S. S. & T. B. DAVIS.

Automatic Feed for Boilers.

No. 217,346. Patented July 8, 1879.

Fig. 1.

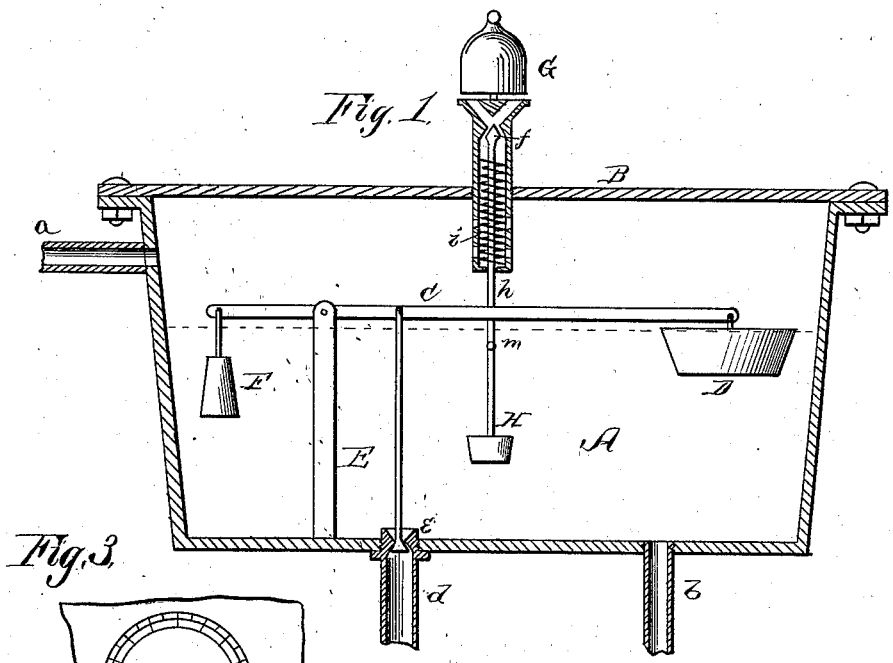


Fig. 3.

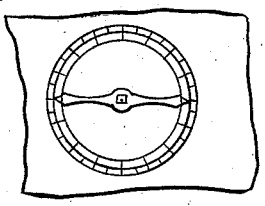


Fig. 2.

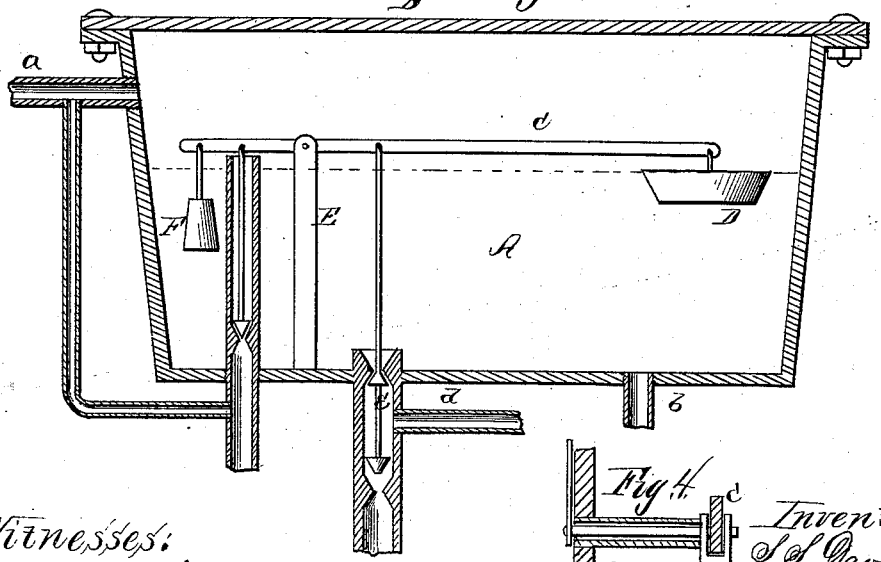
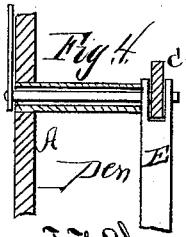


Fig. 4.



