

A. S. HICKEY.
 MEANS FOR PREVENTING RUST IN BOILERS.
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999,108.

Patented July 25, 1911.

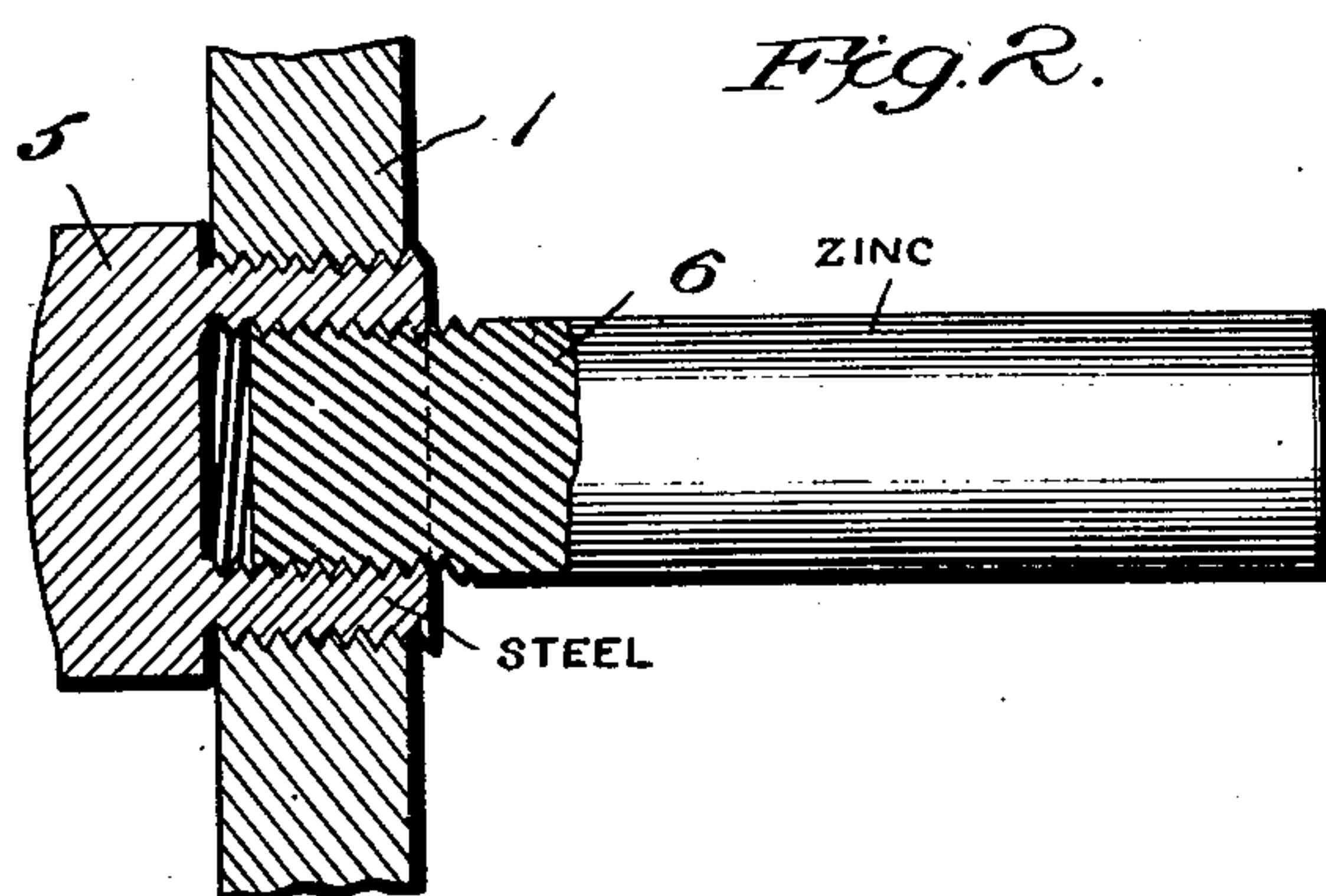
