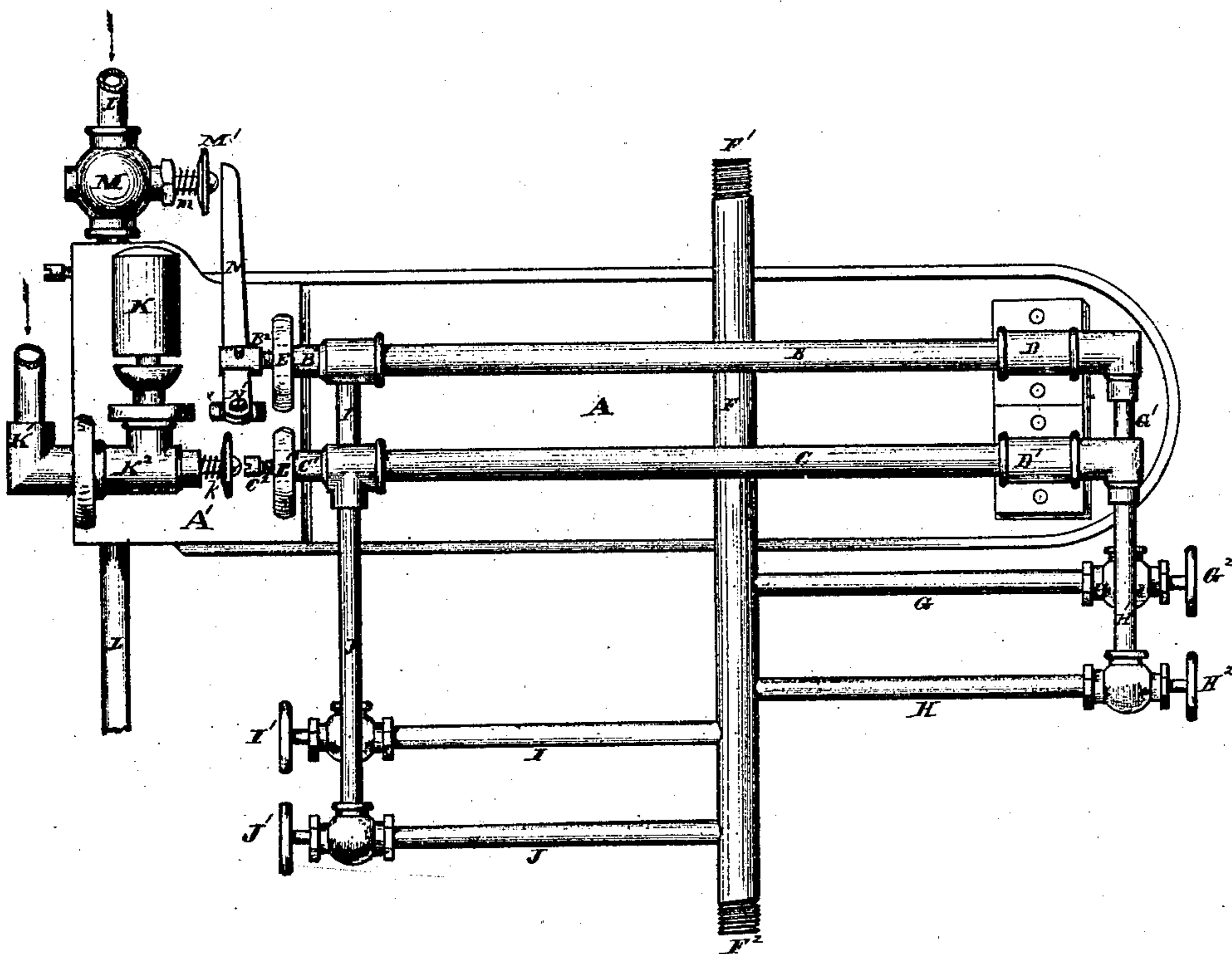


J. L. Starkey,

Steam Boiler Feeder.

No. 109,149.

Patented Nov. 8. 1870.



Witnesses

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JOHN L. STARKEY, OF WORCESTER, MASSACHUSETTS.

Letters Patent No. 109,149, dated November 8, 1870.

IMPROVEMENT IN BOILER-FEEDERS AND LOW-WATER DETECTORS.

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, JOHN L. STARKEY, of the city and county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Boiler-Feeders and Low-water Detectors; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, which represents a front view of my improved boiler-feeder and low-water detector.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it more in detail.

The nature of my invention consists in an improved boiler-feeder and low-water detector, the parts of which are constructed and combined as hereinafter explained.

The part marked A in the drawing represents the bed-plate, which is to be secured to the boiler, or to some suitable support adjacent thereto, as most convenient.