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UNITED STATES PATENT OFFICE.

SAMUEL S. DAVIS AND THOMAS B. DAVIS, OF ROCK ISLAND, ILLINOIS.

IMPROVEMENT IN AUTOMATIC FEED FOR BOILERS.

Specification forming part of Letters Patent No. **217,346**, dated July 8, 1879; application filed May 22, 1879.

To all whom it may concern:

Be it known that we, SAML. S. DAVIS and THOS. B. DAVIS, of Rock Island, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Automatic Feed, Low-Water Alarm, and Gage for Boilers; and we do hereby declare that the following is a full, clear, and exact description thereof, 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 water-feeder for low-pressure boilers with low-water alarm, 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 through the chest. Fig. 2 is a modification used for high-pressure boilers; and Figs. 3 and 4 are details of the gage.

A represents a cast-iron chest containing the working parts, and provided with a top, B, bolted on, so that said working parts can be easily reached. The chest A is to be placed alongside of the boiler and just at the height of the water-line therein, and it is to be connected by a pipe, *a*, with the steam-space of the boiler, and by a pipe, *b*, with the water-space below the water-line of the boiler, so that the water will always be on the same level in the boiler and in the feeder, as the steam-pressure is the same in both. *d* is a pipe connecting the chest with the tank or water-works.

Within the chest A is a post, E, forming the fulcrum for the lever C, said lever passing through and pivoted in the upper end thereof. To the long end of the lever C is suspended a copper vessel, D, which is open at the top and remains full of water. To the other end of the lever is attached a weight, F, which is just heavy enough to overbalance the vessel D when the same is submerged in the water. In the supply-pipe *d* is a valve, *e*, which opens downward and has its stem connected to the lever C.

As the water falls in the boiler, as it is converted into steam, the water falls correspondingly in the feeder, and as it does so it leaves the vessel D above the water in the feeder, and by the greater leverage of this end of the lever C it will overcome the weight F and cause the valve *e* to open. The pressure from the tank or works being greater than the pressure in the boiler or feeder will cause the water to rush into the feeder and thence into the boiler until the water floats the vessel D high enough to close the valve *e*. Instead of the vessel D a float of any suitable material may be used.

G is the alarm-whistle, screwed through the lid B, and is removed with the lid when the same is taken off. In the whistle G is a valve, *f*, provided with a stem, *h*, having a copper vessel, H, suspended from its lower end. The valve *h* is held up against its seat by means of a spring, *i*, strong enough to do so when the vessel H is submerged.

On the valve-stem *h* is a collar or pin, *m*, which extends under the lever C. When the water in the feeder falls below a certain point the lever C will rest on said pin or collar and open the valve *f*, so as to let the steam pass out and sound the alarm. If at any time the lever should fail to act and the water falls below the vessel H, the weight of the water in said vessel will open the valve and cause the alarm to be sounded.

For high-pressure boilers the same device may be used with the following additions: The valve *e* should be double-seated, closing both up and down, and the water-supply from the pump should be connected between the two valve-seats. Another pipe with valve also connects with the pump, and a third pipe also connects with the pump, this latter pipe furnishing steam enough to cause the pump to work slowly. The other pipe with valve is only brought in use when the water falls below the valve-seat therein, when the valve opens and furnishes a greater supply of steam to the pump.

For horizontal or upright boilers a water-gage may also be connected to the mechanism

by making the fulcrum fast to the lever C and causing said fulcrum to pass out through a pipe in the shell of the boiler. A hand or pointer is then attached to the outer end thereof, to show on a dial the state of the water.

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

1. The whistle G, valve *f*, with spring *i*, stem *h*, and collar *m*, in combination with the lever C of the low-water mechanism, as and for the purposes herein set forth.

2. An automatic feed and water gage for boilers, consisting essentially of chest A, provided with pipes *a b d*, post E, lever C, weight F, vessels D H, valve *f*, stem *h*, collar *m*, spring *i*, and whistle G, all arranged to operate substantially as herein set forth.

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

SAML. S. DAVIS.
THOMAS B. DAVIS.

Witnesses:
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