engage conically-shaped seats a^4 a^5 , formed on the rings A' A^2 . Said valve-closures are connected by a connecting-rod C^2 , which is secured to the lower valve-closure and is detachably connected with the upper valve-closure by being provided with an end flange or head c , which enters an opening in the lower side of the upper closure and is confined therein by means of a hollow screw-threaded nut c' , which surrounds the rod inside of said opening and has exterior screw-threaded engagement with said upper closure. When one valve is open, therefore, the other valve is closed. The upper and lower valves are provided with upwardly and downwardly extending guide-stems C^3 C^4 , which engage guide-apertures in the spider-shaped ends of the seat-rings A' A^2 , whereby said valves are held centrally relatively to their seats.

D designates a hollow float open at its top and having the form of a cup. Said float surrounds the connecting-rod C^2 and rests at its bottom on the lower valve-closure, the bottom wall of the float being perforated for the passage therethrough of the rod and the float being fastened in place by means of a nut d , which has screw-threaded engagement with the rod and clamps or confines the float-bottom between the nut and closure. The shell is provided with a filling-nipple a^6 , located above and adjacent to the open end of the cup-float and through which water may be directed to said float to fill the same prior to starting the trap into operation. Said nipple is closed by a removable plug a^7 .

E designates a counterweight for the cup-float, which is hinged or loosely connected at its upper end to the outer end of a lever E' , which latter is pivoted between its ends to a depending arm or bracket F, herein shown as made integral with the upper removable wall a of the shell. The inner end of said lever is hinged to the connecting-rod C^2 , said lever being forked at its inner end, as shown in Fig. 2, and being attached to said connecting-rod by means of a pivot-pin c^2 , extending through the rod and arms.

The weight E is such as to counterbalance

the weight of the cup-float and the parts which move therewith—that is, the valve-closures and connecting-rod. The cup-float is shown as not filled and the valves are both open. It will of course be understood that when the trap is in operation one valve or the other will be entirely open and the reverse opposite valve closed. The lower or outlet valve is closed for the greater part of the time, however, it being opened only for the purpose of periodically draining the water from the trap.

Prior to starting the trap in operation—that is to say, before steam is admitted to the receptacle from which the condensed water is to be drawn by said trap—the cup-float may be filled with water through the nipple a^6 , so as to insure that the lower valve is closed against the passage of steam directly there-through into the outlet-pipe, which is connected with the lower branch a^3 of the shell. After the steam begins to condense in the receptacle with which the trap is connected the water of condensation flows into the shell, and if the float has not been previously filled fills the same, or if previously filled or after the float has been in any manner filled the water collects in the bottom of the shell in a body until it rises to such level as to lift the float and connected valves—that is to say, until the buoyancy of the body of water is sufficient to overcome the weight of the water contained in the cup-float. After the weight of the water in the cup-float has been slightly overcome the parts are raised quickly by the effect of the weight E , thereby acting to open the lower valve and to close the upper valve. The opening of the lower valve in the manner described permits the water to be drained from the shell into the return-pipe with which the shell is adapted to be connected, and when the water has fallen in said shell below the line of flotation of the cup-float and the connected parts the weight of the water in the cup-float acts to close the lower valve and to open the upper valve. In this way the water of condensation is periodically withdrawn from the shell of the trap without the waste of steam therefrom.

In case the upper valve be dispensed with as a valve it may be replaced by a suitable stop to limit the rising movement of the parts. The provision of the upper valve connected and movable with the lower valves and the float, as herein shown, is, however, of considerable importance, inasmuch as it cuts off the steam from the trap-shell or float-chamber at the time when the lower valve is open, and thereby avoids the danger of a sudden rush of steam from the steam-pipe, radiator, or the like which is being drained from flushing out the trap, with the result of losing more or less steam. Again, the said upper valve cuts off the steam from the trap-shell or float-chamber up to the time that the weight of the water in the cup-float overcomes the buoyant ef-

fect of the body of water in the lower part of the shell. When the upper valve is finally opened, the parts have started their descending movement and there is less time for the steam to rush outwardly through the shell and force the water therefrom than if the steam-space of the receptacle being drained were in constant communication with the shell.

