

May 26, 1925.

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FLUE EXPANDER

Filed Sept. 22, 1923

Fig. 1.

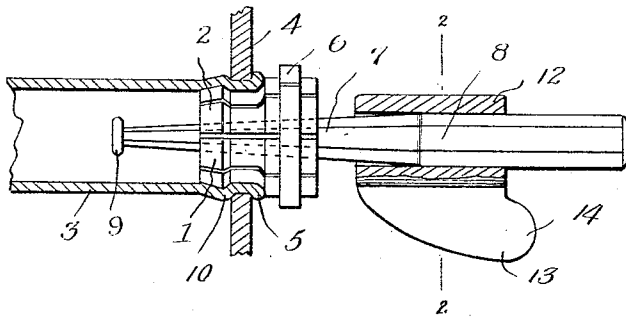
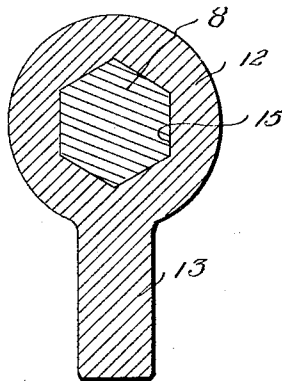


Fig. 2.



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FLUE EXPANDER.

Application filed September 22, 1923. Serial No. 664,303.

To all whom it may concern:

Be it known that I, CARL BUSH, a citizen of the United States, residing at Mattoon, in the county of Coles and State of Illinois, have invented new and useful Improvements in Flue Expanders, of which the following is a specification.

This invention relates to a device for expanding the ends of boiler flues to properly hold them in assembled position relative to the ends or heads of a boiler, and an object of the invention is to provide an expander which may be easily placed in the end of the flue and expanded, to expand and crimp the ends of the flue and which also includes means to facilitate the contraction and removal of the expander from the flue without in any way effecting or mutilating the expanded and crimped end of the flue or loosening the tight connection between the flue and the boiler end.

Another object of this invention is to provide in combination with an expansible flue expanding head a pin which is octagonal shaped in cross section for expanding the head and also an extractor which is carried by the expanding pin and is designed to be struck repeatedly by a pneumatic hammer or like tool for loosening the flue expanding head and extracting it from a properly expanded flue.

Heretofore, considerable difficulty has been experienced in the extracting or the removal of flue expanding heads from boiler flues, and an object of the present invention is to provide a device for overcoming these disadvantages by providing an extractor which will, when it is struck by the hammer be prevented from rotating relative to the expanding head and will administer a slight transverse as well as a longitudinal action against the head.

Other objects of the invention will appear in the following detailed description taken in connection with the accompanying drawing wherein:—

Figure 1 is a side elevation partly in section of the improved expander illustrating its use; and

Fig. 2 is a detail cross-section on the line 2—2 of Fig. 1.

Referring more particularly to the drawings, the improved flue expander comprises an expanding head 1, which is formed of a plurality of individual sections 2 each of which is shaped, so that when assembled

they will expand the boiler flue as shown at 3, at the inner side of the boiler end 4, and will crimp the outer end of the flue against the outer surface of the plate 4 as shown at 5 for tightly connecting the flue 3 with the plate 4. The sections 2 of the expanding head 1 are held in their proper relation one to the other by means of a spring band 6 which extends about the sections outwardly of their flue forming or shaping portions. All of the sections, when assembled are arranged to provide an axial bore which receives therethrough the tapered end 7 of the wedging pin 8. The wedging pin 8 is hexagonal or polygonal in cross section and it tapers inwardly towards its inner end, as clearly shown in Fig. 1 of the drawings.

The head 1 is prevented from passing off the inner small end of the pin 8 by means of an upset head 9. When the expanding head 1 is on the reduced end of the pin 8 the sections 2 will be in their contracted or innermost position which will permit them to be inserted into the end of the boiler tube 3. After the expanding head has been properly inserted into the boiler flue 3 the pin 8 is driven inwardly, preferably by means of a pneumatic hammer which forces the sections 2 outwardly, in all directions, and causes the forming of the bead 10 on the flue against the inner side of the plate 4 and the crimping of the outer end of the flue as at 5 to properly wedge the flue 3 in place. After the flue has been expanded, it will be apparent that the expanding head 1 will be tightly wedged in the flue and to release the expanding head from the flue, to permit the withdrawal of the head a releasing member or extractor 12 is mounted upon the substantially straight end of the pin 8. The releasing member 12 has a laterally extending projection 13 formed thereon which includes a rounded end portion 14 that projects beyond the end of the main body of the releasing member 12. To release the head 1, the pneumatic hammer or like tool (not shown) is placed to strike or apply its force against the rounded end 14 driving the member 12 against the head and consequently forcing the pin 8 outwardly out of the head 1. The ball or rounded end 14 being disposed laterally of the axis of the octagonal pin 8, and forwardly of the end of the member 12 will cause a slight lateral action of the force against the octagonal pin, as

well as causing a longitudinal force against the head 1 which will increase the releasing or loosening action upon the head to permit its withdrawal. By providing the octagonal pin 8, the extractor 12 will be prevented from spinning or turning around on the pin when it is struck with the hammer.

It is, of course, to be understood that the invention may be constructed in other manners and the parts associated in different relations and, therefore, I do not desire to be limited in any manner except as set forth in the claims hereunto appended.

Having thus described my invention, what I claim is:

1. In combination a flue expander including an expansible head, a tapered expanding pin polygonal shaped in cross-section, an extractor mounted upon said pin and provided with a polygonal bore for fitting

about the pin, said extractor adapted to have pressure applied thereto to release the expansible flue expanding head, and means for preventing removal of the expansible head from the pin.

2. A flue expander comprising in combination, an expansible head, a pin polygonal shaped in cross-section and having one end tapered, said pin adapted to be forced by pressure through the head for expanding a flue, an extractor mounted upon said pin outwardly of said head and having a polygonal bore for snugly fitting the pin, a lateral projection on the extractor having a rounded end portion adapted to receive force from a tool, and an upset head on the tapered end of the pin to prevent removal of the expansible head from the pin.

In testimony whereof I affix my signature.

CARL BUSH.