J. W. FAESSLER.
FLUE OR TUBE EXPANDER.
APPLICATION FILED DEC. 17, 1908.

924,049.

Patented June 8, 1909.

Fig. 1.

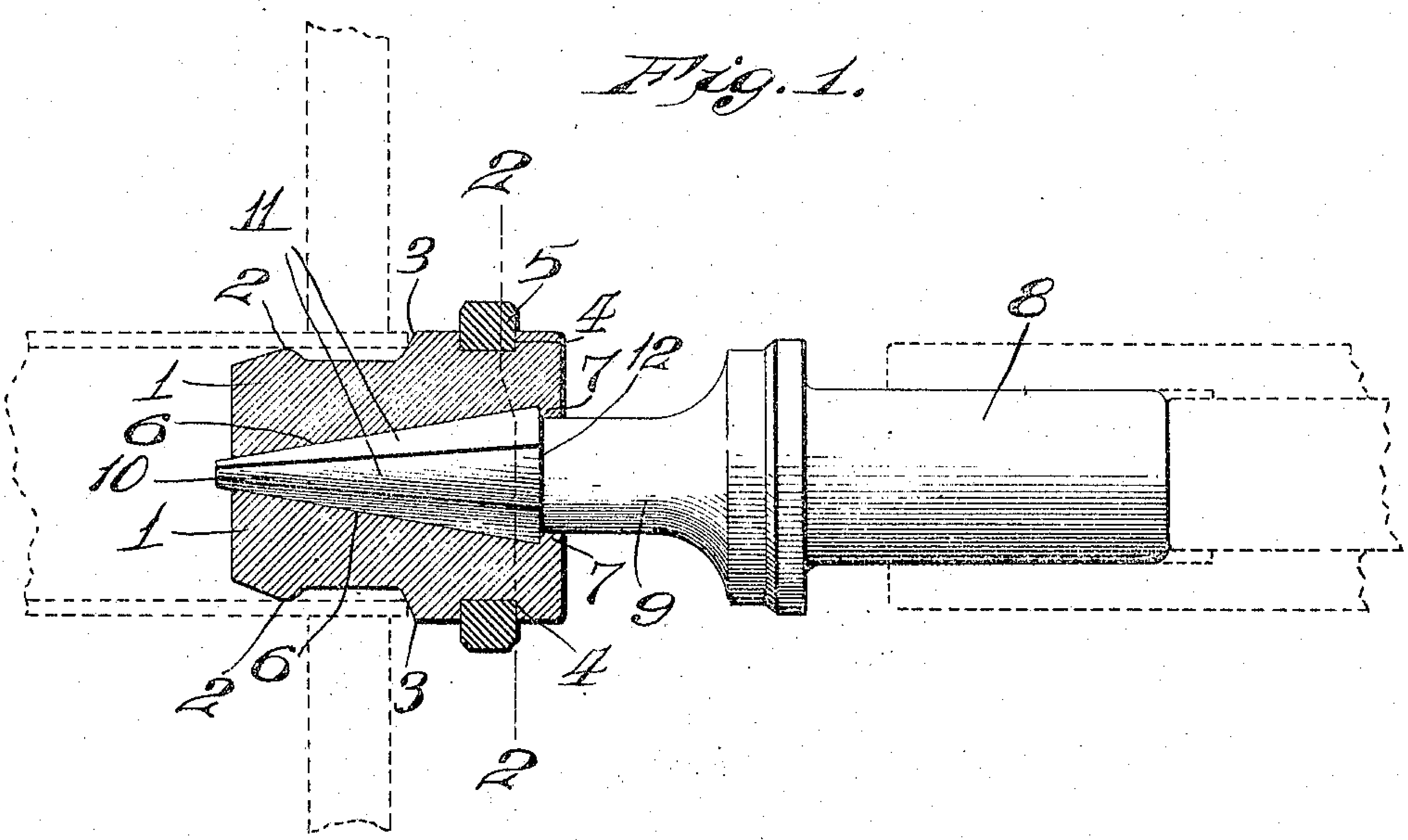


Fig. 2.

