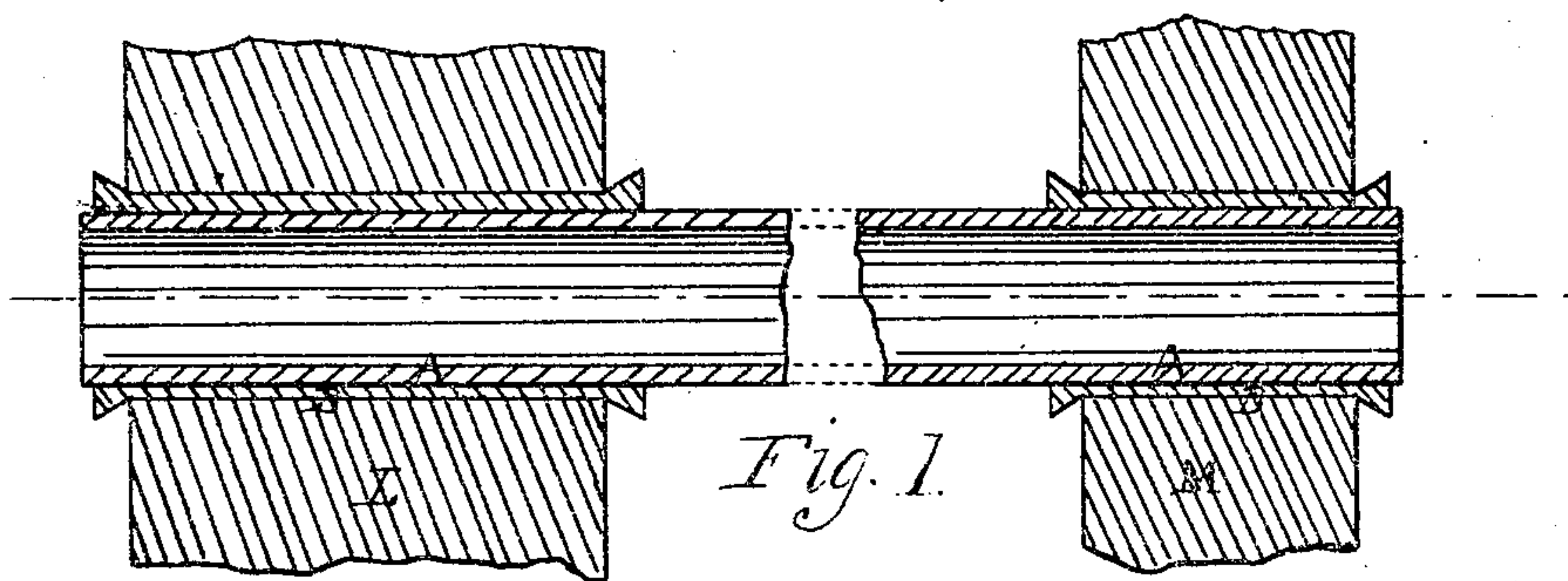
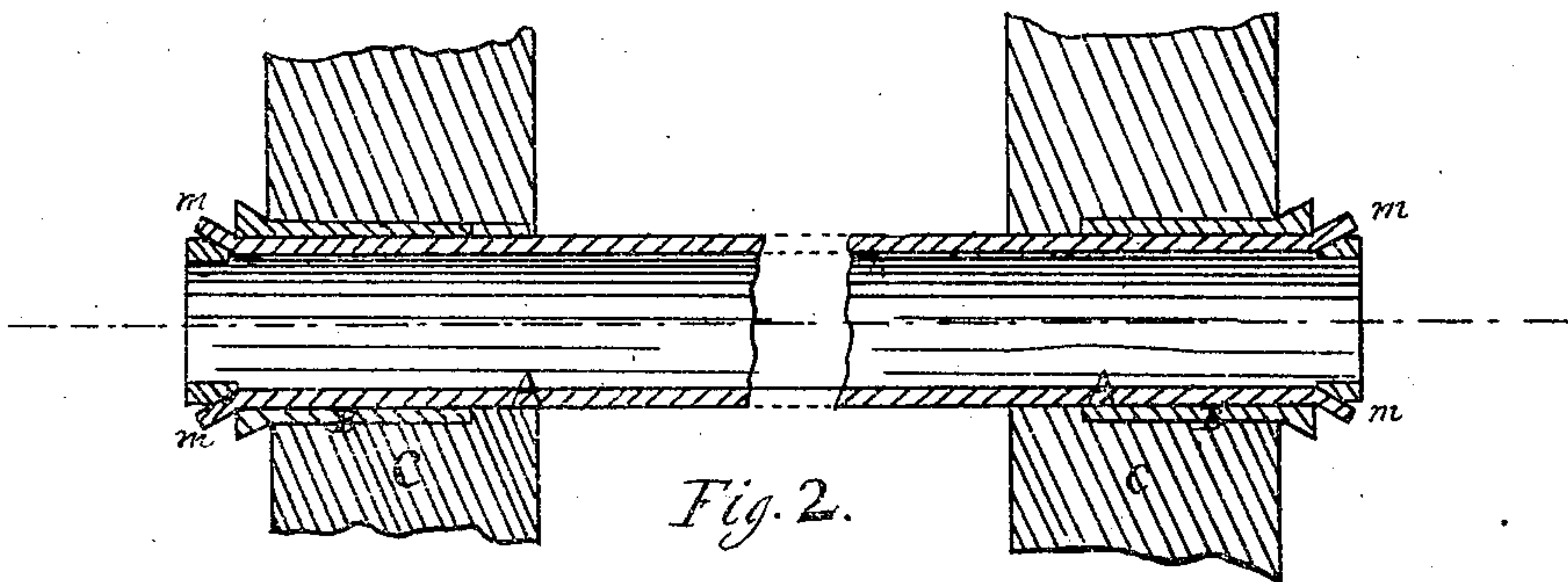
