

T. B. & S. S. DAVIS.
Steam-Trap.

No. 218,941.

Patented Aug. 26, 1879.

Fig. 1.

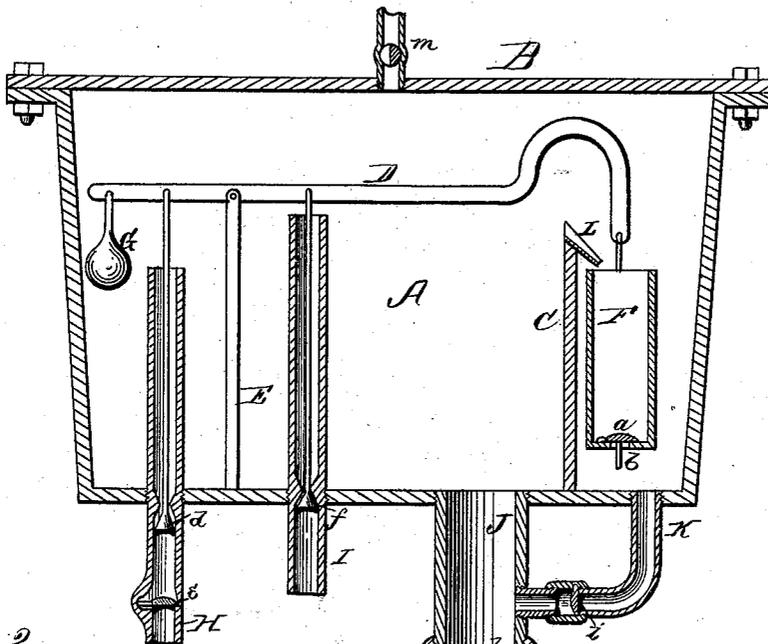
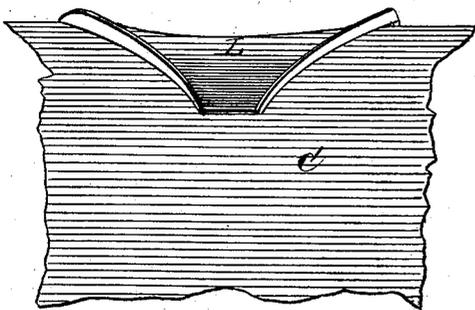


Fig. 2.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN STEAM-TRAPS.

Specification forming part of Letters Patent No. **218,941**, dated August 26, 1879; application filed July 16, 1879.

To all whom it may concern:

Be it known that we, THOS. B. DAVIS and SAML. S. DAVIS, of Rock Island, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Steam-Traps; and we do hereby declare that the following is a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

The nature of our invention consists in the construction and arrangement of an automatic steam-trap for returning the water from steam-coils back to the boiler whether the water-level in the boiler is higher than the coils or not, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which our invention appertains to make and use the same, we will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a central vertical section of our trap; and Fig. 2 is a detail view of the partition C.

A represents a cast-iron chest, of any suitable dimensions, provided with a steam-tight cover, B, and an interior partition, C, of proper height.

E is a standard in the chest, in the upper end of which is pivoted a lever, D, the long arm of said lever being curved, as shown, and extending over the partition C, with a bucket or vessel, F, suspended from the end. In the bottom of this vessel is a valve, *a*, opening upward and provided with a downwardly-projecting stem, *b*, which, when the vessel descends, strikes the bottom of the chest and opens the valve *a*.

From the smaller arm of the lever D is suspended a weight, G, sufficiently heavy to overbalance the vessel F when empty.

H is the return-pipe from the reservoir, provided with a check-valve, *e*, and above the same with a valve, *d*, the stem of which connects with the lever D, between the fulcrum of the lever and the weight G. On the opposite side of the fulcrum from this valve-stem to the lever D is connected the stem of a valve, *f*, which is located in the steam-pipe I from the boiler. Both the valves *d* and *f* open down-

ward, and their respective pipes H and I extend a suitable height in the chest A.

J is the water-pipe to the boiler, in which pipe is a check-valve, *h*. The pipe J opens in the bottom of the chest on one side of the partition C. On the other side of said partition, below the vessel F, is another pipe, K, leading into the pipe J above the valve *h*, and said pipe K is also provided with a check-valve, *i*.

The partition C is provided with a flange or spout, L, at the top, which extends over the side of the vessel F.

A steam-tight reservoir is to be located below the level of the heating-coils and the steam-pipes and the condensed steam drain into this reservoir. The trap is to be set three or four feet above the level of water in the boiler.

The back-pressure, together with the vacuum formed in the trap by the condensing steam, raises the water from the reservoir up into the trap through the check-valve *e* in the pipe H and the valve *d*, it being understood that as long as the vessel F is empty the weight G and pressure of steam on the valve *f* keeps the valve *d* open and the valve *f* closed until the water is sufficiently high to run over the flange L on the partition C into the vessel F, and until the weight of said vessel is sufficient to overcome the pressure of steam against the valve *f*, when the vessel F will fall, which opens the valve *f* and closes the valve *d*, shutting off the water from the reservoir. The steam rushes in through the valve *f* until the pressure on the trap is equal to that on the boiler, when the weight of water in the trap will open the check-valves *h i* in the pipes J K from both sides of the partition C. The valve *a* in the bottom of the vessel F opens when said vessel descends to the bottom of trap.

The water will now run from the trap down into the boiler until it has all run out of the trap and the vessel F, when the weight G will overbalance the empty vessel F and raise the same and set the trap as before, and the steam-pressure from the boiler will close the check-valve *h* in the pipe J.

In the top B of the trap is an automatic air-vent, *m*, which assists in letting the pressure off the trap, and then the condensing steam, forming a partial vacuum until the pressure on the trap gets below the back-pressure on the

reservoir, causes the water to rise and open the check-valve and fill the trap, when it will act as before.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an automatic steam-trap, the chest A, having interior partition C and pivoted lever D, one end of said lever having a vessel, F, suspended from it on one side of the partition, and the other end having a weight, G, and the water and steam-valves connected to it on the other side of the partition, all substantially as and for the purposes herein set forth.

2. In an automatic steam-trap, the combination of the pipe H from the reservoir, having valves *d e*, the steam-pipe I from the boiler, having valve *f*, and the pivoted lever D with

vessel F and weight G, substantially as and for the purposes herein set forth.

3. In a steam-trap, the combination, with the chest A, having partition C, of the water-pipes J K, provided, respectively, with the check-valves *h i*, for the purpose described.

4. In a steam-trap, the valve *a*, with stem *b*, in the bottom of the vessel F, for the purpose described.

In testimony that we claim the foregoing as our own we affix our signatures in presence of two witnesses.

THOMAS BODLEY DAVIS.
SAMUEL SHARPE DAVIS.

Witnesses:

DENT YATES,
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