(No Model.) 2 Sheets—Sheet 1.

# B. B. LAMPREY.

## PROTECTIVE ARCH PLATE FOR MOUTHS OF BOILER FURNACES.

No. 592,635. Patented Oct. 26, 1897.

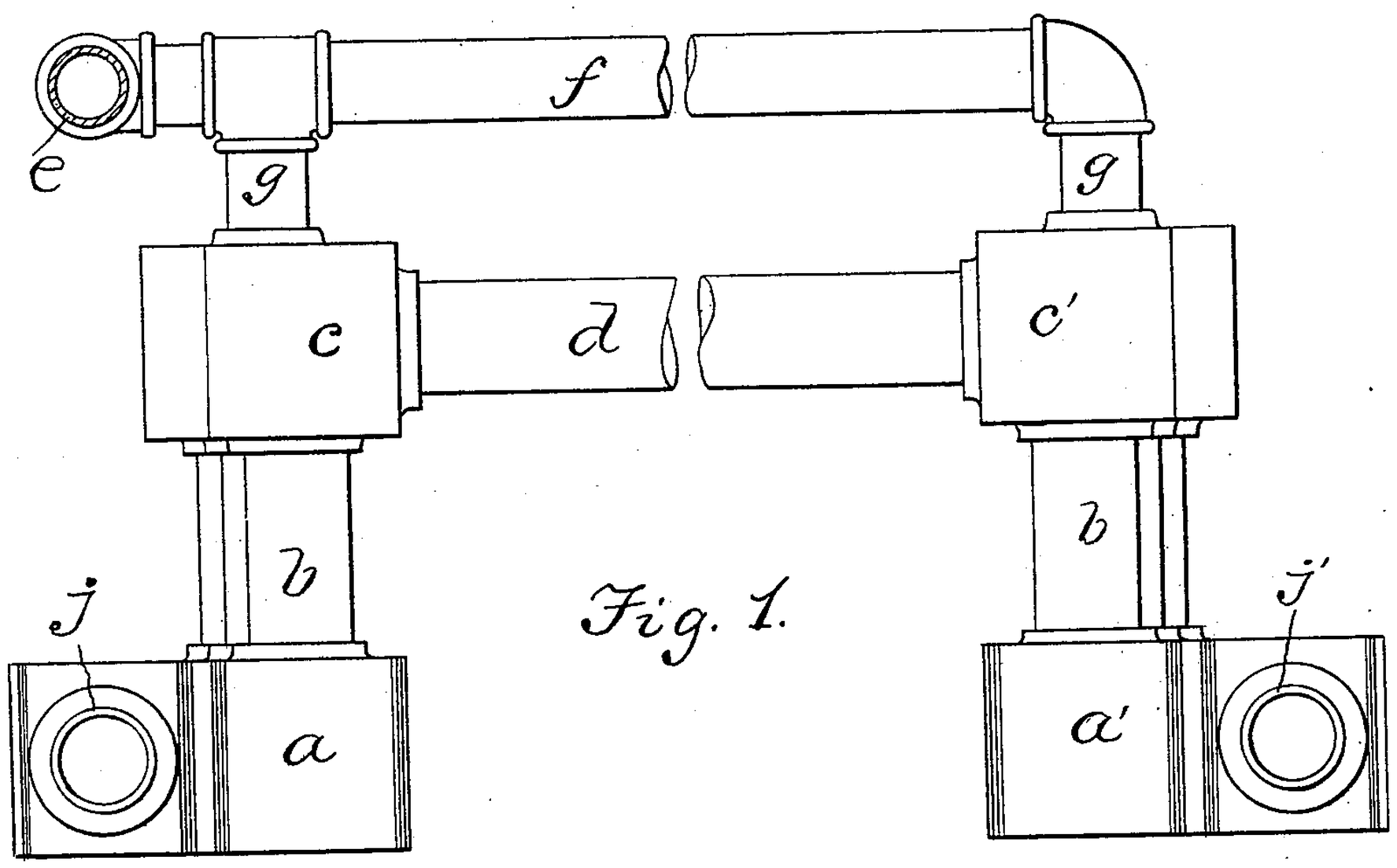


Fig. 1.

