F. W. KEYS.

BOILER FEED-WATER HEATER AND REGULATOR.

No. 176,538. Patented April 25, 1876.

Fig. 1

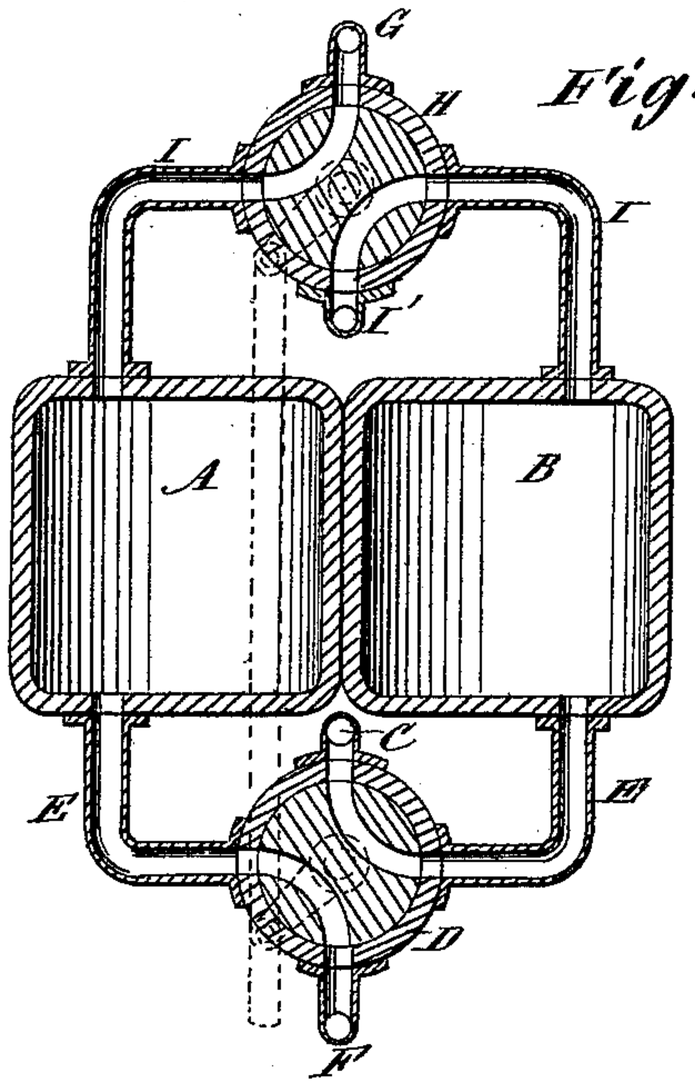


Fig. 2

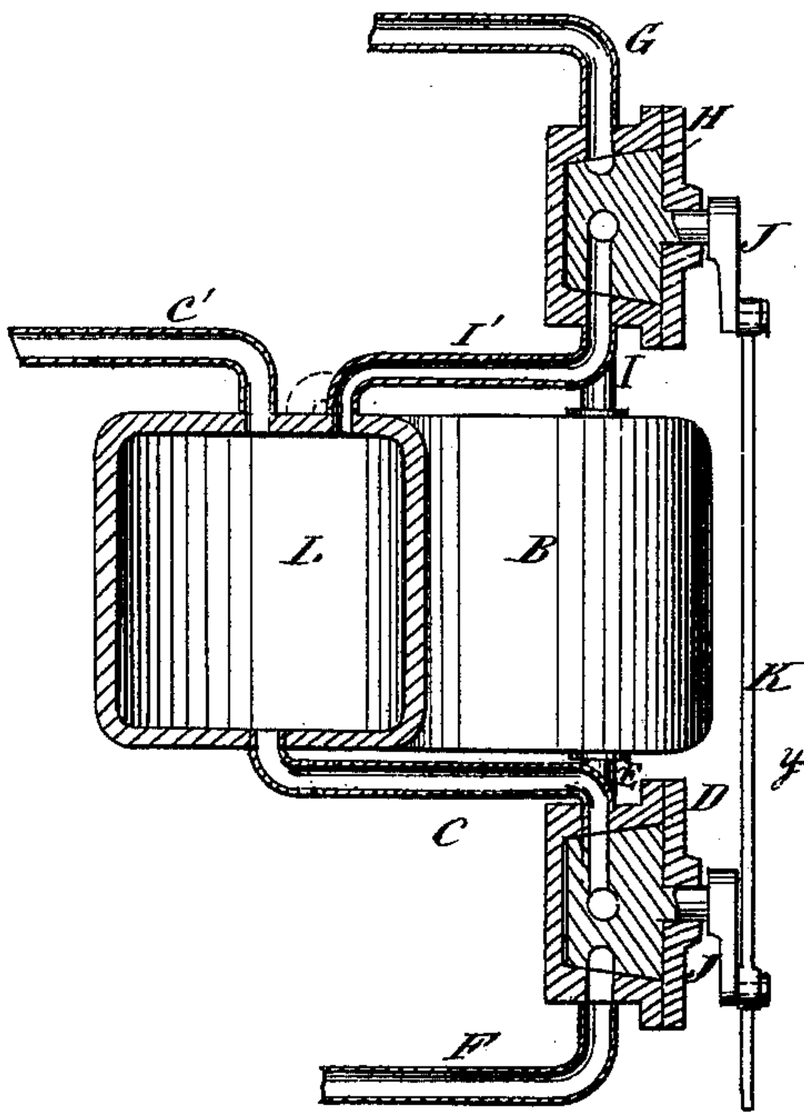
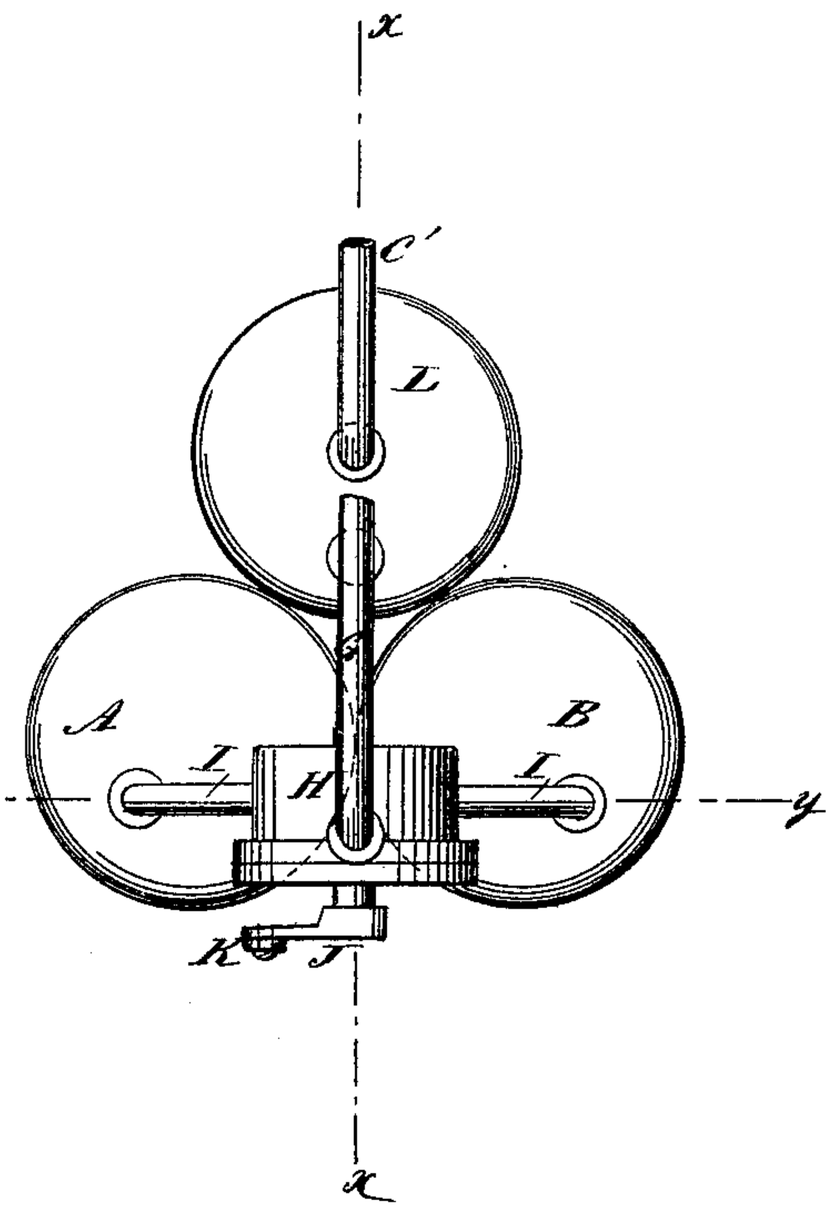


Fig. 3



WITNESSES:

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FRANK W. KEYS, OF NEW YORK, N. Y.

IMPROVEMENT IN BOILER FEED-WATER HEATERS AND REGULATORS.

Specification forming part of Letters Patent No. **176,538**, dated April 25, 1876; application filed March 6, 1876.

To all whom it may concern:

Be it known that I, FRANK W. KEYS, of New York city, in the county and State of New York, have invented a new and Improved Boiler-Feeder, of which the following is a specification:

My invention consists of a couple of tanks, with water-supply and boiler connections, and with valve mechanism, by which they are alternately opened to exhaust and fill, and put in communication with the boiler for emptying thereto by the gravity of the water, the pressure being balanced.

The invention also consists of another tank in connection with the two first-mentioned to receive the water before it enters the others, and also to receive the exhaust steam for heating the water, and thereby economizing more of the waste than can be with the two alone.

Figure 1 is a sectional elevation of my improved feeder taken on line *y y* of Fig. 3. Fig. 2 is a sectional elevation on line *x x* of Fig. 3, and Fig. 3 is a top view.

Similar letters of reference indicate corresponding parts.

