

No. 698,485.

Patented Apr. 29, 1902.

W. B. FOSTER.  
TWYER FOR FURNACES.  
(Application filed July 28, 1900.)

(No Model.)

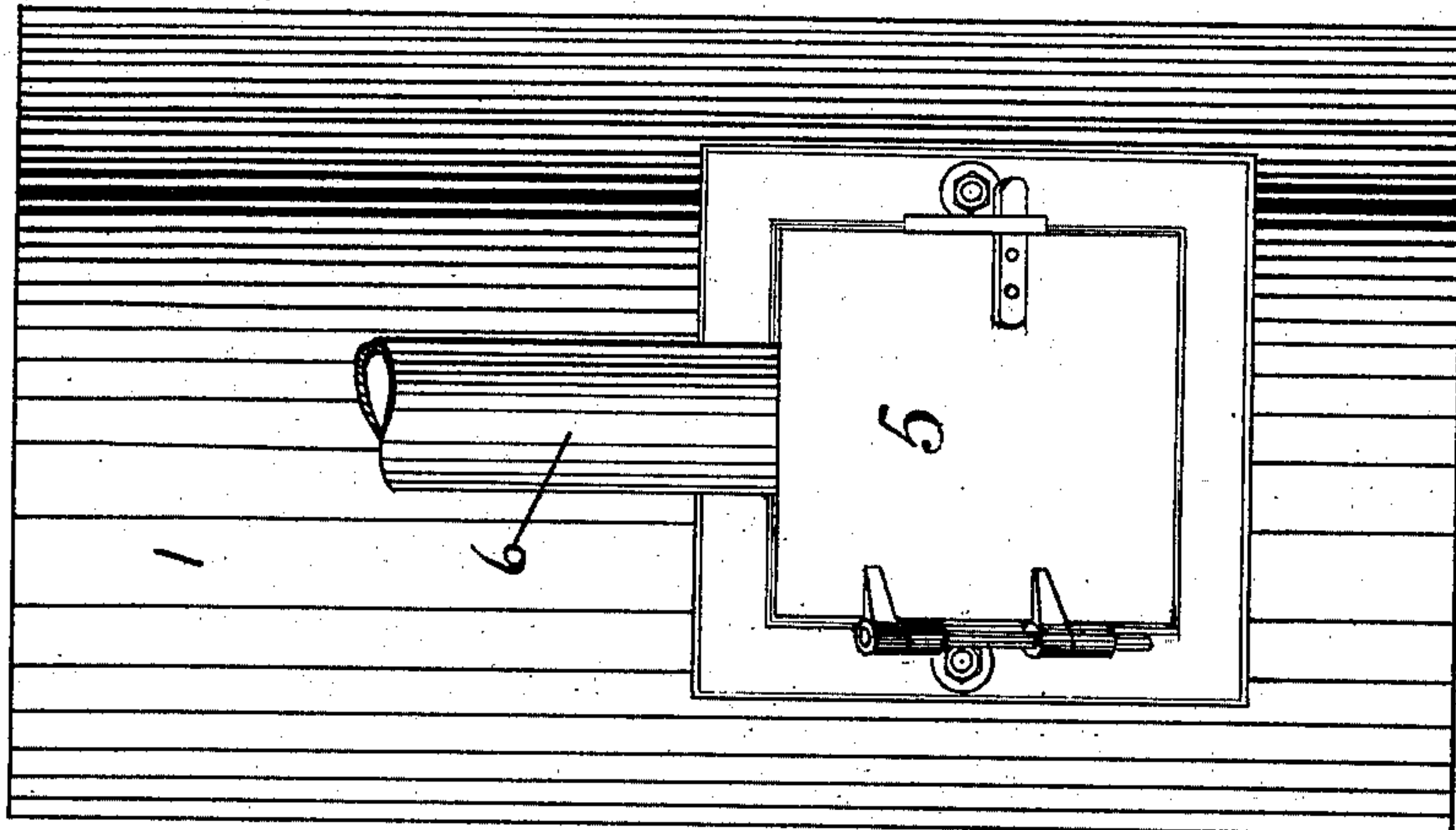


FIG. 2.

