

(No Model.)

J. F. McENTEE.
Steam Boiler.

No. 243,386.

Patented June 28, 1881.

Fig. 1

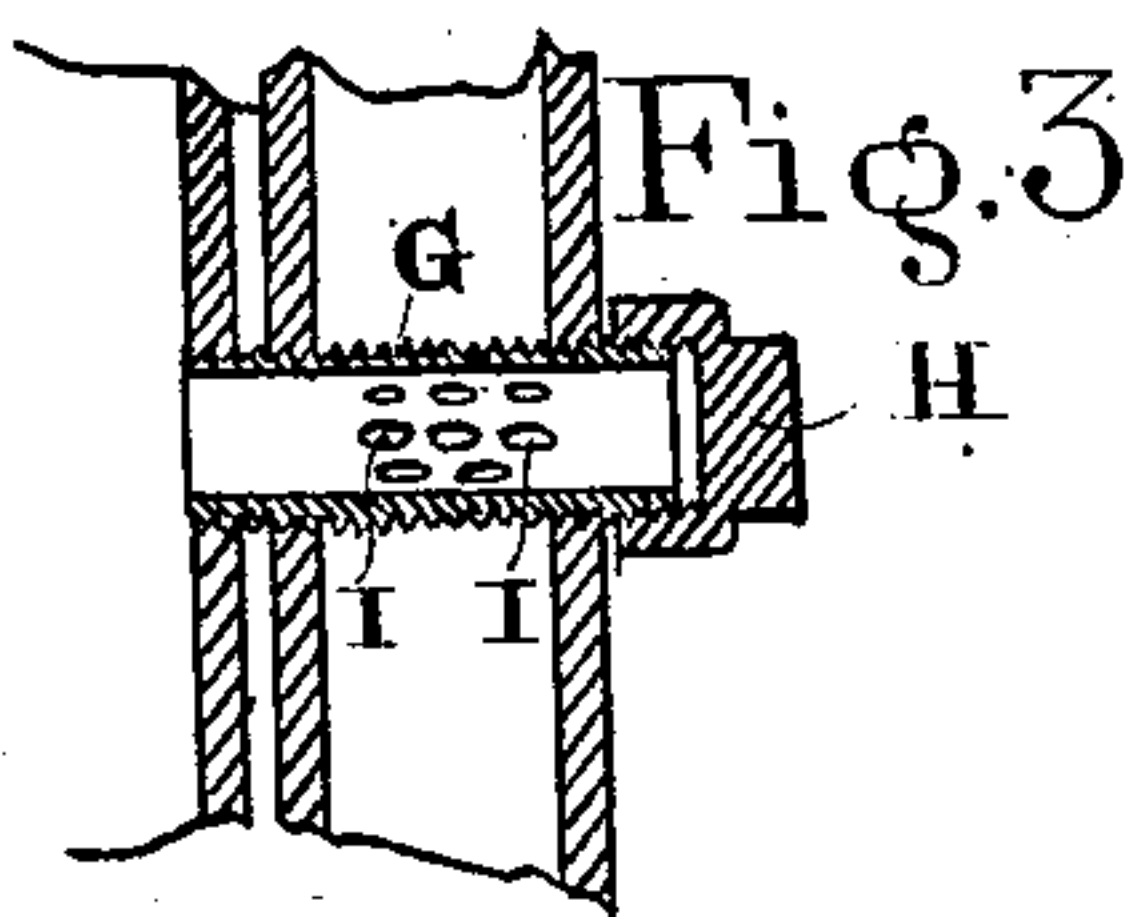
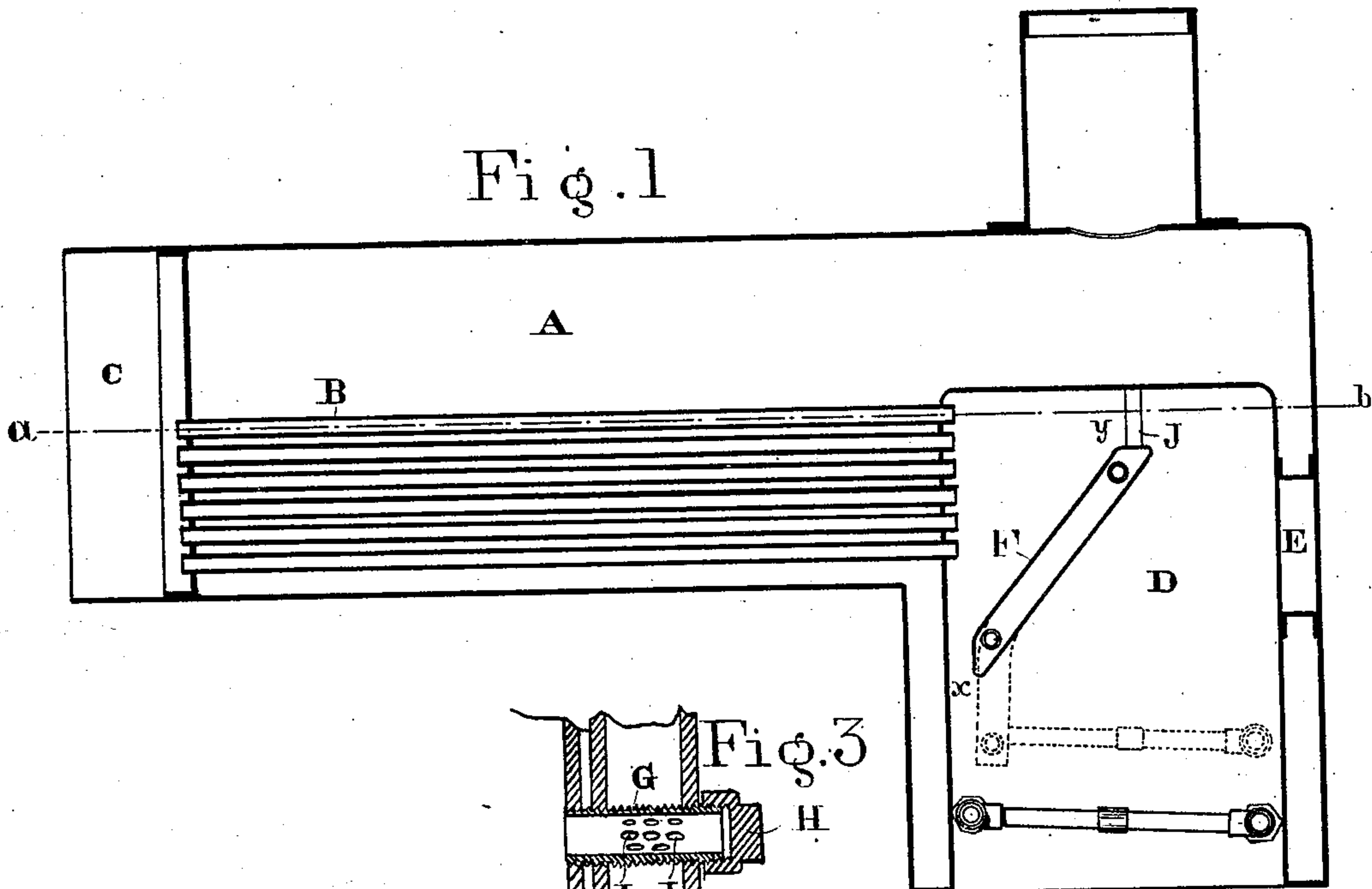


