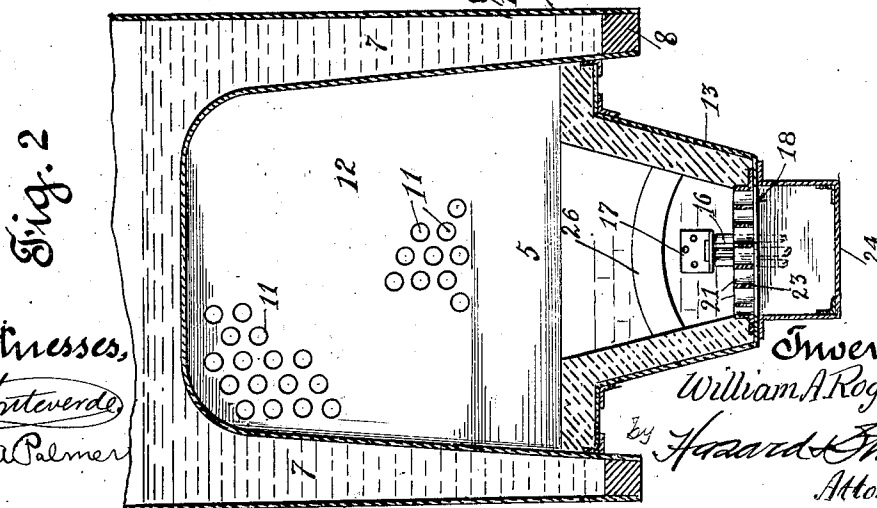
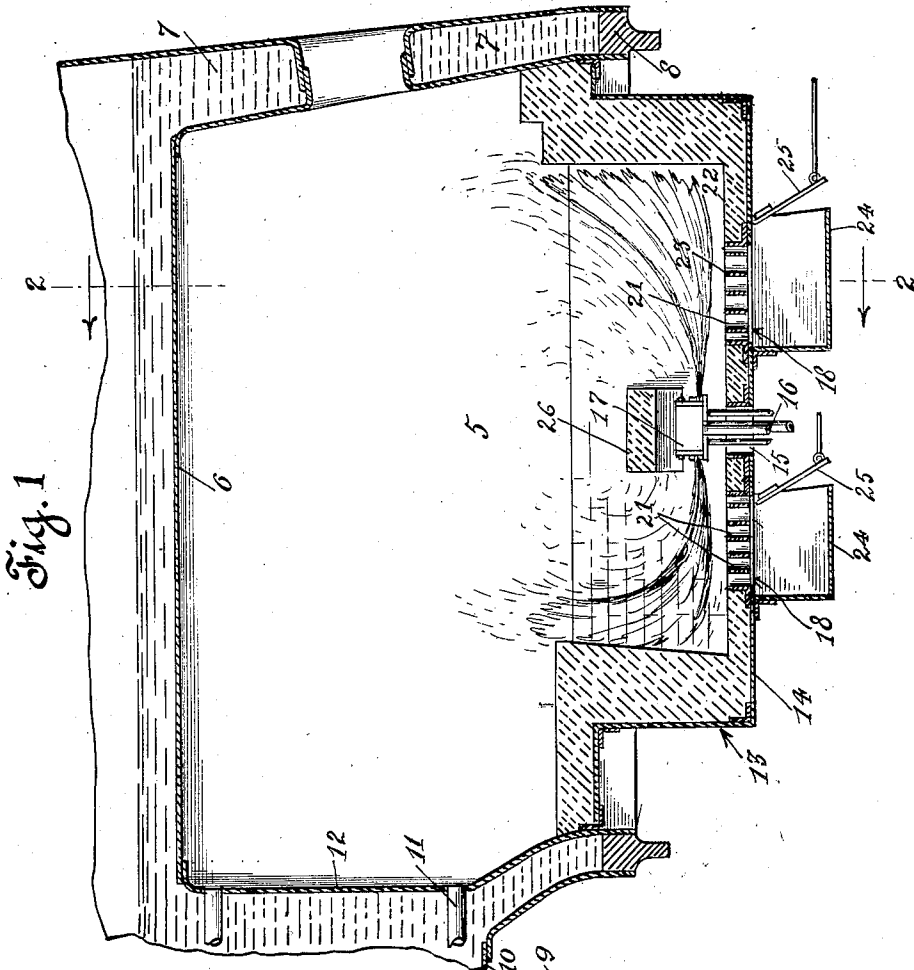


W. A. ROGERS.
OIL BURNING STEAM BOILER.
APPLICATION FILED JULY 8, 1909.

973,138.

