(No Model.) 2 Sheets—Sheet 1.

H. M. NORTON.

SECTIONAL STEAM BOILER.

No. 523,231. Patented July 17, 1894.

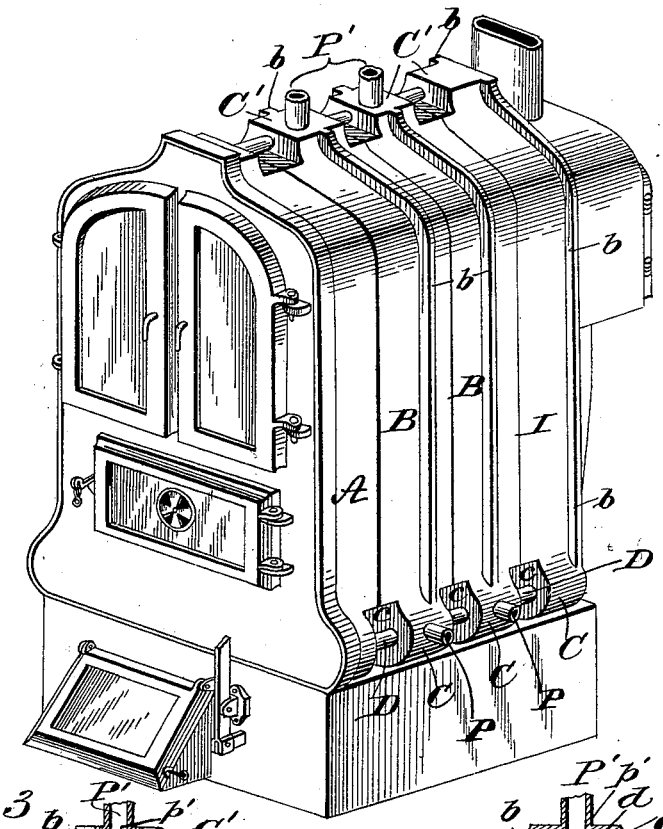


Fig. 1.

Fig. 3

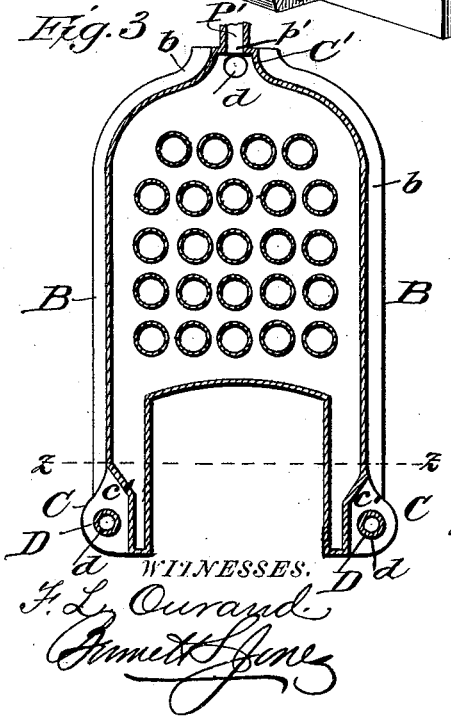
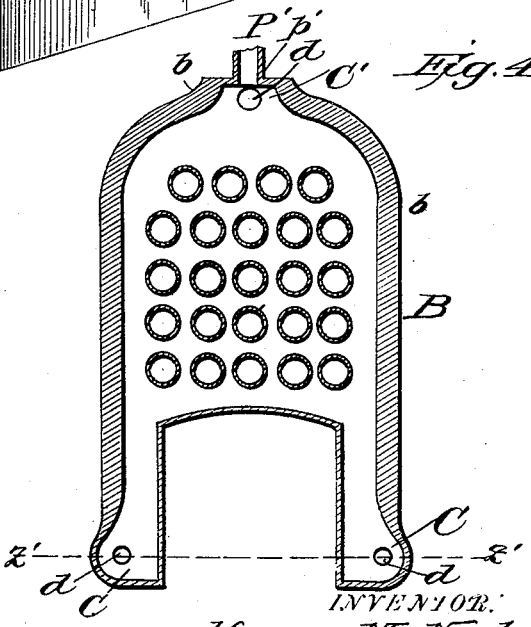


Fig. 4.



