(No Model.)

M. J. GALLIGAN.

FEED WATER HEATER.

No. 345,778. Patented July 20, 1886.

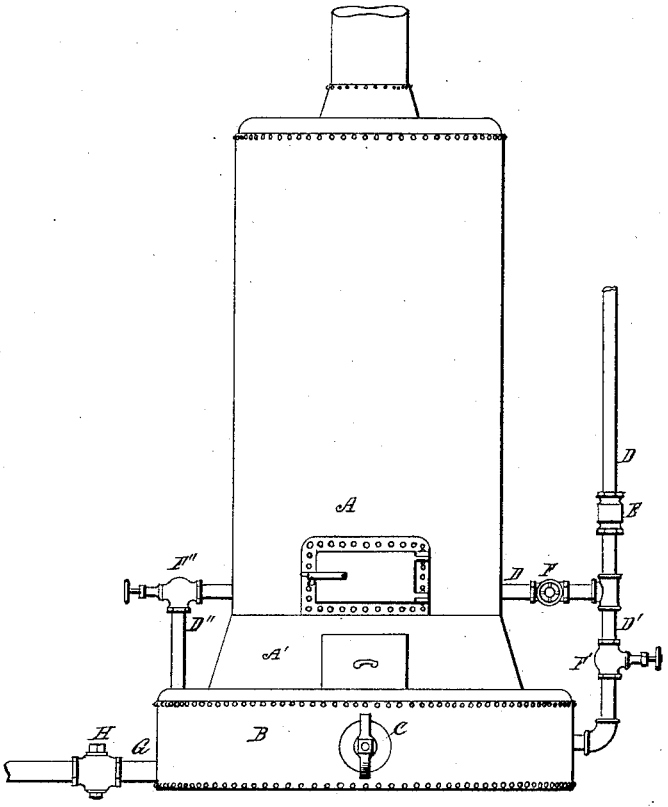

Fig. 1.

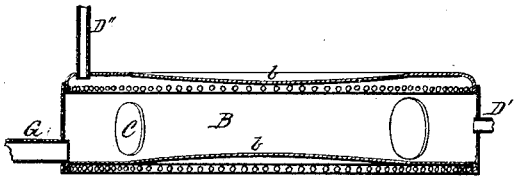

Fig. 2.

Witnesses:
A. L. Adams.
E. R. Watters.

Inventor:
Michael J. Galligan.
By Justus M. St. John.
His Atty.

UNITED STATES PATENT OFFICE.

MICHEAL J. GALLIGAN, OF CEDAR RAPIDS, IOWA.

FEED-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 345,778, dated July 20, 1886.

Application filed December 2, 1885. Serial No. 184,466. (No model.)

To all whom it may concern:

Be it known that I, MICHEAL J. GALLIGAN, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Feed-Water Heaters, of which the following is a specification.

This invention consists in the application of a feed-water heater to the under side of the fire-box of a steam-boiler, and in the construction and arrangement of the connecting-pipes, the object being to use the top of the heater for the bottom of the ash-pit, thus utilizing the heat thereof to raise the temperature of the water beneath, and by the arrangement of the pipes admit of the cleaning out of the heater while the boiler is in operation, as will be more fully set forth in the more particular description following.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of the invention as applied to an upright boiler, and Fig. 2 a vertical section of the same detached.

Similar letters of reference indicate corresponding parts.

In the drawings, A indicates the boiler, and A′ the fire-box. This boiler may be upright or horizontal, the invention being applicable to either, though of course more particularly applicable to such boilers as are provided with an attached fire-box, and commonly known as "portable boilers," either horizontal or upright.

The heater B consists in a drum, preferably somewhat larger superficially than the bottom of the fire-box, and comparatively shallow, as indicated in the drawings. It is provided with one or more hand-holes, C, for convenience of access to the interior in cleaning or otherwise. It is desirable that the whole interior of the heater should be unobstructed, in order that it may be cleaned without difficulty. I therefore dispense with stay-rods in the construction of the heater, and to give the two larger sides of the same the necessary resistance to outward pressure they are made concave, as represented in Fig. 2. This not only serves to strengthen the heater, but, in the case of the upper side, forms a considerable receptacle for ashes. A feed-pipe, D, communicates directly with the boiler and with the pump or injector. It also communicates directly with a branch-pipe, D′, passing into the heater. Further connection is made between the heater and the boiler by pipe or pipes D″. The feed-pipe is provided with a suitable check-valve, E, and the connecting-pipes with globe-valves F F′ F″, respectively. It will be seen that when the valve F is open and the others closed the feed-water will flow directly into the boiler, and when this one is closed and the others opened the feed-water will pass through the heater and be warmed by the heat of the fire-box and ashes above it. In general the water will of course be conveyed to the boiler in this way; but when it is desired to clean out the heater the feed-water may be injected directly into the boiler, and the heater emptied without stopping the engine or interfering materially with the action of the boiler. For this purpose the heater is provided with a suitable blow-off pipe, G, having a gate, H. When it is desired to blow out the whole boiler, all of the connections with the heater should be opened, in which case the impact of the steam at various points in the heater tends greatly to facilitate the removal of mud and other impurities collected therein. Thus constructed and applied, the heater forms a natural and suitable base for the boiler, dispensing with any brick-work or other erection for that purpose, and constitutes a part of the ash-pit. The heater thus occupies no extra room, and, being contiguous to the fire-box, receives much of the heat thereof that otherwise would be wasted. Its position is such as to render it the receptacle for all mud and impurities from the water and boiler, and its construction is such as to make the removal of all this easy and expeditious, and without necessarily discontinuing the operation of the boiler.

I am aware that it is not broadly new to apply a heater contiguous to the fire-box of a boiler; but I am not aware that such heater has ever before been so constructed and applied as to form the bottom of the ash-pit, or otherwise specially adapted to the purposes set forth in this application.

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

1. In combination with a steam-boiler, the described feed-water heater having concave

heads, whereby they are adapted to resist internal pressure without stay-rods, and the upper one forming a receptacle for ashes, substantially as set forth.

2. In combination with a steam-boiler, and forming the bottom of ash-pit therefor, the described feed-water heater, consisting of the drum having concave heads, for the purposes specified, and provided with feed-pipes D′ D″ and blow-off pipe G, all substantially as set forth.

3. In combination with a boiler having feed-pipe D and fire-box A′, the described heater, the upper part of which forms the bottom of the ash-pit, said heater being provided with connecting-pipes D′ D″ and blow-off pipe G, all having suitable valves, the whole being constructed, arranged, and adapted to operate substantially as and for the purpose specified.

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

MICHEAL J. GALLIGAN.

Witnesses:

A. L. ADAMS,
E. R. WATTERS.