

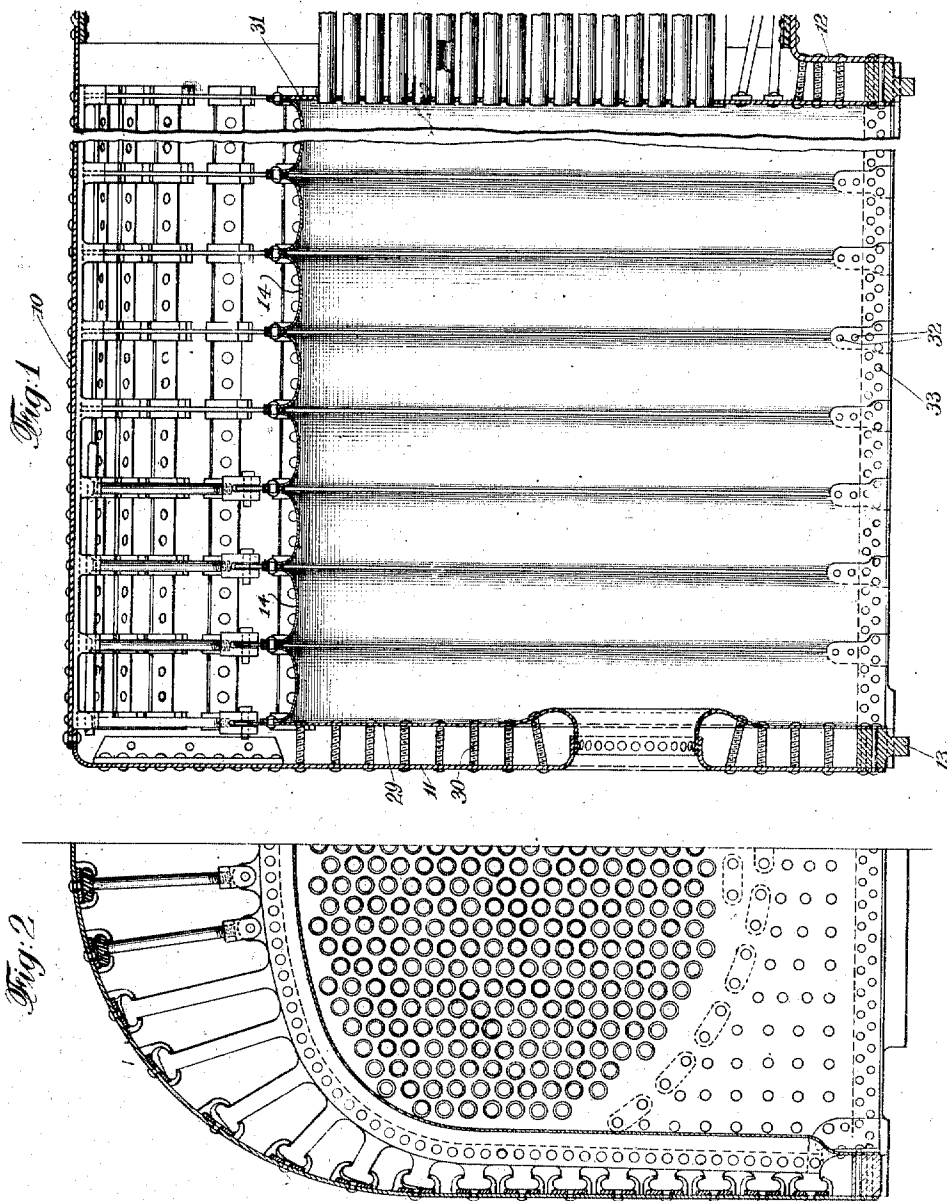
H. W. JACOBS & F. W. SHUPERT.
FIRE BOX.

APPLICATION FILED JUNE 30, 1909.

Patented Jan. 24, 1911.

3 SHEETS—SHEET 1.

982,724.



