

I. N. WILFONG.
Improvement in Steam-Generators.

No. 127,724.

Patented June 11, 1872.

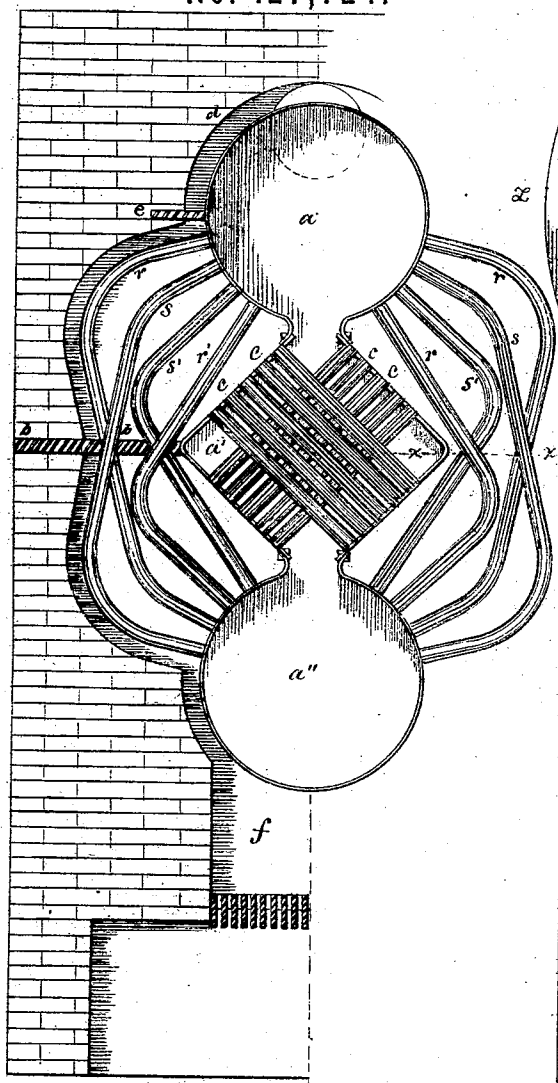


Fig. 1.

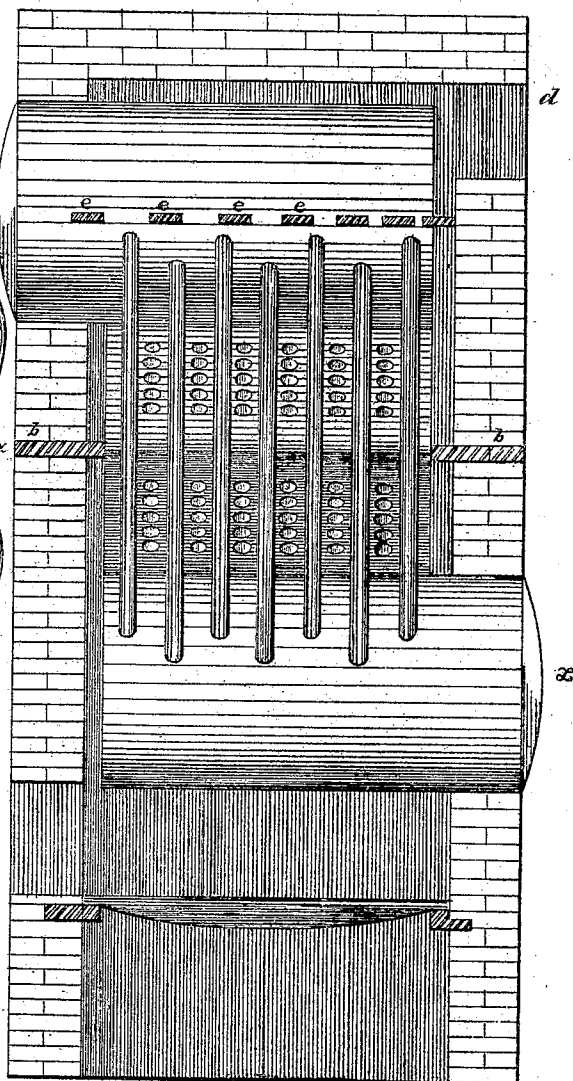


Fig. 2.

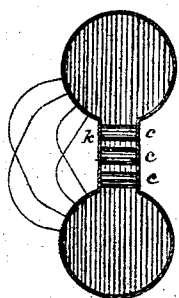


Fig. 3.

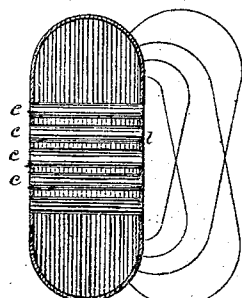


Fig. 4.

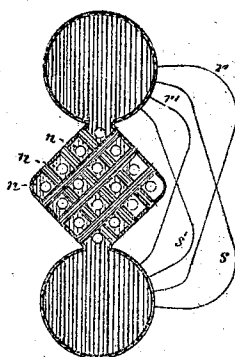


Fig. 5.

