

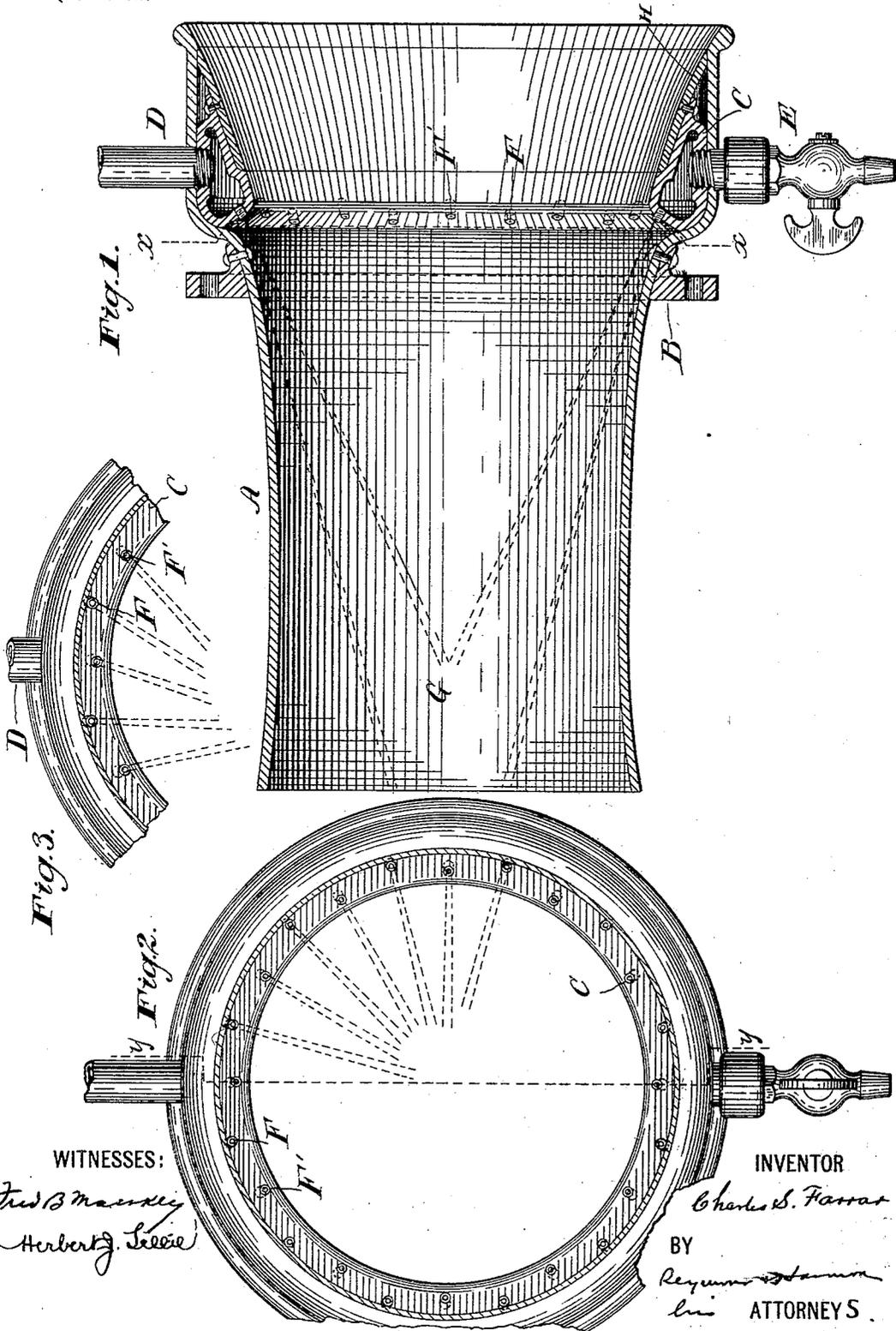
No. 631,007.

Patented Aug. 15, 1899.

C. S. FARRAR.
STEAM BLOWER.

(Application filed Feb. 18, 1899.)

(No Model.)



WITNESSES:
Frederick B. Mansley
Herbert J. Lillie

INVENTOR
Charles S. Farrar
 BY
Raymond S. Hammon
 ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES S. FARRER, OF DUNMORE, PENNSYLVANIA.

STEAM-BLOWER.

SPECIFICATION forming part of Letters Patent No. 631,007, dated August 15, 1899.

Application filed February 18, 1899. Serial No. 706,046. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. FARRER, a citizen of the United States, and a resident of Dunmore, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Blowers, of which the following is a specification.

My invention relates to steam-blowers for force draft for furnaces, blowing ashes from fire-rooms, &c.

In the drawings forming part of this specification, Figure 1 is a section taken on the line *yy* of Fig. 2. Fig. 2 is a section taken on the line *xx* of Fig. 1. Fig. 3 is a view showing a modification.

