

No. 782,896.

PATENTED FEB. 21, 1905.
J. F. BROWN & N. C. GALLIHER.
FLUE EXPANDER.
APPLICATION FILED APR. 25, 1904.

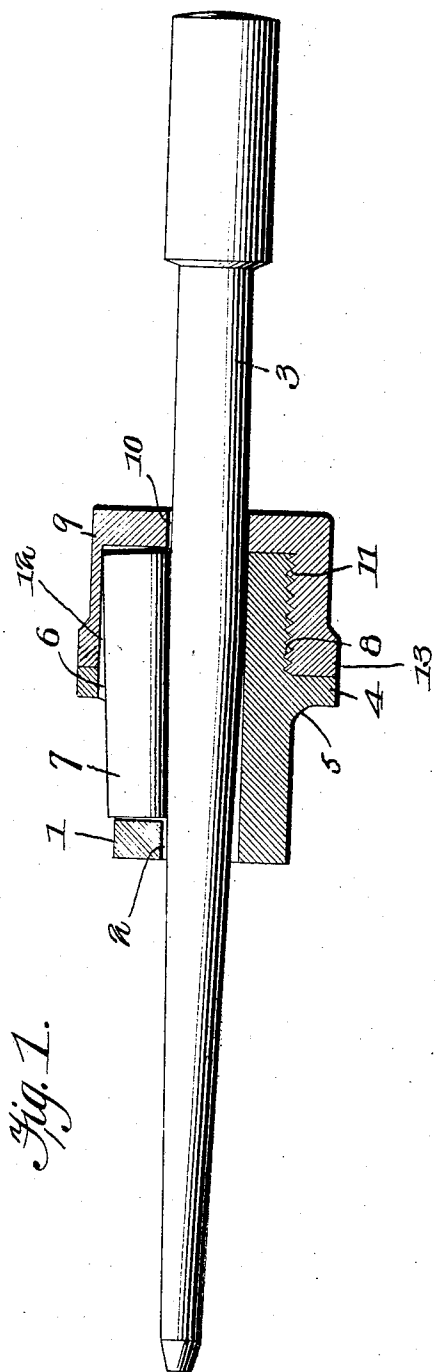


Fig. 1.

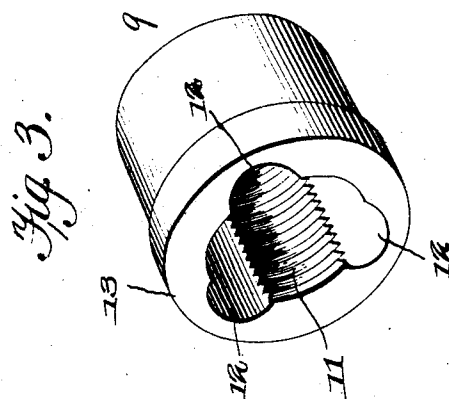


Fig. 3.

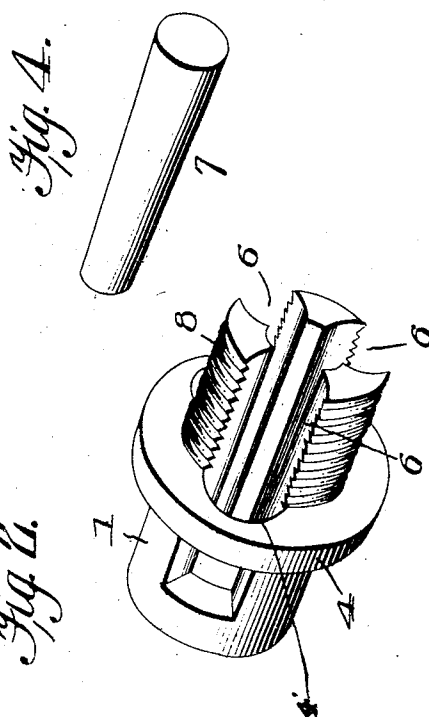


Fig. 4.

