March 20, 1928.

W. L. REID

1,663,216

LOCOMOTIVE FIRE BOX

Filed April 20, 1923

2 Sheets-Sheet 1

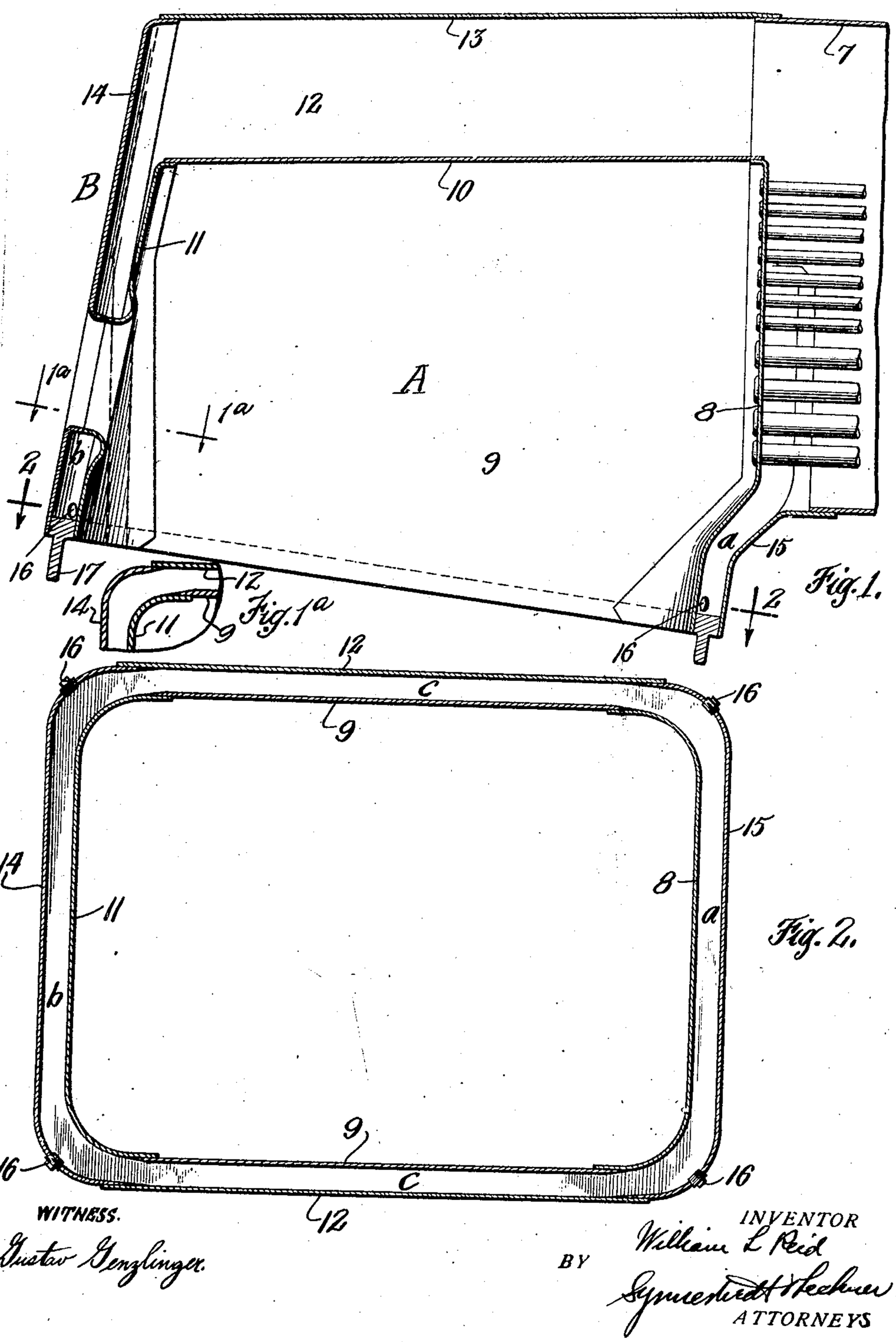


Fig. 1a

Fig. 1.

Fig. 2.

WITNESS.

Gustav Genzlinger.

