

J. C. TITUS.

STEAM BOILER.

No. 273,640.

Patented Mar. 6, 1883.

Fig. 1.

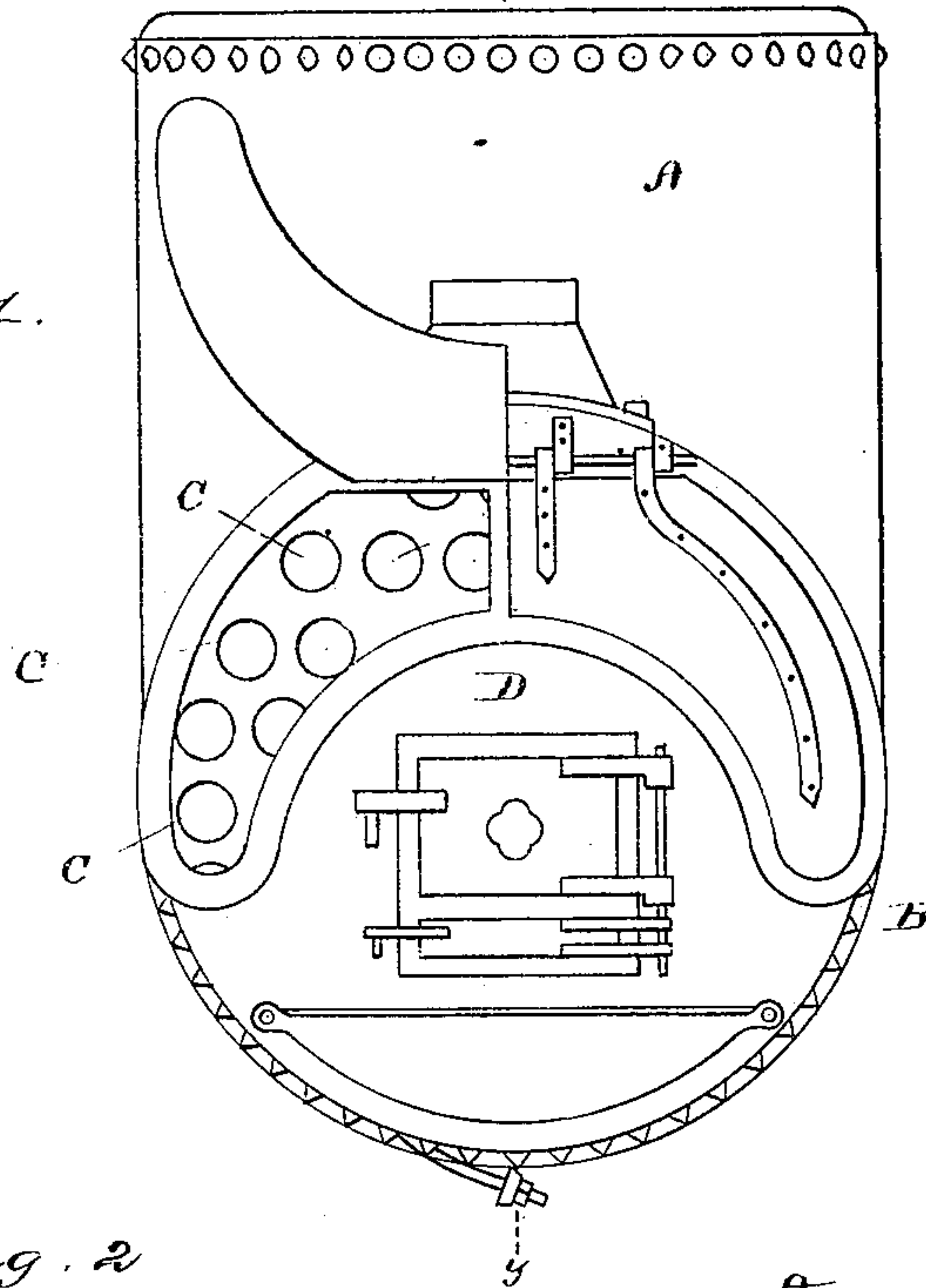
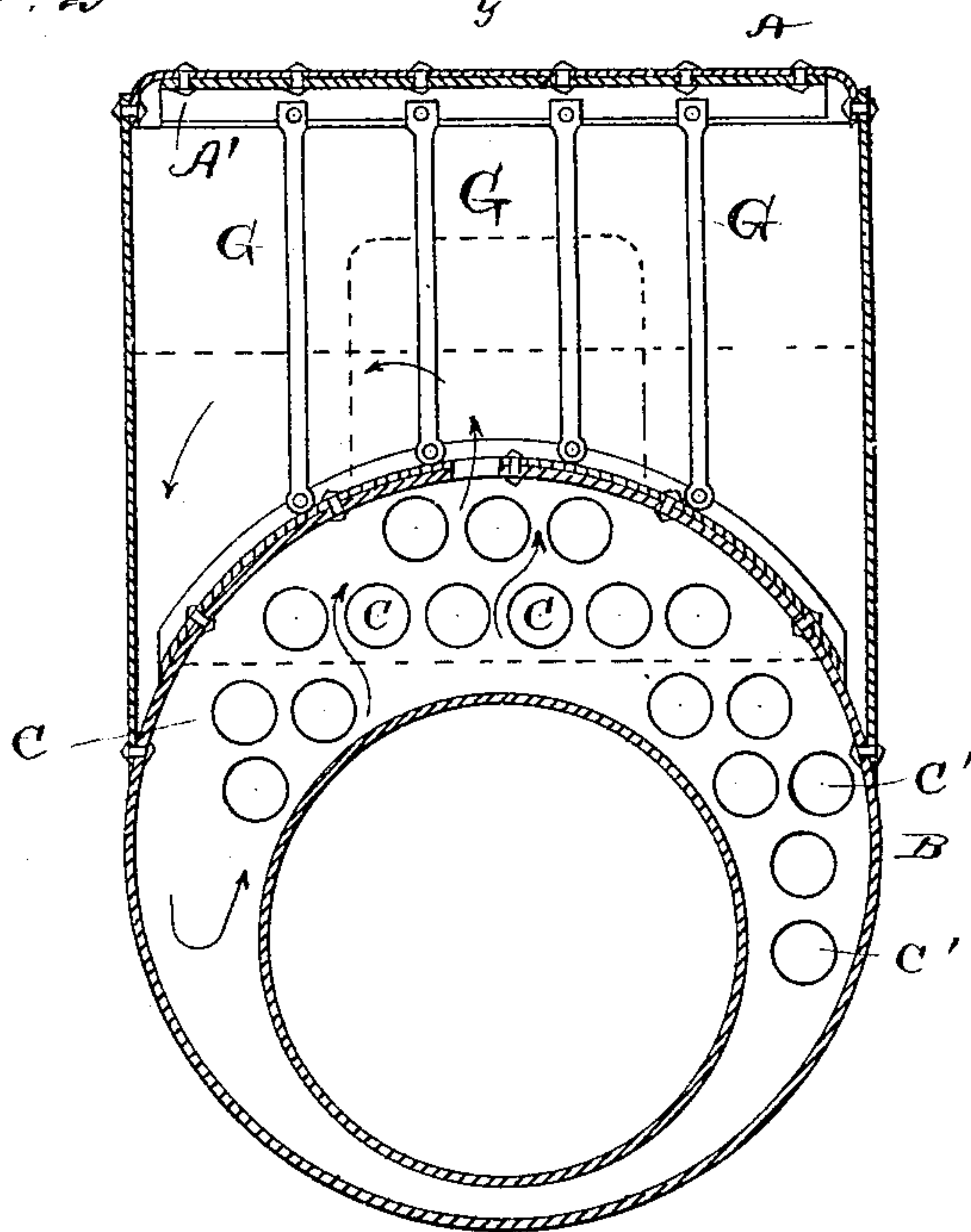


Fig. 2.



