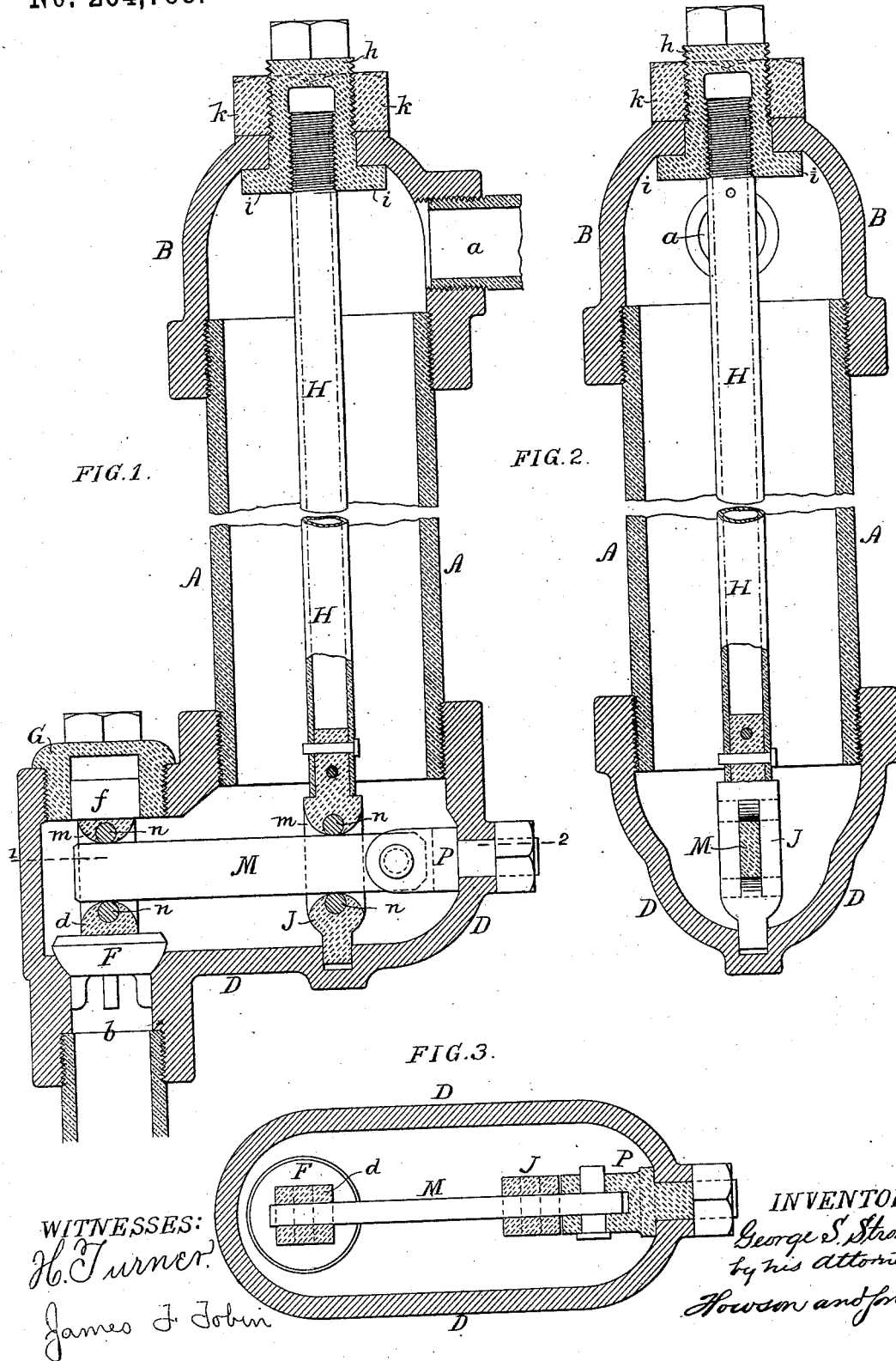


(No Model.)

G. S. STRONG.
STEAM TRAP.

No. 264,788.

Patented Sept. 19, 1882.



UNITED STATES PATENT OFFICE.

GEORGE S. STRONG, OF PHILADELPHIA, PENNSYLVANIA.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 264,788, dated September 19, 1882.

