(Model.) 2 Sheets—Sheet 1.

A. FLETCHER.

STEAM BLOWER.

No. 482,236. Patented Sept. 6, 1892.

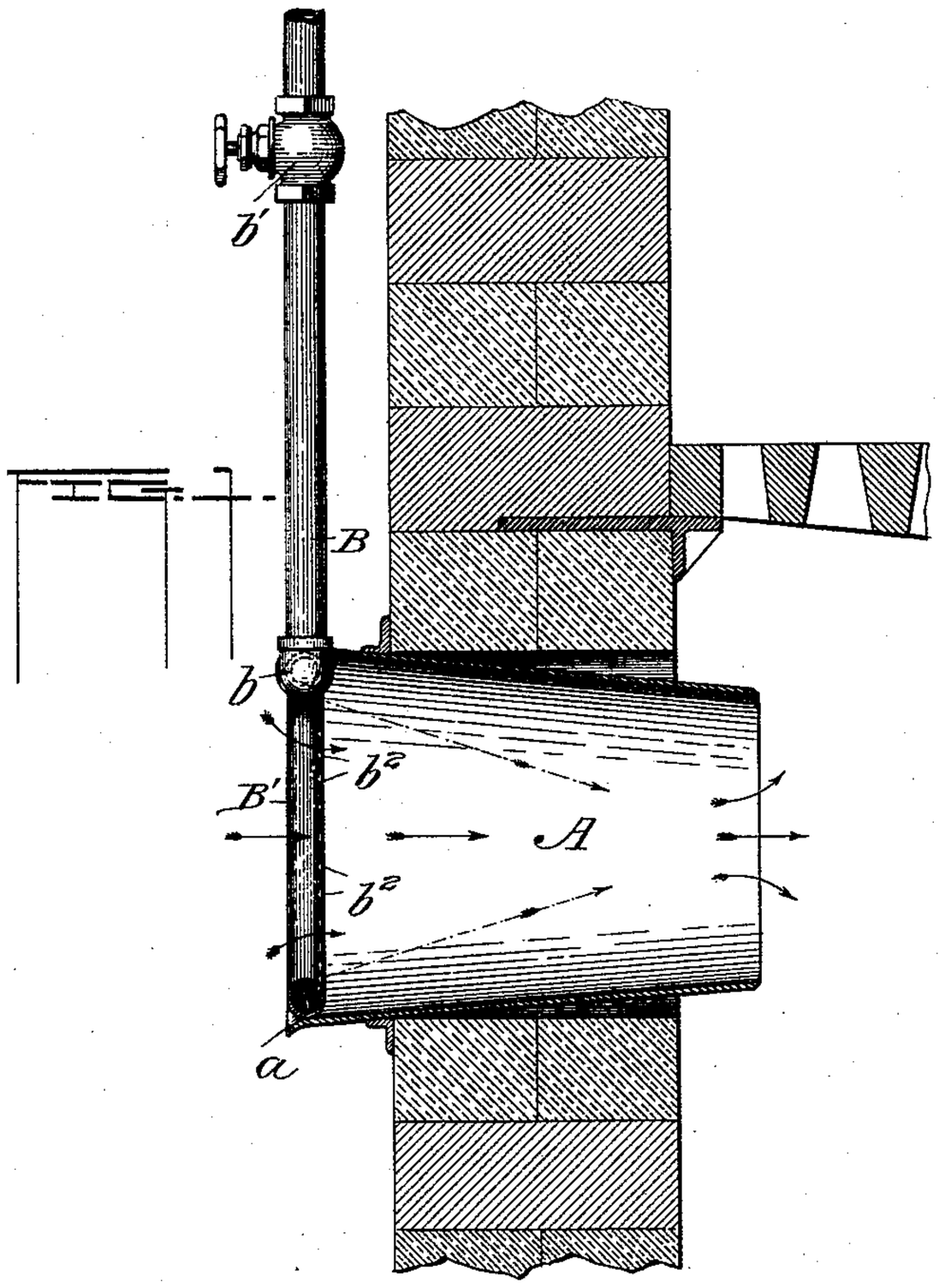


FIG. 3.

