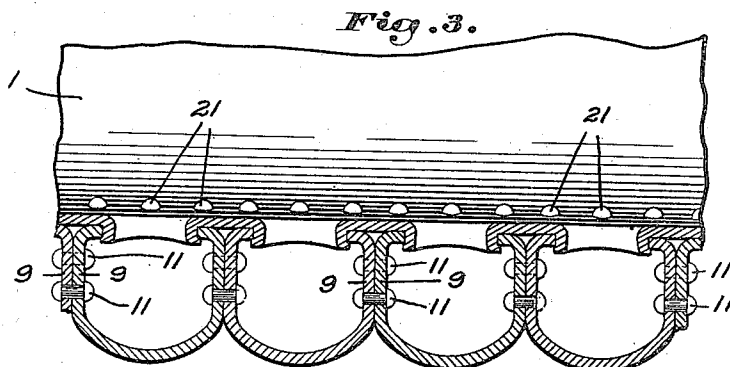
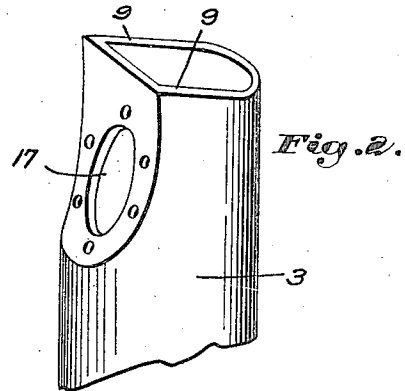
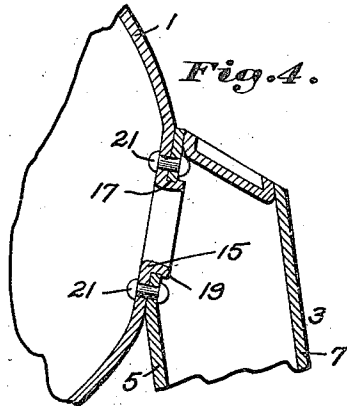
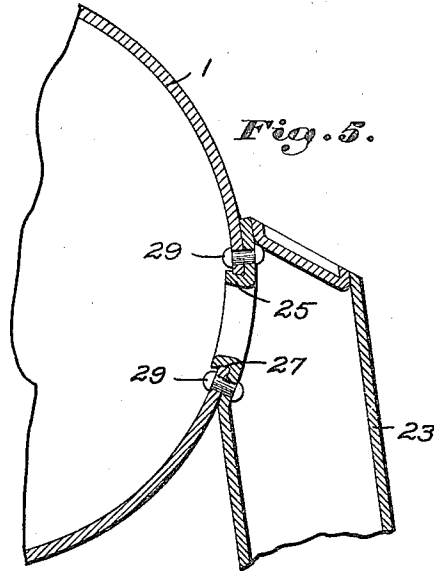
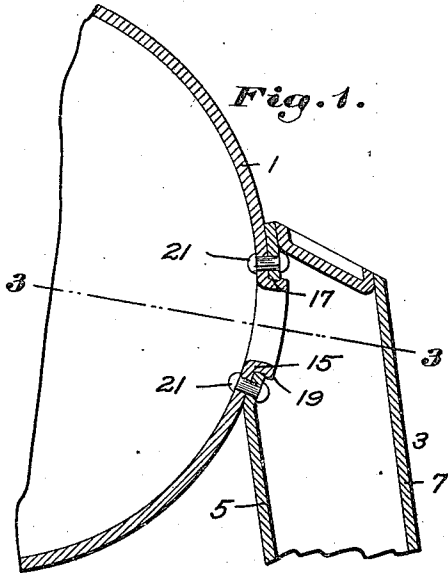


J. M. McCLELLON.
FIRE BOX.
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964,300.

Patented July 12, 1910.



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES M. McCLELLON, OF EVERETT, MASSACHUSETTS.

FIRE-BOX.

964,300.

Specification of Letters Patent.

Patented July 12, 1910.

Application filed May 12, 1910. Serial No. 560,848.

To all whom it may concern:

Be it known that I, JAMES M. McCLELLON, a citizen of the United States, and a resident of Everett, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Fire-Boxes, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawing representing like parts.

This invention is an improvement in fire-box construction and among other objects aims to provide an effective connection of the side walls to the crown of the fire-box.

The character of the invention may be best understood by reference to the following description of an illustrative embodiment thereof shown in the accompanying drawings wherein:

Figure 1 is a partial vertical section of crown and one of the side walls of a fire-box constructed in accordance with the invention; Fig. 2 is a perspective view of one of the elements of the side wall shown in Fig. 1; Fig. 3 is a horizontal section taken on line 3—3 of Fig. 1; Fig. 4 is a partial vertical section of a modification; and Fig. 5 is a similar view of another modification.

Referring to the drawing the crown of the illustrative fire-box structure shown herein as embodying my invention comprises a plurality of drums such as 1 preferably extending longitudinally of the fire-box and arranged contiguously to constitute a complete closure for the top of the fire-box.

The side walls are each made of a plurality of upright adjoining tubes 3 preferably of thin, flexion shell material. To permit these tubes independently to flex to take care of local heat differences within the fire-box, the fire-sides 5 of the tubes and their opposite exterior sides 7 preferably are bulged or convexed in opposite directions. Since the fire-sides of the tubes will be subjected to greater heat stresses than their exteriors, the former may be given a curvature somewhat greater than the latter.

