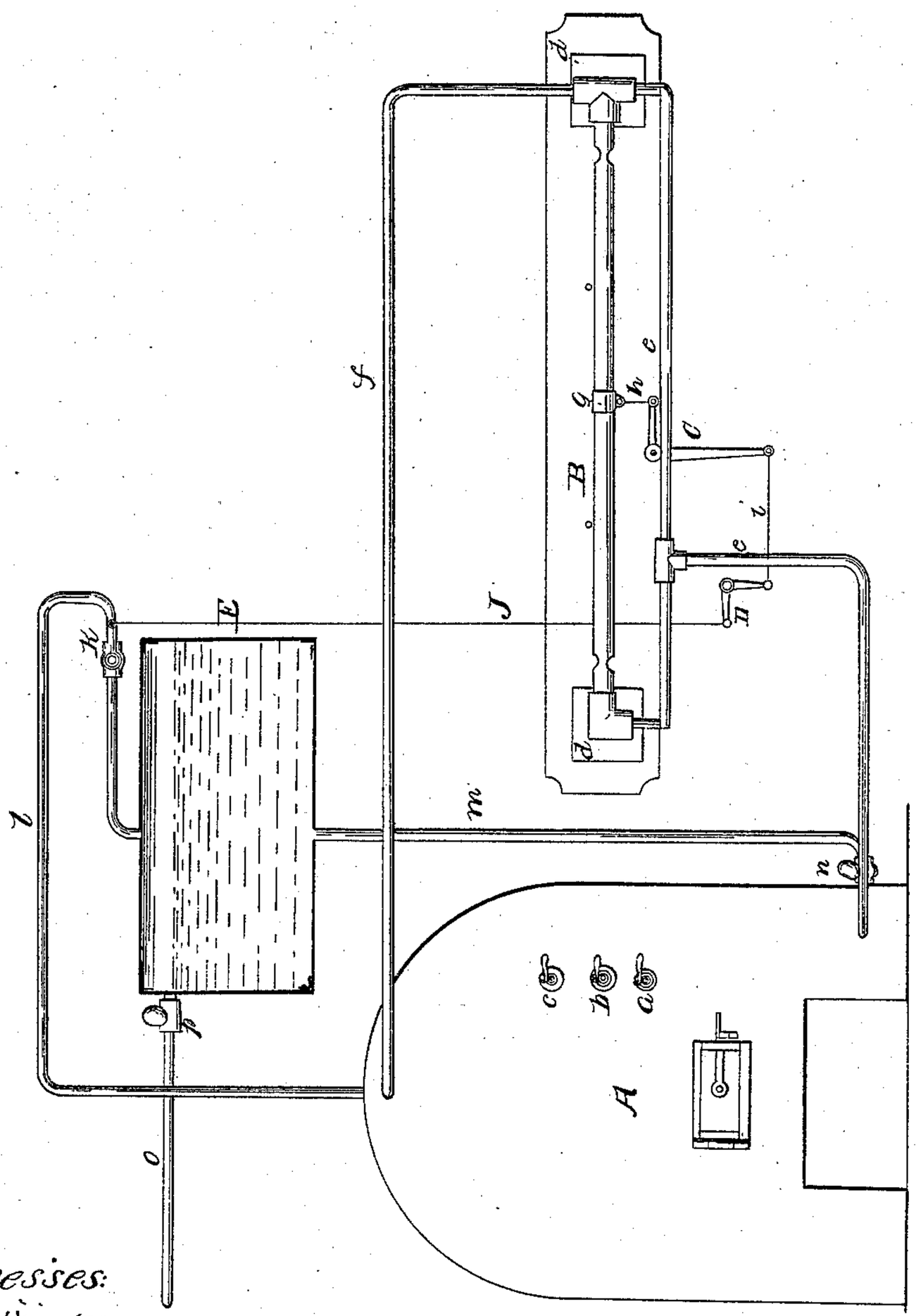
J. N. B. Bond,

Steam-Boiler Water-Feeder,

No. 47,791, Patented May 23, 1865.



