

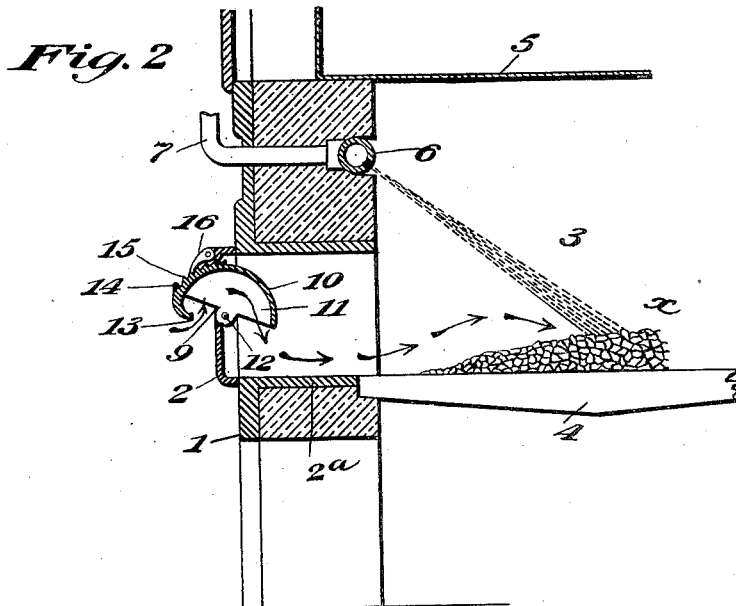
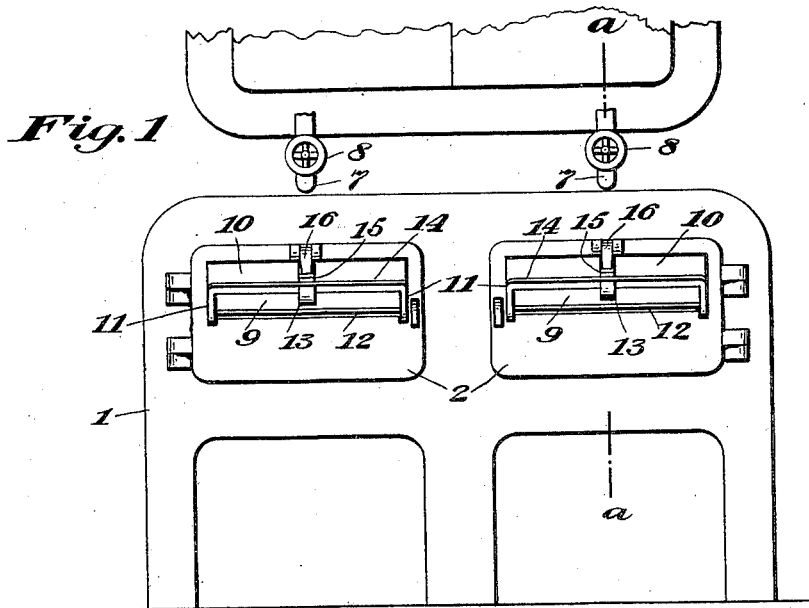
No. 676,734.

Patented June 18, 1901.

G. W. CARY.
BOILER FURNACE.

(Application filed Mar. 8, 1901.)

(No Model.)



Witnesses

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Inventor

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UNITED STATES PATENT OFFICE.

GEORGE W. CARY, OF CINCINNATI, OHIO, ASSIGNOR TO HIMSELF, AND
GILBERT L. VATTIER, OF COVINGTON, KENTUCKY.

BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 676,784, dated June 18, 1901.

Application filed March 8, 1901. Serial No. 50,286. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. CARY, a citizen of the United States of America, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Boiler-Furnaces, of which the following is a specification.

This invention relates to certain improvements in smoke-preventing devices such as are adapted for use in connection with steam-boiler and other furnaces for the prevention of smoke and to effect a corresponding economy in the consumption of fuel; and the object of the invention is to produce a device of this character of a simple and inexpensive nature adapted for use in connection with furnaces of various kinds, for which purpose it is capable of adjustment so as to be adapted for more convenient operation.

The invention consists in certain novel features of the construction, combination, and arrangement of the several parts of the improved smoke-preventing device, whereby certain important advantages are attained and the device is made simpler, cheaper, and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In the accompanying drawings, which serve to illustrate my invention, Figure 1 is a fragmentary front view of a furnace having my improved smoke-preventing device applied thereto, and Fig. 2 is a vertical section taken through the fire-box and charging-door in the plane indicated by the line *a a* in Fig. 1.

As shown in the views, 1 indicates the furnace-front; 2 2, the charging-doors; 2^a, the dead-plate at the mouth of the fire-box; 3, the fire-box; 4, the grate, and 5 the boiler. At the forward end of the furnace is arranged above each charging-door 2 a horizontally-extended jet-pipe 6, with which is centrally connected a steam-pipe 7, extended through the front wall of the furnace and provided with a cock 8, by means of which the entry of steam into the jet-pipe 6 may be conveniently regulated. The jet-pipe 6 has in it a series of jet-apertures, so arranged as to di-

rect jets of steam in a downwardly-inclined direction into the fire-box 3 and upon the fuel therein, as shown at *x* in Fig. 2.

