

DANIEL VAUGHAN.

Improvement in Automatic Boiler Feeder.

No. 124,921. Patented March 26, 1872.

Fig. 2

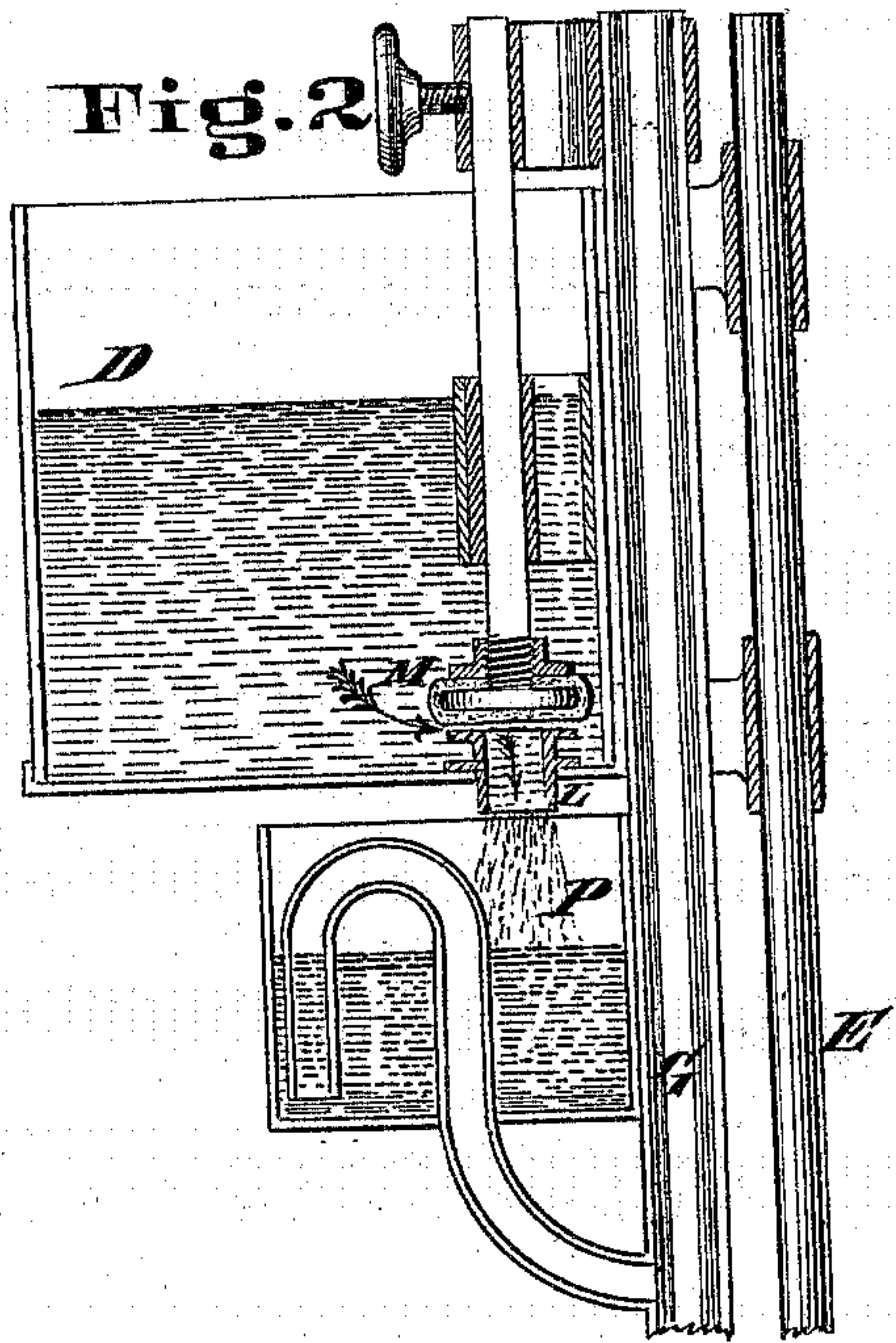
