(No Model.)

B. S. DUNN.

BURNER.

No. 555,308. Patented Feb. 25, 1896.

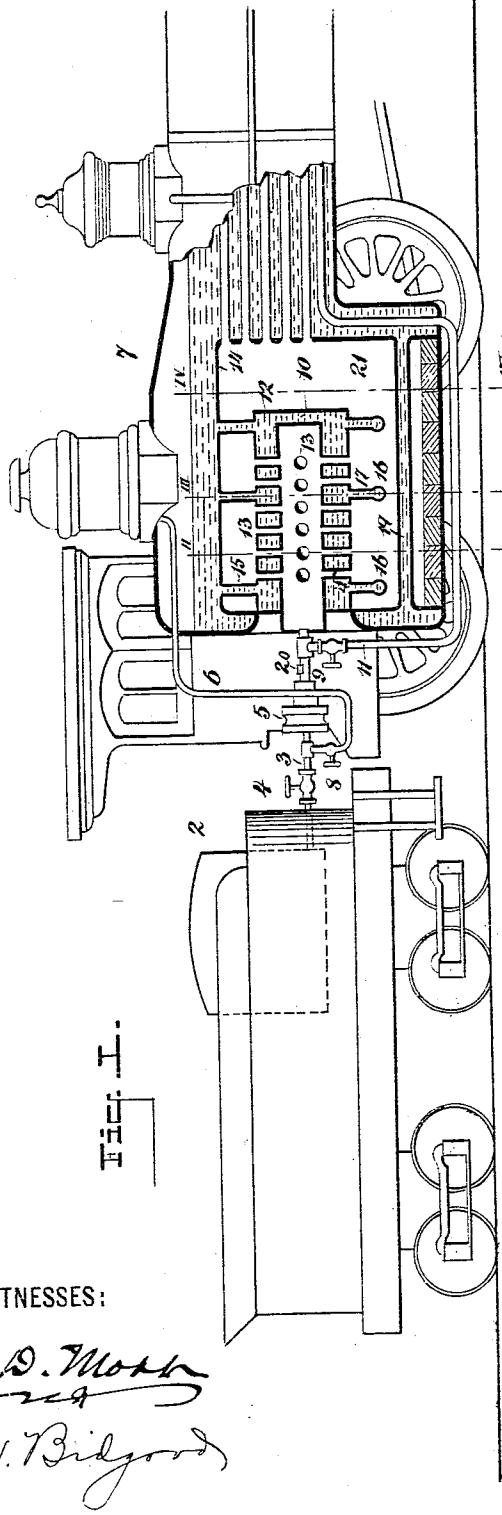

Fig. I.

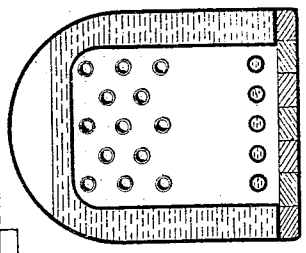

Fig. IV.

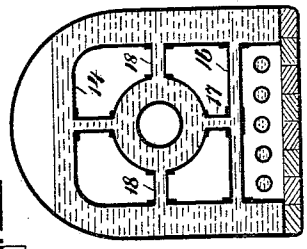

Fig. III.

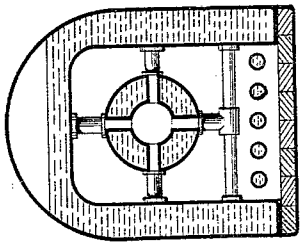

Fig. II.

WITNESSES:

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SPECIFICATION forming part of Letters Patent No. 555,308, dated February 25, 1896.

Application filed February 13, 1895. Serial No. 538,224. (No model.)

To all whom it may concern:

Be it known that I, BALLARD S. DUNN, a citizen of the United States, residing at Brooklyn, county of Kings, State of New York, have invented certain new and useful Improvements in Burners, of which the following is a specification.

The object of my invention is a burner adapted to occupy the fire-chamber of a locomotive-boiler or other furnace and to feed thereto and secure the proper combustion of aerated petroleum or other combustible gas or vapor.

Referring to the accompanying drawings, which form a part of this specification, Figure I is a sectional elevation illustrating the application of my invention to the fire-box of a locomotive. Fig. II, III, and IV are vertical transverse sectional views taken in planes at right angles to the plane of section of Fig. I, the several planes being indicated by the lines II II, III III, and IV IV, Fig. I.

One of my objects has been to devise a burner for vaporized petroleum or other fuel which is capable of being placed in the fire-box of the ordinary locomotive-engine, but the invention is also capable of use where the general construction of the engine has been carried out with a view to the use of this particular burner.

In adapting a locomotive-engine furnace to the utilization of vapor-fuel I place upon the tender 1 a petroleum-tank 2, adapted to supply petroleum through pipe 3, under control of a suitable cock 4, to an injector and mixing-chamber 5, which is supplied with steam through pipe 6 from the locomotive-boiler 7, under control of another cock 8. A pipe 9 leads from the mixer 5 to a cylindrical mixing-chamber 10, placed within the fire-box 21. The pipe 9 receives through pipe 11 air which has been previously warmed in accordance with the method described in my co-pending application, Serial No. 538,222, filed February 13, 1895.

The mixing-chamber and reservoir 10 is supported centrally within a cylindrical water-jacket 12 by the radial tudes 13, which serve as outlets for the mixed vapor, and the water-jacket 12 is itself suspended from the crown-sheet 14 by water-tubes 15 at top and supported upon transverse water-tubes 16 at bottom by other water-tubes 17. Horizontal water-tubes 18 also lead through the side walls of the fire-box.

The ordinary grates are preferably removed and hollow grates 19 put in their place and connected with the interior of the boiler, as shown.

The mixed petroleum, steam, and air are supplied under control of the several cocks in a well-known manner to the main mixing-chamber and reservoir 10 and ignited through aperture 20. The combustion goes on within the main fire-chamber 21. The tubes 13 and chamber 10 and all parts that are in contact with the flame are thoroughly protected by the water-jacket.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In combination with a steam-boiler and a fire-box therein, a cylindrical mixing-chamber 10 supported centrally in the fire-box, the cylindrical water-jacket 12 surrounding the mixing-chamber and communicating with the boiler through the radial supporting-tubes 18, and the radial tubes 13 communicating between the mixing-chamber throughout its length and fire-box and supporting the mixing-chamber, substantially as set forth.

2. In combination with a steam-boiler and a fire-box therein having water-spaces of the boiler on each side, a mixing-chamber 10 supported centrally in the fire-box, the water-jacket 12 surrounding the mixing-chamber, the transverse water-tubes 16 communicating with side water-spaces of boiler, the tubes 17 communicating between water-jacket 12 and tubes 16, the water-tubes 18 supporting the water-jacket and communicating between it and the side water-spaces of the boiler, and the tubes 13 supporting the mixing-chamber in the water-jacket and communicating between the former and the fire-box, substantially as set forth.

BALLARD S. DUNN.

Witnesses:
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