(No Model.)

2 Sheets—Sheet 1.

W. T. BATE.

STEAM BOILER.

No. 400,729. Patented Apr. 2, 1889.

FIG. 1

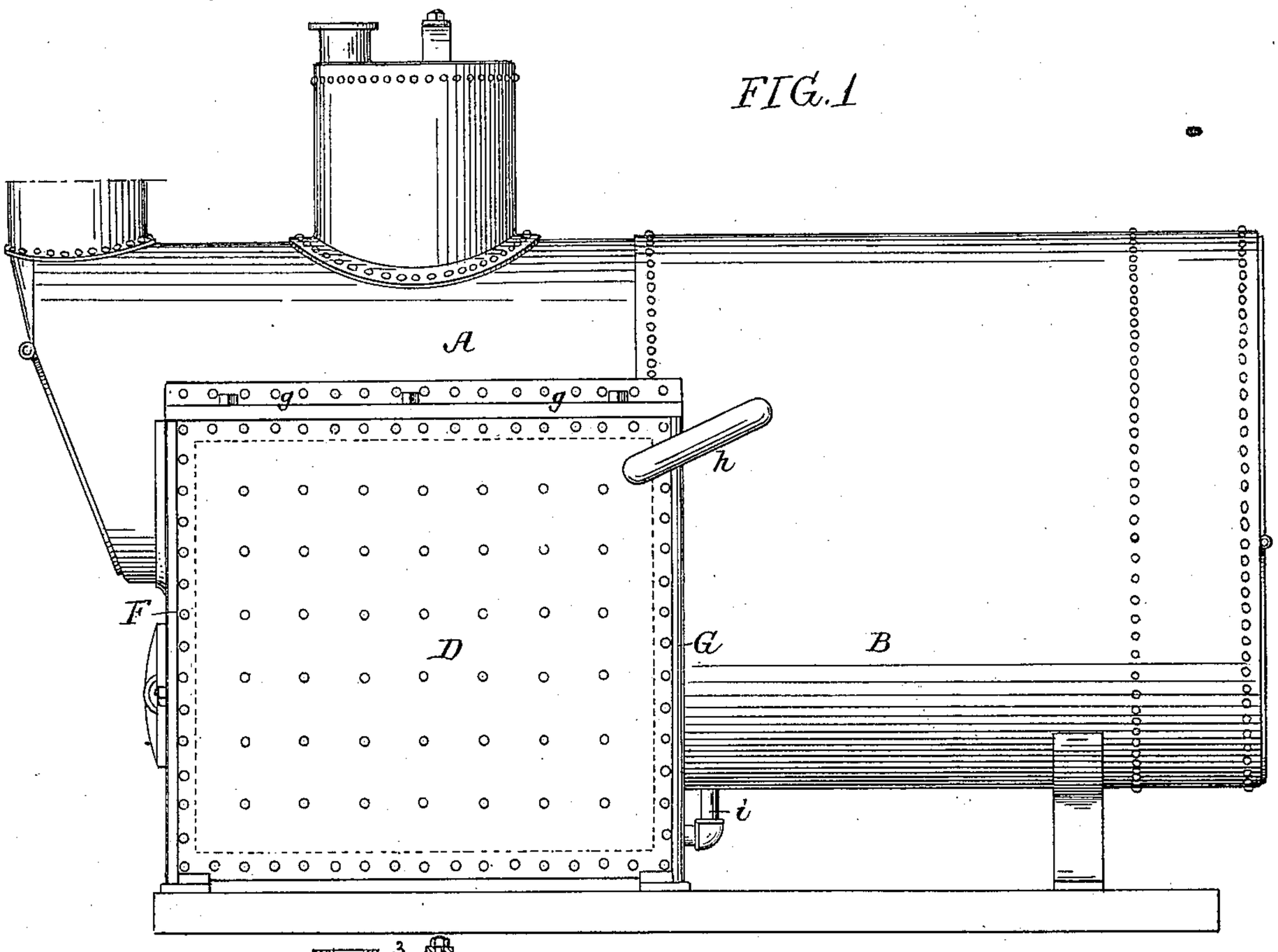
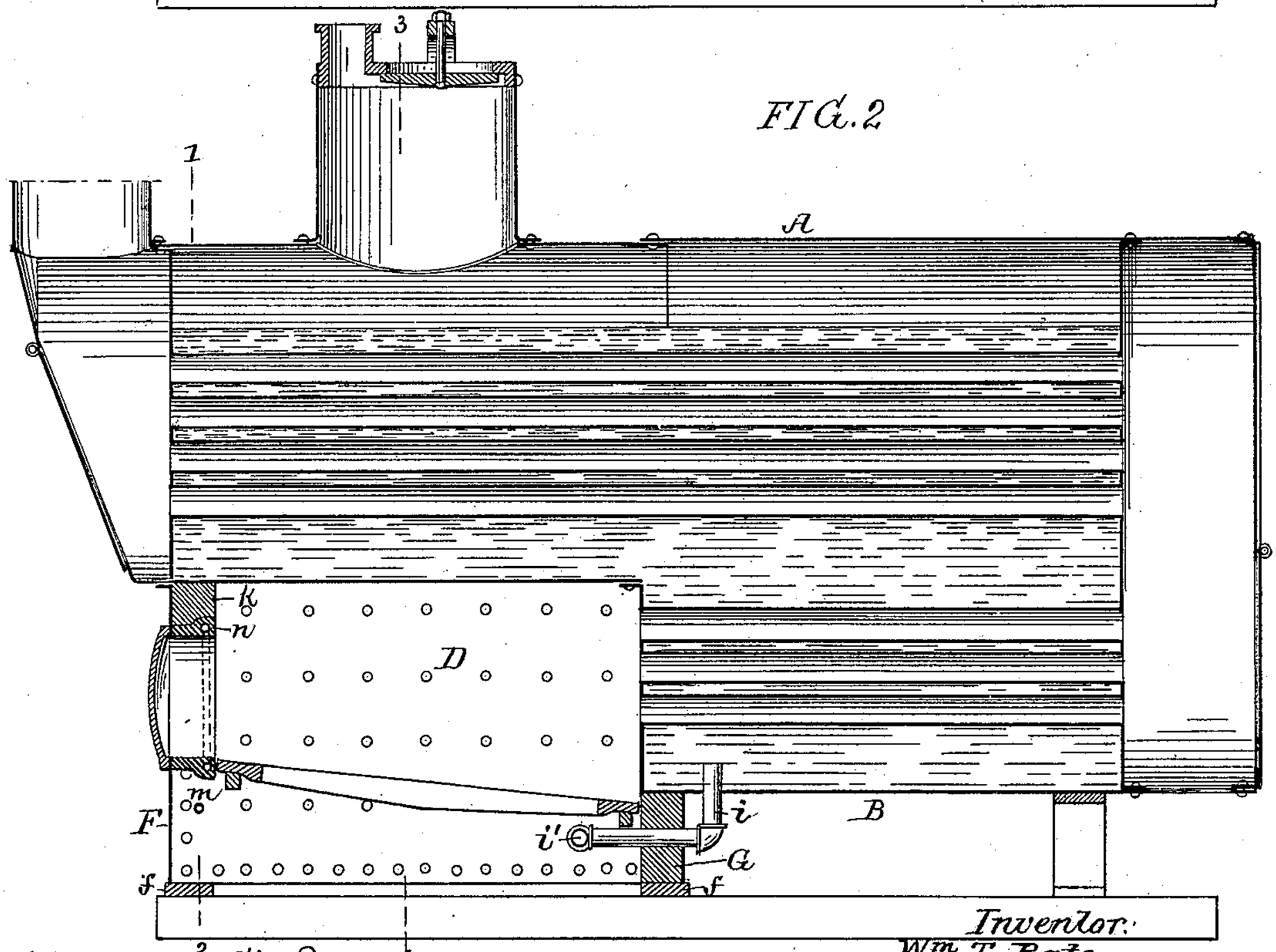


