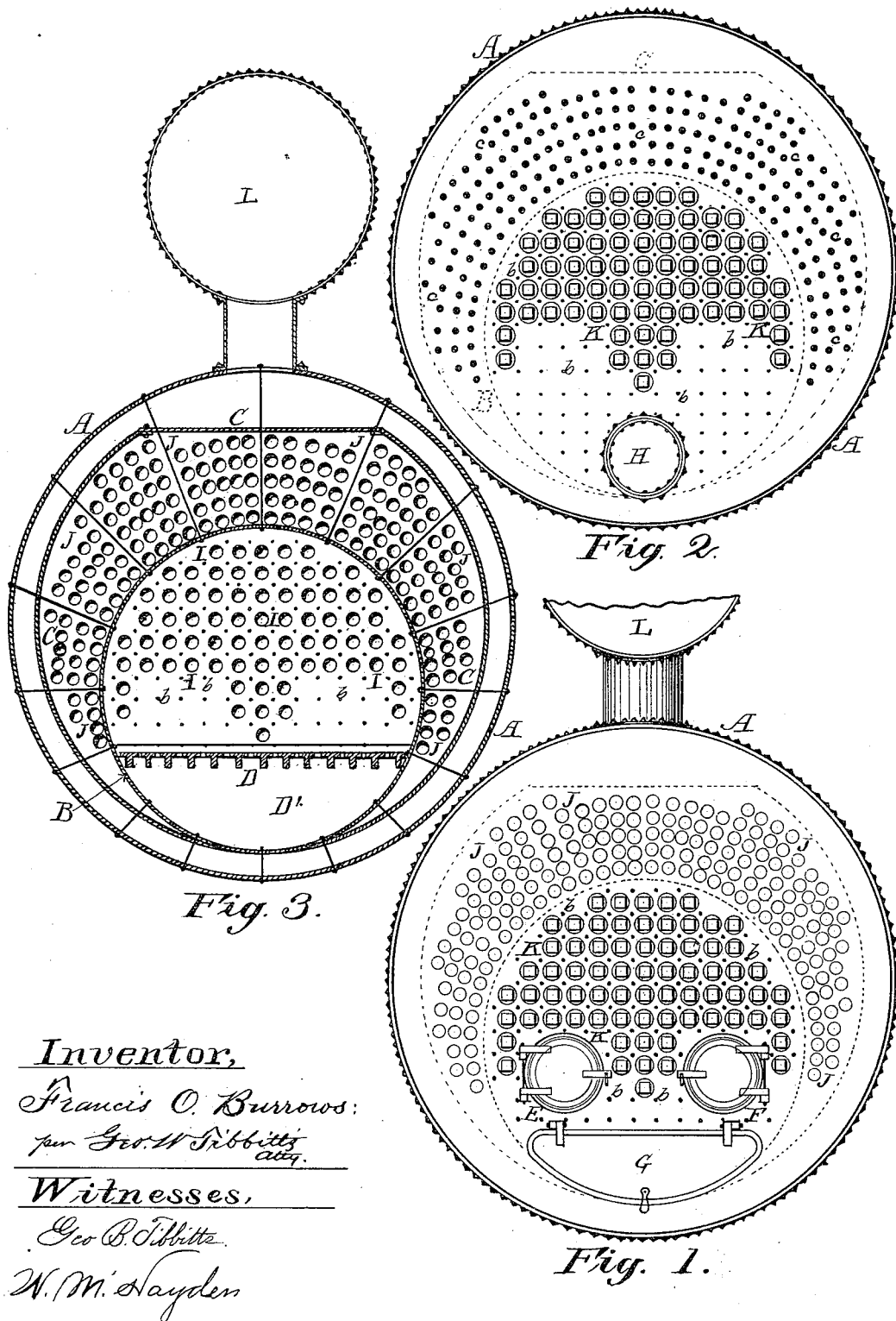


F. O. BURROWS.

STEAM BOILER.

No. 348,315.

Patented Aug. 31, 1886.



Inventor,
Francis O. Burrows:
per Geo. W. Tibbitts
att'y.
Witnesses,
Geo. B. Tibbitts
W. M. Hayden

(No Model.)

