May 6, 1924. 1,493,245

N. D. CLARK

BOILER TUBE PROTECTOR

Filed April 14, 1922

Fig. 1.

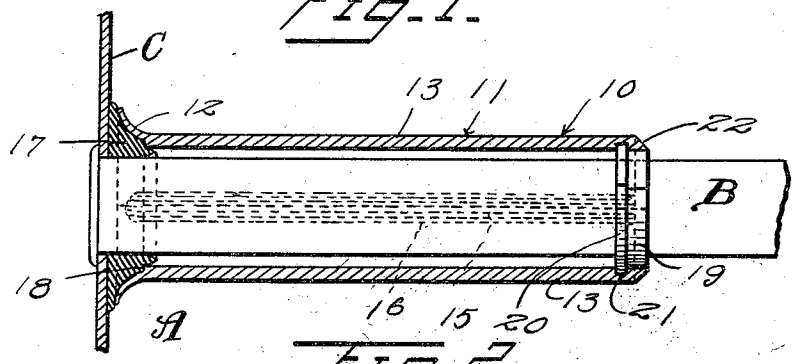


Fig. 2.

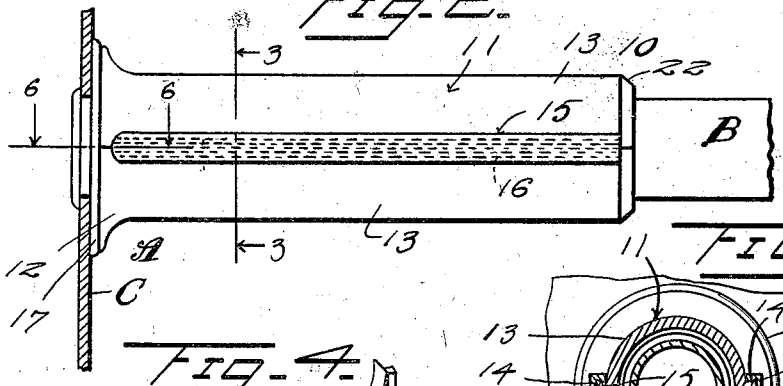


Fig. 3.

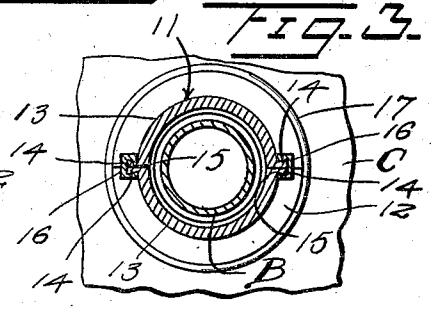


Fig. 4.

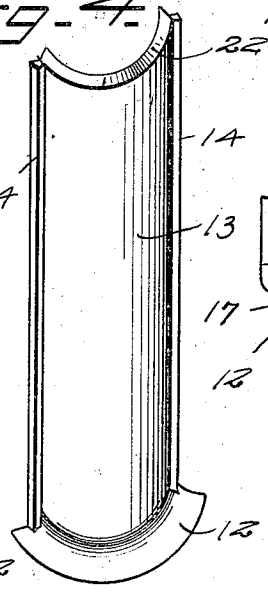


Fig. 5.

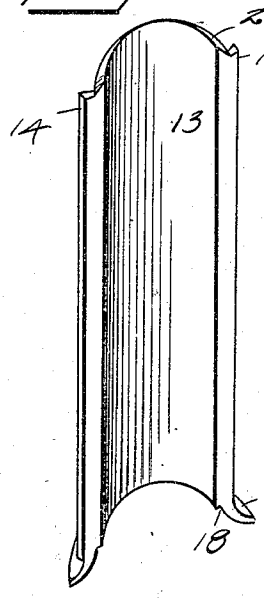
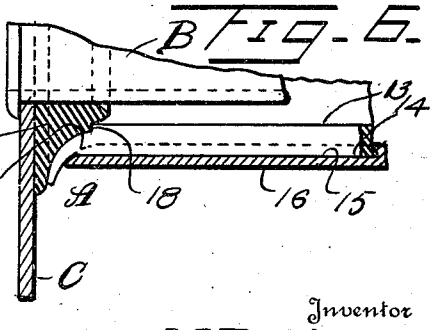


Fig. 6.



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Patented May 6, 1924. 1,493,245

UNITED STATES PATENT OFFICE.

NOAH D. CLARK, OF CLEVES, OHIO.

BOILER-TUBE PROTECTOR.

Application filed April 14, 1922. Serial No. 552,704.

To all whom it may concern:

Be it known that I, NOAH D. CLARK, a citizen of the United States, residing at Cleves, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in a Boiler-Tube Protector; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a protector for steam boiler tubes.

An aim is to provide means to minimize corrosion and disruption of water tubes in steam boilers particularly at the boiler tube sheet end.

It is further aimed to provide a construction in the form of a shield in separable sections and in cooperation with gaskets, preferably of asbestos.

One more object is to provide a novel joint for the shield sections and in combination with flaring ends of said sections which insure fit of one of the gaskets and cooperation with said fastening means or joints to bind all of the parts together.

Still another object is to provide a construction in which the protector is grooved to accommodate mounting of the gaskets in a novel manner.

Additional objects and advantages will become apparent from a consideration of the description following taken in connection with accompanying drawings illustrating one practical embodiment.

