(No Model.) 2 Sheets—Sheet 1.

# J. W. WEAVER.

## FEED WATER REGULATOR.

No. 381,450. Patented Apr. 17, 1888.

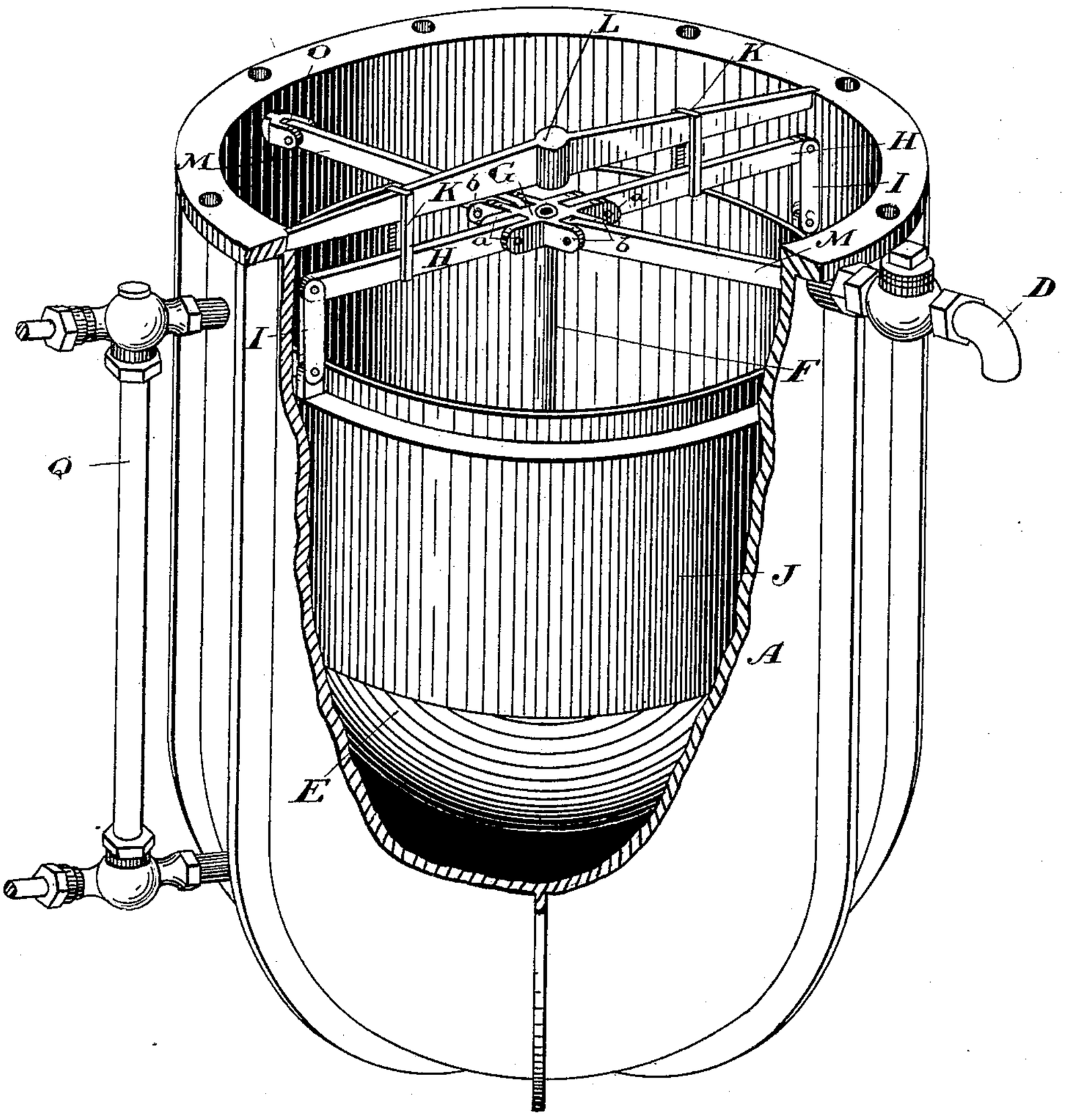


Fig. 1.

Witnesses.

J. Edw. Maybum.

J. M. Jackson.

Inventor.

James W. Weaver.

by Donald C. Ridout & Co

Attys

(No Model.) 2 Sheets—Sheet 2.

