(No Model.)

F. KITTEN.

STEAM BOILER.

No. 409,594. Patented Aug. 20, 1889.

Fig. 1.

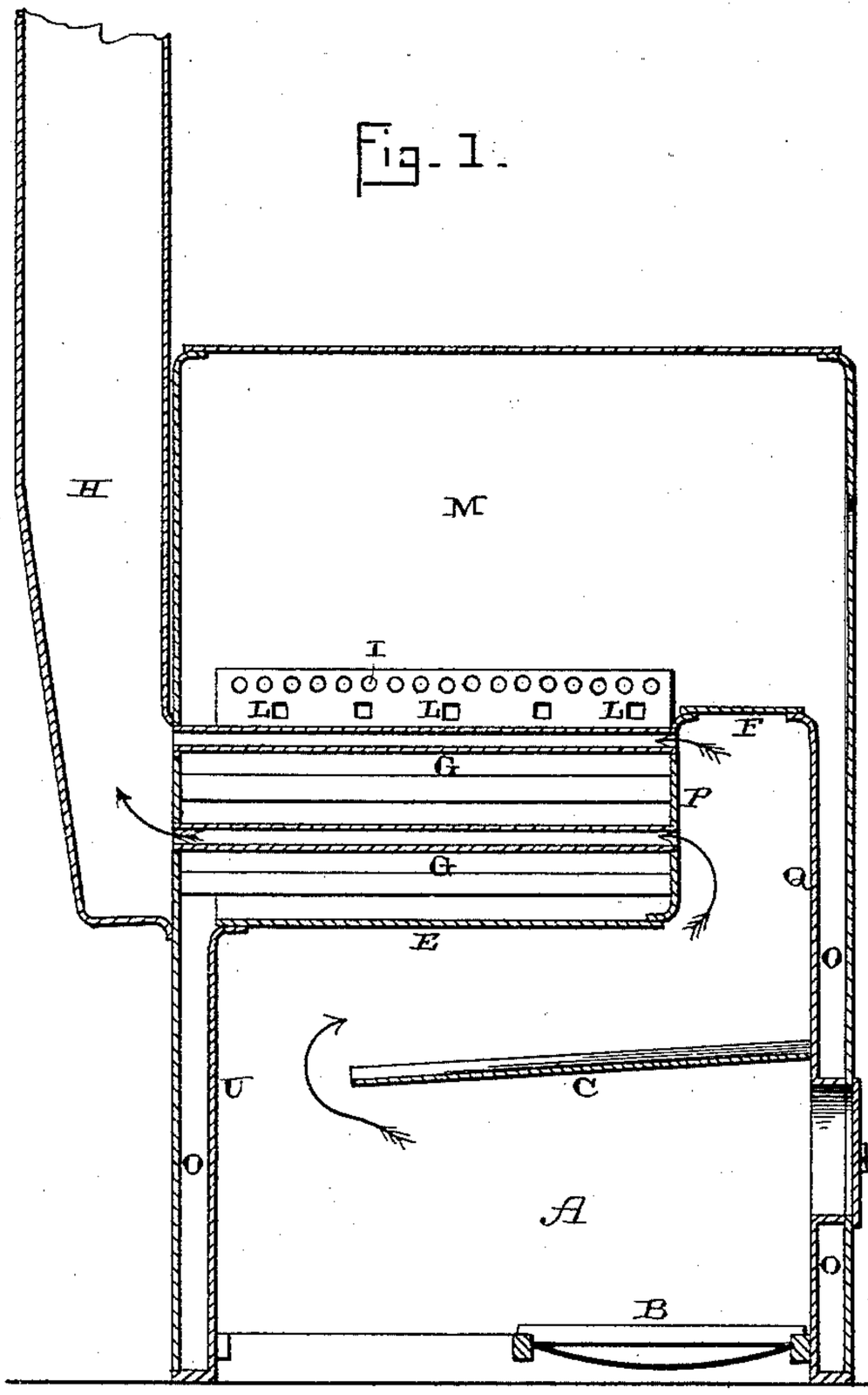
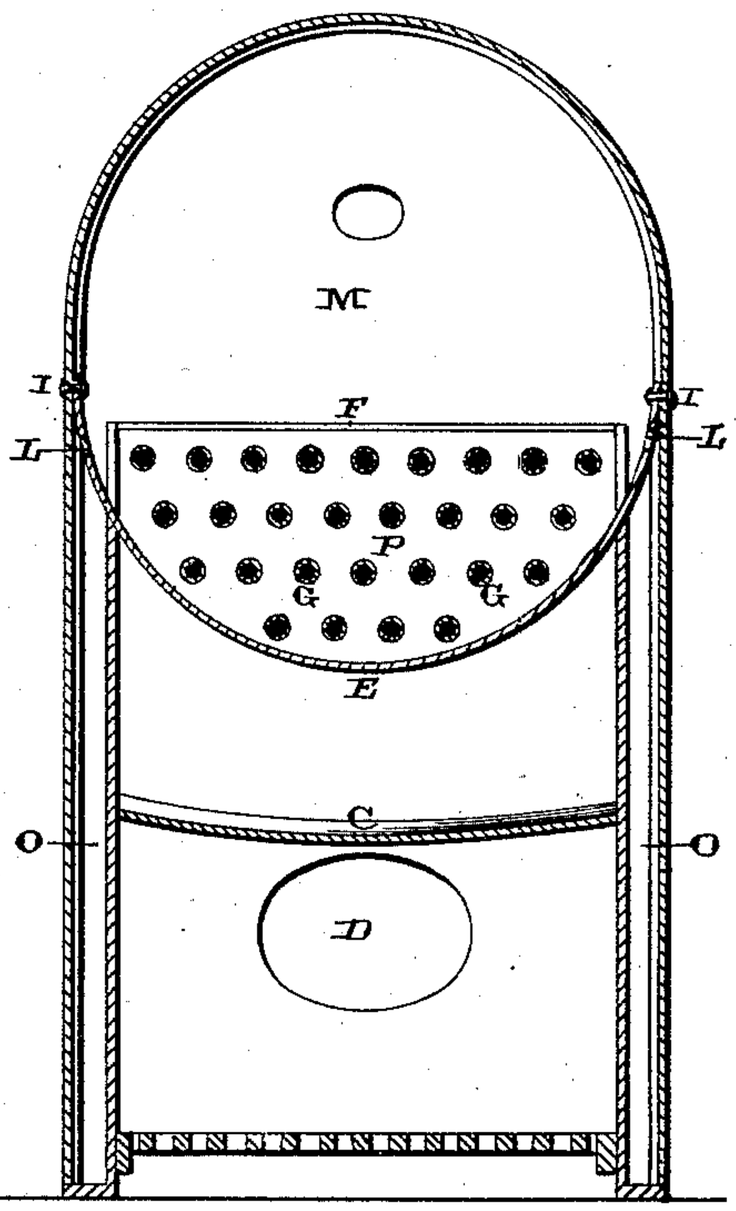


