D. SAUNDERS imp't. in STEAM TRAPS.

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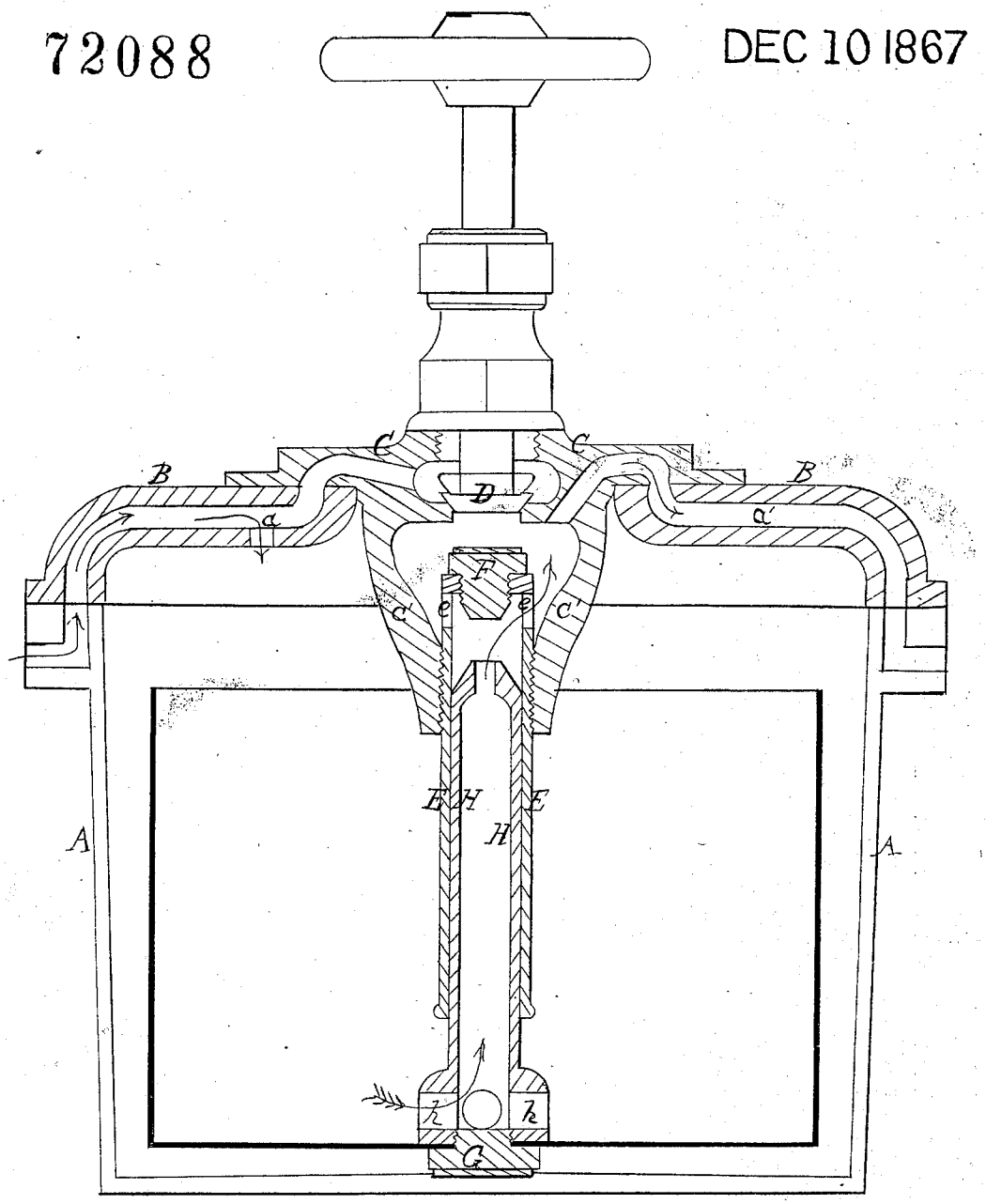

Witnesses.

O. C. Dey

C. C. Livings

Signature.

D. Saunders.

United States Patent Office.

DAVID SAUNDERS, OF BROOKLYN, NEW YORK, ASSIGNOR TO JOSEPH NASON & CO., OF NEW YORK CITY.

Letters Patent No. 72,088, *dated December* 10, 1867.

IMPROVEMENT IN STEAM-TRAPS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, DAVID SAUNDERS, of the city of Brooklyn, in the county of Kings, and State of New York, have invented certain new and useful Improvements in Steam-Traps, by which I mean devices for allowing the water of condensation or other water to escape from steam-pipes or other steam-containing vessels without allowing the escape of the steam; and I do hereby declare that the following is a full and exact description thereof.

I will first describe what I consider the best means of carrying out my invention, and will afterwards designate the points which I believe to be new.

