

(No Model.)

J. C. MORRISON.
BOILER TUBE EXPANDER.

No. 569,651.

Patented Oct. 20, 1896.

FIG. 1.

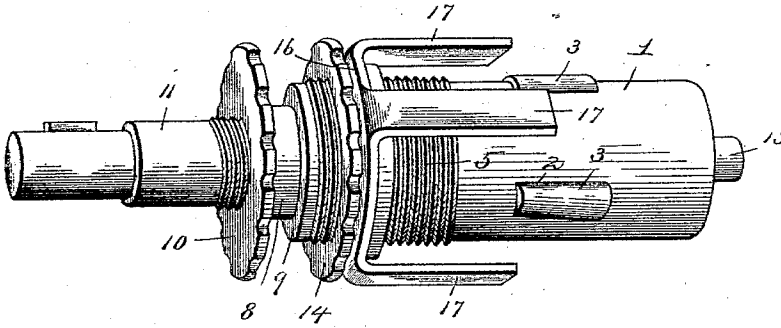
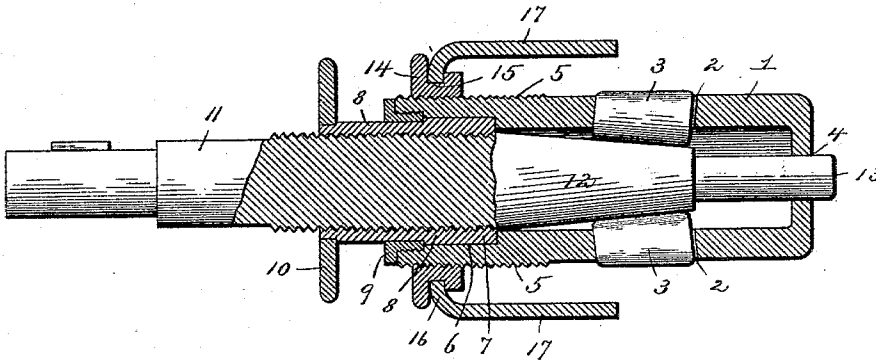


FIG. 2.



Inventor

Joseph C. Morrison

Witnesses

Harry L. Amer.
S. P. Walcott

By His Attorneys.

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

JOSEPH C. MORRISON, OF AKRON, OHIO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-HALF TO JOHN K. WILLIAMS, OF SAME PLACE.

BOILER-TUBE EXPANDER.

SPECIFICATION forming part of Letters Patent No. 569,651, dated October 20, 1896.

Application filed September 14, 1895. Serial No. 562,564. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. MORRISON, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a new and useful Boiler-Tube Expander, of which the following is a specification.

This invention relates to boiler-tube expanders; and it has for its object to provide a new and useful roller-expander of this character having simple and efficient means for expanding the ends of boiler-tubes to securely fasten them in the tube-sheets.

To this end, therefore, the invention contemplates a construction of roller-expander for boiler-tubes whereby the same can be readily adjusted to suit different thicknesses of tube-sheets, and also readily and easily operated for expanding the ends of the tubes parallel with the holes in the tube-sheet.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the drawings, Figure 1 is a perspective view of a roller boiler-tube expander constructed in accordance with this invention. Fig. 2 is a central longitudinal sectional view thereof.

Referring to the accompanying drawings, 1 designates a hollow cylindrical casing-body constructed in a suitable size to adapt the same for insertion within the ends of the boiler-tubes to be expanded, and said cylindrical casing-body is provided therein, at a point intermediate of its ends, with a circular series of longitudinally-disposed slots or openings 2, in which are adapted to loosely work the tapered swaging-rolls 3, that are adapted to be adjusted within said openings out against the inner sides of the tube within which the tool has been inserted. The said cylindrical casing-body 1 is provided in its closed end with a central guide-opening 4; and at its opposite open end the said cylindrical casing-body 1 is exteriorly threaded, as at 5, and is provided with an inner circular bearing-recess 6, in which turns the inner thickened bearing end 7 of the interiorly-threaded feed-nut 8, work-

ing within the open end of the cylindrical casing-body 1. The said interiorly-threaded feed-nut 8 is removably retained within the open end of the hollow body 1 by means of the exteriorly-threaded flanged collar 9, screwed into the open end of the casing-body against the shoulder formed by the thickened bearing end 7 of the feed-nut, and the flange at the outer end of said collar works against one end of said casing-body. The said interiorly-threaded feed-nut 8 projects outside of the body 1 and is provided on its outer end with an adjusting hand-wheel 10, that provides for turning the same, and said nut accommodates for adjustment therein the exteriorly-threaded adjusting-mandrel 11. The exteriorly-threaded adjusting-mandrel 11 is provided with an inner tapered portion 12, from which is extended the straight guide-pin 13, that works in the guide-opening 4 in one end of the casing-body 1. The unthreaded tapered portion 12 of said adjusting-mandrel works against the inner sides of the swaging-rolls 3 and is tapered reversely to the taper of said rolls, so that when the mandrel is adjusted into the casing by turning the feed-nut the outer exposed faces of the rolls will be disposed parallel with the tube in which they are adjusted, so that such tube will be expanded parallel with the hole in the tube-sheet, as will be readily understood by those skilled in the art.

The exteriorly-threaded end portion 5 of the cylindrical casing-body 1 adjustably accommodates thereon an interiorly-threaded finger-nut 14. The interiorly-threaded finger-nut 14 is provided with a circumferential annular groove 15, in which is loosely fitted the gage-collar 16. The gage-collar 16 is provided with a series of gage-arms 17, that are bent therefrom at spaced points and are disposed over the cylindrical casing-body 1, parallel thereto, and by adjusting the nut 14 the ends of said gage-arms toward the closed end of the body 1 will be brought in contact with the outer side of the tube-sheet to hold the tool properly in position for expanding the tube in any thickness of tube-sheet, as will be readily understood.

Changes in the form, proportion, and the minor details of construction may be resorted

to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a tube-expander, a hollow body having a guide-opening in one end, a circular bearing-recess at its other end, and a series of roll slots or openings between its ends, the swaging-rolls, an interiorly-threaded feed-nut mounted for a fixed rotation in said bearing-recess, and a tapered mandrel having exterior threads engaged by the threads of said feed-nut and a straight guide-pin extension working in the guide-opening of the body, substantially as set forth.

2. In a tube-expander, a hollow casing-body provided with a closed end having a guide-opening therein, a circular series of roll slots or openings, and an inner circular bearing-recess formed in its open end, the swaging-rolls arranged in said slots or openings, an interiorly-threaded feed-nut provided with an inner thickened end turning in said bearing-recess and with a hand-wheel at its outer

end, a threaded collar screwed into the open end of the casing-body to hold the feed-nut in place, and an exteriorly-threaded adjusting-mandrel mounted in the feed-nut and provided with a tapered unthreaded portion and a straight guide-pin projected from said tapered portion and working in the guide-opening of the casing-body, substantially as set forth.

3. In a tube-expander, the tool-body provided with an exteriorly-threaded portion, an annularly-grooved finger-nut mounted on said threaded portion, and a gage consisting of a collar loosely fitted in the groove of the nut and a series of horizontal gage-arms bent integrally from the collar and disposed parallel with the tool-body, substantially as set forth.

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

JOSEPH C. MORRISON.

Witnesses:

F. A. WILCOX,

CLINTON H. KNECHT.