

(No Model.)

J. R. VANCE.
STEAM BOILER.

No. 575,786.

Patented Jan. 26, 1897.

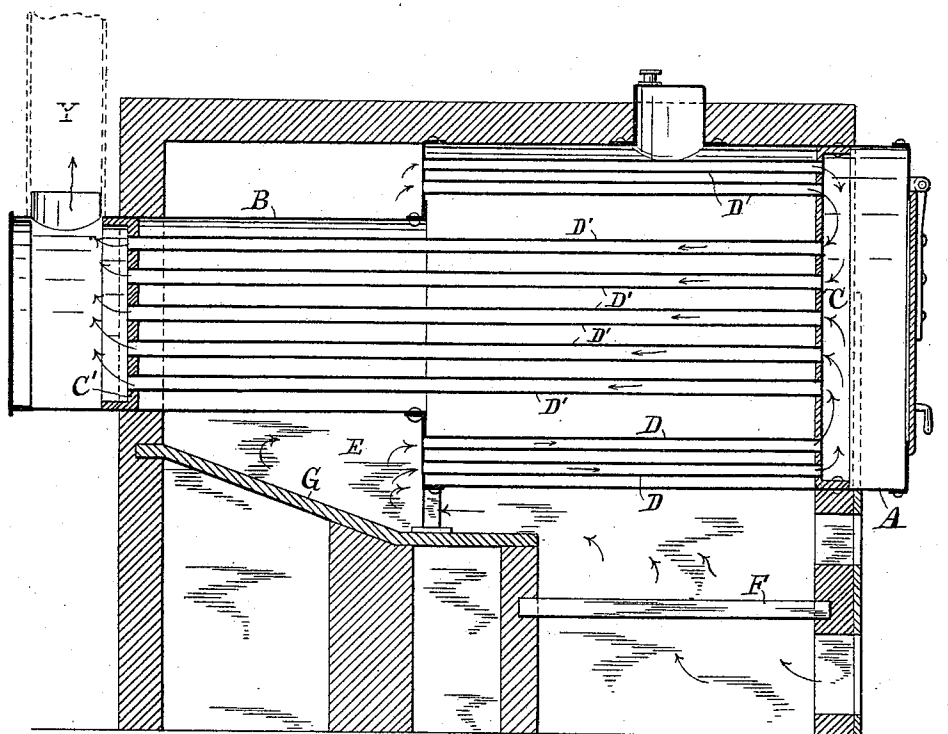


Fig. 1.

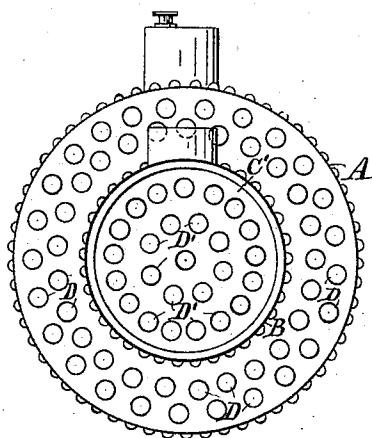


Fig. 2

Witnesses.

R. L. Jancy
H. M. Seaburn

Inventor.

James R. Vance
By C. H. Duell
his Attorney.

UNITED STATES PATENT OFFICE.

JAMES R. VANCE, OF GENEVA, NEW YORK.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 575,786, dated January 26, 1897.

Application filed November 17, 1896. Serial No. 612,406. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. VANCE, of Geneva, in the county of Ontario, in the State of New York, have invented new and useful
5 Improvements in Steam-Boilers, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to steam-boilers, and
10 the object is to increase the efficiency of the boiler and to economize in fuel.