WITNESSES:
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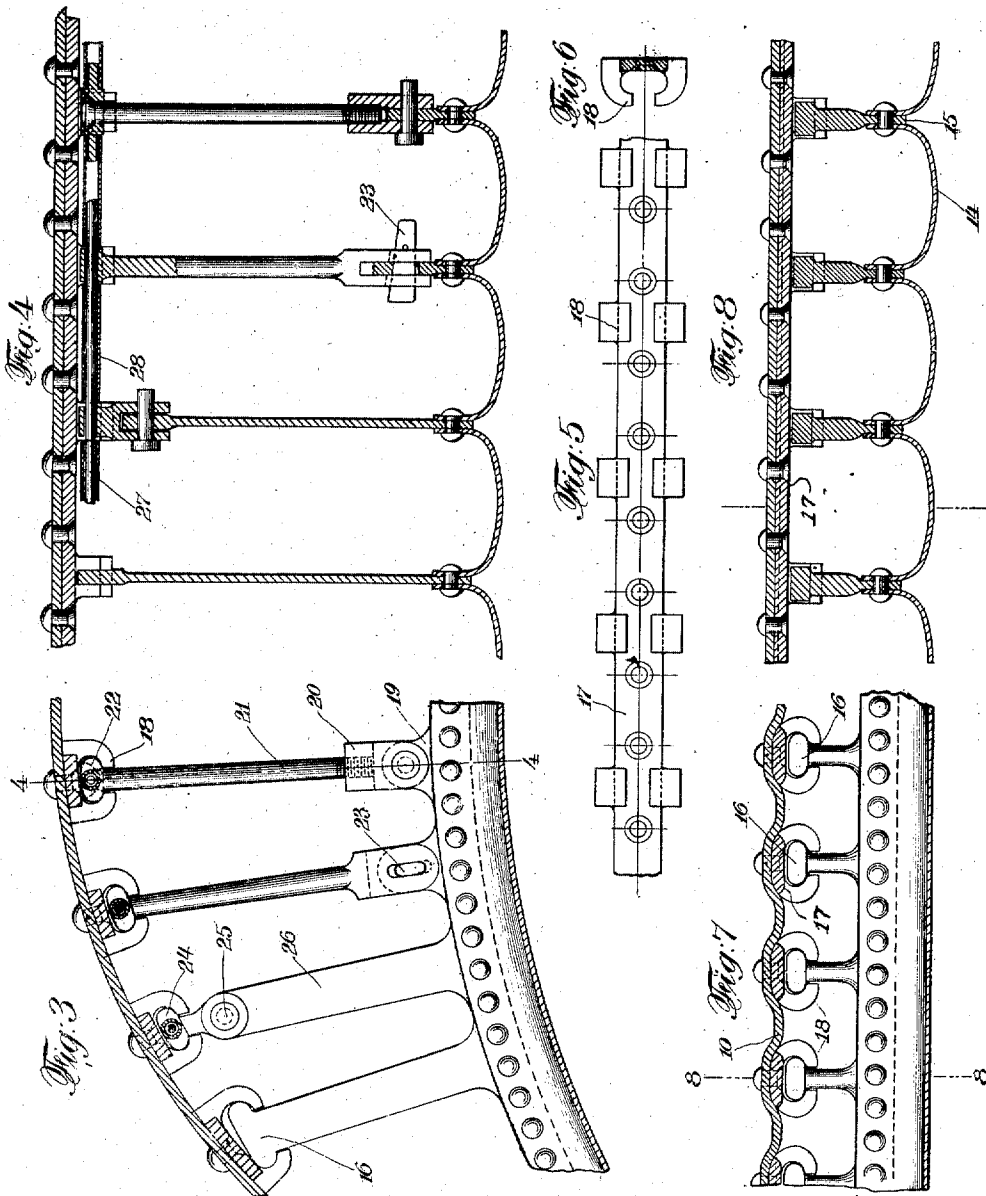
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3 SHEETS—SHEET 3.

