(No Model.)

A. PEICK.

STEAM GENERATING FIRE BOX.

No. 458,593. Patented Sept. 1, 1891.

Fig 1.

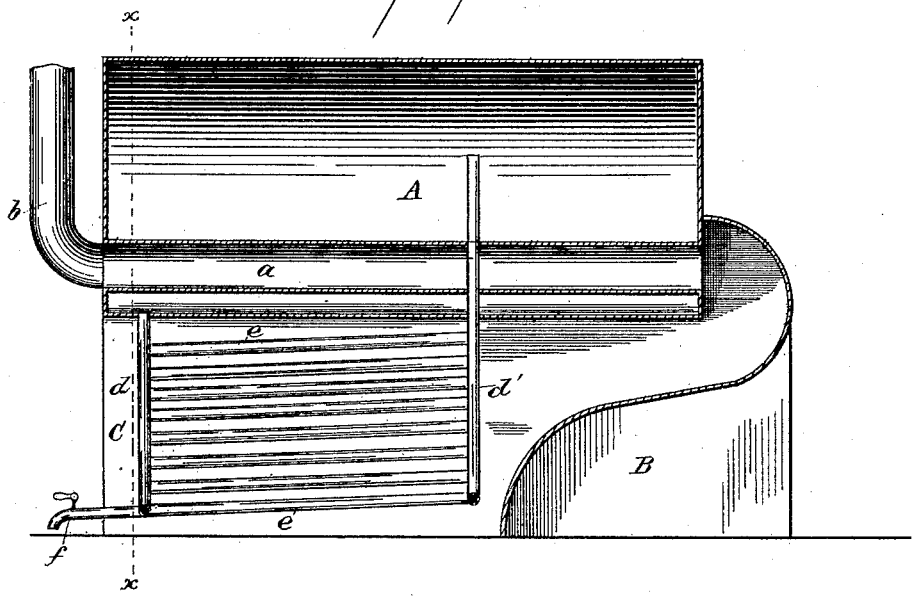


Fig 2.

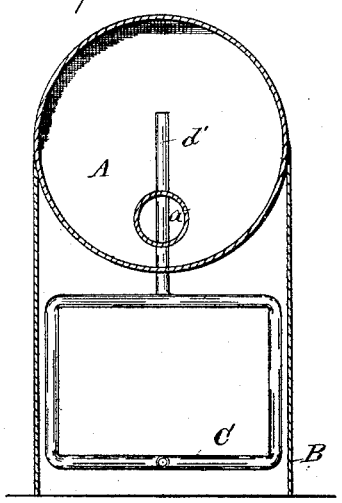
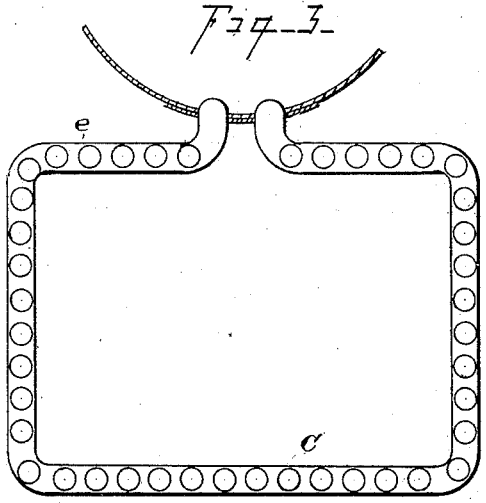


Fig 3.



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UNITED STATES PATENT OFFICE.

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STEAM-GENERATING FIRE-BOX.

SPECIFICATION forming part of Letters Patent No. 458,593, dated September 1, 1891.

Application filed June 23, 1890. Serial No. 356,453. (No model.)

To all whom it may concern:

Be it known that I, ADOLPH PEICK, a citizen of the United States, residing at Sutherland, in the county of O'Brien and State of Iowa, have invented certain new and useful Improvements in Steam-Generating Fire-Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to various new and useful improvements in fire-boxes for the generation of steam in steam-boilers.

The principal object of my invention is to produce and to provide an improved fire-box of normal construction for steam-boilers, whereby steam may be generated very rapidly and the entire heating effect of the fire utilized.

