(No Model.)

M. E. HERBERT.

HOT WATER BOILER.

No. 492,289. Patented Feb. 21, 1893.

Fig. 1.

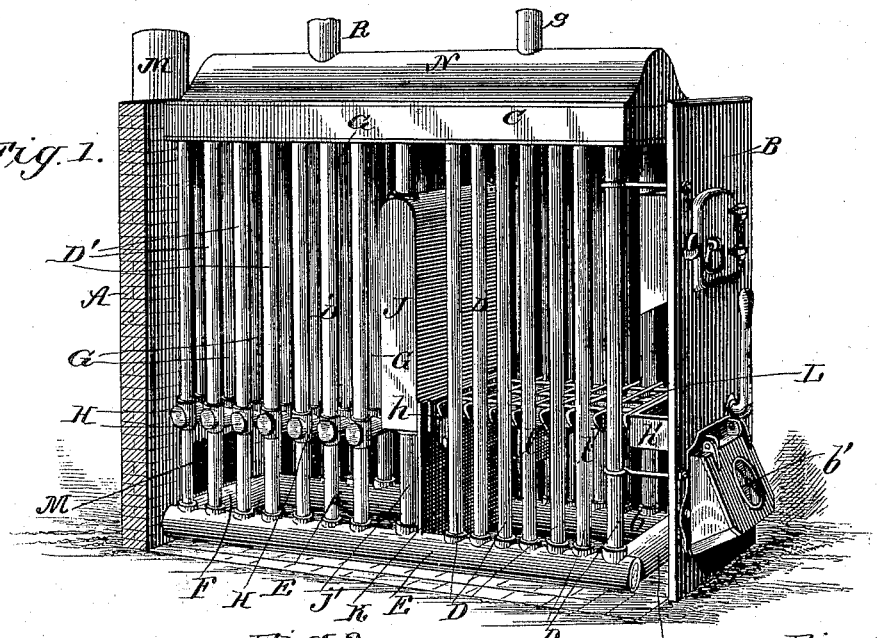


Fig. 2.

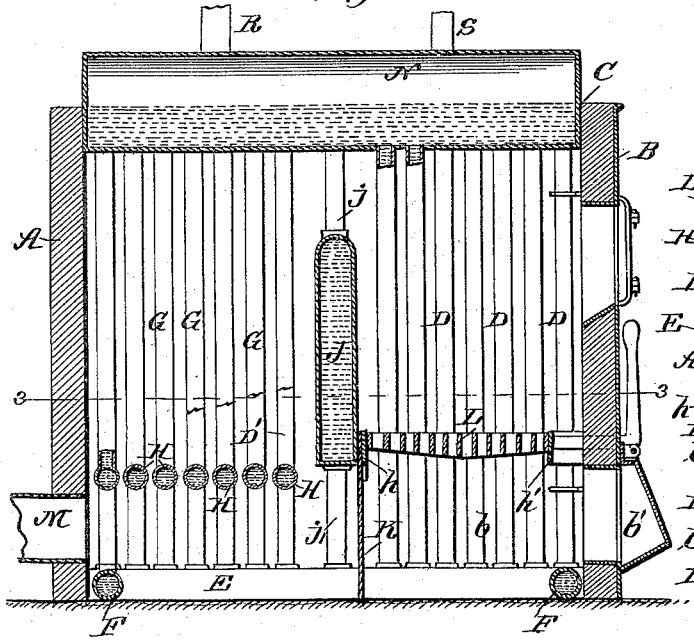
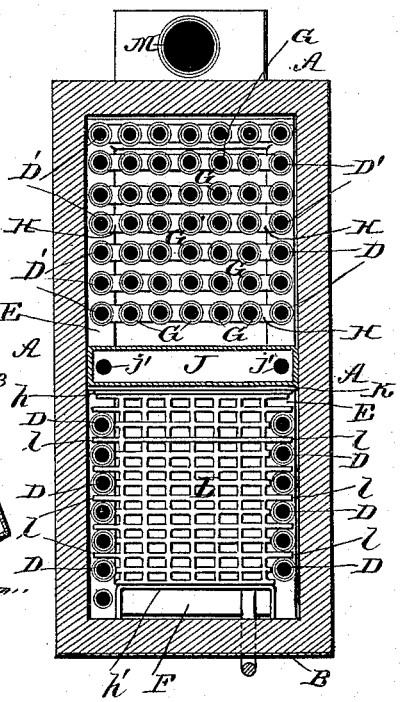


Fig. 3.



WITNESSES:

Fred L. Dieterich

Jos. A. Ryan

INVENTOR:

Micheal E. Herbert

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

MICHEAL E. HERBERT, OF ST. JOSEPH, MISSOURI.

HOT-WATER BOILER.

