



# UNITED STATES PATENT OFFICE.

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TO JAMES A. BAILEY AND ONE-THIRD TO SAMUEL ALLEN, OF DANS-  
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## PIPE-EXPANDER.

No. 803,959.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, SAMUEL E. ALLEN, a citizen of the United States, residing at Dansville, in the county of Livingston and State of New York, have invented certain new and useful Improvements in Pipe-Expanders, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in devices for expanding tubes; and the object of my invention is to provide a device of this class by means of which the operator will be enabled to expand any desired portion of a tube of any length and diameter and to expand it at exactly the desired point.

So far as known to me it has heretofore been customary in the manufacture of tubes to be used in superheaters to shrink the rings upon the outside of the tube, first heating the ring to expand it to the proper diameter to permit of its being slipped in place upon the tube. The unequal expansion and cooling of the rings, associated with other various causes, result in some of the rings being loose or not properly shrunk in place at the end of the operation, and this necessitates the removal of all the rings or the replacing of the loose rings by split rings fastened together by short screws.

By means of the invention herein described the rings can be secured upon the tube while the latter is cold, and this method of securing the rings in place has the advantage of economy in labor, saving of fuel, rapidity in operation, and a firmer, more exact, and more secure positioning of the ring in place.

In the drawings illustrating the principle of my invention and the best mode now known to me of applying that principle, Figure 1 is a longitudinal sectional view of my new pipe-expander, and Fig. 2 is a detail view hereinafter referred to.

The hollow cylindrical body portion *a* carries at its front end the expander-head *b*, within which are loosely mounted the swaging-rolls *c* and at its rear end a bearing-block *d*. Extending longitudinally through the central portion of the bearing-block *d* and the body portion *a* is the expander-rod *e*, the front end of which is tapering and is thereby adapted to force out the swaging-rolls *c* when the expander-rod *e* is forced to the front. Fast upon the bearing-block *d* is a lug *f*, to which

is hinged the gage-arm *g*, the free end of which is bent downwardly to form an index and indented, (or notched,) as shown. A conical centering-collar *h* is fitted loosely (or slidably) upon the body portion *a*.

As shown in Fig. 2, the body portion *a* may be provided with an index or scale by means of which the exact position of the swaging-rolls in the tube to be expanded may be determined or the swaging-rolls brought precisely to the desired point in the tube. This scale may be used alone or with the gage-arm *g*.

In using the device the conical centering-collar *h* is fitted tightly in the end of the tube *i* to be expanded, and thereby serves to center the expander-head *b* in said tube. The indented free end of the gage-arm *g* lies directly over that part of the tube beneath which the swaging-rolls *c* are, as is clearly indicated in Fig. 2. By sliding the body portion *a* through the centering-collar *h* the free end of the gage-arm *g* is brought to the precise position in which the ring *j* is to be secured upon the tube, and at this time the swaging-rolls *c* will be directly under the portion of the tube *i* to be occupied by the ring *j* on the outside thereof, and so will be directly under the part of the tube *i* to be expanded. The scale *k* may be resorted to in order to expedite and confirm the accuracy of the positioning. The expander-rod *e* is now advanced, thereby forcing out or expanding the wall of the tube *i* beneath the ring. The degree of expansion, and hence the amount of initial tension given the ring, is accurately controlled, and this controllability it is impossible to obtain by the method of shrinkage. Every ring is secured firmly and uniformly in place with the advantages outlined above.

What I claim is—

1. In a pipe-expander, the combination of a body portion; an expander-head carried thereby; and a gage-arm which is hinged in fixed position to said body portion and extends lengthwise thereof, the index end of said gage-arm remaining fixed in position over said expander-head.

2. In a pipe-expander, the combination of a body portion, expanding devices carried thereby comprising an expander-head and means for operating the same; and a gage-arm carried by said body portion and having



its free end notched to engage a ring in position over said expander-head.

3. In a pipe-expander, the combination of  
5 a body portion upon which is marked off a scale lengthwise thereof; an expander-head carried thereby; and a gage-arm which is hinged in fixed position to said body portion

and extends lengthwise thereof, the index end of said gage-arm remaining in fixed position over said expander-head.

SAMUEL E. ALLEN.

Witnesses:

GEO. DU S. BAILEY,  
M. E. KIEBLE.