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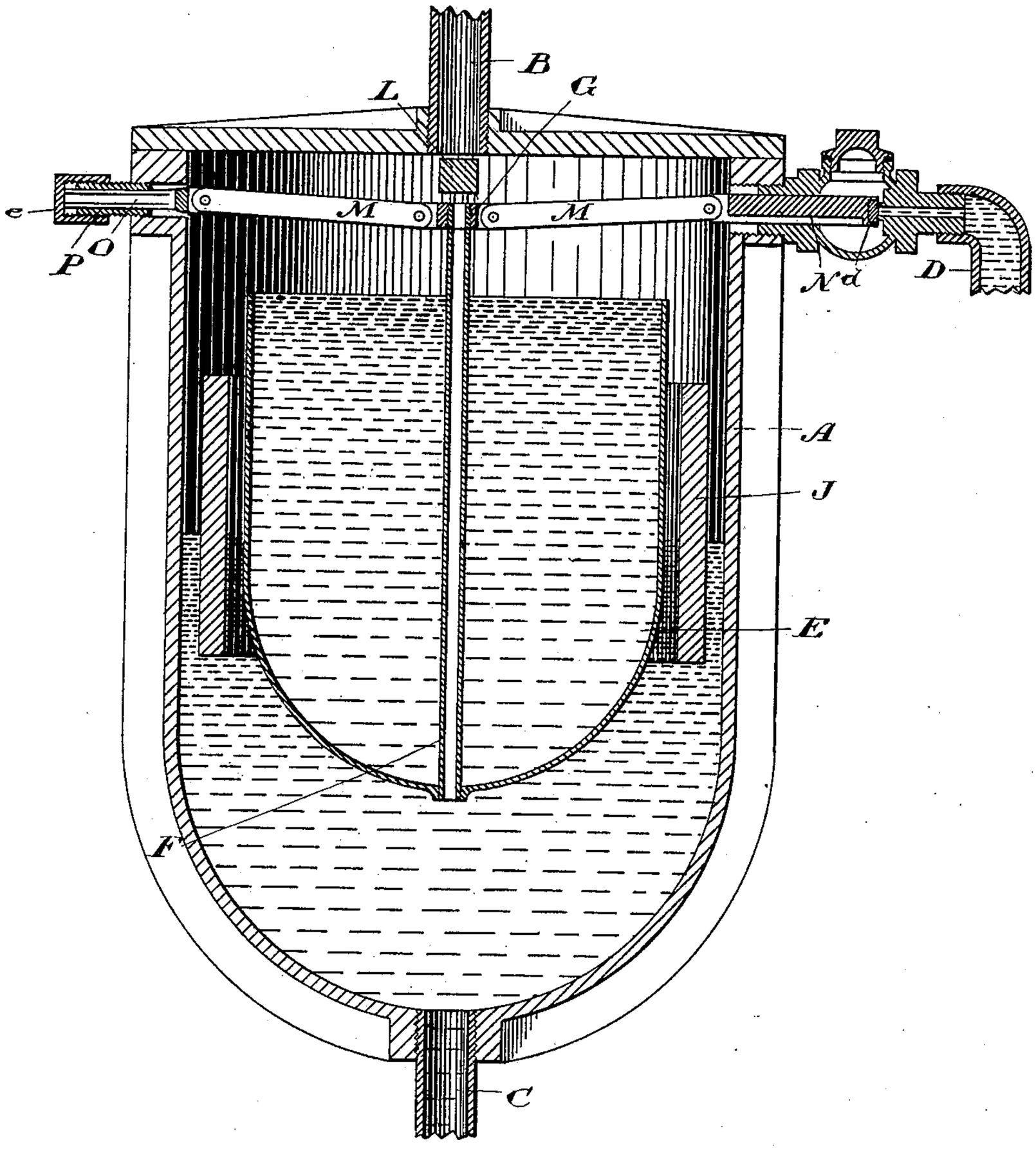


*Fig. 2.*

Witnesses.

J. Edw. Mayer.

J. M. Jackson.

Inventor:

James W. Weaver.

by Donald C. Ridout & Co

Attys

# UNITED STATES PATENT OFFICE.

JAMES WM. WEAVER, OF TORONTO, ONTARIO, CANADA.

## FEED-WATER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 381,450, dated April 17, 1888.

Application filed September 26, 1887. Serial No. 250,712. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES WILLIAM WEAVER, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, steam-fitter, have invented a certain new and useful Improved Automatic Feed-Water Regulator for Steam-Boilers, of which the following is a specification.

The object of the invention is to design a device by which the admission of the feed-water into a boiler will be automatically regulated; and it consists, essentially, in connecting a steam-tight chamber with the steam and water spaces of the boiler and suspending within the said chamber the cup or bucket located so as to receive the feed-water as it enters the chamber, the said cup or bucket being so suspended and connected to a cut-off valve in the feed-pipe that its vertical movement opens and closes the valve as the height of the water in the chamber varies, substantially as hereinafter more particularly explained.

