No. 868,076. PATENTED OCT. 15, 1907.

W. CROSS.

MEANS FOR JOINING PLATES.

APPLICATION FILED OCT. 8, 1906.

Fig. 1.

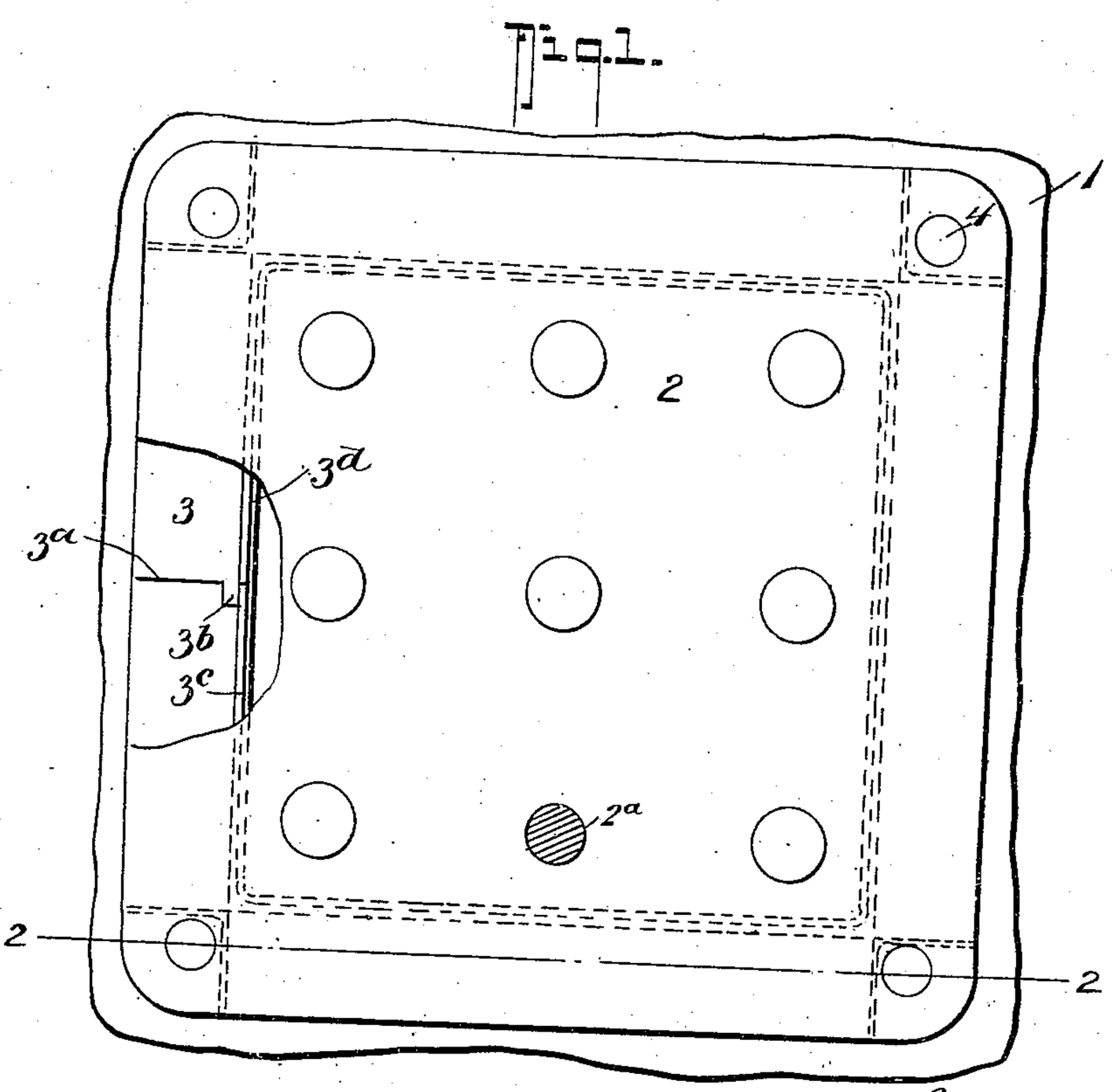


Fig. 5.