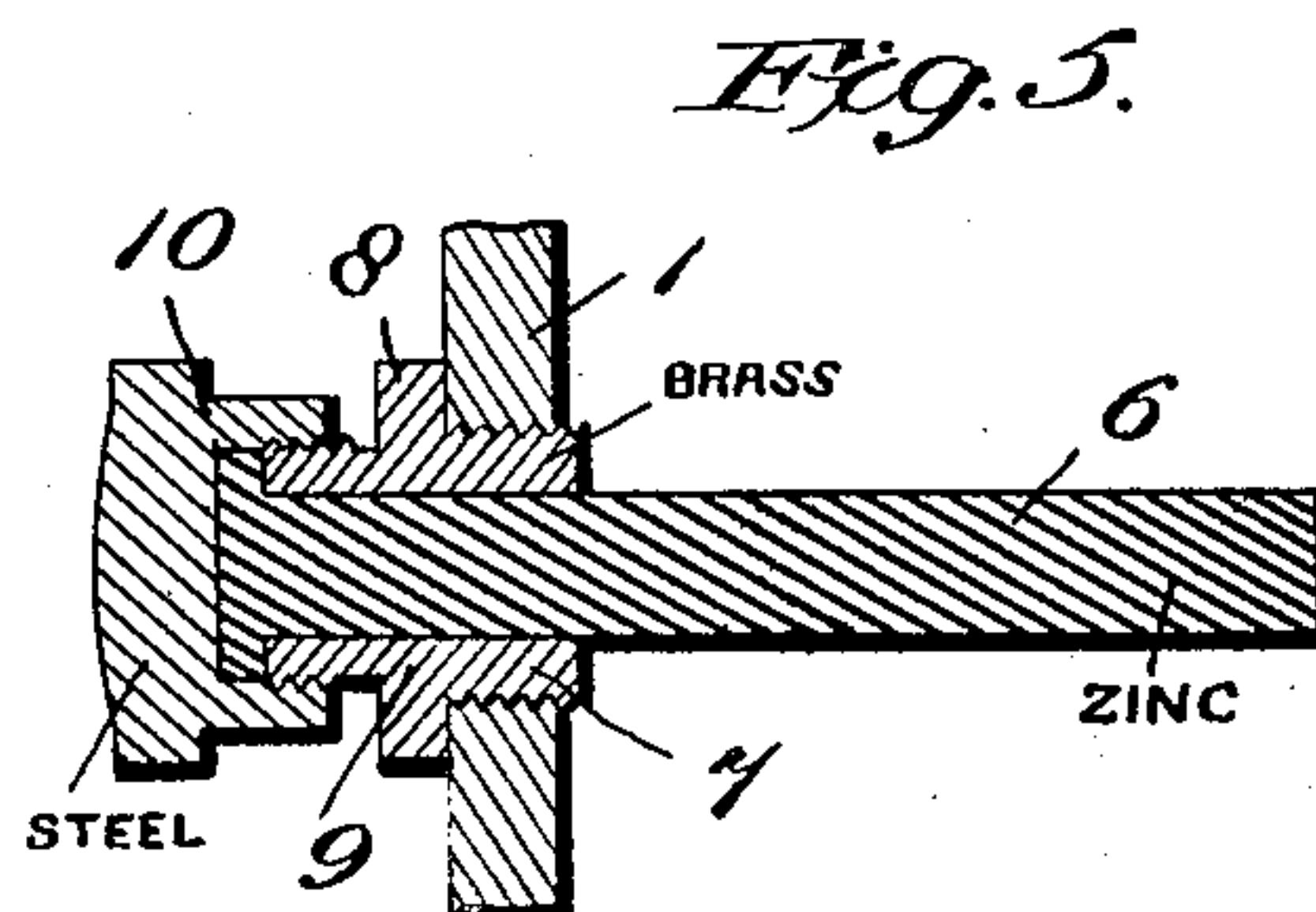
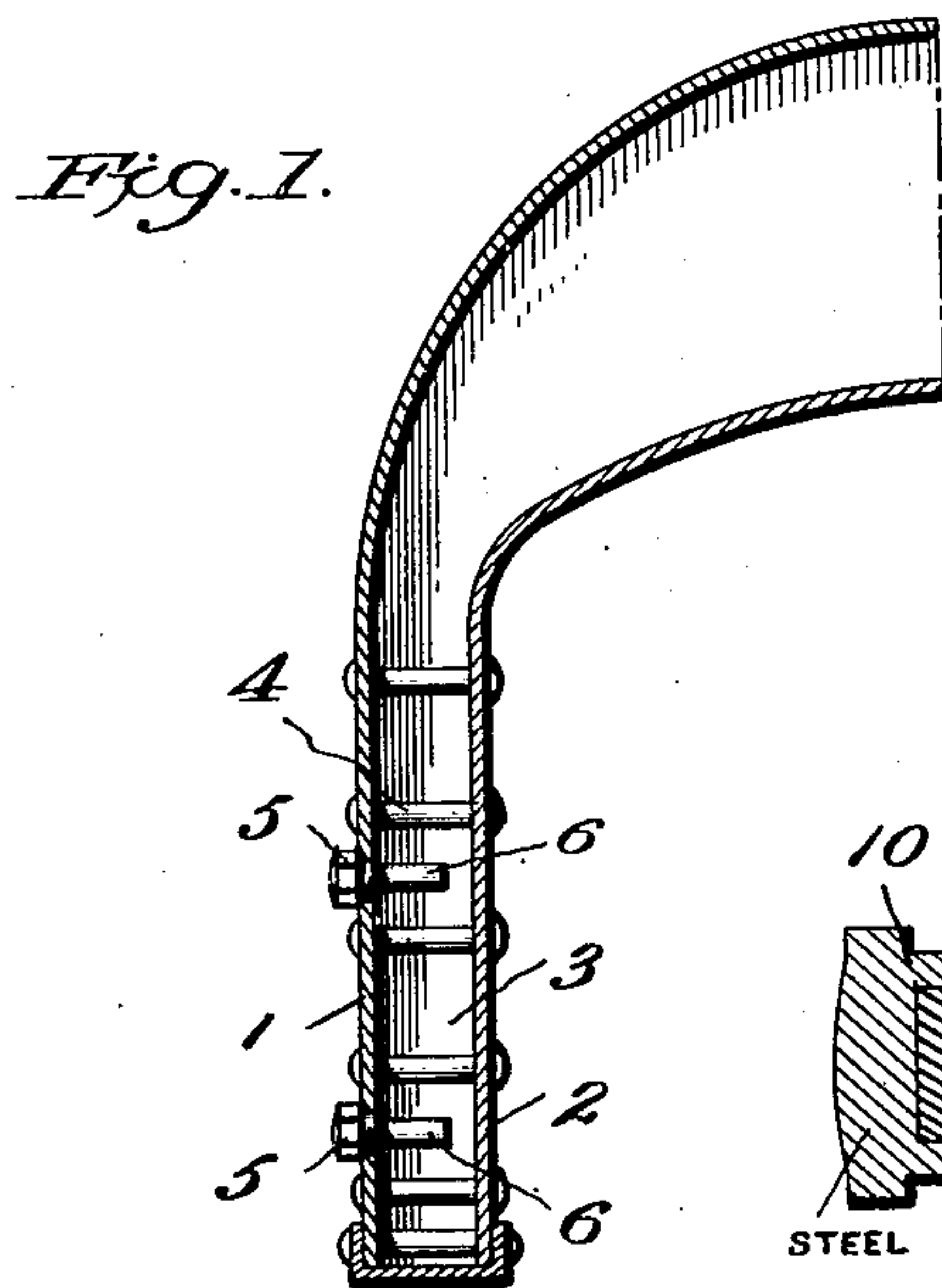