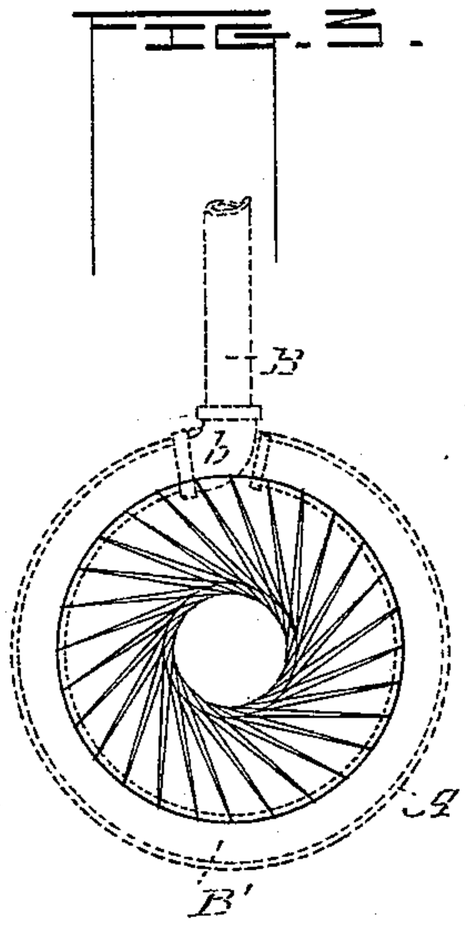
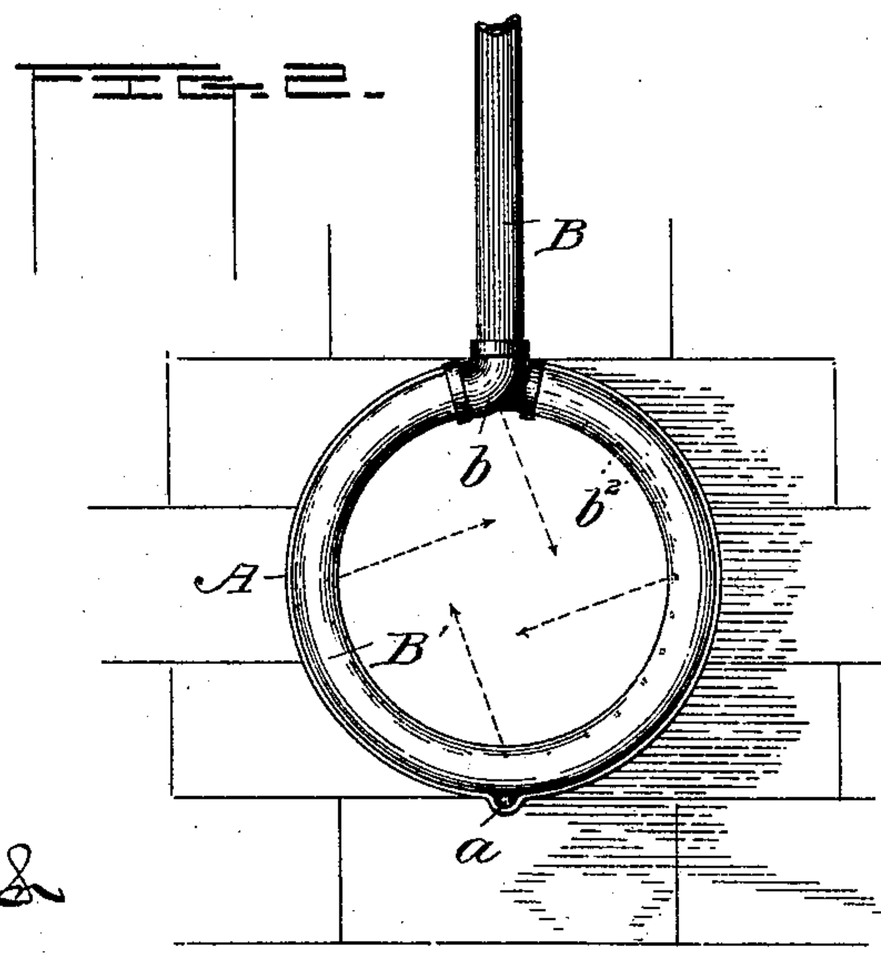


FIG. 2.



