N. ENGLISH.

STEAM TRAP.

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939,677.

Patented Nov. 9, 1909.

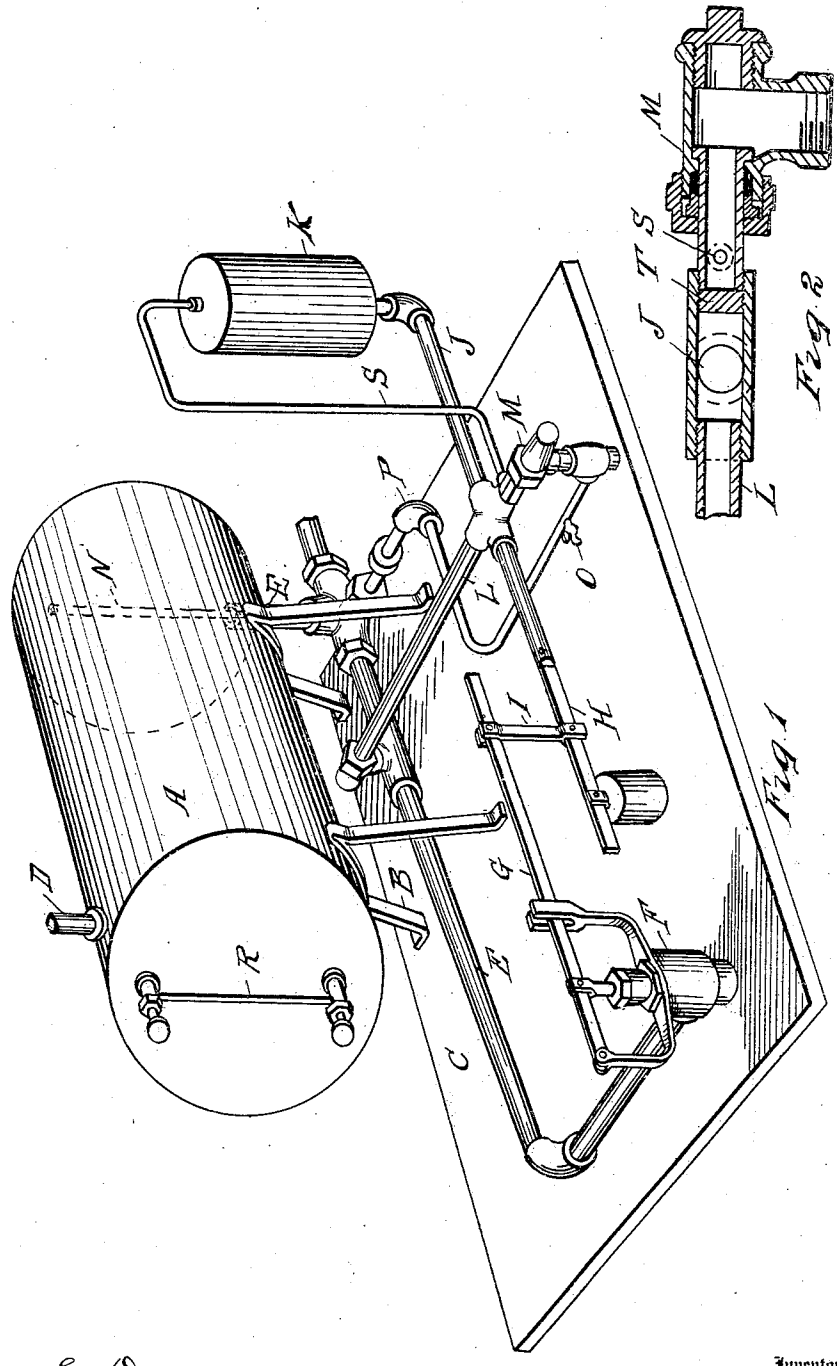

Fig. 1

Fig. 2

Witnesses

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STEAM-TRAP.

939,677. Specification of Letters Patent. Patented Nov. 9, 1909.

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To all whom it may concern:

Be it known that I, NORMAN ENGLISH, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Steam-Traps, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to steam traps, and has for its object an improved device of this type, adapted to rid the steam pipe system of the water of condensation which has accumulated in the steam coils.

While in some respects resembling the operation of the device described and claimed in my application Serial Number 458,327, this device embodies certain modifications, which have been found desirable in the application of the device to certain special uses, such, for instance, as in a plant where more or less sulfurated water is of necessity used for steam purposes, and which has proven in practice to be injurious to, and indeed destructive of, the flexible copper hose employed to connect the fixed and the movable tanks. To obviate this difficulty, it has been necessary not merely to abandon the use of the hose, but also to effect some little reorganization of the parts, due to the fact that other metals are not available as to flexibility for use as substitute materials for the copper.

