

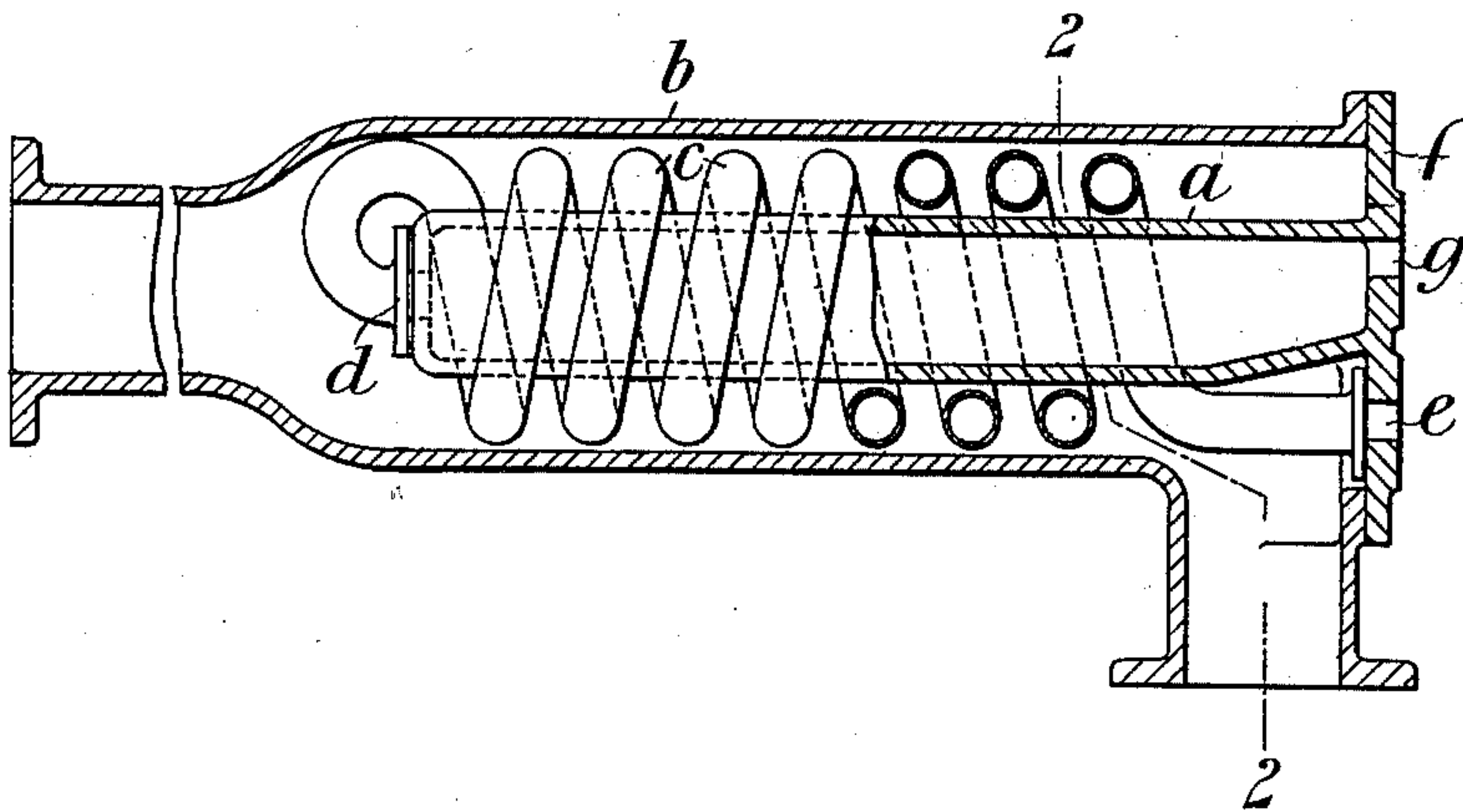
No. 757,846.

PATENTED APR. 19, 1904.