It will be noticed that the trap may be made relatively short and of small diameter, so that it takes up little space, and for this reason it is peculiarly applicable for use in connection with the heating-radiators of steam-heating systems. The trap is also sightly, so that it does not mar the appearance of a room containing a heating device or radiator when adapted to this use.

I claim as my invention—

1. A steam-trap comprising a shell provided with inlet and outlet openings, valves within said casing for closing said openings, a rod contained also within said casing and extending between and directly connecting the movable parts of said valves, whereby, when one of the valves is opened, the other is closed and vice versa, and a float within the shell and attached to said connecting-rod.

2. A steam-trap comprising a shell provided with inlet and outlet openings, valves for closing said openings, a rod connecting the movable parts of said valves, whereby, when one of the valves is opened the other is closed and vice versa, a cup-float within the shell and attached to said stem, a filling-nipple opening into said shell above and adjacent to the upper open end of the cup-float and a closure for said nipple.

3. A steam-trap comprising a shell provided with inlet and outlet openings and with hollow valve-seats in said openings, connected valve-closures adapted to engage, respectively, the seats of the inlet and outlet openings, a cup-float attached to and movable with said valves, and a weight for counterbalancing the weight of the said float and the valves.

4. A steam-trap comprising a shell provided with inlet and outlet openings which latter are provided with valve-seats, valve-closures adapted to engage said seats, a connecting-rod extending between and connecting said valves, an open-topped cup-float supported on the lower valve and surrounding said connecting-rod, and a weight counterbalancing the weight of said float and parts which move therewith.

5. A steam-trap comprising a shell provided with inlet and outlet openings which latter are provided with valve-seats, valve-closures adapted to engage said seats, a connecting-rod extending between and connecting said closures, a cup-float supported on the lower valve and surrounding said stem or connecting-rod, a lever pivoted between its ends to a part stationary with the shell and loosely connected at its inner end with said connect-

ing-rod, and a weight connected with the outer end of said lever and counterbalancing the weight of the cup-float and the parts which move therewith.

5 6. A steam-trap comprising a shell provided with inlet and outlet openings, a valve for closing the outlet-opening, a rod connected therewith, a cup-float attached to said rod, a weight
10 of the float and parts which move therewith, a filling-nipple opening into said shell above and adjacent to the upper open end of the cup-float, and a closure for said nipple.

15 7. A steam-trap comprising a shell provided with top and bottom walls, the top wall of which is detachably connected with the shell, an inlet-passage opening through the top wall, an outlet-passage opening through the bottom
20 wall, a valve for closing said inlet-passage, a rod attached to and extending downwardly from the movable member of said valve, a cup-float carried by said rod, a lever pivoted between its ends to a bracket depending from
25 said top wall of the shell, one end of which lever is pivoted to said rod, and a weight connected with the other end of said lever and

counterbalancing the weight of said float, the rod and said movable part of the valve.

8. A steam-trap comprising a shell provided with top and bottom walls, the top wall of which
30 is detachably connected with the shell, an inlet-passage opening through the top wall, an outlet-passage opening through the bottom wall, a valve for closing said outlet-passage, a rod attached to and extending upwardly from
35 the movable member of said valve, a cup-float carried by said rod, a lever pivoted between its ends to a bracket depending from said top wall of the shell, one end of which lever is pivoted to said rod, and a weight connected
40 with the other end of said lever and counterbalancing the weight of said float, the rod and said movable part of the valve.

In testimony that I claim the foregoing as my invention I affix my signature, in presence
45 of two witnesses, this 23d day of February, A. D. 1904.

CHARLES E. HUXLEY.

Witnesses:

EDWARD JACKSON,
D. K. MORTON.