FIG. 2



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Jno. E. Parker

Inventor:
Wm T. Bate
by his Attorneys
Howson & Howson

(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

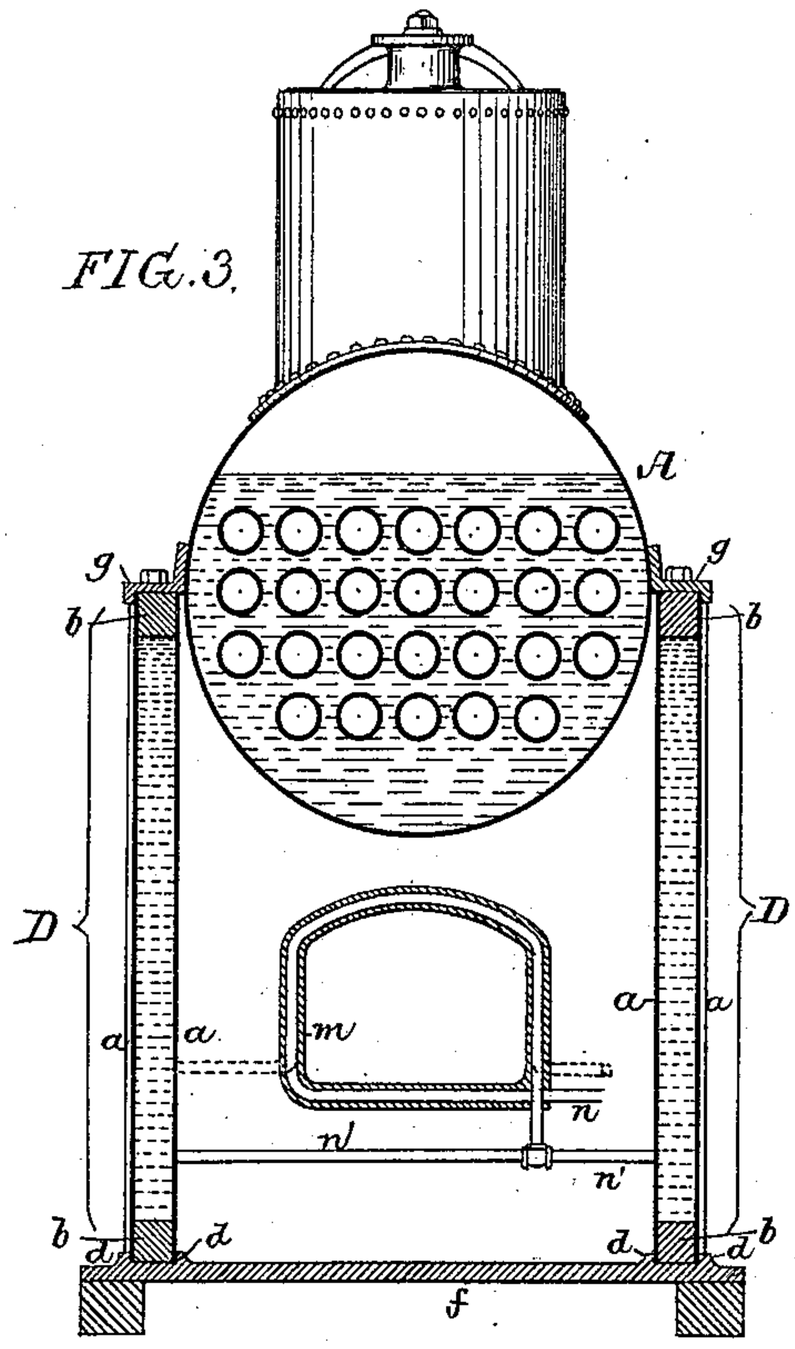


FIG. 4.