Fig. 3.

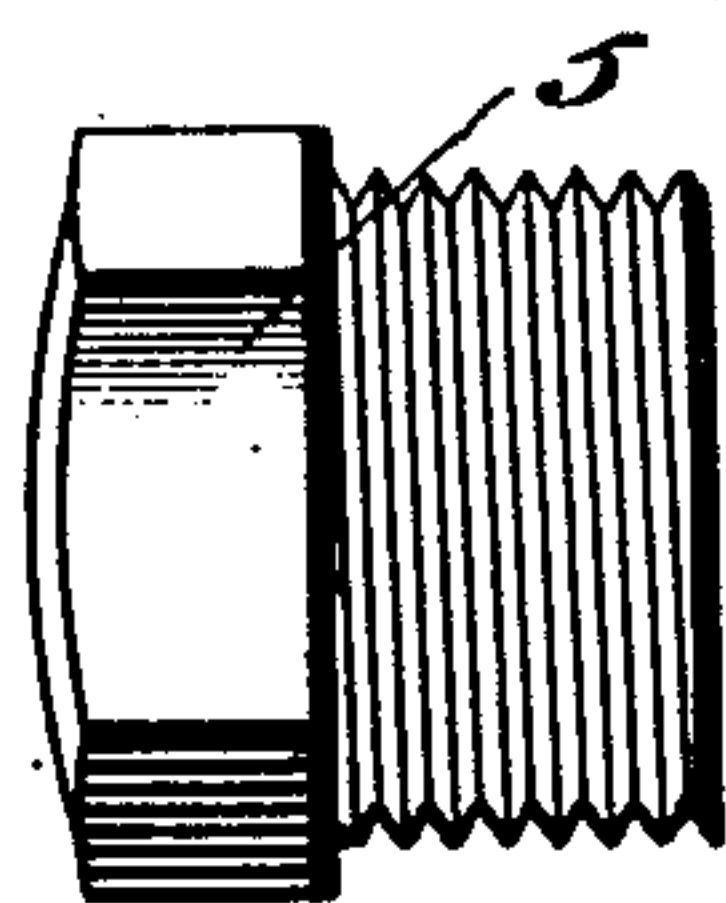
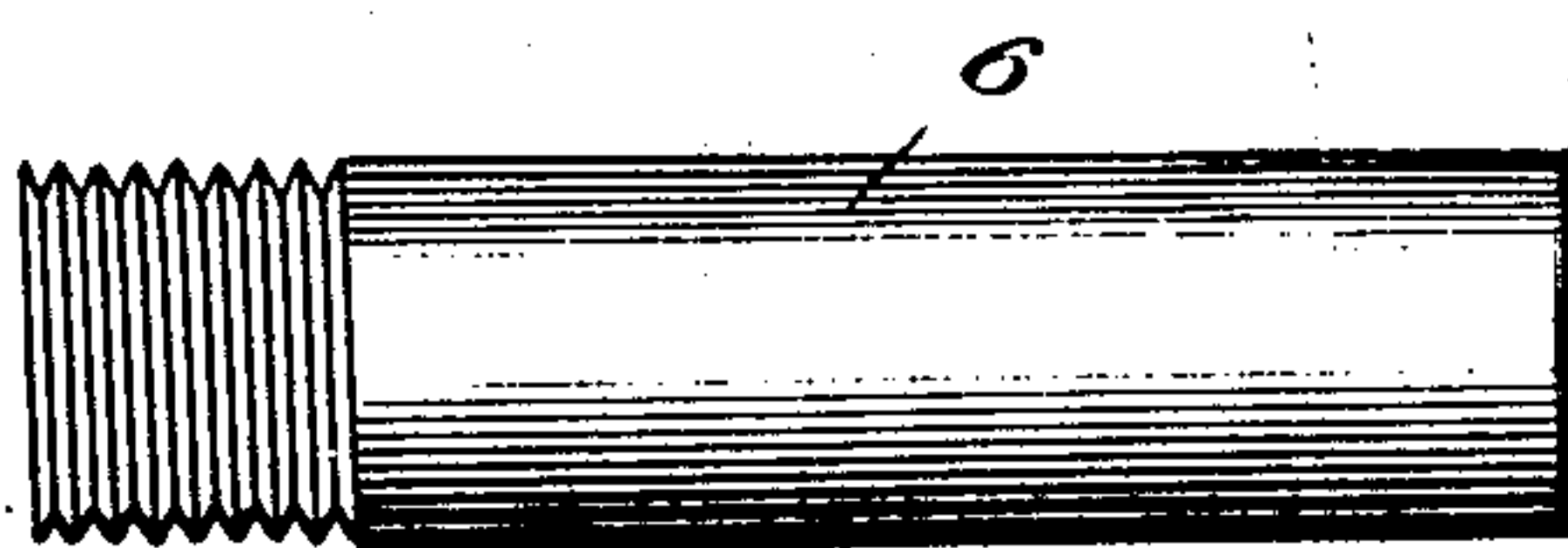


Fig. 4.



Witnesses
Geo. A. Deane.
Edwin J. Belter.

Inventor
A. S. Hickey by
Wm. A. Fisher &
Wichaspoon
 Attorneys

UNITED STATES PATENT OFFICE.

