(No Model.) 2 Sheets—Sheet 1.

G. SELDEN.

PORTABLE TUBULAR BOILER.

No. 479,991. Patented Aug. 2, 1892.

Fig. 1.

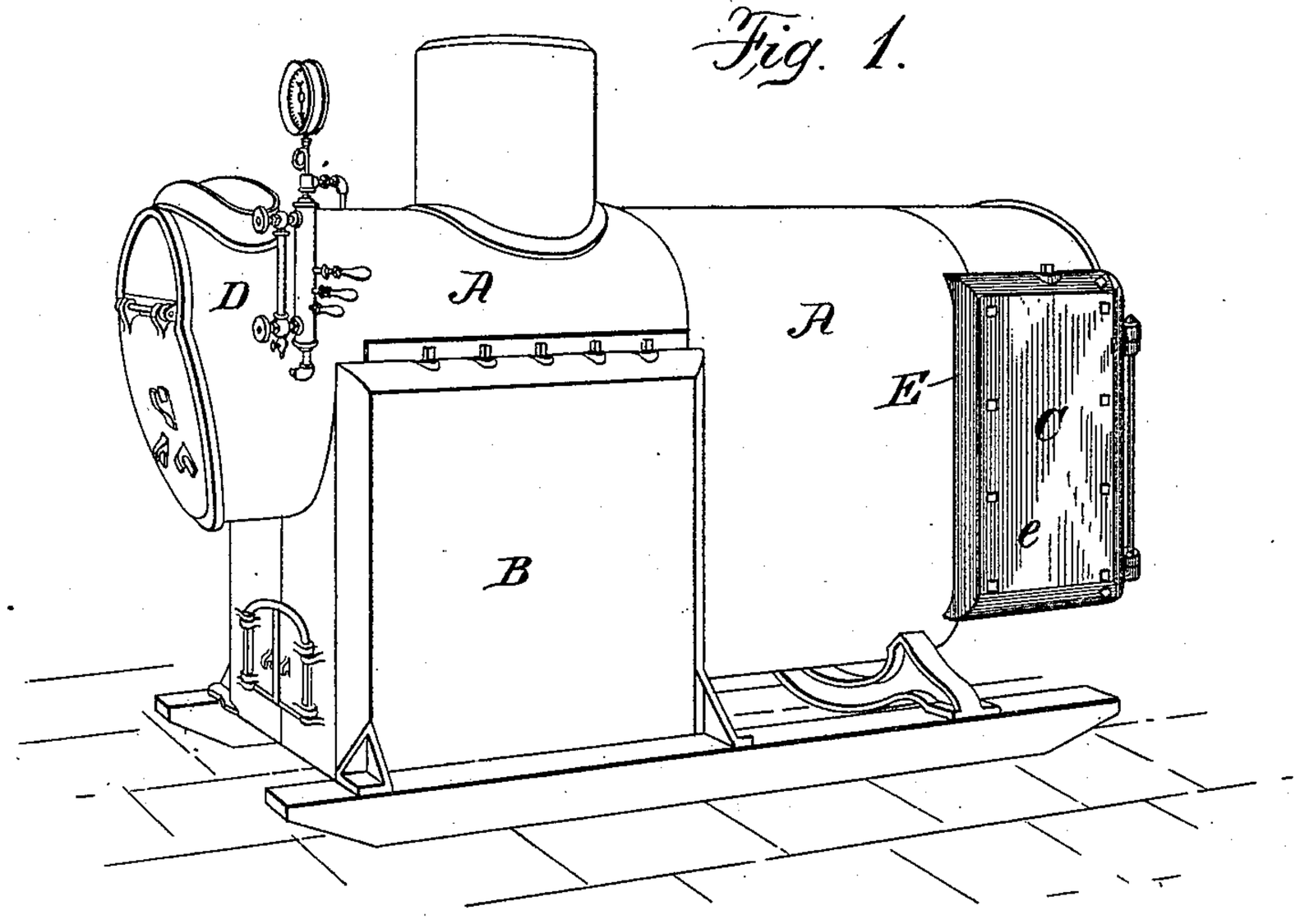
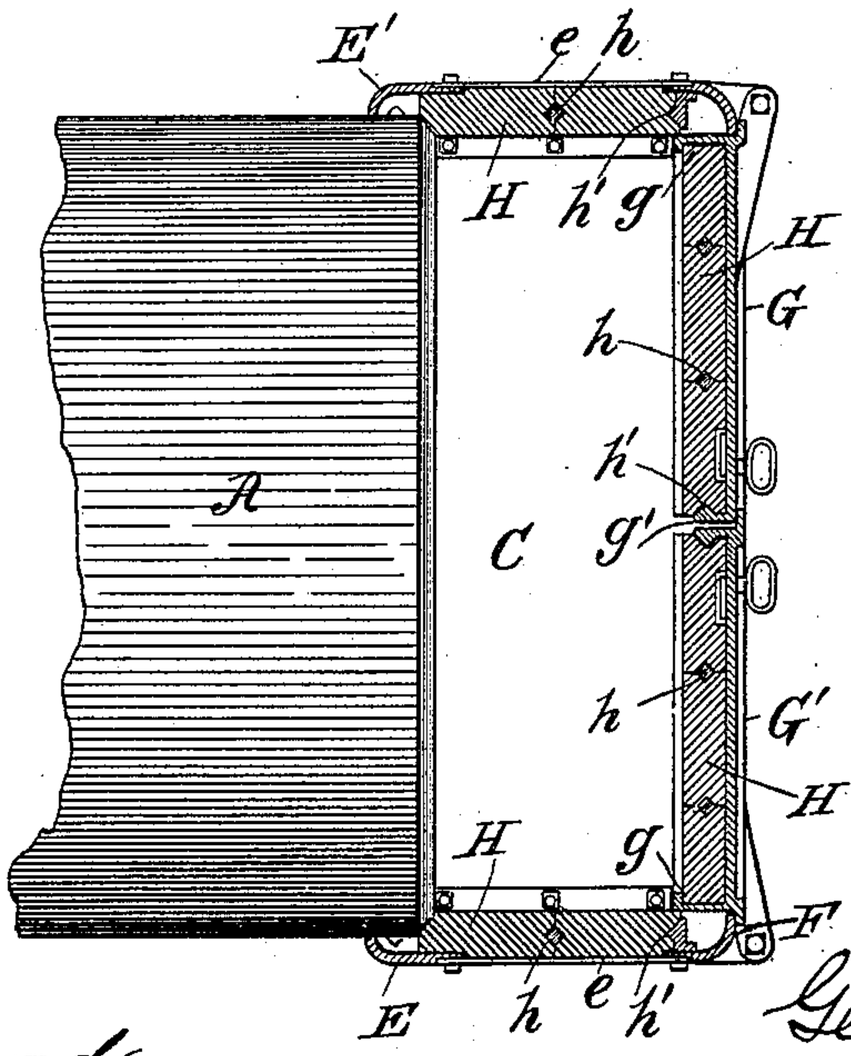


