

J. E. KARNS, W. C. DOUTHETT & J. C. DOUTHETT.

Improvement in Steam-Boiler Feeders.

No. 128,889.

Patented July 9, 1872.

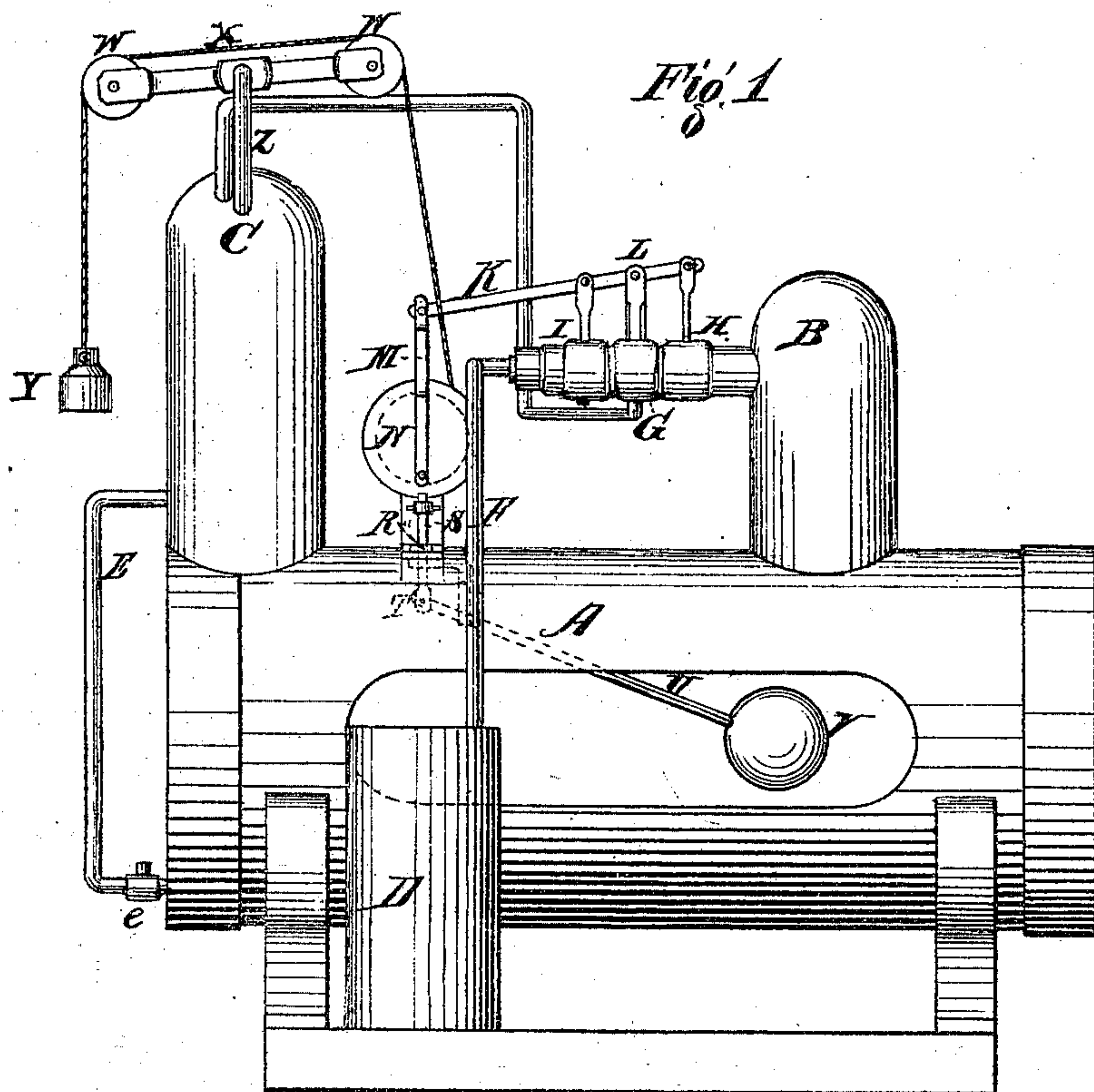
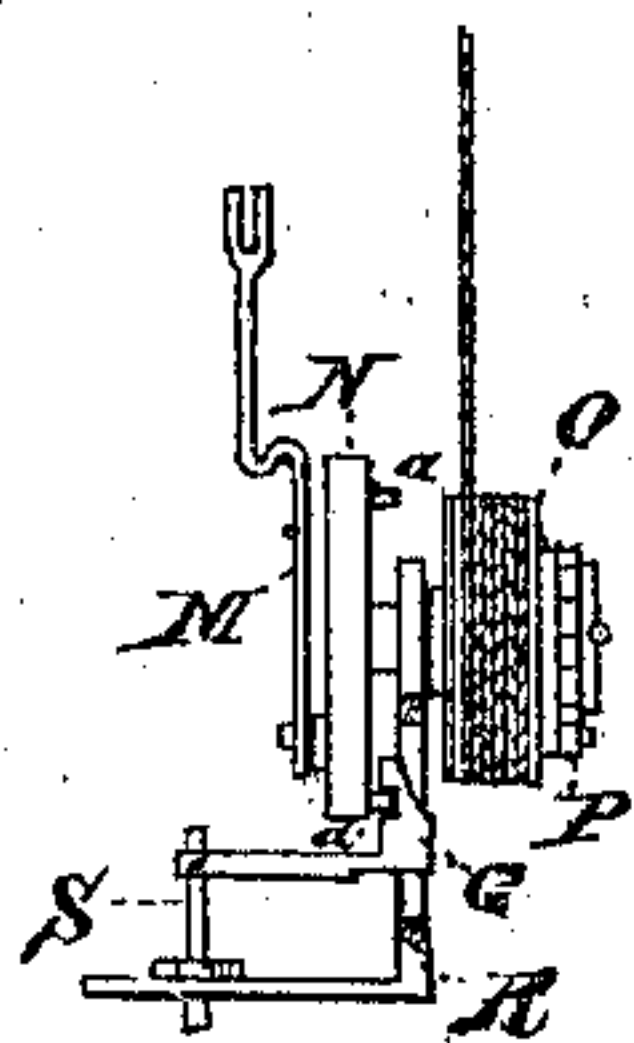