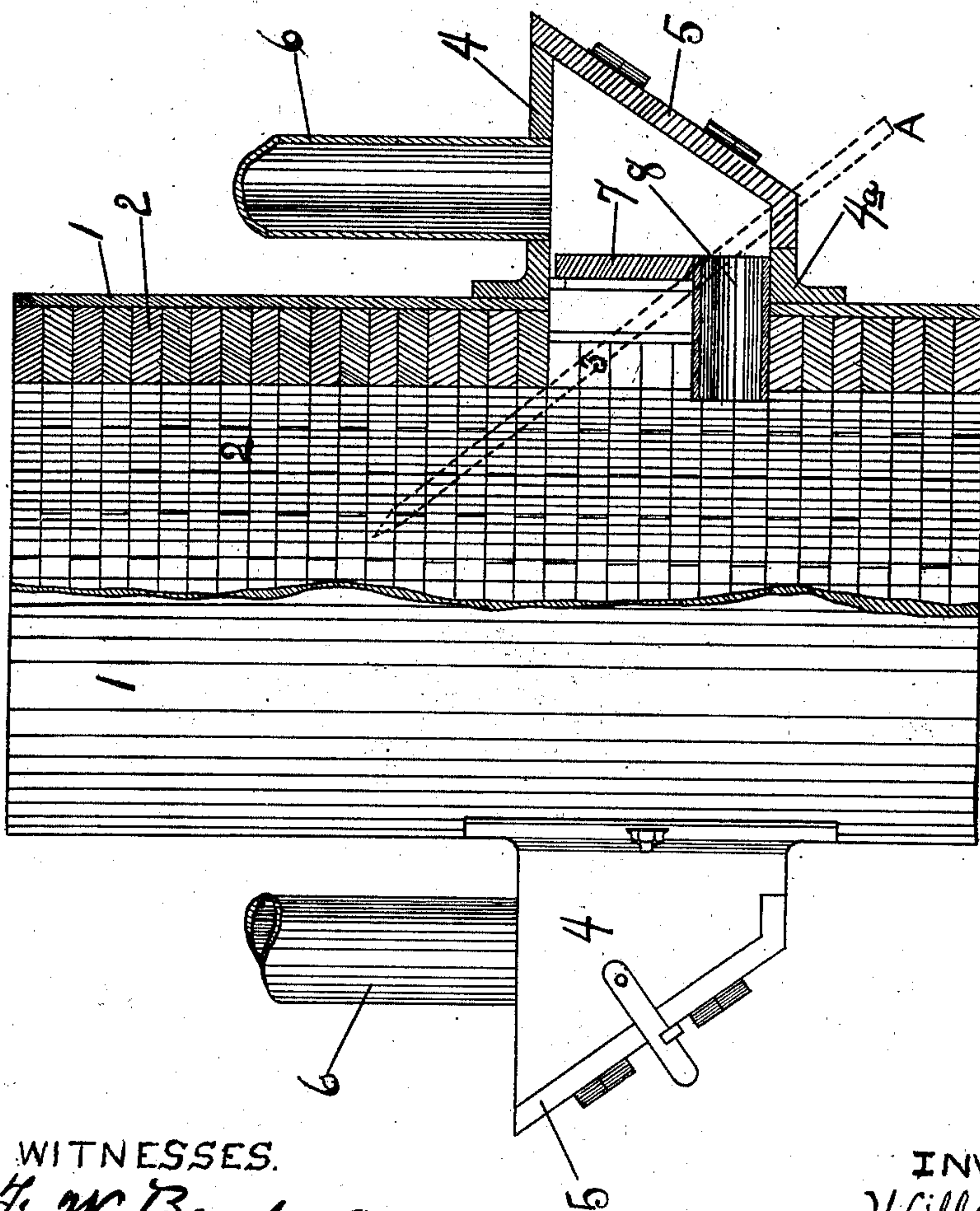


FIG. 1.

