(No Model.)

W. THOMAS.

DEVICE FOR FEEDING AIR TO FURNACES.

No. 315,187. Patented Apr. 7, 1885.

Fig. 1.

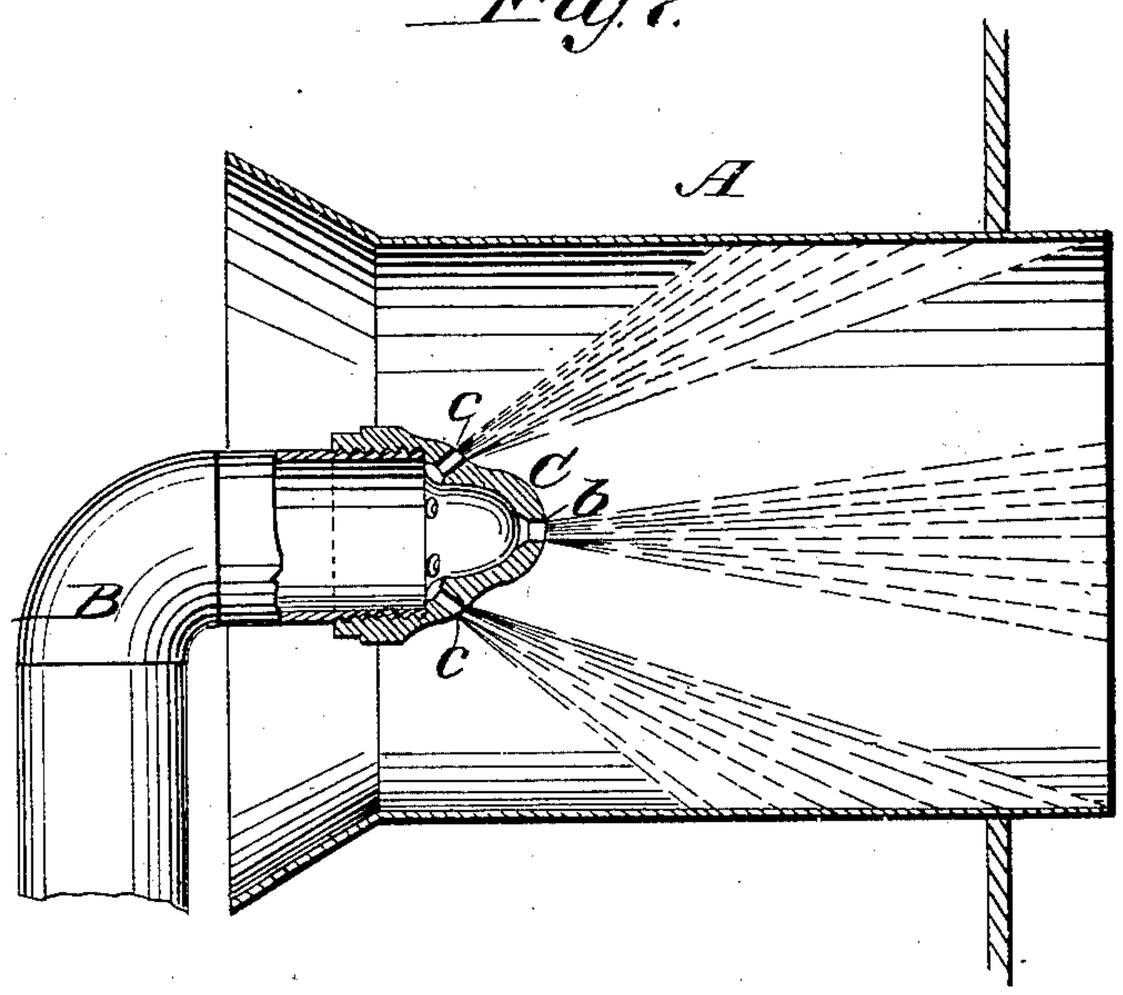


Fig. 2.

