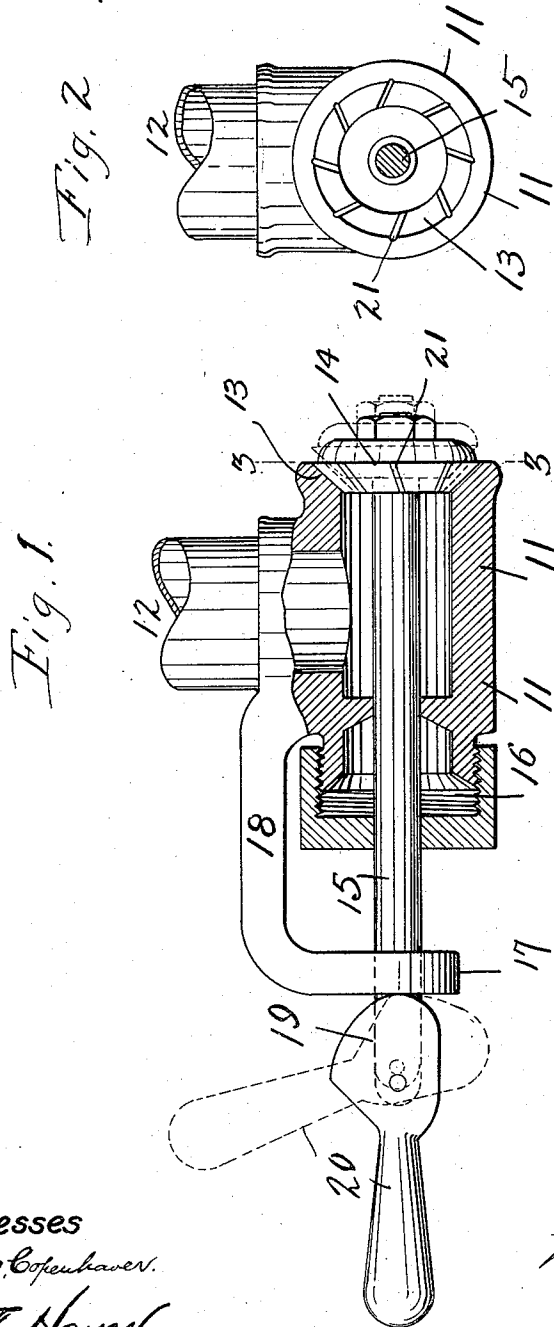


W. G. COLLINGE.
FORCED DRAFT BLOWER.
APPLICATION FILED JUNE 13, 1911.

1,201,149.

Patented Oct. 10, 1916.
2 SHEETS—SHEET 1.



Witnesses

J. M. Copenhafer.

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Inventor

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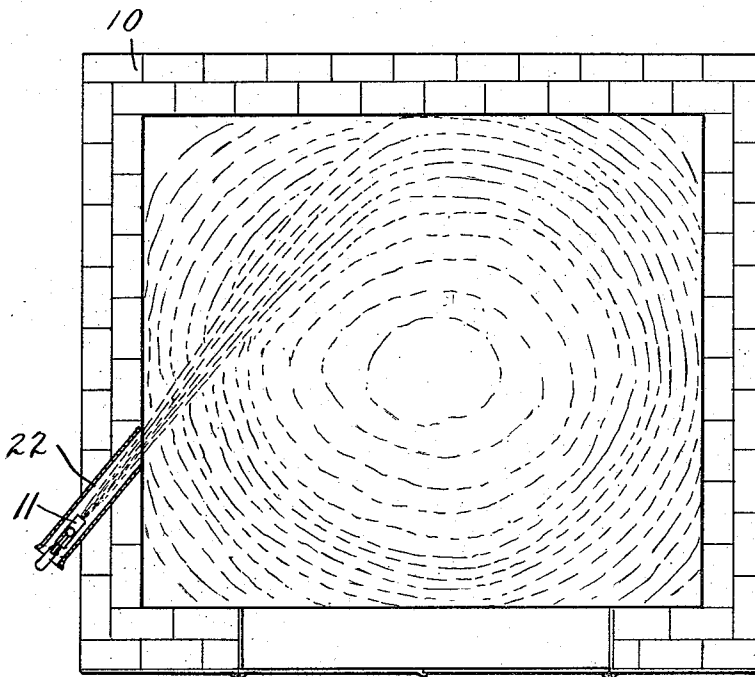
By Chas. Williamson
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Fig. 3.



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UNITED STATES PATENT OFFICE.

WILBER G. COLLINGE, OF PORTLAND, OREGON.

FORCED-DRAFT BLOWER.

1,201,149.

Specification of Letters Patent.

Patented Oct. 10, 1916.

Application filed June 13, 1911. Serial No. 632,950.

To all whom it may concern:

Be it known that I, WILBER G. COLLINGE, of Portland, in the county of Multnomah and in the State of Oregon, have invented a certain new and useful Improvement in Forced-Draft Blowers, and do hereby declare that the following is a full, clear, and exact description thereof.

The object of my invention is to provide a forced-draft blower for furnaces which will create an efficient air blast and which can be kept in good working condition by very little attention.

