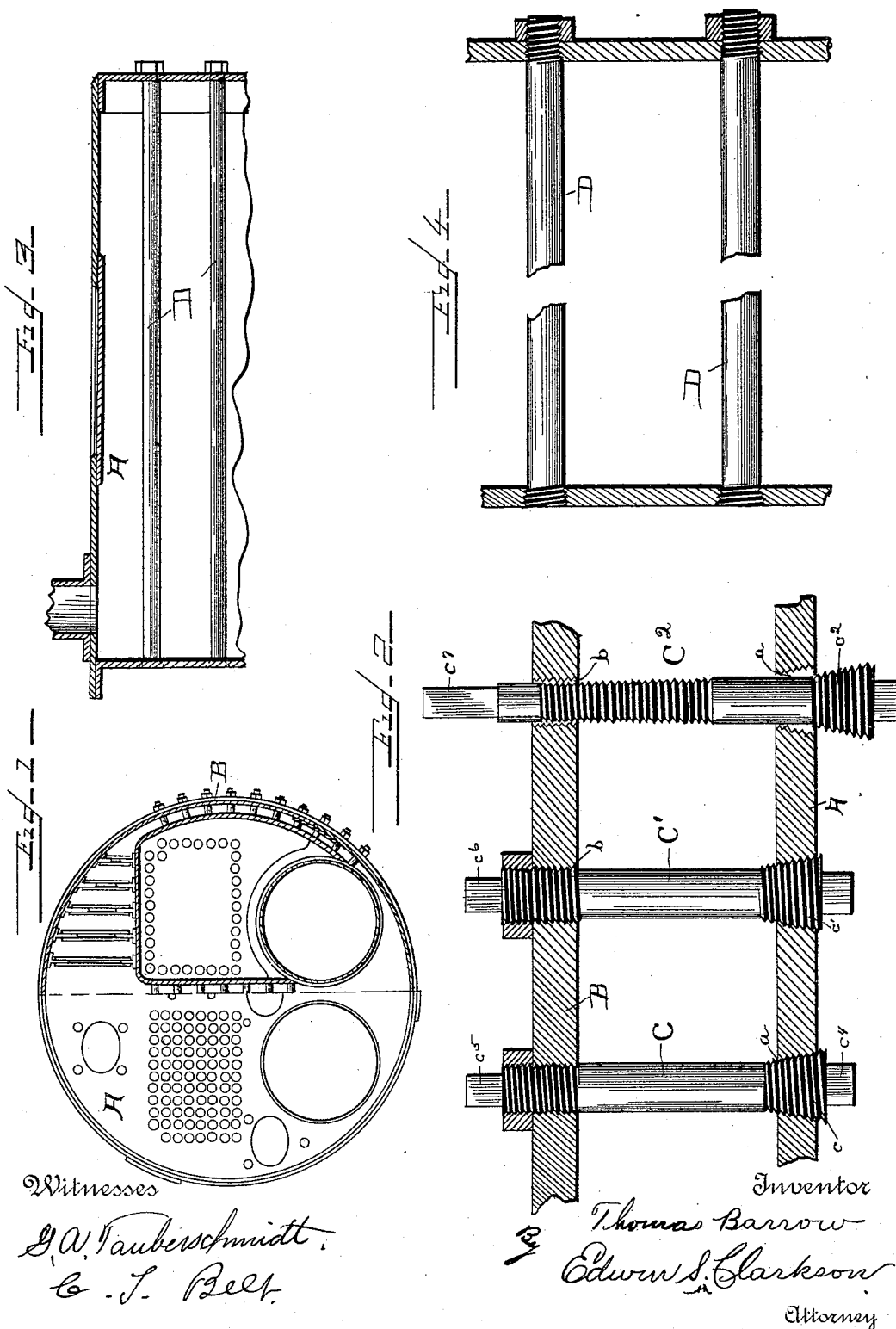


(No Model.)

T. BARROW.
BOILER STAY.

No. 459,954.

Patented Sept. 22, 1891.



UNITED STATES PATENT OFFICE.

THOMAS BARROW, OF CHESTER, PENNSYLVANIA, ASSIGNOR OF ONE-HALF
TO JOHN B. ROACH, OF SAME PLACE.

BOILER-STAY.

SPECIFICATION forming part of Letters Patent No. 459,954, dated September 22, 1891.

Application filed May 12, 1891. Serial No. 392,446. (No model.)

To all whom it may concern:

Be it known that I, THOMAS BARROW, a citizen of the United States, residing at Chester, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Boiler-Stays; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to boiler-stays; and it is adapted to be used for marine, locomotive, portable, and vertical boilers, hollow-bottom tanks or pans, or, in fact, anything that requires stays.

The stays that are in general use are parallel or straight and are screwed in from the outside of the boiler-shell, and when they get into the "bore" they are slack, and therefore require a nut on them on the inside of the box to take up the slack and make them strong enough, whereas my stays are not of an equal diameter throughout and have enlarged heads provided with screw-threads. They are screwed in from the inside of the box and the farther they are screwed in the tighter they get. Further, the nut now used on the inside of the box is by my construction entirely dispensed with. The openings in the "box" through which the stays pass are made larger at one end than at the other, and are provided with screw-threads, thus enabling the head of the stays to be countersunk.

In the drawings, Figure 1 is a sectional view of a boiler and its shell with my stay attached. Fig. 2 is an enlarged detail view. Fig. 3 represents boiler-braces having the enlarged head. Fig. 4 is an enlarged view of the same.

A represents a boiler of usual construction having the usual attachments, and B is the shell commonly used on boilers. The boiler A is provided with holes *a*, which are screw-threaded and vary in diameter from top to bottom.

b are holes in the shell B, which surrounds the boiler. These holes *b* register with the holes *a*.

C C' C² are the boiler-stays, which are each provided with enlarged tapering and screw-threaded heads *c*, *c'*, and *c²*.

The stay C, as above stated, has the tapering head *c* and a square projection or lug *c'*, and at its other end has a thread cut in the

usual manner. The stay C' has the tapering head and a lug or projection similar to the stay C; but the other end of this stay is swelled, and then the thread is cut. By swelling the end of the stay we get the full strength of the body of the same. The stay C² has a tapering head and lug or projection similar to the stays hereinbefore described. The lower portion of this stay tapers slightly and is provided with screw-threads, as shown.

The stays have square lugs or projections *c⁵*, *c⁶*, and *c⁷*.

In practice the stay is screwed in from the inside of the boiler. The head of the stay, being tapered, is countersunk in the boiler, thus dispensing with the nut usually used; and, further, the stay is protected from the action of the steam or water. After the stay is nearly screwed up from the inside I place a wrench on the projection on the opposite end of the stay and draw the stay up tightly, thus securely and effectively staying the shell to the boiler.

This stay may be used as a fore-and-aft brace D D for boilers of any size, and when thus used effects a saving of three nuts on said braces. In the braces now used four nuts are required, whereas with my improved brace only one nut is necessary.

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

1. A boiler stay or brace having one end provided with a tapering screw-thread and the other end provided, also, with a screw-thread, and an intermediate smooth portion, substantially as shown and described.

2. The combination, with a boiler and its shell, of a stay tapered and screw-threaded at intervals throughout its entire length, substantially as shown and described.

3. The combination, with a boiler provided with holes tapering from the inside and screw-threaded, and its shell, of a stay tapered and having alternate smooth and screw-threaded portions, whereby the stay is adapted to be inserted from the inside of the boiler, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS BARROW.

Witnesses:

CHARLES PALMER,
EDWIN S. CLARKSON.