

F. J. SPILLANE.
ARCH FOR FIREBOXES.
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1,393,647.

Patented Oct. 11, 1921.

Fig. 1.

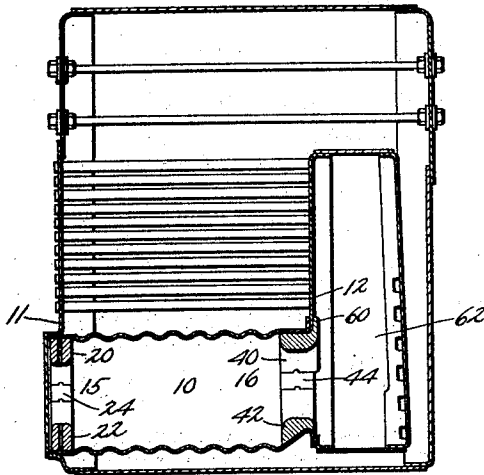


Fig. 6. Fig. 7.

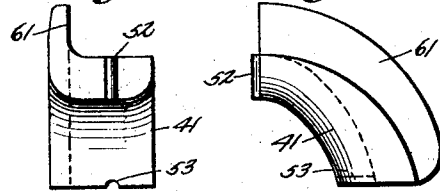


Fig. 8.



Fig. 9.



Fig. 10.

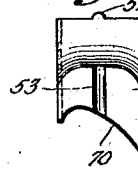


Fig. 11.

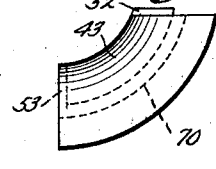


Fig. 2.

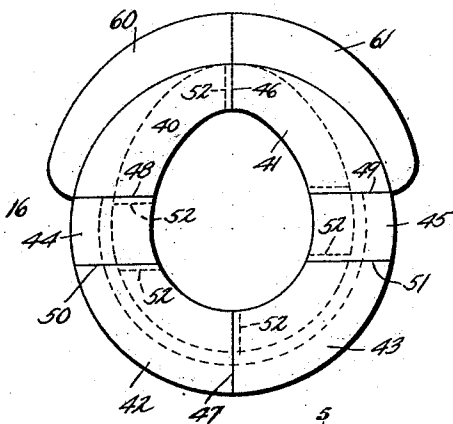


Fig. 3.

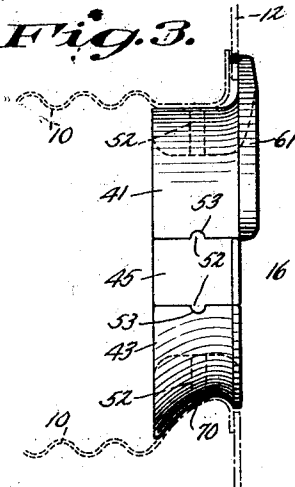


Fig. 4.

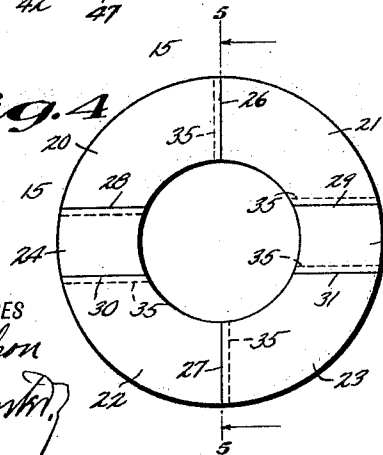
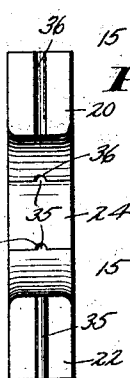


Fig. 5.



WITNESSES

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ARCH FOR FIREBOXES.

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To all whom it may concern:

Be it known that I, FRANK J. SPILLANE, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Arch for Fireboxes, of which the following is a full, clear, and exact description.

The invention relates to oil burning steam boilers, and its object is to provide a new and improved arch for fire boxes of such boilers, arranged to permit of readily assembling the sections of the arch at the front or rear end of the fire boxes and to allow of readily removing and replacing a burned out section by a new one whenever necessary.

Another object is to provide a protecting means for the joint formed by the fire box with the back flue sheet with a view to prevent the flames passing through the arch from reaching the joint and to prevent a too-rapid cooling of the joint after the flame is extinguished.

With these and other objects in view, the invention consists of certain novel features of construction as hereinafter shown and described and then specifically pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal central section of a steam boiler having an oil burning fire box provided with the improved front and rear arches;

Fig. 2 is an enlarged face view of the rear arch;

Fig. 3 is a side elevation of the same with the fire box shown in broken lines;

Fig. 4 is an enlarged face view of the front arch;

Fig. 5 is an edge view of one half of the same looking in the direction of the arrows on the line 5-5 of Fig. 4;

Fig. 6 is a side elevation of one of the top sections of the rear arch;

Fig. 7 is a face view of the same;

Fig. 8 is a side elevation of one of the intermediate or middle sections of the rear arch;

Fig. 9 is a face view of the same;

Fig. 10 is a side elevation of one of the bottom sections of the rear arch; and

Fig. 11 is a face view of the same.