A and B are the two closed hollow cylinders to be alternately filled with feed-water and emptied into the boiler. C is the pipe through which the water enters the valve D; E, pipes from the valve to the tanks; and F, pipes from the valve to the boiler. G is a steam-pipe leading from the boiler to valve H; I, steam-pipes from valve H to the tanks; I′, steam-exhaust pipe; J, cranks; and K, rod for shifting the valves, the rod to be connected to any competent means for shifting the valve at suitable intervals of time.

In Fig. 1 of the drawing, tank A is represented as receiving steam from the boiler, and discharging water into it, and tank B as exhausting steam through pipe I′, and filling with water from pipe C. By shifting the valves when A is emptied and B filled, B will empty into the boiler, and A will fill again, and so on.

Instead of exhausting the steam directly into the atmosphere, I employ another tank, L, into which the steam exhausts, and which receives the water from a pipe, C′, and delivers it through pipe C, whereby a considerable portion of the heat of the exhaust steam is economized by heating the water.

The apparatus is a self-regulator of the height of the water in the boiler, as it ceases to work when the water rises so high in the boiler as to flow back into the tank through pipe G.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination, with tank L, of cylinders A B, the valves D H, connected by cranks and rod, the water-pipes C E F, the steam-pipes G I, and the exhaust-pipe I′, substantially as and for the purpose specified.

FRANK W. KEYS.

Witnesses:

JAMES H. HUNTER,
JOHN GOETHALS.