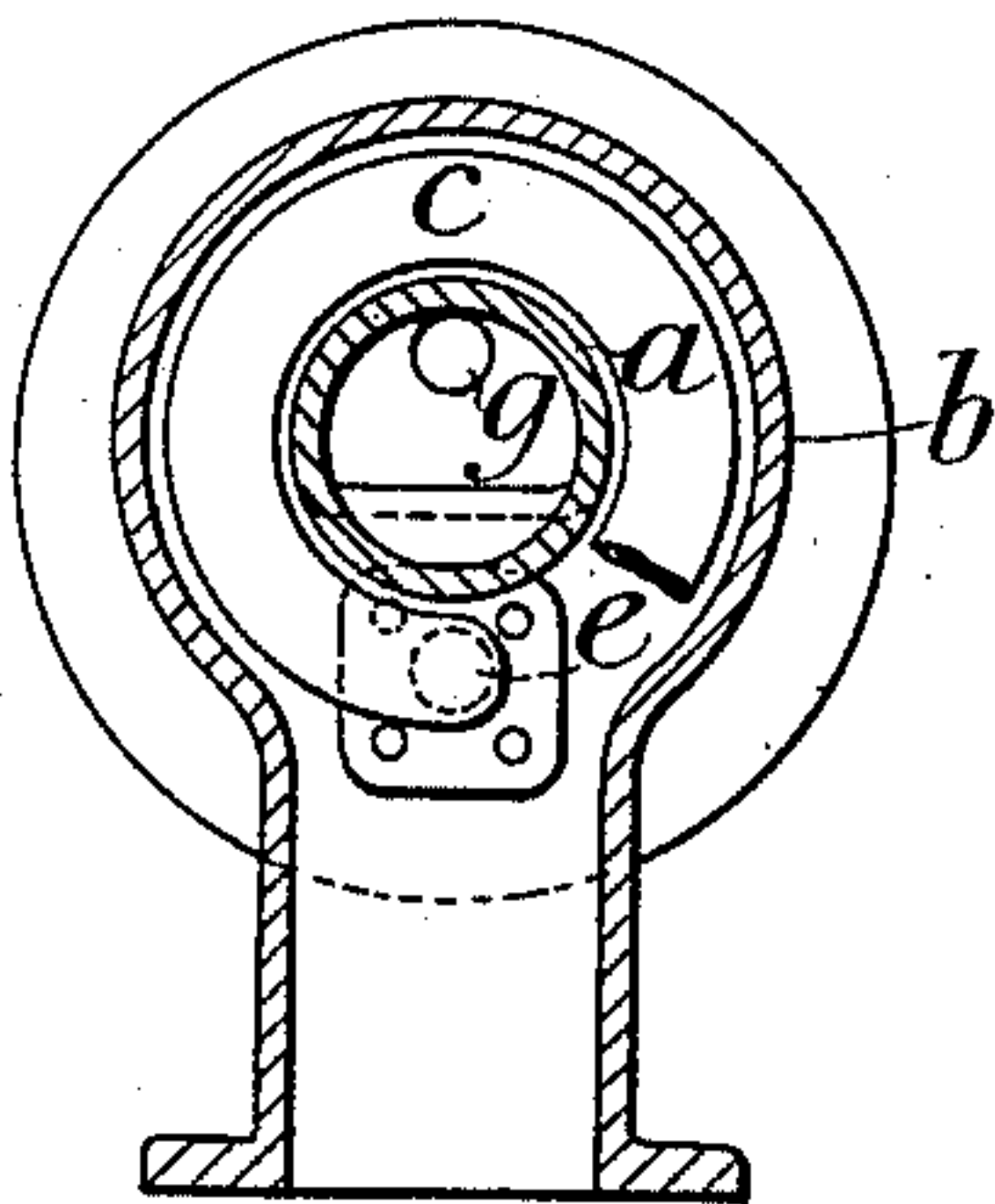
S. W. SIMPSON.  
FEED WATER HEATER.  
APPLICATION FILED MAY 8, 1903.