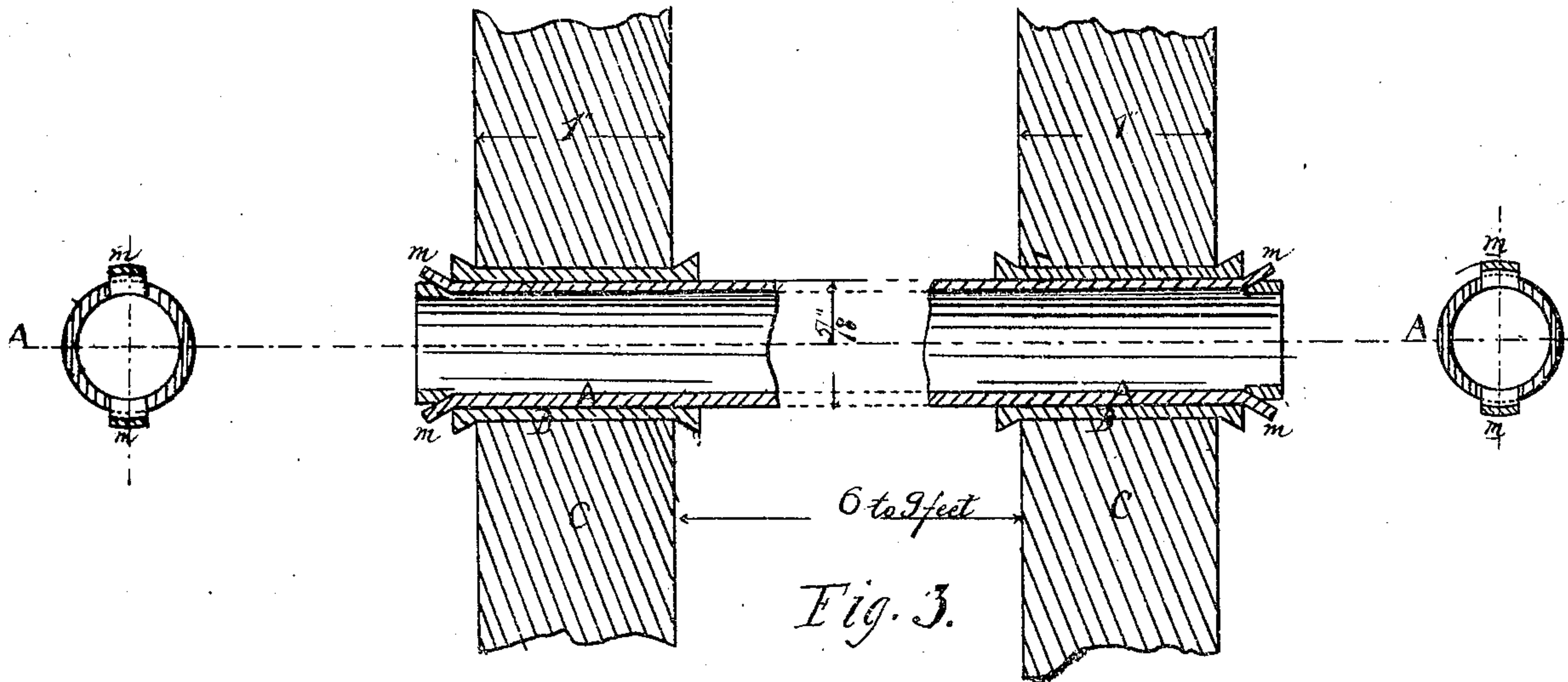