Fig. 2.



Attest:
Geo. T. Smallwood.
Alex Mahon

Inventor:
George Selden,
By Dill & Smith & Son
Attorneys

(No Model.) 2 Sheets—Sheet 2.

G. SELDEN.

PORTABLE TUBULAR BOILER.

No. 479,991. Patented Aug. 2, 1892.

Fig. 3.

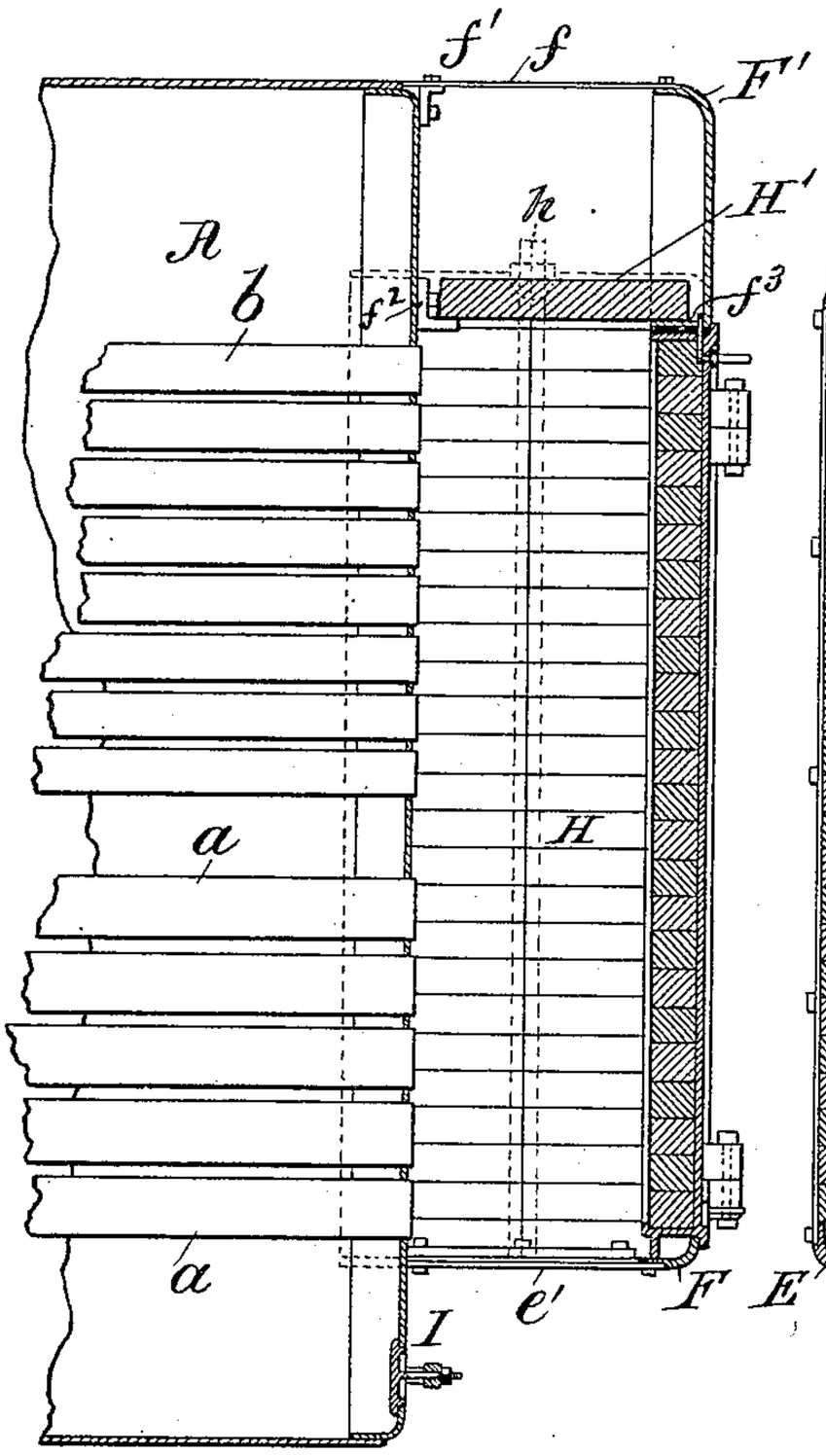
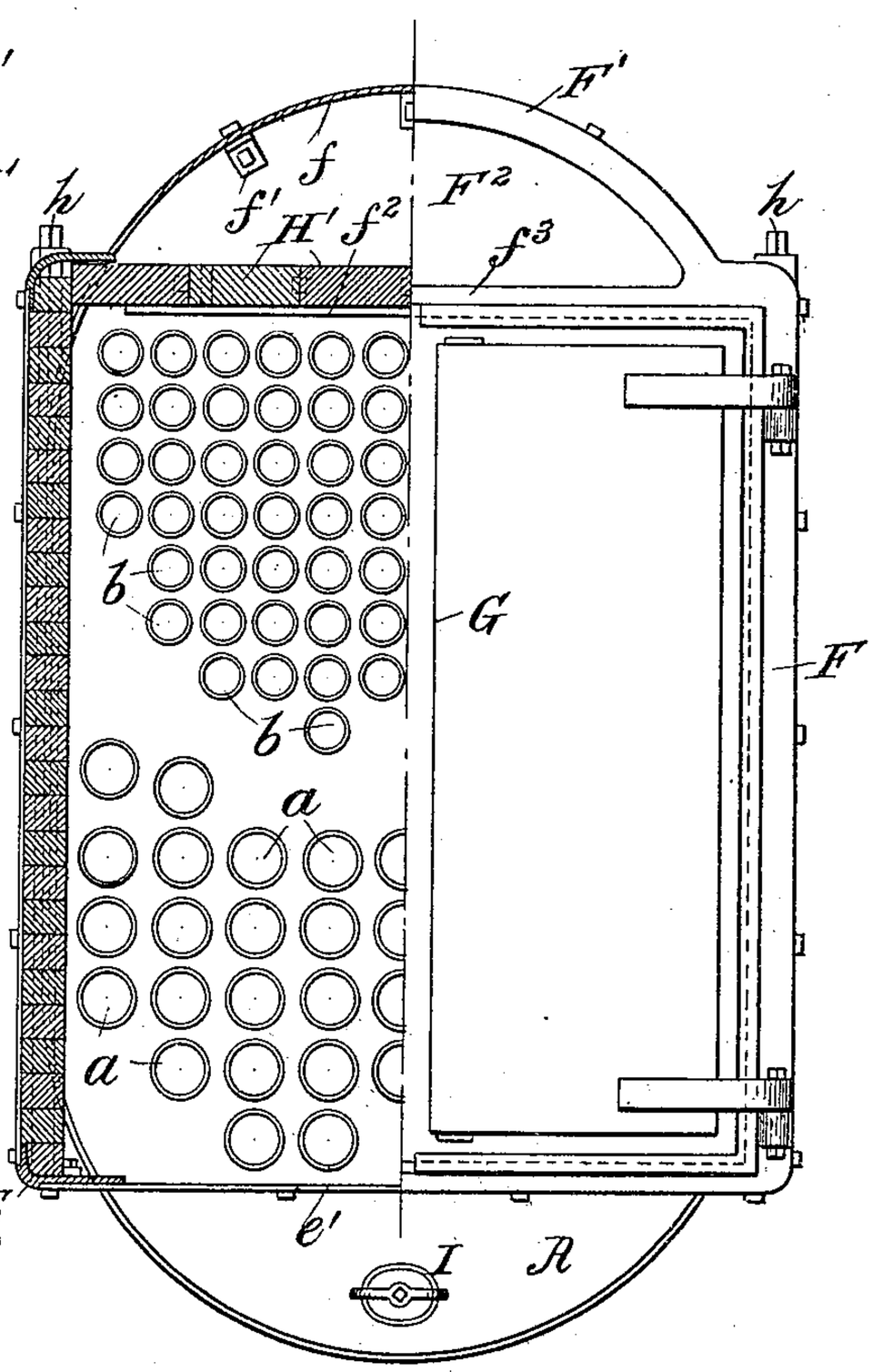