Witnesses.

Edmund L. Jewell.

J. J. Mc Carthy.

Inventor.

John C. Titus

By C. M. Alexander  
Attorney.

(No Model.)

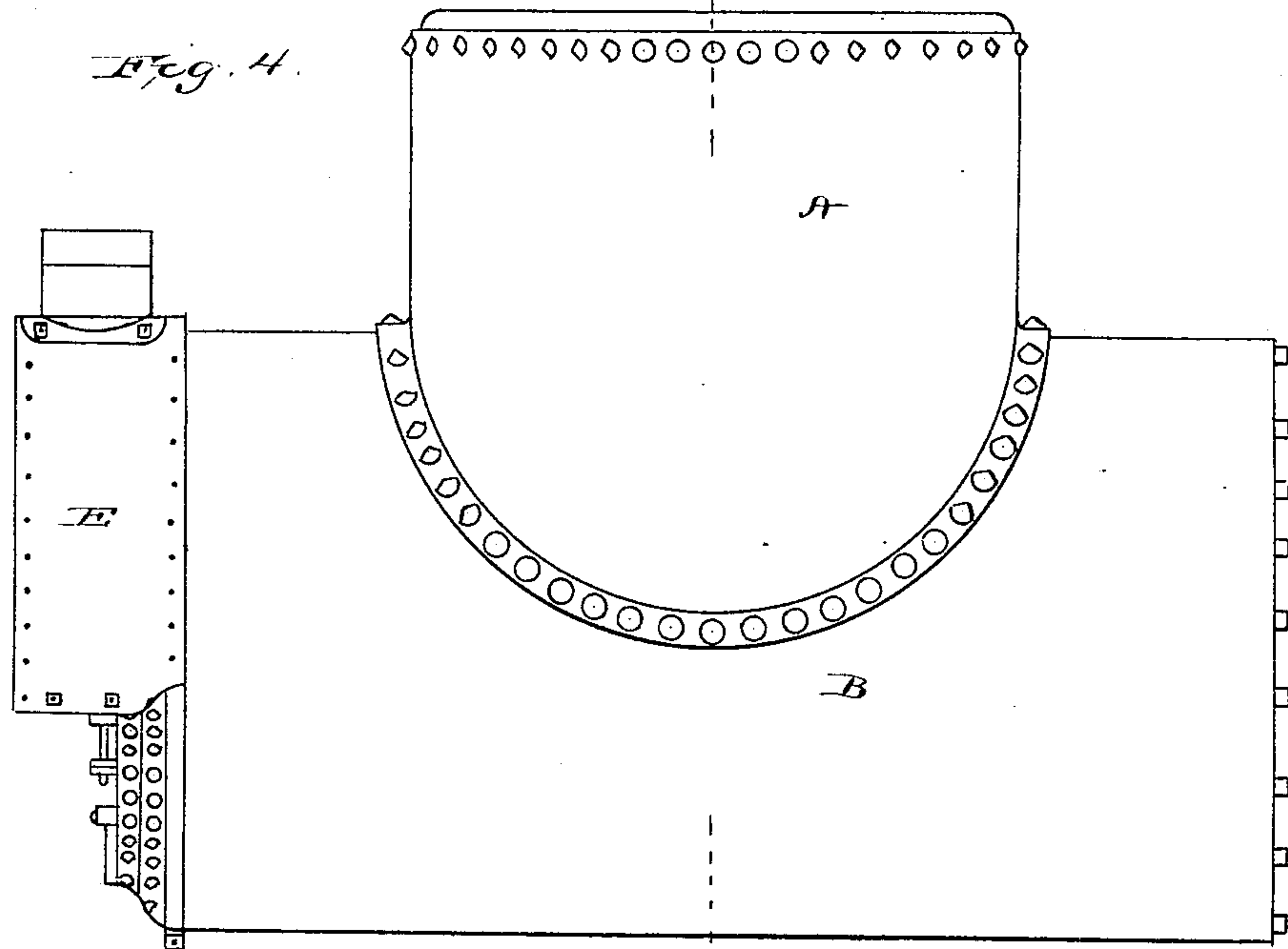
