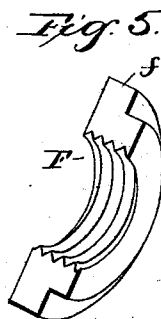
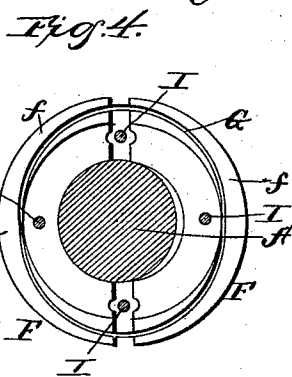
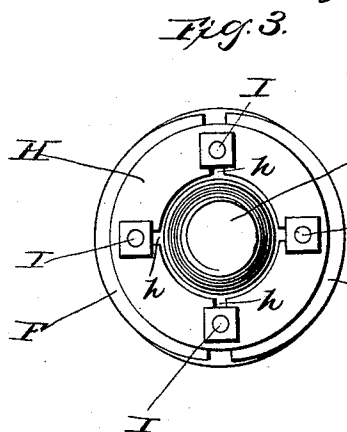
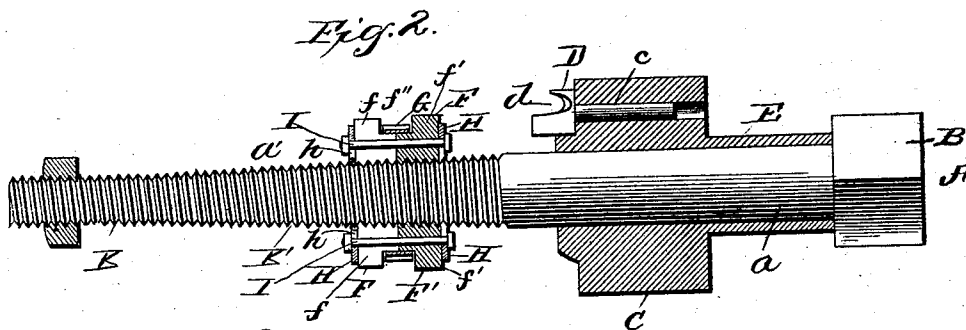
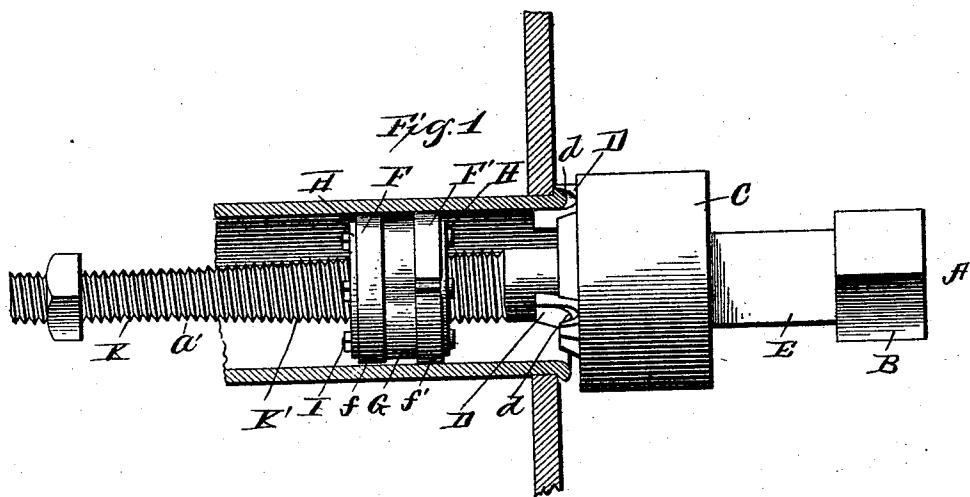


(No Model.)

M. A. LANAGAN.
BOILER TUBE OR FLUE BEADER.

No. 498,277.

Patented May 30, 1893.



Witnesses

E. H. Hurdman
E. J. Coyle

Inventor

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By his Attorneys,

C. A. Snowles

UNITED STATES PATENT OFFICE.

MICHAEL A. LANAGAN, OF MOBILE, ALABAMA, ASSIGNOR OF ONE-FOURTH
TO JOHN ILLINGWORTH, OF SAME PLACE.

BOILER TUBE OR FLUE BEADER.

SPECIFICATION forming part of Letters Patent No. 498,277, dated May 30, 1893.

Application filed September 30, 1892. Serial No. 447,398. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL A. LANAGAN, a citizen of the United States, residing at Mobile, in the county of Mobile and State of Alabama, have invented a new and useful Boiler Tube or Flue Beader, of which the following is a specification.

My invention relates to improvements in tools for beading boiler tubes or flues, and it has for its object to provide a holder or expansion nut which is capable of engaging without injuring the tube; furthermore, to provide means whereby the tubes may be drawn into their respective perforations in the head-plates or tube-sheets; and furthermore, to provide means whereby old tubes may be removed from the head-plates.

