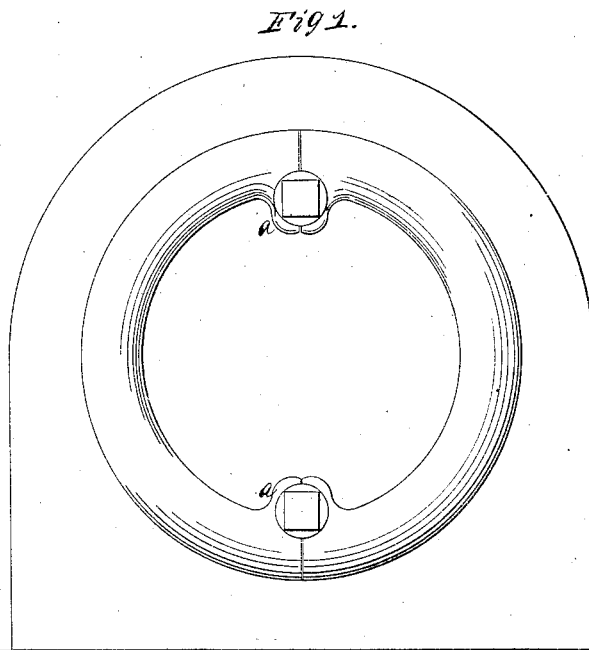
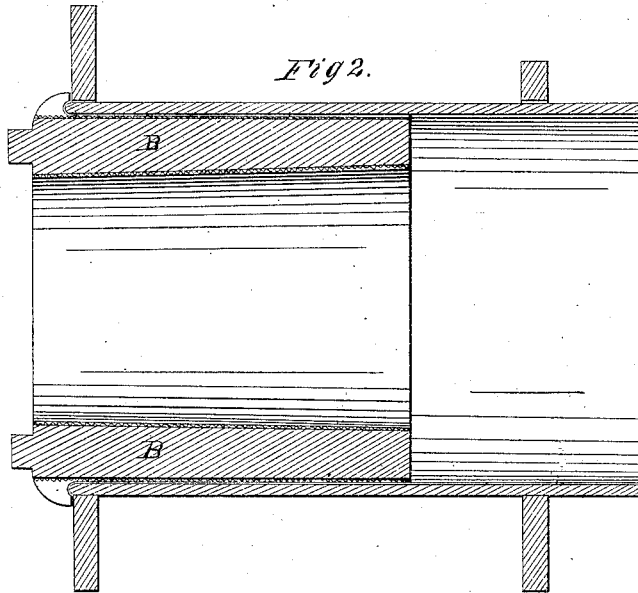


G. W. Durall,
Boiler-Tube Stopper.
No 49,987. Patented Sep. 19, 1865.



Witnesses.
J. Clement Smith
Paul. B. Linn

Inventor.
George W. Durall
By
D. C. Loomis & Co
Attys

UNITED STATES PATENT OFFICE.

GEORGE W. DUVALL, OF NORFOLK, VIRGINIA.

IMPROVED FERRULE FOR BOILER-TUBES.

Specification forming part of Letters Patent No. 49,987, dated September 19, 1865.

To all whom it may concern:

Be it known that I, GEORGE W. DUVALL, of Norfolk, in the county of Norfolk and State of Virginia, have invented a new and useful Improvement in Means for Preventing Boiler-Tubes from Leaking and for Stopping Leaks therein; and I hereby declare the following to be a full, clear, and exact description of the construction and operation of my said invention, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a front view of my device in its proper place inside a boiler-tube, and Fig. 2 is a sectional view of the same with the screws resting in their proper positions.

The object of my invention is to provide better means than have heretofore been devised for preventing steam-boiler tubes from leaking and for stopping leaks therein.

To this end I construct a cylinder, of cast-iron or other suitable material, in two sections or halves. My said cylinder is about five inches in length (more or less) and of a suitable diameter to pass easily inside the boiler-tube. The front end of my cylinder has a scroll-shaped head, and a groove is cut therein, which fits closely over the end of the boiler-tube when the cylinder is in its place. Red lead or other suitable packing is placed in said groove to aid in accomplishing the work. At the points of junction between the two sections of my cylinder I raise each side inward by increasing the thickness thereof, as represented on the drawings by the letter A. In these raised portions of the cylinder I make a screw-hole extending through the entire length thereof. It is about half an inch in diameter at the front end, but decreases in size gradually to about three-eighths of an inch at its farther end. I cut a thread in this screw-hole adapted to the thread on the screw hereinafter described. I also construct a screw with a square head, upon which a wrench may be

easily adjusted. This screw, independent of its head, is of the same length as the cylinder, or it may be a little longer. It has a thread that fits the thread in the screw-hole above described, and is gradually tapered from its head to its point.

I may construct my cylinder with one piece only and with but one screw-hole therein, or I may make it of many pieces or sections, and using screws in proportion to the number of such sections. I prefer, however, to make it in two halves and use two screws. On the drawings these screws are marked B.

The mode of operating my said invention is as follows, namely: Place the cylinder inside the front end of the boiler-tube, one section at a time, and force it firmly against the front end of the tube, so that the scroll-shaped head shall overlap the same and bring it within the groove above mentioned. Then place the points of the screws in the screw-holes and force them firmly into their places with a wrench. The screws gradually crowd the sections of the cylinder apart and force them back against the sides of the tube. The tube, in turn, is crowded against its bearing on the boiler and the leak is closed.

My device excels all others yet known in this, namely: It does the work by screws instead of wedges, and thereby prevents breakage either of the cylinder, the tube, or the boiler. It accomplishes the work without noise or jar, and through it an expanding power may be brought upon the tube far beyond the capacity of wedges.

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

A screw or screws, B, in combination with a cylinder in one or more parts, for the purpose specified, substantially as described.

G. W. DUVALL.

Witnesses:

JAMES A. SAUNDERS,
LEWIS W. WEBB.