Fig. 2



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN STEAM-BOILER FEEDERS.

Specification forming part of Letters Patent No. 128,889, dated July 9, 1872.

### SPECIFICATION.

*To all whom it may concern:*

Be it known that we, JAMES E. KARNS, WILLIAM C. DOUTHETT, and JOSEPH C. DOUTHETT, in the county of Allegheny and State of Pennsylvania, have invented a new and useful method of supplying steam-boilers with water by equalization of pressure, gravitation, and vacuum, all working automatically; and we do hereby declare the following to be a full, clear, and exact description thereof.

Figure 1 is a perspective view of an ordinary cylinder steam-boiler with feed arrangement attached. Fig. 2 is a similar view of portions detached.

Like letters refer to like parts in different views.

This invention consists in a combination of alternately-acting steam and water valves with a wheel for working the same, a weight for operating the wheel, a check device for stopping the wheel, a float for working the check device, and a tank for feed-water, which enters the boiler when the steam-pressures therein and in said tank are equalized.

In operating this boiler-feed a tank, C, and two valves, H and I, are used, to allow the water to discharge through a supply-pipe, E, into the boiler A. First, the steam-valve H is opened and the water-valve I is closed, thus allowing a current of steam to pass from the boiler A into the tank C. This is then discharged, by reversing valves H and I, through pipes F F, in communication with water-tank D. This discharge creates a vacuum in tank C, which is supplied by water rushing through the pipes F F from water-tank D and filling tank C, which is then discharged or allowed to flow into the boiler A by flowing a current of steam from the boiler A into the tank C, and thus equalizing the pressure between the boiler A and the tank C. This is automatically accomplished by two valves, H and I, one a steam-valve, H, the other a water-valve, I. These are moved by a cord, H, and weight Y—or instead of these by a spring the mechanical equivalent of the weight—operating a lever, K, to which the valves H and I are attached through the medium of a pitman, M, attached to a wheel, N, which acts as a crank, and on which are two pins, *a a*, serving as stops, which

are acted upon by a float, V, in the boiler A, through the medium of a piston, S, worked by a lever, W.

Now, when the point determined on as low water is reached by the float V, the pin *a'*, holding the wheel N, is liberated by the movement of the stop Q on piston S, allows wheel N to make a half revolution, opening the steam-valve H and closing the water-valve I, thus allowing the pressure to equalize, when the water in the tank C, by force of gravitation, will open the check-valve *e* in the supply-pipe E, and flow into the boiler A until it has filled it to a point determined on as high water, to which the float V will have raised, and through its piston S will move the stop Q and liberate the pin *a'* on the opposite side of wheel N, which will make a half revolution, (being stopped by the other pin *a'*) thus closing steam-valve H and opening water-valve I, allowing the pressure to escape from tank C through the pipes F F, thus leaving a vacuum in tank C and pressure in boiler A, closing check-valve *e*. Vacuum in tank C will at once be filled with water from tank D, with which it is put in communication by the opening of water-valve I, thus leaving a supply of water in tank C, ready to be let into boiler A whenever the float V has gone down to the point determined on as low water, thus making it automatic and positive in its operation.

The cord X, in the first start, is wound upon the drum O by means of a key, crank, or the like, and when, by the operation of the above-described apparatus, the cord becomes entirely unwound, it has to be again wound up.

The parts shown in Fig. 2 can be used in connection with a diaphragm, instead of a float, in a gas-meter.

The device for operating the valves being entirely outside of the boiler and its attached chambers is easily accessible for adjustment, and is not impeded in its operation by water, rust, or incrustation, as it would be liable to be if placed inside the boiler or its attached chamber.

Having thus described our invention, what we claim as new and valuable herein, and desire to secure by Letters Patent, is—

1. The combination of the valves I H, wheel N, cord and weight or other equivalent motor,

check device R, float V, and tank C, all arranged as specified.

2. The combination of the wheel N provided with the pins *a a'*, the drum O, check device Q, connecting-rod S, and a cord and weight, and float, or other equivalent motors.

In testimony whereof we, the said JAMES E. KARNS, WILLIAM C. DOUTHETT, and Jo-

SEPH C. DOUTHETT, have hereunto set our hands.

JAMES E. KARNS.

WILLIAM C. DOUTHETT.

JOSEPH C. DOUTHETT.

Witnesses:

HENDERSON E. DAVIS,

W. A. ROBINSON.