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ISAAC N. WILFONG, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. 127,724, dated June 11, 1872.

Be it known that I, ISAAC N. WILFONG, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Generators; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawing, in which—

Figure 1 is a vertical transverse section; Fig. 2, a vertical longitudinal section; and Figs. 3, 4, and 5 are modifications in the form of the body of the boiler.

The first part of my invention relates to the construction of the main body of the boiler, which is made in the three compartments *a a' a''*; the upper space *a* for holding the steam; the central space *a'* for augmenting the heating-surface, and, if desired, for changing the direction of the currents of heat; and the lower part *a''* for holding the main body of the water. The parts *a* and *a''* are made large enough to allow a man to enter for the purpose of examining, cleaning, or repairing the interior. The second part of my invention relates to an improved device for distributing and equalizing the heat around the boiler. The third part of my invention relates to a peculiar construction of the body of the boiler, by which the suspension over the fire is facilitated.

As the main features of my invention are embodied in Figs. 1 and 2, I have drawn them on a larger scale for the sake of greater distinctness, and by following the description of them the nature of my invention will be understood.

The top part of *a* and the lower part of *a''* are made semicircular for the purpose of gaining strength. The central part *a'* I make either rectangular—and introduce it between *a* and *a''* in such a manner that the opposite corners of the rectangle shall fall in a perpendicular and horizontal line, those two opposite corners which fall into the vertical line being cut out, so that communication between *a* and *a''* is established, as shown in Figs. 1 and 5—or I let the sides of *a'* be mere continuations of the iron which forms the semicircular ends of *a* and *a''*, as shown in Fig. 4; or this last form may again be modified by contracting the sides of the central compartment *a'*, so that a shape resembling the figure 8 is produced.

In Fig. 1, the rectangular box *a'* is provided

with flues *c c c* and *c*, the ends of which join and are riveted into two opposite sides of the box. It will now be noticed that, if we intercept the heat rising on each side of the boiler about the center of its ascent by the partition *b b*, the heat is compelled to pass through the flues *c c c* and *c*, and thus cross over to the opposite side of the boiler. If, now, the heat was allowed to take its own course, it would pass up to the highest part of the space over the boiler, and then pass off through the flue *d*. To prevent this free escape and consequent waste of heat I provide plates *e e e e*, &c., Figs. 1 and 2, which are walled into the brick-work and touch the boiler near the base of the semicircular top of *a*. From Fig. 2 it will be seen that the distance between said plates is smallest near that end of the boiler on which the chimney *d* is located, gradually increasing toward the end near which the fuel is introduced. The effect of this arrangement is the equalization of the heat in all parts of the fire-space, for the natural tendency of the heat currents—namely, to pass in a straight line from the furnace *f* to the chimney *d*—is counteracted, as the smaller spaces between the plates near the chimney *d* allow only part of the heat to pass, causing the rest to seek the larger openings toward the left end of the boiler. The front part of *a* is elongated, as is also the back part of *a''*, as shown in Fig. 2 at *z z*, for the purpose of suspending the boiler in the brick-work, and of having at least one end in each of the compartments *a a''*, by which we can enter the body of the boiler from the outside of the furnace. The tubes *r r' s s'*, which connect the lower and upper parts of my steam-generator, are curved in such a manner that near the center line *x x* the adjacent rows shall cross each other as *r* and *r'*, *s* and *s'*, for the purpose of deflecting the currents of heat more effectually. The brick-work is made to conform internally to outline of the flues and boiler as near as practicable, as shown in Figs. 1 and 2. In Fig. 5 the flues are further apart than in Fig. 1, for the purpose of leaving room for other flues *n n*, &c., running longitudinally through the boiler. The curved lines *r r' s s'* show how the curved and cross tubes are applied to those forms of boilers, said lines indicating the center lines of the tubes. In Figs. 3 and 4 the flues *c c c* and *c* run through the

boiler horizontally instead of inclined, as in Fig. 1, and their ends are riveted into the sides *k* and *l*, Figs. 3 and 4. All these flues *c c c* and *c*, in Figs. 1, 3, 4, and 5, not only serve the purpose of furnishing heating-surface, but also of strengthening the boiler by holding the flat sides of the part *a'* against the internal pressure.

I do know that vertical cylinders, whose upper and lower ends are connected by tubes, have been used before, as also curvilinear tubes, and such I do not claim; nor do I claim anything that is not mentioned in the following claims, although it may be mentioned in the foregoing specification.

What I claim as my invention is—

1. The combination of the compartments *a*,

a', and *a''*, the compartment *a'* being furnished with flues, as *c c* or *n n*, substantially as and for the purpose set forth.

2. The combination of the subject-matter of the first claim with the curvilinear and crossed tubes *r r' s s'*, substantially as and for the purpose set forth.

3. The combination of the subject-matter of the second claim with the partition *b b*, substantially as and for the purpose stated.

4. The arrangement of the equalizing and distributing plates *e e e e e*, substantially as and for the purpose herein set forth.

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Witnesses:

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