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Fig. 9

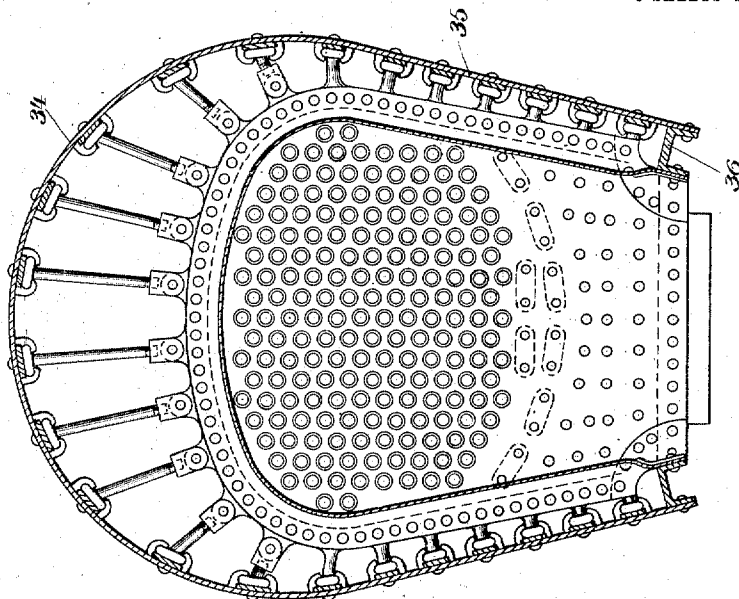
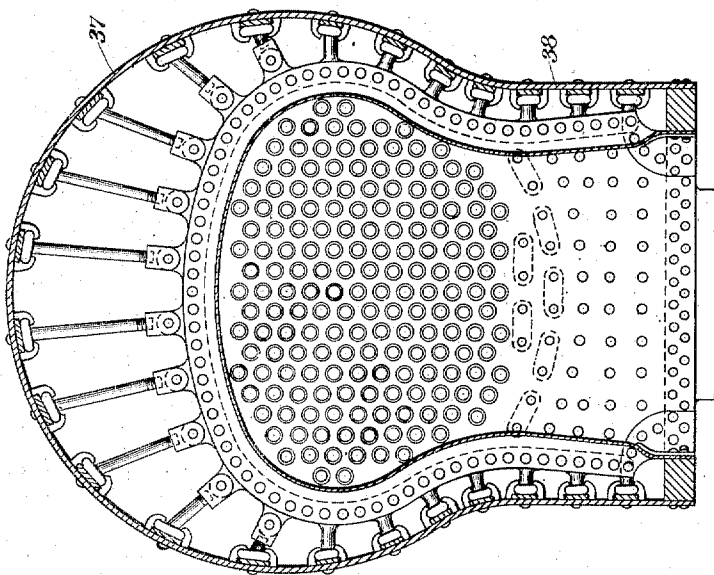


Fig. 10



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UNITED STATES PATENT OFFICE.

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FIRE-BOX.

982,724.

Specification of Letters Patent.

Patented Jan. 24, 1911.

Application filed June 30, 1909. Serial No. 505,117.

To all whom it may concern:

Be it known that we, HENRY W. JACOBS and FRANK W. SHUPERT, both of Topeka, in the county of Shawnee and in the State of Kansas, have invented a certain new and useful Improvement in Fire-Boxes, and do hereby declare that the following is a full, clear, and exact description thereof.

The object of our invention has been to provide an improved form of the fire-box which is the subject of our co-pending joint application for patent upon a fire-box, Ser. No. 505,116, filed June 30, 1909, which fire-box can be readily removed from the boiler shell for repairing, and which is very strong and simple in construction; and to such ends our invention consists in the readily removable fire-box hereinafter specified.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of a portion of a boiler having a fire-box embodying our invention; Fig. 2 is a transverse sectional view of Fig. 1; Fig. 3 is a partial sectional view showing several forms of the top staying; Fig. 4 is a view showing a section through each of the forms of staying shown in Fig. 3; Figs. 5 and 6 are respectively a plan view and an end view of one of the fastening strips of the preceding figures; Figs. 7 and 8 are respectively a horizontal sectional view and a vertical sectional view of another modification of the side staying; and Figs. 9 and 10 show two further embodiments of our invention as adapted to locomotives having narrow fire-boxes.

