(No Model.)

J. P. CHAMPION.

TUBE EXPANDER.

No. 375,259. Patented Dec. 20, 1887.

Fig. 2.

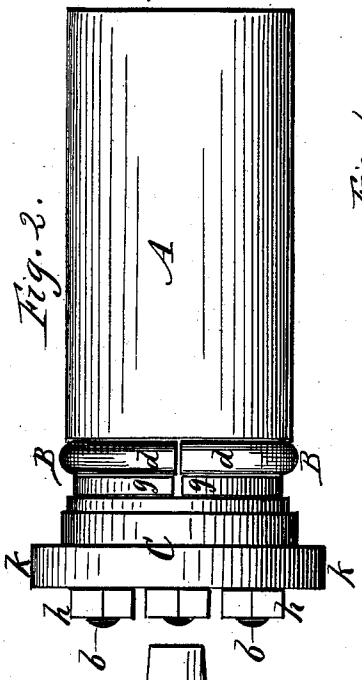


Fig. 4.

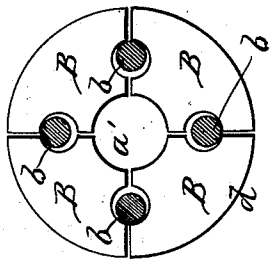


Fig. 5.

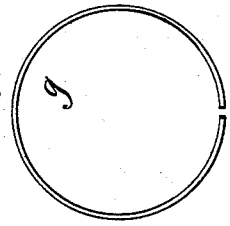
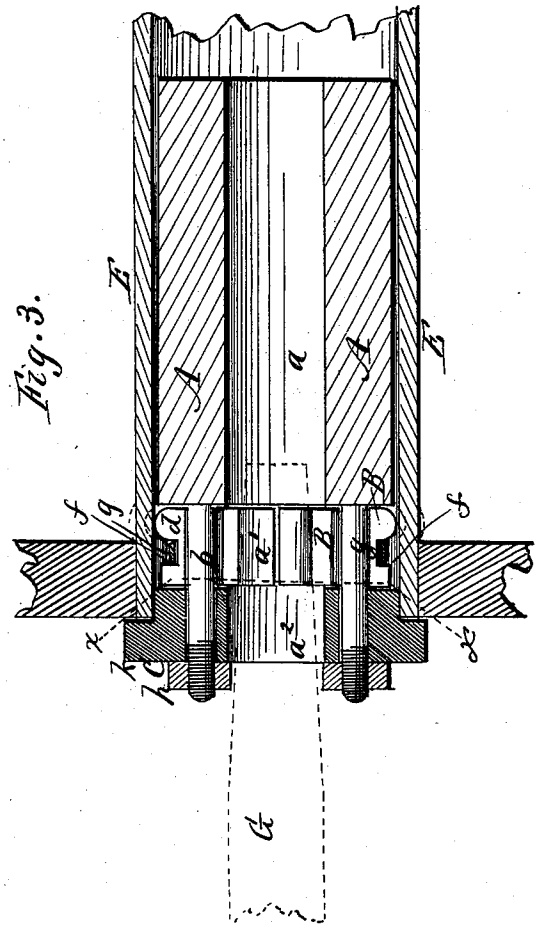


Fig. 1.



Fig. 3.



Attest.

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JOSIAH P. CHAMPION, OF PHELPS, NEW YORK.

TUBE-EXPANDER.

SPECIFICATION forming part of Letters Patent No. 375,259, dated December 20, 1887.

Application filed December 1, 1886. Serial No. 220,342. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH P. CHAMPION, a citizen of the United States, residing at Phelps, in the county of Ontario and State of New York, have invented a certain new and useful Improvement in Boiler-Flue Expanders; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the drawings accompanying this application.

In attaching boiler-flues to the head-plates it is customary to strike out a bead in the flue just inside the head-plate, forming a shoulder to keep the flue and head-plate in place and make a tight joint. Expanders of various kinds are known, and my invention consists of such a device, constructed, arranged, and operating as hereinafter described.

In the drawings, Figure 1 is a side elevation of the driver. Fig. 2 is a similar view of the expanding device. Fig. 3 is a central longitudinal section of the device located in a boiler-flue and in position for expanding the bead in the same. Fig. 4 is a cross-section in line *x x* of Fig. 3. Fig. 5 is a top view of the spring clamping-ring.

A indicates a block of cylindrical form, which constitutes the body of the device. In this block is made a hole or passage, *a*, and at one end are a set of screw bolts or rods, *b b b*, for the attachment of the operating parts.

B B B B are a set of segment-shaped bits or followers, by which the bead is struck out in the pipe. These bits are seated on one end of the block and are held in place and guided as they move out and in by the bolts *b b*. A hole, *a'*, is made in the center of the bits for the insertion of the driver, similar to the larger hole, *a*, made in the body of the block and cap, for the passage of the driver as it is forced in. The outer edge, *d*, of the bits is made of convex or wedge shape to strike the bead, and back of this is a groove, *f*, in which rests a circular split spring ring or wire, *g*, which encircles all the bits and has the tendency to draw them back together.

C is a circular cap having holes that pass over the screw-bolts *b b* and held in place thereon by means of nuts *h h h*. The inner face of the cap rests over and holds the bits B B in place, and at the outer edge is a circular rim or flange, K, that overlaps and rests on the end of the flue E when the device is inserted in the flue, and thus serves as a stop and gage to the device. This cap is also provided with a hole, a^2, for the passage of the driver.

G is the driver, consisting simply of a tapering mandrel or rod.

The operation is as follows: The block is inserted in the end of the flue E till the rim *k* of the cap strikes the end of the flue. This brings the bits B B B in proper position to strike the bead or shoulder in the flue just back of the head-plate H. The conical driver G is then inserted in the hole *a* and driven in, which forces the bits out and strikes the bead or shoulder, as indicated by the dotted lines in Fig. 3. As the several bits occupy the whole circle, the whole bead will be struck without turning the device, except the narrow joints between the bits. A slight turn of the device will cause the bits to cover these joints, when the whole bead can be finished. When the driver is withdrawn, the split spring ring *g* will draw the bits back, so that the device can be easily turned or withdrawn.

The advantage of this device is that three or more segment-bits are employed, so that the whole bead can be struck at once, except the narrow joints, and the parts can at the same time be readily attached and detached, and the cap serves as the stop or gage to hold the device in place and bring the bits in the right position.

This device is applicable not only to expanding boiler-flues, but also other flues and pipes where a bead or shoulder is to be struck.

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

In a flue-expander, the combination of the block A, provided with bolts *b b*, the segment-bits B B, seated on the end of the block and retained by the bolts, the spring *f*, encircling the bits, and the cap C, located on the bolts and inclosing the bits, said parts being provided with a hole or passage for the insertion of a conical driver, as herein shown and described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSIAH P. CHAMPION.

Witnesses:
S. S. PARTRIDGE,
JEREMIAH C. BEST.