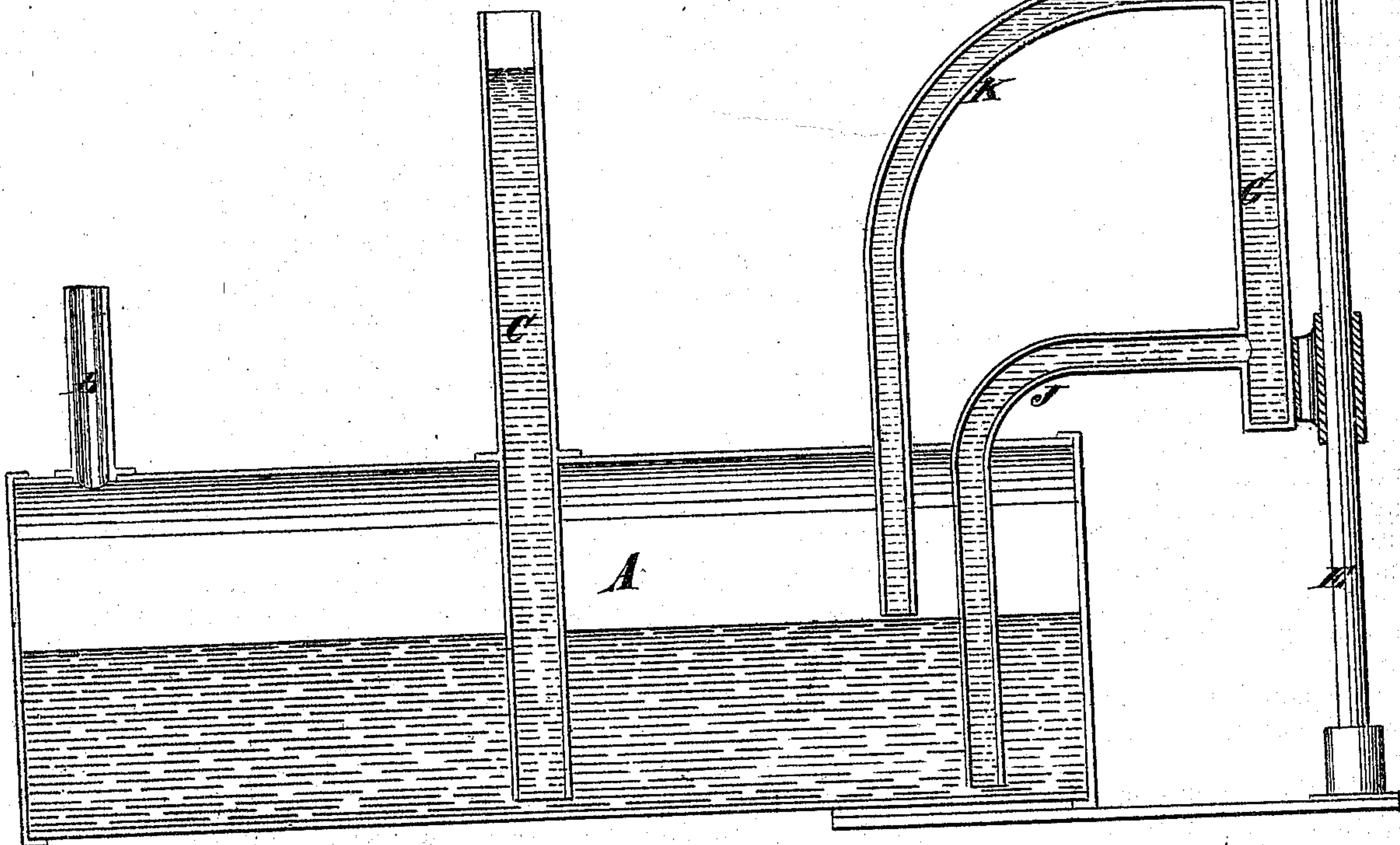
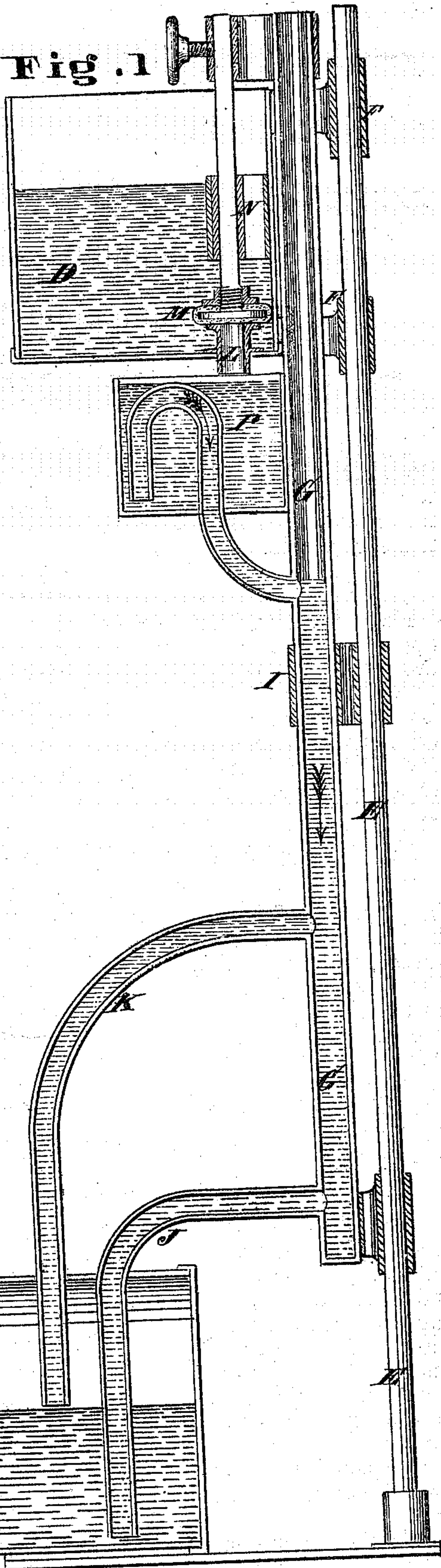


Fig. 1



Attest

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UNITED STATES PATENT OFFICE.