ANDREW S. HICKEY, OF THE UNITED STATES NAVY.

MEANS FOR PREVENTING RUST IN BOILERS.

999,108.

Specification of Letters Patent.

Patented July 25, 1911.

Application filed December 31, 1910. Serial No. 600,295.

To all whom it may concern:

Be it known that I, ANDREW S. HICKEY, ensign, of the United States Navy, a citizen of the United States, at present attached to the U. S. S. *Dolphin*, Washington, District of Columbia, have invented certain new and useful Improvements in Means for Preventing Rust in Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to means for preventing rust in boilers, and has for its object to produce a simple and efficient apparatus which may be applied to those portions of boilers which at present are subjected to corrosion or rust, and are so inaccessible that it is not at present practicable to place zinc therein by the ordinary methods usually employed.

To these ends the invention consists in the novel details of construction and combinations of parts more fully hereinafter disclosed and particularly pointed out in the claim.

Referring to the accompanying drawings forming a part of this specification in which like numerals designate like parts in all the views:—Figure 1 is a diagrammatic view of a portion of a boiler with my invention applied thereto; Fig. 2 is a sectional view on an enlarged scale showing a portion of a boiler shell with my invention in place; Fig. 3 is a view of the threaded hollow bolt or nut-like portion of my invention; Fig. 4 is a plan view of the zinc rod detached from the nut-like portion shown in Fig. 3; and Fig. 5 is a view of a modified form of the invention.

1 indicates an outer shell of a boiler, and 2 the inner shell thereof, said shells forming a narrow and restricted space 3, such as a water leg, while 4 represents the usual stay bolts, which pass through such spaces as 3.

In the case of locomotive boilers having restricted spaces or water legs similar to 3, there is a law, as is well known, which prohibits any hand holes or man holes through the outer shell that would be available for the placing of zinc in such spaces. It results from this law that the zincs which are actually used in such boilers are placed at

such great distances from these inaccessible spaces that the protection of said spaces afforded by said zincs is wholly inadequate. The reason for this is apparent when it is considered that the zincs used in boilers are merely one pole of a galvanic couple of which the boiler shell is the other pole, and that the circuit necessarily follows the path of least resistance, which of course is a path not leading a very great distance from said zinc. In other words, when it comes to inaccessible spaces such as 3, the resistance to the current is entirely too great for the zinc to afford much protection. It consequently results that boilers of the type above mentioned, do in fact suffer from corrosion or rust very materially in their inaccessible spaces or water legs. In order to avoid these objections, I tap holes through the shell of the boiler, as indicated, and screw therein the hollow bolt-like nut 5 in which is threaded the zinc rods 6, as shown. The hollow bolt-like nuts 5 being firmly threaded in the shell 1, they can stand just as much pressure as may be put upon the boiler, and being of a comparatively small size, they do not protrude greatly beyond the outer surface of the boiler, and therefore, are not liable to be accidentally detached. Of course, as many of these headed bolts may be employed as is necessary to protect the space 3, and whenever a zinc rod 6 is eaten up, it is only necessary to unscrew the bolt 5 and supply it with a new zinc. The zincs 6 are preferably made about the same size as the stay bolts 4, and therefore they may be spaced in spaces such as 3, without taking up any more room than would extra stay bolts. The threaded connection between the hollow bolt 5 and the shell 1 makes an efficient electrical connection, as does also the threaded connection between the zinc 6 and the said hollow bolt 5. It, therefore, follows that little, if any, appreciable resistance through the joint is encountered by the low voltage engendered by this couple.

In the modification shown in Fig. 5, the bolt 7 is provided with a collar and a threaded extension 9, over which fits the threaded cap 10, while the zinc 6 passes entirely through said bolt 7. In all cases, if desired, the bolts 5 or 7 may be made of brass or other noncorroding metal so that they will

always be easy to unscrew for the purpose of replacing the zincs 6.

What I claim is:—

An article of manufacture for use in preventing boilers from rusting, consisting of a headed, hollow, threaded bolt adapted to be secured to a boiler shell; a headed zinc rod secured in said bolt; and a cap fitting

over said bolt and rod substantially as described.

In testimony whereof, I affix my signature
in presence of two witnesses.

ANDREW S. HICKEY.

Witnesses:

T. A. THOMSON, Jr.,

M. M. LEON.