With these and other objects in view the invention consists in a sectional holder or expansion nut, which is capable of self-contraction to enable it to be introduced into a tube the end of which has been reduced for the application of a cap or ferrule; furthermore, in a stem or screw having an irregular taper, one portion being more abrupt than the remainder, to enable the nut to be expanded in the tube quickly; and furthermore, to provide a heading-block having removable bits which may be replaced by cutting bits.

My invention consists, further, in certain details of construction and arrangement which will be fully described hereinafter in connection with the drawings, the novel features being particularly pointed out in the appended claims.

In the drawings: Figure 1 is a side view of a beader embodying my improvements. Fig. 2 is a central longitudinal section of the same. Fig. 3 is an end view, showing the expansion nut with the outer plate broken away. Fig. 4 is a transverse sectional view of the expansion nut. Fig. 5 is a detail view, in perspective, of one of the sections of the expansion nut.

A represents the stem, having a plain portion *a*, to the extremity of which is affixed an angular head, B, and a screw-threaded portion, *a'*, which will be more fully described hereinafter. Upon the plain portion of the stem is mounted the head-block, C, having parallel sockets, *c c*, arranged parallel with

and equidistant from the circular periphery of the block, and in these sockets are arranged the heading or beading bits, D. Said bits are provided with concave faces, forming notches, *d*, to receive the end of the tube, the notches being curved so as to cause the edge of the tube to spread and turn back upon itself and against the head-plate. An angular boss, E, is affixed to the rear side of the head-block.

The expansion nut is sectional in construction, being composed of four quarter sections; twin outer sections, F F, and twin inner sections F' F', the outer sections breaking joints with the inner sections, as shown. When the sections are combined, as shown in Figs. 1 and 2, the nut is provided with two opposite bearing rims, *f* and *f'*, carried respectively by the outer and inner pairs of sections, and a single intermediate groove or annular depression, *f''*, arranged between said bearing rims, in which groove is arranged the annular joint between the outer and inner pairs of sections. An annular contraction spring, G, is arranged in the groove or annular depression, to draw the several sections toward the axially-disposed stem.

Arranged upon and parallel with the outer and inner sides, respectively, of the nut, are the retaining plates, H H, provided with radially-disposed slots, *h h*, through which pass bolts, I I. Four of these bolts are employed, and they pass in pairs through perforations in the outer sections and the joints between the inner sections, and through perforations in the inner sections and the aligned joints between the outer sections. The reason for this is that the joints between the inner sections are opposite the medial points respectively, of the outer sections, and vice versa.

The expansion nut is interiorly screw-threaded to engage the threaded portion of the stem, and is held permanently in engagement therewith by the contraction spring.

The screw-threaded portion of the stem is tapered toward its outer end, a reduced, parallel terminal portion, K, being provided, and adjacent thereto the abruptly tapered portion, K'.

In operation, the stem is unscrewed until the expansion nut is located at the terminal reduced portion, above described, when it is

inserted in the tube to be beaded. The abruptly tapered portion of the stem causes the nut to be expanded quickly and positively to fit and clamp the tube, whereupon, by the continued rotation of the stem the head-block is drawn toward the end of the tube and the edge of the latter being engaged by the beading bits is bent upon itself, as before described.

By substituting cutting bits for the beading bits herein shown, the ends of old tubes may be cut to enable them to be removed from the head-plates.

The flat bearing-rims of the expansion nut enable the latter to be firmly clamped in the tube without expanding or otherwise injuring the latter, and the sectional structure thereof prevents unequal straining or bursting.

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

1. In a tube-bearer, the combination with the head-block and the threaded stem, of an expansion nut comprising twin outer and inner sections, arranged to break joints, and a contraction spring connecting said sections, substantially as specified.

2. In a tube-bearer, the combination with a head-block, of a tapered screw stem, having a terminal parallel portion and an abrupt tapered portion adjacent thereto, and an expansion

nut composed of sections spring-pressed toward the stem, substantially as specified.

3. In a tube bearer, the combination of the tapered stem having a plain and a screw-threaded portion, the head-block mounted upon the plain portion and provided with sockets, beading-bits fitting in said sockets, and a sectional expansion nut engaging the screw, substantially as specified.

4. In a tube-bearer, the combination with the head-block and the threaded stem, of a sectional expansion nut provided with duplicate annular bearing rims having smooth surfaces, the sections being spring-pressed toward the stem, substantially as specified.

5. In a tube-bearer, the combination with the head-block and the threaded stem, of an expansion nut having annular bearing-rims and an intermediate annular groove or depression, and composed of twin outer and inner sections which are arranged to break joints, and an annular contraction spring arranged in said groove or depression, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

MICHAEL A. LANAGAN.

Witnesses:

GEO. W. MIDDLEKAUFF,
LEONIDAS B. POUND.