

(No Model.)

J. H. BELL.  
STEAM BOILER.

No. 330,458.

Patented Nov. 17, 1885.

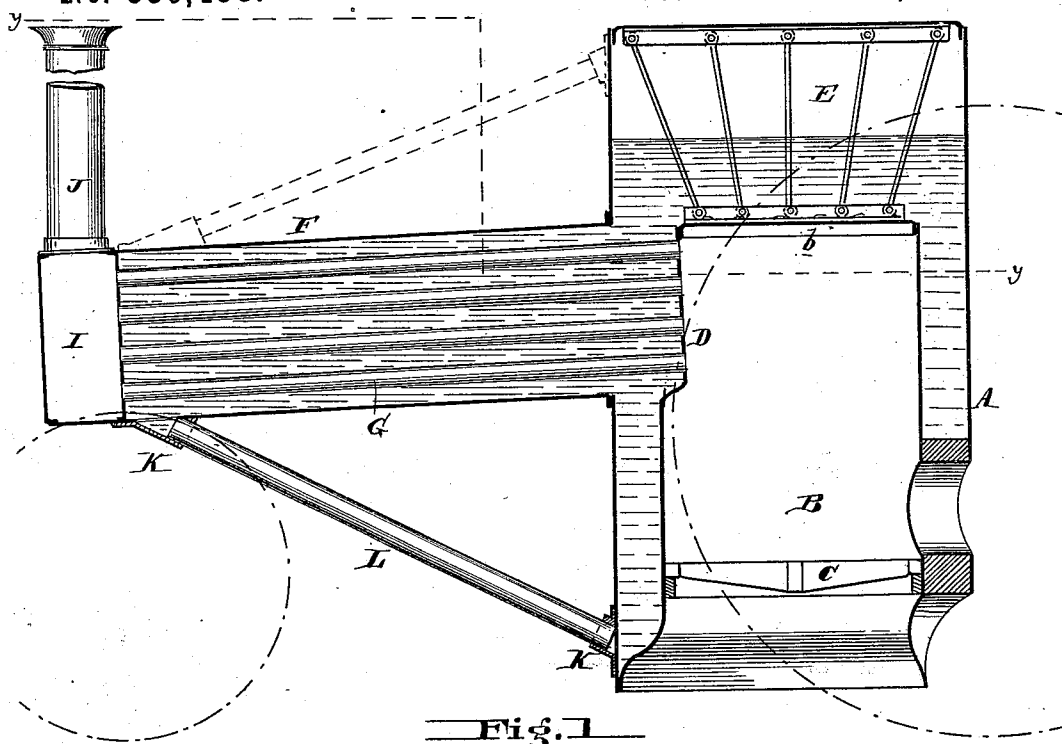


Fig. 1

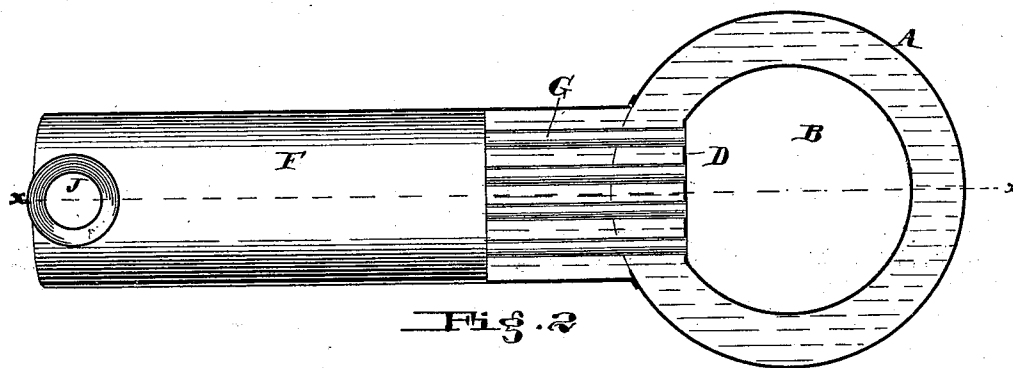


Fig. 2

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Inventor  
John H. Bell  
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*[Signature]*

# UNITED STATES PATENT OFFICE.

JOHN H. BELL, OF MOUNT EPHRAIM, NEW JERSEY.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 330,458, dated November 17, 1885.