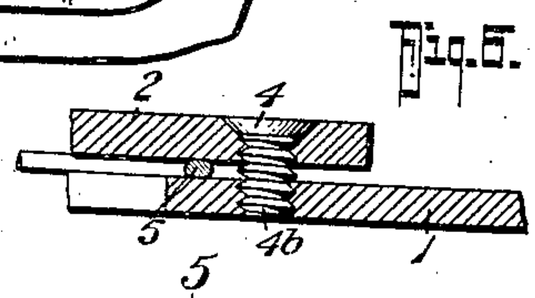


Fig. 2.

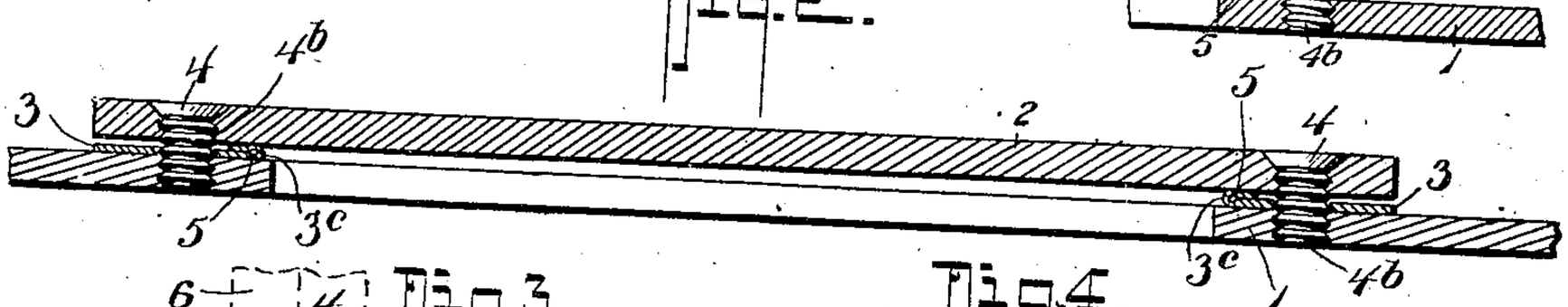


Fig. 3.

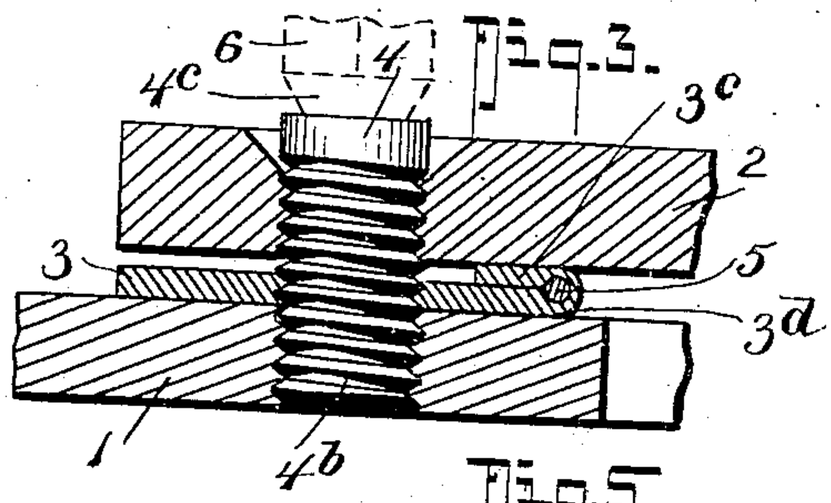


Fig. 4.