To this end my invention consists in the combination of a horizontal cylinder, a smaller horizontal cylinder concentric with and projecting from one end of the first cylinder,
15 fire-tubes extending through each cylinder, a chamber at one end of the large cylinder communicating with all the tubes, one end of each of the tubes in the larger cylinder opening into the furnace, a chamber at the end of the smaller cylinder communicating with its tubes, and a chimney connected to the latter chamber; and my invention consists in certain other combinations of parts hereinafter
20 described, and specifically set forth in the claims.

In the drawings hereto annexed and forming a part of this specification, Figure 1 is a longitudinal sectional view of the boiler and furnace; and Fig. 2 is an end view of the
30 boiler, looking toward the end having the small cylinder, the end of the latter cylinder being removed to show the interior clearly.

Referring specifically to the drawings, A
35 is the large horizontal cylinder or shell of the boiler, and B is the smaller cylinder or shell, which is concentric with the cylinder A and extends from one end of the latter cylinder, to which it is riveted.

C is a partition near one end of the cylinder A, and C' is a partition near one end of the cylinder B, which partitions serve to support the fire tubes or flues and form communicating passages for the heat and smoke between the outer and inner tubes and between the opposite ends of the inner tubes and the chimney Y, (indicated by broken
45 lines.)

D D, &c., are the outer or short tubes extending from the partition C to the end of the large cylinder, which tubes directly open into the furnace or fire-flue E below, and D' D' are

the long central tubes extending longitudinally through both cylinders and supported at their ends by the partitions C and C'. The
55 tubes D' D' are nearly twice the length of the tubes D D, &c.

The grate F for the fire is preferably located below the large cylinder, but may be placed below the small cylinder if desired.
60 The unfeathered arrows show clearly the path of the fire and smoke through the tubes and chambers at the ends of the boiler.

It will be obvious from an examination of the drawings that the fire first strikes the entire outer surfaces of both cylinders, then
65 passes through the tubes D D, &c., to the chamber formed by the partitions C, and then back through the tubes D' D', &c., to the chamber at the end of the small cylinder, where it passes up the chimney Y. By these
70 means the boiler is thoroughly and equally heated at all points and therefore great efficiency is derived. This efficiency is increased by placing the cylinders in a horizontal position and placing the small cylinder concentric with the large cylinder and not to one side, which causes an unequal application of the heat. It is increased also by the inclined
75 surface G of the flue E, which reflects the heat upward and helps to turn the products of combustion toward the open ends of the fire-tubes D D, &c.

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

1. In a steam-boiler, the combination of a horizontal cylinder, a smaller horizontal cylinder concentric with and projecting from one end of the first cylinder, fire-tubes extending through each cylinder, a chamber at one end of the large cylinder communicating with all the tubes, one end of each of the tubes in the larger cylinder opening into the furnace, and a chamber at the end of the
95 smaller cylinder communicating with its tubes and the chimney, substantially as described and shown.

2. In a steam-boiler, the combination of a horizontal cylinder, a smaller horizontal cylinder concentric with the first cylinder and projecting from one end of the latter, said cylinders being of substantially the same length, the larger cylinder having substan-
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- tially twice the diameter of the smaller cylinder, fire-tubes extending through each cylinder, a chamber at one end of the large cylinder communicating with all the tubes, one
5 end of each of the tubes in the larger cylinder opening into the furnace, and a chamber at the end of the smaller cylinder communicating with its tubes and the chimney, substantially as described and shown.
- 10 3. In a steam-boiler, the combination of a horizontal cylinder, a smaller horizontal cylinder joined to one end of the larger cylinder and concentric therewith, partitions C and C', fire-tubes extending through the cylinder
15 ders and supported by the partitions, short fire-tubes extending through the large cylinder and supported by one of the partitions and the end of the cylinder, a furnace inclosing the boiler having the grate below the large cylinder, and a flue leading back beneath the small cylinder having an inclined surface, substantially as and for the purpose specified.
- In testimony whereof I have hereunto signed my name.
- JAMES R. VANCE. [L. S.]
- Witnesses:
GEO. F. DITMARS,
A. R. WYCKOFF.