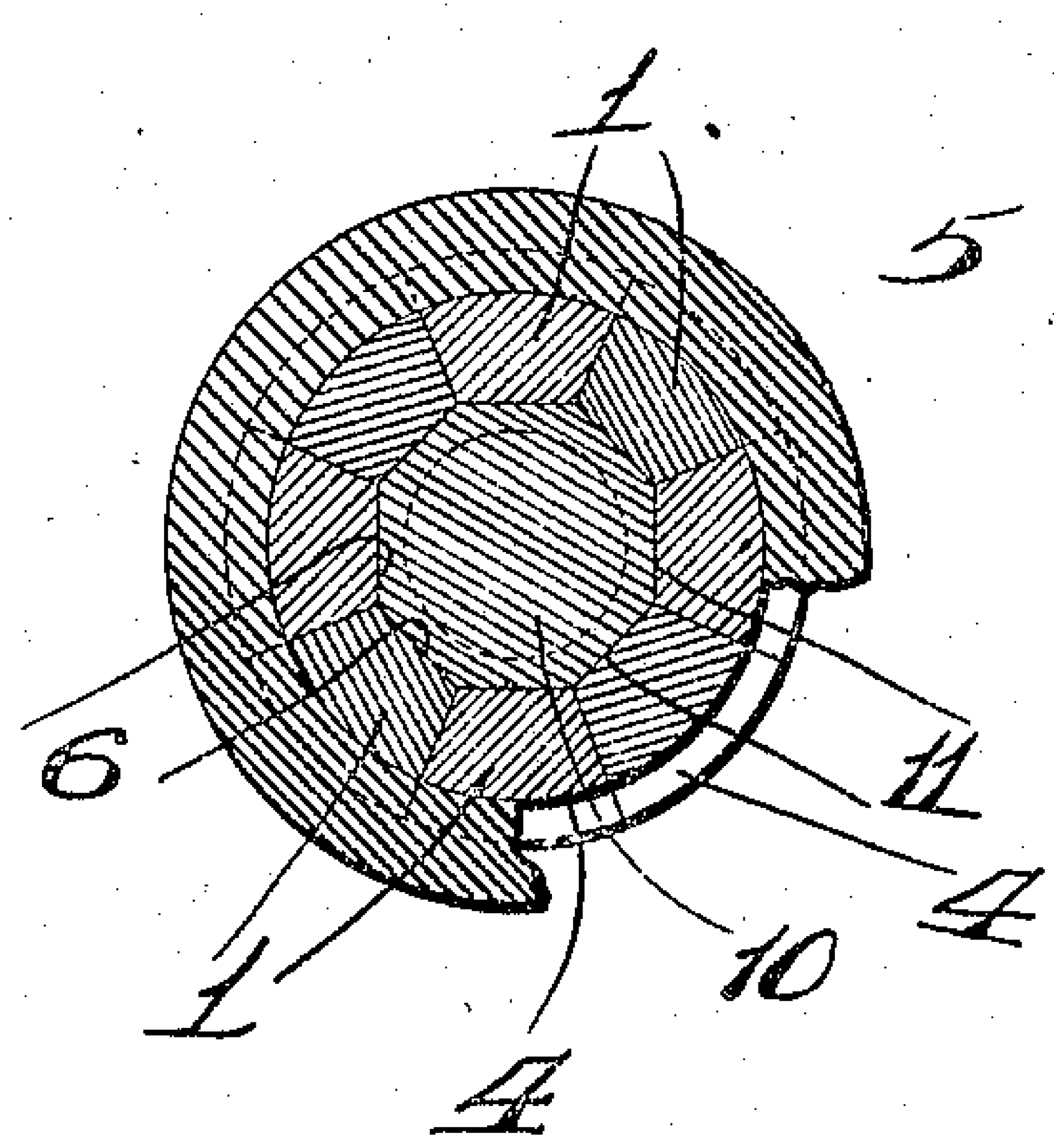
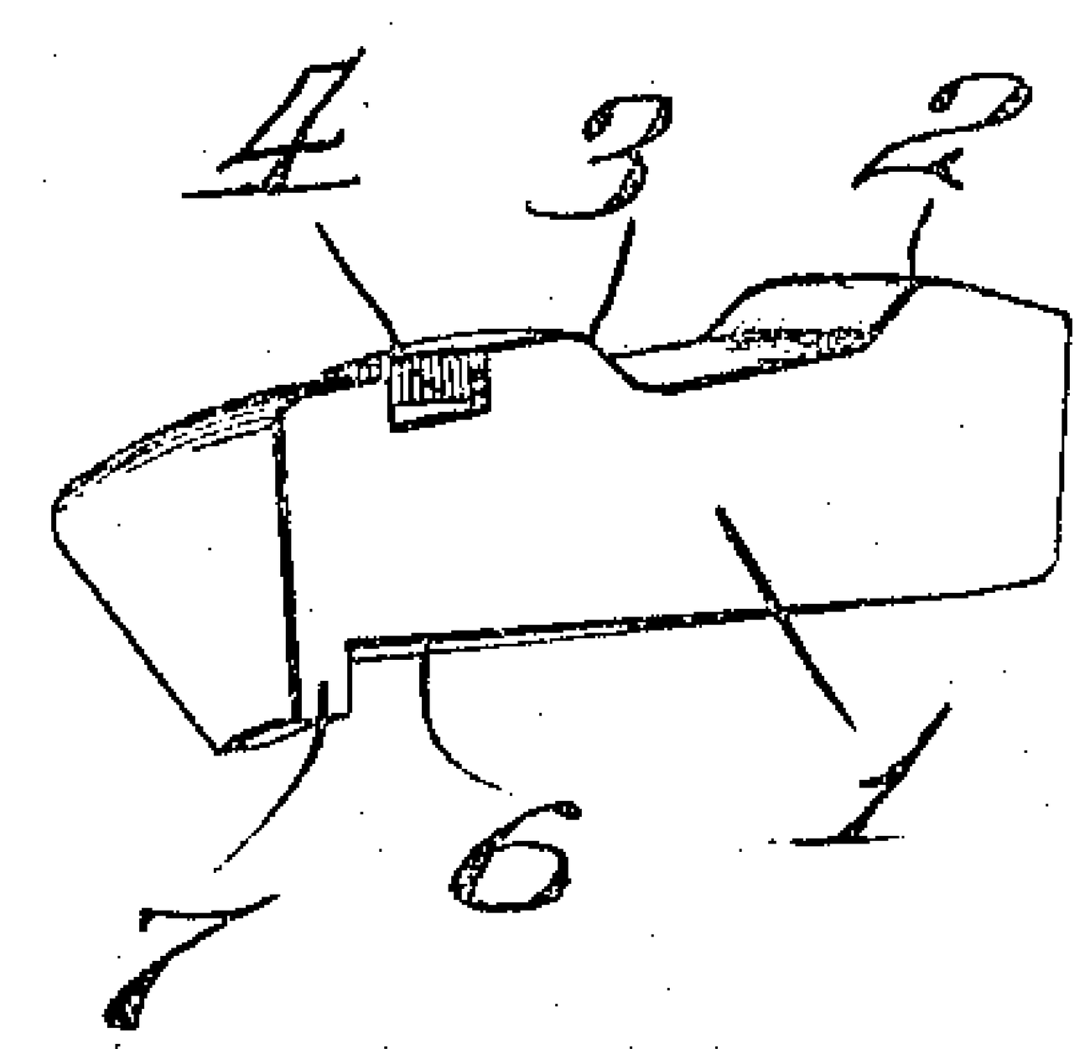


