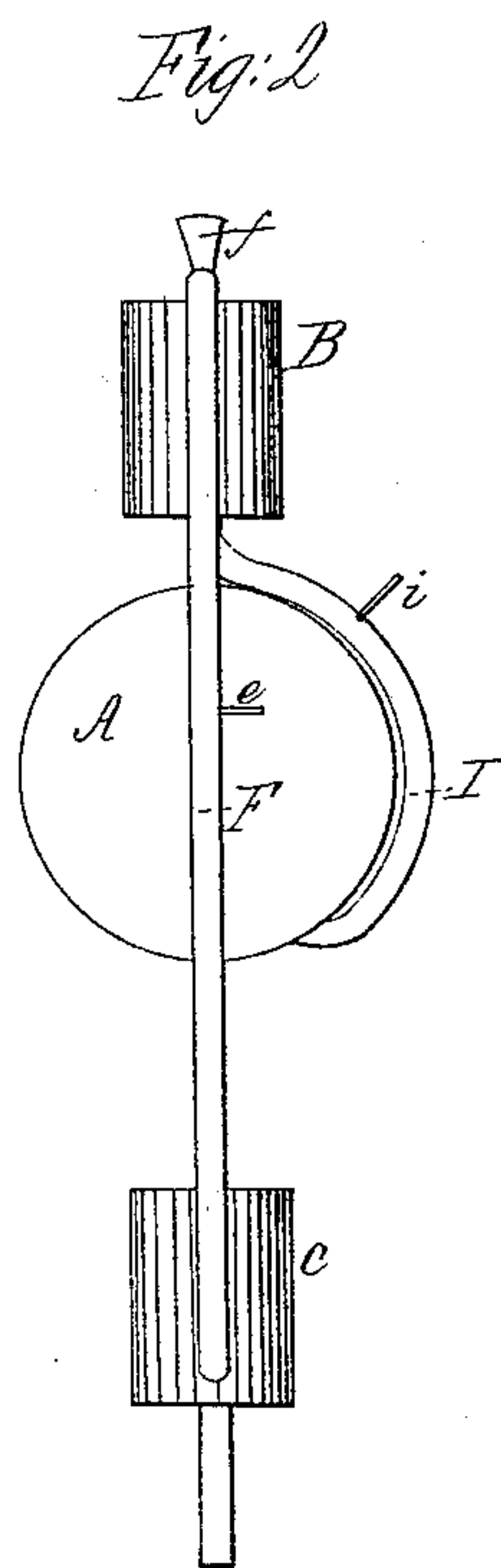
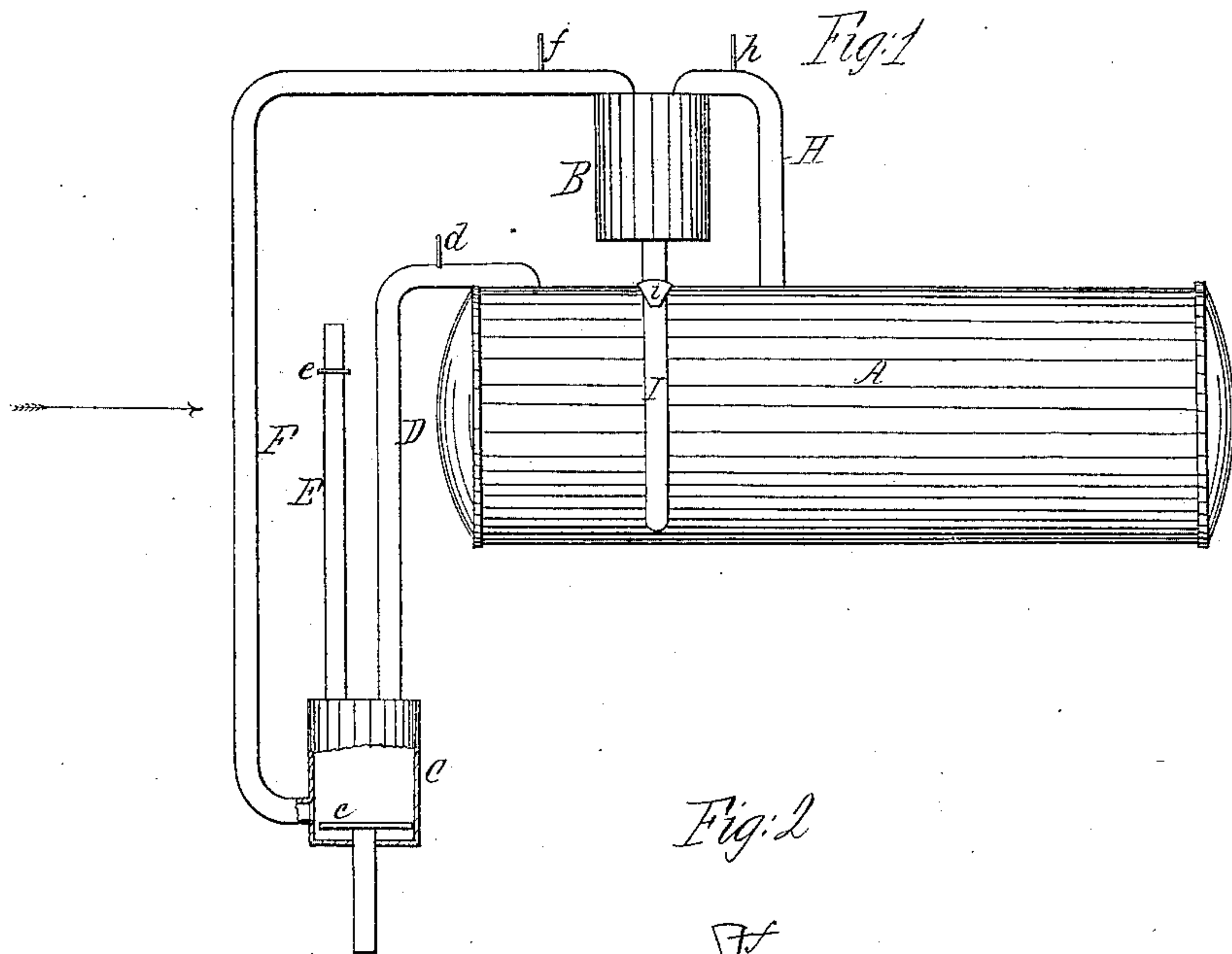