INVENTOR

William L Reid

BY

Synnestvedt & Lechner

ATTORNEYS

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2 Sheets-Sheet 2

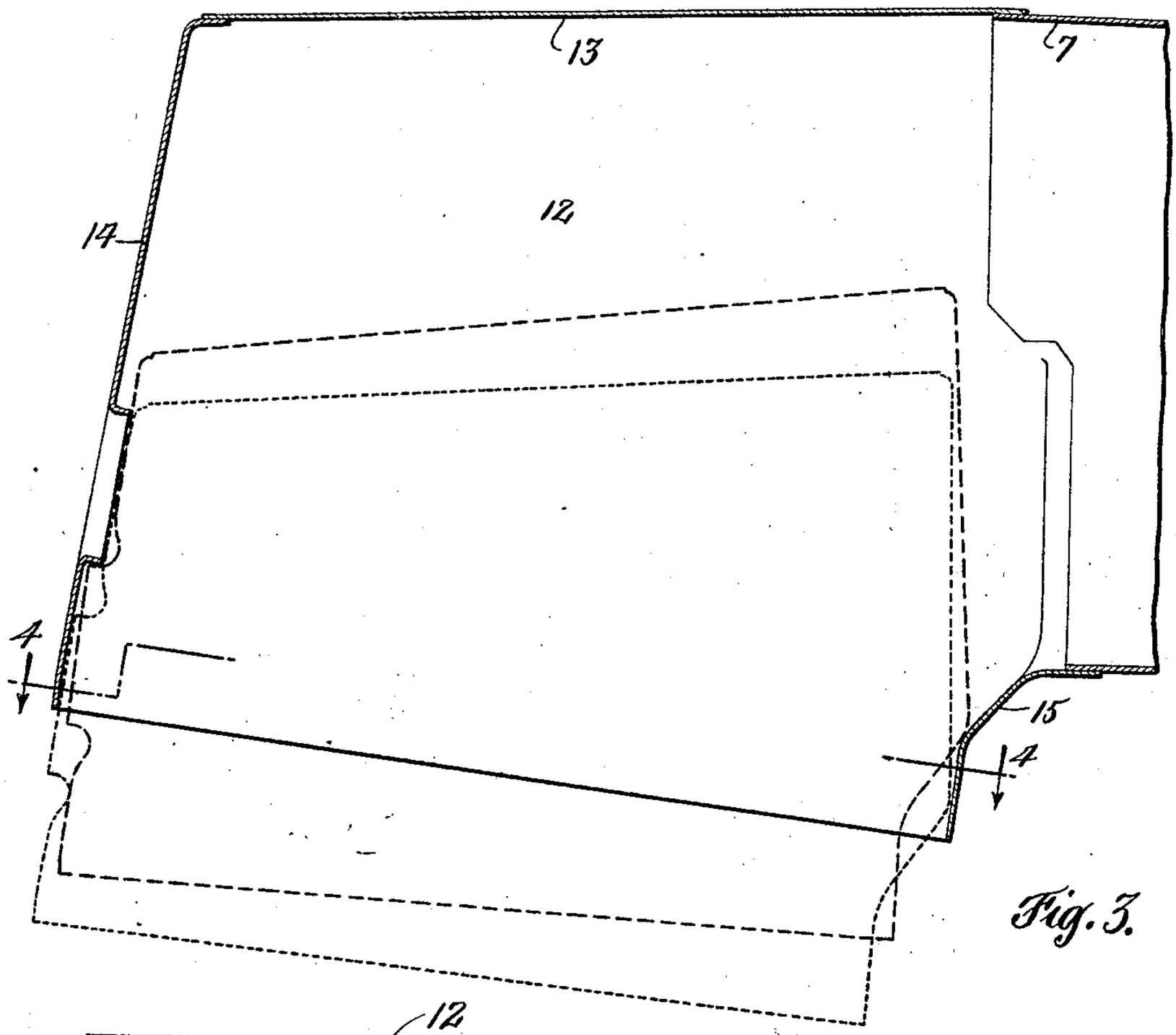


Fig. 3.

