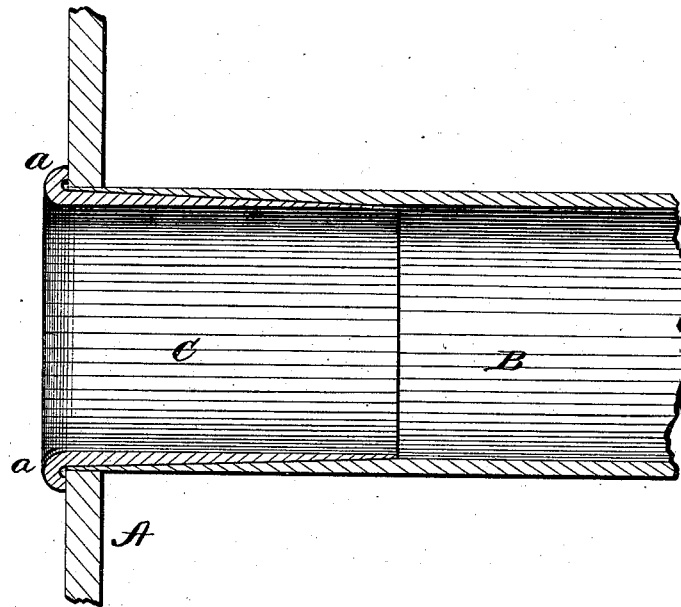


J. C. CARBINE.  
Boiler-Flues.

No. 217,338.

Patented July 8, 1879.



WITNESSES

*P. L. Curran*  
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INVENTOR

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# UNITED STATES PATENT OFFICE.

JOHN C. CARBINE, OF ATLANTA, GEORGIA.

## IMPROVEMENT IN BOILER-FLUES.

Specification forming part of Letters Patent No. 217,338, dated July 8, 1879; application filed May 19, 1879.

*To all whom it may concern:*

Be it known that I, JOHN C. CARBINE, of Atlanta, in the county of Fulton, and in the State of Georgia, have invented certain new and useful Improvements in Boiler-Flues; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to boiler-flues; and it consists in repairing such flues when burned out at the ends without taking out the flues by means of a hollow plug or ferrule, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, which fully represents my invention.

A represents a part of the head of a steam-boiler for engines with flue B. This flue is represented as having been burned out at the end and repaired by means of a ferrule or hollow plug, C, tapering toward the outside, as shown.

The old method of repairing the flue when the end becomes burned and the flue leaking is to plug up the flue with a solid plug, which renders the flue useless; or to take out the flue and repair it and put it back, which would take several days; but by my invention one workman with one helper can repair five or six flues in one day, at less than one-tenth the cost of the old method of repairing flues.

When the flue is burned out at the end the ferrule or hollow plug C is driven in. When thus driven in and the flange *a* turned down on the outside of the head, and then properly corked, as would have to be done with a repaired or new flue, it makes the flue as good as new and equally as water-tight; and when the ferrule or hollow plug C becomes burned, as the ends of flues will after a time, the old plug can be taken out and a new one put in.

It will be understood that boiler-flues are always burned out or damaged at the ends, and such damage or injury to the flue naturally makes the inside of the flue tapering, it being reduced in thickness the most at the end and gradually less and less inward. To repair such boiler-flue without taking it out it is necessary that the hollow plug or ferrule used in repairing must be correspondingly tapering, so as to form a tight joint.

I am fully aware that hollow plugs inserted in the ends of boiler-flues is, broadly, not new, as they have been used in various ways with expanding devices, and I do not, therefore, claim such, broadly, as my invention.

In my invention the hollow plug or ferrule is made tapering on the outside to correspond with the natural taper formed on the inside at the end of the boiler-flue when damaged by fire, so that no auxiliary devices are needed to form a tight joint.

The ferrule or hollow plug C, being made tapering from the end of the outside, can be driven into the flue so as to be perfectly tight without any additional expanding or tightening devices.

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

The hollow plug C, tapering on the outside, as shown, in combination with the boiler-head A and the damaged end of a boiler-flue, B, which has a corresponding inner taper, whereby the flue is repaired and strengthened and a perfectly tight joint made, substantially as herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 29th day of April, 1879.

JOHN C. <sup>his</sup> × CARBINE.  
mark.

Witnesses:

JAS. B. WILSON,  
MARTIN H. DOOLY.