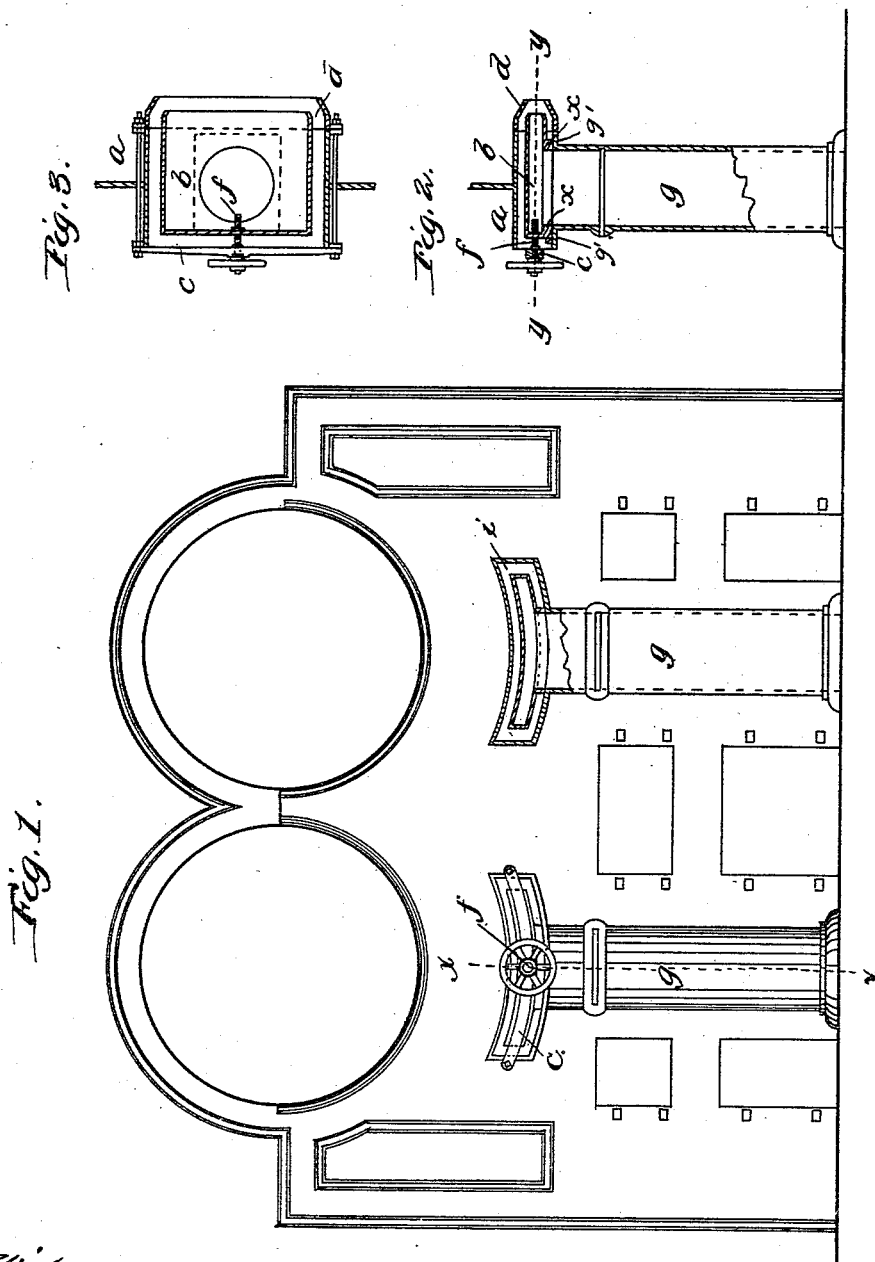


(No Model.)

J. RIDDELL & R. G. MORRISON.
GAS BURNER.

No. 457,750.

Patented Aug. 11, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

JOSEPH RIDDELL AND RICHARD G. MORRISON, OF SHARON, PENNSYLVANIA.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 457,750, dated August 11, 1891.

