

UNITED STATES PATENT OFFICE.

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TUBE-PLUG.

SPECIFICATION forming part of Letters Patent No. 530,840, dated December 11, 1894.

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To all whom it may concern:

Be it known that I, ANDREW L. HARRISON, of Wilmington, in the county of New Hanover and State of North Carolina, have invented a new and Improved Tube-Plug, of which the following is a full, clear, and exact description.

The invention relates to closing devices for leaky tubes of steam boilers and other apparatus, and its object is to provide a new and improved tube plug, which is simple and durable in construction, readily applied and arranged to effectually close the tube to prevent leakage.

The invention consists principally of a plug made of wood or similar expansible material, and formed with a rim adapted to be engaged by metallic rims or heads for pressing the plug rims into firm contact with the interior surface of the tube.

The invention also consists of certain parts and details, and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement before tightening the plugs. Fig. 2 is a similar view of the same after tightening; and Figs. 3 and 4 are face views of the inner head.

The improved tube plug is provided with one or more plugs A, A', made of wood or other similar expansible material, slightly less in diameter than the tube on which the plug is to be applied. The plugs A, A', are fitted centrally on a bolt B, carrying on its inner end a head C, and between the plugs A, A' a head D, and on its outer end a head E, adapted to abut against the outer edge of the tube.

Each of the plugs A, A' is formed with an annular rim A², A³ respectively, of which the rim A³ of the plug A' is engaged on the inner face of the plug by a wedge-shaped rim C' formed on the head C. The rim A³ on the outer face of the plug A' is engaged by a wedge-shaped rim D' on the head D, and the

inner face of the plug A is engaged at the rim A² by a like wedge-shaped rim D' on the head D, as plainly illustrated in Fig. 1, it being understood that the said rim D' is made double wedge-shaped as indicated, to simultaneously fit both rims A³ and A².

On the head C is formed a wedge-shaped hub C² adapted to engage a recess A⁴ in the bore of the plug A', and the head D is provided near its middle with an annular wedge-shaped projection D² extending on both sides of the head and adapted to engage annular recesses A⁵ and A⁶ formed in the opposite faces of the plugs A' and A².

In the web of the head C are formed apertures C³ to permit the water in the tube to pass through the head onto the wooden plug A' to expand the same by the moisture passing into the pores of the wood. Similar apertures D³ are formed in the web of the head D to permit water or moisture to pass to the outer wooden plug A. The inner face of the outer head E is adapted to abut against the outer face of the plug A, and when the several parts are in the position shown in Fig. 1 and the operator screws up the nut B² on the bolt B, then the head B' of the said bolt pulls on the head C, so as to draw the rim C' thereof in engagement with the inner beveled face of the rim A³, whereby the said rim is forced outward in firm contact with the inner surface of the tube so as to firmly close the end of the tube. It will further be seen that by the screwing up of the nut B² the two plugs A and A' are forced toward each other by the action of the heads C and E, the latter finally abutting against the edge of the tube. The movement of the plugs A and A' toward each other moves the same in firm contact with the double wedge-shaped rims D' of the head D, so that the corresponding parts of the rims A³ and A² of the plugs A' and A are pressed outwardly in contact with the inner surface of the tube. After the plugs A and A' have been drawn partly tight in the tube A, as described, then the operator unscrews the nut B² from the outer end of the bolt B, removes the head E and substitutes the head F, formed at its outer end

with an annular inwardly-extending flange F' , and with a second wedge-shaped rim F^2 , concentric to the flange F' and adapted to engage the outer end of the rim A^2 of the plug

5 A. This head F is also formed with a wedge-shaped hub F^3 adapted to extend into a recess A^7 formed in the bore of the plug A.

In the space between the flange F' and the rim F^2 is placed cement, so that on screwing
10 up the nut B^2 the cement is pressed onto the edge of the tube, also onto the tube sheet so that a cement joint is formed between the tube and tube sheet, the head F and part of the rim A^2 of the plug A.

15 It will be seen that by the arrangement described, a very secure tube plug is produced, adapted to positively stop any leakage in the pipe or tube. It will further be seen that the tube plug can be very cheaply manufactured,
20 and easily and conveniently applied to the leaky tube.

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

25 1. A tube plug, comprising a plug of expansible material, a head provided near its outer edge with beveled projections adapted to engage the said plug at the inner surface of its rim, and means for forcing the said

projections into the plug, substantially as described. 30

2. A tube plug, comprising a central bolt adapted to receive an outer head, an expansible plug held on the said bolt and provided at its inner end with an inwardly projecting
35 rim, having a beveled inner surface, and an inner head held on the bolt and formed with a wedge-shaped rim adapted to engage the rim of the expansible plug, substantially as described. 40

3. A tube plug, comprising a plurality of expansible plugs, an expanding head located between two adjacent plugs and adapted to engage each of the same, and means for forcing the said plugs toward each other, sub-
45 stantially as described.

4. A tube plug, comprising an expansible plug, an inner head adapted to engage the inner end of the plug, and an outer head for engaging the outer end of the plug, said outer
50 head being provided with a recess adapted to receive the end of the tube, substantially as described.

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Witnesses:

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