The present device is fully illustrated in the drawings, in which:—

Figure 1, is a perspective of the entire device. Fig. 2, is a vertical section through the trunnion elbow and vent pipe connection.

A represents the fixed tank, suitably supported on standards B, above the base C. The water of condensation enters the pipes from the coils through the pipe D. The escape pipe E leads from the bottom of the tank, the possible flow therethrough being controlled by the normally closed valve F, whose piston is actuated by the lever G, whose free end is connected by means of the link I, with the weighted lever H, upon whose other end is supported the movable tank K.

Branching from the outlet pipe E, intermediate the tank and valve F, is a trunnion L, which is supported at its outer end, that is, the one farthest from its connection with the outlet E, upon the upright support M. Connected with it, as regards piping, is the branch J of the weighted lever H, through which the water led through the outlet pipe E and the trunnion L, is conducted into the movable tank K.

When water accumulates in the main tank A, above the top of the escape pipe E, it flows therethrough, and fills the same as far as the normally closed valve F, and then passes through the trunnion L and the pipe J into the movable tank K. For a time the counterweight on the lever H is sufficient to counteract the weight of the tank, but when a sufficient quantity of water is accumulated therein to overbalance the pull of the weight, it descends about the axial center of the trunnion L as a pivotal center, and raises the end H of the lever, thereby, through the medium of the link I, raising the lever G and opening the valve F, thus permitting the escape of the confined water. As soon as the quantity of water released becomes sufficient to diminish the quantity in the tank K to such a degree that it no longer overbalances the weight end of the lever H, the tank rises, depressing the lever H, and thereby causing the closure of the valve F. In practice the most successful operation of the device involves not the sharp and radical movement of the tank, and the releasing of all the water of condensation in a quantity, but rather the constant and comparatively slight tilting of the tank K, so that the disk of the valve F is almost constantly unseated, each time releasing a slight quantity of water, without necessitating a diminution in the pressure maintained in the steam system as a whole.

To provide for the venting of the air confined in the tanks A and K, the upright stand pipe N is provided, which rises, preferably concentrically with the upright portion of the outlet pipe, to a point within the tank A above the probable or even possible height to which the water of condensation would rise in the tank A. The portion P of the vent pipe leaves the outlet pipe preferably as indicated, and runs to a vent opening O through which the air escapes, as the space not occupied by water within the tank A is constantly diminished by the rise in the level thereof. Similarly the vent pipe S leading from the top of the movable tank K

extends therefrom to a point in the trunnion, which is at all times separated from the part through which the water flows into the pipe J by the diaphragm or partition T, flowing thence through the hollowed standard M to the vent opening O. The height of the water in the tank A can be read as desired through the medium of the glass R.

What I claim is:—

1. In a steam trap, in combination with a fixed tank, a pipe leading thereinto from the steam coils, an outflow pipe therefrom, a valve controlling the flow therethrough, a trunnion pipe leading from a point in said outflow pipe intermediate the tank and the valve, a movable tank, a pipe extending thereto from connection with the trunnion transversely to the axis thereof, interconnecting link and lever members whereby the valve is held closed when the movable tank is at the upper limit of its travel, and a vent pipe connecting the upper portions of the tanks, its ends being above the possible water level therein and there being an intermediate portion external thereto and to the trunnion through which air expelled from either tank by the rise of water therein may be released into the outside air, substantially as described.

2. In a steam trap, the combination of a fixed tank into which the water of condensation may flow, a movable tank, a discharge pipe leading from the fixed tank, a normally closed valve controlling the flow therethrough, a trunnion connection between the discharge pipe and the movable tank adapted to be rocked on its axis by the weighting of the movable tank due to the accumulation of water therein, vent pipes permitting the permanent escape of air or the flow thereof from one to the other of said tanks as the same are filled with water, and means whereby motion due to the rise and fall of the movable tank is communicated to said valve to cause the opening thereof and the consequent release of the water previously held thereby in the outlet pipe and to thereafter close the valve, substantially as described.

3. In a steam trap, in combination with a fixed tank, an inlet pipe leading thereinto from the steam coils, an outlet pipe therefrom, a trunnion branching from said outlet pipe near its point of connection with the tank, a movable tank, a lever arm supporting the same at one side of the trunnion, a portion of said arm being hollow, whereby the interior of the tank is connected with the trunnion and thereby with the discharge pipe, a valve controlling the flow from the discharge pipe, and interconnecting means between it and the tank, whereby it is held closed when the tank is in raised position, and is opened by the descent of the tank due to its weighting when the water of condensation enters it from the fixed tank.

In testimony whereof, I sign this specification in the presence of two witnesses.

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Witnesses:

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