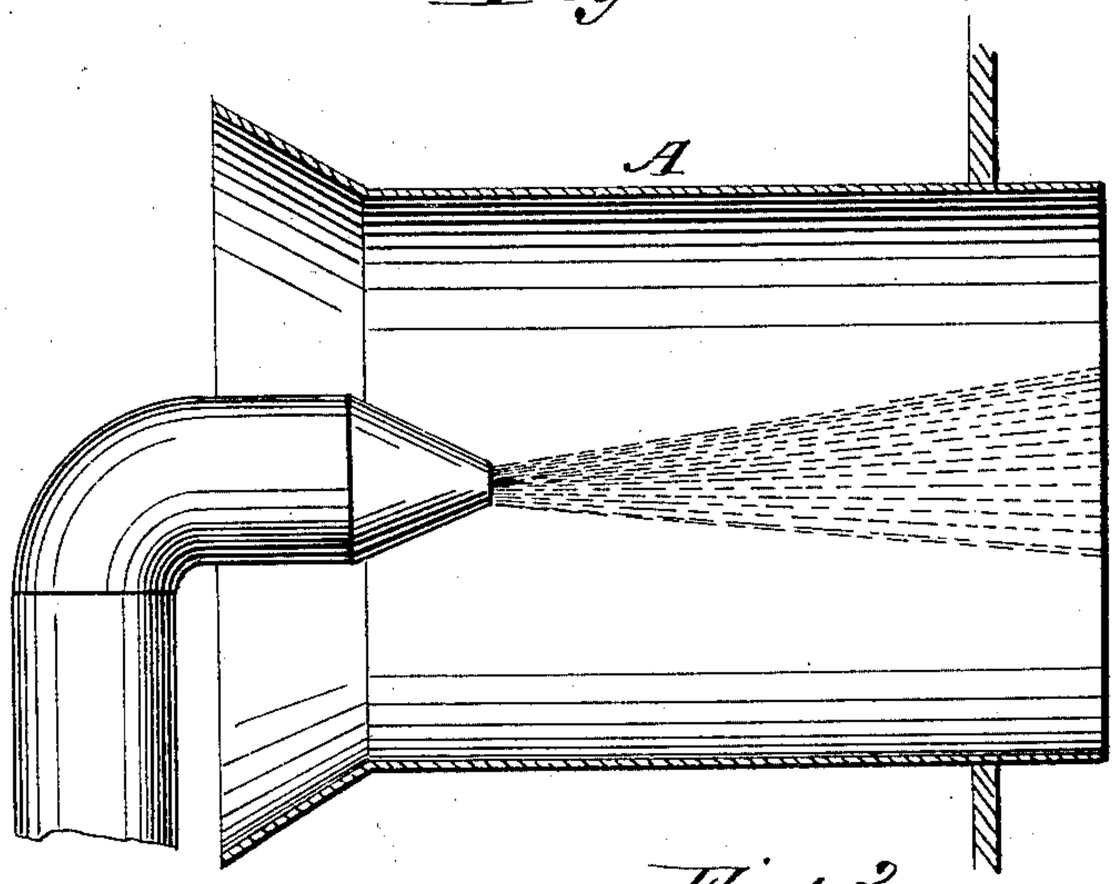
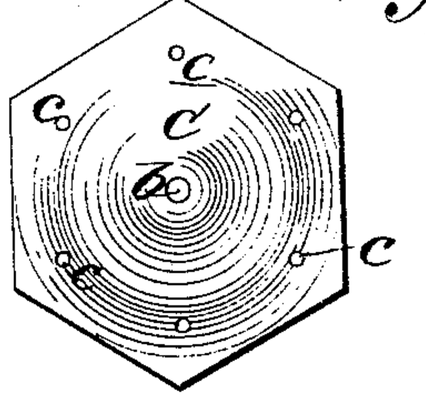


Fig. 3.



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DEVICE FOR FEEDING AIR TO FURNACES.

