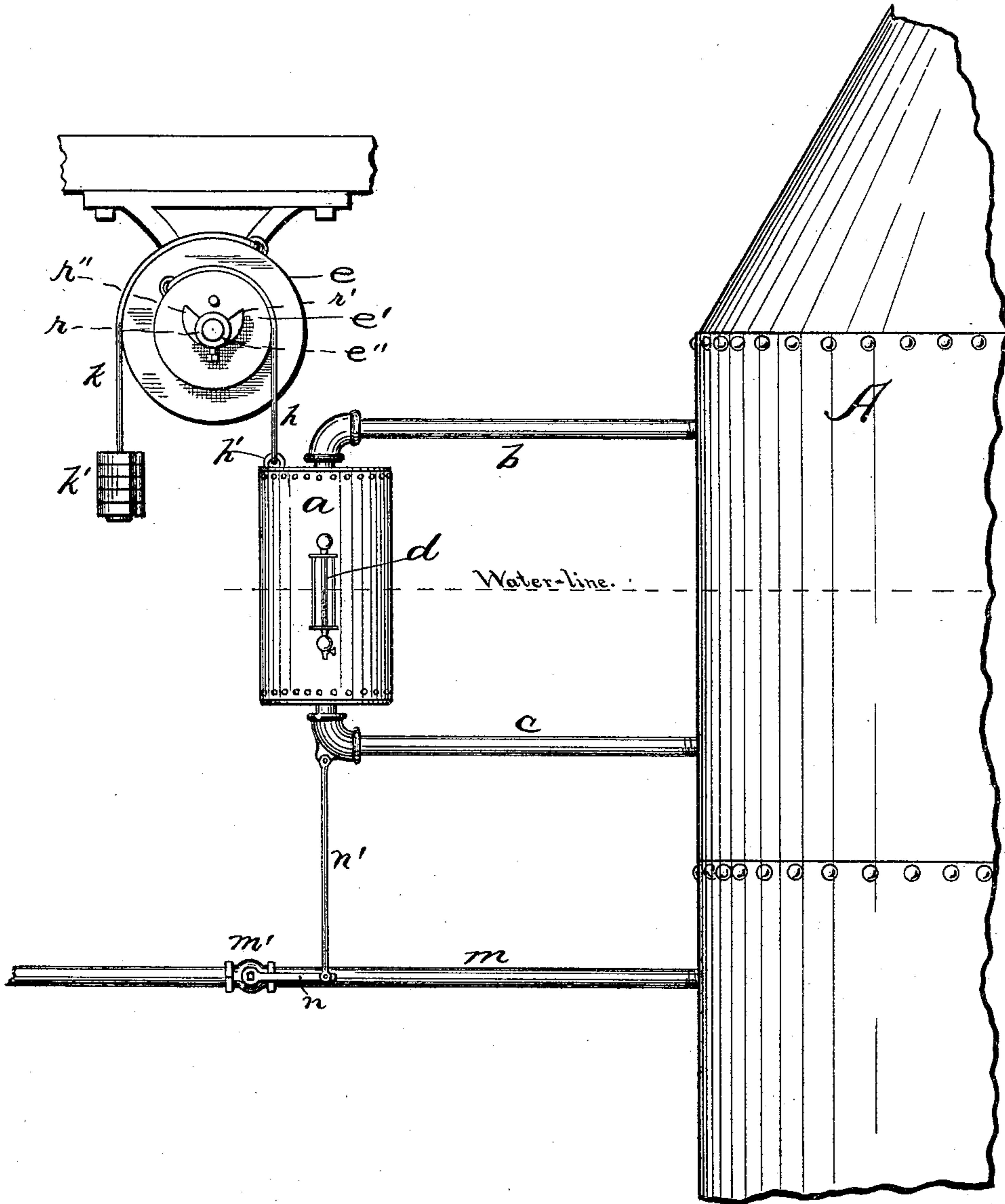


(No Model.)

A. CATCHPOLE.
FEED WATER APPARATUS.

No. 496,040.

Patented Apr. 25, 1893.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ALFRED CATCHPOLE, OF GENEVA, NEW YORK.

FEED-WATER APPARATUS.

SPECIFICATION forming part of Letters Patent No. 496,040, dated April 25, 1893.

Application filed June 20, 1892. Serial No. 437,255. (No model.)

To all whom it may concern:

Be it known that I, ALFRED CATCHPOLE, of Geneva, in the county of Ontario, in the State of New York, have invented new and useful
5 Improvements in Feed-Water Apparatus, of which the following, taken in connection with the accompanying drawing, is a full, clear, and exact description.