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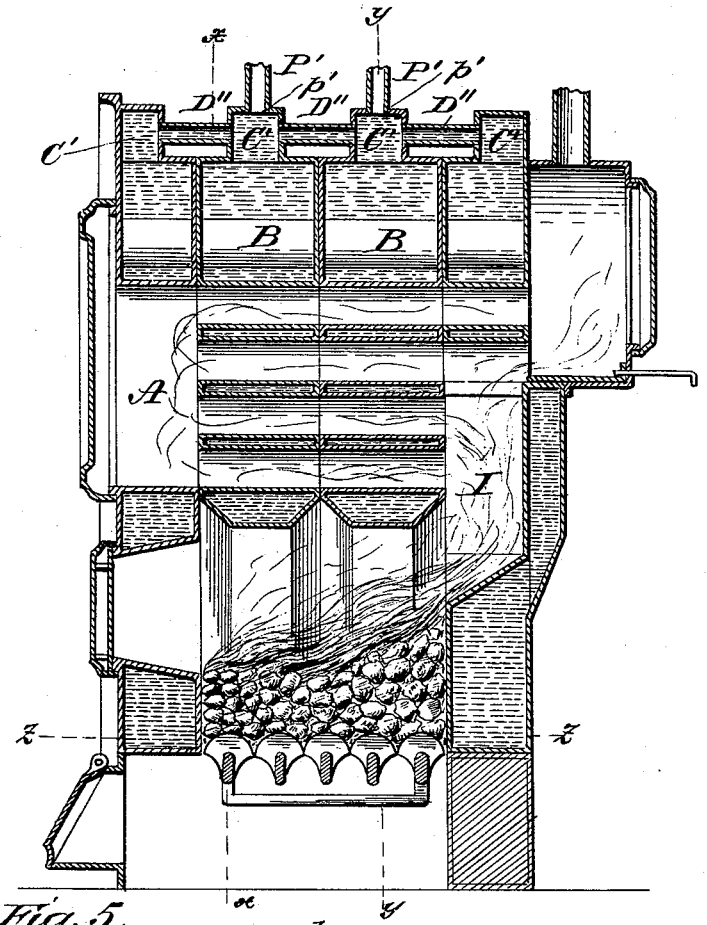


Fig. 2.

Fig. 5.

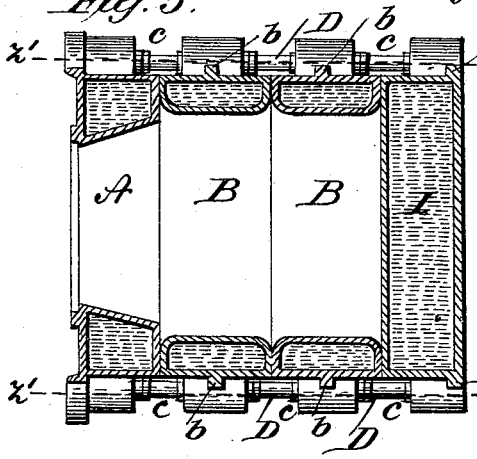
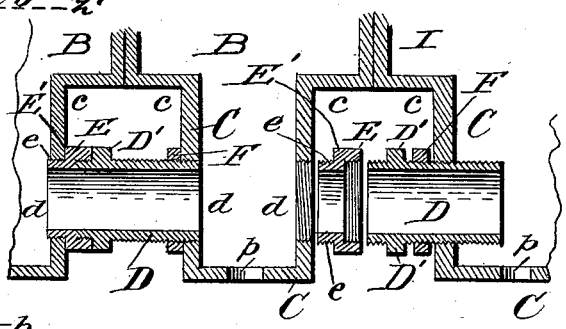


Fig. 6.



WITNESSES:
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UNITED STATES PATENT OFFICE.

