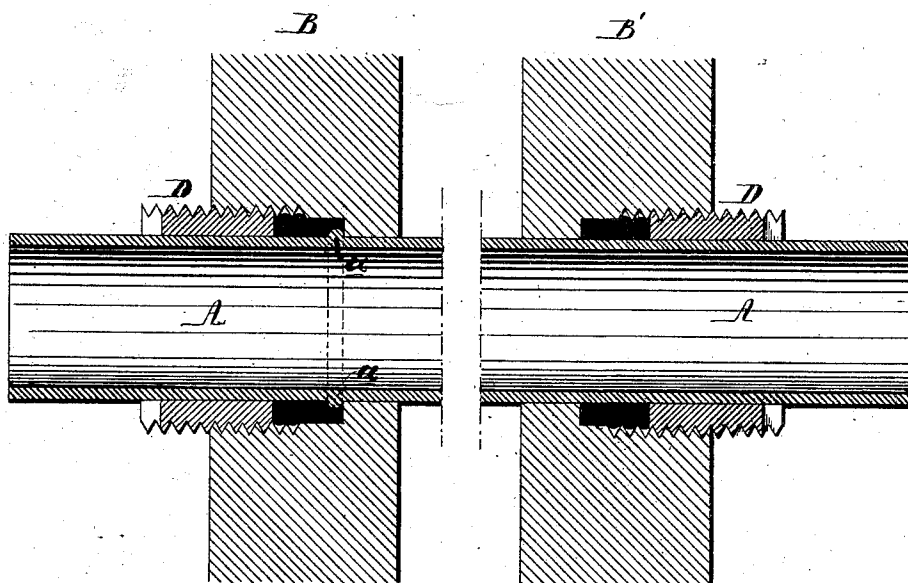


S. ARCHBOLD.
Condenser Tube-Fastenings.

No. 143,314.

Patented September 30, 1873.



Witnesses, Hubert Howson
Harry Smith

Samuel Archbold
by his Attys.
Howson and Son

UNITED STATES PATENT OFFICE.

SAMUEL ARCHBOLD, OF CHESTER, PENNSYLVANIA.

IMPROVEMENT IN CONDENSER-TUBE FASTENINGS.

Specification forming part of Letters Patent No. **143,314**, dated September 30, 1873; application filed August 9, 1873.

To all whom it may concern:

Be it known that I, SAMUEL ARCHBOLD, of Chester, Delaware county, State of Pennsylvania, have invented Improvements in Surface-Condensers, of which the following is a specification:

The object of my invention is to prevent the displacement of tubes in surface-condensers, by attaching to the tube A a collar or projection, *a*, to be confined within the stuffing-box, by which the tube is packed in the side B of the condenser, as illustrated in the accompanying drawing, which represents portions of the opposite sides of the condenser, and of one of the tubes in section, the view being made to a scale of double the actual size for the better illustration of my invention. A serious defect in modern surface-condensers is the gradual longitudinal displacement of the tubes by the violent action of the steam or water, as the case may be, which rushes through the tubes. This defect I remedy in a manner which I will more particularly explain.

A A represent portions of one of the tubes, and B and B' parts of the opposite sides of a surface-condenser. Part of the hole in each side of the condenser for admitting the tube is enlarged and threaded for the reception of

a threaded follower, D, which surrounds the tube, and is secured, by a suitable instrument, tight against the packing *b*, both ends of the tube, where they pass through the sides of the condenser, being thus rendered perfectly steam and water tight. The action of the steam in rushing through the tubes, however, is so violent that the stuffing-boxes will not, of themselves, prevent the gradual longitudinal displacement of the said tubes; hence, I combine with the stuffing-box and tube a collar or projection, *a*, on the latter, this collar being so effectually confined by the packing and follower that the longitudinal displacement of the tube is impossible. The tubes can be readily removed after withdrawing the followers.

I claim as my invention—

A surface-condenser having tubes, each of which has a projection or collar, *a*, confined to one side of a condenser by a follower and its packing, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL ARCHBOLD.

Witnesses:

HARRY SMITH,
HUBERT HOWSON.