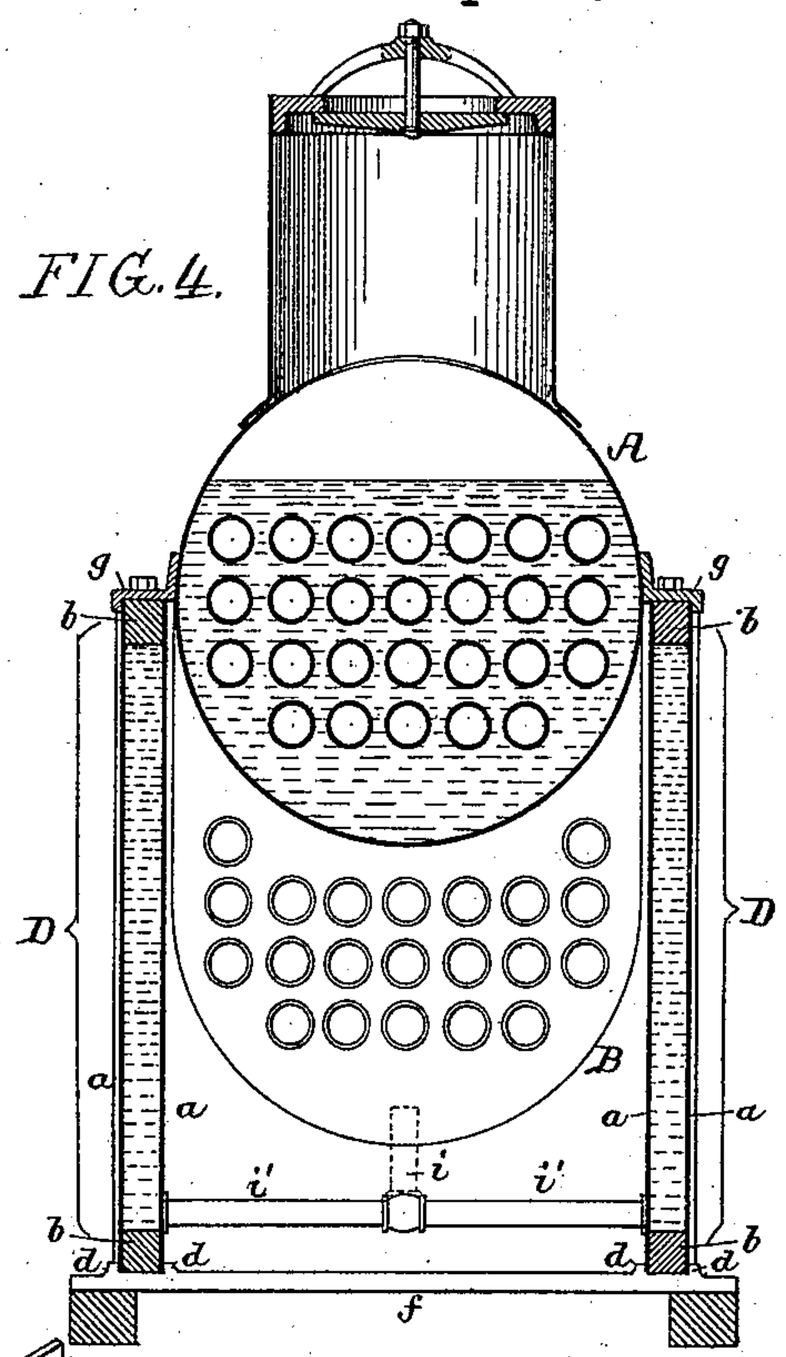
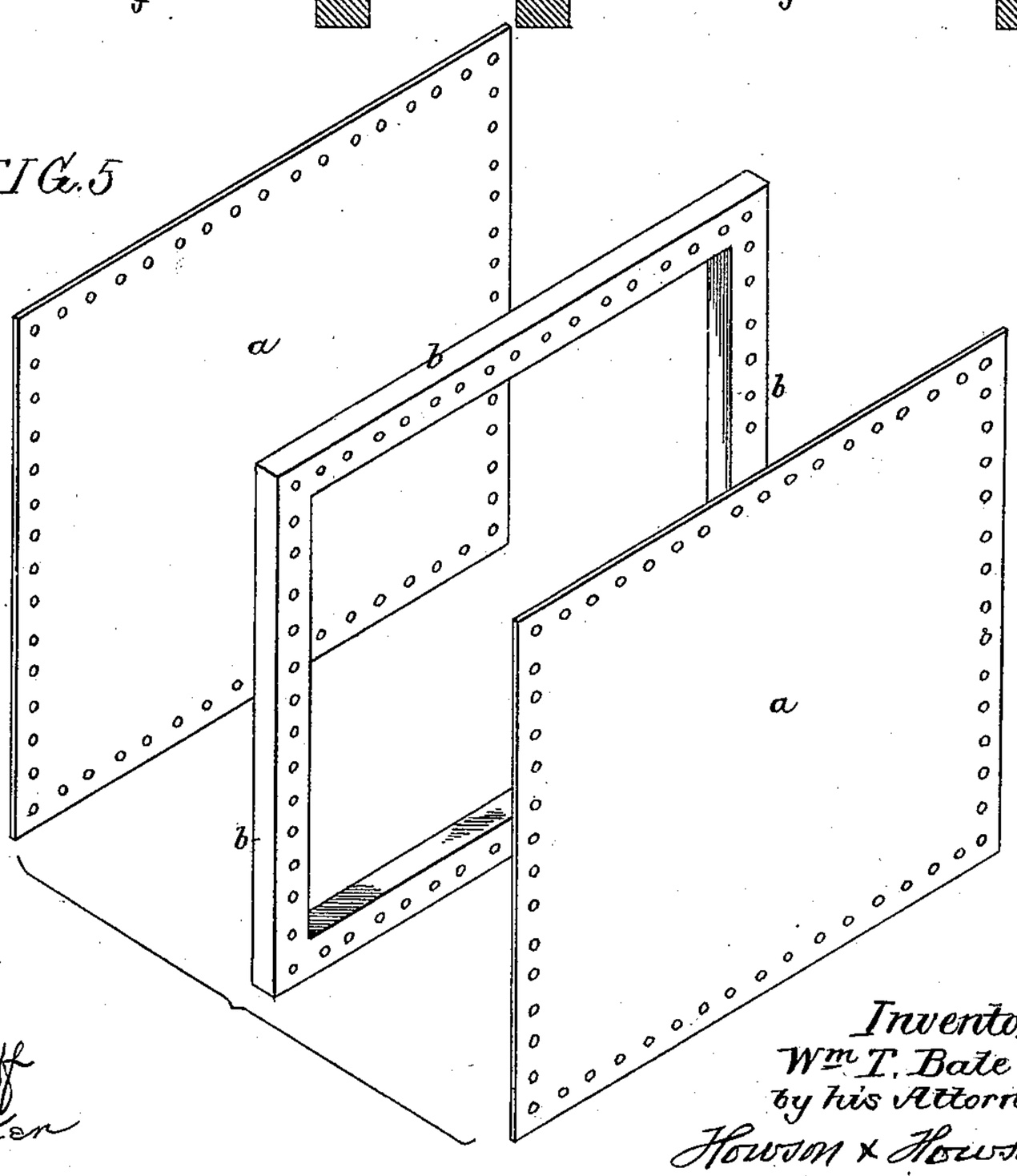