Fig. 4.



Attest:
Geo. T. Smallwood.
Alex Mason

Inventor:
George Selden.
By Hill, Smith & Lon,
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE SELDEN, OF ERIE, PENNSYLVANIA.

PORTABLE TUBULAR BOILER.

SPECIFICATION forming part of Letters Patent No. 479,991, dated August 2, 1892.

Application filed January 7, 1892. Serial No. 417,302. (No model.)

To all whom it may concern:

Be it known that I, GEORGE SELDEN, a citizen of the United States, and a resident of Erie, county of Erie, and State of Pennsylvania, have invented a new and useful Improvement in Portable Tubular Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to that class of portable boilers employing fire-tubes extending from the fire-box through the boiler to a chamber in rear, through which connection is made with return-tubes passing back through the boiler to the smoke-box; and it consists in a novel construction and arrangement of the rear connecting-chamber referred to for promoting combustion of the gases and other unconsumed products of combustion entering it, and thereby causing them to pass into and through the return-tubes at a greatly-increased temperature as compared with the ordinary construction of these chambers, and for facilitating the cleaning of the boiler, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a boiler embracing my improvements. Fig. 2 is a plan of the rear end of the boiler, showing the rear tube-connecting chamber in section. Fig. 3 represents a vertical section through the connecting-chamber and rear end of the boiler; and Fig. 4 is a rear view of the boiler and connecting-chamber, the latter being shown partly in section with one of its doors removed.

The boiler in its organization or general arrangement of parts is similar to that upon which Letters Patent were granted May 19, 1885, to William Moran, No. 318,128, with the fire-box constructed substantially as described in Letters Patent granted to me November 30, 1886, No. 353,595, and need not therefore be described in detail further than is necessary to an understanding of my present improvements.

A indicates the boiler, the forward end of which, extending over and beyond the fire-pot, (indicated at B,) is cylindrical in form, as shown, the rear portion in rear of the fire-pot being substantially elliptical in form. The lower tubes *a a* extend through the lower part of the elliptical portion of the boiler from the fire-pot to a chamber C in rear of the boiler, and through which the products of combustion pass up to the upper or return tubes *b*, which are preferably made smaller than the tubes *a*, as shown, and which pass through the upper part of the elliptical portion of the boiler and through the cylindrical portion, terminating in the smoke-box D, formed in the forwardly-projecting end of the boiler.