Witnesses:
M. M. Lingston
M. Ahearn Jr.

Inventor.
Joseph N. B. Bond.

UNITED STATES PATENT OFFICE.

JOSEPH N. B. BOND, OF NEW YORK, N. Y.

IMPROVEMENT IN AUTOMATIC BOILER-FEEDERS.

Specification forming part of Letters Patent No. **47,791**, dated May 23, 1865.

To all whom it may concern:

Be it known that I, JOSEPH N. B. BOND, of the city, county, and State of New York, have invented a new and Improved Automatic Boiler-Feed; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which—

The drawing represents a sectional front elevation of this invention.

This invention consists in the employment or use of a pipe made of brass or some other material which expands much by the influence of heat, said pipe being secured in suitable rigid bearings at a level with the mean water-line of a steam-boiler, and made to communicate with the water and steam-space of the same, in combination with a tank situated above the boiler and supplied with water from a suitable reservoir, and also made to communicate with the steam and with the water space of said boiler in such a manner that when the water in the boiler sinks below the mean water-line the expansible pipe is exposed to the direct action of the steam, and thereby caused to buckle up, and by this action a cock is opened and steam admitted to the upper part of the tank, causing the water contained therein to sink down into the boiler, and when the water rises above the mean water-line, the expansible pipe cools off and recedes to its original position, and the further supply of water to the boiler is stopped.

A represents a steam-boiler of any desired construction and provided with try-cocks, *a b c*, the middle one of which corresponds to the mean water-line of the boiler. In line with this middle cock, and secured between rigid bearings, *d*, is the pipe B, made of brass or other material which undergoes considerable expansion by the influence of heat. This pipe communicates by a tube, *e*, with the water-space, and by a tube, *f*, with the steam-space of the boiler, and if the water is above the second cock said pipe is filled with water; but if the water sinks below the second cock steam passes into the pipe B and heats the same, so that it buckles up, and by this motion the supply of water to the boiler is regulated.

A sleeve, *g*, secured to the middle of the pipe B, connects by a rod, *h*, with the short arm of an elbow-lever C, the long arm of which connects by a rod, *i*, with another elbow-lever, D, and through it and a rod, *j*, with the stop-cock *k*, which opens or closes the communication between the upper part of the tank E and the steam-space of the boiler. Said tank is made of boiler-iron or other suitable material strong enough to resist the same pressure as the steam-boiler, and from its upper part extends a pipe, *l*, to the steam-space, and from its lower part a pipe, *m*, to the water-space of the boiler. The pipe *l* is provided with a stop-cock *k*, as above stated, and the pipe *m* is provided with a check-valve, *n*, which prevents the water passing from the boiler back to the tank. Said tank is supplied with water from a suitable receiver by a pipe, *o*, which is furnished with a check-valve, *p*, to prevent the steam from the tank rushing out when the cock *k* is open.

The operation is as follows: When the water in the boiler sinks below the mean water-line, the pipe B buckles up and the cock *k* opens. The water contained in the tank is now forced down into the boiler. As soon as the water in said boiler rises above the mean water-line, the pipe B recedes to its original position, the cock *k* closes, and the steam in the tank E condenses. A fresh supply of water rushes in the tank, and the operation continues as long as the boiler is kept in operation. By this arrangement the boiler is rendered self-supplying, and all danger of an explosion from want of water in the boiler is avoided.

It must be remarked that the pipe B may be so applied that by its linear expansion the stop-cock *k* is opened.

I claim as new and desire to secure by Letters Patent—

The expansible pipe B, arranged in combination with the tank E and boiler A, substantially in the manner and for the purpose set forth.

Witnesses: JOSEPH N. B. BOND.

M. M. LIVINGSTON,

C. L. TOPLIFF.