

(No Model.)

J. JOHNSTON.
SMOKE BURNER FOR FURNACES.

No. 261,723.

Patented July 25, 1882.

Fig. 1

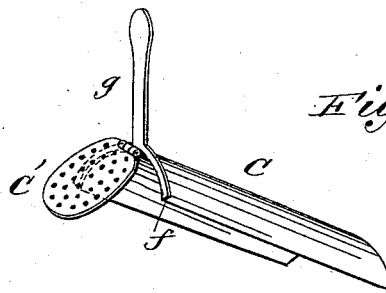
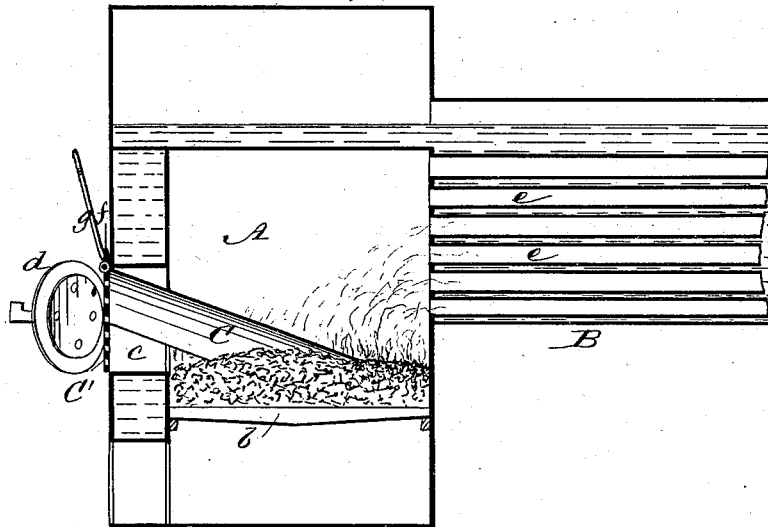


Fig. 2

WITNESSES:

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JAMES JOHNSTON, OF NORTH LA CROSSE, WISCONSIN.

SMOKE-BURNER FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 261,723, dated July 25, 1882.

Application filed May 12, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES JOHNSTON, of North La Crosse, in the county of La Crosse and State of Wisconsin, have invented certain new and useful Improvements in Smoke-Burners for Furnaces, of which the following is a full, clear, and exact description.

This invention is more especially designed to be applied to the fire-boxes of locomotive-engine boilers; but it may be used to advantage in other boilers.

The invention consists in a device of novel construction, which may be readily applied to or removed from the fire-box of the boiler, and is projected through the doorway of the fire-box, and constructed to pass a current or currents of fresh air to and above the burning fuel in the bottom of said box or chamber for the purpose of consuming the smoke produced by combustion of the fuel, and whereby a simple, convenient, and effective means is provided for such purpose, and great economy of fuel and other advantages, as hereinafter specified, are obtained.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 represents a longitudinal vertical section of the boiler of a locomotive-engine in part with my improved smoke-burner applied to the fire-box thereof, and Fig. 2 is a view in perspective of said smoke-burner detached.

A in the drawings indicates the fire-box of the boiler of a locomotive-engine; *b*, its fire-bars, and *c* its mouth-piece or doorway, which may be provided with the usual door, *d*.

B is the waist of the boiler, and *e* its fire or smoke flues.

My improved smoke-burner consists mainly of an elongated hood or half-tube, C, which may be provided with an outside flange, *f*, to assist in holding it in place, and with a handle, *g*, for manipulating it. Said improved burner is arranged, when in its place, to project through and fill the top half of the doorway *c*, and to enter and pass down within the fire-box at an angle of about forty degrees, more or less, and so that air is restrained from passing over the top of it, but is conducted through it down onto, over, and among

the burning fuel in the bottom of the fire-box or chamber, down within which it projects. Air is admitted to the hood or part-tube C through a perforated lid, C', on its front end, which lid is extended downward to control or cover the entire doorway *c*, the general door *d* being open when the smoke-burner is in use. Said perforated lid or screen C' it is preferred to attach by hinge to the hood C or its arm *g*, so that it may be thrown up or open when required to supply fuel to the fire, or for any other purpose.

This smoke-burner C C' may be readily applied to or removed from the fire-box, as circumstances render necessary. Thus it may be inserted or applied when the engine is on duty and be taken out or removed when the engine is off duty, the general door *d* being used, as usual, when getting up steam in the round-house.

When the device is used, its lower end being below the level of the boiler-flues, the space immediately above it is filled with flame, through which the smoke from the coal has to pass and where it is consumed, the air entering below and through the smoke-burner effecting the necessary combustion.

Said device may be used on switch-engines when standing still by applying a blower, and it may be used on all locomotives and on river, marine-engine, or stationary boilers of the locomotive type, and will be found of great advantage in cities by preventing smoke, and, being simple and inexpensive, may be readily applied. It need not be taken out when the engine is on duty, and is no hindrance to the firing of the engine or boiler.

Applied to the boiler of a locomotive-engine, it not only largely economizes fuel and burns the smoke, thus doing away with the annoyance to the passengers of a train and the public generally, or to brakemen on the top of freight-cars, by the escape of smoke from the smoke-stack, but it will also check the escape of sparks through the flues, and by its use the fire-grate need not be so frequently shaken, thereby saving fuel, and it will have the effect of preventing injurious expansion and contraction of the boiler-flues and fire-box by reason of the air being thoroughly heated before any of it can pass through said box and flues.

By means of the handle *g* the smoke-burner may be readily lifted in and out of place in the fire-box; or said handle may be used for shifting it to either side when supplying fuel.
5 It remains in place by its own weight and by its outer and supporting flange, *f*.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

The combination of the elongated hood or 10 partial tube C, provided with means for shifting it and moving it in and out of the fire-box of a locomotive or other steam boiler, and the hinged perforated lid or screen C, essentially as and for the purposes herein set forth.

Witnesses: JAMES JOHNSTON.

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