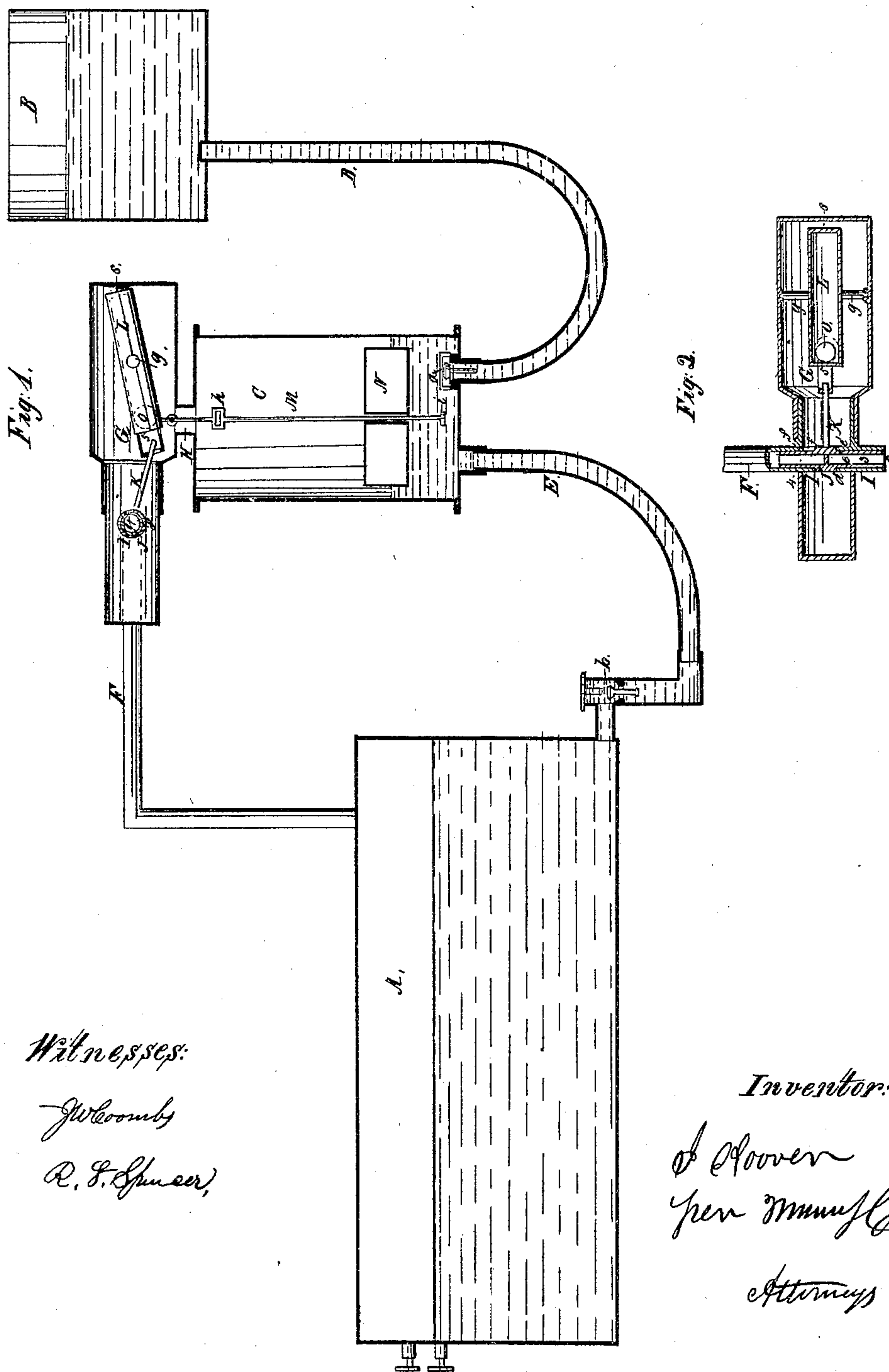


J. HOOVER.  
AUTOMATIC BOILER FEEDER.

No. 32,995.

Patented Aug. 6, 1861.



Witnesses:

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# UNITED STATES PATENT OFFICE.

JAMES HOOVER, OF LEWISBURG, OHIO.

## IMPROVED AUTOMATIC BOILER-FEEDER.

Specification forming part of Letters Patent No. 32,995, dated August 6, 1861.

*To all whom it may concern:*

Be it known that I, JAMES HOOVER, of Lewisburg, in the county of Preble and State of Ohio, have invented a new and useful Improvement in Automatic Feeders for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view of the apparatus, representing it applied to a steam-boiler. Fig. 2 is a horizontal section of a portion of the apparatus.

Similar letters of reference indicate corresponding parts in both figures.

