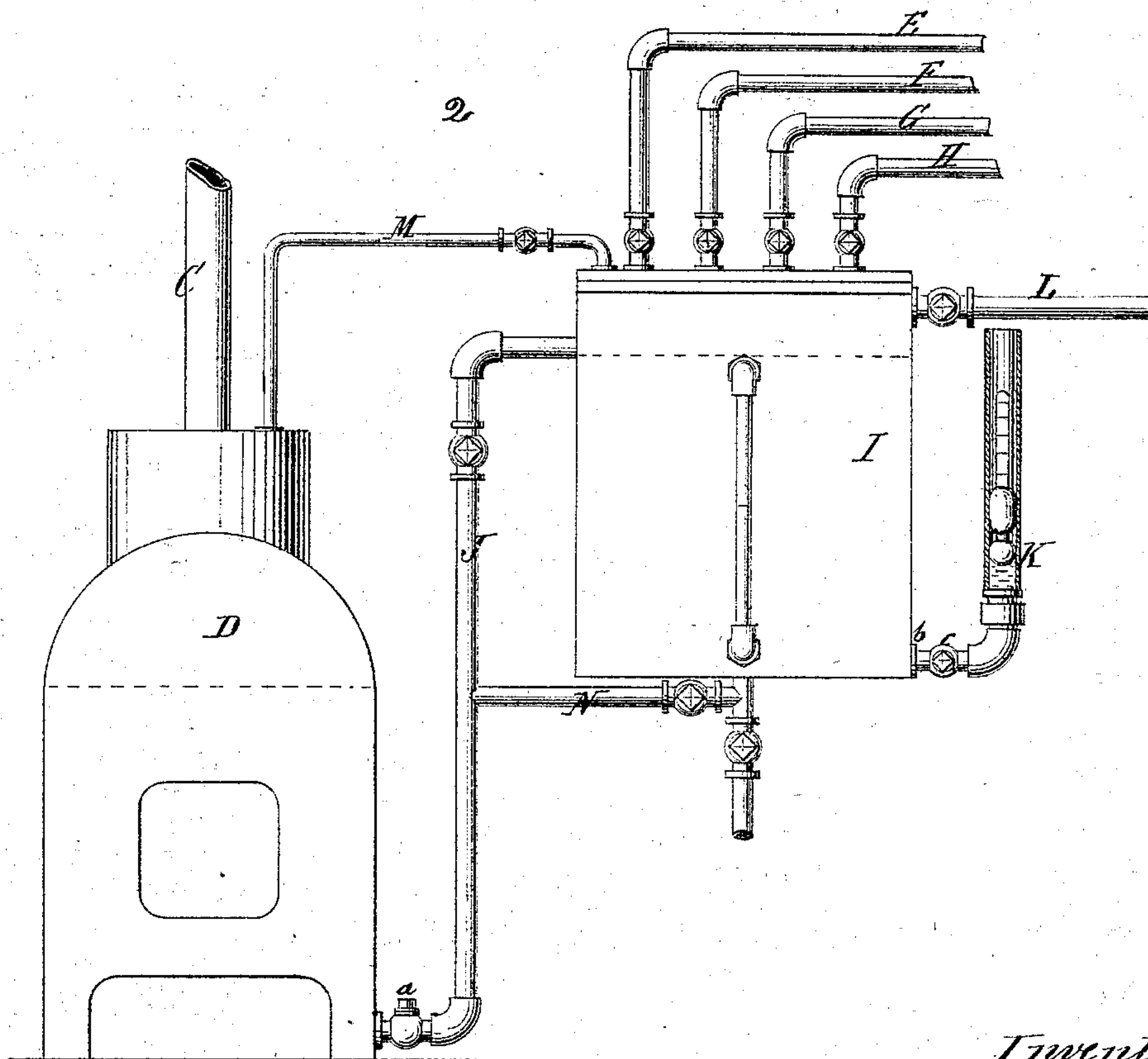
