W. A. Lightall

Securing Tubes in Condensers

No. 75,173 Patented Mar. 3 1868

Fig. 1.

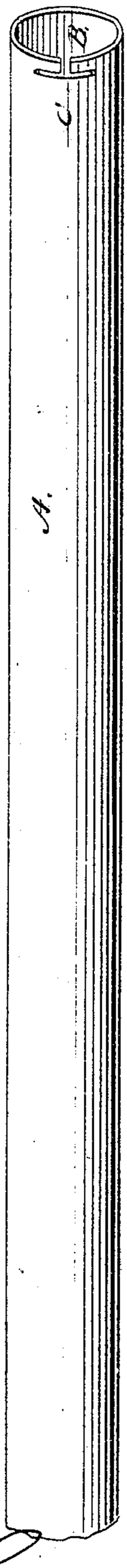
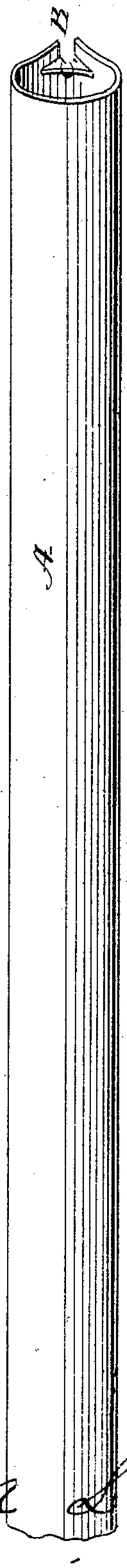


Fig. 2.



Witnesses
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WILLIAM A. LIGHTHALL, OF NEW YORK, N. Y.

Letters Patent No. 75,173, *dated March* 3, 1868.

IMPROVED MEANS FOR SECURING TUBES IN SURFACE-CONDENSERS.

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, WILLIAM A. LIGHTHALL, of the city, county, and State of New York, have invented certain new and useful Improvements in Securing the Tubes of Surface-Condensers for Steam-Engines; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is a perspective view of the tube, showing the slotted apertures in the end of the same, and

Figure 2 is a similar view, showing the lock or fastening made by setting out the slits on the tube.

In surface-condensers, which have the tubes held in place in the tube-heads of the condenser by packings of wood, paper, or other material, to keep them tight and from leakage, when no follower or other analogous means are used to restrain the tubes from moving from position, it is found, in practice, that they are subjected to a movement in the heads, which sometimes takes some of them out of one of the heads of the condenser to which they are attached. This movement is technically termed "crawling," but the cause that produces this movement is as yet unaccounted for. In some cases the tubes "crawl" with the current of cooling water passing through them, and in other cases against the current. If but a few of them move out of the heads, the efficiency of the condenser is materially affected, and if many of them do so, its efficiency is entirely destroyed.

To remedy and overcome this defect is the object and purpose of my invention, which consists in making a longitudinal slit in each end of the tube for a short distance, say one-eighth of an inch, and then cross-cutting such slit at the bottom end with another slit that will make in appearance what is technically termed a "bayonet joint;" the lips of the slit thus made being turned outward, slightly, after the tube is put to place in the tube-head, and properly secured against leakage by packing, so as to hold the tube securely from any longitudinal movement in the head-sheet, and so as to prevent the "crawling" before named.

A is the condenser-tube, B the longitudinal slit, and C the cross-cut slit. As shown in fig. 1, the tube is prepared to be put to place in the tube sheet of the condenser, and in fig. 2 the tube is shown with the lips expanded and set out after being properly secured to place in the tube-sheet, by the proper packing, as before named.

In case the tubes require to be removed from the condenser for any cause, the "lips" of the slits, before named, can be readily set back to place by a pair of pincers or nippers, and can then be re-inserted in place, and be secured as at first.

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

Making the slotted apertures in the ends of the tubes of surface-condensers for steam-engines in the manner and for the purposes set forth.

WM. A. LIGHTHALL.

Witnesses:

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