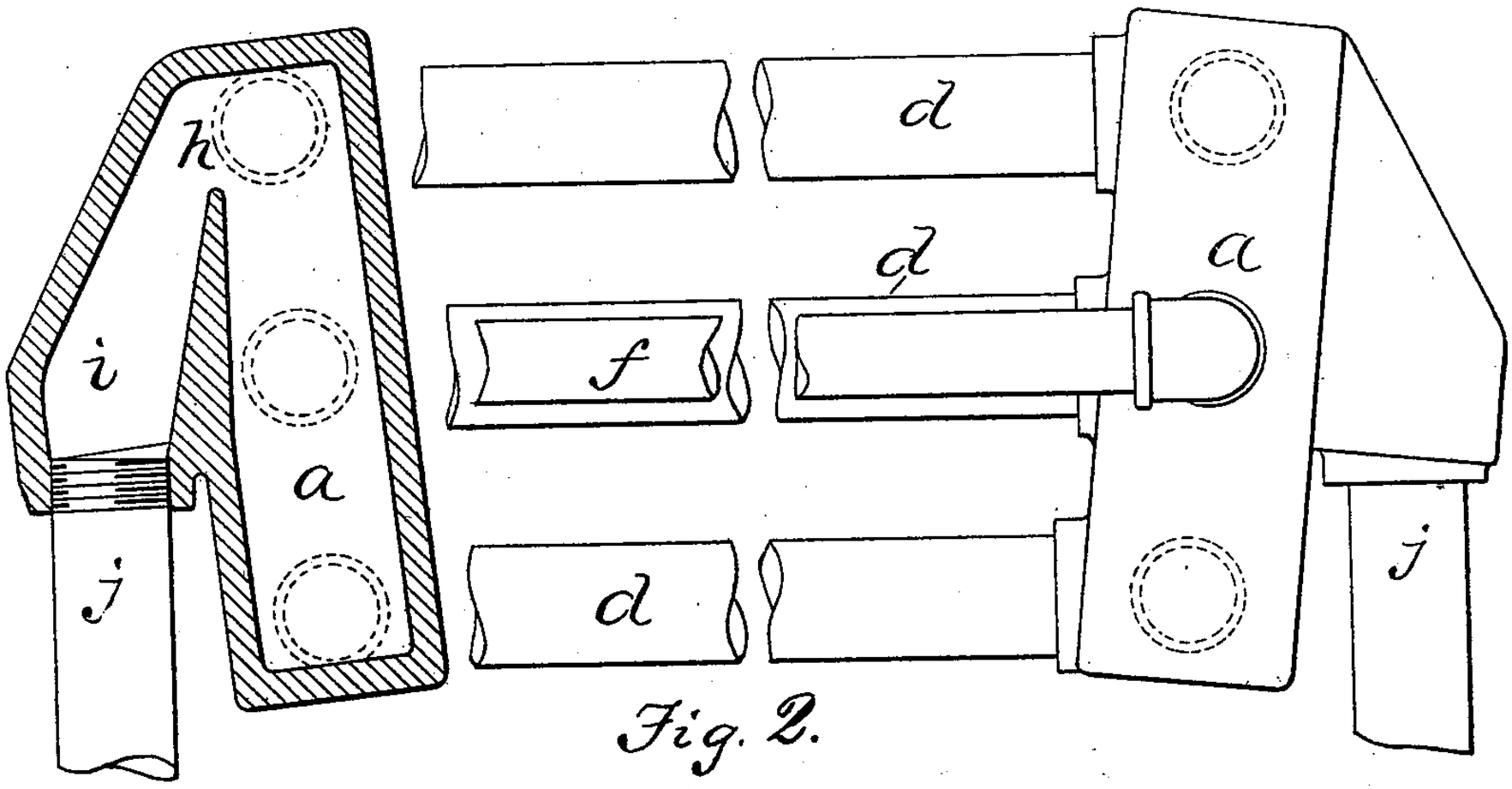


Fig. 2.

WITNESSES

C. C. Cate.

A. J. Dailey.

INVENTOR

B. B. Lamprey.

By A. W. Crossley.

Atty.

(No Model.) 2 Sheets—Sheet 2.

# B. B. LAMPREY.

## PROTECTIVE ARCH PLATE FOR MOUTHS OF BOILER FURNACES.

No. 592,635. Patented Oct. 26, 1897.