Upon the front of the bed A are arranged two parallel horizontal pipes, B and C, which are firmly secured at one end in couplings D D', attached to the bed A, while their other ends B' and C' are supported loosely in the bearings E E' on the head-piece A' of the bed.

A vertical pipe, F, is arranged across the bed A, the upper end of which, F¹, is connected with the boiler, to admit steam, and the lower end, F², is connected with the boiler below the water-level, to admit water, so that the water in the pipe F will stand at the same level as the water in the boiler.

Branch pipes G and H project horizontally from the vertical pipe F, and are joined to the ends of the pipes B and C, at the couplings D D', by vertical lengths G¹ H¹, as shown.

The ends B' C' of the pipes B C are also connected to the vertical pipe F by the branches I and J, which latter form their junction with the pipe F, at some distance below the junction of the branch H.

Stop-cocks G², H², I¹, and J' are arranged on the branches G, H, I, and J, so that either of them can be shut off when desired. The ends B' and C' of the pipes B and C are closed, and each is provided with an adjusting-screw, as indicated.

Supported on the head-block A' of the bed A is an alarm-whistle, K, connected with the boiler by the pipe K¹, through which it is supplied with steam.

Below the whistle is arranged a spring stop-valve, K², the spindle of which projects outward toward the screw C², by means of which the valve is operated.

The pipe L from the boiler to the water-supply pump is also supported on the head-block A', and is provided with a spring stop-valve, M, the spindle M' of which is acted upon by the lever N, one end of

said lever N is fulcrumed at N' upon a projecting portion of the head-block, while its other end extends up past the valve-spindle M', as shown in the drawing.

The lever N passes through and is pivoted in the slotted head of the screw B² in the end of the horizontal pipe B.

The instrument should be set at such a height that the water-line in the boiler will be level with the branch-pipe G.

The operation is as follows:

Should the water fall below the level of the branch G, the steam passes through said branch into the horizontal pipe B, which is caused to expand by the increased heat, and it being firmly secured at the coupling D, the whole force of expansion acts at the end B', and throws forward the lever N against the valve-spindle M', thereby opening the valve M, and letting on the steam, which sets the pump into operation. The pump continues to operate until the water in the boiler rises above the level of the branch-pipe G, thereby shutting the steam out of said branch.

The steam in the pipe B then condenses, forming a vacuum, whereby the water is drawn up into said pipe, which is immediately cooled, and, consequently, contracts and draws back the lever N from the valve-spindle M'. The lever M is then closed by the force of the steam on the back of the valve, and the coiled spring *m* on the valve-spindle, thus stopping the pump, and discontinuing the supply of water until it again falls below the level of the branch G, when the operation is repeated.

Should the feeder or pump, from any cause, refuse to operate, and the water in the boiler fall below the level of the branch-pipe H, which is placed at the safe low-water line, the steam will enter the pipe C, and in a similar manner cause it to expand and open the valve K² and sound the alarm-whistle K, which will continue to sound until the boiler is supplied with water, or the pressure of steam exhausted, when the cooling and contracting of the pipe C relieves the pressure on the valve-spindle, and the valve closes by the action of the steam and the coiled spring *k*.

By arranging the valves K² and M, so that the pressure of the steam, is exerted on the back of the valve, they are rendered much more sure in their action, and the closing springs *m* and *k* can be made much lighter.

The action of the expanding pipes B and C upon the valves can be easily regulated by turning in or out the adjusting-screws B² and C², first removing the lever N from the head of the screw B².

By arranging the valve M in the position shown, it is brought into close proximity to the boiler, so that the steam has no chance to condense and fill the pipe

L with water, as is the case where a long line of pipe is required for the pump, and the valve is arranged near the pump in the ordinary manner.

The water necessarily has to be forced out through the steam-cylinder of the pump, and often causes much annoyance by retarding the action of the pump.

It will be observed that by closing the cocks G² and I¹, the low-water alarm can be used without the feeder, or by closing the cocks H² and J¹, the feeder can alone be used.

Having thus described my improved steam-boiler feeder and low-water detector,

What I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The relative arrangement of the valve M in the pump-pipe L, with the lever N and expanding-pipe

B, whereby the action of the lever is brought directly upon the spindle M' of the valve, and the valve is placed in close proximity to the boiler, substantially as and for the purposes herein set forth.

2. The combination, with the expanding-pipes B and C, of the vertical pipe F and branch-pipes G, H, I, and J, and their stop-cocks, substantially as and for the purposes set forth.

3. A boiler-feeder and low-water detector, the parts of which are constructed and combined substantially as shown and described.

J. L. STARKEY.

Witnesses:

THOS. H. DODGE,
A. E. PEIRCE.