To provide a tight connection between the upright wall-tubes, their adjoining sides are flattened to present contiguous plane faces 9 which may be securely held together by short shanked rivets 11 distributed at intervals throughout the extent of the ad-

joining faces of the walls. The tops of the side wall tubes may be closed by suitable closing cups welded or riveted therein.

The water from the boiler barrel (not shown) is led into the side wall tubes adjacent their bases. To permit the water to circulate from one to another of said tubes they may communicate through suitable apertures or nipples (not shown). The water thus introduced into said walls rises therein and should thence pass into the crown drums.

An important feature of my invention consists in the connection of the side walls to the drums. To this end each side drum (Fig. 1) is provided with a series of nipples or short flanges 15 occurring at intervals along the length of the side of the drum adjoining the top of the side wall. These nipples it will be observed are integral with the drum and conveniently may be pressed or otherwise formed therefrom. The removal of stock incidental to the incising of a series of holes from the side of the drum would weaken the drum, but by actually pressing the nipples out of the sides of the drum so that the nipple material constitutes a part of the drum, the drum is not weakened materially. To connect the drum nipples described to the side wall, each tube may have an aperture 17 of an area sufficient to receive a drum nipple. Each nipple is of sufficient extent to project through and somewhat beyond its aperture. To secure the nipple to the tube with an absolutely tight joint such as would make any leakage thereat impossible the projecting portion of the nipple may be expanded, welded or both expanded and welded into its tube aperture as at 19. To further secure the tubes to the drum the portions of said drum and tubes surrounding the nipples may be held together by suitable rivets 21 spaced at intervals.

The tightness of the connection of the wall to the drum may be further increased by shaping the portion of each tube adjoining said drum to conform to the external contour of the latter (Fig. 2). In some cases if desired the adjoining surfaces of the drum and tubes may both be flattened (Fig. 4).

In Fig. 5 is shown a modification which utilizes the integral nipple idea, but in-

stead of forming the nipples integral with the drum they are formed integral with the wall tubes 3. Herein is shown a typical tube 23 having a nipple 25 pressed or otherwise formed therefrom, said tube projecting through a lateral aperture 27 in the drum and expanded, welded, or expanded and welded therein, the portions of the tube and drum surrounding the nipple being secured together by rivets 29. As shown in this modification the tube is flattened to conform to the contour of the drum as in Fig. 1, but both the tube and drum may be flattened if desired. The water or steam rising in the side wall tubes may pass freely through said nipples into said drum.

As shown herein the nipples are positioned on the drum beneath the normal water level in the drum in order that the nipple connection between the drum and tubes may ordinarily be covered with water. The integral nipple connection described provides a very effective construction. The portion of the tube or drum surrounding its nipple constitutes a strengthening and stiffening collar which reinforces the nipple and the drum and tube. The nipples securely hold the side wall to the drum and effectually withstand the racking and shaking to which locomotive fire-boxes are subjected without working loose or causing leakage and effectually withstand the stresses from unequal strains set up in the fire-box wall tubes from local temperature differences in the fire-box.

Having described selected embodiments of my invention without limiting myself thereto what I claim as new and desire to secure by Letters Patent is:

1. In a fire-box the combination of a crown drum; a tubular wall; and nipples integral with one and secured to the other providing a reinforced connection of said drum with said wall.

2. In a fire-box the combination of a crown drum; a tubular wall; and nipples integral with said drum and projecting through apertures in the wall tubes to provide a communicating reinforced rigid connection of said drum with said wall.

3. In a fire-box the combination of a crown drum; a wall comprising upright tubes having plane sides secured together; and nipples integral with said drum and

projecting through apertures in said tubes to secure the latter to said drum.

4. In a fire-box the combination of a crown drum; a wall comprising upright, flexion shelled tubes having plane sides secured together at intervals throughout their lengths; and nipples integral with one and secured to the other.

5. In a fire-box the combination of a drum; a wall; and connecting means integral with said drum projecting therefrom and extending into said wall and secured thereto.

6. In a fire-box the combination of a drum; a wall comprising upright tubes having portions overlapping said drum, said portions being formed to conform to the contour of said drum; and nipples integral with one and projecting through openings in the other to secure the same together.

7. In a fire-box the combination of a crown drum; tubes; and nipples integral with one and secured to the other.

8. In a fire-box the combination of a drum; a wall comprising upright tubes having bulged sides facing the fire, said tubes having portions overlapping said drum and formed to conform to the contour of said drum; and nipples integral with one and secured to the other.

9. In a fire-box the combination of a crown drum; tubes; and nipples integral with one and welded into the other to provide reinforced tight communicating connections between said drum and tubes.

10. In a fire-box the combination of a crown drum; a tubular wall; and nipples integral with said crown drum and projecting laterally therefrom through apertures in the tubes of said wall and expanded into said apertures.

11. In a fire-box the combination of a crown drum; a tubular wall; and nipples integral with one and secured to the other, said crown drum and tubes of said wall having portions surrounding said nipples riveted together.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES M. McCLELLON.

Witnesses:

HENRY T. WILLIAMS,
ROBERT H. KAMMLER.