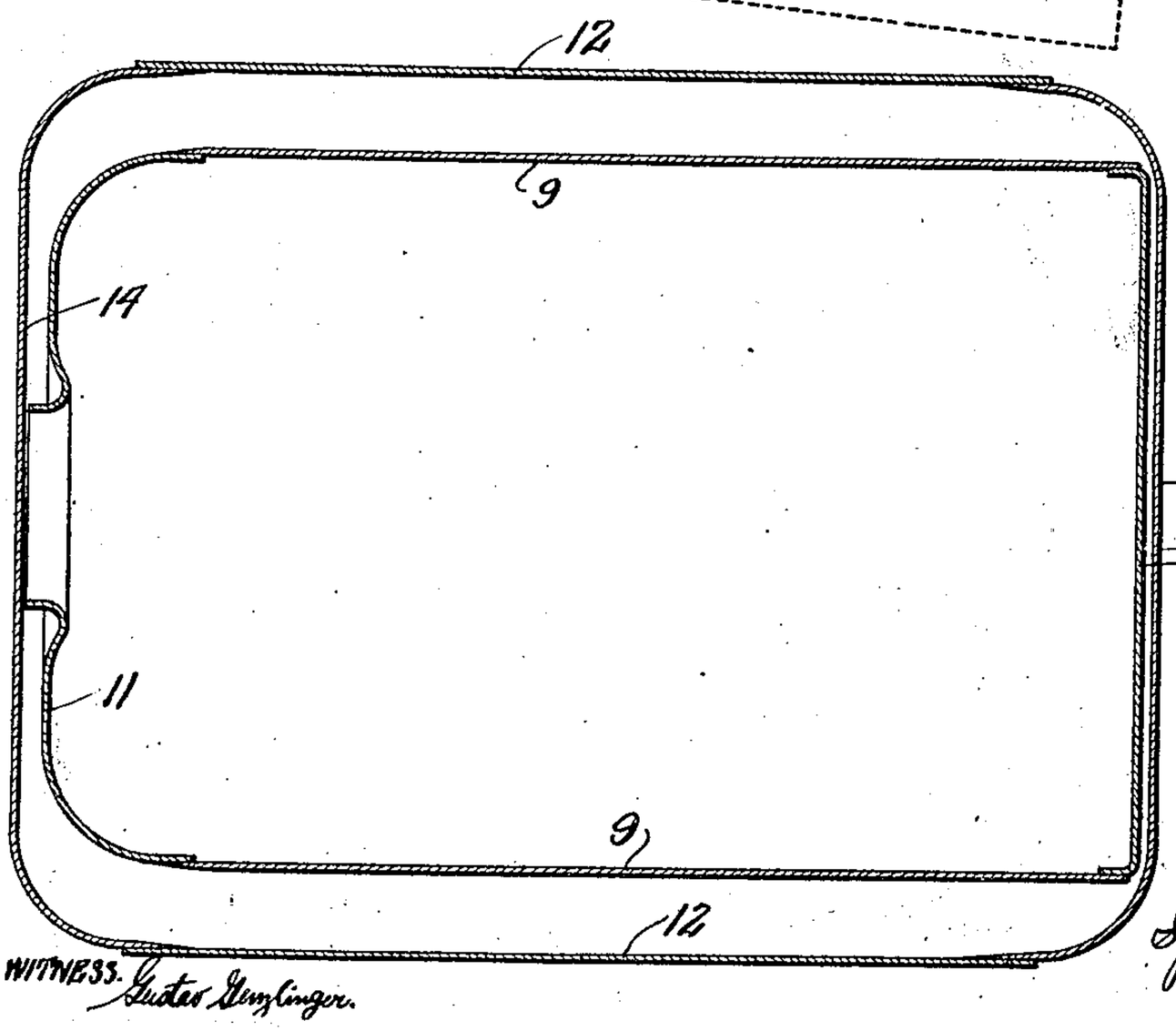


Fig. 4.

WITNESS. Gustav Glenzinger.

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UNITED STATES PATENT OFFICE.

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LOCOMOTIVE FIRE BOX.

Application filed April 20, 1923. Serial No. 633,371.

This invention relates to locomotive fire boxes and it has for one of its primary objects, increasing the rapidity of circulation through the box, making it possible to evaporate more water in less time, which is of great importance in view of the rapid development of locomotive power requirements.

Another of the objects of the invention is to facilitate the washing down of the sides of the water spaces and the mud ring and to make it possible to see along both water legs from the corners, for examination of the stay bolts.

A further object of the invention is to provide a construction in which it is possible to obtain tight seams with much less difficulty than heretofore and in which the maintenance cost is reduced.

Still another object of the invention is the provision of a construction which is simple to manufacture and in which assemblage is expedited and the process of manufacture generally cheapened.

I accomplish the foregoing, together with such other objects as may hereinafter appear, or are incident to my invention, by means of a construction which I have illustrated in preferred form in the accompanying drawings, wherein:

Fig. 1 is a longitudinal section through a locomotive fire box embodying my improvements; Fig. 1ª is a section on the line 1ª—1ª of Fig. 1; Fig. 2 is a section taken on the line 2—2 of Fig. 1; Fig. 3 is a diagrammatic longitudinal section illustrating the manner in which the inside fire box is inserted in the outside box; and Fig. 4 is a section taken on the line 4—4 of Fig. 3 indicating the clearances available when inserting the inside box.

