(No Model.)

T. McDONNELL, Jr.

FEED WATER HEATER.

No. 551,991. Patented Dec. 24, 1895.

Fig. 1.

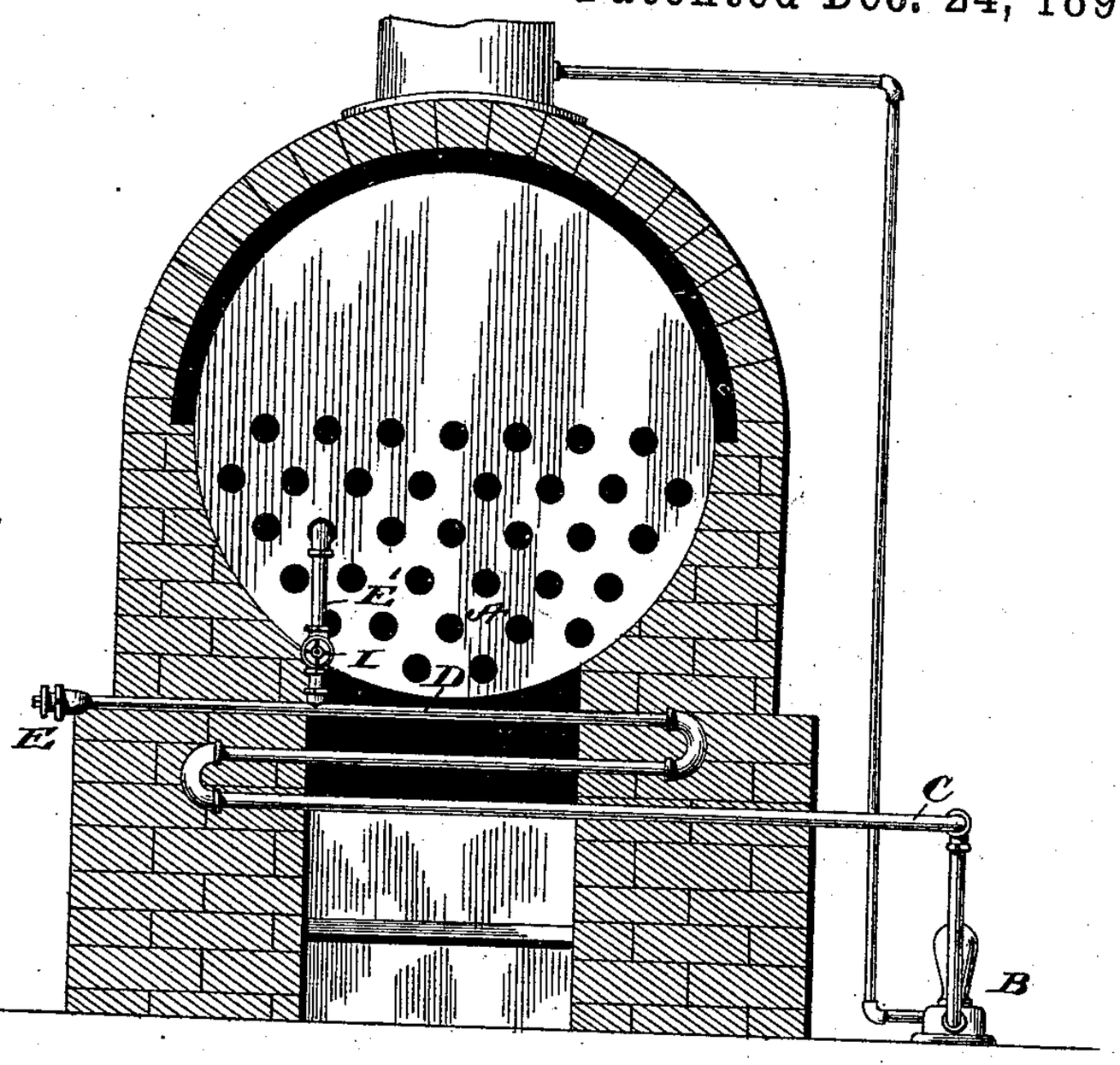


Fig. 2.

