(No Model.)

J. J. LAWLER.

DRAFT REGULATOR.

No. 515,591. Patented Feb. 27, 1894.

Fig. 1

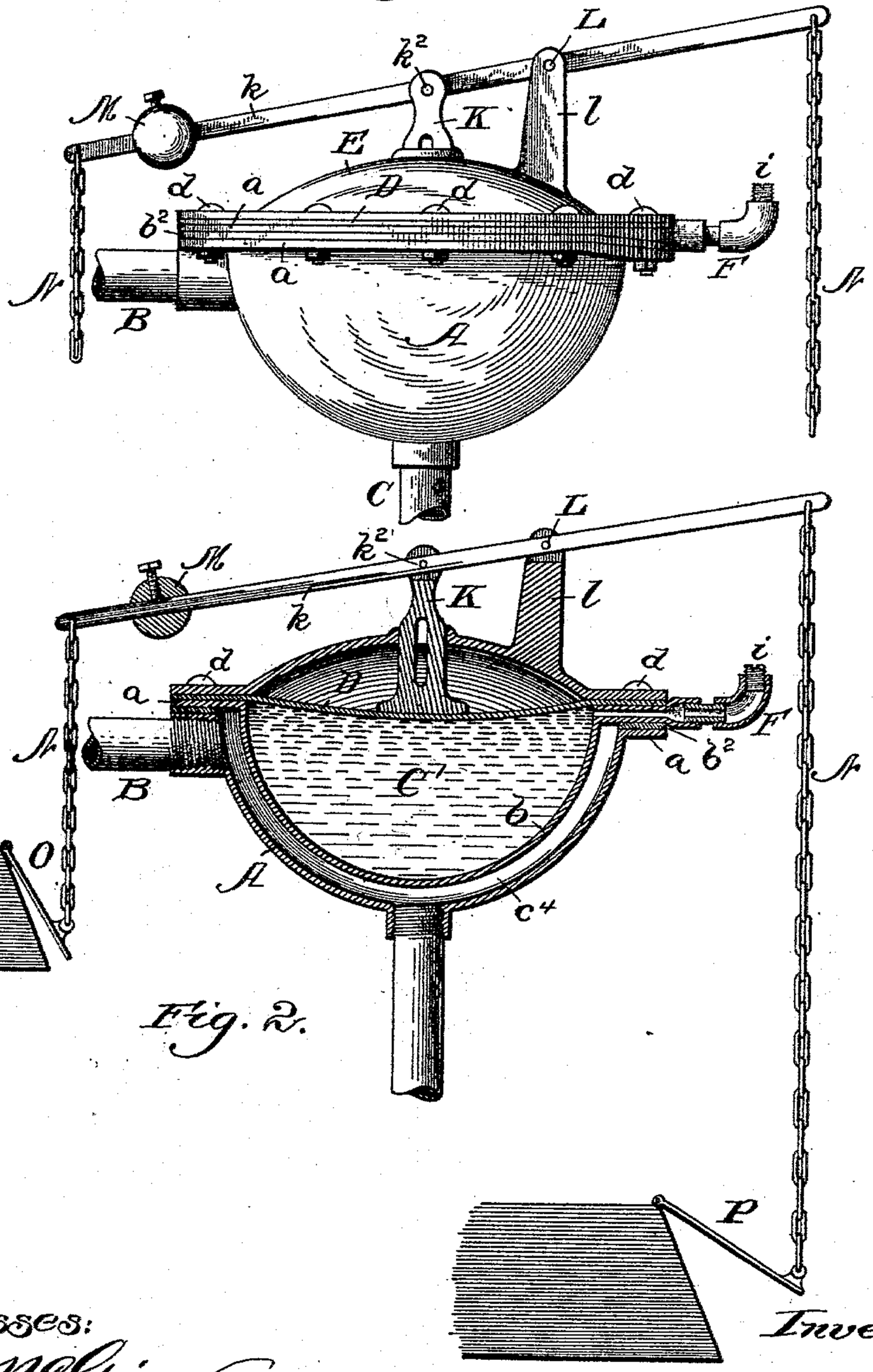

Fig. 2.

Witnesses:
J. B. McGinn.
B. F. Thornett.

Inventor.
James J. Lawler
per Evert A. Appleman
Attys.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES J. LAWLER, OF SCRANTON, PENNSYLVANIA.

DRAFT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 515,591, dated February 27, 1894.

Application filed May 9, 1893. Serial No. 473,510. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. LAWLER, a citizen of the United States of America, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Draft-Regulators, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain new and useful improvements in draft regulators, for automatically governing or regulating the draft of heating apparatus and particularly to such as employ hot water or other heated liquids.