SPECIFICATION forming part of Letters Patent No. 315,187, dated April 7, 1885.

Application filed July 23, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM THOMAS, of Pittston, in the county of Luzerne and State of Pennsylvania, have invented new and useful Improvements in Devices for Feeding Air to Furnaces, of which the following is a full, clear, and exact description.

This invention is applicable to various kinds of boiler-furnaces, but will be found especially useful in those of such furnaces in which culm is burned, owing to the fact that such fuel requires more air than does clean coal, and in burning which the ash-pit is usually closed and air forced in through a tube, either by means of a fan or steam-blower.

My invention relates to a steam blower or nozzle for the purpose; and it consists in the construction and arrangement of parts, as will be hereinafter fully described and claimed.

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

Figure 1 represents a longitudinal section of an air-tube for feeding air to a furnace, with a steam-jet device or blower embodying my invention applied. Fig. 2 is a similar view of a like air-tube with a steam-jet device or blower of the ordinary construction applied, and Fig. 3 a face view of my improved steam-jet nozzle.

A is the air-feeding tube, that may be entered in or through the side of the furnace beneath the grate, for use when the ash-pit is closed. Ordinarily, when a steam-blower is used, the steam is introduced by a large central jet, as shown in Fig. 2. This blows a large quantity of steam through the tube without filling it, which gives too much steam for the air introduced. If too much steam is introduced, it is liable to extinguish the fire and to send off a quantity of unconsumed gas to the top of the stack or chimney, where, coming in contact with the oxygen of the air, it not infrequently ignites; also, after the fire lights up, explosions sometimes occur, doing both personal and material damage. If, again, on the other hand, said nozzle introduces too small a central jet, then the draft is insufficient. My invention removes these objections by using on the pipe B, which conveys the steam to the air-tube A, a nozzle, C, (see Figs. 1 and 3,) of convex or other suitable shape, provided with a reduced central jet-aperture, *b*, and any number of smaller jet-orifices, *c c*, arranged back of the central aperture, and so as to incline outwardly in a forward direction—say at an angle of sixty-five or seventy degrees (more or less) to the longitudinal axis of the nozzle. Such nozzle will throw a small jet of steam through the center of the air-tube and a series of smaller jets out against the sides of said tube or all around it, thereby completely filling the tube. The aggregate area of the several apertures in said nozzle need not be more than one-third that of the central jet-orifice in an ordinary nozzle to furnish a certain amount of air to the furnace, and the steam, being more confined, will issue from the jet-orifices with almost boiler-pressure, thus making a very strong draft with very little steam, the pipe or tube being filled with a series of swift jets. With the use of such a nozzle the fire will burn brighter and clearer, almost as much so when using culm as when burning clean coal by a strong natural draft. If desired, the same nozzle may not only be used for stationary boilers or furnaces, but also for the stacks of locomotive-engines in place of the ordinary straight nozzle, making a partial vacuum in the smoke-box. The ash-pit doors should then be opened when the steam is on, but may be more or less closed when not much steam is being used, and the device may only be used when the steam is low. The peculiar nozzle not only creates more draft with less steam, but it will be less noisy than the ordinary center jet-nozzle. The same device, by using fine jets of superheated steam, may be employed in the place of a fan and with less cost for blacksmiths' fires.

If desired, the steam pipe and nozzle, instead of being made to project to the extent shown in the drawings within the air-pipe, may be set farther back, so that the steam-jets will strike the air-tube at or in its bell-mouth.

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

In devices for producing a forced draft and feeding air to furnaces, the combination, with the cylindrical air-tube A, open at both ends, of the steam-pipe B and the jet-nozzle C, screwing on said pipe and arranged to enter centrally within said tube, and constructed with a central jet-orifice, *b*, and a series of diverging smaller jet-apertures, *c*, in rear of the central orifice, essentially as shown and described.

WILLIAM THOMAS.

Witnesses:
S. P. FENN,
F. H. KYTE.