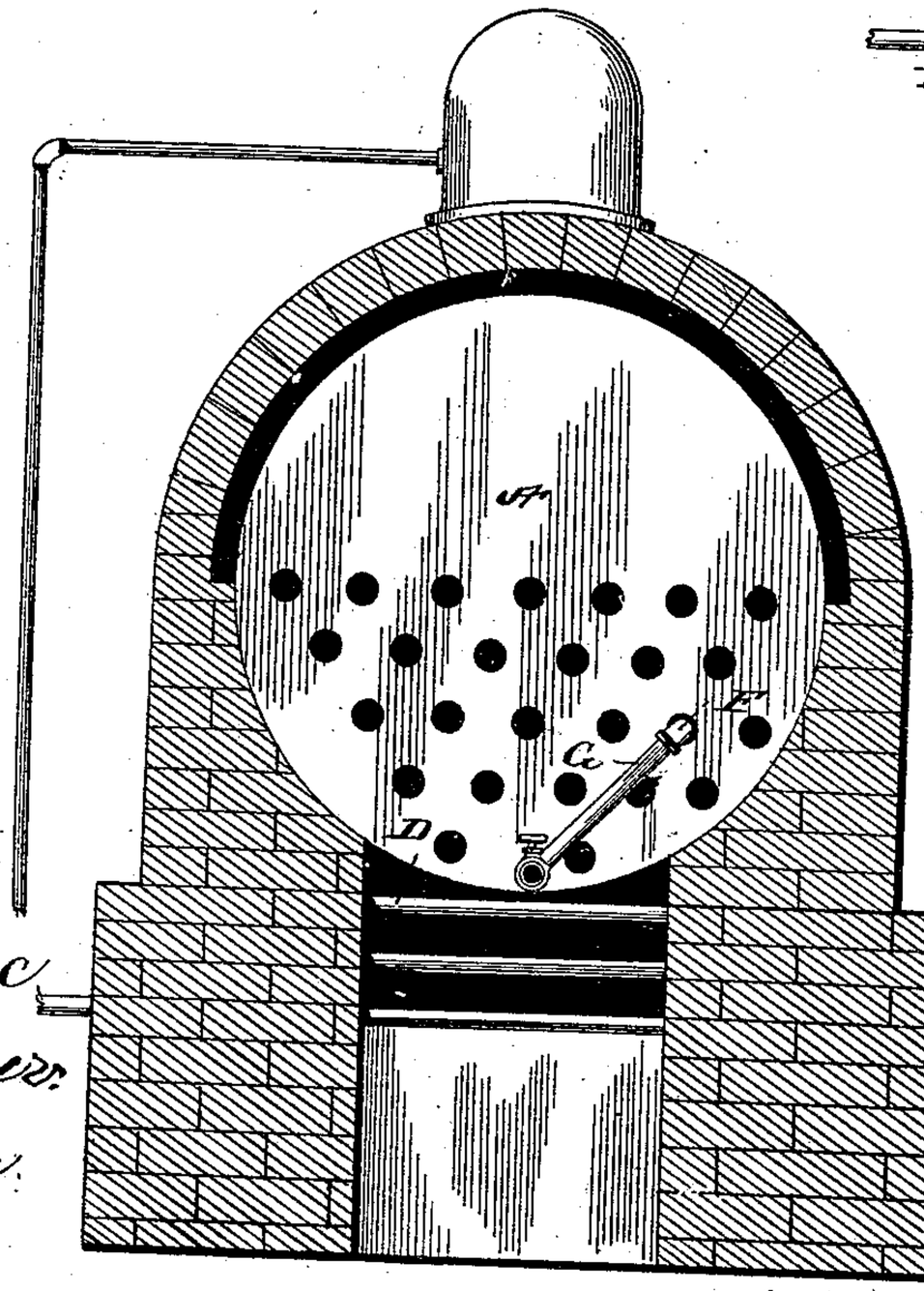
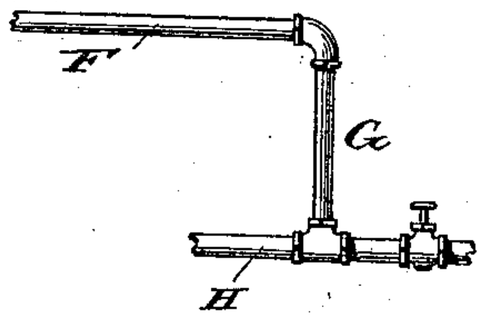


Fig. 3.