This invention relates to that description of automatic boiler-feeder which consists of a vessel interposed between the boiler and reservoir and furnished with a system of valves which are in part so actuated by a float within the said vessel as first to open the said vessel to the reservoir and to the atmosphere while its communication with the boiler is closed, and afterward to close it to the reservoir and to the atmosphere while its communication with the boiler, both above and below the water-line, is opened, thereby causing the water to run first from the reservoir to the said vessel and afterward from the said vessel to the boiler by gravitation, such operation only taking place while the water in the boiler is below the desired level.

The improvement consists in a novel system of devices through which the float is made to actuate the steam and air valves.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the boiler.

B is the elevated reservoir.

C is the feeding-vessel, made strong enough to bear the highest pressure of steam that will be carried by the boiler, having its bottom very little below the highest level to which it is intended the water shall rise in the boiler. This vessel is connected at its bottom with the reservoir by a pipe, D, and with the lower part of the boiler by a pipe, E. The pipe D is fitted at its connection with the feeding-vessel C with a puppet-valve, *a*, opening upward, and the pipe E is fitted at its connection with the boiler with a check-valve, *b*.

F is a steam-pipe connecting the upper part of the boiler with a close chamber, G, which is connected by a pipe, H, with the top of the feeding-vessel.

I is the socket of a double cock extending right through the chamber G, as shown in Fig. 2, which represents a horizontal section of the said chamber, one end of said socket having the steam-pipe F connected with it and the other opening at *c*, Fig. 2, to the atmosphere. J is the plug of the said cock, hollow, but having a transverse partition, *d*, (see Fig. 2,) which makes it constitute two valves, 3 and 4, the latter of which has a port, *f*, for opening communication between the steam-pipe F and chamber G, and the former of which has a port, *e*, for opening communication between the chamber G and the atmosphere, two corresponding ports, *e'* and *f'*, being provided in the socket I, and the several ports being so arranged that when the said chamber is in communication with the steam-pipe it is out of communication with the atmosphere, and vice versa, but that a small turning movement of the plug J in the socket will be sufficient to open either communication and close the other.

K is a lever attached to the plug J for turning it, said lever being arranged within the chamber G and connected with one arm of a hollow rocker, L, provided with horizontal trunnions *g g*, fitted to bearings within the chamber G. This rocker has suspended from it a light rod, M, which passes down through the pipe H into the feeding-vessel C, and on which are two shoulders, *h* and *i*, between which the float N is fitted to the rod to slide freely up and down it, the said float resting upon the water in the said vessel. The hollow rocker L contains a ball, O, which rolls from one end to the other as the said rocker inclines in one or the other direction.

The operation of the apparatus is as follows: When the steam-valve 4 is closed and the valve 3 open, the pressure of steam in the boiler closes check-valve *b* and the head of water in the reservoir B opens the valve *a*, and the water flows from the reservoir into the feeding-vessel C and carries up the float N till the latter comes in contact with the collar *h* and raises the rod M high enough to move the rocker L past a horizontal position, when the ball O rolls from the end 5 next the



lever K to the opposite end, 6, thereof, and by its weight suddenly carries down the latter end and raises the other end and the lever K, and so moves the valves 3 and 4 to the position in which the valve 3 is closed and that 4 is open, when steam enters the feeding-vessel C and subjects the water therein to the same pressure as that in the boiler, and consequently the valve *a* is closed by such pressure, and the weight of the water in C opens the check-valve and the said water flows into the boiler, causing the float to descend until it has come in contact with the shoulder *i* on the rod M and depressed the said rod so much as to bring the end 5 of the rocker L to a position lower than the end 6. The ball O then rolls down the rocker toward the end 5, and suddenly carries down that end and the lever K and causes the valve 4 to be closed and the valve 3 to be opened, thus shutting off steam from the feeding-vessel and opening it to the atmosphere. The pressure of the water in the reservoir then opens the valve *a* and the feeding-vessel fills again to repeat the feeding operation. The water in the feeding-vessel can never fall below the level in the boiler, and consequently, while the level in the boiler is so high that the level in the feeding-vessel cannot fall low enough for the float to strike the shoulder *i*, the steam-valve

4 cannot be closed or the air-valve 3 opened, and hence the pressure of steam keeps the valve *a* closed and stops the operation of the apparatus.

It will be observed that the chamber G is always in communication with the feeding-vessel, and hence may be considered as a part of said vessel, or may be dispensed with by arranging the valves 3 and 4 and the rocker L within the feeding-vessel itself.

I do not claim, broadly, an automatic boiler-feeder consisting of a vessel interposed between the boiler and a water-reservoir and fitted with valves, and a float so applied as to cause the said vessel to be alternately filled from the reservoir and discharged into the boiler; but

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

The employment, in connection with a boiler, reservoir, and feeding-vessel constructed substantially as shown, of the oscillating hollow rocker L and self-adjusting weight O, in combination with the float N, lever K, and valves 3 4, all in the manner and for the purpose herein shown and described.

JAS. HOOVER.

Witnesses:

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