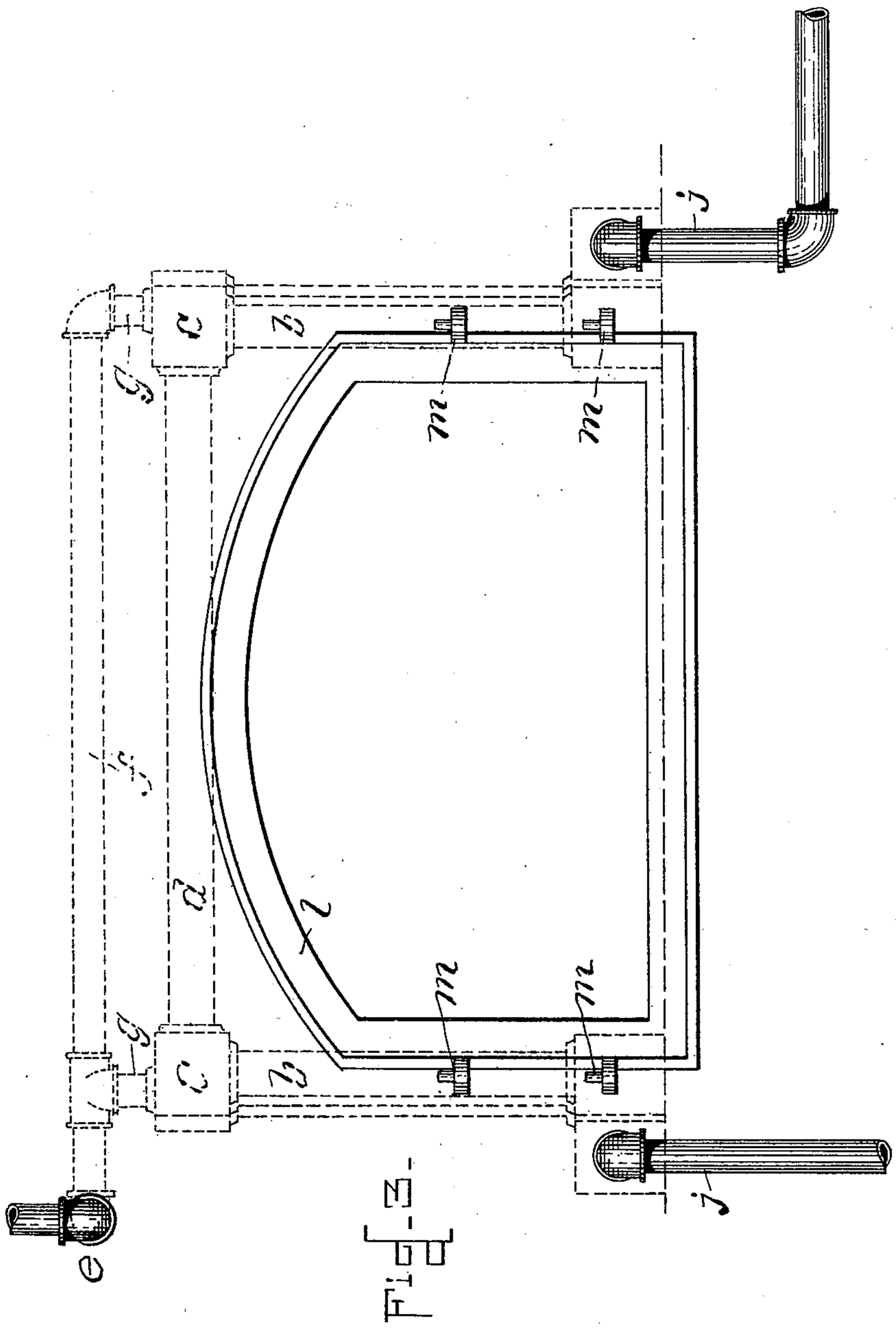


FIG. 2.

Witnesses.
Charles B. Crocker.
Arthur F. Randall.

Inventor.
B. B. Lamprey.
By Arthur C. Fraser.
Atty.

# UNITED STATES PATENT OFFICE.

BEN B. LAMPREY, OF LYNN, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO BURDETTE JOHN WHITE, OF WESTFIELD, MASSACHUSETTS.

## PROTECTIVE ARCH-PLATE FOR MOUTHS OF BOILER-FURNACES.

SPECIFICATION forming part of Letters Patent No. 592,635, dated October 26, 1897.

Application filed March 22, 1897. Serial No. 628,609. (No model.)

*To all whom it may concern:*

Be it known that I, BEN B. LAMPREY, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Protective Arch-Plates for the Mouths of Boiler-Furnaces, of which the following is a description sufficiently full, clear, and exact to enable those skilled in the art to which appertains or with which it is most nearly connected to make and use the same.