Witnesses
T. A. Commerford
Gales P. Moore.

Inventor
Augustus Fletcher,
By Geo. P. Whittlesey
Attorney

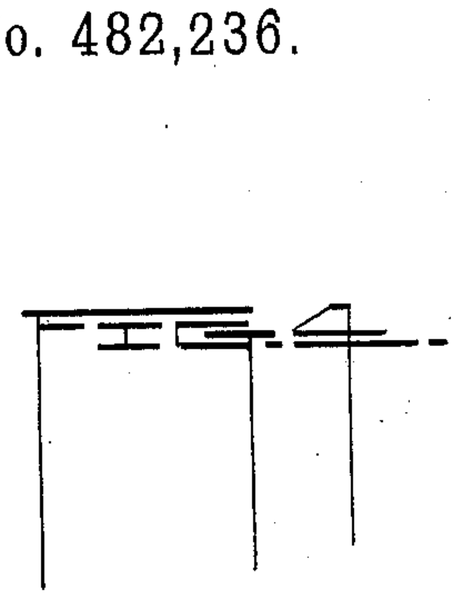
(Model.)

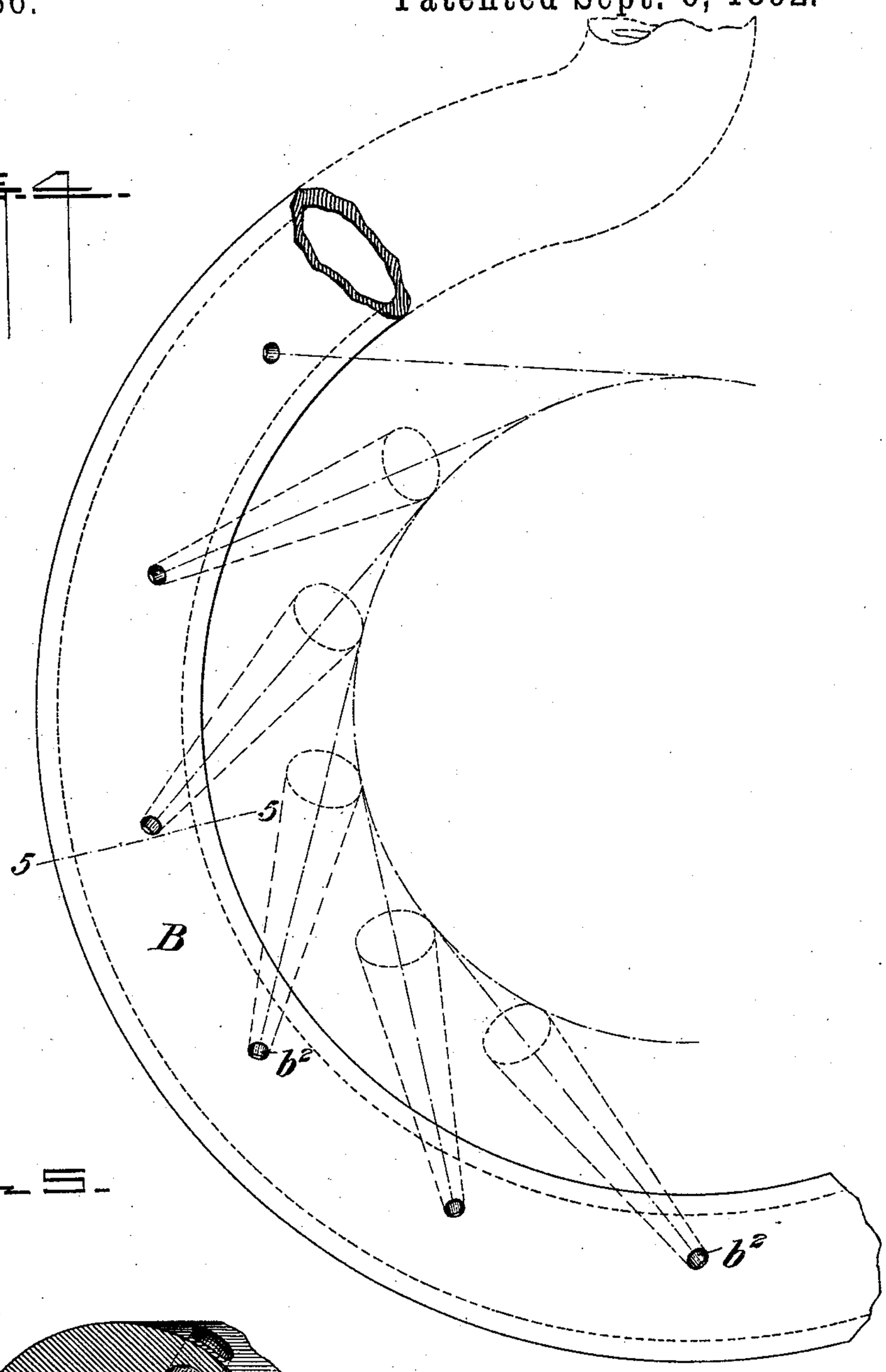
2 Sheets—Sheet 2.