My invention relates to devices or apparatus for automatically supplying feed-water to steam boilers, by the automatic operating of the valve in the main induction pipe, actuated to be opened or closed by the variation of the water level in the boiler; opening it
10 when the water goes below the predetermined level, and closing it when it rises to it again.

My object is to produce such an apparatus, adapted to operate quickly, and effectively, and to provide it with means to adjustably
20 regulate the degree to which the valve can be opened, to positively stop it when closed and to prevent it from being opened by the backward rotation of the valve beyond the closing point, so that it cannot be thereby
25 opened to let in more water after it has been closed by the rising of the water to the normal level, and to thereby prevent the flooding of the boiler; and also by this stop mechanism, to prevent the forward rotation of the
30 valve beyond the point where it is wide open, so as to shut off part of the inflow, when the water is low in the boiler; all being automatic in its action.

My invention consists in the several novel
35 features of construction and operation hereinafter described and which are specifically set forth in the claim hereto annexed. It is constructed as follows, reference being had to the accompanying drawing, in which I show
40 a side elevation of my apparatus connected to a boiler.

A—, is a part of the boiler, and —a— is a tank or vessel, connected to the boiler above and below the water line therein and of the
45 requisite strength to stand the boiler pressure; the pipes —b—, —c— being such connections, and the one permitting the free flow of water into the tank from the boiler to maintain the same water level therein as in the
50 boiler, and the other permitting the free flow of steam from the boiler into said tank. A water-glass —d— upon the tank shows the

water level therein. Said pipes —b— and —c— are springy and elastically support said tank, in conjunction with the balancing mechanism, which maintains the tank at its normal position when the water therein and in the boiler is at the normal level. This mechanism comprises a pair of differential pulleys —e—, —e'— secured together and mounted
60 loosely upon an arbor —e''— suitably supported; a cord —h— connected at one end to an eye —h'— upon the tank, and at the other end to an eye upon the rim of the pulley —e'—, and a cord —k— connected at one end to an
65 eye upon the rim of the pulley —e—, and carrying the weight —k'— upon its free end.

The induction pipe —m— is connected to the boiler in the ordinary manner, and provided with a suitable valve —m'— shown in
70 the drawing as adapted to be rotated by its stem, to be opened or closed, and having a lever —n— secured to said stem, and —n'— is a rod connected to said lever, and to the pipe —b—, but it may also be connected to
75 the tank.

Upon the arbor —e''— I secure a collar —r— adjustably, and provided with arms —r'— and —r''— of proper length to engage
80 with a stop-pin —w— upon the side of the pulley —e'— when said pulley rotates upon the arbor either way, and thus regulate and control the extent of such rotation. When the water falls below the normal level, the weight —k'— will over-balance and raise the
85 tank, and this will raise the valve lever and open the valve, and let in the water, and also will bring the arm —r'— against the stop-pin when the valve is open far enough. Then as the water rises above the normal level in the
90 boiler and tank, the weight of the tank over-balances the counterbalance, rotates the pulley to the right and closes the valve, and just as the same is closed, the arm —r''— will come against said stop-pin and hold the valve
95 in that position. It will be seen that this stop mechanism is a prevention both of low water and of flooding in the boiler.

I am aware that feed-water devices having a movable feed-tank counterbalanced by a
100 weighted lever, have heretofore been employed, and also that such tanks counterbalanced by a spring have been used, but no device of the kind having differential pulleys

simultaneously rotated has before been used in connection with the said movable feed-tank. The advantage accomplished by my invention, is that the differential action of
5 the simultaneously rotated pulleys is quicker and more positive than the action of weighted levers or springs.

What I claim as my invention, and desire to secure by Letters Patent, is—

10 In a feed-water device for steam boilers, the combination, with the flexibly supported feed-water chamber, and the valve of the feed-water pipe opened thereby, of a pair of differentially acting pulleys, a large one and a

small one, the latter connected to the feed- 15 water chamber and the other provided with a counter-balancing weighted cord, the fixed arms r, r' secured to the arbor upon which the pulleys are journaled and the intermediate stop-pin secured to the face of the small 20 pulley to limit the movement of the parts of the device, substantially as specified.

In witness whereof I have hereunto set my hand this 14th day of June, 1892.

ALFRED CATCHPOLE.

In presence of—

F. A. MALETTE,

CHAS. S. BURRALL.