

(No Model.)

G. SELDEN.
Portable Steam Boiler.

No. 242,230.

Patented May 31, 1881.

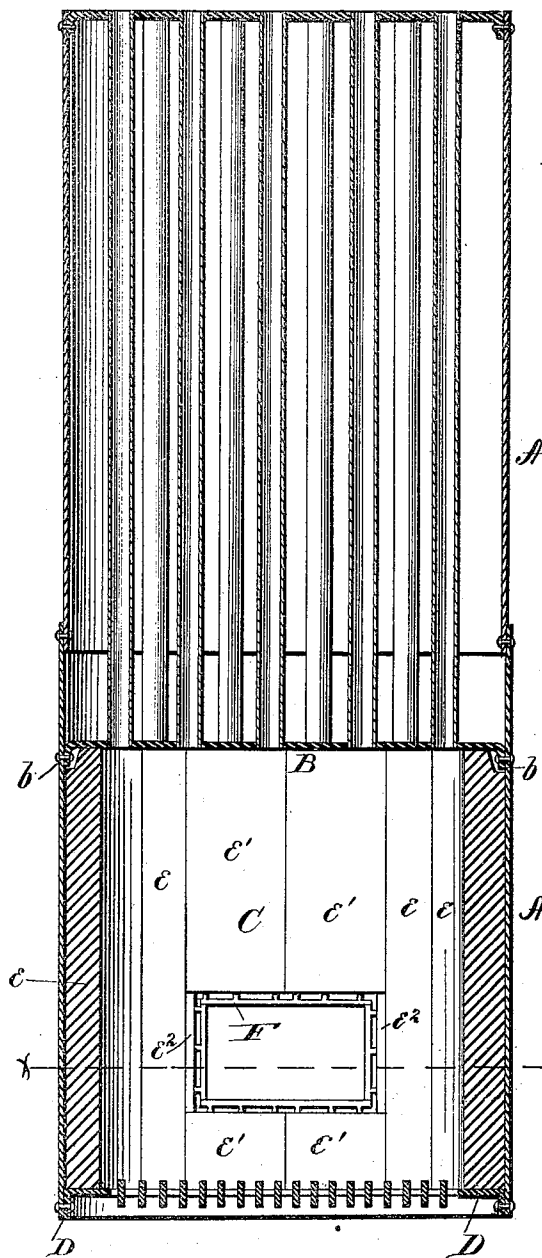


Fig. 1.

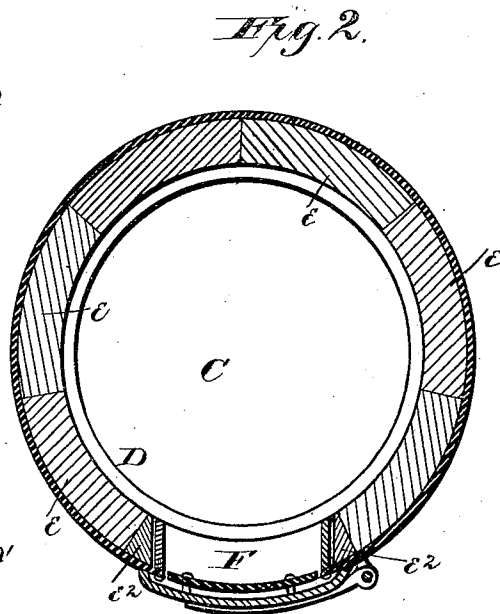
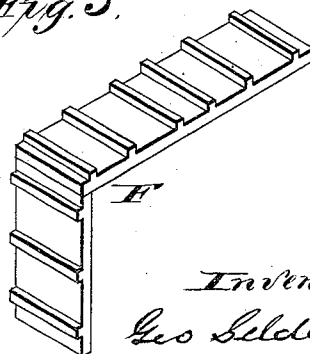


Fig. 2.

Fig. 3.



Witnesses.
Frank L. O'Rand
A. M. Smith

Inventor.
Geo Selden

UNITED STATES PATENT OFFICE.

GEORGE SELDEN, OF ERIE, PENNSYLVANIA.

PORTABLE STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 242,230, dated May 31, 1881.

Application filed April 24, 1880. (No model.)

To all whom it may concern:

Be it known that I, GEORGE SELDEN, of Erie, county of Erie, State of Pennsylvania, have invented a new and useful Improvement in Portable Upright Steam-Boilers, of which the following is a full and exact description, reference being had to the accompanying drawings, making a part of the same, and in which—

Figure 1 represents a vertical section through my improved boiler. Fig. 2 is a horizontal section through the same, taken on the line *x x*, Fig. 1; and Fig. 3 is a perspective view of a portion of the door-frame enlarged.

Similar letters of reference denote corresponding parts wherever used.