The principal novelties of my invention consist in making a fire-box for a boiler entirely of metal tubes arranged, as will be fully hereinafter described, and placed beneath the boiler, and in connecting this fire-box with the boiler, so that the boiler may be readily cleaned or drained of water and the flues cleaned, and, further, to provide a constant current of water from the boiler through the flues and such a connection between the boiler and the flues composing the fire-box that there will be a constant circulation of the water from the boiler into the fire-box tube and the steam therefrom into the boiler.

For a better comprehension of my invention attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a longitudinal sectional view of the boiler, fire-box, and connecting-tubes; Fig. 2, a cross-sectional view of the same, taken on the lines *x x;* Fig. 3, a front sectional view of the tube or pipe.

In all of the above views corresponding parts are designated by the same letters of reference.

A represents the boiler, made of plate iron or steel in the usual way and of the known cylindrical horizontal type. I prefer to extend entirely through the boiler from end to end a large single flue *a*, which connects at the front end of the boiler with a stack or pipe *b*. The boiler is mounted in the usual way on the masonry or other convenient foundation B, so that a flue will be formed beneath the boiler which will connect with the flue *a*, extending through the same.

Directly beneath the boiler in the front portion is a fire-box C, before referred to. The front and rear of this fire-box is formed of a single metal tube *d d'*, of a general rectangular shape, as shown, and each of which is connected with the boiler, the front tube *d* simply passing through the shell of the boiler and the rear tube *d'* perpendicularly running up into the boiler above the water-line. Connecting the tube *d* with the tube *d'* are a number of metal tubes *e e e*, arranged side by side and communicating with the interior of the front and rear tubes *d* and *d'*, so that a free and clear passage is had between these tubes for the water.

The forward end of the fire-box is somewhat lower than the rear end for the purposes hereinafter set forth. At the forward end of the fire-box and connecting with the interior of the tube C is an ordinary spigot or faucet *f*.

The operation of my invention is substantially as follows: The boiler is filled with water and the fire is built in the fire-box C. The products of combustion therefrom will pass out around the tubes *e e*, under the boiler, and through the return-flue *a* and out of the smoke-stack. The effect of the fire will be first upon the tubes *e e e*, that constitute the fire-box, and the water therein being exposed to the direct action of the fire will be generated into steam in the tubes *e e* and will pass up into the boiler through the tube *d'* at the back end of the fire-box, and the displaced water will be immediately supplied from the boiler through the tube *d*, and in this manner the steam will be generated rapidly and a constant circulation of water from the boiler through all the pipes *e e*, which compose the fire-box. The heat also attacks the boiler in a very effective manner as it comes out from between the tubes and along through the flue beneath the boiler and the return-flue. When it is desired to draw out the water from the boiler to dry and clean the same, it is done through the faucet *f*, which is at the lower

portion of the fire-box, as before explained, and by inclining the fire-box as I have described it will be seen that the water will flow readily into the same at the front or lower end and out at the faucet. This lowering of the front end will also aid the circulation of the water and enable the steam to escape up into the boiler at the back end of the fire-box.

It will be distinctly understood that the construction described above of the fire-box is capable of many changes which might be resorted to without the exercise of inventive ingenuity. For example, instead of arranging the flue-tubes *e e e* in a longitudinal position, as shown, it might be desirable to place them at right angles or inclined. The tube *d* could also be made in a rectangular form and have its front face fastened on by bolts, so as to be removable, and thus give opportunity to easily clean the tubes *e e* or replace any that are out of repair without being compelled to take the fire-box to pieces; and it should be further understood that it is intended that the above description shall include any and all fire-boxes so long as they are made of steam-generating tubes connected with the boiler—that is, if the intention is to utilize the fire at top, bottom, and both sides.

Having now described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

A return-flue tubular boiler provided with a fire-box beneath the same for containing combustible material and composed entirely of tubes connected at both ends with the interior of said boiler, whereby there is produced a continuous circulation from the boiler through the tubes composing said fire-box and back again through the boiler, and said fire-box being constructed with an inclined bottom and with a faucet at its lower end for removing the contents of said boiler and fire-box, as and for the purposes described.

ADOLPH PEICK.

In presence of—
J. Y. CARTONS,
MATT PFEIFFER.