Witnesses
E. J. Clarke
W. H. Clarke

Joseph F. Brown
Nathan C. Gallier
Inventors
by *C. A. Snow & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

JOSEPH F. BROWN AND NATHAN C. GALLIHER, OF BRISTOL, TENNESSEE.

FLUE-EXPANDER.

SPECIFICATION forming part of Letters Patent No. 782,896, dated February 21, 1905.

Application filed April 25, 1904. Serial No. 204,852.

To all whom it may concern:

Be it known that we, JOSEPH F. BROWN and NATHAN C. GALLIHER, citizens of the United States, residing at Bristol, in the county of Sullivan and State of Tennessee, have invented a new and useful Flue-Expander, of which the following is a specification.

This invention relates to tube or flue expanders, and has for its principal object to provide a novel form of tool which may be used to advantage in expanding tubes or flues in the construction of boilers.

A further object of the invention is to provide a novel form of roller-box in which the rollers may be held and from which they cannot be accidentally dislodged when the operating-mandrel is removed.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claim, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a flue or tube expander constructed in accordance with the invention. Fig. 2 is a detail perspective view of the roller-box detached. Fig. 3 is a similar view of the roller-retaining cap. Fig. 4 is a detail perspective view of one of the rollers.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The roller-box is in the form of a cylindrical body 1, having a central opening 2 extending throughout its entire length for the insertion of the operating-mandrel. The box is provided with a series of radiating slots 6, extending from the central opening to the periphery of the body portion and from one end of said body to a point near the opposite end, a comparatively thin ring of metal being left in order to hold the several arms formed by the cutting of the slots 6. At a point inter-

mediate of the length of the box is an outwardly-extending annular flange 4, which serves as a further means of uniting the several arms and strengthening the structure, and at points in alinement with the slots curved recesses 4' are formed in order to permit outward movement of the rollers during the operation of the mandrel. One of the walls of the flange is tapered or inclined, as indicated at 5, in order to engage with the end of the flared tube at or before the completion of the expanding operation.

In the several slots 6 are placed rollers 7, the rollers tapering from end to end, and it will be noted that the width of the inner ends of the slots, or at their juncture with the longitudinal passage 2, is less than the diameters of the rollers, so that even when the operating-mandrel 3 is removed the rollers cannot fall through to the opening 2, but at all times are retained in position ready to be spread on the insertion of the mandrel.

One end of the roller-box is provided with screw-threads 8 for the reception of a roller-retaining cap-piece 9, that has integral threads 11. The interior of the cap is further provided with curved recesses 12, corresponding to the recesses 4', formed in the flange 4 and serving also to permit free outward movement of the rollers as they are forced into engagement with the interior of the tube.

In assembling the parts the rollers are first inserted in the sides of the slot 6 and are moved toward the center of the roller-box until their peripheries are within the peripheral line of the roller-box. The cap-piece 9 is then screwed on until its end flange 13 is jammed up tight against the flange 4, care being taken that the cap-piece is stopped with the recesses 12 in alinement with the recesses 5. The tool is then ready for use, and on the insertion of the mandrel 3 the rollers will be spread apart and engage with the inner surface of the tube to be expanded. The flange 4 being disposed at a point intermediate the length of the slots serves to hold the rollers from displacement under practically all conditions even when the cap 9 is removed, and the ring at the same time serves as a connecting-brace for the several arms which extend between the slots.

Having thus described the invention, what is claimed is—

In a flue-expander, a cylindrical roller-box provided at one end with peripheral threads 5 and having a central longitudinally-disposed mandrel-passage, there being a plurality of radially-disposed slots formed in the box and extending from one end thereof to a point near the opposite end, an integral flange bridg- 10 ing the slots and connecting the several arms of the box, said flange having roller-receiving recesses and provided on one face with a flared or inclined portion, rollers arranged in the

slots and of a diameter greater than the width of the inner portions of the slots, and a thread- 15 ed cap-piece screwed on the open end of the box, said cap-piece having roller-receiving recesses corresponding to those of the flange.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures 20 in the presence of two witnesses.

JOSEPH F. BROWN.

NATHAN C. GALLIHER.

Witnesses:

A. L. HILL,

MELVIN L. CARRIER.