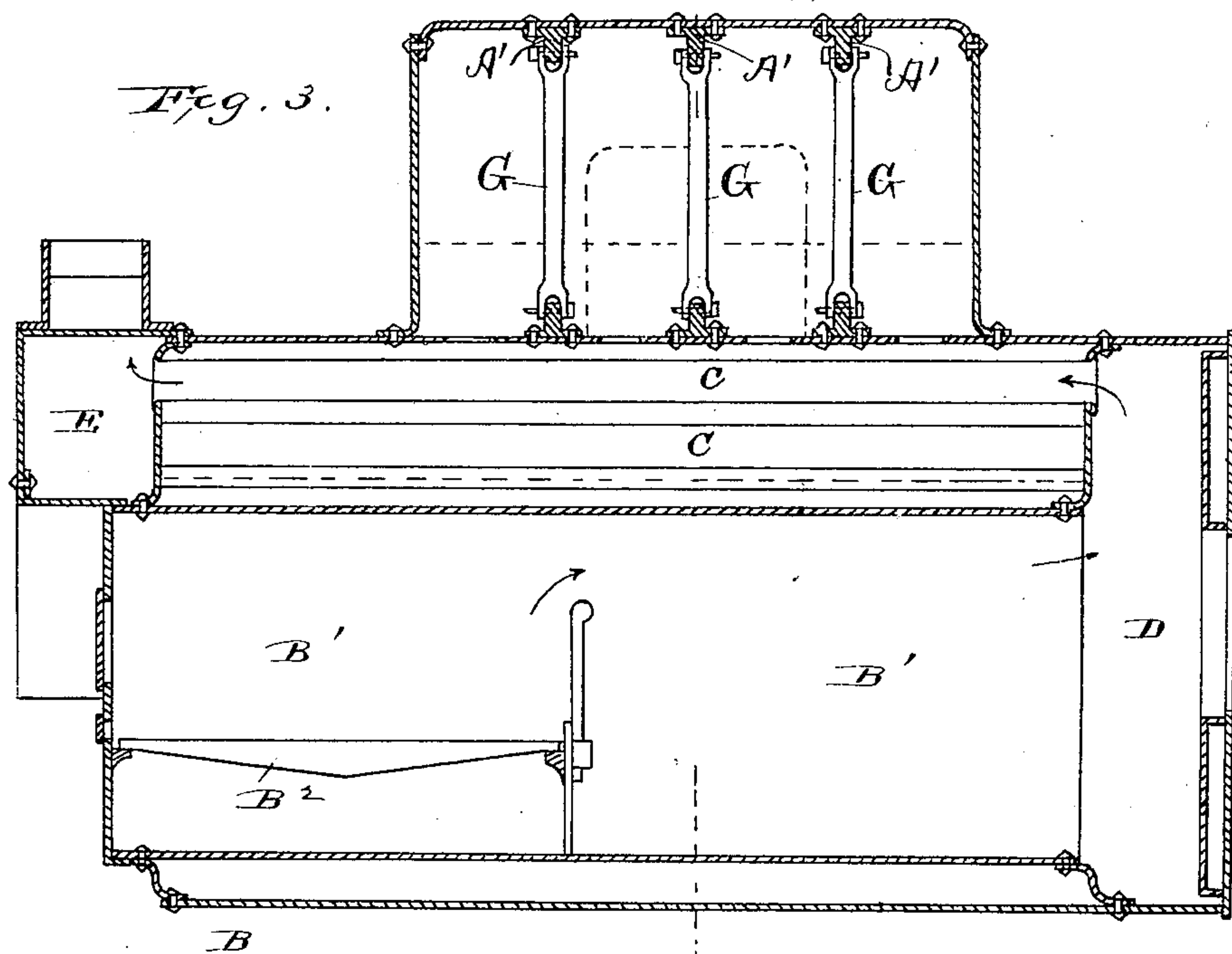
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Witnesses,  
Edwin L. Jewell.  
J. J. McCarthy.

