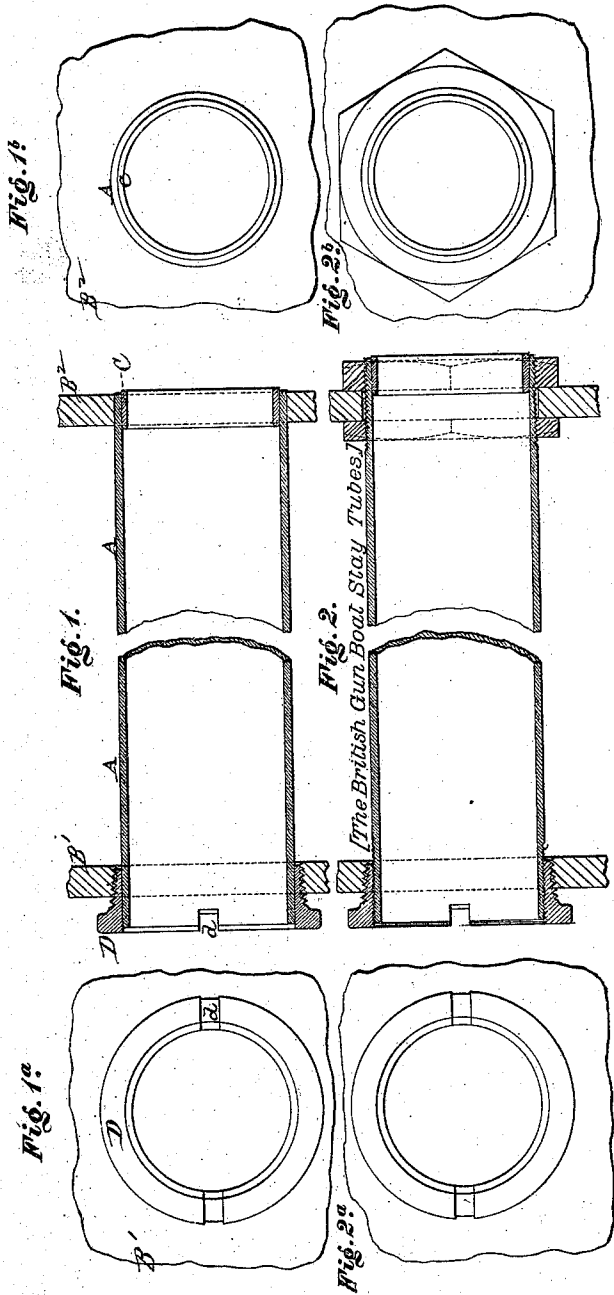


G.P. Hunt,

Steam Boiler Tube.

No. 100,531.

Patented Mar. 8, 1870.



Witnesses. *C. C. Livingst*
Wm. C. Dea

Inventor.

Geo. P. Hunt
by his attorney *J. L. Stearns*

United States Patent Office.

GEORGE P. HUNT, OF THE UNITED STATES NAVY.

Letters Patent No. 100,531, dated March 8, 1870.

TUBE-FASTENING FOR STEAM-GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern :

Be it known that I, GEORGE P. HUNT, formerly of New York, now of the United States navy, temporarily located at the navy yard in Charlestown, Massachusetts, have invented certain new and useful Improvements in Tube-Fastenings for Steam-Boilers and Analogous Constructions; and I do hereby declare that the following is a full and exact description thereof.

My invention relates to means for joining one or both ends of the tubes to the tube-sheets, or to the material, by whatever name it may be denominated, in which the tube is set or secured.

Double-threaded taper thimbles have been applied on threaded tubes, as shown in the patent of Howell & Birdsell, January 26, 1854, but such construction, like many others which involve cutting threads on the tubes and variously welding and enlarging, is too expensive to be generally adopted.

I have discovered that a plain thimble may be compressed bodily upon a plain tube, and have wrought out the idea, so as to avoid all the labor of threading the tubes and preserve the full size and strength of the tube to the extreme end.

