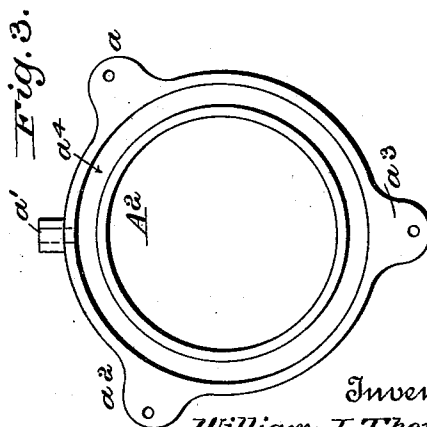
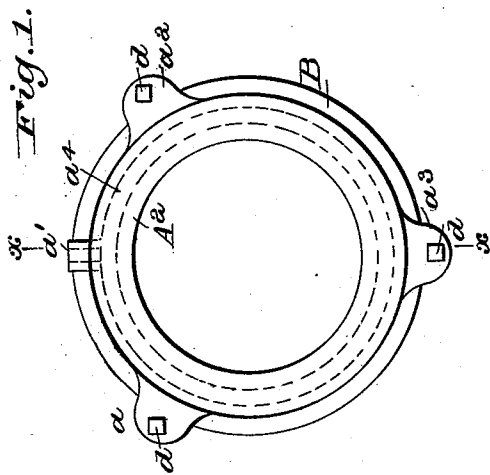
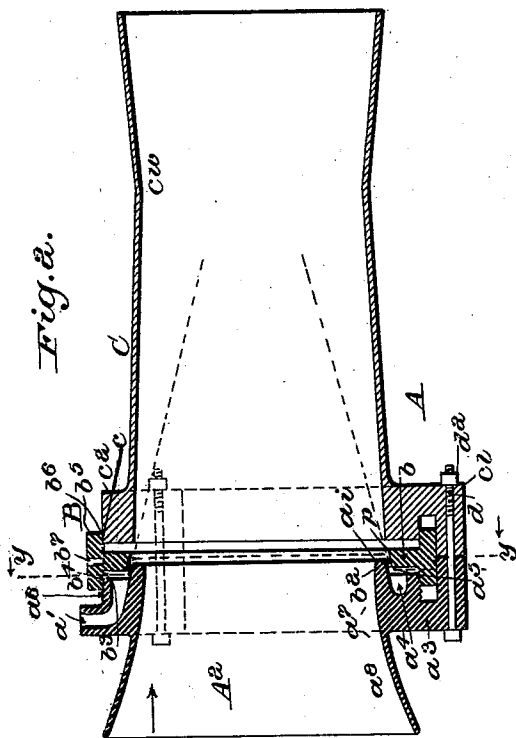


(No Model.)

W. J. THOMAS.
STEAM AND AIR BLOWER FOR FURNACES.

No. 542,864.

Patented July 16, 1895.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM J. THOMAS, OF TAMAQUA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF
TO ISAAC CHRIST, OF SAME PLACE.

STEAM AND AIR BLOWER FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 542,864, dated July 16, 1895.

Application filed February 20, 1895. Serial No. 539,102. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. THOMAS, a citizen of the United States, and a resident of Tamaqua, in the county of Schuylkill, in the State of Pennsylvania, have invented a new and useful Steam and Air Blower for Furnaces, of which the following is a correct description.

The invention relates to that class of draft-supplying apparatus which are employed in connection with a steam-chamber, and in connection, also, with the space below the fuel-chamber and grate of a furnace, the objects being to accelerate the draft, intensify the combustion, and facilitate the rapid generation of steam by introducing jets or streams of steam in such manner as to create a strong induction of air-currents, the action of the united currents being such that the jets of steam are broken up and are mingled with the air-currents in the proportions most suitable for the accomplishment of the intended purpose.

In most if not in all of the devices hitherto employed for the purpose described the apparatus for discharging steam, and, through the action of such discharge, introducing a forcible draft of air, has been placed within the opening of the air-passage itself, thereby to the extent of the area of such apparatus obstructing the passage and thus preventing the free admission of the air-currents.

A leading object of my invention is the production of a blower which shall be certainly effective in the discharge of suitable quantities of steam at the desired point and in which no obstacle to the inflow of air shall be placed in the passage through which the currents of air are to be introduced.

Another object of the invention is the provision of a means within the wall or body of the air and steam passage or "nozzle" of a steam-blower, whereby the introduction of steam may be graduated and regulated at pleasure.

The invention consists in the novel construction and in the novel combinations of parts, which will first be described in detail, and then distinctly set forth in the paragraphs which succeed such detailed description.

In the accompanying drawings, which con-

stitute a part of this specification, Figure 1 represents a front elevation of the apparatus as seen when looking in the direction of the arrow shown in Fig. 2. Fig. 2 is a vertical longitudinal section as in the line $x x$ of Fig. 1. Fig. 3 represents a transverse section as in the line $y y$ of Fig. 2 and looking toward the receiving end of the blower.