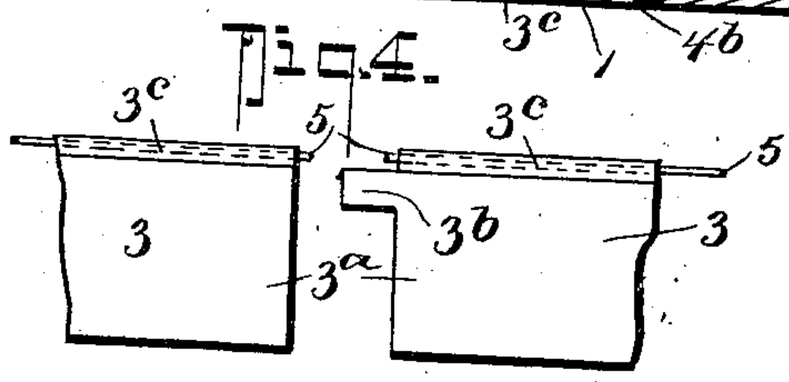
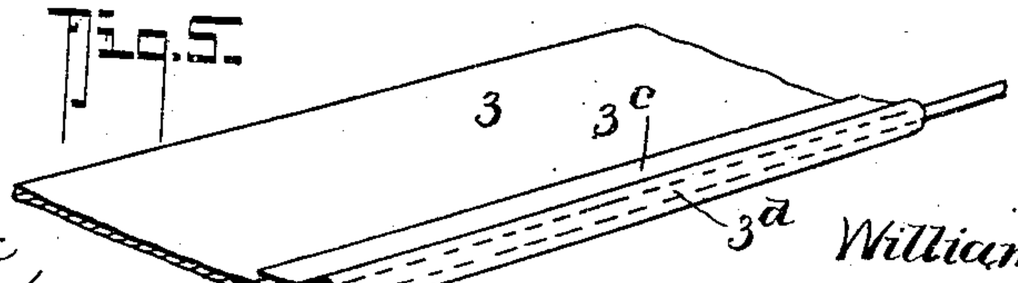


Fig. 6.



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UNITED STATES PATENT OFFICE.

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MEANS FOR JOINING PLATES.

No. 868,076. Specification of Letters Patent. Patented Oct. 15, 1907.

Application filed October 8, 1906. Serial No. 337,915.

To all whom it may concern:

Be it known that I, WILLIAM CROSS, a citizen of the Dominion of Canada, and a resident of Winnipeg, in the Province of Manitoba, Canada, have invented certain new and useful Improvements in Means for Joining Plates, of which the following is a specification.

My invention relates to certain new and useful improvements in means for joining boiler plates or other steel and iron plates that require to be made steam, oil, water and air tight. My invention also seeks to provide means in patch-plates and liners for uniting metallic plates, etc.

Generically my invention embodies a thin sheet of copper or other soft metallic substance which will withstand the heat, water or steam, one edge of which is turned up or bent back upon itself to inclose a wire core, the sheet thus formed serving as a liner and is placed between the plates to be joined.

My invention is particularly adapted for use in patching locomotives and other types of boilers, fire-boxes, and the like, and for convenience of description, I shall hereinafter describe my invention as used in connection with a patch for locomotive fire-boxes, locomotives and other types of boilers and the like.

In its more detailed nature, my invention comprises certain improvements on the invention disclosed in my Patent No. 780324 of Jan. 17, 1905.

With other objects in view than have been heretofore specified, the invention comprises certain novel construction, combination and arrangement of parts, all of which will be first described in detail, and then be specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which:—

Figure 1, is a face view of a portion of a fire-box with my improvement applied, parts being broken away. Fig. 2, is a cross section thereof on the line 2—2 of Fig. 1. Fig. 3, is an enlarged detail view of a portion of my invention showing the position of the parts just prior to the final tightening of the securing screws or rivets. Fig. 4, is a detail view of the adjoined ends of the copper lining. Fig. 5, is a perspective view of a portion of the liner. Fig. 6, is a modification hereinafter referred to.

Referring now to the accompanying drawings in which like numerals and letters of reference indicate like parts in all of the figures, 1 designates a boiler fire-box, which may be of the ordinary construction and which, *per se*, forms no part of this invention.

