A. FOUBERT.
Beer-Boiler.

No. 206,010. Patented July 16, 1878.

FIG. 1.

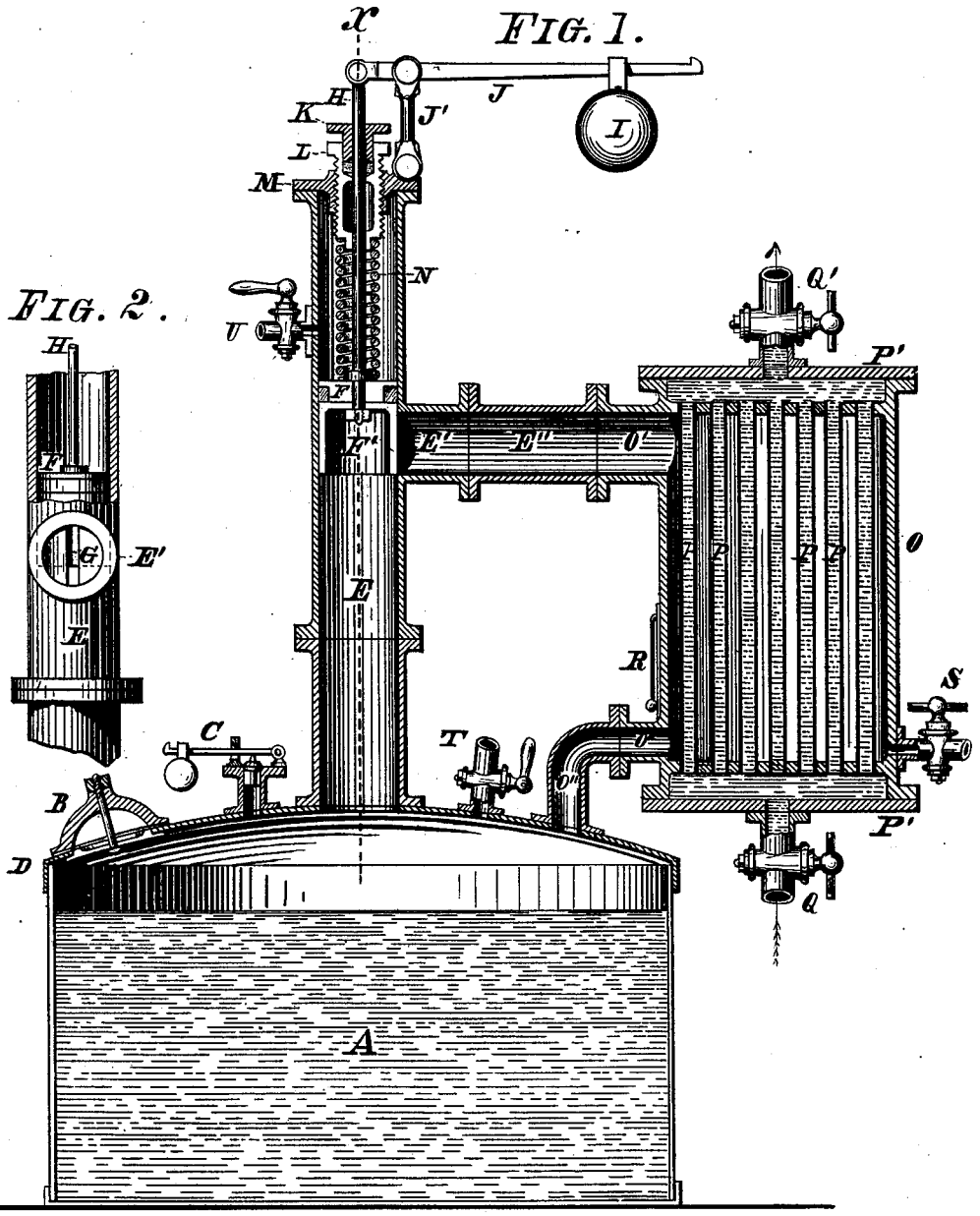

FIG. 2.

Witnesses:

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UNITED STATES PATENT OFFICE.

ANDREW FOUBERT, OF BUFFALO, NEW YORK.

IMPROVEMENT IN BEER-BOILERS.

Specification forming part of Letters Patent No. **206,010**, dated July 16, 1878; application filed June 8, 1878.

To all whom it may concern:

Be it known that I, ANDREW FOUBERT, of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements on an Apparatus for Boiling Wort for Beer; and I do hereby declare that the following description of my said invention, taken in connection with the accompanying sheet of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has special reference to an apparatus for boiling wort for beer; and it consists in the peculiar arrangement of parts and details of construction, as hereinafter first fully set forth and described, and then pointed out in the claims.

In the drawings hereinbefore mentioned, which serve to illustrate my invention more fully, Figure 1 is a longitudinal sectional elevation of my improved beer-boiling apparatus. Fig. 2 is a similar view of a fragment of the regulator-tube, taken in line *x x* of Fig. 1.

Like letters of reference indicate corresponding parts in both figures.

A is the beer kettle or boiler, which may be of any of the well-known constructions, my improvements being applicable to all the various kinds of steam and otherwise heated boilers. This boiler is provided with a man-hole, B, by means of which access can be had to the interior thereof, and with a safety-valve, C, to relieve the same of any undue pressure.