In upright portable steam-boilers as ordinarily constructed the boiler is extended in the form of an annular water-leg which surrounds and forms the side walls of the fire-pot, the purpose being to protect the boiler-shell from injury by the fire, and at the same time extend the surface exposed to the direct action of the fire, and thereby increase the steam-generating capacity of the boiler; but in practice it is found that the water filling the water-leg keeps the wall of the fire-pot at so low a temperature as to seriously interfere with the combustion of the smoke and gases arising from the burning fuel, thereby causing material waste.

One object of my invention is to overcome this difficulty, and while promoting combustion by dispensing with the water-leg to retain the advantage of having the fire-pot form a part of the portable boiler; and to this end my invention consists in extending the boiler-shell to form the fire-pot, and lining and protecting the same with fire-brick, as hereinafter explained.

It further consists in a novel means for supporting the fire-brick lining and keying the same in place, as hereinafter described.

In the accompanying drawings, A represents the cylindrical shell of the boiler, extended at A' below the tube-sheet B to form also the shell or casing to the fire-pot C underneath said tube-sheet. The tube-sheet B, which is perforated to receive the lower ends of the fire-tubes, arranged in any usual or preferred way, has an annular flange, *b*, formed on its edge, on

its lower side, through which it is riveted to the shell A; and at the lower end of the shell, or rather at the lower end of the fire-pot, (for the shell may be further extended, if desired, to form the ash-pit,) is secured an annular angle-iron or flanged ring, D, the pendent vertical rim of which is riveted to the shell, the horizontal part forming the support for the fire-brick, which rest thereon. This horizontal part of the ring D projects inward beyond the fire-brick, as shown, and serves to support the grate or grate-bars.

The fire-bricks *e e* are made in the form of segments of a ring tapering inward, and by preference are made of sufficient length to extend from top to bottom of the fire-pot, except at the door, and are notched or recessed at their upper ends, on their outer faces, to adapt them to fit over and cover the flange and rivets connecting the tube-sheet with the shell. This is important, as said joint is thereby protected from the direct action of the fire, and in consequence is rendered much more durable than it would be otherwise.

Above and below the door-frame are short sections of brick *e'*, similar in form in horizontal section to bricks *e*, and filling the spaces above and below said frame, and after these are in place key-pieces *e''* are inserted at the sides of the opening for the door-frame, said pieces serving, when in place, to uphold the pieces over the door-opening until the door-frame is inserted. The latter, F, is by preference made to taper slightly outward, adapting it to be inserted from the inside after the bricks, including the key-pieces *e''*, are all in place, this form serving more effectually to lock or key the entire lining in place. It may be made in a single piece in any preferred form, or it may be made in sections, the top and bottom separate from the sides, and the latter may be so made as to key the former in place. Various modifications in details of construction may thus be made for facilitating the insertion of the brick and the keying of the same in place, adapting them to be securely retained in position while the boiler is being moved from place to place.

The outer faces of the door frame or plates may be provided with transverse ribs, as shown

in Fig. 3, for removing the fire-brick slightly, and forming air-spaces, which serve to protect the frame and prevent its being burned out.

By the construction shown the ordinary water-leg is dispensed with, and in lieu thereof is provided a fire-brick lining which covers and protects the joints and the extended shell from injury by the fire, and the fire-brick, as is well understood, is susceptible of being raised to such a high temperature as to materially promote combustion of the smoke and gases released in the process of combustion, and thereby greatly increases the quantity and intensity of heat produced from a given amount of fuel, more than sufficient to compensate for the diminished extent of boiler-surface exposed to the direct action of the fire.

The water-leg, as is well-known, constitutes one of the most expensive, as well as one of the most troublesome and dangerous, features of a boiler, owing to the imperfect circulation therein, and the water therein is usually at a comparatively low temperature at the lower end, which consequently becomes the receptacle of all sediment and incrustation, so that frequently in a short time it becomes so filled as to exclude the water, when it is liable to be burned out, and thereby cause the explosion of the boiler. These difficulties, as will be seen, are all obviated by my improvement, while at the same time the first cost of the boiler, as

also the cost of keeping it in repair, is very greatly reduced.

Parts of the boiler not particularly described may be constructed in any usual or preferred manner.

I am aware that upright boilers have been used with brick or brick-lined fire-pots, and I therefore do not claim the combination of said feature broadly and irrespective of the construction and arrangement described; but,

Having now described my invention, I claim—

1. A portable upright boiler the shell of which is extended below the tube-sheet to form the fire-pot, and provided with the flanged foot or angle-iron for the support of the fire-brick lining, in combination with said lining, made in sections, keyed in place and against said extension, substantially as described.

2. The portable upright boiler having its shell extended below the tube-sheet to form the fire-pot, and provided with the flanged foot or angle-iron for the support of a fire-brick lining, applied thereto in sections, in combination with the removable door-frame adapted to key said lining in place, substantially as described.

GEO. SELDEN.

Witnesses:

N. B. SMITH,
J. M. YZNAGA.