R. A. Copeland.

Boiler Tube Ferrule.

No. 88,611. Patented Apr. 6, 1869.

Fig. 1.

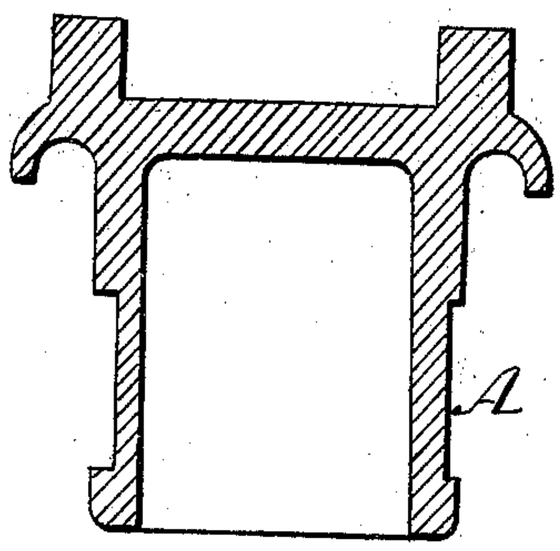


Fig. 2.

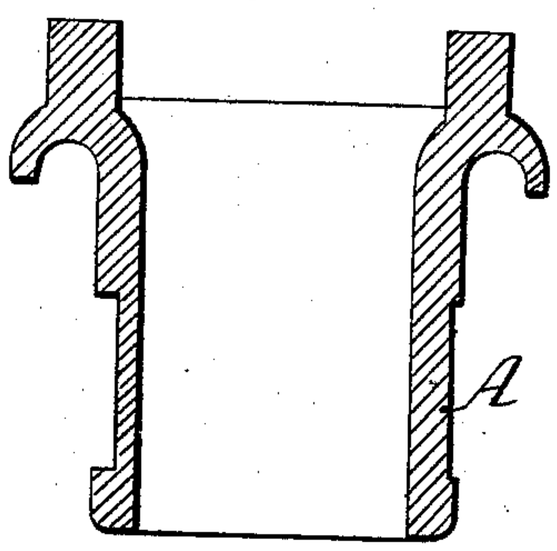


Fig. 5.

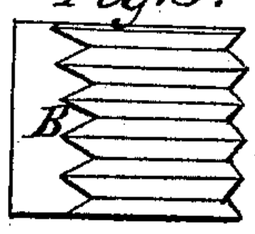


Fig. 6.

Fig. 4.

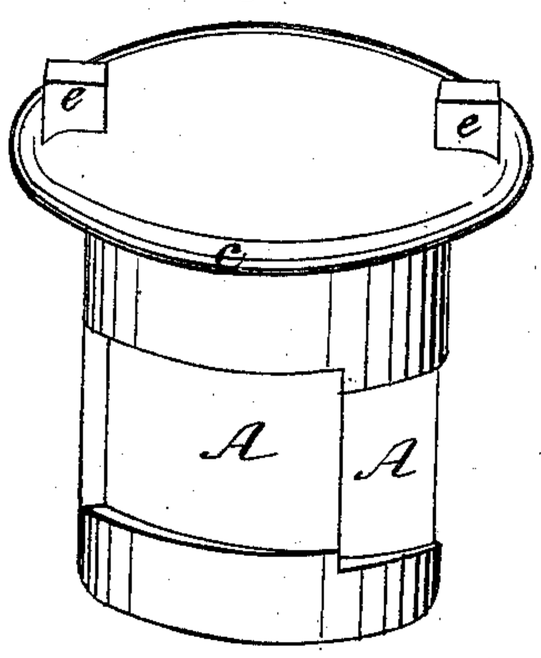
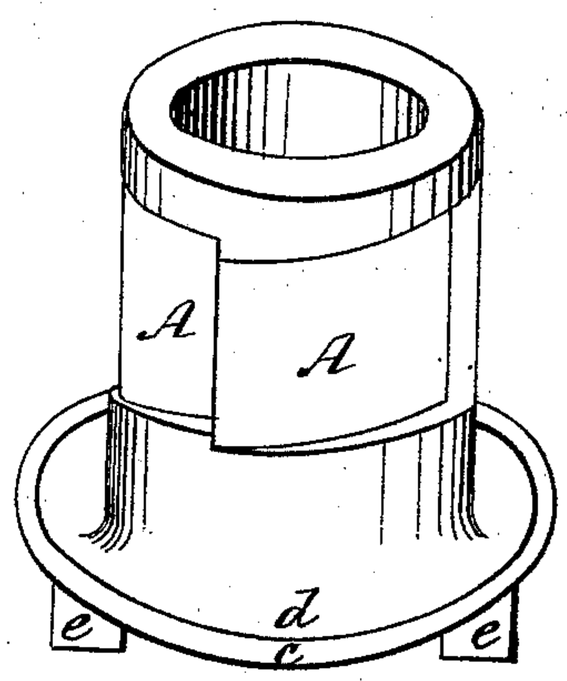


Fig. 3.



Witnesses

T. A. Quinlan

Wm. E. Hale.

Inventor

Robert Avis Copeland

United States Patent Office.

ROBERT AVIS COPELAND, OF BROOKLYN, NEW YORK.

Letters Patent No. 88,611, *dated April* 6, 1869.

IMPROVEMENT IN FERRULES FOR BOILER-TUBES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ROBERT AVIS COPELAND, of the city of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in the construction of a Plug and Ferrule for leaky boiler-tubes; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in providing a flanged plug, or ferrule, with one or more wedging slides, so arranged as to engage the inside of the tube and draw the plug, or ferrule to its seat when turned or rotated in a tube.

To enable others skilled in the art to make my improved plug, or ferrule, I will proceed to describe its construction and operation.

Figure No. 1 represents a longitudinal section of the ferrule.

Figure No. 2, a longitudinal section of the plug.

Figure No. 3, a perspective view of the ferrule.

Figure No. 4, a perspective view of the plug.

Figures Nos. 5 and 6 show two views of the sliding wedges B B, which are provided with teeth, or corrugations on their convex sides, either lengthwise or crosswise, and are fitted into the grooves A A, shown in figs. 3 and 4, slightly dovetailed, the grooves A A being cut a little under or wider at the bottom, in order to allow them (the slides) to work freely, and to prevent their dropping out whilst applying the plug, or ferrule.

The teeth, or corrugations shown in the sliding wedge B B, Nos. 5 and 6, are for the purpose of insuring their taking firmer hold of the inner surface of the tube.

The grooves in the plug, or ferrule, are cut diagonally, so that, on turning the plug, or ferrule in a tube, the flange *c* is drawn in towards the tube-sheet.

The flange *c* is provided, on its inner side, with a groove, *d*, for the reception of a suitable packing; and on its outer side or end, it is provided with two lugs, or holes, *e e*, for the purpose of attaching a wrench, or lever.

The body is made of cast or malleable iron, and the wedge of steel.

By placing the plug, or ferrule in a tube, and turning it, the flange is drawn close to the boiler-head, by the screw-like action of the slides, and held there securely by their wedging between the inner surface of the tube and the outer surface of the plug, or ferrule.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The wedging slides B B and the grooves A A A, substantially as specified.

2. The wedging slides B B and grooves A A A, in combination with the plug, or ferrule, and flange *d*, as set forth.

ROBERT AVIS COPELAND.

Witnesses:

T. A. QUINLAN,

WM. E. THALI.