Each charging-door 2 has at its upper part an opening 9, in which is arranged an adjustable damper formed of a semicircular part or shell 10, the ends of which are closed, as shown at 11, and are perforated for the passage of a pivot pin or rod 12, held at its ends in flanges on the door 2. Each shell or part 10 is situated in its opening 9 with its curved surface uppermost and is supported on its pivot-pin so as to oscillate upon a horizontal axis, and said horizontal axis is in substantially the same plane as the charging-door itself. Along its upper edge each part or shell 10 has a projecting bead or flange 14, adapted to form a stop for engagement with the front surface of the door, and the said part or shell 10 is so proportioned that when said bead or flange 14 is thus in contact with the door on the outer or front side thereof the opposite lower edge of the shell will be in contact with the inner surface of the door, and when the shell is in this position the opening 9 is closed and the entry of air through the opening 9 in the door is altogether prevented. At its upper curved part the semicircular part or shell 10 is formed with centrally-located teeth or notches 15, with which is adapted to be engaged a dog or pawl 16, pivoted at the upper part of the door 2, and the said shell is also provided with a centrally-arranged hook or handle 13 at its upper part, by means of which the shell may be moved pivotally upon the rod or pin 12, so as to withdraw the lower inner edge of the shell from contact with the inner surface of the door 2 and permit the passage of air through the opening 9 into the fire-box. When the shell is thus moved, the dog or pawl will ride over and successively engage the several teeth or notches 15 of the shell and will thus serve as a means for holding the shell in adjusted position, so as to permit of regulating the flow of air through the opening in the charging-door.

In operation the damper formed of the part or shell 10 will first be adjusted to permit the entry of a proper volume of air by way of the opening 9 in door 2 into the fire-box, the po-

sition to which the damper or shell is adjusted depending on the particular circumstances of each case—as steam - pressure, draft, &c.—and when the shell has been properly adjusted it will be held in adjusted position by the engagement of the dog or pawl 16 with the teeth or notches 15 of the shell. By reason of the downward curvature of the shell 10 on the inner side of the charging-door the air thus entering by way of the opening 9 will be directed downwardly upon the dead-plate 2^a and will be caused to flow along the lower part of the fire-box, so as to absorb as much heat as possible from said dead-plate and the grate. In this way the air introduced by way of the opening 9 will be well heated by the time it comes in contact with the fuel. The arrows in Fig. 2 indicate the course of the air admitted through the charging-door. The steam-jets discharged from the jet-pipe 6 will also act to prevent the air thus admitted from rising in the fire-box as it becomes heated, and the entering air, being thereby held closely upon the fuel, insures thorough combustion of the fuel and prevents the formation of smoke.

The device constructed as above described is of a very simple and inexpensive nature and permits of a very material economy in the consumption of fuel owing to the more perfect combustion secured, as above set forth, and it will also be seen that the device is of a nature such that when once installed it requires little if any attention on the part of the fireman in order to produce satisfactory results. It will also be obvious from the above description that the device is capable of some modification without material departure from the principles and spirit of the invention, and for this reason I do not wish to be understood as limiting myself to the precise form and arrangement of the several parts herein set forth.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a smoke-preventing device, the combination of a charging-door having an opening, a shell situated in and adapted in one position to close said opening, said shell being arranged with its curved surface upward and supported to oscillate on a horizontal axis, the axis of said shell being in substantially the same vertical plane as the door and means for holding the shell in adjusted positions whereby the flow of air through said opening may be regulated, substantially as set forth.

2. In a smoke-preventing device, the combination of a charging-door having an opening, a shell situated in and adapted in one position to close said opening, said shell being arranged with its curved surface upward and supported to oscillate on a horizontal axis, the axis of said shell being in substantially the same vertical plane as the door and means for holding the shell in adjusted positions whereby the flow of air through said opening may be regulated, said means comprising a series of teeth formed on the upper curved surface of the shell and a dog carried by the charging-door for engagement with said teeth, substantially as set forth.

3. In a smoke-preventing device, the combination of a charging-door having an opening, a shell situated in and adapted in one position to close said opening, said shell having closed end portions and being arranged with its curved surface upward and supported to oscillate on a horizontal axis, a pivot-pin passed through the closed end portions of the shell and held at its ends to the charging-door and extended in substantially the same vertical plane as the door and means for holding the shell in adjusted positions whereby the flow of air through said opening may be regulated, substantially as set forth.

Signed at Cincinnati, Ohio, this 6th day of March, 1901.

GEORGE W. CARY.

Witnesses:

GILBERT L. VATTIER,
JOHN ELIAS JONES.