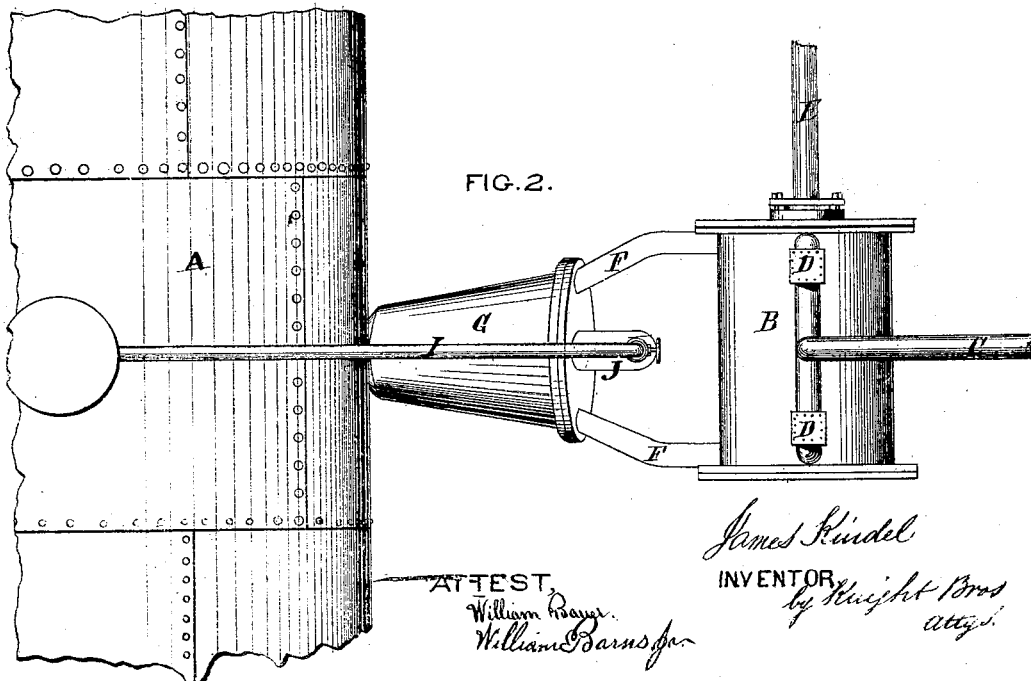
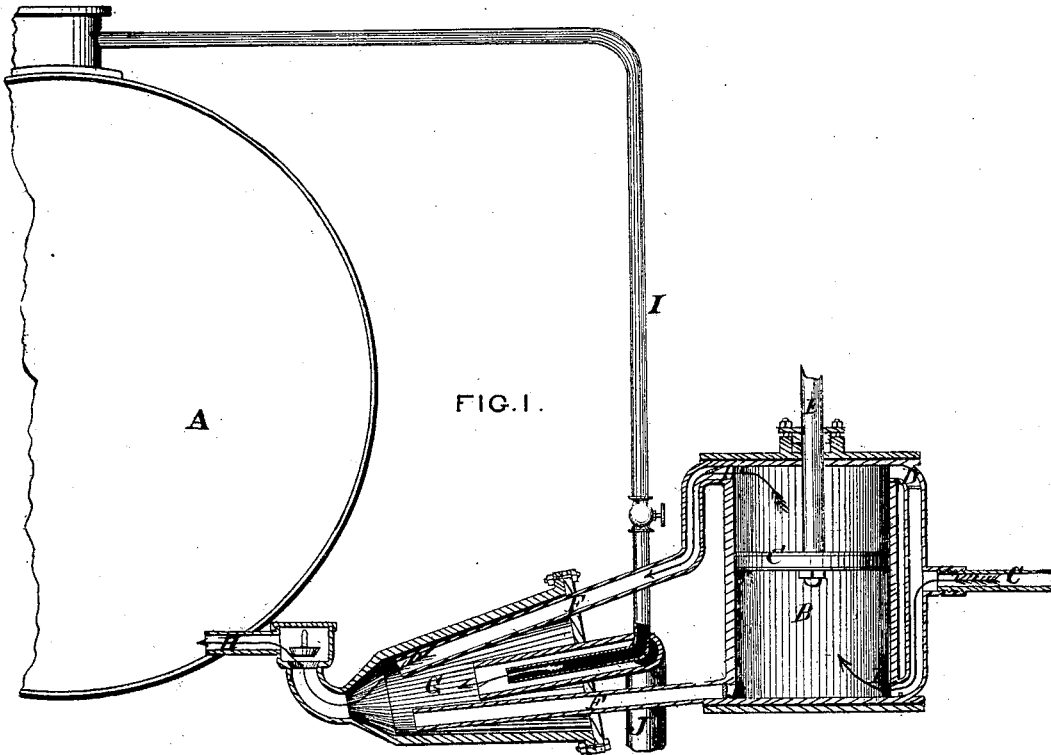


J. KINDEL.
FEED WATER APPARATUS.

No. 111,650.

Patented Feb. 7, 1871.



ATTEST

William Rogers
William Barnes

James Kindel
INVENTOR
by Knight Bros
attys.

UNITED STATES PATENT OFFICE.

JAMES KINDEL, OF WILMINGTON, OHIO.

IMPROVEMENT IN FEED-WATER APPARATUS.

Specification forming part of Letters Patent No. **111,650**, dated February 7, 1871.

To all whom it may concern:

Be it known that I, JAMES KINDEL, of Wilmington, in the county of Clinton and State of Ohio, have invented certain new and useful Improvements 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 drawings, in which—

Figure 1 is a vertical section of an apparatus embodying my invention. Fig. 2 is a top plan view of the same.

Similar letters of reference denote corresponding parts in the several figures of the drawings.

My invention has for its object to provide improved means for supplying steam-boilers with water; and to this end it consists in the construction and arrangement of the apparatus, which I will now proceed to describe in detail.

In the accompanying drawings, A is an ordinary steam-boiler.

B is a pump receiving the exhaust-steam from the steam-cylinder through the pipe C, alternately above and below its piston E, by valve-guarded ports D.

The piston of the steam-pump may be worked from the steam-engine either by direct or any intermediate connection with the piston-rod of the engine.

When the pump is in operation, the exhaust-steam entering through the pipe C is forced through valve-guarded pipes F into a chamber,

G, which communicates by the valve-guarded pipe H with the bottom of the boiler.

I is a pipe leading from the steam-space of the boiler into the chamber G, midway between the two pipes F.

J is the pipe for supplying fresh water to the boiler, and may be introduced at any part of the steam return passages, but is preferably inserted axially in or around the steam-pipe.

The operation is as follows: When it is desired to supply the boiler with water, live steam is let into the chamber G through the pipe I, which, in connection with the water-supply pipe J, acts upon the well-known principle of the "Giffard injector," and forces the water from said pipe J into the chamber, and from thence into the boiler through the pipe H. As the exhaust-steam from the engine enters the chamber G, it comes in contact with the water from the pipe J and is rapidly condensed, and in the form of water returned to the boiler, as will be readily understood.

Having thus described my invention, what I claim as new is—

The described arrangement of the steam return pump B and chamber G, with their pipes F and H, live-steam pipe I, and water-supply pipe J, for the purpose set forth.

In testimony of which invention I hereunto set my hand.

JAMES KINDEL.

Witnesses.

GEO. HY. KNIGHT,
JAMES H. LAYMAN.