SPECIFICATION forming part of Letters Patent No. 492,289, dated February 21, 1893.

Application filed June 16, 1892. Serial No. 437,007. (No model.)

To all whom it may concern:

Be it known that I, MICHEAL E. HERBERT, residing at St. Joseph, in the county of Buchanan and State of Missouri, have invented certain new and useful Improvements in Hot-Water Boilers, of which the following is a specification.

My invention relates to hot water boilers and it consists in the peculiar and novel combination and arrangement of parts all of which will hereinafter be fully described in the specification and particularly pointed out in the claims reference being had to the accompanying drawings in which

Figure 1 is a perspective view of my improved boiler parts of the casing being broken away. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a horizontal section thereof taken on the line 3—3 Fig. 2.

Referring to the accompanying drawings A indicates the brick masonry which incloses the sides and rear end of the boiler, and B the front metallic casing section, which is provided with the usual feed door, ash pit, and draft door *b* and *b'* as shown clearly in Fig. 1.

The interior or body portion of my boiler consists of a hollow top or water chamber C mounted upon a series of water tubes D D' the lower ends of which connect and communicate with the longitudinal circulating pipes E which are connected at their front and rear ends by transverse circulating pipes F.

G indicates a series of drop tubes projected from the rear portion of the hollow chamber C the lower ends of which are connected to and communicate with transverse header tubes H the ends of which communicate with the vertical tubes D'.

J indicates a water leg disposed centrally of the body of the boiler, the upper end of which extends up nearly to the hollow top C, it being connected thereto by the tubes *j j*, its lower end being supported on short tubes *j' j'*, the lower ends of which are secured to the side circulating pipes E such tubes opening up a communication between the water leg and the circulating pipes for a purpose presently described.

K indicates a division wall which closes off communication between the rear and front sections of the boiler, at a point below the grate L. The grate L in its general construction is an ordinary rocking grate and is mounted in bearings *h* and *h'* secured respectively to the lower end of the water leg and the front B of the casing, its outer rocker sections being however formed with lateral projections *l l*, which project between the vertical tubes D as clearly shown in Fig. 3, such projections preventing the larger particles of coal from falling between the tubes into the ash pit.

It will be observed that by arranging the water leg and connecting it with the upper chamber and the circulating pipes as shown, a positive circulation of the water is obtainable and which can be rapidly and economically heated. It will also be noticed that the water leg forms a bridge wall, and causes the fire to pass up over the top thereof, to circulate among the rear drop tubes, as it is drawn down and out through the smoke pipe M which is located at the lower end of the rear chamber as shown.

N indicates a steam space formed on the top of the chamber C and running longitudinally thereof as shown. This space may however be omitted if desired and the chamber C formed of a shallow body as shown in dotted lines in Fig. 2.

R and S indicate the flow and return pipes respectively.

From the foregoing description taken in connection with the drawings the advantages and operation of my improved boiler will be readily apparent to those skilled in the art to which it appertains. The same is exceedingly simple in its construction, can be produced at the cost within the reach of an average house owner, and will effectively and rapidly serve for the purpose intended at a small expense of fuel.

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

1. A hot water boiler, comprising a casing an upper chamber forming the top, longitudinal circulating pipes, vertical tubes connecting the circulating pipes and the upper chamber, a hollow bridge wall, tubes connecting the upper end thereof with the upper chamber, the grate, and the feed opening at the upper front edge and the smoke exit at the lower rear edge of the casing all substantially as and for the purpose described.

2. In a hot water boiler, the combination with the casing having a feed opening in the upper end of the front and a smoke exit at its lower end of the rear wall, a water leg disposed centrally of the body, a partition wall extending from the bottom thereof to the bottom of the boiler, longitudinal circulating pipes disposed at the bottom, a hollow chamber forming the top of the boiler, vertical tubes connecting such top and circulating pipes, and tubes connecting the upper and lower ends of the water leg with the upper chamber and the circulating pipes, all substantially as and for purpose described.

3. In a hot water boiler, the combination with the casing formed with a fuel feed at its front end and a smoke exit at the lower edge of its rear wall, the hollow chamber C the circulating pipes E, the tubes D D′ connecting the pipes E and the chamber C, the hollow bridge wall J, the grate, said bridge wall communicating with the chamber C and pipes E, the drop tubes, the transverse headers and the partition wall K, all substantially as shown and described.

4. In a hot water heater, the combination with the casing, the fire chamber and a series of vertical and horizontal circulating tubes, of the water chamber C closing the upper end of the heater and communicating with the vertical circulating tubes, said chamber having a longitudinally arranged upward extension or dome portion N, substantially as and for the purpose described.

MICHEAL E. HERBERT.

Witnesses:
F. M. WHITSON,
CHAS. WILSON.