The accompanying drawing forms a part of this specification, and is a central vertical section of the steam-trap in the open condition, that is to say, the condition in which the water is being discharged from the trap.

A is the main casing, B is the main cover of the steam-trap, and C is a supplementary cover, which carries most of the parts which it is necessary to occasionally remove and adjust or repair. The fact that the part C is made separate from the part B, allows the removal of those parts without removing the entire cover. D is a valve, operated by a hand-wheel above, as represented, by raising which into the position indicated in outline, the steam is allowed to blow through, when desired, in order to clear the passages, or for any other purpose. When the apparatus is in action, this valve is closed tightly, as indicated in the shaded part. The portion C′ which extends down from the central supplementary cover C is threaded on its interior, and receives the fixed tube E, which is open at the lower end, and carries a solid plug, F, at its upper end. There are holes, *e*, through which the water may flow freely from the interior of this tube E into the escape-passage, whenever the rising and floating part drops down. G is a floating-cock, of thin brass or other suitable material, firmly secured to the interior of the tube H, provided with holes *h* at the base, as represented. The upper end of this tube H is adapted to fit tightly against the plug F, before described, whenever this floating part and its connections are elevated to their highest position. The parts G H are fixed firmly together, but are free to move up and down easily in the tube E.

It will be observed that these tubes E and H correspond to the tubes, one within the other, employed in the ordinary construction of steam-traps, but that their position is reversed. In the ordinary steam-traps, the interior tube projects downward from above, and the exterior tube extends upward from the floating part. In the ordinary arrangement, the point of tight contact, which stops the interior tube when the floating part is up, is near the base of the steam-trap, where it is liable to be clogged with dirt. In its improved form it is at such an elevation that dirt will not accumulate upon it.

The steam and water enter through the hole *a*, having arrived there through the channel indicated by arrows, it being understood that this steam-trap is placed lower than the steam-pipes or other steam-containing vessels, which it is intended to drain. After the water has flowed over the upper edge of the floating part G in sufficient quantity, it accumulates within the casing A to a sufficient height to float the latter, except when it is nearly filled with water. The friction of the exterior of the pipe H against the interior of the pipe E being so slight that it may be overcome by the alternate changes in the weight or buoyancy of the floating part G and its connections, the whole is alternately raised and depressed, and causes the steam-trap to discharge the water at intervals. When the water accumulates in the floating part G, and loads it to a sufficient extent, it sinks into the position indicated in the figure. In this position the pressure of the steam entering from the passage *a* and filling the steam-trap, acts on the surface of the water contained, and forces it in through the holes *h*, and up through the pipes H, and out through the holes *e*, and ultimately discharges it from the passage *a′* into the atmosphere, or into some vessel at a lower pressure than that of the vessel which is being drained. So soon as this discharge of the water has lowered the level of the water in the floating part G to a sufficient extent, the floating part G and its connections rise in consequence of its increased buoyancy, and the upper end of the pipe H now fits tightly against the base of the plug F, and prevents any further escape. The apparatus remains in this condition until the influx of water through the hole *a* again loads the floating part G to a sufficient extent to again cause it to sink, when the discharging operation is again repeated.

By mounting the interior and exterior pipes E and H in the positions and relations represented, which is

the reverse of their positions in ordinary steam-traps, I am able to manufacture the pipes with more facility than usual. I can elevate the point of contact or of stoppage of the interior pipe to a considerable height above the base of the apparatus without thus reversing the position, and such elevation would realize a part of the advantages of my invention; but I much prefer the reversed position described.

Some of the advantages due to certain features of my invention may be separately enumerated, as follows:

First, by reason of the fact that the centre C of the cover is made separate from the main body of the cover, with the connections arranged as represented, I am able to remove the vital parts of the apparatus without breaking the joints at the connection of the main cover B with the main case A, and consequently with less labor and expense, and with less chance of inducing leakage.

Second, by reason of the fact that the stopping point between the interior pipe H and the plug F is elevated instead of being at the base of the apparatus, the risk of its being clogged with dirt is very materially lessened.

Third, by reason of the reversed arrangement of the interior tube H and of the exterior tube E, I am able to manufacture the apparatus cheaper, as will be obvious to those familiar with the manufacture.

Having now fully described my invention, what I claim as new in steam-traps, and desire to secure by Letters Patent, is as follows:

1. I claim the arrangement of the central part C of the cover and main cover B, substantially as herein set forth.

2. I claim the arrangement of the stop-joint between the floating part and the fixed part of the apparatus, whereby to avoid the clogging by accumulations of dirt, as specified.

3. I claim the arrangement of the tubes E and H, the tube H being mounted upon the floating part, substantially as herein specified.

D. SAUNDERS.

Witnesses:
W. C. DEY,
C. C. LIVINGS.