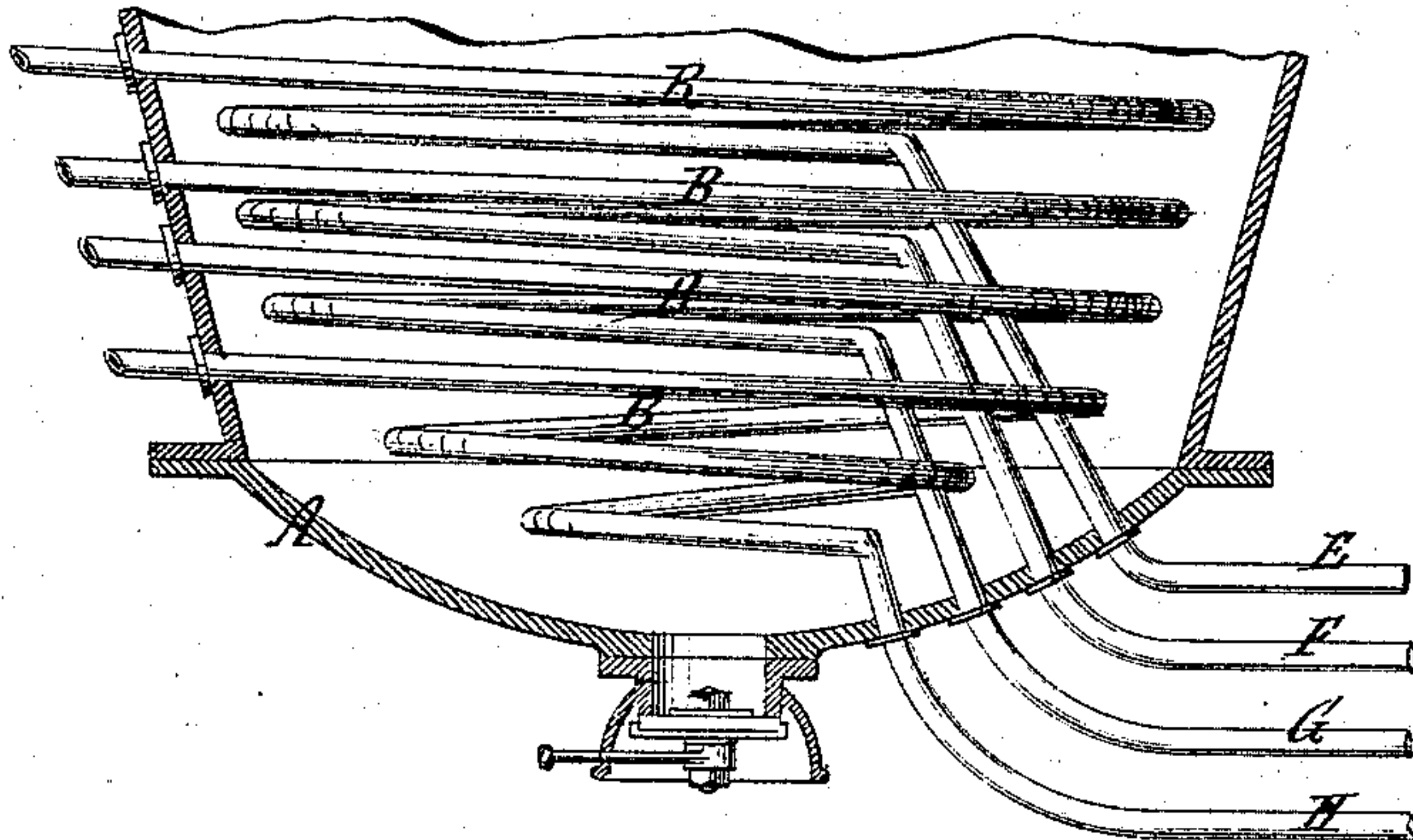