Patented Oct. 18, 1910.



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UNITED STATES PATENT OFFICE.

WILLIAM A. ROGERS, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO CHARLES A. HAMMEL, OF LOS ANGELES, CALIFORNIA.

OIL-BURNING STEAM-BOILER.

Specification of Letters Patent.

Patented Oct. 18, 1910.

Application filed July 8, 1909. Serial No. 506,491.

To all whom it may concern:

Be it known that I, WILLIAM A. ROGERS, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Oil-Burning Steam-Boilers, of which the following is a specification.

This invention has relation to improvements over that type of oil burning steam boilers illustrated and described in United States Letters Patent No. 882,756, granted to Charles A. Hammel on March 24th, 1908, and entitled "Oil burning steam boilers." In the above described patent a plurality of oppositely disposed hydrocarbon burners was shown, each burner being supplied with a deflecting arch of refractory material, no provision being made whereby one burner or a set of burners could be operated independently of the oppositely disposed burners.

It is a prime object of the present invention to provide a construction, which while embodying the essential features of the above noted construction, a novel disposition of the burners is arranged so that a single burner may be operated, if an occasion (as when drifting) demands, thus effecting a saving in fuel consumption.

A further object is to provide a construction that will effectively and economically generate steam in tubular boilers and attain complete combustion within the firebox without injury thereto.

In the attainment of the above objects I preferably employ a double hydro-carbon burner provided with a plurality of oppositely disposed flame outlets, centrally disposed in the fire box of the boiler lined with a refractory material, an arch formed of refractory material being disposed above the burner to protect it from the intense heat generated thereby. Provision is also made for admitting air directly to the burner and an air supply being provided for each burner flame and a controlling means therefor.

In the annexed drawings, forming a part of this specification:—Figure 1— is a central longitudinal section through the fire-box of a locomotive boiler, illustrating an application of my invention. Fig. 2— is a transverse view taken on line 2—2 of Fig. 1.

Referring more particularly to the drawings, inside firebox or combustion chamber 5 is of usual construction, being closed at the

top by crown sheet 6 and surrounded by water jacket 7, the bottoms of which are closed by the usual mud ring 8. The outside shell 9 of firebox 5 is connected to the waist 10, through which the usual tubes 11 pass through tube sheet 12, to the smoke stack (not shown) at the front end of the boiler.

Firebox 5 is closed at the bottom by a sheet or plate metal box 13, as illustrated in the Hammel construction hereinbefore mentioned, and corresponds in general form to the ash pan of locomotive boilers in which fuel of a solid type is consumed.

Box 13 is provided with a metallic bottom plate 14, which has an opening 15 preferably disposed in the center thereof through which the pipes 16 of a double hydrocarbon burner 17 project, the air to the burner being taken through opening 15. Plate 14 is also provided with a plurality of rectangular openings 18 in which are mounted a plurality of short metal tubes 21, preferably arranged in staggered relation, and whose upper ends are flush with the top of the fire brick 22 with which the box 13 is preferably lined. The space around the tubes above plate 14 is preferably filled with a heat resisting material 23. Bolted or otherwise secured to the under face of plate 14 and directly below the tubes in each opening 18, are sheet metal air inlet boxes 24, the rear vertical wall of each box being open to the atmosphere, and each provided with a damper 25 controlled from the cab of the engine in a suitable manner (not shown). By means of these air inlet boxes the admission of air through the tubes into the firebox may be satisfactorily controlled. This method of taking the main air supply from the bottom through a series of tubes is essentially the same in all respects as that described and illustrated in the Hammel construction heretofore noted, it preventing as in that construction, the entrance of an excessive or undue amount of cold air to the combustion chamber, and at the same time retards the volume of air entering thereto and enables the fireman of the locomotive to control the distribution of the air more effectively. The air as it enters the tubes becomes heated from the operation of the burners and expands, heating it to a high temperature, so that it will readily form a union with the gases that are being con-

sumed within the combustion chamber. The air passing through the air inlet boxes tends to raise the burner flames and prevents dragging.

