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UNITED STATES PATENT OFFICE.

EDWARD H. JONES, OF ALBANY, AND R. STEVENSON, OF SCHENECTADY, NEW YORK.

FURNACE OF STEAM-BOILERS.

Specification of Letters Patent No. 25,901, dated October 25, 1859.

To all whom it may concern:

Be it known that we, EDWARD H. JONES, of the city and county of Albany, and ROBERT STEVENSON, of the city and county of Schenectady, State of New York, have invented a new and useful Improvement in Furnaces of Steam-Boilers; and we hereby declare the following to be a full and exact description thereof, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a vertical section of the "inside fire box," showing the grate frame in half-section; and Fig. 2, a plan view.

Our invention relates to placing the fire grates of the boiler at the bottom of an adjustable, hopper-shaped box; thereby reducing the grate surface, and at the same time retaining the great amount of most effective heating surface obtained by the use of a large furnace; this box is so arranged that it may be raised or lowered as the contingency of a "light" or "heavy fire" may require. The reduced area of great surface tends to increase the intensity of the draft, produces a more perfect combustion, and prevents the admission of a surplus supply of atmospheric air more than is necessary to maintain the fire, thereby preventing the loss of effect of the fuel by the cooling of the heating surfaces of the boiler. The inclined sides of the box serve to concentrate the fuel during the process of consumption, and deflects the flame against the sides and crown-sheet of the furnace, its action being very similar in effect to the action of the flame in a reverberatory furnace.

The following description will enable others skilled in the art to make and use our invention.

A, is the inside fire box of the boiler. The hopper-shaped box is made of the two frames B, B', connected together at any required distance by means of the stays C, C, etc.; the side plates D, D, D, D, are made to fill up the spaces left between the frames B, B', and may be made with spiculated surfaces for the purpose of retaining fire-clay or any other non-conducting material to prevent the loss of heat from radiation. The rocking grates E, E, are hung upon journals e, e, and are held to their

place by boxes as shown at e'; attached to each grate is an arm F, F; connected together by the rod f, and to the hand-lever G, by the rod g. The hopper-shaped box rests upon four cams H, H, etc.: simultaneous motion is given to these cams by means of the hand-lever J, which, by the rod j, is connected to the arm I, of the tumbling shaft h', to which are fastened two of the cams, they being connected to the other two by the rods h, h. The hanger K, serving as fulcrums for the hand-levers G, and J, is attached to the foot board L.

The arrangement herein shown has special reference to its use in locomotive engines; when used for stationary or marine purposes the hand-levers G and J, may be attached to the boiler or to any convenient point contiguous thereto.

The fuel, when too closely packed, or choked by an accumulation of ashes, is agitated by rocking the grates by giving a slight motion to the hand-lever G; and when required the fire may be entirely dumped by the same means by giving more motion to the lever.

The box may be held to any required elevation by moving the cams by the lever J, and securing it.

The grates may be rocked or agitated by means of the lever G and its connections without disturbing the position of the grate frame or box; and the grate frame or box may be elevated or depressed while the grates may be retained in a horizontal or other position; or the grate frame or box may be elevated or depressed at the same time that the grates are rocked or agitated, to insure a more speedy clearance of the grates if desired.

We do not confine ourselves to the particular arrangement herein shown to raise and lower the hopper-shaped box, as the same may be effected with equal facility by means of connected screws, racks and pinions, and other well known devices.

Among the advantages that we claim for our improvement, is its economy of fuel by reason of the more perfect combustion obtained, and by regulating the height of the fire to the work required; its simplicity, and its non-liability to derangement.

What we claim as our invention and desire to secure by Letters Patent, is—

The arrangement of the hopper-shaped grate box B, D, so constructed as to be adjustable in height, combined with the grates E, E, having means attached for rocking or agitating them, in their relation to each

other and to the boiler fire box A in the manner, and for the purposes set forth.

EDWARD H. JONES.

ROBERT STEVENSON.

Witnesses:

JAS. E. NOBLE,

WM. H. LOW.