C. W. DURANT.

Apparatus for Treating Saccharine Liquids.

No. 135,788.

Patented Feb. 11, 1873.



Witnesses:  
Ernst Billmeyer  
Chas. Wickers.

Inventor:  
Charles W. Durant  
per  
Van Santvoord & Haupt  
att



# UNITED STATES PATENT OFFICE.

CHARLES W. DURANT, OF NEW YORK, N. Y.

## IMPROVEMENT IN APPARATUS FOR TREATING SACCHARINE LIQUIDS.

Specification forming part of Letters Patent No. 135,788, dated February 11, 1873.

*To all whom it may concern:*

Be it known that I, CHARLES W. DURANT, of the city, county, and State of New York, have invented a new and useful Improvement in Apparatus for Treating Saccharine Liquids; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, which drawing represents a sectional front view of the apparatus which I use in carrying out my invention.

This invention consists in combining with the heating-coils of a vacuum-pan a closed receiver, which connects with the steam-boiler, from which the steam for the heating-coils is taken, the pipe connecting the receiver being provided with a check-valve, while the receiver connects with a tubular vessel for receiving a saccharometer in such a manner that the steam from the boiler passes through the heating-coils into the receiver, where the same condenses, and whence the water of condensation flows back into the boiler by its own gravity, thereby producing a uniform heat in the pan and feeding the boiler with water at a high temperature, and if a leak occurs in one of the heating-coils, so that a part of the liquid contents of the pan will escape through said coil and collect in the receiver, and by opening from time to time the connection with the tubular vessel and introducing a saccharometer, the leak is detected, and much loss of saccharine liquid and also injury to the boiler and to the heating-coils are avoided.

In the drawing, the letter A designates a vacuum-pan, in which are situated four (more or less) heating-coils, B. The receiving ends of these coils connect with a steam-pipe, C, which emanates from a steam-boiler, D, and the tail-pipes E F G H connect with a receiver, I. This receiver is by preference made of boiler-iron, closed everywhere, and strong enough to resist the boiler-pressure. It is situated at a level above the steam-boiler, and from its side, near its top, extends a pipe, J, to and into the bottom part of the boiler. This pipe is provided with a

check-valve, a, next to the boiler, and as the steam from the boiler passes through the heating-coils into the receiver I, which is partially filled with water, the steam condenses, and, as soon as the level of the water in the receiver rises above the mouth of the feed-pipe J, it descends by reason of its own gravity into the boiler, the pressure in the receiver being the same as that in the boiler. From the side of the receiver extends a pipe, b, which connects with a tubular vessel, K, by preference made of glass or provided with transparent sides, so that its interior can be inspected. In the pipe b is a cock, c, and by opening this cock a portion of the contents of the receiver can be let into the tubular vessel, which I term the "try"-vessel. After this vessel has been filled with liquid from the receiver, I introduce therein a saccharometer of any desired construction, so as to ascertain the gravity of the liquid.

By these means I am enabled to ascertain at any time if the liquid in the receiver is mixed with saccharine matter. If any such saccharine matter is found it shows that one or the other of the heating-coils is defective, and that a portion of the contents of the vacuum-pan passes through a leak in the heating-coil down into the receiver. As soon as such a defect is detected the vacuum-pan is emptied and the defect remedied, and no injury is done to the boiler or to the pipes; but if the tail-pipes of the heating-coils are in direct communication with the steam-boiler, and one of said coils becomes leaky, the saccharine matter escaping from the vacuum-pan through such defective coil passes directly into the boiler, where it produces an injurious foaming and danger of an explosion; and, furthermore, the loss of saccharine liquid is not detected for some time, and the defect in the heating-coil cannot be remedied until much injury has been done.

The receiver I is supplied with water through a pipe, L, and it connects with the steam-space of the boiler by a pipe, M, and with the water-space or feed-pipe by a pipe, N.

If the vacuum-pan is not in operation and the boiler requires to be fed with water, the receiver is partially filled; then the steam-pipe M is opened, and, as soon as the pressure in

the receiver becomes equal to that of the boiler-pressure, the water from the receiver descends through the pipe N and feed-pipe J into the boiler. This boiler-feed can also be made automatic; but, since the same forms no part of my present invention, I abstain from giving a more detailed description thereof.

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

1. The receiver I, provided with a vessel or "try-chamber," K, to receive a saccharometer for testing the contents or gravity of the

liquid of the receiver, and for the purpose herein specified.

2. In combination with the receiver having a testing-chamber and connecting with the tail-pipes of the heating-coils of a vacuum-pan, essentially as described, the pipes M J N L, operating in respect to each other and to a steam-boiler substantially as set forth, for the purpose specified.

C. W. DURANT.

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.