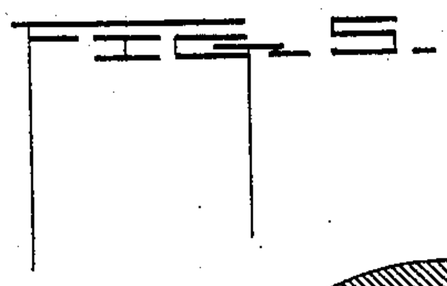
A. FLETCHER.

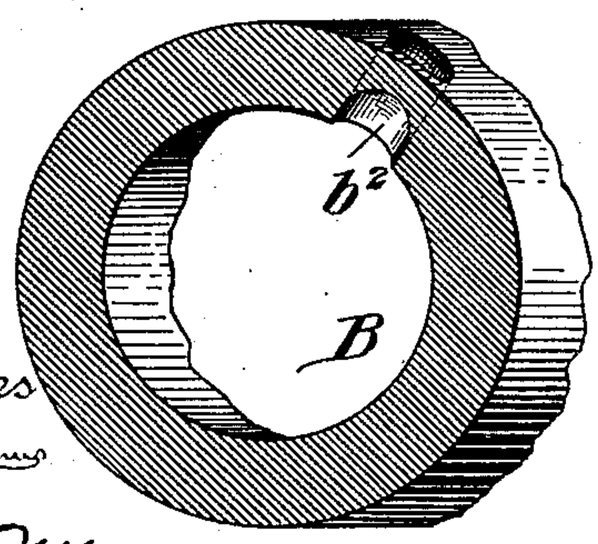
STEAM BLOWER.

No. 482,236. Patented Sept. 6, 1892.









Witnesses
Stephen Jammus
Galen P. Moore

Inventor
Augustus Fletcher,
By Geo. P. Whittemore
Attorney

UNITED STATES PATENT OFFICE.

AUGUSTUS FLETCHER, OF MINERSVILLE, PENNSYLVANIA.

STEAM-BLOWER.

SPECIFICATION forming part of Letters Patent No. 482,236, dated September 6, 1892.

Application filed November 2, 1891. Serial No. 410,569. (Model.)

To all whom it may concern:

Be it known that I, AUGUSTUS FLETCHER, a citizen of the United States, residing at Minersville, in the county of Schuylkill and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Blowers; and I do declare the following to be a full, clear, and exact description of the invention, such as 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 letters of reference marked thereon, which form a part of this specification.

My invention relates to steam-blowers, a class of devices wherein steam in jets is directed through a nozzle for the purpose of drawing air through said nozzle and delivering it in a heated condition to a furnace, whereby the combustion of the fuel is facilitated.