This invention relates to means for protecting the mouths of boiler-furnaces against destruction by undue heat from the furnace, such means being incidentally employed for the additional purpose of heating the feed-water and assisting to heat the water in the boiler for the generation of steam.

It is the object of the invention to provide improvements in means of the kind mentioned which will simplify the construction, enhance its efficiency, render the clean-out more ready of access and more thorough in its operation, and secure the entrance of the cold or cool water into the most highly-heated part of the protector, or, at any rate, to that part of the protector where the heat is adapted to operate with the greatest effect thereon.

To these ends the invention consists of a furnace-mouth protector and feed-water heater comprising in its construction hollow side bases, each having an opening or port at its rear or rearward part communicating with an outside conduit extending to or toward the front and pipes extending up the sides and across the top of the furnace-mouth, said pipes communicating at their lower ends with the hollow side bases, all as I will now proceed to describe in detail, and then point out with particularity in the claims.

Reference is to be had to the annexed drawings and to the letters marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 is a front view of my improved furnace-mouth protector, parts being shown as broken away. Fig. 2 is a top plan view of the same, a portion being represented in horizontal section. Fig. 3 is a front view showing the invention as applied and arranged with respect to a furnace-door, the door-framing only being shown and the doors being represented as removed.

In the drawings, *a a'* designate the hollow side bases, with the tops of which there are connected the upright pipes *b*, which extend up along the sides of the furnace-mouth and connect and communicate at their upper ends with the upper hollow bars or parts *c c'*, between which, across the top of the furnace-mouth, extend the communicating pipes *d*.

*e* is a pipe which in practice is extended and leads to a high point of the boiler, which it enters.

*f* is a pipe extending from the pipe *e* and communicates with the hollow side bars or chambers *c c'* through the medium of the short pipes *g*.

The hollow bases *a a'* are each provided at their rear ends with ports or openings *h*, which communicate with the outside inclined passages *i*, with the forward ends of which pipes *j j* are connected, as shown.

With this construction and arrangement of parts the cooler water from the boiler when the pump is shut off passing through the pipe *j* and passage *i* will enter the hollow base *a* at the rear, where it is hottest, and from thence will circulate through the pipes, expanding and eventually escaping through the pipe *e* to a high point in the boiler. The same thing will take place supposing the feed-water to be introduced through the pipe *j'*. In all cases the water introduced will first go to the hottest point of the protector and then be uniformly distributed for circulation through the pipes at the sides and over the top.

Either the pipe *j* or *j'* may be made the feed-water pipe, the other communicating with the boiler, it being understood, of course, that other adjustments and arrangements will be made accordingly, as is well known to those skilled in the art.

In case of blow-off through either the pipe *j* or *j'* the mud or sediment will be drawn from those points where it is most likely to settle or accumulate, and the side passages *i* being on an incline by disconnecting the pipes *j j'* ready access is had to the hollow or chambered side bases *a a'*. To facilitate this, it is preferred in most cases to set the side bases

*a a'* and upper chambered bars *c c'* on an incline, as shown.

In Fig. 3 the door-frame *l* to the mouth of the furnace is shown, the doors being represented as removed from their hinges *m*. In this figure part of the invention is shown in full lines and part in dotted lines.

It is understood that changes may be made in the form and arrangement of parts comprising my improvements without disparity from the nature or spirit thereof.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, it is declared that what is claimed is—

1. A furnace-mouth protector and feed-water heater comprising in its construction the hollow side bases *a a'*, provided at their rear parts or ends with openings or ports *h*, side extensions provided with passages *i* communicating with the ports or openings *h*, and pipes connected with the said side extensions and communicating with the passages *i*.

2. A furnace-mouth protector and feed-water heater comprising in its construction the hollow side bases *a a'*, provided at their rear parts or ends with openings or ports *h*, side extensions provided with passages *i* communicating with the ports or openings *h*, and pipes connected with the said side extensions and communicating with the passages *i*, the said passages being formed on an incline or angle with respect to the hollow side bases.

3. A furnace-mouth protector and feed-water heater comprising in its construction the hollow side bases *a a'* arranged on an incline with respect to the sides of the furnace-mouth and provided at their rear parts or ends with openings or ports *h*, side extensions provided with passages *i* arranged on an incline with respect to the hollow side bases, and communicating with the ports or openings *h*, and pipes communicating with the passages.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 11th day of December, A. D. 1896.

BEN B. LAMPREY.

Witnesses:
ARTHUR W. CROSSLEY,
C. C. CATE.