Fig. 3.



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FLUE OR TUBE EXPANDER.

No. 922,048. Specification of Letters Patent. Patented June 8, 1909.

Application filed December 17, 1908. Serial No. 466,015.

To all whom it may concern:

Be it known that I, JOHN W. FAESSLER, a citizen of the United States, and resident of Moberly, Missouri, have invented certain new and useful Improvements in Flue or Tube Expanders, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to a flue or tube expanding tool, the object of my invention being to construct a simple tool to be used in connection with a pneumatic hammer or the like for expanding the ends of boiler flues or tubes in a boiler sheet or head, and which tool is so constructed that the segmental members of the body of the tool are held together in proper position while the tool is in use, and the mandrel of the tool being so constructed as to maintain its proper position within the body of the tool while the same is in use.

To the above purposes my invention consists in certain novel features of construction and arrangement of parts hereinafter more fully set forth, pointed out in the claims and illustrated in the accompanying drawings, in which:

Figure 1 is a sectional view taken through the center of the body of a tool of my improved construction, and showing the mandrel in elevation; Fig. 2 is a cross section taken on the line 2—2 of Fig. 1; Fig. 3 is a perspective view of one of the segmental members forming the expanding body of the tool.

Referring by numerals to the accompanying drawings, the body of the expander is made up of a series of segmental members 1, which are in the form of elongated blocks of hardened metal, the outer faces of which are slightly curved in cross section in order that the body may be formed perfectly round when the segmental members 1 are assembled. Formed on each member 1, a short distance from the outer end thereof, is a lug 2, and the lugs on all of the members combine to form a rib, which, when the tool is in use, engages the boiler flue or tube immediately adjacent the inside of the sheet or boiler head.

Formed on the outer surface of each member 1, a short distance to the rear of the lug 2, is a shoulder 3, and the shoulders on all of the members 1 engage against the end of the boiler tube or flue and expand the same against the outer face of the sheet or boiler head when the tool is in use. Formed in the outer face of each member 1, adjacent the rear end thereof, is a notch 4, and the notches of all of the members form a groove adjacent the rear end of the body of the tool, in which groove is seated a heavy elastic ring 5 of rubber or analogous material, although this ring may be in the form of a split steel ring. The inner faces 6 of the members 1 are perfectly flat and are formed on such longitudinal angles that the opening in the center of the body of the tool tapers toward the forward end, and formed integral with the rear ends of the members 1 are lugs 7, which combine to form a flange around the opening in the center of the body of the tool at the rear end thereof.