Fig. 2

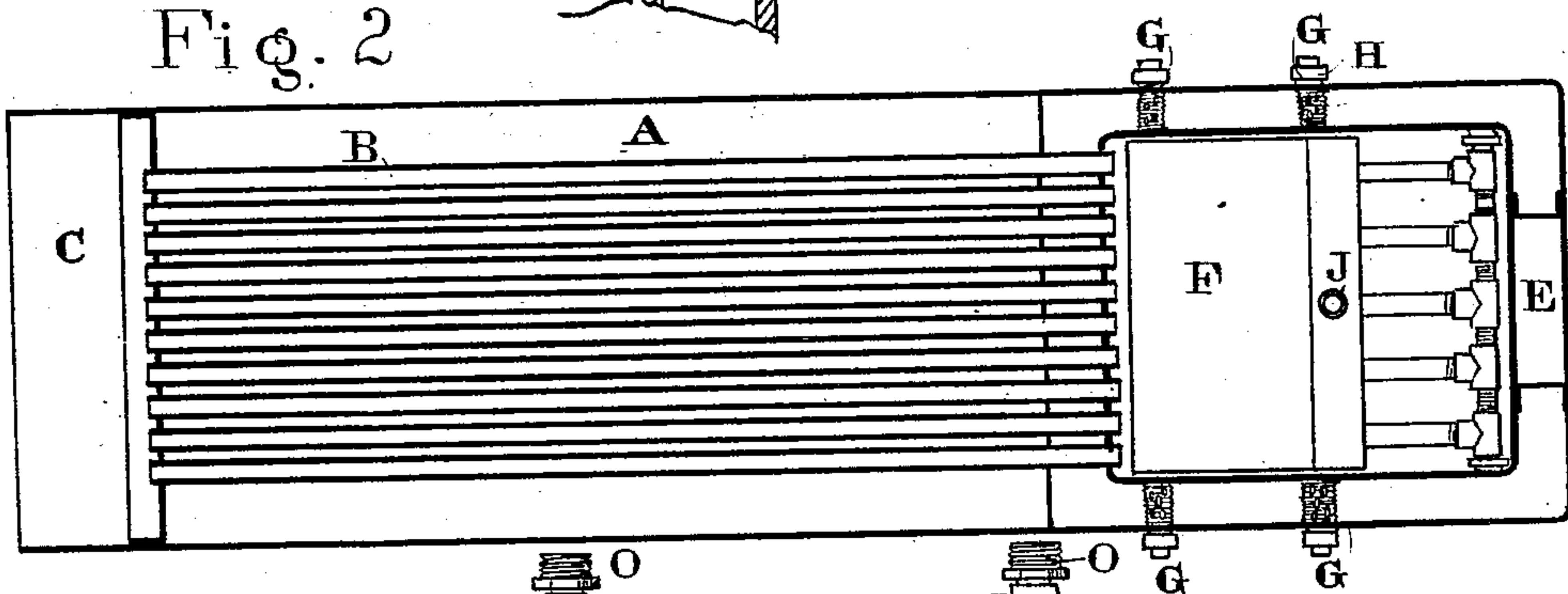
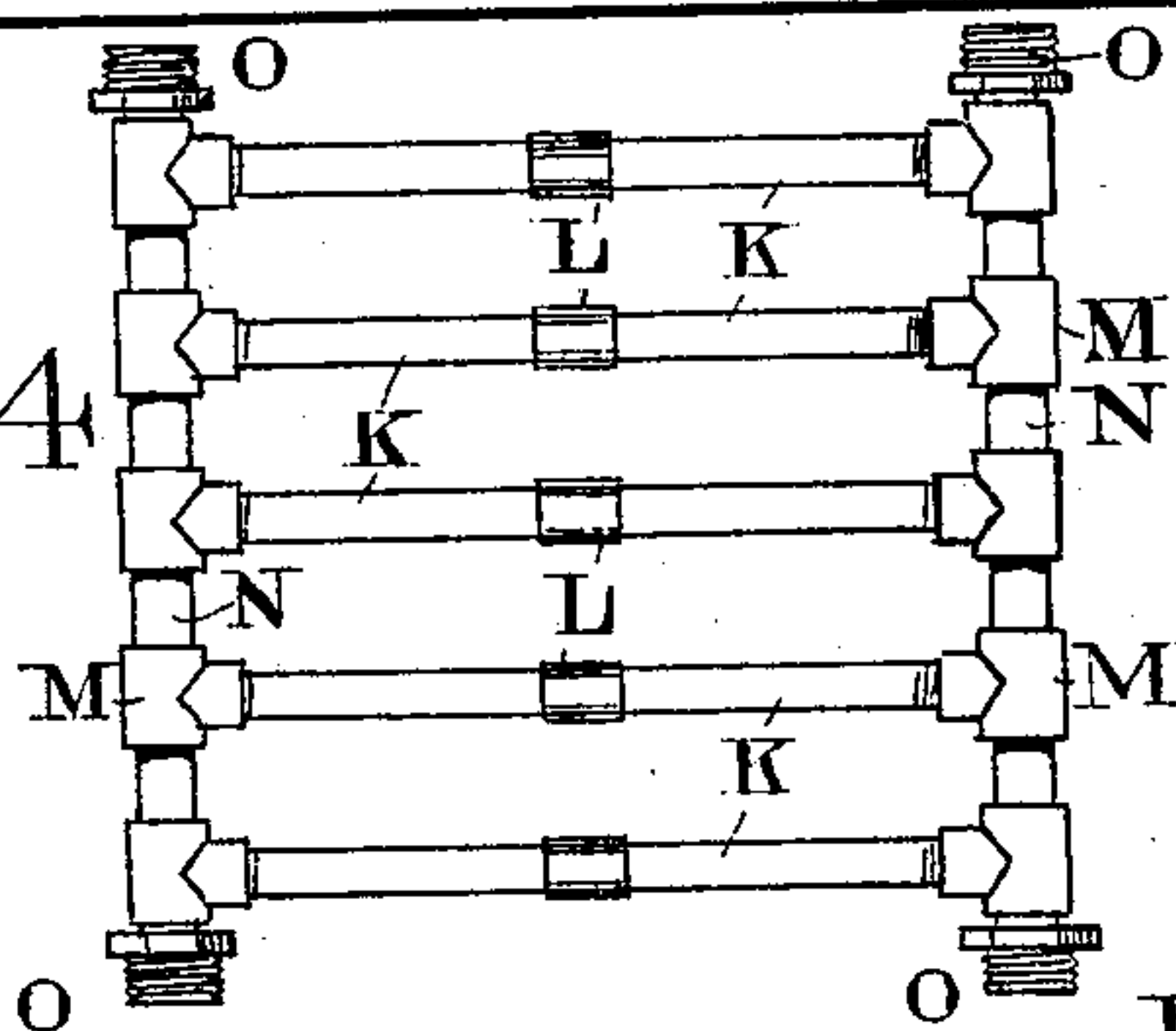


Fig. 4



WITNESSES
Carlisle P. Blanchard.
Watt. Clarken.