When my invention is used to patch boilers and the like, the plate 2 is formed of any desired shape, depending upon the nature of the break in the boiler plate, and the plate also includes the ordinary stay-bolt apertures 2^a, as shown.

Interposed between the plate 2 and the boiler or fire-box 1 is a copper strip or liner 3, which may be cut out of a single sheet or which may be formed in a strip.

When the liner is formed in a strip and bent into a closed path, the free ends 3^a abut one another and one of said ends 3^a has an over-lapping ear 3^b to overlap the other end 3^a, as indicated in the drawings.

3^c designates a rim or bead formed by doubling over the inner edge 3^d of the strip 3 and between the folds of the strip formed by the bent over edge, I place a wire or thin strip of soft metal, such as an ordinary copper wire, thus enabling a more tight joint to be made than were the wire omitted.

The plate 2 and the copper strip are secured to the boiler 1 by the steam tight plugs 4, as shown in the drawings and in the same manner as in my patent hereinbefore referred to.

By providing the liner with the soft wire core between the bent over or folded portion thereof, I find that a better joint can be made, and all liability of the bent over portion of the strip cracking along its bead is avoided.

When the wire strip is used, the bent over edge of the plate is formed into a bead-like edge 3^d, thus preventing cracking of the liner material, as before stated, and also strengthening the construction as well as enabling a more lasting and better joint to be had.

In my present invention the soft wire strip is indicated in the drawings by the reference number 5.

From practical experience, I have found that in joining boiler plates, particularly in joining a patch-plate to a boiler, and especially in patching locomotive fire-boxes, as known in the art, prior to my present invention, and that disclosed in my patent hereinbefore referred to, such patching is liable to give more or less trouble after a few months service owing to the fact that the patch-plates crack from the securing bolts outwardly, such patches not being protected by the inside calking, which is found in most new work, *i. e.*, in the primary union of the plates together by riveting, the universal practice being to calk both seams. I have therefore designed the patch-plate disclosed in my patent hereinbefore referred to, and the present improvements thereon, thus forming a liner with an upturned edge and soft wire strip held between the folded parts of the plate to act as a substitute for the back calking. As in my patent before referred to, the liner of my present invention may be applied not only in securing a patch to a boiler but in primarily uniting the boiler plates together to do away with the usual calking of the same.

In joining the plates together, in my present invention, I proceed in the same manner as that disclosed in my patent before referred to, and a detail de-

scription of such manner of holding and joining the plates is thought to be unnecessary in this application.

I desire it clearly and distinctly understood that while I have shown and described my invention as particularly adapted for use in patching boilers and fire-boxes etc. yet the same can be equally as well used in the primary construction of the boiler or for joining boiler plates and other steel and iron plates that require to be made steam, oil, water and air tight. The invention, in other words, may be used in uniting any iron and steel plates when ever it is desired to obtain a steam, oil, water or air tight joint, be it in boiler building or repairing or ship building or repairing and the like. I may also use the wire strip 5 by itself, omitting the soft sheet metal strip or liner 3 and in this case the wire 5 forms the liner itself as shown in detail in Fig. 6.

From the foregoing description taken in connection with the accompanying drawings, it is thought the complete construction, operation and numerous advantages of my invention will be readily understood by those skilled in the art to which it appertains.

What I claim, is:—

1. A liner for boiler plates of the character described, comprising a soft metal member having an edge folded back upon itself to form a calk and a wire strip loosely held within the folded over portion of the soft metal member adjacent the fold edge, the folded over portion of the metal strip being of less area than the remaining portion thereof, substantially as shown and described.

2. A device of the character described comprising in combination with a pair of plates, a soft metal liner interposed between said plates and having an edge folded back upon itself the folded back portion being of less width than the remaining portion of the liner, a soft wire strip loosely held within the fold of the liner adjacent the fold edge, and means for securing the two plates and the liner together, substantially as shown and described.

WILLIAM CROSS.

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