C. F. H. DITTMANN.

DEVICE FOR TIGHTENING DAMAGED TUBES OF BOILERS.

APPLICATION FILED DEC. 3, 1908.

956,311. Patented Apr. 26, 1910.

FIG. 1.

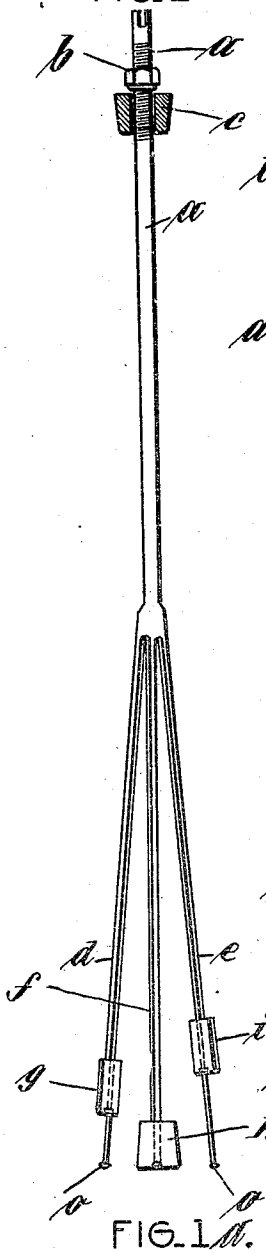

FIG. 2.

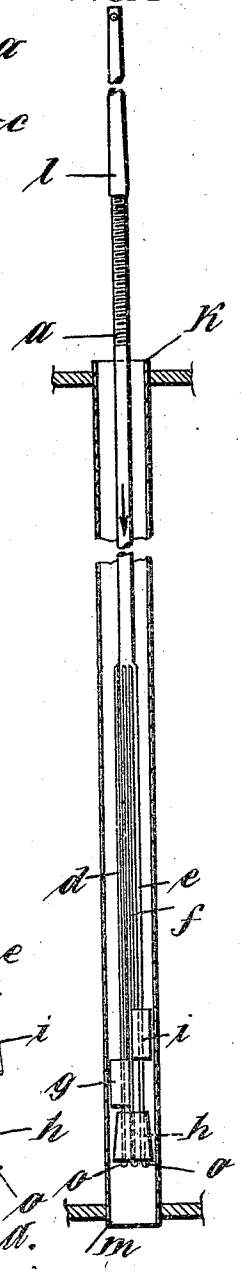

FIG. 3.

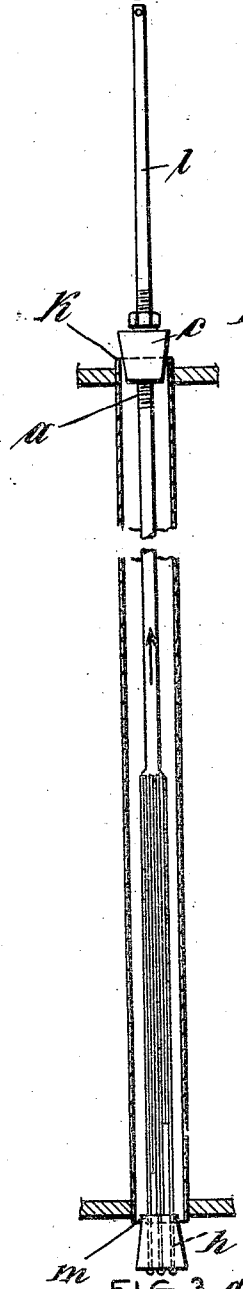

FIG. 4.

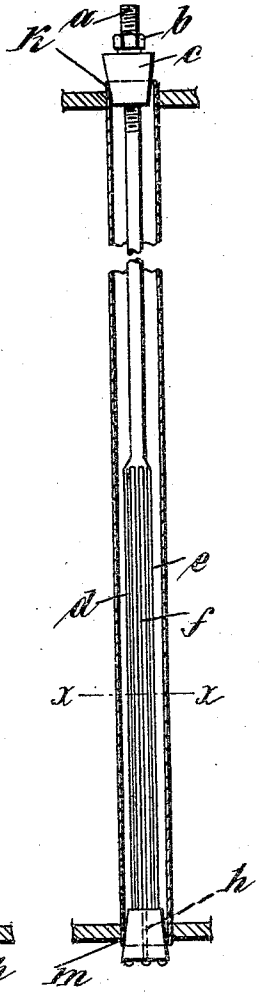

FIG. 1a.

