C. BRIED.
Steam-Boiler.

No. 221,510. Patented Nov. 11, 1879.

Fig. 1

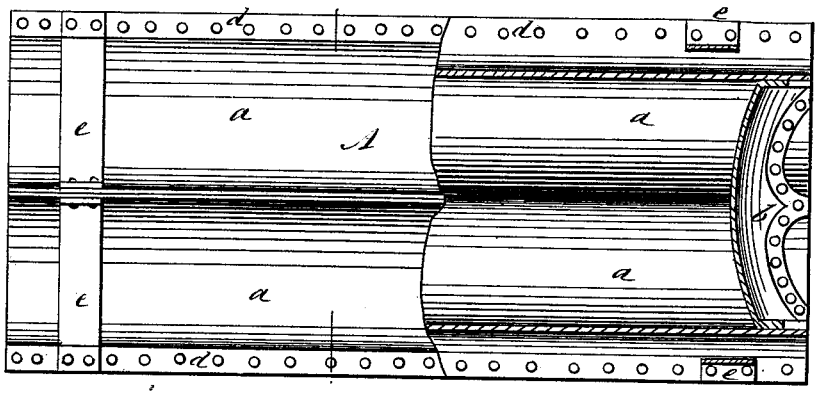
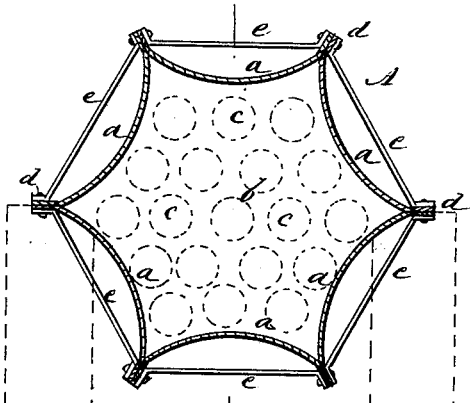


Fig. 2



WITNESSES:
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UNITED STATES PATENT OFFICE.

CHARLES BRIED, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **221,510**, dated November 11, 1879; application filed August 28, 1879.

To all whom it may concern:

Be it known that I, CHARLES BRIED, of Newark, in the county of Essex and State of New Jersey, have invented a new and Improved Steam-Boiler, of which the following is a specification.

The object of my invention is to construct a steam-boiler capable of resisting high pressure, and having a large extent of heating-surface in comparison with the space inclosed by the shell, and for this purpose to embody in a boiler-shell the principles of the arch, so that the pressure outward on the boiler shall be opposed by the compressive as well as the tensile strength of the metal.

The invention consists in a boiler-shell constructed of convexo-concave plates, united together with their convex surfaces inward to form a fluted cylinder, and with their joints stayed against springing by braces applied at the outside of the boiler, whereby the shell is rendered capable of sustaining high pressure at the inner side without spreading or rupturing.

The invention is shown in the accompanying drawings, and will be explained with reference thereto.

In the drawings, Figure 1 is a vertical longitudinal section of a horizontal boiler constructed in accordance with my invention. Fig. 2 is a vertical transverse section of the same.

Similar letters of reference indicate corresponding parts.

A is the boiler-shell, composed of plates or sections *a* and heads *b*, and fitted with flue-tubes, if desired, as shown by dotted lines at *c*. The boiler may be fitted in a horizontal or vertical position, and set in brick-work or made in portable form.

The convexo-concave sections or plates *a* are rolled in semicircular or other curved form, and may be a single plate of metal, or several plates united by riveted lap-joints to form a single section, and the sections or plates are placed together with their convex surfaces inward and riveted at the joints, so as to form a fluted cylinder with the flutes running lengthwise. The adjoining edges of the plates are united by rivets *d*, that pass through from the concave or outer side of one plate to the same side of the next, both ends of the rivets being, therefore, outside and readily accessible. Around the outside of the shell are braces *e*, that are united to the shell at the joints, and may be continuous concentric bands or separate short braces at each section *a*.

It will be seen, first, that the surface of the shell A exposed outward is the same in extent, or more than if the plates were united to form a boiler of the usual cylindrical shape, while the inclosed space is in proportion much smaller. The boiler is thereby adapted for rapid heating of water and generation of steam.

It will also be seen that internal pressure will be opposed by plates in a form most adapted to resist that pressure. Instead of the pressure being resisted by the tensile strength of the metal alone, each plate or section *a* is an arch that resists the pressure by compressive strength.

The braces *e* prevent springing or spreading of the plates at the sides and joints, and the braces, being entirely at the outside, are easily accessible for inspection or renewal. These braces are more especially intended for large boilers, and may be dispensed with in small boilers.

I do not limit myself to any special number of curved plates or flutes in the boiler-shell, nor to curves of any prescribed radius, these details being dependent upon the size of the boiler and quality of the metal; and, if desired, the edges of the curved plates may be made in straight lines tangential to the curved portion.

The heads *b* consist of plates in dished form, with edges shaped to fit the ends of the fluted cylinder, to which the heads are united with their convex surface inward by rivets *f*. These heads may, however, be flat disks.

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

1. The improved steam-boiler, consisting of a hollow fluted cylinder, A, fitted with heads *b*, substantially as and for the purposes set forth.

2. The improved steam-boiler A, formed of

a series of curved plates or sections, *a*, united with their convex surfaces inward, and fitted with heads *b*, substantially as and for the purposes set forth.

3. The improved steam-boiler A, formed of a series of curved plates or sections, *a*, united with their convex surfaces inward, fitted with heads *b*, and provided with the braces *e*, substantially as and for the purposes set forth.

CHAS. BRIED.

Witnesses:
GEO. D. WALKER,
C. SEDGWICK.