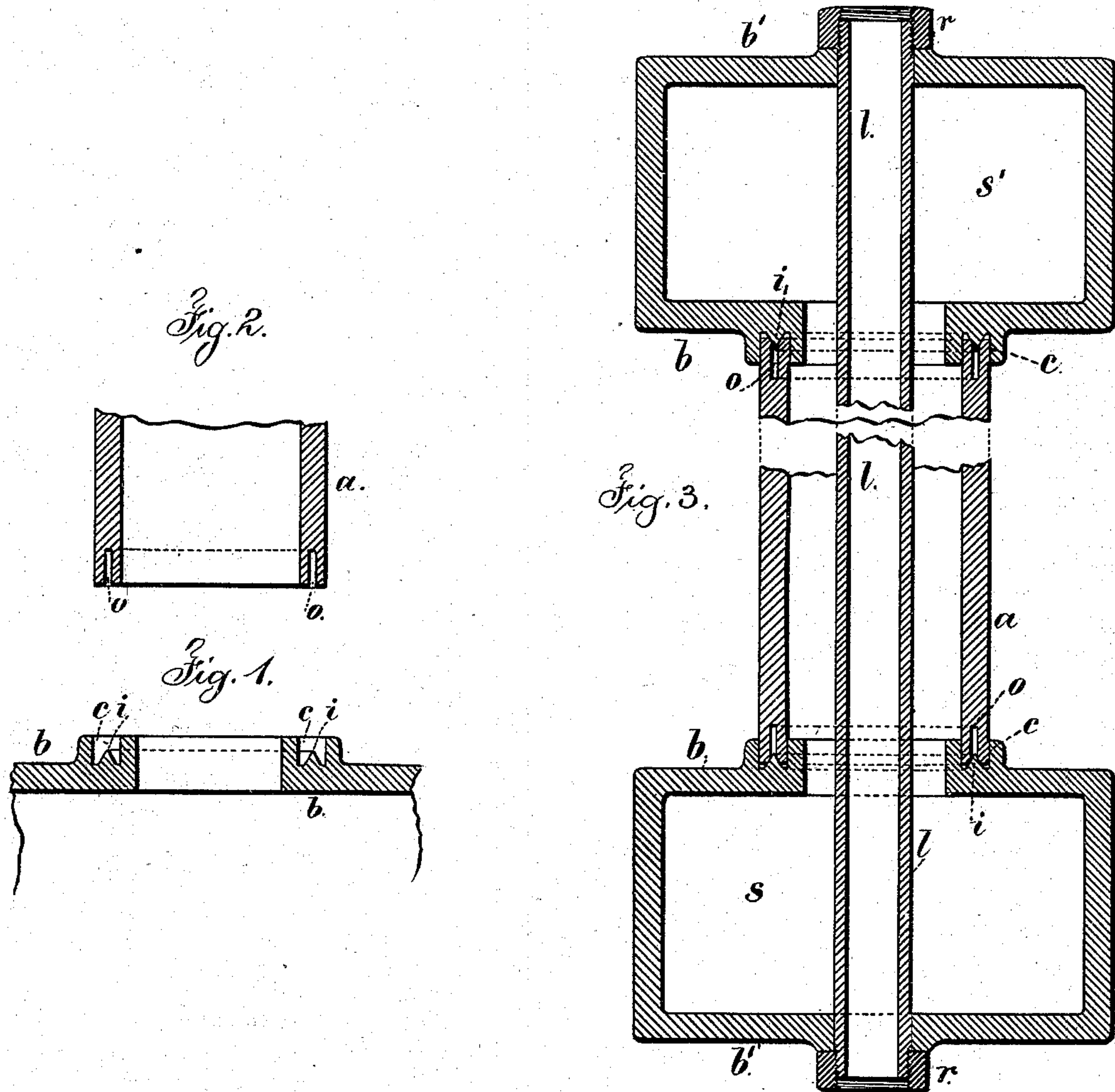


(Model.)

J. A. REED.
BOILER TUBE JOINT.

No. 249,546.

Patented Nov. 15, 1881.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN A. REED, OF NEW YORK, N. Y.

BOILER-TUBE JOINT.

SPECIFICATION forming part of Letters Patent No. 249,546, dated November 15, 1881.

Application filed July 16, 1881. (Model.)

To all whom it may concern:

Be it known that I, JOHN A. REED, of the city and State of New York, (formerly of Duncellen, in the county of Middlesex and State of New Jersey,) have invented an Improvement in Joints for Boiler-Tubes, of which the following is a specification.

The object of this invention is to render the joint between the end of the tube and tube sheet or plate water-tight, and to allow the parts to be pressed together to a greater or less extent without the risk of leakage by expansion or contraction. The tube sheet or plate is made with an annular recess for receiving the end of the tube, and in the bottom of the said recess is an annular V-shaped rib. The end of the tube is turned off true, and a narrow circular channel is turned in the end of the tube to rest upon the rib, so that when the tube sheets or plates at the respective ends of the tube are drawn toward each other the V-rib will enter the circular channel and spread the metal each way and form a tight joint, regardless of the extent of compression, until the edge of the V-rib touches the bottom of the circular channel. This allows for a number of tubes to be confined simultaneously, and each one to take a correct even bearing and form a tight joint, and compensates for inaccuracy of workmanship and of pressure in screwing the various bolts.

In the drawings, *a* represents the metal tube, and *b* the tube sheet or plate to which the end of the tube is connected. This plate *b* is part of the water box or case of the boiler, heater, or radiator. Upon the surface of the tube-sheet there is a circular boss or projection, within which the annular groove *c* is turned, as shown in the separate section, Fig. 1, and there is a V-shaped annular rib, *i*, at the bottom of the annular recess. Each end of the tube *a* is turned up true and a narrow circular recess cut in the end, as shown at *o* in the section Fig. 2.

When the parts are put together, as shown in the section, Fig. 3, and forced together by

pressure, the V-rib entering the circular recess spreads the metal, making a tight joint. The tube *l*, passing across the water or steam space *s* in the heater or boiler or radiator, passes through the metal of the case or plate *b'*, and is screwed into the same, or else has a nut, *r*, applied to the same, so as to apply the necessary force to draw the end of the tube *a* against its V-shaped rib within the recess of the plate *b*, and spread the metal and confine the same between the V-rib and the walls of the annular groove.

It is to be understood that in a boiler with vertical tubes the space *s* is filled with water, and also the tube *a*, up to a desired water-line, and the space *s'* in the upper case may be for steam, and the products of combustion from the fire will pass through the tube *l*, and in steam-boilers the products of combustion will also act outside the tube *a*.

If the improvement is used in a radiator, the steam or heated gases will be within the spaces *s s'* and tube *a*, and heat will be radiated from the tube *a* and to the air that circulates through the tube *l*.

I claim as my invention—

1. The joint for wrought-metal tubes, composed of the V-shaped annular rib in direct contact with the metal at the end of the tube, the said tube having a circular groove, into which the V-shaped rib passes and spreads the metal when under compression, substantially as specified.

2. The combination, with the tube *l*, case *b b'*, and nut *r*, of the tube *a*, with a circular recess in the end, the annular recess *c* in the plate *b*, and the rib *i*, substantially as and for the purposes set forth.

Signed by me this 18th day of June, A. D. 1879.

JOHN A. REED.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.