Centrally upon the crown D is placed a tube, E, provided with a closely-fitting piston, F, the lower part of which is composed of a shell, F′. This piston serves to prevent the escape of the gases generated within the boiler A through said tube E, and at the same time to act as a regulator-valve, in conjunction with a slotted aperture, G, Fig. 2, in said tube.

The piston is attached to a valve-rod, H, extending through the upper end of the tube E, and attached to a balance or lever, J, carrying a poise or weight, I, said lever having its fulcrum within a support, J′. The piston-rod H passes through a stuffing-box, K, in the upper end of a screw socket or tube, L, inserted into a cap, M, which closes the upper end of the tube E. Within the tube E is further provided a spiral spring, N, interposed between the screw-socket L and piston F, and tensioned, by means of said screw-tube, to any desired elasticity or pressure upon said piston.

E′ is a branch on the tube E, having a flange or similar means of connection with a tube, E″, to which, in turn, is secured a condenser, O, by means of a branch, O′, on the exterior shell of said condenser. The interior of this shell is fitted with two tube-heads, within which a series of tubes, P, is expanded in the usual manner, the shell being closed on both ends by caps or plates P′. These plates are fitted with induction and eduction pipes and stop-cocks Q Q′, respectively. The exterior of the condenser-shell has a further branch, O″, to which is attached an elbow-pipe, O‴, connecting the lower end of the condenser with the crown of the boiler A, and it has also a draw-off cock, S, and a thermometer, R.

The object of this device is, first, to enable the boiling of the wort to be conducted under pressure, whereby the liquor is boiled at a higher temperature; and, second, to return the evaporated product to the boiler in liquid form at a temperature but slightly below the boiling-point of the liquid, and thereby to considerably reduce the expenditure of heat, and consequently of fuel, and to retain all the aroma and essential and volatile parts of the liquor, which, in the usual open kettles, escape into the atmosphere, and are thereby lost.

These results are obtained in the following manner: The kettle or boiler A being supplied with the liquid and necessary ingredients, and heated in any of the well-known manners by direct fire or steam, the gases produced fill the upper part of said boiler, and, the latter being hermetically closed, accumulate there and attain a degree of tension limited by the safety-valve C to a fixed and predetermined worm. These gases, also acting upon the regulator-piston F, tend to move the same upward, which action is counteracted by the spiral spring N, which may be tensioned to any desired degree of resistance by screwing the socket L in or out of the tube E or by shifting the weight I on the lever J farther from or nearer to its fulcrum. Assuming, now, that the safety-valve C be set so as to liberate the gases when the pressure in the

kettle A exceeds, say, five pounds to the square inch, the spring N would be so tensioned as to resist a pressure against the piston F of about two or three pounds only, so that, as soon as this latter pressure is attained, the piston is moved upward, and thus discloses the escape-opening G in said tube E, causing the gases to escape through the pipes E′ E″ O′ into the condenser O. In this condenser a continuous flow of cold water is kept from the bottom upward through the tubes P, and the gases coming in contact with the exterior surfaces of said tubes are condensed and returned to the kettle A by the pipes O″ O‴ in liquid form. The temperature in the interior of the condenser O is indicated by the thermometer R, and is, by regulating the supply of cold water, adjusted in such manner that the returned liquid still possesses a temperature but slightly below its boiling-point.

It will now be readily observed that, as the pressure in the kettle A increases, the piston F is moved farther up in the tube E, and thereby still further discloses the aperture G, making the escape-opening also correspondingly larger. In this manner the escape of the gases is regulated automatically by the piston F and its accessories; but should, for any reason, a pressure within the boiler be reached exceeding that determined by the safety-valve, such gases would find vent through said safety-valve.

This entire process is carried on in sealed vessels having no open communication with the atmosphere. It is therefore evident that the aromatic, essential, and volatile matters are retained in the liquid, and that for this reason it requires a smaller quantity of hops for a batch of beer, and yet the latter will be stronger and have a better flavor. This method further results in a great saving of fuel and time in boiling a batch of beer.

To protect the metallic parts with which the gases come in contact, I shall tin the same on such surfaces.

Instead of the spiral spring N, the weight of the piston F may be used as a medium of resistance to the pressure within the kettle A, such piston being, in that case, made heavy enough to counterbalance any reasonable maximum pressure under which the boiling may be carried on, and the adjustment for a minimum pressure effected by shifting the weight on the lever J accordingly.

The size of the condenser is determined by the capacity of the boiler to which it is attached; but it should, in all cases, be large enough to condense all the gases capable of being generated in such boiler.

Having thus fully described my invention, I claim as new and desire to secure to me by Letters Patent of the United States—

1. The combination, with the boiler A, of the tube E, provided with the slotted aperture G, piston F, connections E′ E″, condenser O, and pipes O″ O‴, substantially as specified, whereby the gases are passed through said condenser and returned to the boiler in liquid form, the escape being automatically regulated, substantially in the manner and for the purpose specified.

2. In an apparatus for boiling wort for beer, an escape-pipe having an escape-aperture, the size of which is automatically varied by the varying pressure of the gases in the apparatus acting upon a piston within said escape-pipe, a condenser and tube or tubes returning the escaped gases in liquid form to said boiler, as and for the purpose specified.

In testimony that I claim the foregoing as my invention I have hereto set my hand and affixed my seal in the presence of two subscribing witnesses.

A. FOUBERT. [L. S.]

Attest:
MICHAEL J. STARK,
J. MONIN.