Application filed July 14, 1885. Serial No. 171,582. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. BELL, of Mount Ephraim, in the county of Camden and State of New Jersey, have invented a new and useful Improvement in Steam-Boilers, of which the following is a specification.

My invention has reference to steam-boilers of what is known as the "locomotive" pattern, and is especially adapted to portable engines which are commonly used for agricultural purposes; and it consists, essentially, of an upright boiler provided with a waist from one side thereof, located wholly below the water-level, and provided with flues, through which the products of combustion must pass to the chimney, and in many details of construction, all of which are fully set forth in the following specification and shown in the accompanying drawings, which form part thereof. Heretofore boilers of this class employed very little steam and water space over the fire-box, and had a large waist, which was only kept partly full of water, so as to just cover the tubes. When such boilers are used upon portable engines, running over uneven ground would cause the water-level to change, often exposing the tubes and crown-sheet of the fire-box. I am also aware that it has been proposed to provide horizontal tubes in an upright boiler, said tubes extending across the fire-box and providing a suitable construction by which the products of combustion are caused to pass through said flues. This, however, is nothing but a slight modification of an ordinary upright boiler.

It has been proposed to make a locomotive-boiler—such as shown in patent to Culver, No. 289,989, December 11, 1883—with a dome placed upon the cylindrical waist, between the fire-box and forward end, which is connected by a small opening in the boiler-shell to allow of circulation of water, and in which boiler the water was maintained above the level of the main boiler-shell and partly filling the dome; but the construction of such a boiler is complicated, and does not in any-wise embody the advantages in construction of my improved boiler.

The object of my invention is to so construct a locomotive-boiler that the waist shall be simply a hot-water receptacle having no steam-

space, and the fire-box portion shall be large, having a great heating capacity, and by having the steam-space wholly in this portion of the boiler any tipping of the boiler will not expose the crown-sheet, as the water surface or area is not sufficient for that purpose; also, by the construction set forth the main weight comes upon the fire-box end of the boiler, and when used for portable engines said weight would be supported mainly by the rear wheels, as indicated in dotted lines; again, by the construction set forth and shown I am enabled to use a cylindrical fire-box, thereby giving great strength, combined with cheapness, and at the same time I am enabled to employ flat sheets into which to rivet the tubes.

In the drawings, Figure 1 is a sectional elevation, on line *x x*, of a boiler embodying my improvements; and Fig. 2 is a sectional plan view of same on line *y y*.

A is the main vertical shell, and contains within it the vertical cylindrical fire-box B, which has the flattened part D, to receive the tubes G of the waist F, the said sheet D being substantially at right angles to the tubes. C is the grate. Above the crown-sheet *b* of the fire-box is the water and steam space E, the outer shell, A, being made of sufficient height to provide for both, thereby obviating the necessity of a steam-dome. The waist F is made small, and, being entirely a water-space, is filled with flues or tubes G, through which the products of combustion from the fire pass, to escape into the smoke-box I, and from it by the chimney J. This waist is preferably set at a slight angle to the main body A, as shown, so that the steam generated therein may readily pass into the steam-space E, and to insure a more perfect circulation a pipe, L, may connect the water-spaces in the lowermost part of the waist and main shell or body, which pipe may be screwed thereto by cast-iron shoes K.

While I prefer the construction shown, I do not limit myself to the details thereof, as they may be varied without departing from the spirit of my invention.

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

1. A boiler of the locomotive type having its waist, of comparatively small diameter, lo-

cated below the water-level, and set at an incline to the main body or fire-box portion, substantially as and for the purpose specified.

2. A boiler of the locomotive type having its waist, of comparatively small diameter, located below the water-level, and set at an incline to the main body or fire-box portion, and having the water-space in the lowermost parts of said waist and fire-box portion connected by a circulating-pipe, substantially as and for the purpose specified.

3. In a boiler, the body-shell A, made cylindrical and set on end, and its fire-box B, in combination with the cylindrical waist F, having tubes G, but located wholly below the water-level in the shell A, substantially as and for the purpose specified.

4. In a boiler, the body-shell A and its fire-box B, having the flattened part D, in combination with the waist F, having tubes G, but located wholly below the water-level in the shell A, substantially as and for the purpose specified.

5. In a boiler, the body-shell A and its fire-box B, in combination with the inclined waist F, having tubes G, but located wholly below the water-level in the shell A, and pipe L, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

JOHN H. BELL.

Witnesses:

R. M. HUNTER,  
JAMES S. PHILLIPS.