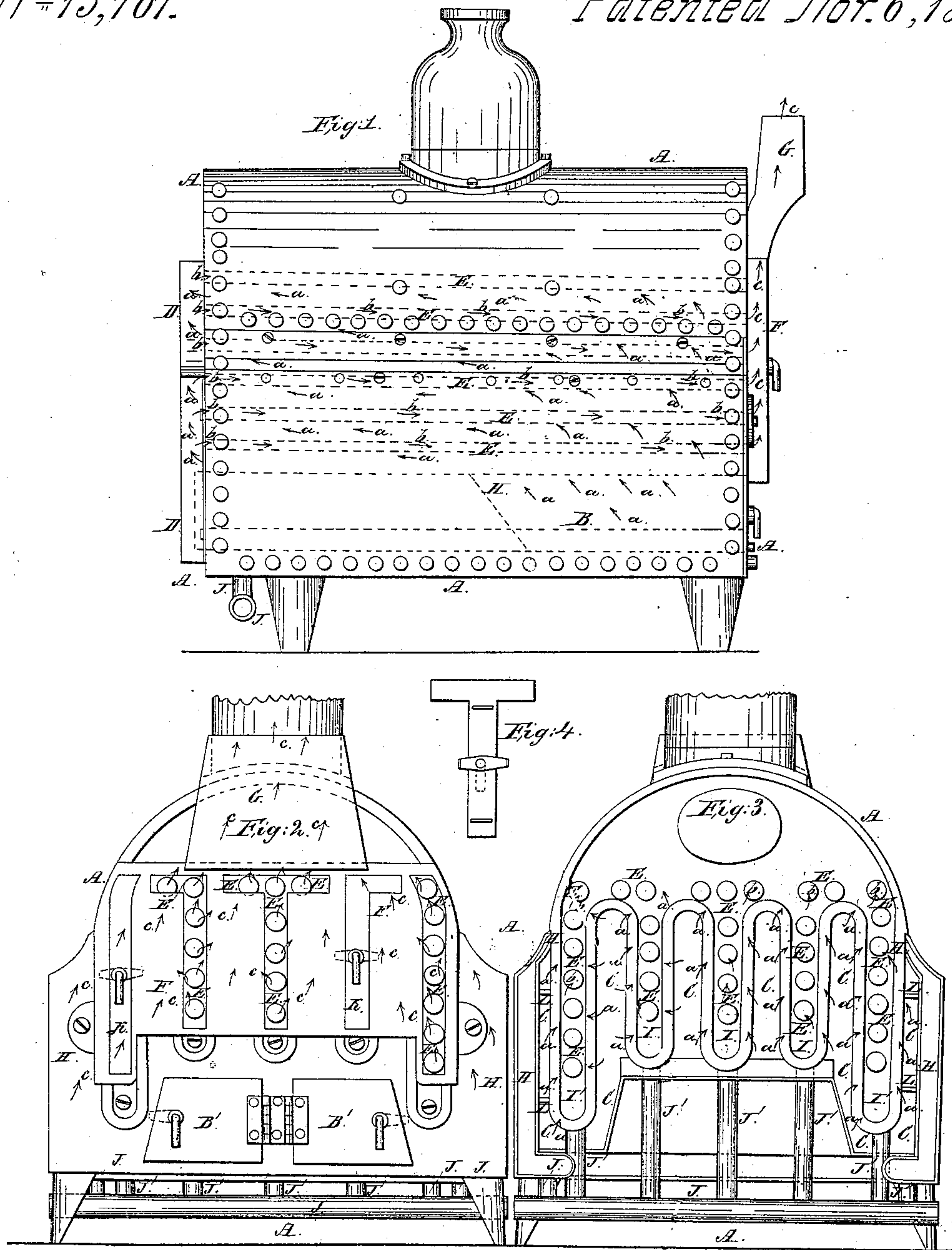


H. N. Pettengill,
Steam-Boiler Water-Tube.
N^o 13,761. Patented Nov. 6, 1855.



UNITED STATES PATENT OFFICE.

HENRY N. PETTENGILL, OF ROCKFORD, ILLINOIS.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **13,761**, dated November 6, 1855.

To all whom it may concern:

Be it known that I, HENRY N. PETTENGILL, of Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Improvement in the Construction of Steam-Boilers; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation; Fig. 2, a front end view, and Fig. 3 a back end view.

Like letters denote like parts in the several views.

A indicates the general outline of the boiler with the dome on top. The boiler is constructed of the usual materials, and to any desirable size, to which is attached the usual appendages of safety-valves, blow-off and gage cocks, &c.

B, Fig. 1, is the furnace, which may be constructed in the usual manner; and B', Fig. 2, the furnace-doors. The fire from the furnace B passes in the direction of the arrows *a*, through the main flues C, (shown in Fig. 3,) to the back end of the boiler into the fire-case D, as shown in Fig. 1. From the fire-case it then returns through the flues E, as indicated by the arrows *b*, Figs. 1 and 3, to the smoke-case F, the smoke passing off through the chimney G, as indicated by the arrows *c*.

On each side of the boiler are water-chambers H and H, as seen in Fig. 3, the case D being removed. These water-chambers connect with the boiler at H' H'. The projections I I' extend longitudinally from one end of the boiler to the other, as does, also, the flues C between the projections which form a part of the boiler, and so does also the water-chambers H H. The water passes unobstructed throughout the entire arrangement. The feed-water pipe J communicates with the projections I by means of the pipes J', and with

the chambers H H by the pipes J''. By means of the chambers H H there is no waste-heat, as the heat in passing through the outside main flues is taken up in the water-chambers H H and outside projections I' I'; also, the expense of the wall is much reduced.

The projections I' I' and chambers H H constitute the sides of the furnace, and the three center projections are directly over the furnaces, so that the heat is first brought in contact with them as it passes through the main flues C, in the manner before described. By this arrangement a large amount of fire-surface is obtained, by which steam may be generated with great rapidity and with economy of fuel.

In the smoke-case are slide-doors K K, which open opposite the flues E, so as to be convenient for cleaning and repairing. Fig. 4 represents one of the doors detached. The cases D and F may be entirely removed from the ends, so as to render it convenient for repairing and cleaning the flues and boiler.

L L, Fig. 3, represent braces connecting the chambers H H with the outside projections I' I'.

The boiler should be braced in some desirable manner, in accordance with the pressure of steam to be required in the boiler.

I do not claim as new and of my invention any one of the several parts herein described; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

The arrangement of the flues C and E, the water-chambers H H, and projections I and I', with the feed-water pipes J and J', combined in the manner and for the purpose set forth.

HENRY N. PETTENGILL.

Witnesses:

H. H. HOLDEN,
W. H. BURRIDGE.