Inventor.  
John C. Titus  
By C. M. Alexander,  
Attorney.



# UNITED STATES PATENT OFFICE.

JOHN C. TITUS, OF MARION, OHIO.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 273,640, dated March 6, 1883.

Application filed March 16, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN C. TITUS, of Marion, in the county of Marion, and in the State of Ohio, have invented certain new and useful  
5 Improvements in Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a  
10 part of this specification, in which—

Figure 1 is a front end elevation of my improved steam-boiler with one lid of the smoke-box raised to expose the return-flues. Fig. 2  
15 is a vertical cross-section through the boiler, taken in the plane indicated by dotted lines  $x$   $x$ , Figs. 3 and 4. Fig. 3 is a diametrical section through the boiler in the vertical plane indicated by dotted lines  $y$   $y$  on Fig. 1. Fig. 4 is a side elevation of the boiler.

20 Similar letters of reference indicate corresponding parts.

This invention relates to an improvement on steam-boilers which are specially designed for portable engines, steam-tugs, and the like,  
25 but which is also useful for road or farm locomotives having boilers of the kind denominated "return-flue" boilers.

My invention relates to steam-boilers of the horizontal or return-flue kind; and the nature  
30 of my invention consists in certain novel features, which will be fully understood from the following description, when taken in connection with the annexed drawings.

A designates the dome or vertical section of  
35 the boiler, and B the horizontal portion or body of the boiler.

The letter G designates a series of two or more vertical stays or braces having a firm and strong connection with the crown-sheet  
40 of the dome A and with the boiler, the function of which is to insure a reliable and unyielding union between the dome and boiler. The said stays or braces are connected with the crown of the dome or chamber A by means  
45 of the transverse bars A', which are themselves riveted to the crown.

B' designates the main fire-flue and combustion-chamber, in which is the grate B<sup>2</sup>.

50 C C are the return fire-flues; D, the smoke-box or combustion-chamber at the end of the boiler, through which the products pass on their way to the return-flues, which latter pass forward and communicate with the uptake E,

as indicated by the course of the arrows on Fig. 3.

As ordinarily constructed the water-line in  
55 this class of horizontal steam-boilers is a short distance above the crown of the main fire-flue B', and the small dome on the top of the boiler-shell is used exclusively for receiving the  
60 steam.

The advantages of a boiler constructed substantially in the manner above described are to raise the water-line above the horizontal  
65 part B of the boiler into the vertical part A thereof, so that as either end of the boiler is raised or lowered, as in going up or down grade, no part of the fire-surface is left bare  
70 of water. I thus avoid the danger of overheating any part, and consequently there will be no tendency to explosion from softening of plates and over-pressure.

It is obvious that by raising the water-line above the highest point of the section B a  
75 larger number of return-flues, C, can be arranged in the boiler, and the heating capacity thereof greatly augmented.

By arranging the flues as shown and extending the water-line up into the enlarged dome  
80 A a larger body of water can be carried in a boiler of a given size to absorb and retain the heat than can be carried in the well-known return-flue boilers.

If desired, three or more of the return-flues (marked C' in Fig. 2) may be omitted from  
85 one or both sides of the boiler, for the purpose of insuring better circulation.

Having described my invention, I claim—

The combination, in a steam-boiler, of the  
90 outer shell having its upper portion perforated and provided with a cylindrical water-chamber having strengthening-bars attached to its crown and united to the shell by rivets and  
95 braces or stays, with the inner shell secured to the outer and provided with grate-bars located therein, and return-flues running there-through and communicating with the uptake, substantially as shown and described.

In testimony whereof I affix my signature, in  
100 presence of two witnesses, this 5th day of December, 1881.

JOHN C. TITUS.

Witnesses:

JOHN E. DAVIDS,  
LIBBIE M. DAVIDS.