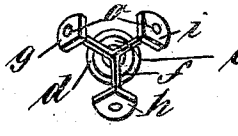

FIG 5

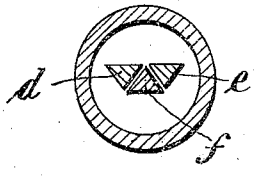

FIG. 3a.

FIG. 4a.

Witnesses:

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UNITED STATES PATENT OFFICE.

CHRISTIAN FRIEDRICH H. DITTMANN, OF HAMBURG, GERMANY, ASSIGNOR TO THE FIRM OF DITTMANN & WAGNER, OF HAMBURG, GERMANY.

DEVICE FOR TIGHTENING DAMAGED TUBES OF BOILERS.

956,311. Specification of Letters Patent. **Patented Apr. 26, 1910.**

Application filed December 3, 1908. Serial No. 465,873.

To all whom it may concern:

Be it known that I, CHRISTIAN FRIEDRICH HANS DITTMANN, a subject of the German Emperor, and resident of Hamburg, Germany, have invented certain new and useful Improvements in Devices for Tightening the Damaged Tubes of Boilers, of which the following is a specification.

This invention relates to an improved device for tightening the tubes of steam boilers, when damaged, in an easy and very quick manner.

The accompanying drawing represents the improved device.

Figure 1 is a view of the same, while Figs. 2, 3 and 4 show the same in three different positions when being used on or applied to the boiler tube; Figs. 1^a, 3^a and 4^a being underside views of Figs. 1, 3 and 4 respectively. Fig. 5 is a cross section on the line x—x of Fig. 4, on a larger scale.

The device comprises a rod a which is somewhat longer than the boiler tube to be tightened. One end of said rod is provided with screw-threads and carries thereon a nut b while a cone c can be shifted over the rod. The other end of said rod is divided into three long branches d, e, f which possess a certain spring action and carry each a loose part of a cone which is divided into three equal sections g, h, i. Each branch is provided with a step in such a way that when the cone sections rest against said steps they lie behind each other as shown in Figs. 1 and 2. The branches terminate each in a head o to prevent the cone sections from falling off. The ends of the branches receiving the cone sections are of triangular cross section (Fig. 5), so that the same can be shifted but not turned thereon, the cone sections being so disposed on the branches that when they are shifted upon the heads o they lie tightly against each other and thus form a full cone.

The device is used in the following way:— Upon a boiler tube getting loose, the rod is with its branches in front pushed through the tube from the front of the boiler (see arrow, Fig. 2), the passage of the branches therethrough being allowed owing to the cone sections thereon being placed behind each other. The rod is shifted so far into the tube that the three cone sections project beyond the rear orifice m of the same, whereupon the branches jump asunder owing to their spring action. Upon the rod being again drawn to the front (see arrow, Fig. 3), first the cone section g and then the cone section i are shifted toward their heads o, until they lie both tightly against the cone section h and form thus a full cone which projects then somewhat from the rear into the boiler tube orifice m. Upon this, the full cone c is shifted on the front end of the rod a until it projects somewhat into the front orifice k of the boiler tube, the nut b being then tightened whereby the rear cone sections g, h, i, as well as the front cone c are firmly pressed upon the orifices m and k and the boiler tube is thus perfectly tightened.

To facilitate the operation of shifting the rod a into the boiler tube and to move it to and fro therein in order to bring the cone sections g, h, i into the proper position, a prolongation l may be screwed on the front end of the rod a, the same being again taken off when the device is in proper place.

To again remove the device from the tube when the boiler is to be repaired, the heads o of the branches d, e, f must be cut off whereupon the device can be drawn out to the front leaving the rear cone sections in the rear orifice of the tube from where they can be taken out by hand.

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

A device for tightening the damaged tubes of boilers, comprising in combination, a rod adapted to be shifted through the boiler tube to be tightened and having screw threads on one end, a nut on said screw-threads, a cone loosely arranged over said screw-threaded end and designed to fit one orifice of the boiler tube to be tightened, three long branches integral with the opposite end of said rod and having a certain spring action, three equal cone sections loosely arranged on said branches and adapted when shifted together to form a full cone designed to fit the other orifice

of the boiler tube to be tightened, a step on each branch so disposed that the cone sections when resting thereon lie behind each other, and a head on each branch to secure the cone sections thereon, all for the purpose set forth.

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

CHRISTIAN FRIEDRICH H. DITTMANN.

Witnesses:
ERNEST H. L. MUMMENHOFF,
OTTO W. HELLMRICH.