Fig. 2.



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UNITED STATES PATENT OFFICE.

FLORENS KITTEN, OF FERDINAND, INDIANA.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 409,594, dated August 20, 1889.

Application filed May 29, 1889. Serial No. 312,503. (No model.)

To all whom it may concern:

Be it known that I, FLORENS KITTEN, of Ferdinand, in the county of Dubois and State of Indiana, have invented certain new and useful Improvements in Steam-Boilers; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in steam-boilers; and the objects of my invention are to place inside of the fire-box a fire-shield formed of a plate or water-bars, so as to compel the products of combustion to pass from the grate-bars in the rear end of the fire-box forward toward the front end of the boiler, and then upward and back under the crown-sheet and forward through the flues; to secure the crown-sheet of the boiler, made of a single piece, to the flue-head at its rear edge and to the top of the front wall of the fire-box at its front one, and to construct a boiler which will generate a greater quantity of steam in a certain time and with a certain quantity of fuel than other furnaces of the same size.

Figures 1 and 2 are vertical sections taken through a steam-boiler which embodies my invention.

A represents the fire-box, in the rear end of which the grate-bars B are placed. This box may be of any desired shape or size, and placed in it and extending entirely across the box is the fire-shield, formed of a plate or water-tubes C, which extend nearly to the front end of the fire-box, and which is located just above the door D. This shield causes the products of combustion to pass toward the front end of the fire-box up against the curved crown-sheet E, backward and upward against the flat crown-sheet F, and then through the flues G and up the stack H at the front end of the boiler. The curved crown-sheet E, formed of one or more pieces, the flue-head P, and flat crown-sheet F form the top of the fire-box A, and are shaped as shown in Fig. 2. The rear edge of the crown-sheet E is secured to the lower edge of a flue-head, and its front edge is secured to the top of the front wall U of the fire-box. Through the outer edges of the crown-sheet are made two sets of perforations—one for the rivets I, where it is joined to the shell of the boiler, and a second set L, where the steam and water pass from the boiler M proper down into the water-leg O, which entirely surrounds the fire-chamber. The flue-head P extends vertically and is secured at its lower edge to the curved crown-sheet E and at its upper edge to the flat crown-sheet F, and to this flue-head the flues G are secured in the usual manner. The outer edge of the flat crown-sheet F is secured to the top edge of the inner rear wall Q of the fire-box. The rear end piece of the boiler is provided with an opening to form the door D and an opening to form a manhole. The flue-head and the crown-sheet F may be straight, round, or curved, as desired.

With a boiler constructed as here shown a greater amount of steam can be generated in a given time with a given amount of fuel than can be done in other boilers of a similar size, owing to the greater amount of fire-surface to which the water in the boiler is exposed.

This boiler is especially adapted for traction-engines, but is suitable for any and all places where a boiler is needed.

Having thus described my invention, I claim—

1. The combination of the fire-box with a fire-shield formed of a plate or water-bars, and which is placed in the box above the door, so as to cause the products of combustion to first move toward the front end of the boiler, then backward under the crown-sheet, and then through the flues to the front of the boiler, substantially as shown.

2. In a boiler, the combination of the crown-sheet having its ends secured directly to the shell of the boiler and provided with a series of holes for the passage of the water to and from the water-leg, substantially as shown.

3. In a boiler, the combination of the crown-sheet having its ends secured directly to the shell of the boiler, the front wall U, having its upper edge secured to the front edge of the crown-sheet, the flue-head P, the flues, and the crown-sheet F, substantially as described.

4. In a boiler, the combination of the fire-box, the crown-sheet E, having its ends secured directly to the shell of the boiler and provided with perforations L, the front and side sheets of the water-leg secured at their upper edges to the crown-sheet, the flue-head, the flues, the crown-sheet F, and the fire-shield C, substantially as specified.

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

FLORENS KITTEN.

Witnesses:
JACOB A. HOFFMANN,
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