This invention, generally considered, has to do with locomotive fire boxes of the round corner type. I am aware that such fire boxes have been manufactured heretofore, but, for reasons which will appear in connection with the description of the invention, the advantages herein set forth were not present in such prior boxes.

Referring now to Fig. 1, the reference number 7 denotes the boiler shell, and the reference letter A the inside fire box, and the reference letter B the outside box or casing. The inside box A comprises a flue and throat sheet 8, the side sheets 9, the crown 10, and the back sheet 11. The outside box comprises the side sheets 12, the roof sheet 13, the back sheet or head 14 and the throat sheet 15. The roof and crown and side sheets are pereferably composed of a single sheet suitably formed.

This arrangement provides the usual front and rear water legs *a* and *b*, respectively, and the side water legs *c*, closed at the bottom by the mud ring 17. It will be observed, however, that the corners of the fire box are rounded and that the width of the space at the corners is greater than the width of the adjacent water spaces, to which end the corners of the inside box are formed substantially on approximately the same radius as the corners of the outside box, or on a greater radius, the radius being in all cases, as shown, not less than the distance between the side sheets. The radii at a corner diminish upwardly so that the full area of the water spaces is maintained and their efficiency not cut down. (See the shading in Fig. 1 and compare the radii of the rear corners in Figs. 1ª and 2.) Heretofore, in round-cornered fire boxes, the corners of the outside and inside boxes have been struck from substantially the same center or with an inner radius less than the outer radius and, therefore, have presented considerable resistance to flow or circulation of water. By my arrangment the resistance to flow from one water leg to the other is reduced to a minimum.

In addition to the advantage of obtaining more rapid circulation, this construction makes it possible to effectively wash down the sides of the water legs throughout and also to inspect the stay bolts (not shown) which tie the sheets together. The washout plugs 16 are provided for this purpose and are located about midway of the radius. Furthermore, the corners are easier to form and the seams do not come so close to the corners. In ordinary construction the seams lie very close to the corners with the result that difficulty is experienced in securing tight seams.

A still further and important advantage is that it is possible, as in the arrangement shown, to assemble the boxes and insert the inside box within the outside box without having to resort afterward to riveting the back head in place by use of patch bolts or hand riveting, which is both unsatisfactory and costly.

In the box shown, the method of manufacture is substantially as follows: The outside casing, the throat sheet, the shell of the

boiler and the back head are riveted together in a hydraulic riveting machine. The inside box is riveted together in a separate operation and is then inserted in the opening at the bottom of the outside box. The dotted lines in Fig. 3 indicate the manner in which this is brought about. The mud ring is then placed in position between the boxes and the boxes riveted thereto. Heretofore in boxes having materially rounded corners but with the radii at each bottom corner being struck from the same center, it has not been possible to assemble the boxes separately and insert the inside box from below, as described and shown. It will be readily understood by those skilled in the art that this simplifies manufacture greatly.

It will, of course, be understood that the mud ring is constructed so as to conform, i. e., the inside and outside curves at the corners are struck from the same center as the corners for the inside and outside boxes.

What I claim is:

1. A locomotive fire box comprising the usual inside and outside boxes, the corners of the boxes, however, being materially rounded and formed on radii diminishing upwardly, the radius of the outside corners at the bottom being approximately equal to the radius of the inside corners at the bottom and both bottom radii being not less than the distance between side sheets.

2. A locomotive fire box comprising the usual inside and outside boxes, the corners of the boxes, however, being materially rounded and formed on radii diminishing upwardly, the radius of the outside corners at the bottom being not in excess of the radius of the inside corners at the bottom and both bottom radii being not less than the distance between side sheets.

3. A locomotive fire box comprising the usual inside and outside boxes, the corners of the boxes, however, being materially rounded with the radius of the outside corners being not in excess of the radius of the inside corners and both radii being not less than the distance between side sheets.

4. A locomotive fire box comprising the usual inside and outside boxes, but said boxes, however, having materially rounded corners with the radius of the outside corners at the bottom being not in excess of the radius of the inside corners at the bottom.

In testimony whereof, I have hereunto signed my name.

WILLIAM L. REID.