2 Sheets—Sheet 2.

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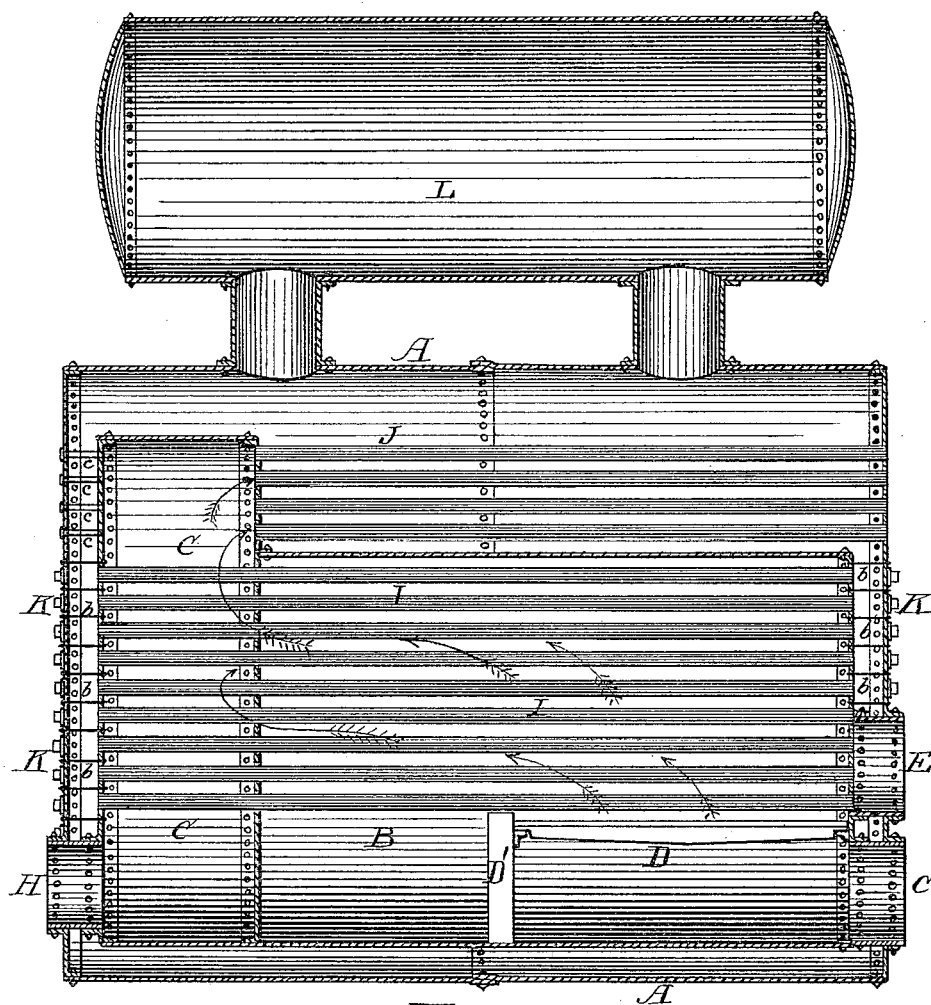


Fig. 4.

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UNITED STATES PATENT OFFICE.

FRANCIS O. BURROWS, OF CLEVELAND, OHIO.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 348,315, dated August 31, 1886.

Application filed February 23, 1886. Serial No. 192,862. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS O. BURROWS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

This invention relates to steam-boilers; and it consists in certain peculiar features of construction and arrangement of the parts, as hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a front end elevation, and Fig. 2 is a rear end elevation, of my improved boiler. Fig. 3 is a cross-section, and Fig. 4 is a longitudinal and vertical section, of the same.

The nature and objects of the invention will fully appear from the subjoined description, when considered in connection with the drawings.

A represents a cylindrical casing or jacket, in which is contained all the parts comprising the boiler and its heating-furnace.

B is a cylinder comprising the combustion-chamber. It is about two-thirds the diameter of the outer cylinder, A, and about three-fourths its length. To the rear of the said cylinder B is annexed an enlarged sub-chamber, C, the crown of which stands higher than the crown of chamber B, and is flattened across its top portion. This double combustion-chamber is secured within the aforesaid outer cylinder by means of stay-bolts *bb*, joining the heads of the two cylinders firmly together. This combustion-chamber is made a few inches shorter than the outer cylinder, and is situated near to the lower side thereof, thus leaving a space all around said combustion-chamber, thereby providing a complete water-jacket, entirely surrounding it. In the lower forward part of said combustion-chamber is provided a furnace-grating, D, the rear ends of the bars of which are supported by a bridge-wall, D'.

E F are door-openings fixed in the two cylinders and leading into the fire-place for feeding fuel to the furnace. Beneath the said openings E F is another broad door-opening, G, leading into the ash-pit. At the rear end of the boiler is also a door-opening, H, for the convenience of getting into the rear part of

the combustion-chamber for cleaning or repairs. Within the combustion-chamber is arranged a series of water-flues, I, connected with the water-space at each end of the boiler.

Partially surrounding the combustion-chamber B is a series of smoke-flues, J, connected with the inner vertical wall of the sub-chamber C and leading outward through the front wall of the outer cylinder, A, where the boiler is to be provided with a smoke-hood connected with a smoke-stack or chimney.

In the front and rear end walls of the outer cylinder, A, are provided holes directly opposite the ends of the flues I, which are provided with screw-plug stoppers K. The object and purpose of these holes is to provide a means for removing, replacing, or cleaning these flues.

In the rear end of cylinder A, connecting it with the rear wall of the sub-chamber C, the stay-bolts *c c* are made tubular and are closed at the outer ends with plugs, similar to the plugs K, but smaller. These tubular stay-bolts *c c* are located directly opposite the inner ends of the smoke-flues J and are provided as a means for blowing out and cleaning out the said smoke-flues. The method of doing this is as follows: By withdrawing the plug from the tubular bolt and inserting a pipe therein, reaching through and entering the end of the smoke-flue, and injecting steam through said pipe into the flue, the soot and dirt may be effectually discharged into the hood, thence into the smoke-stack or chimney. The water-flues are arranged in arch form over the fires of the furnace, and are thus exposed to the full heat of the furnace, the products of combustion passing up between said flues and into the sub-chamber, thence through the smoke-flues J into the stack or chimney in the direction indicated by the arrows. The boiler is surmounted with a steam-drum L.

Having described my invention, I claim—

1. In a steam-boiler, the combination of an outer cylinder, A, an inner cylindrical combustion-chamber, B, and annexed enlarged sub-chamber C, said cylinder B provided with fire-grating D and supporting bridge-wall D', the combustion-chambers B C having the series of water-flues I arranged within, and the

said chamber B surrounded with a series of smoke-flues, J, leading from the sub-chamber forward and through the front end wall of the casing A, substantially as described.

- 5 2. The combination, with the rear head of the boiler-casing A and the rear wall of the sub-chamber C, of the tubular stay-bolts *c c*,

located opposite to the ends of the flues J, as and for the purpose specified.

FRANCIS O. BURROWS.

Witnesses:

W. M. HAYDEN,
GEO. W. TIBBITTS.