NO MODEL.

*Fig. 1.*



*Fig. 2.*



Witnesses:  
J. K. Moore  
S. H. Hubbard

Inventors:  
Sydney W. Simpson.  
by  
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att'y

# UNITED STATES PATENT OFFICE.

SYDNEY WESTHORPE SIMPSON, OF CAMPERDOWN, GREAT  
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## FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 757,846, dated April 19, 1904.

Application filed May 8, 1903. Serial No. 156,243. (No model.)

*To all whom it may concern:*

Be it known that I, SYDNEY WESTHORPE SIMPSON, a subject of the King of Great Britain, residing at Devonport House, Camperdown, Great Yarmouth, county of Norfolk, England, have invented new and useful Improvements in Feed-Water Heaters, of which the following is a specification.

This invention relates to improvements in feed-water heaters chiefly designed for use in connection with condensing-engines.

According to the invention I make use of a device comprising a cylindrical or other suitably-shaped chamber adapted to be fitted in the steam-pipe, which may be enlarged to receive it. Around this chamber is coiled a pipe, preferably of copper or other material which is a good conductor of heat, the said coil forming a continuation of the chamber. The feed-water to be heated is caused to enter the chamber through which it flows and thence passes into the coil. The exhaust-steam bathes the cylindrical chamber and the coil, so that the feed-water is heated both in its passage through the cylindrical chamber and through the coil. In practice the device is so fitted in the steam-pipe that it can be removed for examination, cleansing, and repair, and replaced with facility. To avoid the disadvantages which are met with when pumping hot water, I prefer to fit the device in the steam-pipe so that the feed-water first flows through the pump by which it is forced through the heater.

To enable the invention to be fully understood, I will describe it by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal section of a feed-water heater made according to the invention, and Fig. 2 is a section on the line 2 2, Fig. 1. *a* is the cylindrical chamber, which is fitted inside the expansion or enlargement *b* of the steam-pipe (which I term the "steam-chamber.") *c* is the pipe, of copper or other material that is a good conductor of heat, which is coiled around the chamber *a*. One end of this pipe is attached to the inner end of the chamber *a*,

as shown at *d*, the other end being connected to the outlet *e*.

As will be seen, the device, including the chamber *a* and the coil *c*, is fitted to a cover or flange *f* in such a manner that the said device can be inserted into the expansion *b* of the steam-pipe and bolted in place and removed for examination, cleansing, and repair with extreme ease.

The exhaust-steam flows through the pipe *b*, bathing both the coil *c* and the chamber *a*, and the feed-water is caused to flow, preferably through the medium of a pump, into the chamber *a* through the inlet *g* in the flange *f*, the said water passing through the said chamber *a*, where it has heat imparted to it by the walls of the said chamber. On reaching the end of the chamber it enters the coil *c* and flows in a spiral path through the said coil around the chamber *a* and has more heat imparted to it by its contact with the walls of the hot coil, the heated water finally escaping through the outlet *e*.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a feed-water heater, the combination with the steam-chamber, provided with steam inlet and outlet, of a detachable closing device fitted over an aperture in the walls of said chamber and provided with water inlet and outlet, and a water-heating device secured to said closing device and extending into the interior of said chamber and connected to said water inlet and outlet, whereby by removing said closing device said heating device may be removed from said chamber for examination, cleaning and repair, substantially as described.

2. In a feed-water heater, the combination with the steam-chamber provided with a steam-inlet, a steam-outlet, and an auxiliary aperture, a removable closing-plate secured to said chamber and closing said aperture, a feed-water heating-chamber secured to said

plate, extending into said steam-chamber and  
having an opening communicating therewith  
through said plate, a coil connected at one end  
to the inner end of said chamber and surround-  
5 ing the same, and having its other end com-  
municating with an aperture in said plate,  
whereby by removing said plate, said water-

chamber and coil may be removed therewith  
from the steam-chamber, substantially as de-  
scribed.

SYDNEY WESTHORPE SIMPSON.

Witnesses: -

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