INVENTOR
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Atty

UNITED STATES PATENT OFFICE.

JOHN F. McENTEE, OF SAN FRANCISCO, CALIFORNIA.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 243,386, dated June 28, 1881.

Application filed August 23, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN FRANCIS McENTEE, of San Francisco, California, have invented a new and useful Improvement in Locomotive-Shaped Steam-Boilers, of which the following is a specification.

My invention relates to the novel manner of attaching a hollow deflecting-plate or water-back within the furnace of a locomotive-shaped boiler, so that there may be a perfect circulation of water within said water-back, and that its application within the furnace may be made more conveniently and with less expense than heretofore.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a boiler having my improvements attached. Fig. 2 is a longitudinal sectional plan through line *a b*, Fig. 1. Fig. 3 is an enlarged longitudinal sectional view through the thimble connecting the water-back to the sides of the furnace. Fig. 4 is a plan of the grates.

Referring to the drawings, in which in all the figures like letters of reference refer to like parts, A is the shell of the boiler. B are the tubes. C is the smoke-box. D is the fire-box or furnace. E is the fuel-door. F is my improved water-back, and G are the connecting pipes or thimbles which attach it to the sides of the furnace and lead the water from the water-space in the sides of the furnace into the water-back. The thimbles are pieces of pipe with a thread cut on the outside. They are as long as is necessary to screw them from the outside of the fire-box through the water-space into the water-back, leaving enough projecting outside the fire-box to admit of a plug or a cap, H, being screwed on to close their ends. (See Figs. 3 and 4.) There are a number of holes, I, in each thimble at that portion of their length which will come between the inside and outside plate of the water-space of fire-box, so that the water may circulate very freely between the water-space and water-back.

It is proper that the upper thimbles be set as near the top of the water-back as possible, so that little or no steam-space may occur in the water-back above them; and, if found desirable, a pipe, J, may connect the top of the water-back with the crown-sheet of the furnace, so as to lead off any steam which may accumulate above the upper thimbles; other-

wise the top of the water-back might soon burn out from lack of water at that point.

The water-back should be set in front of the tubes, at an angle of about forty-five degrees, according to the size and shape of the furnace. Generally, however, I propose to leave a space of two inches at *x*, between the lower edge of water-back and tube-sheet, and from six to eight inches at *y*, between upper edge of water-back and crown-sheet of furnace.

The water-back may be of cast or plate iron, as preferred, and should have about two and a half inches thickness of water-space. It should reach entirely across the furnace, being only enough less in width than the width of the furnace as may be necessary to avoid rivet-heads, &c. This water-back deflects the flame arising from the fuel from passing directly through the tubes. Its being set a little distance out from the tube-sheet allows of two air-currents, one passing up from the grates behind the water-back, and the other over the top edge, both intermingling behind in a sort of combustion-chamber. This action serves, in a measure, to arrest the gases as they are evolved from the burning fuel, and insures their thorough ignition prior to their entering the tubes, the result being a considerable economy of fuel. The water-back itself gives additional heating-surface, thereby increasing the steam-producing power of the boiler.

My next improvement is in the manner of setting the pipes K, which form the fire-grates, through which water freely circulates from the boiler. Fig. 4 clearly illustrates this improvement without added description. I will state, however, that K are the pipes, in two pieces, forming the grates, coupled with sleeve-couplings L, to allow of the whole being put together.

M are ordinary T's. N are common gas-pipe nipples or short lengths of pipe. O are reducers with hexagon flanges, upon which a wrench may be applied. These pipes and fittings are put together, and holes are tapped in the inside of the furnace in such a position as to give the grates a slight slant, that a proper circulation of water within them may be maintained. The grates are then introduced within the furnace and the reducers O screwed out, so as to enter the holes in the furnace made to receive them.

If it is preferred, in some cases the back end of the grates may be inserted in the lower end of my water-back, as I show in Fig. 1 by dotted lines, thus saving labor and expense in fitting;
5 but in such cases the water-back will have to be made a few inches deeper.

What I claim as my invention, and desire to secure by Letters Patent, is as follows:

10 In a boiler-furnace of the locomotive type, the water-back F, when attached to the sides of the furnace by the thimbles G, consisting

of short pipes screwed from the outside through both sheets, forming the water-legs of furnace, said pipes having holes perforated in them between the two sheets, and a screw-cap on outer 15 end, substantially as and for the purpose herein described.

JOHN FRANCIS McENTEE.

Witnesses:

GEORGE PARDY,
MATT. CLARKEN.