The device consists of a nozzle A, having an attaching-flange B for securing it in position, the smaller end of the nozzle being the exit end.

C is an annular ring, which I term the "steam-ring." The steam-pipe D communicates with the chamber in this ring. E is a blow-off cock for said chamber. The ring is in the general form shown, the forward face being on a bevel or at an angle and being provided with series of apertures F F'. These apertures are arranged in two rows, as shown, the rows being at different distances from the center. These apertures are inclined at an angle, so that the prolongation of the axis of one of the apertures will strike the center line of the nozzle. The angle varies for each series of apertures. The outermost series, or one farther from the center, is inclined at a greater angle with respect to the center line of the nozzle than those apertures which are nearer the center. The relative angles are clearly indicated in Fig. 1. The prolongation of the axis of one of the apertures F would strike the center line of the nozzle at a point G, while the prolongation of the axis of an orifice F' would strike said center line at a greater distance from the inlet end of the nozzle. In order that the general shape of the inlet-passage shall be bell-shaped, I provide the inlet end of the nozzle with an enlargement or recess of sufficient size to contain the steam-ring, as clearly shown in Fig. 1. I either make the ring of such a shape that it will conform to the symmetrical continuation of the shape of the nozzle, or, as shown in Fig. 1, I make the ring of the shape

there shown and provide a hood or apron H, which is placed over the ring and not only assists in securing the same in place, but itself forms the inner wall of the nozzle and gives to the inlet end its smooth bell shape. This latter construction has an additional advantage—namely, that the hood or apron prevents the direct impact of the air against the steam-ring, and thus in great measure prevents loss by condensation, which would occur did the air come in direct contact with the steam-ring. This hood or apron may be secured in place in any suitable manner.

I preferably make the orifices larger than is necessary and secure therein plugs I, which are bored to the size required for the jet-orifice. I may use as many series or rows of orifices as may be necessary, though I preferably have but two. In case more than two should be used the angle of the orifice with the center line of the nozzle would decrease in each row of holes from the periphery toward the center.

In Fig. 3 I have shown a slight modification of my construction. In this construction the orifices are not only given the described inclination toward the center, but they are also given a lateral inclination, as indicated by the dotted lines. The result of this will be that the air will be given a rotary motion, as will be clearly seen.

The operation of the device is as follows: The jets of steam passing through the orifices will draw the air through the inlet end of the nozzle or pipe and force the same into the furnace under the grates or wherever desired. The multiplication of the rows of orifices gives a better distribution of power and a greater effect than a single row will do. The outer row of orifices, or the one having the greatest inclination, acts first upon the air, drawing it into the pipe and forcing it through, and as the air passes through it receives the added impulse from the inner orifices, which are inclined at a smaller angle to the center. Thus a series of impulses is given to the same body of air, the result being increased speed and high pressure. Owing to the conformation of the interior of the nozzle there is no obstruction offered to the inlet of air or its passage through the same. Consequently the lines of ingress of air and of propulsion after meeting

the steam-jets are perfect in contour. By this construction I get the maximum effect by the least expenditure of power.

The operation of the device shown in Fig. 3 is the same as that shown in Figs. 1 and 2 with this addition, that the lateral inclination of the orifices causes the body of air passing through to rotate much in the manner of a projectile from a rifle or gun, which may be advantageous under certain circumstances.

I claim—

1. In a steam-blower, the combination of a nozzle or pipe, a steam-ring in said nozzle, said ring having a series of rows of perforations, the orifices in each row differing in amount of inclination toward the center line of the pipe or nozzle, substantially as described.

2. In a steam-blower, the combination of a nozzle or pipe, a steam-ring therein, a series of rows of perforations in said ring, the row farthest from the center having the greatest inclination to the center line of the nozzle, the angle of inclination decreasing in each successive row from the periphery inward, substantially as described.

3. In a steam-blower, the combination of a nozzle or pipe, a recess at the inlet end thereof, a steam-jet ring in said recess, said ring

being so shaped as to conform to the general contour of the inner surface of the nozzle, whereby obstruction to the passage of air is prevented, substantially as described.

4. In a steam-blower, the combination of a nozzle or pipe, a recess near the inlet end thereof, a steam-jet ring in said recess, a hood or apron placed over said ring and securing the same in place, said hood or apron being shaped to conform to the general contour of the inner surface of the nozzle, substantially as described.

5. In a steam-blower, the combination of a nozzle or pipe, a steam-ring therein, said ring having a series of rows of orifices, these orifices being inclined at different angles toward the center, said orifices being also given a lateral inclination, whereby a rotary motion is given to the body of air, substantially as described.

Signed at Dunmore, in the county of Lackawanna and State of Pennsylvania, this 11th day of February, A. D. 1899.

CHARLES S. FARRER.

Witnesses:

ERNEST G. CLOSE,
G. DU B. DIMMICK.