The mandrel used in connection with my improved tool comprises a solid cylindrical shank 8, on which is adapted to be engaged the forward end of a pneumatic hammer or like tool, in order that the plunger of said tool will strike against the end of said shank 8, and formed integral with the forward end of this shank 8 is a small cylindrical shank 9, with which is formed integral a head 10, on the exterior of which is formed a series of flat beveled or inclined bearing faces 11, which, when the tool is assembled and in use, bear against the corresponding faces 6 formed on the members 1. The rear end of the head 10 is of such size as that an abrupt shoulder 12 is formed between said head and the shank 9, which shoulder bears against the inner faces of the lugs 7 when the tool is assembled, thus preventing the mandrel from becoming easily disengaged from the body of the tool.

When an expander of my improved construction is in use, the forward portion of the body, made up of the segmental members 1, is inserted in the end of a boiler flue or tube, as shown in Fig. 1, and when the mandrel 8 is forcibly struck with the plunger of a pneumatic hammer or like tool, the head 10 of said mandrel will be forced forward, and as a result all of the segmental members 1 will be uniformly moved outward, which results in an expanding action on the end of the tube or flue, and as this operation is continued the flue or tube is properly expanded and set in the sheet or boiler head.

The ring 5 tends to draw the members 1 together and during the use of the tool maintains said members in their proper positions.

The flat bearing faces 11 are so formed as that they have full bearing on the faces 6 of the members 1, and thus cause said members 1 to move uniformly outward, and there is no tendency for the head to stick or bind in moving rearward as the segmental sections are drawn together by the action of the ring 5. The rearward movement of the mandrel is limited by the engagement of the shoulder 12 against the lugs 7, and this construction prevents the mandrel from becoming disengaged or separated from the body of the expander.

An expanding tool of my improved construction is very simple, strong and durable, can be operated by either a hand or a pneumatic hammer, and the mandrel is at all times held in proper position within the body of the tool.

I claim—

1. A tube expander, comprising a body made up of a series of segmental members, elastic means encircling the rear portion of the body for holding the segmental members together, the inner faces of the segmental members being flat and inclined so as to form a tapered opening through the body, a mandrel, one end of which is provided with a series of flat beveled bearing faces adapted to engage the corresponding faces on the segmental members of the body, and means formed integral with the rear ends of the segmental members for engaging the mandrel and holding the same against withdrawal from the body.

2. In a flue expander, the combination with a series of segmental members radially arranged to form a cylindrical body, elastic means encircling the rear portion of the body for holding the segmental members together, there being inclined faces formed on the inner faces of the segmental members so as to form a tapered aperture through the body, inwardly projecting lugs formed integral with the rear ends of the segmental members, of a mandrel, and a tapered head formed integral with one end of said mandrel, which tapered head is provided with flat bearing faces corresponding to the faces formed on the segmental members, and there being a shoulder formed between the tapered head and the mandrel, which shoulder bears against the lugs formed on the segmental members.

3. A flue expander, comprising a series of segmental members radially arranged to form a cylindrical body, a yielding member encircling the rear portion of the body to hold the segmental members together, there being inclined faces formed on the inner sides of the segmental members so as to form a tapered opening through the body, lugs integral with the rear ends of the segmental members, which lugs project inwardly, a mandrel, and a tapered head formed integral with one end of the mandrel, which tapered head fits the tapered opening through the cylindrical body, and the base of said tapered head being engaged by the lugs on the segmental members.

4. A tube expander, comprising a body made up of a series of segmental members, elastic means encircling the body for holding the members together, there being a tapered opening through the longitudinal center of the body, a tapered mandrel seated in the tapered opening, and means carried by the rear ends of the segmental members for engaging a portion of the mandrel and holding the same against rearward withdrawal from the body.

5. A flue expander, comprising a body made up of a series of segmental members, elastic means encircling the body for holding the segmental members together, there being a tapered opening through the longitudinal center of the body, inwardly projecting lugs integral with the rear ends of the segmental members, a mandrel, a tapered head integral with the forward end of the mandrel, there being a shoulder formed between the base of the head and the body of the mandrel against which shoulder the inwardly projecting lugs engage to prevent the rearward withdrawal of the mandrel from the body of the expander.

In testimony whereof, I have signed my name to this specification, in presence of two subscribing witnesses.

JOHN W. FAESSLER.

Witnesses:
M. P. SMITH,
E. L. WALLACE.