FIG. 5



Witnesses.
Alex. Barkoff
Jno. E. Parker

Inventor:
Wm T. Bate
by his Attorneys
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UNITED STATES PATENT OFFICE.

WILLIAM T. BATE, OF CONSHOHOCKEN, PENNSYLVANIA.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 400,729, dated April 2, 1889.

Application filed December 22, 1887. Serial No. 258,675. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. BATE, a citizen of the United States, and a resident of Conshohocken, Montgomery county, Pennsylvania, have invented certain Improvements in Portable Steam-Boilers, of which the following is a specification.

My invention consists of an improved form of fire-box for that class of boilers (such as shown in my patent, No. 207,940, dated September 10, 1878) in which the tubular barrel of the boiler has a tubed depending leg at the rear, the object of my invention being to provide a water-chambered fire-box of economical construction, which will not detract from the effective area of the depending rear leg, and either side of which can be readily detached from the boiler when necessary.

In the accompanying drawings, Figure 1 is a side view of the boiler with my improved fire-box. Fig. 2 is a longitudinal section of the same. Fig. 3 is a transverse section on the line 1 2, Fig. 2. Fig. 4 is a transverse section on the line 3 4, Fig. 2; and Fig. 5 is a detached perspective view, on a reduced scale, of the parts comprising one of the hollow cheek-pieces of the fire-box.