DANIEL VAUGHAN, OF CINCINNATI, OHIO, ASSIGNOR TO HIMSELF, AUGUSTINE L. HELM, AND JOHN B. MAHONEY, OF SAME PLACE.

IMPROVEMENT IN AUTOMATIC BOILER-FEEDERS.

Specification forming part of Letters Patent No. 124,921, dated March 26, 1872; antedated March 6, 1872.

I, DANIEL VAUGHAN, of Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Automatic Boiler-Feeders, of which the following is a specification:

Nature and Objects of Invention.

My invention relates to the class of feeding apparatus which are adapted to feed by hydrostatic pressure only; and consists in the provision, in connection with the feeding-reservoir and boiler, of an expansion-tube carrying a valve governing the flow from the reservoir, and a siphon-vessel or "Tantalus' cup," to govern the amount of water fed to the boiler at each operation of the feed.

Description of the Accompanying Drawing.

Figure 1 is a vertical section of a steam-boiler and feeding apparatus embodying my invention, the figure representing the "Tantalus' cup" discharging water into the boiler. Fig. 2 is a vertical section of the same apparatus, with the parts in such a position that the reservoir is discharging water into the "Tantalus' cup," the expansion-tube having lengthened and opened the valve, owing to the occurrence of low water in the boiler, and the consequent flow of steam into the expansion-tube.

General Description.

The boiler A, shown in Fig. 1, is one specially designed for use under moderate pressure for such purposes as heating buildings. It is provided with a pipe, B, to convey steam to heating apparatus, or for other purposes. It may also be fitted with a safety-tube, C, which ends at the lower part near the bottom of the boiler, and projects to a sufficient height above the boiler to enable a hydrostatic column contained therein to balance the required working pressure and act, at the same time, to prevent the accumulation of an excessive pressure.

D is the supply-reservoir, supported rigidly on the column E by means of brackets F, or other suitable device. An expansion-tube, G, is rigidly secured at H to the column E, or other stationary object, and fitted to slide through the guide I when in the act of ex-

panding or contracting. This tube communicates with the boiler by curved pipes J K, the former ending near the bottom of the boiler, and the latter at the required water-line of the boiler. At the bottom of the vessel D a discharge-pipe, L, is fitted, whose upper end forms a valve-seat for the governing-valve M. The valve M is faced with leather or rubber, and slides through the support N. It is adjustably connected at the upper end to the top of the expansion-tube G, by which it is operated. Below the pipe L is a small vessel, P, with a siphon like the "cup of Tantalus" used for philosophical experiments, the lower end of the siphon being inserted into the expansion-tube G.

Operation.

When the water in the boiler sinks below the pipe K, a large portion of the generated steam passes through the tube K into the expansion-tube G, and the latter, being expanded by the resulting heat, opens the valve and permits the water to fall into the siphoned vessel or "Tantalus' cup." As the latter fills to a certain point, its contents are discharged, by the action of the siphon, into the expansion-tube G and the boiler. The fluid thus passing into the boiler cools the main tube G, and the consequent contraction of the metal closing the valve cuts off for a time the supply of water. The water continues to flow, however, from the cup P, owing to the action of the siphon, until this cup is discharged sufficiently to expose the short end of the siphon. In this way a certain quantity of water is discharged into the boiler at each operation of the feeding apparatus, and the irregularities that may, under differing temperatures of feed-water or steam, occur in the time required to expand or contract the tube G, do not interfere materially with the amount of water fed. If the main tube cannot conveniently be given sufficient length for efficient action, it should be made to open and close the valve through the medium of a lever of the third kind, or by some other means of augmenting the range of the movement at the expense of power. If it is required to feed the boiler from a hydrant instead of a reservoir, the chamber D should be closed at the top, and be in permanent com-

munication with the hydrant by means of a pipe, while the valve-stem should enter chamber D through an air-tight socket or stuffing-box. The valve M may be of the "puppet" description shown, or a slide-valve, or even a common faucet. It should be so adjusted that it is closed water-tight when the expansion-tube G is not occupied by steam. The tube J, if the tube K is made large enough, may, in some cases, be dispensed with, although the operation of the apparatus with this change would be less efficient.

Claim.

An apparatus for feeding steam-boilers au-

tomatically with water, combining in its construction an expansion-tube, G, water-reservoir D, valve M, and siphon-cup P, the whole being adapted to operate in the described connection with the boiler, substantially in the manner specified.

In testimony of which invention I hereunto set my hand.

DANIEL VAUGHAN.

Witnesses:

FRANK MILLWARD,
JOHN B. MAHONEY.