F. TRUMP.

Combined Cast and Wrought Iron Boilers.

No. 204,461. Patented June 4, 1878.

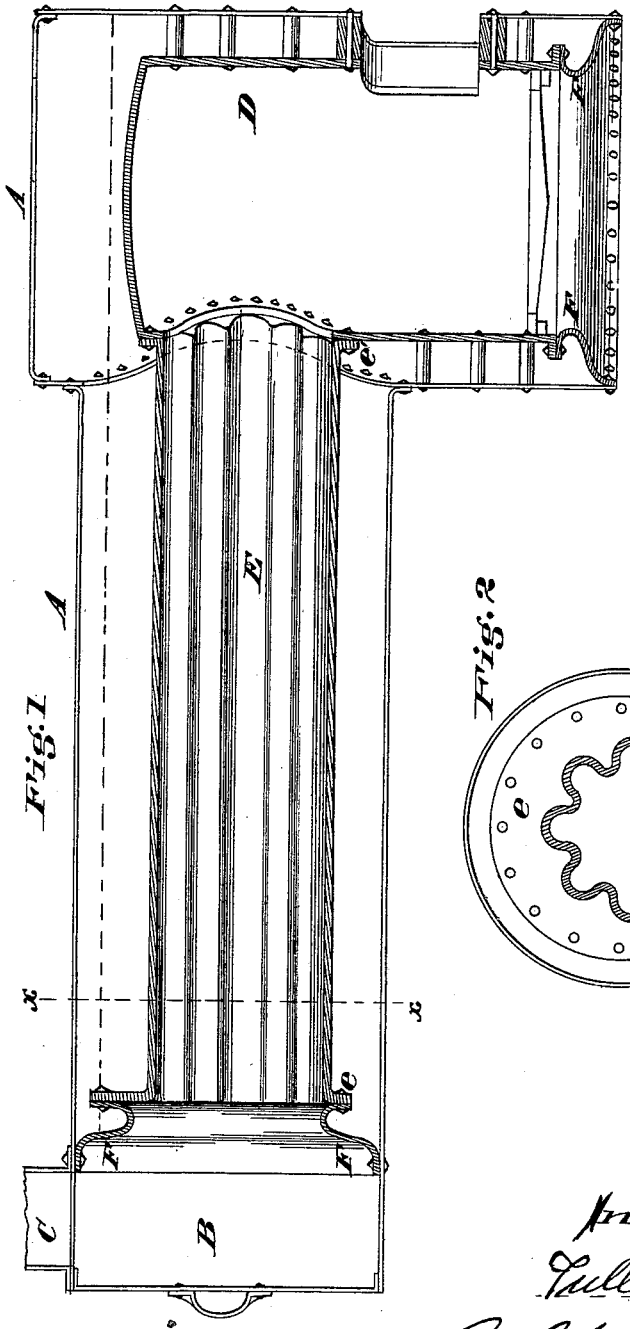

Fig. 1

Fig. 2

Witnesses:

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UNITED STATES PATENT OFFICE.

FULLER TRUMP, OF SPRINGFIELD, OHIO, ASSIGNOR TO JOHN W. BOOKWALTER, OF SAME PLACE.

IMPROVEMENT IN COMBINED CAST AND WROUGHT IRON BOILERS.

Specification forming part of Letters Patent No. **204,461**, dated June 4, 1878; application filed November 26, 1877.

To all whom it may concern:

Be it known that I, FULLER TRUMP, of Springfield, Clarke county, State of Ohio, have invented an Improvement in Combined Cast and Wrought Iron Boilers, of which the following is a specification:

My invention relates to the construction of boilers, upright or horizontal, in which the interior flues, flue-heads, and fire-box are of cast-iron and the outer shell of wrought-iron; and my invention consists in the provision, between the flanges of the cast interior and the wrought-iron shell, of a ring of malleable cast-iron or cast-steel, molded and cast to a shape adapted to give a great degree of flexibility. The purpose of this flexible joint is to avoid the danger of cracking the cast interior in riveting it to the wrought-iron shell.

It has been found, in the manufacture of that class of boilers to which my invention relates, that, in riveting the cast and wrought iron parts together — that is, riveting the cast interior directly to the wrought exterior or shell—when said riveting is nearly completed there will be some slack in said shell, which must be taken up to form a tight joint. In taking up this slack by fastening the last rivets the cast-iron is subjected to an undue strain, that frequently results in the cracking or fracture of such cast part. If, as is the case in some instances, the riveting is completed without apparent damage to the boiler, it too often occurs that upon the first application of heat thereto the cast portion will, in consequence of the strain to which it has already been subjected, and of the unequal expansion of the metals, be cracked or fractured, and thus render the boiler useless, and, perhaps, occasion loss of life.

By the use of my flexible joint of malleable cast-iron or cast-steel these difficulties are obviated, as it not only affords a tight joint without any danger of strain to the cast or wrought iron parts, but admits of the unequal expansion and contraction of the parts when subjected to heat.

In the accompanying drawings, Figure 1 is a longitudinal section of a horizontal boiler embracing my improvement. Fig. 2 is a cross-section through the fire flue or flues.

A is the outer shell of the boiler, composed, in the usual way, of wrought-iron, the part around the fire-box being circular in horizontal cross-section. B is the smoke-box, and C the chimney.

The interior parts—those to which the heat is applied, and which constitute the heating-surface of the boiler—are the fire-box D and the flue or flues E.

In the drawing, the flue or flues E embrace the end flanges *e e'*, and the corrugated character of the part itself makes it a corrugated flue, or intercommunicating nest of flues, as shown, the object being a great extent of heating-surface; but it is obvious that in place of such a form of casting one having a number of separate flues united to end heads or flanges would be the same thing, so far as my invention is concerned.

At the points of junction between the cast and wrought iron parts of the boiler I interpose a ring, F, of malleable cast-iron or cast-steel, having a curved surface transversely, as shown.

The ring is provided for the purpose of forming a joint between the cast and wrought iron parts of the boiler, having sufficient flexibility to admit of its being riveted to both the cast and wrought iron parts without straining either of these parts, and thus avoiding all danger of cracking the cast-iron in the act of riveting. This flexible joint-ring is also useful in neutralizing the effect of the unequal expansion of the metals when subjected to the action of heat when in use.

I am aware that it is not new, broadly, to connect two parts or flues of a steam-boiler by a flexible ring to merely provide for differences of expansion.

I claim—

In a boiler having a shell of wrought-iron and heating-surface interior of cast-iron, a connecting-ring of malleable cast-iron or cast-steel, the flexibility of which absorbs the strain occasioned by taking up the slack of the shell in riveting, so as to relieve the cast-iron interior from such strain, and which also provides for differences of expansion between the wrought-iron shell and the cast-iron interior, substantially as specified.

In testimony of which invention I hereunto set my hand.

FULLER TRUMP.

Witnesses:

A. T. BYERS,

ROBT. C. RODGERS.