

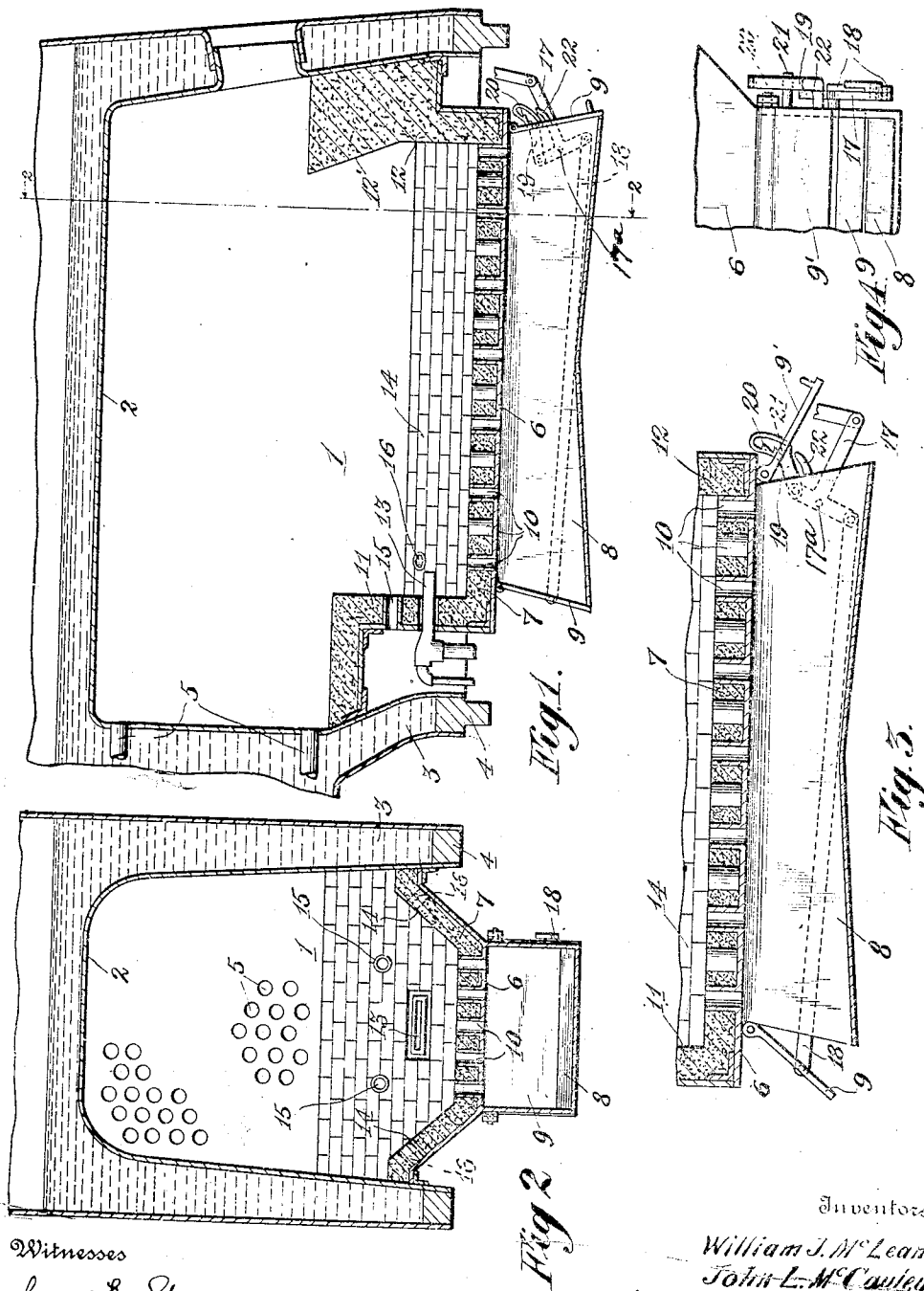
W. J. McLEAN & J. L. McCAULEY.

OIL BURNING STEAM BOILER.

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1,039,570.

Patented Sept. 24, 1912.



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UNITED STATES PATENT OFFICE.

WILLIAM J. McLEAN AND JOHN L. McCAULEY, OF BELLINGHAM, WASHINGTON.

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Application filed April 27, 1911. Serial No. 623,745.

To all whom it may concern:

Be it known that we, WILLIAM J. McLEAN and JOHN L. McCAULEY, citizens of the United States, residing at Bellingham, in the county of Whatcom and State of Washington, have invented certain new and useful Improvements in Oil-Burning Steam-Boilers, of which the following is a specification.

Our invention has for a primary object to provide a construction of this character, wherein a more perfect combustion can be obtained, and further, in the provision of a construction permitting of a single burner being operated, as desired, without injury to the fire box.

Other objects will be set forth as our description progresses and those features of construction, arrangements and combination of parts on which we desire protection, succinctly defined in our annexed claims.

Referring to the accompanying drawing, wherein like numerals of reference indicate like parts throughout the several views: Figure 1 is a fragmentary longitudinal section through the fire box of a locomotive boiler, equipped and constructed in accordance with our invention. Fig. 2 is a transverse section thereof taken on line 2—2 of Fig. 1. Fig. 3 is a longitudinal section, on large scale, through the lower portion of the fire box and underlying air conduit, the valves or dampers for the latter being shown in open position, and Fig. 4 is a fragmentary end elevation, illustrating more particularly the valve controlling mechanism.

Referring to the drawing by numerals of reference, 1 indicates the combustion chamber from which the flues 5 lead, said chamber which is of usual construction, being closed at the top by a crown wall or sheet 2 and surrounded by water jacket 3, closed at its lower portion by a mud ring, as 4.