My blower consists of a tube, in which the nozzle is located. The nozzle is connected with a source of fluid (steam or air) under pressure, and the discharge end of the nozzle is made with a flared or tapered seat, and on such is seated a conical plug. The seating faces of the plug and its seat in the nozzle are provided respectively with grooves which, when the plug is on its seat, constitute orifices through which the fluid may escape, and by which it is caused to impinge at an angle upon the wall of the tube in which the nozzle is located. I have found, in actual experimentation, that a solid sheet of fluid emitted from the nozzle, though at an angle, does not give the result desired, while a plurality of steam jets escaping through the orifices referred to do produce the desired effect. The isolated jets seem to have the property of creating a better vacuum, drawing in the air and finally discharging the same from the blower with great force, and in so doing producing an effective blast.

Another feature of my invention is, the plug is normally held to its seat by means which may be adjusted to release the plug to permit it to be forced from its seat by the fluid pressure in the nozzle, and the fluid rushing out over the opposed faces of the plug and its seat provides an efficient way of keeping the orifices clean.

Another feature of my invention is, the blower is introduced in the ash-pit of the furnace at an angle in a horizontal plane, so that the blast is directed at an angle against the rear wall of the ash-pit. This arrangement causes the blast emitted from my blower to dislocate the ashes from the back wall of the ash-pit, while otherwise they have a tendency to pack there and become cemented in place, and in a short while build up against the grate bars and

finally interfere with the admission of air through the latter.

The details of construction of my device are hereinafter more fully described.

Referring to the accompanying drawings—Figure 1 is a view partly in side elevation and partly in vertical section of an injector that constitutes an embodiment of my invention; Fig. 2 a cross section on the line 3—3 of Fig. 1; and Fig. 3 a horizontal section through the ash pit on a plane below the grate of the furnace to illustrate the location of the injector with reference to the furnace.

In the embodiment of my invention illustrated in the drawings, and referring to Fig. 3, in which is shown a horizontal section through the ash pit 10 below the grate of the furnace it will be seen that my blower is so arranged that the blast therefrom is directed at an angle upon the rear wall of the ash pit with the result that a circulatory spiral motion is set up in the ash pit that results in the practically uniform or even distribution of the feed throughout the ash pit under the grate, and the prevention of the accumulation of ashes at the back of the pit.

My blower consists of a tube 22 in which is located the nozzle in the form of a substantially cylindrical body 11 connected to a valve controlled feed pipe 12, which in practice is connected with a source of fluid under pressure. The body 11 has at its discharge end an outwardly flared or conical seat 13 with which coöperates a correspondingly shaped plug 14 attached to one end of a stem 15 that passes longitudinally through the body 11 and emerges at the other end thereof after passing through a stuffing box 16, and through the perforated arm 17 of supporting bracket 18 which conveniently is formed integral with the body 11. By means of a cam 19 pivoted to the stem having an operating handle 20 by which the cam may be rocked, the plug 14 is normally held to its seat, and may be released so that the pressure in the nozzle will move the plug from its seat and this has the effect of clearing the orifices referred to.

In the operation of my invention steam or fluid regulated as desired, is delivered from the nozzle in the tube and so produces a forced draft of air through the latter. The air blast so created impinging against the furnace wall at the rear thereof, sets up

a spiral motion therein which results in the distribution of the air throughout the ash pit and prevents an excess accumulation of ashes at the back of the pit. Should the orifices of the nozzle be clogged or a deposit formed therein, the cam 19 can be operated to permit the plug 14 to be moved from the seat 13 by the pressure of the fluid in the nozzle and thus permit momentarily a strong blast of steam to pass between the plug and its seat. The conical face of the plug 14 with the grooves 21 being toward the steam as it rushes from the casing 11, it will be seen that the cleaning action is prompt and efficient for the steam has immediate access to the grooves 21. The movement of the plug being effected by a simple sliding one, such movement can be more quickly effected than is possible were a screw motion employed.

Practical tests have shown that by my invention complete combustion of the fuel is possible and there is a material increase in the efficiency of the boiler and practical elimination of clinkers due to the burning of cheap coal, and the ashes fall from the grate bars of the furnace.

To obtain the best results, the orifices should be disposed at approximately 30 degrees to the axis of the injector tube, and the inlet end of the tube 22 should be made in bell-form and the outlet end of the tube is preferably out at an angle to come flush with the inner wall face of the ash-pit.

In actual tests my blower has been successfully operated to keep a fire over two feet of dead ashes sufficient to keep up steam for an overloaded boiler.

Having thus described my invention what I claim is—

In a forced draft blower, the combination of an injector tube of uniform bore, a nozzle located axially therein and provided with an outwardly flaring conical valve-seat at its discharge end, a valve having its seating face flared to conform with said flared valve-seat, there being formed between the valve-seat and the valve a plurality of groove-like orifices of uniform bore and having a direction with a radial component, the valve fitting closely its seat between said grooves, whereby, when said valve is seated, said orifices emit in the ejector-tube, jets of the blast-producing fluid diverging radially from the axis of the injector-tube and of predetermined uniform volume, and means accessible from the exterior for holding the valve seated, said means also being operable to space the valve to a predetermined distance from its seat for cleaning purposes.

In testimony that I claim the foregoing I have hereunto set my hand.

WILBER G. COLLINGE.

Witnesses:

FREEMAN J. GLOVER,
W. E. WILLIAMSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."