- 5 In the Hammel construction the burners were oppositely disposed, projecting their flames toward each other, thus necessitating the operation of both burners simultaneously. By means of the novel arrangement
10 of the double outlet burner in this construction, the flames are thrown in directions opposite to each other to the front and rear of the firebox, thus permitting the use of a single burner when the engine is drifting or does not require as much power as at
15 other times.

To protect the burner from the excessive heat generated by its operation, I have provided an arch 26 formed of refractory material extending transversely of the firebox
20 13 directly over the burner, the cool air entering through inlet 15 maintaining the burner in a comparatively cool condition at all times.

- 25 It will be observed from the foregoing description that I have provided an improved form of firebox construction over that described in the hereinbefore mentioned patent, that will enable me to operate an
30 engine on less fuel than it has heretofore consumed.

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

- 35 1. The combination with a steam boiler having a firebox, of a double hydrocarbon burner centrally disposed in said firebox for delivering independent hydrocarbon flames in opposite directions into the firebox, means
40 for establishing a draft of air into the firebox adjacent the flame delivery means, means for admitting air directly into the firebox adjacent to and under each flame, and a controlling means for each air admission means.

- 45 2. The combination with a steam boiler having a firebox, of a double hydrocarbon burner centrally disposed in said firebox for delivering hydrocarbon flames in diametrically opposite directions into the firebox,
50 means for establishing a draft of air into the firebox adjacent the hydrocarbon burner, a heat deflecting arch disposed directly above and over the hydrocarbon burner, a plurality of air inlets in the bottom of said
55 firebox, and means to control the flow of air through said air inlets.

3. The combination with a steam boiler,

having a firebox lined with a refractory material, of a hydrocarbon burner having a double flame outlet, centrally disposed in said firebox for delivering hydrocarbon flames in diametrically opposite directions into the firebox, means for establishing a draft of air into the firebox adjacent the burner, a heat deflecting arch transversely disposed in said firebox above the burner, a plurality of air inlets in the bottom of said box, a metallic casing having an opening therein disposed under each air inlet, a closure for the opening in each casing, and means to control said closures.

4. The combination with a steam boiler having a firebox, of a double hydrocarbon burner disposed in said firebox for delivering hydrocarbon flames in opposite directions into the firebox, means for establishing a draft of air into the firebox adjacent the hydrocarbon burner, a heat protective means for said hydrocarbon burner disposed in said firebox, and means for admitting air directly into the firebox adjacent to and under each flame.

5. The combination with a steam boiler having a firebox, of a double hydrocarbon burner capable of delivering independent flames therefrom in diametrically opposite directions into the firebox, means for establishing a draft of air into the firebox adjacent the hydrocarbon burner, a heat protective arch located in said firebox above said burner, means for admitting air directly into the firebox adjacent to and under each flame delivered by the hydrocarbon burner, and means to control the volume of air passing through said air admission means.

6. The combination with a steam boiler having a firebox, of a double hydrocarbon burner disposed in said firebox for delivering a plurality of independent hydrocarbon flames, said flames being delivered in directions opposite to each other into the firebox, means for establishing a draft of air into the firebox adjacent the flame delivery means, means for admitting air directly into the firebox adjacent to and under each flame, and means to control the volume of air passing through said air admission means.

In witness that I claim the foregoing I have hereunto subscribed my name this 1st day of July, 1909.

WILLIAM A. ROGERS.

Witnesses:

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MYRTLE A. PALMER.