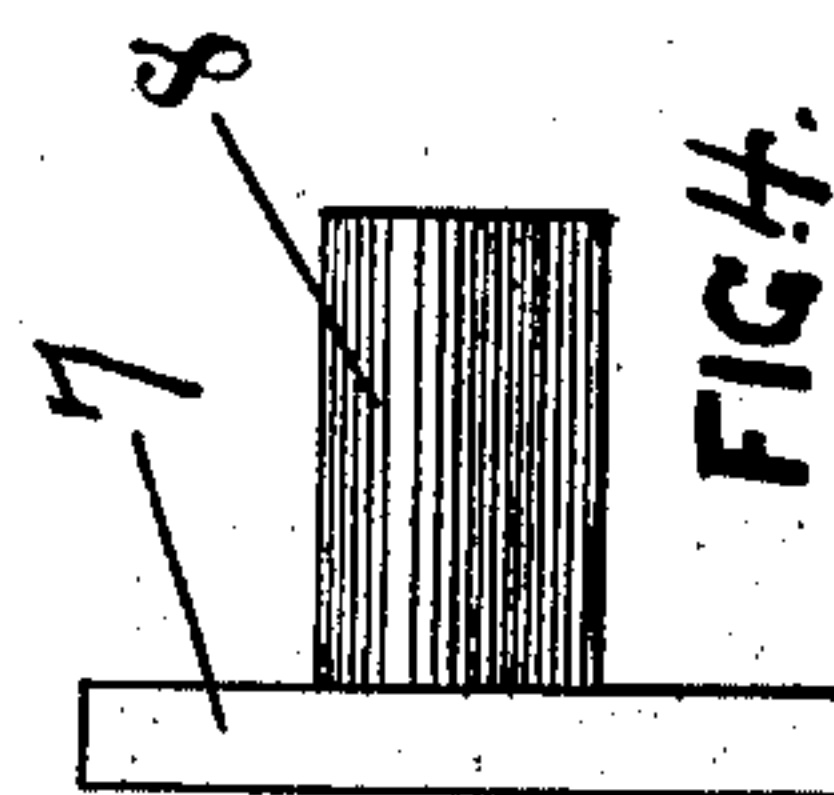


FIG. 4.

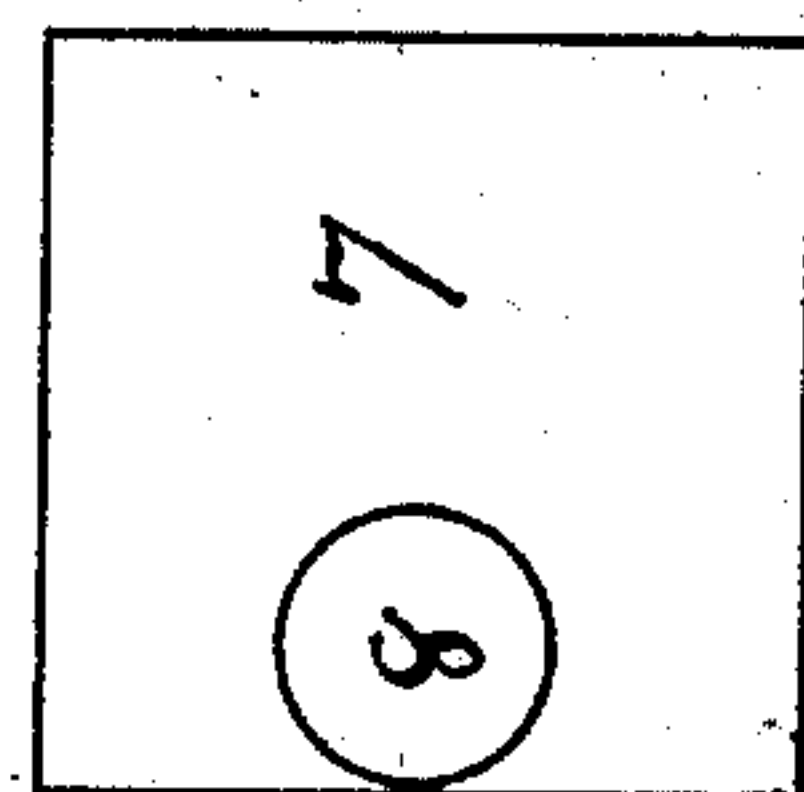


FIG. 3.

WITNESSES.  
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# UNITED STATES PATENT OFFICE.

WILLIAM B. FOSTER, OF UTICA, NEW YORK.