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UNITED STATES PATENT OFFICE.

THOMAS McDONNELL, JR., OF COCKEYSVILLE, MARYLAND.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 551,991, dated December 24, 1895.

Application filed April 23, 1895. Serial No. 546,904. (No model.)

To all whom it may concern:

Be it known that I, THOMAS MCDONNELL, Jr., a citizen of the United States, residing at Cockeysville, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Feed-Water Heaters; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention is a device for heating feed-water for steam-boilers; and it consists in certain novel features hereinafter described and claimed.

In the annexed drawings, Figure 1 is a front elevation of a steam-boiler provided with my improved feed-water heater, and Fig. 2 is a rear elevation of the same. Fig. 3 is a detail view.

The boiler A is of the usual construction, and the water is supplied to the same by a pump B in the ordinary manner. The pipe C leading from the pump does not pass directly to the boiler, however, but communicates with a transverse coil D arranged over the fire-chamber of the furnace and passing horizontally back and forth in the path of the flame and heat. The top branch of this coil projects to one side of the furnace and is closed by a plug or cap E to facilitate the cleaning of the pipes. From the top branch, near the end thereof, a short vertical pipe rises to the height of one of the fire-tubes of the boiler, at which point it is connected to a horizontal pipe F, which passes through said tube to the rear end of the boiler. This horizontal pipe F need not necessarily pass through the fire-tube, however, as it may pass over the top thereof in the path of the heat and other products of combustion, but the best results are obtained by passing it through the tube. The rear end of the pipe F is turned downward, as shown at G, and communicates with the blow-off pipe H between the boiler and the blow-off valve. The vertical pipe E′ is provided with a valve or stop-cock I, as clearly shown.

The construction and arrangement of the device being thus made known, the operation of the same will be readily understood.

The fire is kindled in the fire-chamber and the circulation of the heat is, as usual, toward the rear end of the furnace and thence forward over the boiler and through the fire-tubes. The water is forced through the transverse horizontal coil by the pump, and is consequently caused to pass back and forth through the path of the heat at the point where the temperature is highest, thus being heated before passing into the boiler so that the steam will be rapidly formed. The preliminary heating of the water is continued up to the moment it enters the boiler as it passes from the transverse coil through one of the fire-tubes or over the top of the boiler in the path of the heat. The water being thus raised to a high temperature will be converted into steam very quickly after entering the boiler, and a decided saving of fuel is thereby effected. By closing the valve I and removing the plug or cap E any sediment which may have accumulated in the coil will be rapidly blown out and the pipe cleaned. If the blow-off valve be opened at the same time, the sediment in the remaining portion of the pipe will be blown out and the entire apparatus thoroughly cleaned.

The device is very cheap and simple, and its advantages are thought to be obvious.

I am aware that various devices for heating feed-water prior to its entrance to the boiler have been heretofore provided, and I make no broad claim to such a device. My feed-water-heating apparatus is all inclosed by the walls of the furnace so that the heated water is at no time exposed to the cooling action of the atmosphere before entering the boiler. No steam-jets are required to maintain the circulation of the water, and the apparatus may be readily and rapidly fitted to any ordinary steam-boiler.

The apparatus is simplicity itself and carries the feed-water through almost the entire path of the flame and products of combustion so that there is a decided rise in its temperature before it enters the boiler. The inflowing feed-water is not met at any point of its circulation by water flowing from the boiler,

and consequently there is no eddying or arresting of the circulation due to the meeting of different currents.

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

In a feed water heater, the combination with a furnace, of a feed water supply pipe leading from a pump, and coiled back and forth directly over the grate and directly in front of the boiler, the other end of said pipe projecting outside the furnace wall and provided with a plug or cap affording adjustable means for attaching a blower, and an upwardly extending pipe leading from the upper member of the coil and provided with a valve, and projecting into the front of the boiler, and thence through one of the tubes to the rear and there connected on the outside and within the furnace wall with a short downwardly inclined pipe which connects with a horizontal pipe, one end of which projects into the lowest point of the boiler, and the opposite end being opened and closed by a valve which is used only when it is necessary to cleanse the pipes.

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

THOMAS McDONNELL, JR.

Witnesses:

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JOSEPH A. MINNICH.