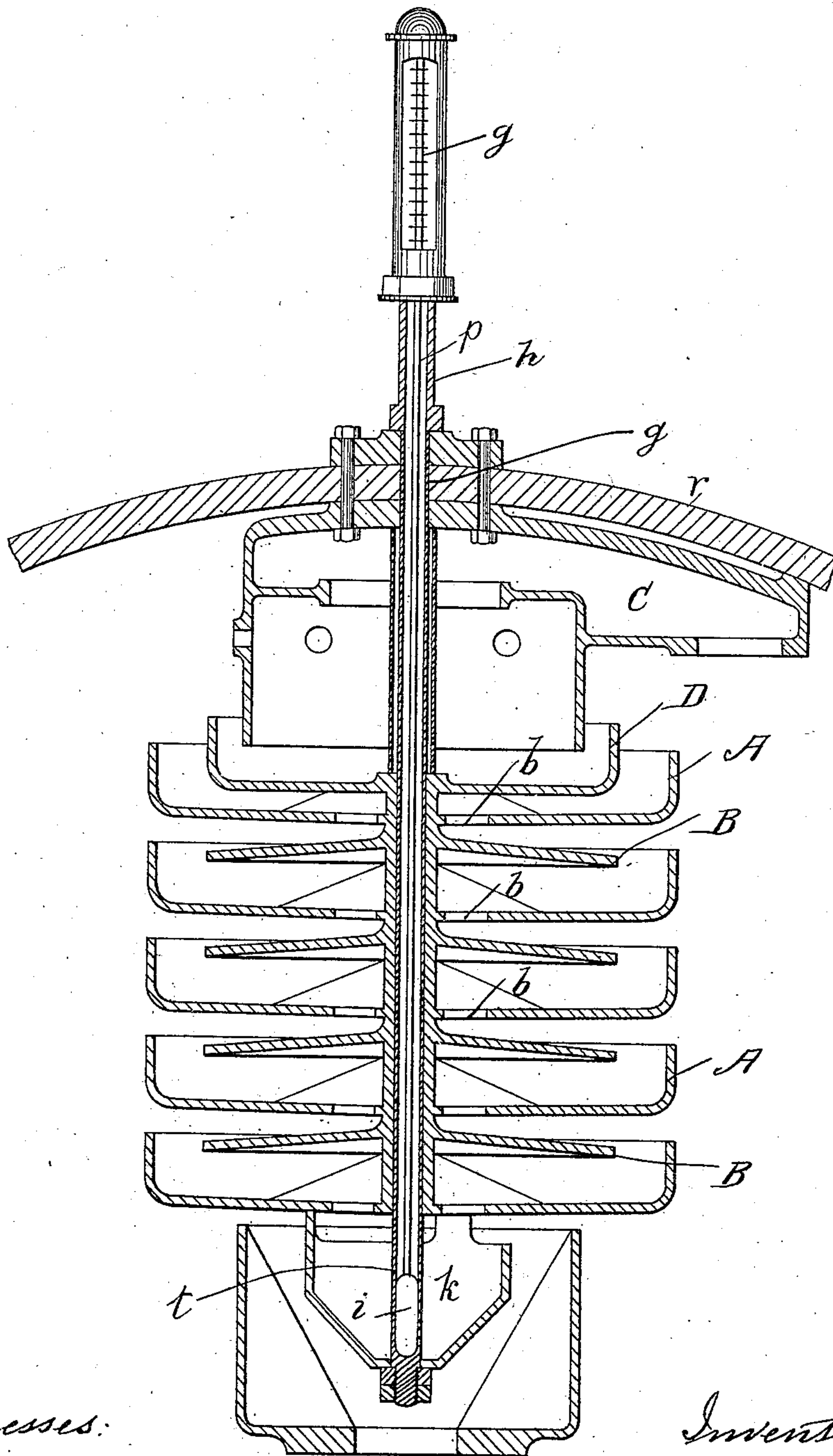


No. 883,925.

PATENTED APR. 7, 1908.

G. WILKINSON.  
FEED WATER HEATER.  
APPLICATION FILED MAY 24, 1907.



Witnesses:

L. E. Brown.

Walter Allen

Inventor.