I will proceed to describe what I consider the best means of carrying out my invention, and will afterwards designate the point which I believe to be new.

The accompanying drawings form a part of this specification.

Figure 1 represents my invention as applied at one end of the tube, the end on the left.

The opposite end of the tube is represented as secured by previously-known means.

Figure 1 is a longitudinal section through the two ends and the adjacent parts, the middle being represented as broken away.

Figure 1^a is an end view of the end to which my invention is applied.

Figure 1^b shows the opposite end.

Figure 2 is a corresponding longitudinal section, showing the construction which I prefer for the stay-tubes distributed among the others, and figs. 2^a and 2^b are end views thereof.

I do not claim these stay-tubes as new, except the score in both the tube end and the thimble at the left-hand end.

In other words, fig. 2 and accompanying end views, contain a part only of my invention.

Similar letters of reference indicate corresponding parts in all the figures.

In fig. 1, and its accompanying end views, the tube is unthreaded or plain, both on its exterior and interior surfaces.

The tube is represented by A;

The tube-sheets are represented by B¹ B²;

The ordinary internal thimble is represented by C; and

A peculiar thimble constructed and arranged according to my invention is represented by D.

To adapt the tube-sheet B¹ to receive my peculiar thimble, it is tapped with a tapering tap of a size considerably larger than the tube.

The tube is first inserted loosely at each end, then a thimble, D, cylindrical on its inner surface, and only a very little larger than the tube, so as to allow of being slipped or driven thereon, and tapering and threaded on its exterior, having been applied on the end of the tube, as represented, is turned forcibly around so that its threads match the threads previously produced by the tapering tap.

The exterior of the thimble D is threaded in a form tapering to correspond to the hole before described, and by turning the tapering thimble either alone or with the tube, it is caused to fit within the threads in the tube-sheets B¹. It fits at first loosely, then snugly, and at last very tightly.

This tightness causes the material of the thimble to be compressed inwardly, so as to contract its inner diameter a little, and cause it to embrace the tube A very tightly.

I provide a score across the front edge of the thimble D, as represented by *d*, which will receive a cross-key with a strong handle to allow of turning the thimble very forcibly.

I correspondingly notch the end of the tube, and match the notches in the thimble and tube, so that they coincide, as represented, and turn both together.

After I have secured one of the ends of the tube very strongly by my invention, the other end may be sufficiently secured by driving in the internal thimble C to expand it in the ordinary manner.

To release the tubes the several operations are reversed.

In case the tubes have been long set, and are somewhat corroded, it will require considerable force to start any part, but my invention allows great force to be applied without danger of injuring either the thin, and sometimes soft material of the tube, or any other part.

I make the outer edge of my thimble D of considerable thickness, as represented, to allow the requisite force to be applied with safety.

It will be understood that red lead, or other ordinary tightening means may be employed to aid in tightening some of the joints when judged expedient, but I have tried several of these tubes in the boilers of the United States naval steam vessels "Leyden" and "Pealos," for several months, without experiencing any difficulty from any source.

Every sixth tube, or from that to every twentieth,

or thereabouts, may be a threaded tube, substantially as shown in fig. 2. These threaded tubes, mounted as represented, serve as stays to aid the tube-sheets $B^1 B^2$ in resisting any pressure, whether internal or external. Such have long been used, except that they have not, I think, been before scored across both the thimble and the tube.

I claim—

In connection with a properly-prepared and properly-stayed tube-sheet B^1 , the plain cylindrical tube A , and close-fitting thimble D , having a tapering

threaded exterior, and plain cylindrical interior, all combined and arranged as represented.

Also, the sets of coinciding notches d , formed in both the tube end A , and tight-fitting thimble D , as specified.

In testimony whereof I have hereunto set my name in presence of two subscribing witnesses.

GEORGE P. HUNT.

Witnesses:

WM. C. DEY,

C. C. LIVINGS.