Application filed November 3, 1890. Serial No. 370,112. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH RIDDELL and RICHARD G. MORRISON, of Sharon, in the county of Mercer and State of Pennsylvania, have invented a new and useful Improvement in Gas-Burners; and we do hereby declare that the following is a full, clear, and exact description of the same.

Our invention relates to gas-burners, and is designed for use in connection with steam-boilers, blast-furnace stoves, or in other similar situations. The contracted air-nozzle can also be attached to the gas-flue on the outside of the burner on a boiler-front or hot-blast stove.

Our object is to provide a very simple construction and arrangement of the parts whereby economy is secured in the cost of the burner, and also to provide for the perfect combustion of the gas, thus economizing in the matter of fuel also.

We have shown in the accompanying drawings the burners in connection with a range of steam-boilers; but it will be understood that the burners are shown in this connection only for the sake of convenience, and may be used in any other desirable situation.

In the drawings, Figure 1 represents a front elevation of a range of boilers with the burner under one represented in elevation, while the burner under the other is partly in section. Fig. 2 is a vertical section on the line $x x$ of Fig. 1. Fig. 3 is a horizontal section through the head of the burner on the line $y y$ of Fig. 2.

The gas is supplied to the burner from any suitable source through a stand-pipe g , and this stand-pipe carries upon its upper end the burner proper.

This burner consists of a hollow head of metal, which is formed, preferably, concavo-convex in cross-section, as shown to the right in Fig. 1, being open at its rear end and with its front end, which projects into the furnace beneath the boilers, formed as a frustum of a cone. Supported within the hollow head, which we have indicated at a , is a gas-nozzle b , which, like the head, is concavo-convex in cross-section, having its rear end closed, as shown in Fig. 2, while its front end is formed tapering, corresponding to the shape of this

end of the head. Between this nozzle and the inner wall of the hollow head is provided an air-space i , which is open to the outside air, as shown in the right of Fig. 1. The nozzle covers the opening leading from the stand-pipe, as shown in Fig. 3, and directs the gas to the tapering exit of the nozzle, as at d .

Instead of the hollow head being of metal and formed as a part of the burner proper, it may be located in the brick-work of the furnace-wall and constructed of any suitable material, and if made of metal it may be either of one piece or in sections, as desired.

Across the front of the hollow head we support a bar or plate c , which serves as a bearing for a turning screw f , provided with a hand-wheel. The end of this screw engages with an opening in the rear wall of the gas-nozzle, whereby the said nozzle may be adjusted so as to increase or diminish the space between it and the contracted end of the hollow head, thus regulating the supply of air needed for the perfect combustion of the gas issuing from the nozzle. The gas-supply pipe g has horizontal flanges g' at its upper end, and upon these rest the flanges x of the nozzle, and from this construction it will be clear that when the nozzle is adjusted the joint at the flanges will always be covered, and there will be no opening formed through which the gas may leak without passing through the nozzle. By the use of this device we obtain complete control of the quantity of air introduced, as well as the manner of introducing it in a thin body, thus insuring a perfect combustion, and requiring but a comparatively small amount of gas to accomplish the desired result.

We do not of course limit ourselves to the precise arrangement of the hollow head, gas-nozzle, and supply-pipe, as the supply may be connected with the nozzle from above, if desired, or from one side, very slight changes in construction being required for this purpose.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In combination with a gas-supply pipe open at its upper end and having this end formed with a hood which is open at one end with the other end contracted and an opening

through the same, and a second hood and nozzle placed within the outer hood and covering the end of the gas-supply pipe, said inner hood or nozzle having a contracted opening
5 at one end, with means for adjusting it, substantially as described.

2. In combination with a gas-supply pipe or flue open at its upper end, the horizontal flanges extending therefrom, an adjustable
10 hood or nozzle located above the open end of the pipe and having horizontal flanges extending outwardly from the opening in the bottom thereof, whereby adjustment of the

hood or nozzle is permitted without allowing leakage, and an outer hood or nozzle inclosing
15 the inner, each hood or nozzle being formed with a contracted portion at one end, with an opening therein, substantially as described.

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

JOSEPH RIDDELL.
R. G. MORRISON.

Witnesses:

A. W. WILLIAMS,
GEO. TRIBBY.