HORACE M. NORTON, OF EASTON, PENNSYLVANIA.

SECTIONAL STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 523,231, dated July 17, 1894.

Application filed April 19, 1894. Serial No. 508,139. (No model.)

To all whom it may concern:

Be it known that I, HORACE M. NORTON, a citizen of the United States, and a resident of Easton, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Sectional Steam-Boilers, (Case A;) and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of a sectional steam-boiler, or steam-generator, embodying my improvement; the outside asbestus-covering or jacketing having been removed. Fig. 2 is a longitudinal sectional view of the same, on a vertical plane through the middle thereof. Fig. 3 is a transverse sectional view on the plane denoted by the broken line marked x—x in Fig. 2. Fig. 4 is a similar view, on the parallel transverse plane denoted by the broken line marked y—y. Fig. 5 is a longitudinal sectional view on the horizontal plane indicated by the broken line marked z—z in Figs. 2 and 3; and Fig. 6 is a longitudinal sectional view, on an enlarged scale, through the side-nipples and their connections, on line z'—z' in Figs. 4 and 5.

Like letters of reference designate corresponding parts in all the figures.

This invention has relation to sectional steam-boilers, or safety-boilers, of that type which are intended, more particularly, for hot-water and steam-heating systems adapted for dwellings, schools, churches, factories, and buidings of all kinds; and my present improvement consists in the peculiar construction of the several sections and the novel and improved method of, and device for, connecting the several sections and uniting them to one another to form the complete boiler; substantially as will be hereinafter more fully described and claimed.

On the accompanying drawings, I have represented a boiler of my improved construction made up of only four hollow sections, viz: a front and a rear section, and two intermediate or "body" sections; but it will be obvious that the number of the intermediate hollow-cast sections may be increased at will, according to the capacity which the boiler is to have in a given case. As all these intermediate sections are constructed and arranged precisely alike, a description of one of them will suffice for all.

As will appear by reference to the drawings, each hollow "body" section, B, is cast with an exterior packing-flange b, and bottom-recesses c c, one on each side, leaving hollow projections or bosses C C between said side-recesses, one on each side of each section at its extreme lower end and flush or even with the bottom thereof. The front section A and rear section or back, I, are similarly cast with hollow side-projections or bosses C C; but have only one recess c appertaining to each of these, instead of a recess on each side thereof; the opposite side of the hollow boss or projection C being flush with the packing-flange b of its appropriate section.

Each hollow section (both front, intermediate, and rear) is also cast with a top-projection or steam-head C′; the heads of the several sections, as well as their lower side-bosses C C, being in exact alignment with one another. The hollow bosses C C of the intermediate sections B B are reinforced by the vertical side packing-flanges b b, the lower ends of which intersect and merge into the body of the bosses. The recesses c c are preferably beveled on top, as shown at c' in Fig. 3, on opposite sides of the central hollow boss or projection C. Similarly, the top-projection or hollow steam-head C′ appertaining to each separate section is reinforced by the side packing-flanges b b, one on each side thereof; and a recess is formed on both sides of the head C′ appertaining to the intermediate sections, and on one side of the heads appertaining to the front and back sections, A and I; so that, in either case, the hollow top-projections or steam-heads C′ will be in vertical alignment with the lower side-bosses C C cast upon and appertaining to the same sections, as well as with one another.

Each of the hollow side-bosses C C, and top-projections C′ C′, is bored through transversely at d, with an interiorly-threaded circular aperture, for the insertion and water-tight attachment of the screw-threaded connecting-tubes or nipples D, the construction and arrangement of which, relative to one another and to their appropriate sections,

