H. J. Stein,

Constructing Steam Boilers.

NO. 107,976 Patented Oct. 4. 1870.

Fig. 1.

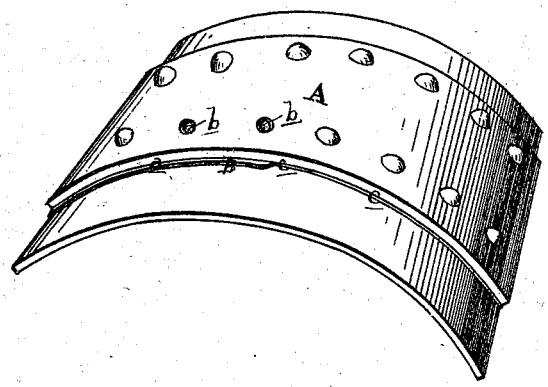
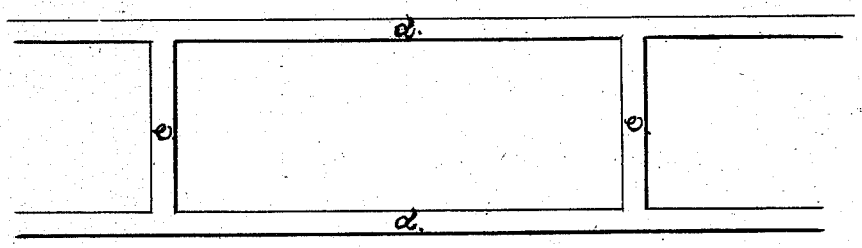


Fig. 2.



Attest.
S. J. Sprague.
Frederick Eberts

Inventor.
Henry Julius Stein
per attorney
Thos. J. Sprague

UNITED STATES PATENT OFFICE.

HENRY JULIUS STEIN, OF HANNIBAL, MISSOURI.

IMPROVEMENT IN THE CONSTRUCTION OF STEAM-BOILERS AND TANKS.

Specification forming part of Letters Patent No. **107,976**, dated October 4, 1870.

To all whom it may concern:

Be it known that I, HENRY JULIUS STEIN, of Hannibal, in the county of Marion and State of Missouri, have invented a new and useful Improvement in the Construction of Steam-Boilers, Tanks, &c.; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, and being a part of this specification, in which—

Figure 1 shows a section of a boiler-seam shimmed and partially calked on my improved plan, and Fig. 2 is a plan of a shim-piece for a band or hoop lap.

Like letters indicate like parts in each figure.

The nature of my invention relates to an improved construction of steam-boilers, tanks, &c.; and it consists in the interposition between the overlapping edge of the boiler-sheets of a strip of copper or other suitable metal, with an edge projecting on the face that is to be calked. The shim is then punched through the rivet-holes with a taper punch, the rivets inserted and riveted up. The burr turned up in the shim by the punch calks them perfectly. The projecting edge of the shim is then calked up against the edge of the lapping sheet with a square-faced tool, making the seam perfectly tight at a less cost than the usual method of chipping and calking the seams, which is the frequent cause of great damage to such boilers by cracking the plate from the rivet-holes outward, and weakening the lower plate by cutting the skin by the chisel in chipping.

In the drawings, A represents a section of a steam-boiler, between whose sheets at the lap is interposed a shim or strip, B, of copper, about two inches in width, with an edge projecting outwardly on the side that is to be calked, as shown at *a*, Fig. 1, the rivet-holes in the plates being first punched in the usual manner. When the shim is in place, from the side that the rivet-heads are made I drive a taper punch through the shim at each rivet-hole, which turns up a burr on the shim lining the hole. I then rivet up the seams, the burr serving to calk the body of the rivet under the head. The burr is shown at *b*, Fig. 1. When the boiler is riveted up, I calk the projecting edge of the shim against the seam with a square-faced tool, as shown at *c*, Fig. 1, obviating the expense of chipping the edge of the overlapping plate, which, it is well known, is liable to crack the plates at the rivet-holes in hard calking; also the weakening of the under plate by cutting it with the corner of the chisel. A seam so calked will remain perfectly tight, will not be corroded from leakage, and is not affected by the expansion and contraction of the plates, nor will the rivets leak under the heads.

Fig. 2 shows a plan of a shim designed for a cylinder-boiler built up of alternate large and small hoops, the former overlapping the latter. The shim is composed of two parallel strips, *d*, extending around the boiler, and designed to have the ends abut at the top of the sheet, with a bridge-piece, *e*, wherever needed to shim a longitudinal seam, which bridge-pieces may be brazed to the others.

Preferably I calk the seams from the inside of the boiler, when practicable, in which case the shims should have added to their two inches of width the thickness of the plate.

In calking the fire-boxes of locomotive-boilers and irregular joints, the shims must of course be cut to the proper shape before inserting them in the laps.

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

In the construction of steam-boilers, tanks, and other vessels, the shims B, when interposed between the overlapping seams thereof and calked, as set forth, for the purpose specified.

HENRY JULIUS STEIN.

Witnesses:

PETER WACHENDORFER,

LUDWIG DÜTSCHER.