(No Model.)

D. J. CROZIER.

STEAM JET BLOWER.

No. 523,198. Patented July 17, 1894.

Fig. 1.

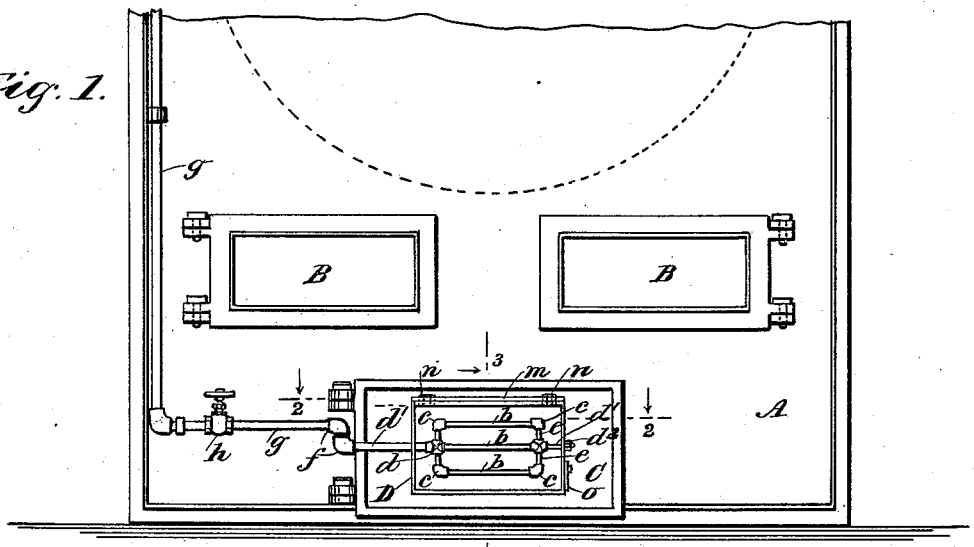


Fig. 5.

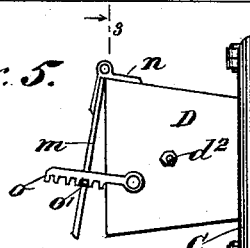


Fig. 3.

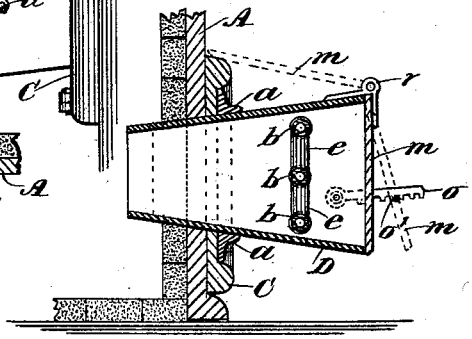


Fig. 2.

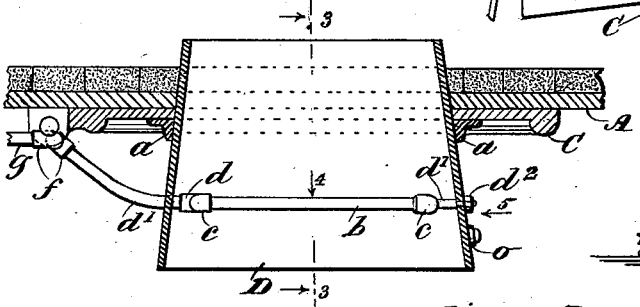
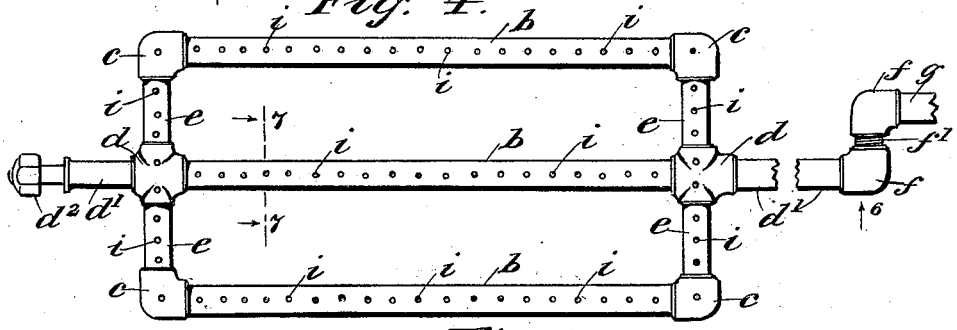


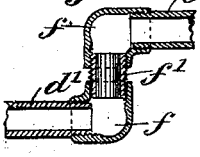
Fig. 4.



Witnesses.
C. Sedgwick
Wm. I. Patton

Fig. 7.

Fig. 6.



Inventor.
D. J. Crozier
By Munn & Co
Attorneys.

UNITED STATES PATENT OFFICE.

DAVID JOHN CROZIER, OF BROOKLYN, NEW YORK.

STEAM-JET BLOWER.

SPECIFICATION forming part of Letters Patent No. 523,198, dated July 17, 1894.

Application filed March 24, 1894. Serial No. 505,009. (No model.)

To all whom it may concern:

Be it known that I, DAVID JOHN CROZIER, of Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Steam-Jet Blowers, of which the following is a full, clear, and exact description.

