C. B. WHITE.

Tube for Surface Condensers.

No. 227,142. Patented May 4, 1880.

Fig. 1.

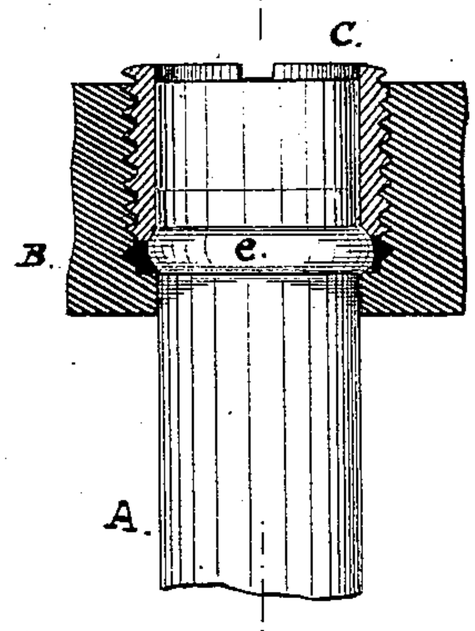


Fig. 2.

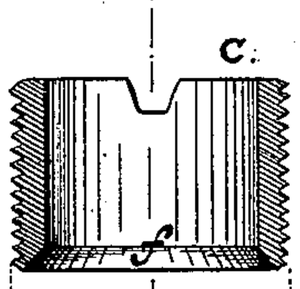
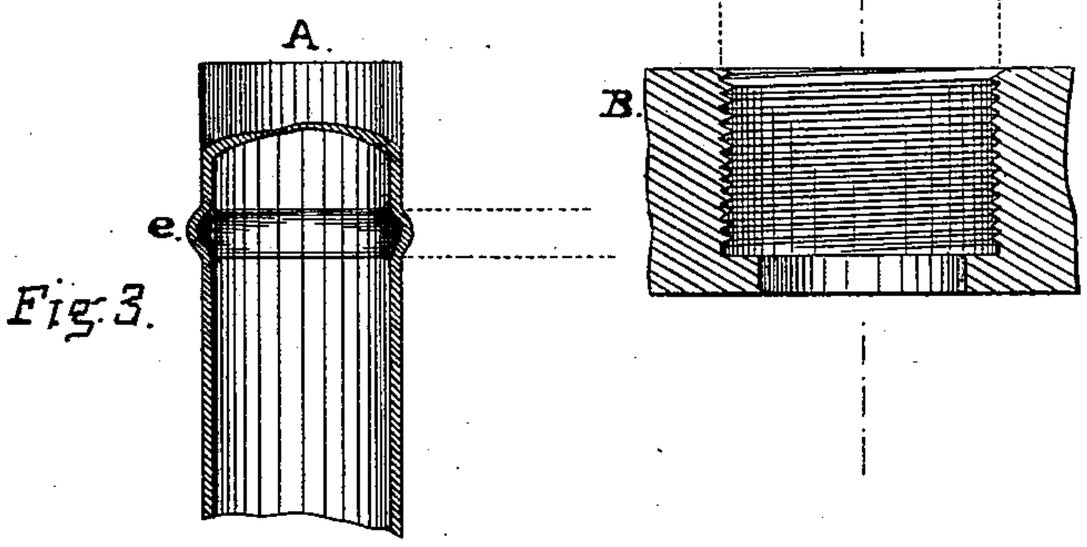


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

CHARLES B. WHITE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO WILLIAM DEACON, OF SAME PLACE.

TUBE FOR SURFACE-CONDENSERS.

SPECIFICATION forming part of Letters Patent No. 227,142, dated May 4, 1880.

Application filed January 19, 1880.

To all whom it may concern:

Be it known that I, CHARLES B. WHITE, of the city and county of San Francisco, in the State of California, have invented certain new and useful Improvements in Tubes for Surface-Condensers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings.

In the construction of surface-condensers for steam-engines numerous devices have been in use for fastening the ends of the tubes in the head of the condenser-vessel. One of the methods heretofore employed was to solder a ring or wire around the tube near one end, so as to form an enlargement that could be secured between a shoulder in the head on one side and a gland or follower on the opposite side. This fastener has caused a great deal of trouble by reason of the rings being stripped off the tubes by the continual expansion and contraction to which the tubes are subjected.

My invention relates to this class of fastenings; but instead of soldering a ring or wire around the tube to form the enlargement, I ream a bead in the tube itself, so as to produce a swell or enlargement directly in its tube material entirely surrounding the tube, with which I combine a screw-threaded ring or thimble, with its inner end beveled on its inside, and a packing. This ring or enlargement then forms an integral part of the tube, which cannot be pulled off without destroying the tube.

Referring to the accompanying drawings, Figure 1 shows the end of one of my improved tubes and the manner of securing it in the tube-sheet, this latter part being in section. Fig. 2 is a detail view, in section, of the screw-threaded ferrule and a part of the tube-sheet into which it fits. Fig. 3 is a detail view of an end of one of my condenser-tubes.

A is a section of a tube such as is used in the construction of surface-condensers, and B is a section of one of the heads of the condenser. The ends of these tubes pass entirely through the heads of the condensing-vessel and are packed and secured by some convenient device.

In order to provide a suitable enlargement on the end of the pipe for staying it in the head, I take each tube, after it has been cut to the desired length, and insert a beading-tool, such as is used by tinners for forming beads on pipes or tin material, into the end of the tube, and compress it against the tube at the desired distance from its end. A few turns of this tool will then cause it to traverse around the interior of the tube and press a narrow portion of the tube material outward, so as to form a projecting bead, swell, or enlargement, *e*, on the exterior of the tube. The hole in the head of the condenser-vessel through which the tube is inserted and in which its end is secured is made small enough at the inner part of the head to prevent this swell, enlargement, or bead from passing through, while the outer portion of the hole is considerably larger, so as to form an annular space surrounding the outer end of the tube. This outer portion is tapped with internal screw-threads. Suitable packing is then placed in this annular space, around the outer end of the tube, and a ring, C, the exterior of which is tapped with screw-threads, is then passed over the end of the tube and screwed into the annular space, so as to compress the packing against the outer side of the swell or enlargement and make a tight joint between the bead and ring. The inner end of this ring or thimble is beveled upon its inside, as at *f*, as clearly seen in Fig. 2, the object of which is to permit the ring, or rather that end thereof, to fit snugly and tightly upon the bead, swell, or enlargement *e* of the tube, to serve directly to confine the tube in place without the aid of the packing, as in the method heretofore adopted using a packing.

It will further be seen that by thus beveling the ring or thimble the packing is compressed into the least possible space, and thus serves to render the joint perfectly water, steam, or air tight. This forms a fastening that cannot give way without pulling the tube to pieces, as the bead forms an integral part of the tube.

Any suitable beading-machine can be used for forming the bead or projection; but the operation is easily and quickly performed by the beading-machine above alluded to.

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

The combination, with the tube having an external bead, swell, or enlargement, and the head having an enlarged opening, of the screw-threaded ring or thimble, with the inside of its inner end beveled, and the packing compressed around the bead of the tube by the ring or thimble, substantially as and for the purpose specified.

In witness whereof I have hereunto set my hand and seal.

CHARLES B. WHITE. [L. S.]

Witnesses:
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