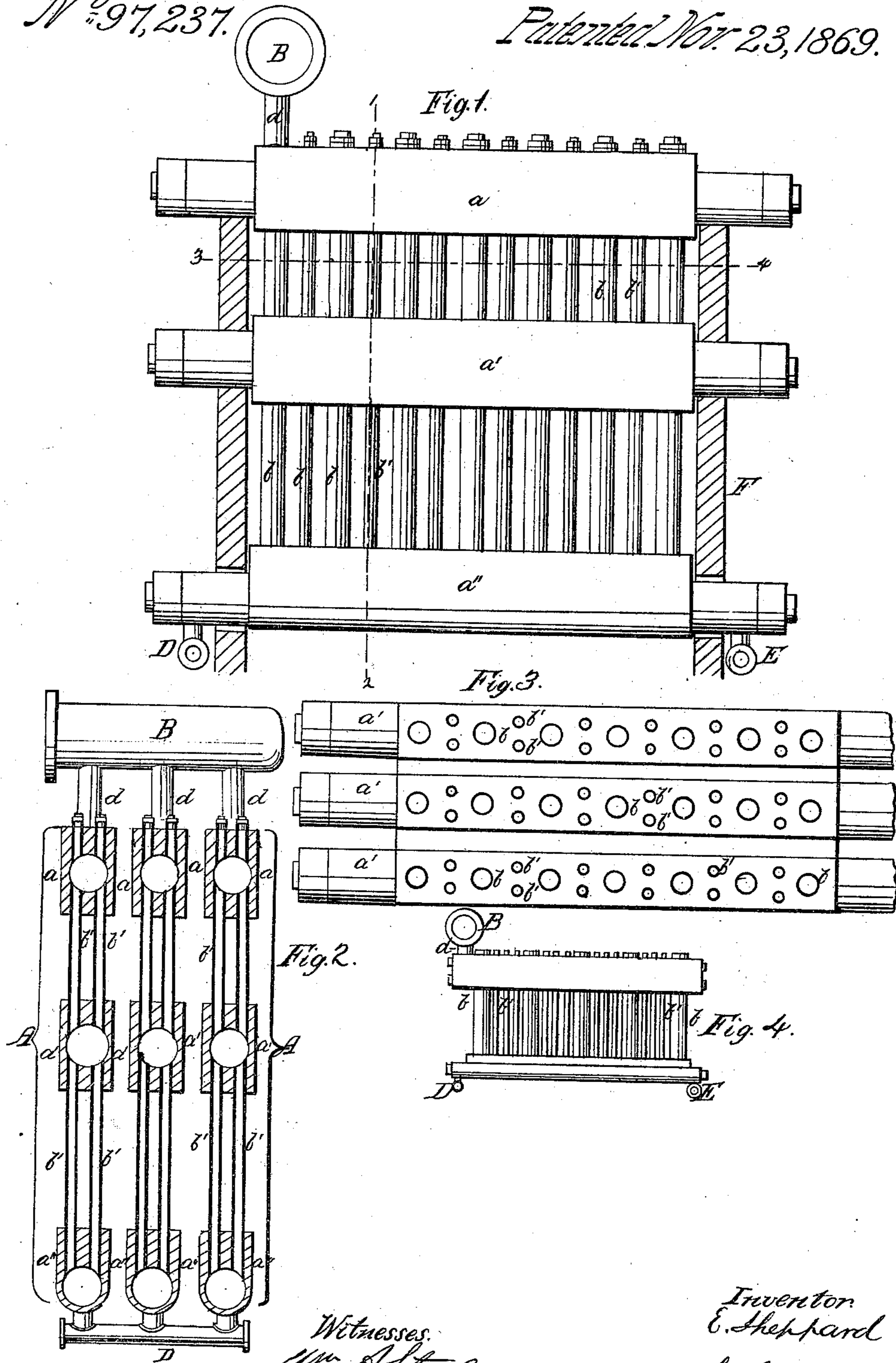


E. Sheppard *Steam Boiler*

N^o 97,237.

Patented Nov. 23, 1869.



Witnesses.
Wm. A. Steel
Jno. B. Harding.

Inventor.
E. Sheppard
by his atty.
A. Howard.

United States Patent Office.

EDWIN SHEPPARD, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 97,237, dated November 23, 1869.

IMPROVEMENT IN STEAM-GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, EDWIN SHEPPARD, of Philadelphia, Pennsylvania, have invented an Improved Steam-Boiler; and I do hereby declare the following to be a full, clear, and exact description of the same.

My improved steam-generator is composed of a number of sections, each of which consists of two or more pipes or chambers, connected together by large and small tubes, arranged substantially as described hereafter, so as to insure a free circulation of water in the boiler.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a side view of my improved steam-boiler;

Figure 2, a vertical section, on the line 1-2, fig. 1;

Figure 3, a sectional plan, on the line 3-4, fig. 1; and

Figure 4 represents a modification of the boiler, drawn to a reduced scale.

Similar letters refer to similar parts throughout the several views.

The body or main portion of the boiler, as seen in figs. 1, 2, and 3, is composed of a number of sections, A, (three only being shown in the present instance,) and each section consists of longitudinal chambers or pipes, *a*, *a'*, and *a''*, situated one above the other, and at a suitable distance apart, closed at each end, and connected together by vertical tubes *b* and *b'*, the peculiar arrangement of which constitutes an especial feature of my invention.

As seen in fig. 1, tubes *b*, of large diameter, and smaller tubes *b'*, are arranged alternately, first a large tube and then two smaller tubes, and this is continued throughout the series. By this arrangement a rapid

and free circulation of water is maintained through each section of the boiler, while an uninterrupted ascent of the globules of steam takes place.

The different sections of the boiler are connected together in front, at the top, by a steam-pipe or drum, B, from which project pipes *d d d*, each pipe communicating with one of the sections, as shown in fig. 2, and the sections are connected together at the bottom, in front, by a feed-pipe, D, and at the rear by a discharge-pipe, E.

It is not essential, in carrying out my invention, that each section should have three horizontal pipes *a*, as in boilers of large capacity there may be a greater number of these pipes, while in smaller boilers each section may consist of but two horizontal pipes, with connecting vertical tubes, as shown in fig. 4. Nor is it absolutely necessary that the precise arrangement of vertical tubes, illustrated in figs. 1, 2, and 3, should be maintained, for there may be two or three sets of smaller tubes between those of larger diameter. (See fig. 4.)

The boiler may be mounted within brick walls F F', (shown by red lines, fig. 1,) above a suitable furnace, but different modes of mounting may be employed without departing from my invention.

I claim as my invention, and desire to secure by Letters Patent—

The horizontal pipes or chambers *a*, connected by large tubes *b* and small tubes, *b'*, arranged substantially as described.

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

EDWIN SHEPPARD.

Witnesses:

JOHN WHITE,
HARRY SMITH.