The bottom of the fire box is formed by a metallic wall 6, lined with fire brick or other suitable refractory material, as 7, and beneath wall 6 we provide a longitudinal air conduit 8 whose bottom is inclined downwardly toward suitable air intake openings, that are provided in its end portions the said inclination of the bottom being provided to prevent accumulation of oil in the air conduit. These conduit intake openings are controlled by valves or dampers 9, 9'.

Reference numeral 10 indicates air inlets

provided in the bottom wall 6 of the fire box to establish communication between the latter and conduit 8, these air inlets conveniently consisting of short tubes fixed to the metallic wall 6 and projecting through lining 7 to be protected by the latter, as is well understood.

In accordance with our invention, the bottom wall 6 extends horizontally, or substantially so, for the entire distance between the vertical end walls 11 and 12, in the former of which a suitable burner 13 of the hydrocarbon type, is mounted to direct its flame across the path of the air discharging from inlets 10.

The series of air inlets 10 extend from burner 13 to side walls 14 and to wall 12, which latter has an inwardly and upwardly inclined deflecting portion 12', overlying some of the air inlets 10. We also provide air inlets, as 15 and 16 in end wall 11 and side walls 14 respectively. Through this arrangement of inlets for the admission of air, we have found by actual test that a practically perfect combustion of the fuel is obtained, enabling the generation of steam economically, as contradistinguished from devices of like nature used prior to our invention. Further, end wall 12 is protected against injury by the heat, through the admission of air at the base, or beneath the overhanging portion 12' thereof, which latter in deflecting the air inwardly retards or tends to hold part of the same. In the furtherance of this object, we preferably provide means for simultaneously swinging valves 9, 9' with the valve 9' being operated the greater distance to thereby obtain a larger supply of air at the point farthest removed from burner 13, said means comprising an operating lever 17, having arms projecting on opposite sides of its fulcrum 17^a and connected by links 18 and 19 with valves 9, 9' respectively, the connection of the link 19 with its valve 9' being nearer the axis of movement of the valve than the connection of the link 18 with its valve 9. With this arrangement, it will be evident that inasmuch as the valve 9' is open a greater distance than the valve 9, more air can enter at the end controlled by said valve 9', and a greater circulation of air will therefore take place alongside the wall 12. This comparatively great volume of air serves to keep the end wall 12 cool and thereby protects it to

a material degree. Link 19 has its free end portion slotted as shown, and provided on one side wall thereof with teeth 20 adapted for engagement with a pin 21 of valve 9', through the medium of which independent opening movement of the valve is permitted. An abutment or strike part 22 on the side wall of conduit 8, trips link 19 during downward swinging of valves 9, 9' when the lever 17 is raised thereby permitting the last named valve to close in case it has been manually opened and held by the outer of the teeth 20.

Various changes can be made in the details of our herein disclosed construction, as fall within the scope of our annexed claims.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent of the United States, is:

1. In a structure of the character set forth, the combination with a furnace having an air inlet and a burner for projecting a flame into said furnace, of means for supplying air to the inlet comprising a conduit having opposite intake openings, and a bottom that inclines downwardly in opposite directions from an intermediate point toward said intake openings.
2. In a structure of the character set forth, the combination with a furnace having an air inlet and a burner for introducing a flame into said furnace, of means for supplying air to said inlet, comprising a conduit having a plurality of openings, valves controlling the openings, and common means for actuating the valves and causing one to move a greater distance than the other.
3. In a structure of the character set forth, the combination with a furnace having an air inlet and a burner for introducing a flame into said furnace, of means for supplying air to said inlet, comprising a conduit having a plurality of openings, valves controlling the openings, and common means for actuating the valves and permitting one to be operated independently of the other.
4. In a structure of the character set forth, the combination with a furnace having a plurality of air inlets and a burner for introducing a flame into said furnace at a predetermined point, of means for supplying air to said inlets, comprising a conduit having a plurality of openings located at different distances from the burner valves controlling the openings, and common means for actuating the valves and causing

one to move a greater distance than the other.

5. In a structure of the character set forth, the combination with a furnace having a plurality of air inlets and a burner for introducing a flame into said furnace at a predetermined point, of means for supplying air to said inlets, comprising a conduit having a plurality of openings located at different distances from the burner, valves controlling the openings, and common means for actuating the valves and causing the valve of the opening that is farther from the burner to move to a more open position than the valve nearer the said burner.

6. In a structure of the character set forth, the combination with a furnace having an air inlet and a burner for introducing a flame into said furnace, of means for supplying air to said inlet, comprising a conduit having a plurality of openings, valves controlling the openings, an actuating lever, and links connected to the lever and to the valves to cause both valves to be operated, and one to move to a more open position than the other.

7. In a structure of the character set forth, the combination with a furnace having an air inlet and a burner for introducing a flame into said furnace, of means for supplying air to said inlet, comprising a conduit having a plurality of openings, valves controlling the openings, an actuating lever, and links connected to the lever and to the valves, one of said connections being detachable and adjustable.

8. In a structure of the character set forth, the combination with a furnace having a plurality of air inlets in its bottom and a burner for introducing a flame into said furnace at a predetermined point, of means for supplying air to said inlets, comprising a conduit below the bottom having opposite intake openings, one of which is located nearer the burner than the other, swinging valves controlling the intake openings, an actuating lever, links connecting the lever with the valves to swing both to open position and arranged to move one a greater distance than the other, and an adjustable connection between one of the valves and its link.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM J. McLEAN.
JOHN L. McCAULEY.

Witnesses:

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