Application filed July 31, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. STRONG, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Steam-Traps, of which the following is a specification.

My invention relates to certain improvements in that class of steam-traps in which the movements of the expansion rod or tube are transmitted to the discharge-valve through the medium of a lever, the objects of my improvements being to simplify the construction of the trap, to increase the sensitiveness of the same, and generally to render it effective in its working.

In the accompanying drawings, Figure 1 is a longitudinal section of my improved steam-trap; Fig. 2, a transverse section; and Fig. 3, a sectional plan on the line 1 2, Fig. 1.

A is the tubular casing of the trap, communicating at the top with an inlet-chamber formed within a cap, B, and at the bottom with a discharge-chamber formed within a laterally-projecting branch, D, the steam-inlet pipe *a* being adapted to a threaded opening in the cap B, and the branch D having a discharge-opening, *b*, to which is adapted a valve, F, the stem *d* of which has at the upper end a piston, *f*, fitted snugly to an opening in a screw-plug, G, on the branch D, the downward pressure on the valve F being thus balanced by the upward pressure on the piston *f*.

H is the expansion-tube, the upper end of which is threaded for adaptation to an internally-threaded opening in a sleeve, *h*, the latter being fitted to a central opening in the top of the cap B, and having a flange, *i*, bearing on the inside of the cap, and an external thread adapted for the reception of a nut, *k*, which bears on the outside of said cap, so that the sleeve is firmly confined thereto.

To the lower end of the tube H is secured a block, J, guided at the lower end in an opening in the branch D, and having a central slot, *m*, for the reception of the lever M, which is hung to the forked head of a bolt, P, secured to the branch D. Extending transversely across the slot *m*, at the top and bottom of the same, are pins *n*, preferably of steel or phosphor-bronze, which fit snugly to the top and bot-

tom of the lever M and form the bearing-surfaces for the same.

The stem *d* of the valve F is constructed in a manner similar to the block J—that is to say, it has a slot, *m*, and transverse pins *n*—the stem being adapted for the reception of the outer end of the lever M.

In setting the trap live steam is admitted to the tube A and the tube H is expanded to its full extent. The screw-sleeve *h* is then turned so as to cause the valve F to bear firmly upon its seat and prevent the escape of steam through the opening *b*, the sleeve being then confined to the cap B by tightening the nut *k*. The tube H being thus secured at its upper end, any contraction of the tube, due to the collection of water of condensation in the trap or to the lowering of the temperature of the steam therein, must cause the operation of the lever M and the opening of the valve F, so as to permit the escape of the water of condensation or steam and the admission to the trap of steam at a higher temperature, which causes the tube H to again expand and close the valve. Extreme sensitiveness is insured by the use of the lever M, whereby the slightest contraction or expansion of the tube H is caused to open or close the valve F. In a trap of this class, however, the connections between the lever and the valve-stem and expansion-tube must be snugly fitting and as free from friction as possible; otherwise they will retard the movement of the parts and render the trap sluggish in its action. For this reason I dispense with the usual pivot-pin joints and adopt the slots and bearing-pins above described, which provide snugly-fitting anti-friction connections. The sensitiveness of the trap is further increased by balancing the valve F, as will be readily understood.

Although I have described an expansion device consisting of a tube, H, I consider a rod to be the equivalent of the tube, although the latter is preferred as being more sensitive than a rod.

The driving of the pins *n* transversely through the slots *m* of the valve-stem and block J, or the embedding of said pins in the stem or block during the casting of the same, I consider the most economical and effective

means of providing the said stem or block with hardened bearings for the lever M; but the pins *n* may in some cases be dispensed with, the metal at the top and bottom of each slot being chilled or otherwise hardened.

I claim as my invention—

1. The combination of the lever M with a valve stem or block, J, having a slot, *m*, with transverse bearing-pins *n*, as set forth.
2. The combination of the casing of the trap, the expansion-tube H and its slotted block J, the balanced valve F, having a slotted stem, *d*, and the lever M, adapted to the slots of the valve-stem and block J, as set forth.

3. The combination of the casing of the trap, the expansion-tube H, threaded at the upper end, the nut *k*, and the flanged sleeve *h*, having an internal thread adapted to that on the tube H, and an external thread for the reception of the nut *k*, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE S. STRONG.

Witnesses:

JAMES F. TOBIN,
HARRY SMITH.