

(No Model.)

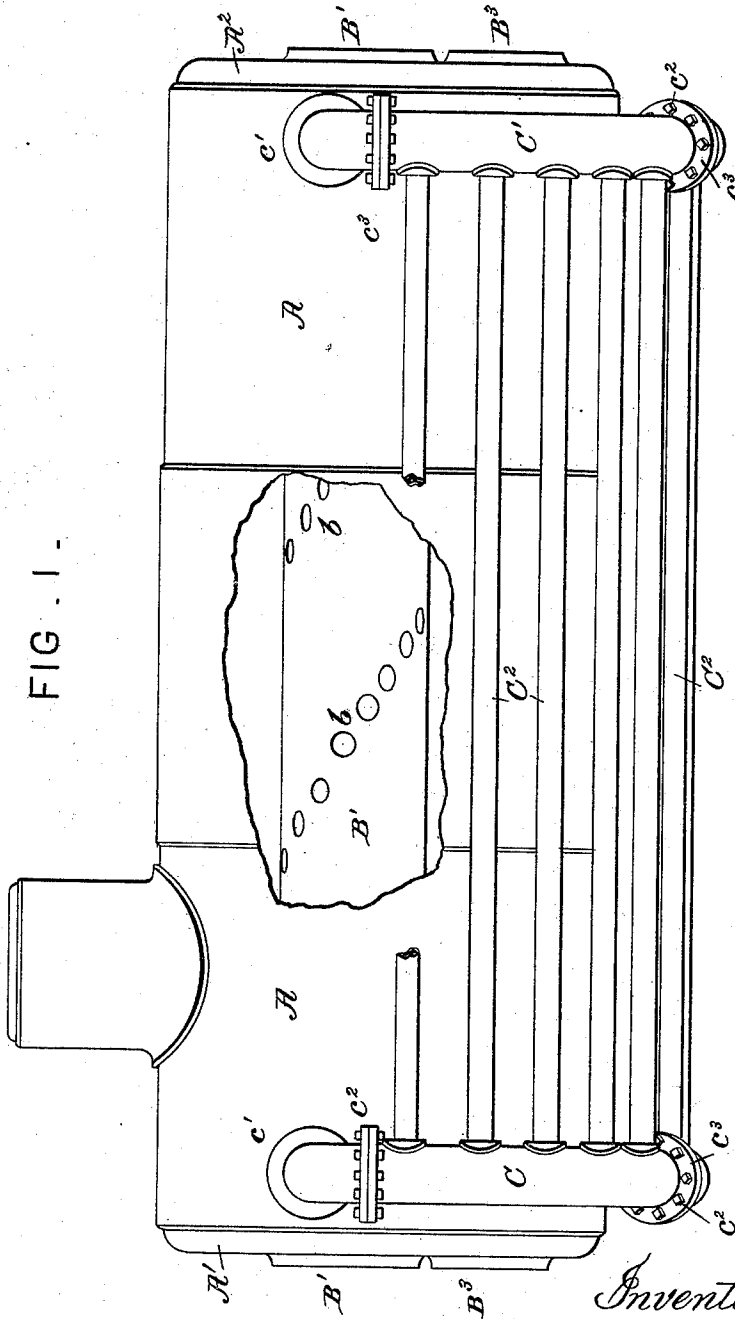
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J. WAYMAN.
BOILER.

No. 474,887.

Patented May 17, 1892.

FIG. 1.



Attest:
Geo. T. Smallwood.
Rexford M. Smith

Inventor:
John Wayman.
By A. B. Webb,
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(No Model.)

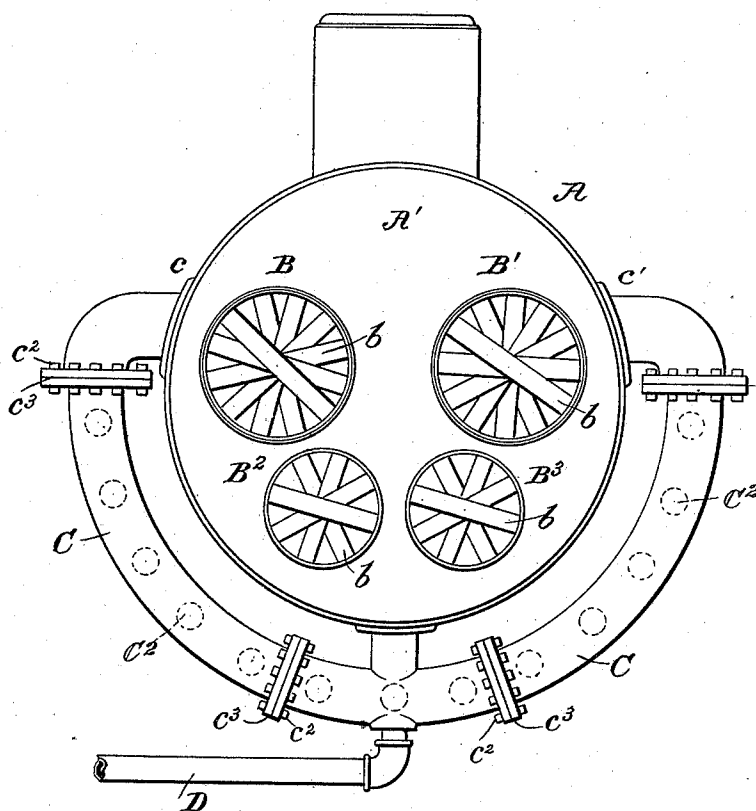
2 Sheets—Sheet 2.