In our said application for patent, we have illustrated and broadly claimed a fire-box which is readily detachable from the boiler shell for repairing. The broad invention is claimed in the said application for patent Ser. No. 505,116. In the present application we have illustrated another form of the said invention. While the broad invention is not claimed in the present application, we realize that that form of the invention, which is the subject of the present invention, is capable of embodiment in many different forms, and desire not to be restricted to the specific details of the present embodiment.

In the present form of our invention, the boiler consists of a wrapper sheet 10, a back end 11, and a throat sheet 12. A mud ring 13 is secured around the lower edges of the

said sheets, and a fire-box is secured to the inner side of said mud ring. The fire-box preferably consists of U-shaped sections 14, having outwardly projecting flanges, and between said flanges are riveted strips 15, having T-shaped heads 16 made of boiler plate projecting therefrom. On the inner side of the wrapper plate are fastened a series of bars 17 having oppositely projecting lugs 18, which form between them T-shaped spaces that are adapted to receive the said T-heads 16.

As shown in Figs. 3 and 4, instead of the simple T-heads 16, various forms of staying can be used. For instance, in the right-hand form shown in Fig. 3, an eye 19 is formed on the calking strip, and a yoke 20 is pivoted thereto. The said yoke carries a rod 21 having a T-head 22 that is adapted to engage the lugs 18 on the wrapper sheet. In the next form of staying shown in Fig. 3, instead of the yoke being pivoted to the eye on the calking strip, it is connected to it by a wedge 23, which can be driven through and drawn down, and thus shorten the staying, putting it under tension and effectively supporting the crown sheet. In the next form of staying shown in Fig. 3, the T-head 24 is pivoted by a pin 25 to an arm 26 formed on the calking strip. As shown in Fig. 4, the T-heads in a single longitudinal line are preferably connected by having a rod 27 extending through them, the said rod having a nipple 28 thereon between each of the two heads, to keep the said heads properly spaced apart. As illustrated, the back end 11 may be connected with a door sheet 29 by ordinary stay-bolts 30, and the flue sheet 31 may be connected with the throat sheet 12 in the same manner.

As shown in Figs. 7 and 8, the T-heads 16, for the purposes of the side staying, may be constructed of cast-steel, and the wrapper sheet 10 may be corrugated at the sides of the fire-box so as to receive, in the depressions thereof, the series of bars 17. The effect of this construction is to strengthen the portions of the wrapper sheet at the side of the fire-box, and to increase the capacity of the water legs. In order to fasten the fire-box sections 14 to the mud ring 13, the flanges thereof are bent into a plane intermediate the edges of the flanges where they are attached to the wrapper

sheet 10 and the inner curved faces of the sections, as shown in Fig. 2; the flanges are then overlapped, rivets 32 are inserted to secure the overlapping flanges together, and the lower edges of the entire series of sections are riveted to the mud ring by means of rivets 33. It will be noted that the rivets 32 are located in alignment with the outwardly projecting flanges of the U-shaped sections of the fire-box. It has been found that this comparatively simple construction adequately prevents any leakage through the joints between the mud ring and the lower ends of the sections.

In Figs. 9 and 10 we have shown two further embodiments of our invention, in which a removable fire-box is shown which is wider than the bottom of the wagon top. In the modification shown in Fig. 9, the upper portion 34 of the wagon top is round and the sides 35 are inclined to the perpendicular. This modification as shown is also provided with a channel mud ring 36 to avoid the necessity of completely detaching the same when removing the fire-box, as hereinafter described. This feature is also equally applicable to the other modifications herein described. In the modification shown in Fig. 10, the upper portion 37 is also circular in cross-section, but the sides 38 are vertical.

In the operation of that form of our invention which is illustrated in Figs. 1 to 8, the fire-box is normally supported from the wrapper sheet by engagement of the T-heads with the lugs 18. When it is desired to remove the fire-box the mud ring and the connections between the fire door sheet and the back end, and the connections between the flue sheet and the throat sheet, are removed (the flues, of course, having first been removed) and the rivets between the flanges forming the fire door opening, are removed. The entire fire-box is then moved forward until the T-heads are disengaged from between the lugs 18, when the fire-box can be disconnected and dropped down. If necessary, blows are struck on the rear ends of the rods 27 to loosen the T-heads between the lugs, and for this purpose holes may be provided in the back end, so as to put a tool against the rear end of the said rods.