My invention relates to improvements in steam jet blowers for boilers, and has for its object to provide a novel jet blower, which will be adapted for an attachment upon the door of the ash pit below the fire chamber of a boiler or other steam generator, to blow the fire, and by the novel means for connecting the steam supply thereto, permit a free swinging movement of the ash pit door, to open or close it.

A further object is to provide the jet blower with a flap valve to seal the draft aperture which is formed in the blower casing, and also afford means to graduate the influx of air thereto.

To these ends my invention consists in the construction and combination of parts, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front view of the improvement, in place on a boiler front shown in part. Fig. 2 is an enlarged sectional plan view on the line 2—2 in Fig. 1. Fig. 3 is a transverse sectional view on the line 3—3 in Figs. 1 and 2. Fig. 4 is an enlarged inside view of a detail of construction of the improvement, taken opposite the arrow 4 in Fig. 2. Fig. 5 is a side view taken opposite the arrow 5 in Fig. 2. Fig. 6 is a sectional side view of the pipe connection for the jet blower, taken opposite the arrow G in Fig. 4; and Fig. 7 is a transverse sectional view of a part of the jet producing device, on the line 7—7 in Fig. 4.

The improvement may be applied to any steam generator having a fire chamber and an inclosed ash pit below said chamber. For the purpose of illustrating the application of the improved steam jet blower it is shown in connection with the front wall of the fire chamber of a horizontal boiler, A representing the lower portion of said wall, B B doors of the fire chamber, and C the door of the ash pit.

The improved jet blower device is provided with a rectangular metal casing D, which is inserted in a laterally elongated aperture made to receive it in the door C, the casing D projecting at each side of the door, as shown in Figs. 2 and 3, the main portion being located on the side of the door that is outermost when the latter is closed.

Preferably the casing D is tapered from the outer edge inwardly so as to incline the end walls and side walls toward a common center point an equal degree, this convergence being designed to diminish the opening in the casing at its inner side.

The casing is held in connection with the door, by angle pieces *a*, that are secured to the door and casing and seal the joint between said parts, or an integral flange may be formed on the casing for the purpose of attaching it to the door.

The steam jet producer consists of a set of three tubes *b* that are proportioned in length to permit their free introduction at a proper point within the casing D, said tubes being held in a parallel plane at a suitable distance from each other by the L fittings *c*, four-way fittings *d*, and nipples *e*, these parts when assembled producing an elongated tubular structure of rectangular form.

In the fittings *d*, two long nipples *d'* are screwed, so as to project from these parts in the same plane, said nipples being engaged with opposite perforations formed in the side walls of the casing D, through which they project, one nipple having a solid end piece of reduced diameter, which passes through the casing and is thereto secured by a nut on its projecting terminal, as shown at d^2, in Figs. 1 and 2.

The other nipple *d'* is extended from the side wall of the casing B toward the side edge of the door C, and is connected with a steam supply pipe *g* by the flexing joint that is composed of two L fittings *f* and a short nipple *f'* as shown clearly in Fig. 6, the location of this joint being at a point that will adapt it to swing freely when the door is moved on its hinges.

The steam supply pipe *g* is secured in po-

sition on the front wall A of the fire chamber and is extended from the steam generator, a valve *h* being introduced, for controlling the flow of steam to the jet producer that is adapted for the discharge of numerous small jets of steam, by the perforations *i*, that are formed in the tubes, nipples and fittings on their inner side at proper intervals, as indicated in Fig. 4.

On the front or outer edge of the casing D a sealing gate *m* is pendently secured by the hinges *n*, that are located at the upper edge of said casing, so that the gate may be folded upwardly and rearwardly to expose the full opening of the casing, or be entirely closed. A latching bar *o* that is pivoted on one side of the casing is serially notched for a hooked engagement with a stud *o'* on the edge of the gate, whereby the latter may be secured in a partly open condition at different angles, and thus control the influx of air to the casing, as may be desired.

The gate *m* being adjusted by the specified means to admit a proper amount of air, steam is introduced to the jet producer by the adjustment of the valve *h*, which will cause a forcible escape of steam in numerous jets from the perforations *i*, thereby producing a partial vacuum in the casing D, that will induce a forcible flow of air within said casing, and thence project it into the ash pit and upwardly through the fire bed, producing a forcible combined steam and air blast, that permeates the mass of ignited coal in the fire chamber and causes its intense combustion.

The peculiar formation of the casing D and jet producer within it, affords a wide, thin injected sheet of air and steam that is very effective in operation, speedily blowing the fire uniformly throughout its area and giving much better results than circular jet blowers.

The simple swing joint provided, permits the door C to be freely opened and closed when this is needed, and the pendent gate *m* enables the operator to completely seal the fire chamber when the fire is to be banked and the use of the steam generator is to be temporarily suspended, thereby effecting a saving of fuel, and maintenance of the fire without replenishment, for a considerable period of time, ready for subsequent service.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

In a steam jet blower, the combination with a rectangularly apertured door hinged to swing on the front of a boiler fire chamber, a rectangular inwardly converged casing secured in the aperture of the door, and a pendent hinged and adjustable gate at the front of the casing, of a rectangular tubular jet producer located transversely within the casing, a steam supply pipe extending through the side of the casing, a swing joint in said pipe between the door hinges and adapted to align therewith, and a valve in the steam pipe, substantially as described.

DAVID JOHN CROZIER.

Witnesses:
JESSE S. CARMAN,
FREDERICK RABBE.