The object of the invention is to produce in a draft regulator, means to automatically control a hot water heating apparatus so that when the liquid has reached a predetermined temperature, the doors or dampers in the air, draft or discharge flue may be opened or closed to urge the fire or moderate its intensity respectively, as it may lag below or quicken above the desired standard; this resulting in uniform temperature as well as economizing in the fuel; furthermore to provide a simple construction in accomplishing the above results, making the parts easily adjustable and readily removable to renew those worn or broken in use, furthermore providing in a draft regulator elements that shall be efficient and satisfactory in use and comparatively inexpensive in manufacture.

Finally the invention abounds in various novel details of construction, arrangement and combination of parts to be hereinafter more fully described and specifically pointed out in the claims.

In describing the invention in detail, reference is had to the accompanying drawings forming part of this specification in which like letters of reference indicate corresponding parts in the several views, in which—

Figure 1. is a view in elevation of the regulator ready to be mounted in place on a boiler or heating apparatus and Fig. 2. is a longitudinal, vertical, sectional view of the same.

In the drawings, A, indicates a bowl-shaped shell provided with flanges *a*, *a*, securing it to the accompanying parts, also connections B, C, by which means the device is attached to the heating apparatus. Inside, and running parallel with the outer shell a receptacle *b*, is provided which is designed to retain the liquid C′, to be acted upon by the heat circulating between B and C, through the chamber c^4, operating as a flow pipe, or there may be formed a separate circulation by connecting a hot water pipe near the top of the boiler at B, and extending a pipe from C, to the bottom of the boiler, so that the hot water then circulating would act upon the contents of the bowl and raise or lower its temperature according to the temperature of the circulating liquid. The expansion of C′, or the steam generated therefrom will exert a pressure on a diaphragm D, which is provided and formed of suitable elastic material secured by the bolts *d*, *d*, which serve also to engage the flanges of the oval top E, and of *b*, and A, respectively; as well as suitable washers b^2, for the purpose of forming tight joints.

In order to fill the receptacle *b*, the supply pipe F, is provided which is hermetically closed by a plug or cap *i*. The top is provided with a slot or other form of aperture for the reception of a piston rod K, which takes the motion of the diaphragm as it expands or contracts, said piston rod in turn actuating the lever *k*, pivoted at k^2, and also at L; to bifurcated arm *l*. The lever is provided with a movable weight M, which balances the draft doors, being adjustable to allow for any difference that might exist in weight—furthermore, said lever carries at its free ends chains or other connections N, N, attached to the doors or dampers O and P, which are operated oppositely by a movement of the lever L.

In operation, the receptacle *b*, is filled with liquid which will expand or generate steam when heated, water circulating through the connecting pipes B, C, will act upon the liquid in the regulator. When the water in the boiler or apparatus reaches the desired temperature it will cause the liquid in the regulator to generate steam or expand and by the pressure therefrom the diaphragm would be elevated carrying with it the lever *k*, which would result in the opening of the damper O, and the consequent closing of P, thus moderating the fire. As the water in the apparatus cooled by the diminished heat the contents of the regulator would be acted upon, causing a contraction of the liquid or a condensa-

tion of the steam, thus causing the diaphragm to descend to its normal position.

It is particularly noted that various changes may be made in the detail construction of the device without departing from the general idea involved.

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

1. In a draft regulator, the combination of the hemispherical receptacle having flanges, an outer casing running parallel therewith forming a chamber intermediately, said outer casing being provided with flanges and having inlet and outlet pipes through which the heating medium reaches the chamber, the diaphragm, the piston actuated thereby to which is pivoted the lever carrying the chains or connections operating the doors, substantially as described.

2. In a draft regulator, the combination of the hemispherical receptacle, the outer casing running parallel therewith and forming a chamber intermediately, the inlet and outlet pipes communicating with the chamber, the supply pipe, the diaphragm, the piston actuated thereby which in turn communicates motion to the pivoted lever, substantially as described.

3. In a draft regulator, the combination of the hemispherical receptacle, the outer casing running parallel therewith and forming a chamber intermediately, said outer casing having inlet and outlet pipes as described, the supply pipe leading to the receptacle, the diaphragm, the piston actuated thereby, and the lever pivoted to the piston and bifurcated arm, and the connections extending from the lever to the draft doors, as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES J. LAWLER.

Witnesses:

PERCIVAL J. MORRIS,

J. ELLIOT ROSS.