Figure 1 is a perspective view, partially in section, of my device, with the cover removed from the chamber. Fig. 2 is a sectional side elevation of the same.

In the drawings, A is a closed chamber made sufficiently strong to withstand the pressure carried by the boiler it is intended to be applied to.

B is a pipe which connects the top of the chamber A with the steam-space of the boiler.

C is a pipe which connects the chamber A with the water-space of the boiler.

D is a pipe leading from the chamber A to the source of supply from which the feed-water is obtained.

E is a cup or bucket suspended in the chamber A by the central tube, F, the bottom end of which is secured to the cup E and its top end to a head, G, having four pairs of jaws formed on it, as shown in Fig. 1.

H are two levers, the inner ends of which are pivoted on the jaws *a*, formed in the head G. The outer ends of these levers H are connected, through the pivoted links I, to the annular weight J. The levers H are pivoted on the hangers K, which are suspended from the cross-bar L, which extends across and is fitted into the top of the chamber A.

M are levers, the inner ends of which are pivoted to the jaws *b*, formed in the head G. The outer ends of the levers M are connected to the plungers N O. The plunger N forms a cut-off valve for the feed-pipe D, the end of the plunger N having a rubber disk, *d*, forming a seat on the end of the plunger N, as indicated. The plunger O extends into a tube, P, which has an adjustable cap fitted on it.

Q is an ordinary water-gage applied to the chamber A.

It will be seen from the foregoing description that the cup E is suspended from the cross-bar L, and that the annular weight J is employed as a counterpoise.

I may here state that the annular weight J does not quite counterbalance the weight of the cup E when filled with water. Consequently, when the cup E is filled with water and there is little or no water in the chamber A, the inner ends of the levers M will be held down and the valve end of the plunger N will be held from its seat. Consequently the feed-pipe D will be open, and the feed-water is thus admitted into the chamber A, from which it passes into the boiler through the water-pipe C. As the chamber A is connected to the boiler in the manner before described, the height of the water in the chamber A must necessarily correspond with the level of the water in the boiler, as the chamber A is located at the altitude where the ordinary water-gages are placed. By the time that the water has reached the desired level in the boiler it will be sufficiently high in the chamber A to float the cup E, thereby raising the inner ends of the levers M, and thus cause the valve end of the plunger N to close the feed-pipe B. When the rubber disk *d* wears, I adjust the cap *e* so as to compensate for the said wear, it being understood that the levers M are connected together, as described, so as to form a toggle-joint, the straightening of which forces the end of the plunger N against the valve-seat and the end of the plunger O against the cap *e*. Immediately that the level of the water in the chamber A falls below the desired point the displacement of the cup E will be less than the difference between its weight when full of water and the weight J. Consequently the cup E will fall and draw with it the inner ends of the levers M, thereby open-

ing the valve of the feed-pipe D, admitting water into the chamber A, when the operation is repeated.

Although I prefer the cup or float E made in the form shown and designed to be weighted by the admission of water, it will of course be understood that its shape may be considerably altered, and that it may be otherwise weighted without interfering with the principle of my invention.

What I claim as my invention is—

1. A chamber, A, provided with a pipe, D, for the admission of water, and a pipe, C, for its discharge, in combination with the cup or float E, having communication with said chamber and suspended from the head G, and the levers M, arranged to form a toggle-joint with the said head, and a cut-off valve, substantially as and for the purpose specified.

2. A chamber, A, provided with a pipe, D, for the admission of water, and a pipe, C, for its discharge, the plungers N O, connected together by the levers M, which are centrally jointed, in combination with the cup or float E, connected to the levers M and levers H, the latter of which are pivotally supported from the cross-bar L and support the weight J, substantially as and for the purpose specified.

3. A chamber, A, provided with a pipe, D, for the admission of water, and a pipe, C, for its discharge, a plunger, N, forming a cut-off valve for the feed-pipe D and connected by the toggle-jointed levers M to the plunger O, which butts against an adjustable cap, *e*, in combination with the cup or float E, suspended from the toggle-jointed levers M within the chamber A, substantially as and for the purpose specified.

4. A chamber, A, provided with a pipe, D, for the admission of water, and a pipe, C, for its discharge, a plunger, N, forming a cut-off valve for the feed-pipe D and connected by the toggle-jointed levers M to the plunger O, which butts against an adjustable cap, *e*, in combination with the cup or float E, suspended from the toggle-jointed levers M, connected to the pivoted levers H, which are pivotally supported and connected to the counterpoise-weight J, substantially as and for the purpose specified.

Toronto, September 6, 1887.

JAS. WM. WEAVER.

In presence of—
CHARLES C. BALDWIN,
CHAS. H. RICHES.