As will be apparent from the drawings, the steam and air supplying apparatus A consists, essentially, of three circular sections A^2 , B, and C, the outwardly-flaring receiving-section A^2 being provided with lateral projection and inlet-passage a' and with equidistant peripheral perforated securing-lugs a , a^2 , and a^3 , and having in its rear face, which is exteriorly threaded, as shown, the annular gutter-like recess or steam-passage a^4 . The intermediate annular section B, which in transverse section is of T shape, is in its inner or body portion b provided with an inclined or beveled face b^2 , which corresponds with the similarly-inclined face a^2 , which is formed upon the inner wall a^1 of the steam passage or recess a^4 . Within the inner face of the flange b^3 of the intermediate section is a threaded surface b^4 , which corresponds with the outwardly-threaded face a^5 of the section A^2 . The inner face b^6 of the flange b^5 of the section B is "machine-faced" to correspond with a like surface c upon the section C, and at suitable intervals along the center of the outer periphery of the section B are cavities or handle-holes b^7 , which extend inwardly toward the axial center of the section. The section C is provided with perforated securing-lugs c^1 , which are coincident with the lugs a , a^2 , and a^3 upon the section A^2 , and bolts d and nuts d^2 serve to secure the sections A and C together, face to face, as seen in Fig. 2.

By preference the section A^2 is, in its inner or body portion a^7 , but slightly flared outwardly, but in its outer portion a^8 it is more abruptly flared, as shown in Fig. 2.

In its shortened or shouldered receiving portion c^2 the section C is of slightly greater diameter than the corresponding portion of the section A^2 , in order, as will be obvious, that no obstruction may be presented to the inflow of steam as it issues from the passage

or recess a^4 and through the variable passage p produced by the coincidence of the parts b^2 and a^1 , as already described. From the shortened interior portion c^2 of the section C the walls thereof preferably converge toward the rear or discharging extremity of the nozzle for a distance equal to about two-thirds the longitudinal extent of the section to the obtuse angle or waist cw , from which point they diverge slightly outward to the discharging extremity of the blower.

The described sections will ordinarily be formed by the process of casting from any suitable metal, the intermediate adjustable regulating-section B being preferably composed of brass.

In the operation of the apparatus steam, being introduced through any suitable pipe into the lateral supply-passage a' , is at once forced into the circuitous passage a^4 , from which it is instantly discharged through the restricted variable tapering passage p , issuing therefrom in a thin funnel-like convergent sheet, as indicated by the dotted lines in Fig. 2, the mouth of the section C extending in line, or substantially in line, with the oblique surface b^2 of the body b of the intermediate section, thereby not only presenting no obstruction to the passage of the steam-currents, but, on the contrary, by the configuration thereof, directing and facilitating the movement of such currents, as will readily be understood. By reason of the provision of the engaging-openings b^7 in the outer periphery of the section B such section may, by the use in connection therewith of any suitable operating rod or lever, be turned circumferentially upon the threaded surface a^6 of the section A^2 and upon the turned or faced surface c of the section C, either to the right or to the left, according as it may be desired to increase or to diminish the volume and the velocity of the incoming currents of steam. The rapidity with which the body of steam enters the passage or nozzle B C of the apparatus causes a partial vacuum to be continuously maintained therein and a consequent rapid induction of air through the unobstructed flaring mouth a^8 a^7 of the apparatus and into and through the steam-conducting sections B and C.

The blower thus constructed may conveniently be mounted in any suitable opening in the wall w of a furnace and in any suitable relation to the fuel-support f thereof.

The invention having been thus described, what is claimed is—

1. A steam and air blower which consists of an outer interiorly unobstructed circular air-receiving section which in its inner extremity is provided with an end-recess for the passage of steam; an inner unobstructed circular section which is rigidly and non-revolubly secured to the outer section; and an intermediate section which overlies, in part, both the outer section and the inner section,

and is revoluble thereon, in connection with the end-recess, to either permit, or prevent the inflow of steam; substantially as set forth.

2. A steam and air blower which consists of an outer annular interiorly-unobstructed section which is provided in its inner end with a circumferential recess; an intermediate section which in one part projects inwardly and encircles the outer section, and which in another part overlies the end recess in the outer section, and forms in connection therewith a circular steam-passage; and an inner section which is peripherally embraced by the intermediate section, and which is secured to the outer section; the intermediate section being operative, in the manner described, either to admit steam in a circular unbroken sheet-blast of varying thickness, or to wholly cut off the inflow of steam, as may be desired.

3. In a steam and air blower the combination of an outer annular section which is provided in its inner extremity with a circumferential steam-receiving groove or recess; an inner annular section which rests in contact with the outer section, and is rigidly secured thereto; an intermediate three-part section which by two of its parts incloses and is adjustably movable upon the outer section and the inner section, and which by its third part projects from the peripheral portion of the section inwardly, and overlies the groove or recess in the outer section, to constitute in connection therewith an annular steam-passage, and to permit, or to prevent the passage of steam therethrough; the three sections being interiorly unobstructed; substantially as described.

4. In a steam and air blower for furnaces, the outer section A^2 , having securing-lugs a , a^2 , a^3 , and having also inner and outer walls which embrace a circular steam-passage which is formed in the face of the inner end of the section; the intermediate annular section B, which engages the inner wall and the outer wall of the steam passage; and the inner section C, encircled by the intermediate section, provided with engaging lugs, and secured to the outer section; in combination, substantially as described.

5. The herein-described steam and air blower, consisting of the outer annular section A^2 , having the end-recess or groove a^4 , inlet-passage a' , securing-lugs and bolts, and exteriorly-threaded face a^6 ; the inner annular section C, having machine-faced outer peripheral surface c , and securing-lugs as specified; and the intermediate annular section B, having the beveled face b^2 , the inner threaded surface b^4 , the inner unthreaded surface b^6 , and the exterior peripheral engaging-openings b^7 .

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Witnesses:

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