In said drawings:—

Figure 1 is a vertical sectional view illustrating the protector in connection with a boiler tube;

Figure 2 is a fragmentary side elevation illustrating the improvement on a boiler tube;

Figure 3 is a cross sectional view on the line 3—3 of Figure 2;

Figure 4 is a perspective view of one of the shield or protector sections at the exterior thereof;

Figure 5 is a perspective view of the part of Figure 4 looking toward the interior thereof;

Figure 6 is a detail sectional view on the line 6—6 of Figure 2.

Like reference characters designate like or similar parts in the different views.

To facilitate an understanding of the invention, a steam boiler is fragmentarily shown at A consisting of a boiler tube B extending from the usual tube sheet at C. Said boiler tube B in actual practice being of metal; due to moisture, rapidly corrodes and particularly at the end adjacent the sheet C. The present invention provides a means to protect said end of the tube against moisture and to thus minimize corrosive action. It will be understood of course that in actual practice, each of the tubes extending from the sheet C in the complete boiler will be similarly protected.

The protector is generally designated 10 consisting of a metallic tubular shield curved or flared outwardly at one end as at 12. The shield may be made of iron or any other suitable metal or material. It is also preferably made in a plurality of separable sections 13, for instance two as shown.

Along the longitudinal edges of each section 13, are lateral ribs or flanges 14, preferably integral with the sections and each pair collectively forming a dove tail. Fastening strips 15, of metal or other suitable material have dove tail grooves 16 therein and said strips are adapted to be slid along the sections to secure them together, the ribs 14 being disposed in the grooves 16. One of the ends of the strips 15 abuts against flared portions 12. The portions 12 are preferably resilient and accordingly the engagement thereof with the strips 15 will serve to bind the strips and sections together against accidental detachment.

Surrounding the tube B at its junction with the sheet C is an annular gasket 17, in one or more sections as desired and of a suitable packing material, preferably asbestos. The fastening of the shield in place compresses the gasket 17 to exclude the entrance of moisture at the adjacent end of the shield. In order to locate and maintain the asbestos 17 properly positioned, the sections of the shield 11 are recessed or cut away as at 18.

At the other end of the shield 11, it is closed against entrance of moisture by packing, preferably asbestos, in the form of a gasket 19. This gasket is compressed about the tube by fastening of the shield 11 and is preferably L-shaped in cross section and in a plurality of sections. The offset or flange of the gasket 19 is designated 20 and the shield sections are recessed

or cut away as at 21 in order to accommodate gasket 19 as shown.

It will be understood that the shield 11 may be made of any length desired or diameter and thickness of metal. The forward or free edges of the shield sections are preferably beveled off as at 22.

It will be realized that as the shield and the gasket are in separable sections, that the same may be applied to the boiler tube while the same is in place and mounted as shown in the drawings. The gaskets 17 and 19 effectively prevent the entrance of moisture into the shield 11 and thus the ends of the boiler tubes which usually first corrode and become injured as a result, are protected and the said objection overcome. Attention is particularly called to the fact that the compression of the gasket 17 against 18 serves to maintain the strips 15 and shield sections in frictional binding relation. In addition, the degree of fastening of the strips 15 is increased by their contact with the yieldable flared portions at 12.

As merely one practical embodiment has been illustrated and described, it is to be understood that changes in the details may be resorted to provided they fall within the spirit and scope of the invention.

I claim as my invention:—

1. A tube protector consisting of a shield, said shield being in separable sections, said sections being flared outwardly at one end, slidable fastening means for the sections engageable with the sections at the flared portions and a tube-engaging gasket within and adjacent the end of the shield opposite to the flared portions.

2. A tube protector consisting of a shield, said shield being in separable sections, said sections being flared outwardly at one end, slidable fastening means for the sections engageable with the sections at the flared portion, the flared portions being resilient and a tube-engaging gasket within and adjacent the end of the shield opposite to the flared portions.

3. A tube protector consisting of a shield, said shield being in separable sections and having outwardly flared flexible portions, said sections having flanges to form dovetails, fastening strips slidably applicable to said flanges and at one end being engageable with said flared portion and a tube-engaging gasket within and adjacent the end of the shield opposite to the flared portions.

4. A tube protector consisting of a shield, said shield being in separable sections and having outwardly flared flexible portions, said sections having flanges to form dovetails, fastening strips slidably applicable to said flanges and at one end being engageable with said flared portion, in combination with packing disposable between the flared portions and the tube, and a tube-engaging gasket within and adjacent the end of the shield opposite to the flared portions.

5. A tube protector consisting of a shield, said shield being in separable sections and having outwardly flared flexible portions, said sections having flanges to form dovetails, and fastening strips slidably applicable to said flanges and at one end being engageable with said flared portions, in combination with packing disposable between the flared portions and the tube, a gasket adjacent the other end of the shield, and the shield on the interior being recessed to accommodate the second gasket.

6. A tube protector consisting of a shield, said shield having an interior substantially L-shaped groove, and a gasket of similar shape to the groove and disposed therein, against displacement.

7. A tube protector consisting of a shield in separable sections, said sections being flared outwardly at one end and being flexible, said sections being cut away at the inner surfaces of the flare, a gasket engageable by the cut away portions of the flares, the sections adjacent the other end having a substantially L-shaped groove, a gasket disposed in said groove against displacement, said sections having ribs collectively forming dove tails, and fastening strips having dove tailed grooves to receive said ribs and at one end to bind with said flares.

In testimony whereof I affix my signature in presence of two witnesses.

NOAH D. CLARK.

Witnesses:
GEORGE SCHWANDNER,
ANNA SCHWANDNER.