The corrugated tubular fire box 10 is connected at its front and rear ends in the usual manner with the front and rear flue sheets 11 and 12 of the boiler, as plainly shown in Fig. 1. In the front end of the fire box 10 is arranged an arch 15 and in the rear of the said fire box is mounted an arch 16, the said front and rear arches 15 and 16 being made of fire clay or other suitable refractory fire-proof material to readily withstand the high heat developed in the fire box through the burning of a hydrocarbon or other oil. The front arch 15, shown in detail in Figs. 4 and 5, comprises two top sections 20, 21, two bottom sections 22, 23, and intermediate sections 24, 25. The top sections 20 and 21 provide at their upper ends a vertical joint 26 diametrically opposite a vertical joint 27 formed by the lower ends of the bottom sections 22 and 23. The lower ends of the top sections 20, 21 form with the upper faces of the middle sections 24, 25 horizontal joints 28, 29 and similar joints 30, 31 are formed between the upper ends of the bottom sections 22, 23 and the under faces of the middle sections 24, 25. The several joints 26, 27, 28, 29, 30 and 31 are each provided with tongue and groove connections 35 and 36 to hold the sections against longitudinal movement one relative to the other.

The rear arch 16 is formed of similar top sections 40, 41, bottom sections 42, 43 and intermediate or middle sections 44, 45 providing the vertical joints 46, 47 and the horizontal joints 48, 49, 50 and 51, corresponding to the joints 26, 27, 28, 29, 30 and 31 of the front arch so that further description of the same is not deemed necessary. By reference to Figs. 2, 3, 6, 7, 8, 9, 10 and 11 it will also be noticed that the joints are provided with tongue and groove connections 52, 53, similar to the tongue and groove connections 35 and 36. The top sections 40 and 41 of the rear arch 16 are provided at their outer ends with integral flanges 60 and 61 extending exteriorly over the joint between the rear end of the fire box 10 and the rear flue sheet 12 so as to protect the said joint against the flame passing from the fire box into the combustion chamber 62 of the boiler. The bottom sections 42 and 43 of the rear arch 16 are provided with an exterior groove 70 corresponding to the corre-

spondingly shaped rear end of the lower portion of the fire box 10, as will be readily understood by reference to Figs. 1, 3 and 10.

From the foregoing it will be seen that by the arrangement described the bottom and top sections of the front or rear arch 15 or 16 can be readily placed in position in the fire box and then the middle or intermediate sections can be slipped in place sidewise from within the opening of the arch. In assembling the sections in the manner described they are locked in place against longitudinal movement owing to the tongue and groove connections, and the top sections of the rear arch 16 are held against inward movement by the flanges 60, 61, and the bottom sections 42 and 43 are held against longitudinal shifting by the grooved exterior faces 70. It will also be noticed that by the arrangement described a burned out section can be readily removed and replaced by a new one whenever necessary. It will further be noticed that the joint between the rear end of the fire box 10 and the rear flue sheet 12 is protected by the flanges 60, 61 thus preventing the flame passing from the fire box through the opening in the rear arch from injuring said joint, and at the same time the joint is protected against too-rapid cooling after the flame in the fire box is extinguished.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

35 1. An arch for an oil burning fire box, comprising top sections joined at their upper ends on a vertical center line, bottom sections joined at their lower ends in the said vertical center line, and side sections slidably joined with the lower ends of the top sections and the upper ends of the lower sections.

2. An arch for an oil burning fire box, comprising top sections joined at their upper

ends on a vertical center line, bottom sections joined at their lower ends in the said vertical center line, and side sections slidably joined with the lower ends of the top sections and the upper ends of the lower sections, each of the joints having a tongue and groove connection.

3. An arch for an oil burning fire box, comprising top sections joined at their upper ends on a vertical center line, bottom sections joined at their lower ends in the said vertical center line, and side sections joined with the lower ends of the top sections and the upper ends of the lower sections, each of the joints having a tongue and groove connection, of which the tongues and grooves of the top and bottom joints extend vertically and the tongues and grooves of the side joints extend horizontally.

4. An arch for an oil burning fire box, comprising top sections joined at their upper ends on a vertical center line, bottom sections joined at their lower ends in the said vertical center line, and side sections slidably joined with the lower ends of the top sections and the upper ends of the lower sections, the bottom sections being grooved exteriorly to conform to the correspondingly shaped bottom portion of the fire box.

5. An arch for an oil burning fire box, comprising top sections joined at their upper ends on a vertical center line, bottom sections joined at their lower ends in the said vertical center line, and side sections slidably joined with the lower ends of the top sections and the upper ends of the lower sections, the top sections having at their outer ends integral flanges adapted to extend exteriorly over the upper portion of the joint formed between the flue sheet and the fire box to protect said fire box joint against the flame passing through the arch.

FRANK J. SPILLANE.