H. Allen.

Connecting Tubes with Surface-Condensers.

N^o 73221

Patented Jan. 14, 1868.



Witnesses:

Inventor:

Chas. L. Taylor.
Fred W. Child

Horatio Allen

United States Patent Office.

HORATIO ALLEN, OF NEW YORK, N. Y.

Letters Patent No. 73,221, dated January 14, 1868.

IMPROVEMENT IN CONNECTING THE TUBES WITH THE HEADS OF 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, HORATIO ALLEN, of the city and State of New York, have invented "Improvements in Tube-Joints;" and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In tubular surface-condensers, and other instruments where the combination of the tubes with the tube-head allows a movement of the tube in the joint, it sometimes occurs that the tube, under the effect of successive expansions and contractions, will have a continuous movement in one direction, which may cause it to leave the head. The objects of my present improvements are either to cause the expansion to take place only in one head, or to make such provision that the tube cannot leave either head under the influence of expansion and contraction.

I effect the first object by making one tube-head of greater thickness than the other. This is shown in fig. 1. L and M are the two heads; the head L is thicker than the head M, (say, one, one and a half inch thick; the other one, one inch thick.) There will then be greater resistance to movement in the thick head, and consequently all the movement from expansion and contraction will be in the thin tube-head, and the end of the tube in the thick head will have no movement in the head. To effect the second object, I make provision, by cutting in each end of the tube one or more tongues, about three-sixteenths wide and three-sixteenths long, and after the tube is in place, bending out the tongues into a bell-mouth form.

Figure 1 or 2 represents a tube in its tube-heads, with the bell-mouth tongues.

A is the tube, *cc* the tube-heads; B is the packing, of any kind that makes the joint tight; *mm* are tongues cut into the end of the tube, about three-sixteenths wide and three-sixteenths long. After the tube is in its place the tongues *mm* are bent outward, as represented. Ample allowance for range of expansion and contraction is made in the length between the tongues at one end and the tongues at the other end. When a tube is to be removed, a few slight blows on the tongue will restore it into its original position as part of the tube; and when the tube is replaced, a slight action on the tongue will bend it out to the bell-mouth form.

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

1. Making one of the tube-heads of greater thickness than the other, in the manner and for the purpose herein described.

2. I claim cutting, and bending into bell-mouth form, tongues in the ends of the tubes, for the purpose and substantially in the manner herein described.

HORATIO ALLEN.

Witnesses:

CHAS. A. TAYLOR,
FRED. W. CHILD.