A represents the shell of the boiler, having an upper tubed cylindrical barrel with tubed depending leg B at the rear. With this boiler I use a detachable fire-box casing, consisting of opposite hollow cheeks D D, front plates, F, and rear plate, G. Each of the hollow cheeks D is composed of inner and outer plates, *a*, bolted or riveted to a jointless rectangular frame, *b*, and suitably stayed to resist the pressure to which they are subjected. The cheek-pieces D rest at the bottom between lugs *d* on transverse bearing-bars *f*, the upper edges of the cheek-pieces supporting brackets *g*, which are bolted or riveted to the boiler-shell and overlap the upper bars of the cheek-pieces, to which they are suitably secured, the front and rear plates, F and G, likewise overlapping and being secured to the cheek-pieces at the corners. The opposite hollow cheek-pieces, with the front and back plates of the fire-box, can thus be readily secured to each other and to the boiler, the hollow cheek-pieces adding to the capacity of the boiler, as said cheek-pieces are connected to the water-space of the boiler at the top by means of side pipes, *h*, and at the bottom by means of a connecting-pipe, *i*, and branches *i'*, so that a constant circulation of water in the cheek-pieces is insured, and the steaming capacity of the boiler thereby materially increased, owing to the high degree of heat to which these cheek-pieces are subjected. The cheek-pieces, moreover, are outside of or laterally beyond the depending rear leg, so that the full area of the latter is available for the reception of tubes, whereas permanent water-chambered cheek-pieces necessarily detract to the extent of their own width from the available width of the depending rear leg.

The water-chambered cheek-pieces, besides adding to the capacity of the boiler, are more durable than a fire-clay lining, the only lining needed in my improved fire-box being the front and back blocks, *k*, which are shaped to conform to the shell of the boiler.

The feed-opening in the front plate of the fire-box has an internal casing, *m*, which is preferably thickened around the inner edge for the reception of a pipe, *n*, through which is forced the water for supplying the boiler, this water, after passing through the casing, being conveyed by the branches *n'* to the water-chambers of the cheek-pieces, before reaching which, however, it has acquired a high temperature, because of the intense heat to which the casing *m* is subjected, the circulation of water through the casing, moreover, preventing the rapid burning out of the same or of the fire-brick lining mounted thereon. The pipe *n* may pass only part way around the flange, if desired, as shown, for instance, by dotted lines in Fig. 3; but the carrying of the pipe completely around the flange is preferred.

As each of the water-chambered cheek-pieces of the fire-box is of simple and inexpensive construction, my invention is especially applicable to the production of portable boilers of the cheaper class, and, as each cheek-piece is a complete and self-contained structure, it can be readily removed or replaced without disturbing either the other cheek-piece or the barrel of the boiler.

Without claiming broadly, therefore, a fire-box with water-chambered walls, I claim as my invention and desire to secure by Letters Patent—

1. The combination of the shell of the boiler,

comprising the tubed cylindrical barrel and tubed depending leg at the rear, with opposite water-chambered cheek-pieces extending forward from the depending leg of the boiler and forming the sides of the fire-box, each cheek-piece being a self-contained independent structure outside of and forming a joint with the barrel and leg of the boiler, all substantially as specified.

2. The combination of the shell of the boiler, comprising the tubed cylindrical barrel and tubed depending leg, with the fire-box casing having a front plate conforming to the shape of the cylindrical barrel, a back plate conforming to the shape of the depending leg, and opposite water-chambered cheek-pieces extending forward from said depending leg and forming the sides of the fire-box, each cheek-piece being a self-contained independent structure outside of and forming a joint with the barrel and leg of the boiler, all substantially as specified.

3. The within-described water-chambered cheek-piece for the fire-box of a steam-boiler, the same consisting of a jointless rectangular frame forming the top, bottom, and ends of said cheek-piece, and opposite side plates secured to said frame, so as to form therewith a hollow rectangular slab, all substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM T. BATE.

Witnesses:
WILLIAM D. CONNER,
HARRY SMITH.