Heretofore blowers of this character have generally been composed of an annular steam-pipe arranged at the mouth of a conical nozzle, the pipe being perforated to permit the steam to escape in a circle of jets in a direction parallel with or in the plane of the axis of the nozzle. This construction requires the steam to be of considerable pressure in order to establish a draft of air through the nozzle. It has been found that the use of this high-pressure steam interferes with the economical working of the blower, since the steam expands to such an extent as to completely fill the nozzle, choking the supply of air and forming a solid column of wet steam, the rapid condensation of which checks the fire and vitiates the intended effect.

The object of my invention is to overcome these difficulties by so constructing the blower as to permit the use of steam at a lower pressure and to insure the delivery to the furnace, whatever the steam-pressure, of a powerful stream of pure hot dry air having sufficient velocity to lift and pass through the most compact mass of fuel. I am thus able to use the smaller and cheaper grades of coal, such as "buckwheat" and "culm," or coal-dirt. I accomplish this by deflecting the steam-jets from the plane of the axis and giving them a direction obliquely tangential to an imaginary cone whose base coincides with the circle of jets and whose axis lies in the axis of the nozzle at or near the delivery end thereof. This arrangement, taken in connection with the inner conical surface of the nozzle, gives the jets a conical spiral direction. Thereby sweeping around the inside of the nozzle, they unite to form a vortex or whirlpool of steam, which sucks in a strong current of air, dries and heats it, and forces it in a solid column, surrounded by the whirling steam, into the fire-box of the furnace.

In the accompanying drawings, Figure 1 is a longitudinal section of my improved blower. Fig. 2 is an elevation of the outer end thereof, and Fig. 3 is a view of the inner end. Fig. 4 is a view of a portion of the ring, showing the direction taken by the steam-jets. Fig. 5 is a cross-section of the ring on the plane 5 5, Fig. 4.

The nozzle A is composed of a frusto-conical tube open at each end and arranged with the smaller end communicating with the fire-box of the furnace. A lip *a* may be formed at the bottom of the mouth of the nozzle to discharge the drip of the condensed steam. In the mouth of the nozzle is an annular pipe B, fitting snugly into the nozzle and connected by an elbow *b* with a steam-supply pipe B′, which is provided with suitable stop-valve *b*′. Through the inner side of the annulus B is drilled a number of small holes b^2, each arranged to deliver a jet of steam into the nozzle in a direction both laterally and inwardly oblique to the axis of the blower, the lateral inclination being preferably about thirty degrees to a plane intersecting the axis of the nozzle and the hole b^2 and the inward inclination being about seventy-five degrees to the plane of the circle of jets, as indicated by dotted lines in Figs. 1 and 2. When a supply of steam is turned into the ring B and issues from the hole b^2, the circle of jets, striking the inner surface of the nozzle, is deflected into a conical spiral path and forms a hollow vortex, hugging the inner surface of the nozzle and forming at the center a vacuum, into which the air is sucked and from which it is delivered into the fire-box, in a strong steady current, hot and dry. The whirling motion of the vortex gives the particles of steam a centrifugal movement, which tends to prevent them from choking the supply of air.

The quantity of air passing through the vortex of this blower has been found to be two thousand four hundred cubic feet per minute with a boiler-pressure of thirty-five pounds of steam.

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

1. A steam-blower consisting of an annular pipe containing passages through its walls for the escape of the steam, the direction of said passage being laterally and inwardly oblique to the axis of the blower, substantially as described.

2. A steam-blower consisting of a frusto-conical nozzle and an annular steam-pipe located in the large end of said nozzle, said pipe having a series of small holes arranged to give the jets of steam issuing therefrom a direction both laterally and inwardly oblique, substantially as described.

3. A steam-blower consisting of a nozzle and a steam-pipe delivering jets of steam into said nozzle in a direction laterally oblique to the axis of the nozzle, whereby the steam is caused to form a vortex, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUSTUS FLETCHER.

Witnesses:
GUSTAV FISCHER,
THEODORE GROSS.