In the operation of the modification shown in Fig. 9, when it is desired to remove the fire-box, the flues are removed, the rivets connecting the outer flange of the mud ring 36 with the wrapper sheet and the throat sheet are removed and the rivets connecting the back end and the wrapper sheet are removed. The entire fire-box, including the back end and the mud ring can now be moved rearwardly from beneath the wrapper sheet. In the case of the modification shown in Fig. 10, the operation is the same,

except that the mud ring is entirely disconnected from the various sheets to which it is riveted, before removing the fire-box.

We claim:—

1. In a boiler, the combination of a shell and a fire-box, one of said parts carrying enlarged projections, and the other of said parts having corresponding recesses whereby said parts may be fastened together by a lateral movement of said enlarged projections in said recesses.

2. In a boiler, the combination of a shell, a fire-box, transversely enlarged heads carried by one of said parts, corresponding recesses on the other of said parts, said recesses being open at their forward sides, whereby engagement between said heads and recesses can be effected by a relative longitudinal movement.

3. In a boiler, the combination of a shell and a fire-box, one of said parts having transversely enlarged heads, the other of said parts having lugs adapted to engage the sides of said heads, said heads and lugs being short longitudinally to permit the lateral disengagement thereof.

4. In a boiler, the combination of a shell, and a fire-box, one of said parts having T-shaped transversely extending heads, the other of said parts having lugs adapted to embrace the sides of said heads while permitting lateral disengagement.

5. In a boiler, the combination of a shell, a fire-box, one of said parts having T-shaped transversely extending heads, the other of said parts having lugs adapted to embrace the sides of said heads, said heads being formed in longitudinal rows, and rods connecting said heads.

6. In a boiler, the combination of a shell, a fire-box, one of said parts having T-shaped transversely extending heads, the other of said parts having lugs adapted to embrace the sides of said heads, said heads being formed in longitudinal rows, rods connecting said heads, and spacing pieces on said rods.

7. In a boiler, the combination of a corrugated shell and a fire-box, one of said parts carrying enlarged projections, and the other of said parts having corresponding recesses whereby said parts may be fastened together by a lateral movement of said enlarged projections in said recesses.

8. In a boiler, the combination of a corrugated shell, a fire-box, the fire-box carrying enlarged projections, and bars located in the corrugations of the shell having recesses to engage the enlarged projections.

9. In a device of the character described, the combination of a shell, a fire-box made of a plurality of sections, said sections having outwardly projecting flanges secured together, and a mud ring to which the sections are attached, the sections being over-

lapped above the level of the mud ring and secured together.

10. In a device of the character described, the combination of a shell, a fire-box made of a plurality of sections, said sections having outwardly projecting flanges secured together, and a mud ring to which the sections are attached, the sections being overlapped above the level of the mud ring and secured together by means of rivets.

11. In a device of the character described, the combination of a shell, a fire-box made of a plurality of sections, said sections having outwardly projecting flanges secured together, and a mud ring to which the sections are attached, the sections being overlapped above the level of the mud ring and secured together by means of rivets located in alinement with the outwardly projecting flanges.

12. In a device of the character described, the combination of a shell, a back head connected thereto, a fire-box, coupled staying

for the same, said staying being so constructed as to permit the detachment of the fire-box from the shell while the shell is connected to the back head by uncoupling the staying between the shell and the fire-box.

13. In a device of the character described, the combination of a shell, a back head and a throat sheet connected thereto, a fire-box, coupled staying for the same, said staying being so constructed as to permit the detachment of the fire-box from the shell while the back head and throat sheet are connected to the shell by uncoupling the staying between the shell and the fire-box.

In testimony that we claim the foregoing we have hereunto set our hands.

HENRY W. JACOBS,
FRANK W. SHUPERT.

Witnesses:

A. NEWCOMB,
M. MEIKLE.