T. Armitage,
Steam-Boiler Water-Feeder,
No 25,617, Patented Oct. 4, 1859.



Witnesses:

James Lee
Chas E. Foster

Inventor

Thomas Armitage

UNITED STATES PATENT OFFICE.

THOMAS ARMITAGE, OF PHILADELPHIA, PENNSYLVANIA.

FEED-WATER APPARATUS FOR STEAM-BOILERS.

Specification of Letters Patent No. 25,617, dated October 4, 1859.

To all whom it may concern:

Be it known that I, THOS. ARMITAGE, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Feed-Water Apparatus for Steam-Boilers; 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 and to the letters of reference marked thereon.

My invention consists in a vessel immersed in a well and furnished with a valve opening inward in combination with a system of pipes and a drum, the whole being arranged in respect to a steam boiler, substantially in the manner described hereafter, so as to form a cheap and serviceable substitute for the ordinary feed pump.

In order to enable others to make and use my invention I will now proceed to describe its construction and operation.

On reference to the accompanying drawing which forms a part of this specification—Figure 1 is a side view of my improved apparatus for feeding steam boilers with water. Fig. 2 an end view looking in the direction of the arrow Fig. 1.

A is an ordinary cylindrical steam boiler and B, a steam drum secured in any convenient manner above the boiler.

C is a reservoir immersed in the water contained within the well from which the boiler is to be replenished. A pipe D, furnished with a cock *d*, forms a communication between the upper or steam space of the boiler and the reservoir C.

E, is an air pipe furnished with a cock *e*, and communicating with the upper end of the reservoir C. Another pipe F, forms a communication between the lower portion of the reservoir and the upper portion of the drum B, which also communicates through a pipe H, with the upper or steam space of the boiler A.

A pipe I, forms a communication between the drum B, and the lower portion or water space of the boiler.

The reservoir C, has a valve *c*, opening upward, the valve when down serving to close the communication between the reservoir C, and the well in which it is immersed and when raised allowing the water in the well to rush into this reservoir.

As long as there is sufficient water in the boiler the cocks *d*, *f*, *h*, and *i*, of their respective pipes are closed the cock *e*, of the

air pipe E being open, and the water in the well having free access to the reservoir C. When the boiler requires replenishing with water however, the cock *e*, of the air pipe is first closed and the cocks *f* and *d*, opened. The steam descending the pipe D, fills the reservoir C, by its pressure closes the valve *c*, and forces the water in the reservoir up the pipe F, into the drum B. The steam being brought into immediate contact with the water has imparted heat to the latter so that by the time it is lodged in the drum the water is at the proper temperature for economical use as feed water. The drum B, having been filled with heated water the cocks *f* and *d*, are again closed and the cock *e*, opened so that the water in the well raising the valve *c*, may gain admittance to the reservoir C, ready for being used to replenish the drum by a repetition of the above described action.

When the contents of the drum are to be admitted to the boiler, the cocks *h* and *i*, are opened, when the pressure of the steam within the drum being equal to that in the boiler, the water in the drum will descend through the pipe I, into the boiler by its own weight. The cocks *h* and *i*, are then closed until another supply of water is required for the boiler.

It will now be seen that the above described apparatus affords an effective means of supplying steam boilers with heated feed water, that the apparatus is less expensive and troublesome as well as less liable to get out of repair, than the ordinary feed pumps.

I do not claim broadly replenishing steam boilers with water by the pressure of the steam of the boiler acting on a body of water in a reservoir, but

I limit my claim to, and desire to procure Letters Patent for—

The vessel C, with its valve *c*, opening inward, in combination with the pipes D, E, F, H, and I, with their respective cocks and the drum B, the whole being arranged in respect to the boiler substantially as, and for the purpose herein set forth.

In testimony whereof, I have signed my name to this specification before two subscribing witnesses.

THOMAS ARMITAGE.

Witnesses:

HENRY HOWSON,
HENRY ODIORNE.