## TWYER FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 698,485, dated April 29, 1902.

Application filed July 26, 1900. Serial No. 24,913. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM B. FOSTER, of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Twyers for Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form part of this specification.

The object of my present invention is to provide a twyer for blast-furnaces or cupolas having means or facility for inserting a bar through the twyer-opening into the furnace to break a "bridge" formed in the furnace.

Figure 1 shows a partial side elevation and a partial vertical section of a part of a blast-furnace including the features of my invention. Fig. 2 shows a view taken at right angles from that in which the parts are shown in Fig. 1. Fig. 3 shows a side elevation, and Fig. 4 a plan view, of a removable twyer-plate, including twyer or blast-pipe.

Referring to the reference-figures in a more particular description, 1 indicates the casing of a cupola or furnace, which is lined in the usual manner with a lining 2 of fire-brick. The twyer-opening 3 is inclosed on the outside by a casing 4, surrounding the opening 3 and secured to the furnace-shell. The casing 4 is provided with an elongated upper wall and a short lower or bottom wall 4<sup>a</sup>. The outer end of the twyer box or casing 4 is closed by a door 5, which may be mounted on hinges and supplied with a catch, as shown. The tube 6 connects the twyer-box with a blast-blower or some air-forcing mechanism. For substantially closing the end of the box or casing toward the furnace there is provided a removable plate 7, having attached thereto a short section of pipe 8, which is the twyer or blast-pipe.

It is a well-known fact that in furnaces, particularly those of smaller capacity, and on long runs "bridges" of the fuel and material are liable to form in the furnace above the twyer-openings, which interfere with the operation of the furnace. It is necessary or desirable to break these bridges, letting fuel

and material moved down in the furnace as the fuel is consumed and the material melted. I propose to do this by inserting a bar through the twyer-opening, and in order to reach the bridge it is necessary to be inserted at quite an acute angle with the axis of the furnace. This my construction of twyer and twyer-box permits. When it is desired to break the bridge, the door 5 of the twyer-box is opened and the plate 7, with the section of pipe 8, is removed. This allows a bar to be inserted substantially as shown by the dotted lines and indicated by A. After the bridge is broken the plate 7, with its blast-pipe, is replaced and the door 5 closed. This operation can be performed in a few seconds without interfering with the operation of the furnace to any material extent.

It will be noted that the twyer-opening through the wall of the furnace which I employ is of considerably larger proportions, particularly vertically, than those heretofore in use. This, together with the fact that the lower wall 4<sup>a</sup> of the twyer-box is reduced to the minimum, allows the bar to be inserted through the twyer-opening at quite an acute angle with the axis of the furnace.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a furnace of a twyer-opening having a vertical extent equal at least to the thickness of the furnace-wall at the twyer-opening, a plate for said opening removable without necessitating the removal of other coacting parts and having a blast-opening and means for conducting the air to said blast-opening, substantially as set forth.

2. The combination in a furnace of a twyer-opening and its surrounding casing, said opening and casing being not less in vertical extent than the distance from the inner face of the wall of the furnace, to the outer edge of the bottom wall of the casing, a removable plate having a blast-opening, means for conducting the air to said blast-opening and means for opening and closing the casing, substantially as set forth.

3. A furnace having a twyer-opening of a size to permit the introduction of a bar at an acute angle with the axis of the furnace, as set forth, a removable plate for said twyer-opening having a blast-opening therein and a



casing surrounding said twyer-opening, substantially as set forth.

4. The combination with a furnace having the large twyer-opening 3 of a twyer-casing 4  
5 surrounding the twyer-opening and having an extended upper wall and a lower or bottom wall shorter than the upper wall, and a door closing the outer end of said twyer-casing, a removable plate closing the twyer-opening  
10 and a blast-opening, through said plate, substantially as set forth.

5. The combination with a furnace having a large twyer-opening, of a twyer-plate re-

movable without necessitating the removal of other coacting parts, and having a blast-opening 15 of smaller area than that of the twyer-opening, and means for conducting the air-blast to said blast-opening, substantially as set forth.

In witness whereof I have affixed my signature, in presence of two witnesses, this 24th day of July, 1900. 20

WILLIAM B. FOSTER.

Witnesses:

CHARLES G. IRISH,  
S. A. BROWN.