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FIG. 2.



Attest.
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UNITED STATES PATENT OFFICE.

JOHN WAYMAN, OF FORD CITY, PENNSYLVANIA.

BOILER.

SPECIFICATION forming part of Letters Patent No. 474,887, dated May 17, 1892.

Application filed December 15, 1891. Serial No. 415,160. (No model.)

To all whom it may concern:

Be it known that I, JOHN WAYMAN, a citizen of the United States, residing at Ford City, in the county of Armstrong and State of Pennsylvania, have invented certain new and useful Improvements in 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 appertains to make and use the same.

My invention relates to an improvement in steam-boilers of the horizontal stationary type; and its object is to construct a boiler and arrange and dispose its tubes and flues in such manner that increased heating-surface will be presented, thus facilitating and expediting the generation of steam.

My invention consists in the combination, with the main body portion of a steam-boiler, of two or more external semi-cylindrical tubes of large diameter, located beneath the boiler proper, one at or near each end thereof, said tubes communicating with the boiler directly on opposite sides thereof, and also communicating with each other by means of interposed horizontal tubes of less diameter; also, in the combination, with the boiler proper, of flues of varying diameters extending through the same from head to head and provided with transverse tubes arranged in spiral form and relation to each other and located at a sufficient distance apart to permit the ready passage of the products of combustion between them; also, to certain details of construction and arrangement hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a side elevation of my improved steam-boiler, showing the arrangement of the external tubes and partly broken away to show the flues and the arrangement of the transverse spirally-arranged tubes therein. Fig. 2 is an end elevation of the same, showing also the water-supply pipe.

The drawings show simply the boiler and its connections as far only as is necessary to illustrate my improvements therein, the fire-box, brick casing, &c., being omitted, as my improvements lie only in the construction of the boiler itself, having no bearing upon matters outside thereof.

A represents the boiler proper, being made

cylindrical in form and composed of metal plates riveted together at their joints in the usual manner.

A' and A² indicate the heads or ends of the boiler, also secured by rivets in the usual well-known manner.

B, B', B², and B³ are the flues, made cylindrical in form and extending through the interior of the boiler from end to end. These flues may be of various diameters, and need not necessarily be cylindrical in cross-section. It will be apparent that the ends of the boiler will thus be closed, except at the orifices at the front and rear of the flues.

b b indicate short tubes extending transversely the flues just described, and adapted to permit the water to pass through the flues, where it may be exposed more directly to the hot air traversing said flues. These tubes b b are arranged, relatively to each other and to the flues, in spiral form, as clearly indicated in both figures of the drawings. This arrangement facilitates the passage of the products of combustion through the flues and between and around tubes therein.

C and C' indicate tubes of comparatively large diameter located one at or near each end of the boiler proper. These tubes extend around beneath the boiler and communicate with the interior thereof at points c and c approximately in or slightly above the horizontal plane of the axial center of said boiler and also at a point c² underneath the same. The tubes C and C' further connect directly with each other through a series of horizontal tubes C² of lesser diameter, the latter, as shown, underlying the boiler and being directly and primarily exposed to action of the heat. The tubes C and C' are further made up of several sections connected and clamped together by means of bolts, passing through collars or annular flanges C³ on the adjacent ends of said sections.

D represents the supply-pipe through which the water is conducted to the tubes C, C', and C², thence to the interior of the boiler, and through the spirally-arranged tubes extending through the flues.

The operation, which will be readily understood, is as follows: The fire-box being located under one end of the boiler, the products of combustion are caused to pass along under the

body of the boiler proper, thus acting on the tubes C, C', and C², thence up into the rear orifices of the flues entirely through said flues, and thence up and out through the smoke-stack. It is deemed important that the curved tubes C be arranged upon a circle concentric with the boiler, as shown, whereby they, together with the tubes C², are brought in closer contact with or proximity to the boiler and the water therein more readily heated.

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

1. A stationary horizontal boiler provided with large transversely-arranged semicircular water-tubes extending around beneath said boiler and concentric therewith and communicating with the interior thereof at points near the horizontal plane of the axial center of said boiler, in combination with straight horizontal tubes, also located beneath the boiler and connecting said semicircular tubes, substantially as and for the purpose set forth.

2. The combination, with a stationary horizontal steam-boiler provided with the horizontal flues passing through the interior of said

boiler and connecting the heads thereof, of the spirally-arranged water-tubes extending transversely through said flues, for the purpose described.

3. In a stationary horizontal steam-boiler, the combination of the through-flues B, B', B², and B³, the transverse spirally-arranged water-tubes *b*, extending through said flues, the semicircular tubes underlying said boiler and communicating with the interior thereof, and the horizontal tubes interposed between and connecting said semicircular tubes, and arranged as and for the purpose specified.

4. The combination, with the main body portion of a steam-boiler, of semicircular water-tubes underlying said boiler and concentric therewith, made up of sections coupled together, and the interposed horizontal tubes connecting said semicircular tubes, all substantially as described.

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

JOHN WAYMAN.

Witnesses:

REUBEN DANIELS,
D. J. GIÖRTH.