As thus far described, the arrangement of parts is similar to that of the patents referred to; but the chamber C, instead of being formed by sheet-iron extensions of the sides, top, and bottom of the boiler, as in said patents, is constructed as follows: E and E′ represent iron frames, preferably cast each in open rectangular form, with the sides of the frame made in concavo-convex form in cross-section, as shown, to give them the required strength without unnecessary weight of material, facilitating their being bolted to the sides of the boiler and to a rear end frame F and to accommodate a fire-brick lining, as hereinafter described. These frames are secured one to each side of the rear end of the boiler, forming an extension thereof, and at their rear ends to the rear transverse frame F, which is of similar construction, except that it has an arched extension F′, conforming to the arching upper portion of the boiler, to which it is connected by a sheet-iron cover *f*, bolted thereto, or angle-iron clips *f′*, bolted to the rear end of the boiler. The open side frames E and E′ are covered with sheet-iron plates or panels *e e*, and have their lower ends connected by a horizontal plate *e′*, which at its rear edge is bolted also to the frame F, which may, if desired, be cast in one piece with the side frames. The open frame F is closed by means of doors G and G′, hinged to the sides of the frames F, and which may be cast in the form of open rectangular frames provided with sheet-iron panels similar to the frames E and E′, or they may be cast with the panels in the form indicated in section in Fig. 2, having flanges *g* and *g′* on the sides, top, and bottom to accommodate the fire-brick lining, as shown, and at the same time to give the required strength to the casting without unnecessary weight of mate-

rial. The opening at F^2 in the arch of the frame F may be closed by a sheet-iron panel like those in the frames E E′, or the panel may be cast therein, as in the doors G and G′. The side frames and the doors G G′ thus constructed have a lining of fire-brick applied to them held in place in a manner similar to that of the fire-pot of my former patent referred to—that is to say, the bricks H have V-shaped notches formed in their ends, which at one side engage V-shaped projections h' on the flanges of the frames and at intermediate points with upright through-bolts h, rectangular in form in cross-section and set obliquely, as shown, to enter the V-shaped notches in the adjacent ends of the bricks, and thus prevent accidental displacement of the bricks.

The rear wall of the boiler A, just above the return-flues b, has an L-shaped iron f^2, bolted to and extending transversely across it, and upon the horizontal ledge thereof and a horizontal flange on the upper transverse bar f^3 of the frame F are placed a series of tongue-and-grooved fire-bricks H′, which interlock and form a deflecting-board for turning the products of combustion inward and causing them to pass through the return-flues. It will be observed that the bottom sheet e' of this chamber, instead of conforming to the curve of the boiler, extends horizontally across said end, leaving room below it for the hand-hole, (indicated at I,) through which access is had to the lower part of the boiler for cleaning it or for other purpose. By this arrangement access can be had to the boiler without opening the doors G and getting at it through the chamber C.

In the construction of the walls of the chamber C of thin iron, as in the former patents referred to, much of the heat reaching said chamber was lost through radiation, and the gases and other unconsumed products of combustion were thereby so cooled as to be allowed to pass out through the return-tubes without being consumed, whereas by the construction described, the walls of the chamber with which the products of combustion come in contact being thoroughly protected by the lining of fire-brick, radiation is to a large degree prevented and the bricks, becoming thoroughly heated, give to said chamber the character of a combustion-chamber, greatly assisting the process of combustion and causing such products to pass into the return-flues at a much higher temperature, and consequently in a much more effective condition than where the walls are not protected as described. Like the fire-pot of my former patent, referred to, the connecting combustion-chamber can be readily and quickly removed, thereby facilitating handling and transportation.

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

1. The combustion-chamber for connecting the direct and return tubes of the tubular boiler, made removable and composed of cast side and rear connecting-frames and doors paneled and brick-lined, substantially as described.

2. The combination, with a portable tubular boiler made cylindrical in form over the fire-pot and elliptical in form in rear thereof and provided in said rear elliptical portion with direct flues and over the latter with return-tubes and with a hand-hole for giving access to said flues, of a removable brick-lined combustion-chamber located above said hand-hole and connecting the direct and return tubes, substantially as described.

In testimony whereof I have hereunto set my hand this 2d day of January, A. D. 1892.

GEORGE SELDEN.

Witnesses:
EDWARD P. SELDEN,
A. P. MOFFETT.