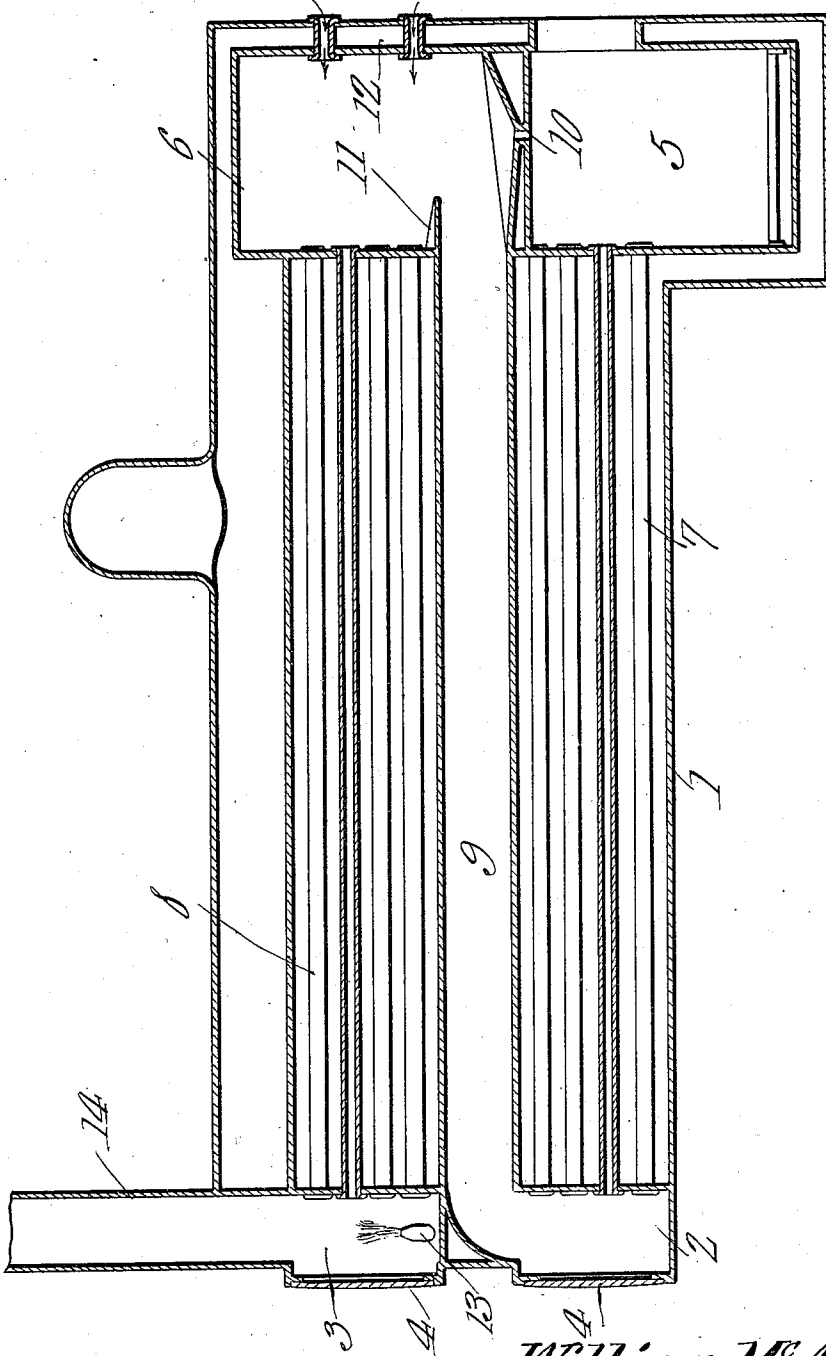


W. McARTHUR.
LOCOMOTIVE BOILER.
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1,015,501.

Patented Jan. 23, 1912.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM McARTHUR, OF TENINO, WASHINGTON.

LOCOMOTIVE-BOILER.

1,015,501.

Specification of Letters Patent.

Patented Jan. 23, 1912.

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To all whom it may concern:

Be it known that I, WILLIAM McARTHUR, a citizen of the United States, residing at Tenino, in the county of Thurston and State of Washington, have invented a new and useful Locomotive-Boiler, of which the following is a specification.

This invention relates to locomotive boilers and furnaces in which any kind of coal or oil may be used as a fuel, although the device is particularly designed to use lignite.

One of the objects of the invention is to provide means whereby the products of combustion upon reaching the front end of the boiler, will be directed backward to the rear end thereof where they are subjected to a torch or flame from the fire box and all combustible products thus consumed prior to the passage of the remaining products to the stack at the front end of the boiler.

With the foregoing and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claim.

In the accompanying drawing, which is a vertical longitudinal section through a boiler constructed in accordance with the present invention, the preferred form of the invention has been shown.

Referring to the drawing by characters of reference, 1 designates a boiler having superposed smoke boxes 2 and 3 at the front end thereof, each of said boxes being provided with a door 4. A fire box 5 is located back of and below the lower portion of the boiler and a combustion chamber 6 is located above the fire box and back of the upper portion of the boiler. Flues 7 such as ordinarily utilized, are arranged within the boiler and connect the fire box with the lower smoke box 2 and another set of flues 8 connects the upper fire box 3 with the combustion chamber 6. A return flue 9 extends from the upper portion of the smoke box 2 to the lower portion of the combustion chamber and the bottom of said combustion chamber is preferably inclined downwardly toward an outlet opening 10 through which cinders and the like may pass into the fire box. This opening 10 also serves as

a vent through which a jet of flame may pass into the combustion chamber for the purpose hereinafter set forth. A deflecting shield 11 preferably extends into the combustion chamber from the upper wall of the return flue 9 and serves to spread gases over the said chamber prior to their passage into the flues 8.

As shown in the drawing, the combustion chamber and the fire box are preferably inclosed by a water jacket 12 communicating with the interior of the boiler and the steam exhaust nozzle 13 is located in the bottom of the upper smoke box 3 so as to produce a forced draft through the stack 14.

It will be apparent that when fuel is burned within the fire box 5, the products of combustion will pass through the flues 7 to the smoke box 2 and will then return by way of the flue 9 to the combustion chamber 6. Any unconsumed combustible products contained within the chamber 6 will be ignited by a flame passing through the opening 10, combustion being supported by air admitted to the chamber 6 through one or more ports 15. The remaining products will pass through the flues 8 to the upper smoke box 3 and thence outward through the stack 14. The deflecting or spreading shield 11 serves to spread the products of combustion transversely of the chamber 6 where they can be readily ignited by the jet of flame entering said compartment through the opening 10.

It is to be understood of course that various changes may be made in the construction and arrangement of the parts without departing from the spirit or sacrificing any of the advantages of the invention as defined in the appended claim.

What is claimed is:—

A boiler including a fire box, a combustion chamber thereabove, there being a flame receiving opening in the bottom of the combustion chamber through which communication between the fire box and said combustion chamber is constantly maintained, there being a constantly open air inlet in one wall of the combustion chamber, the bottom of said chamber being arranged to direct unconsumed particles through the bottom opening and back into the fire box,

a smoke box, flues connecting the smoke box and the fire box, a single flue connecting the upper portion of the smoke box with the lower portion of the combustion chamber,
5 and flues extending from the upper portion of the combustion chamber to the smoke outlet.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM MCARTHUR.

Witnesses:

P. C. KIBBE,

FRANK D. WICKERSHAM.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