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# UNITED STATES PATENT OFFICE.

GEORGE WILKINSON, OF BEECH MOUNT, HARROGATE, ENGLAND.

## FEED-WATER HEATER.

No. 883,925.

Specification of Letters Patent.

Patented April 7, 1908.

Original application filed December 11, 1906, Serial No. 347,300. Divided and this application filed May 24, 1907.  
Serial No. 375,449.

*To all whom it may concern:*

Be it known that I, GEORGE WILKINSON, residing at Beech Mount, Harrogate, in the county of York, England, engineer, have invented certain new and useful Improvements in or Relating to Feed-Water Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This application is a division of the application filed by me on December 11th, 1906, Serial Number 347300.

It has previously been found advantageous to apply to an external heater a thermometer for indicating the temperature of the feed water after heating, and by my present invention a thermometer can be similarly used in connection with an internal heater, indicating outside the boiler the temperature of the water after passing through the heater. Thus, if the quantity of feed water being delivered should happen to be in excess of the efficient capacity of the heater, this will be made evident by a lowering of temperature indicated by the thermometer; and if the heater should become blocked so that the supply of feed water is interrupted, the thermometer will indicate the steam temperature only, thus calling attention to the interruption.

According to my invention the closed end of a suitable tube enters the tank or receptacle which receives the water from the heater and passes it on to the general body of boiler water; this tube extends to the outside of the boiler, a suitable gland or packing device being placed at the point where the shell of the boiler is pierced for the exit of the tube. The bottom of the tube may contain mercury or the like fluid, and the stem of a thermometer may be passed down the said tube into the bath of mercury or the like.

In the drawings, the figure is a vertical section of an internal feed-water heater provided with a thermometer according to this invention.

The feed-water heater is supported inside the shell *r* of the boiler, and it is provided with a series of dishes *A* and a series of plates *B* arranged alternately one above the other. *C* is a de-aerating chamber at the top of the heater, and *D* is the first dish or chamber into which the feed-water is first delivered

by any approved means. The dishes *A* have holes *b* near their centers, and the water flows from these holes over the plates *B* beneath them, and is heated by contact with the said plates and dishes and with the steam in the boiler before being discharged into the water space or coming into contact with any fire-tubes or the sheets of a fire-box.

A settling chamber *k* is arranged under the last dish of the series, and the water when fully heated flows over the edge of this chamber or vessel *k*. The vessel *k* and the plates and dishes are supported by any approved means, and a tube *t* is preferably provided for this purpose and its upper part is secured to the boiler shell in a hole or perforation *g*.

The thermometer *p* is preferably arranged in the tube *t* so that it may be protected, and the upper end *g* of the thermometer projects from the boiler shell to a point where the level of the indicating fluid in it can be read against a suitably graduated scale. A stuffing-box or pipe *h* is provided so that steam cannot escape from the tube *t*. The bulb *i* of the thermometer is arranged inside the settling chamber *k* where the feed-water is hottest.

The tube *t* is kept relatively cool by the descending feed water in the dishes, so that it does not have the full temperature of the steam in the boiler. In this manner the thermometer is enabled to give a substantially correct indication of the temperature of the hottest feed water in the vessel *k* in which its bulb is arranged.

What I claim is:

1. The combination, with a boiler shell, and a tube depending therein, of a series of heating dishes and plates for the feed water carried by the said tube and preventing it from having the temperature of steam, a chamber for the hottest feed water carried by the lower end of the said tube, and a thermometer inclosed in the said tube with its bulb arranged in the said chamber and its upper end portion projecting above the said tube and boiler shell.

2. The combination, with a boiler shell, and a tube depending therein, of a thermometer arranged in the said tube with its bulb in the lower part of the said tube and its upper end projecting from the said boiler shell, a chamber for the hottest feed water surrounding the lower part of the said tube

and the said bulb, a series of heating plates  
and dishes encircling the middle portions of  
the said tube, and means for discharging the  
feed water onto the top of the said series,  
5 whereby the said feed water is heated and  
the stem of the said thermometer is pre-  
vented from becoming hotter than its bulb.

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

GEORGE WILKINSON.

Witnesses:

J. RIASDALE,  
ROBT. McCOURT.