will readily be understood by reference to the enlarged detail-view, Fig. 6, on the left side of which the connection between adjacent hollow bosses C C is shown complete; while on the right-hand side of the same figure, I have shown the screw-threaded tubular nipple D, its bushing E, and lock-nut F, in the respective and relative positions of these several parts before they are screwed up home and firmly connected to one another, and to the hollow bosses or projections C C of adjacent sections, which they serve to connect and unite. Referring, now, to this figure, it will be seen that the connecting-nipple D screws at one end into the contiguous wall of the projection C, and at the other end into an extension-piece or screw-threaded bushing E, one end, *e*, of which is threaded exteriorly and screws into the opposite boss C, while its other end is threaded interiorly to receive the corresponding exteriorly threaded end of nipple D. The latter is provided with a squared shoulder or collar D′, which, when the parts are screwed up tight, or home, bears against the bushing E, as illustrated on the left side of Fig. 6; the shoulder E′ of the bushing itself being screwed up tight against the contiguous wall or side of the adjacent boss C. The object of this squared shoulder D′ is not, however, to form a tight joint for the nipple at the point where it enters the bushing E, as the joint would be steam-tight without it; but it is intended to form a hold for a narrow key or wrench adapted to fit upon it and to be used in screwing the nipple D into, or unscrewing it from, its bushings E. It will be obvious, therefore, that this shoulder or collar D′ may be dispensed with, and a plain nipple used, in all cases where there is room enough between adjacent bosses C C for the insertion of an ordinary pipe-wrench. At the other end the nipple D is, as we have seen, screwed into boss C on that side, and locked in place tight by means of a lock-nut F.

The top-projections or steam-heads C′ C′ of the several sections are connected to one another in precisely the same manner by means of threaded nipples D″ D″, each provided with its appropriate bushing and lock-nut, precisely as the side-nipples D D and operating in exactly the same manner although these nipples D″ are shown as plain tubes in Fig. 2. I prefer, however, to construct these top-nipples D″ D″, which connect the steam-heads C′ C′ to one another, in the same way as the bottom-nipples D D, the construction and combination of parts of which is fully illustrated on the enlarged detail view Fig. 6. Steam is taken from the boiler through pipes P′ screwed into apertures *p*′ made in the top of the steam-heads C′; and the "return" is made by pipes, P, screwed into apertures *p* in the lower hollow side-bosses C. This manner of connecting and uniting the several hollow sections of a sectional boiler or steam-generator offers many advantages, among which may be enumerated the following:

As I dispense entirely with the usual laterally projecting side-drums for connecting the sections and provide for the circulation of water through them, I not only economize space, but prevent cooling of the hot water as it circulates through these laterally projecting water-drums, which are some distance from the fire and surrounded by cold air. Again, by dispensing with the laterally projecting pipes, which connect the water-legs of the sections to the longitudinal connecting-drums, I greatly reduce the liability to leakage; and by means of the side-recesses *c c*, I provide room for the connecting-nipples, which do not project laterally beyond the sides of the boiler, and also facilitate the insertion or removal of the nipples, and their extension-pieces or bushings, in connecting or disconnecting the several sections. Finally, if one of the intermediate sections should become damaged and inoperative, it may be "cut out" without interferring with the operation of the remaining intact sections; and the connections may be taken out for repairs, and replaced, without the necessity of displacing or interfering with any of the other parts of the boiler.

It will be obvious that this device for connecting the several sections may be applied to a vertical boiler (that is: a sectional steam-generator in which the several component sections are superimposed upon one another, in a vertical pile or column) as well as to the horizontal form of boiler illustrated on the drawings, without departing from the spirit of my invention; and also that the same improved method of, and device for, connecting the several component parts or sections of a sectional steam-boiler may be applied in precisely the same manner to several well-known forms of radiators.

Having thus described my invention, I desire it to be understood that I do not in this present application claim any of the improvements which I have described and claimed in another application of even date herewith, to wit: my application, Serial No. 508,140; but

What I do claim, and desire to secure by Letters Patent of the United States under this present application, is as follows:

In a sectional steam-boiler or steam-generator, the combination with the several component recessed sections of the screw-threaded and shouldered connecting-nipples, screw-threaded extension-pieces or bushings, and lock-nuts, located within the recesses in the sections and connecting the projections or hollow bosses formed on each section by the recesses; substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

HORACE M. NORTON.

Witnesses:
C. T. CAMPBELL,
C. L. D. KONN.