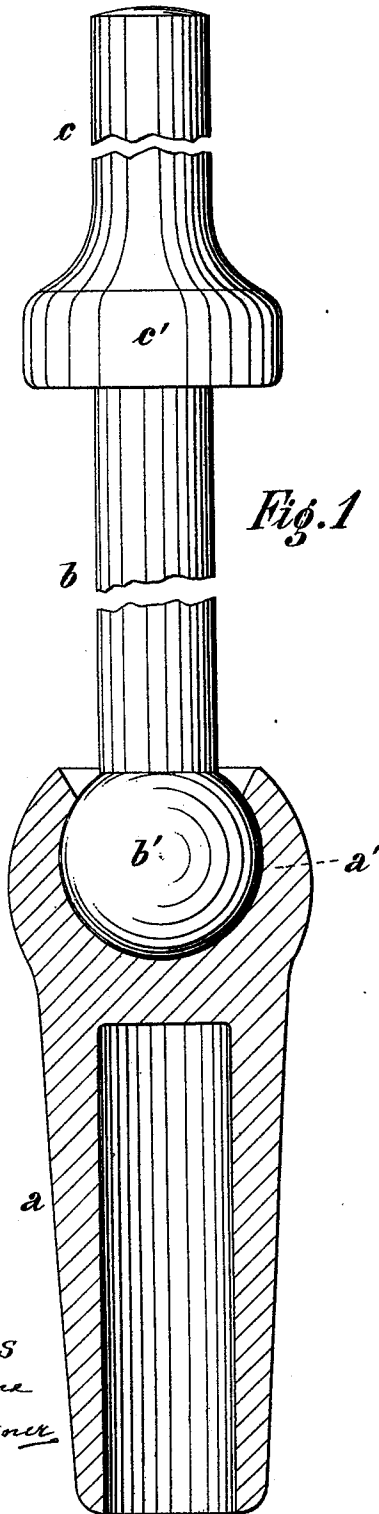


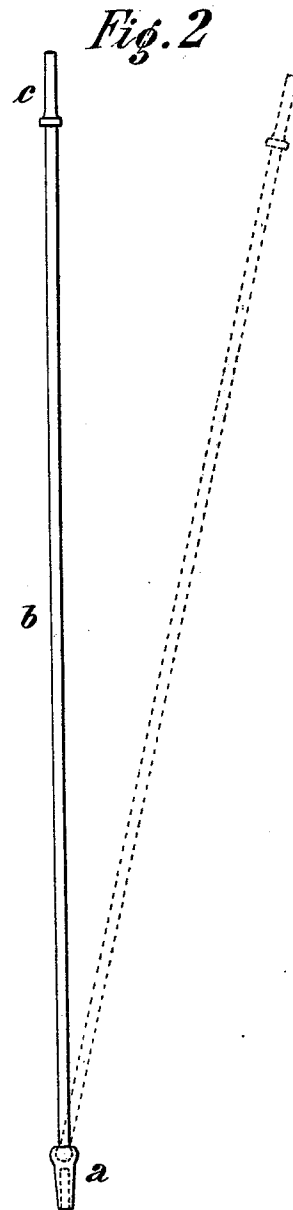
C. WINORD.
TUBE-EXPANDER.

No. 175,316.

Patented March 28, 1876.



Witnesses
Hemi Guillaume
Gustavus Lessor



Inventor
Christian Winord
per Henry Orth
att'y

UNITED STATES PATENT OFFICE.

CHRISTIAN WINORD, OF VIENNA, AUSTRIA.

IMPROVEMENT IN TUBE-EXPANDERS.

Specification forming part of Letters Patent No. **175,316**, dated March 23, 1876; application filed January 11, 1876.

To all whom it may concern:

Be it known that I, CHRISTIAN WINORD, of Vienna, Empire of Austria, have invented a new and useful Improvement in Tools for Expanding the Ends of Boiler-Tubes, which improvement is fully set forth in the following specification, reference being made to the accompanying drawings.

The object of this invention is to supply a simple tool for quickly upsetting, expanding, or calking the ends of locomotive-boiler tubes which may become loose and leak while in use. Leaking tubes can thus be calked while the locomotive is running, and without disturbing the fire.

With reference to the accompanying drawings, Figure 1 shows the tool about full size, and partly broken and partly in section. Fig. 2 shows the entire tool, the dotted lines indicating its position when used at an angle.

This tool consists, as shown in the drawings, of a conical mandrel, *a*, connected with a bar, *b*, by means of a ball-and-socket joint, *a' b'*. The length of the bar *b* varies according to the depth of the fire-box, and has to be such as to enable the person using it to conveniently handle the tool. Near the end of the handle *c* of the tool there is a projection, *c'*. When the end of a boiler-tube requires calking, the tool is inserted through the fire-door into the fire-box, and the mandrel *a* thrust into the boiler-tube. The other end of the tool is then struck with a hammer, weighing not more than about two or three pounds. For with-

drawing the tool the projection *c'* has to be struck by the hammer in the contrary direction.

The ball-shaped end *b'* of the bar *b* fits into the socket *a'* of the mandrel *a*, and thus forms a ball-and-socket joint, enabling the tool to assume any position necessary for facilitating the calking of any one of the tubes, taking place by inserting the tool through the fire-door.

It has been found in practice that, on account of the ball-and-socket joint, the effect of the blow struck against the end of the tool is pretty equally distributed over the entire surface of the end of the tube surrounding the mandrel.

In order to diminish the weight of the tool, the mandrel is preferably made hollow, as shown.

I claim—

1. A tool for calking boiler-tubes, and consisting of a mandrel, connected by a ball-and-socket joint to a bar and handle.

2. The combination of a mandrel, *a*, joint *a' b'*, and bar *b*, with handle *c* and projection *c'*, essentially as described, and for the purpose described.

In witness that I claim the foregoing, I have hereunto set my hand this 9th day of December, 1875.

CHRISTIAN WINORD.

Witnesses:

C. O. PAGET,
T. BARTA.