

(No Model.)

T. W. JENKINS.

AIR FEEDING DEVICE FOR FURNACES.

No. 307,466.

Patented Nov. 4, 1884.

Fig. 1.

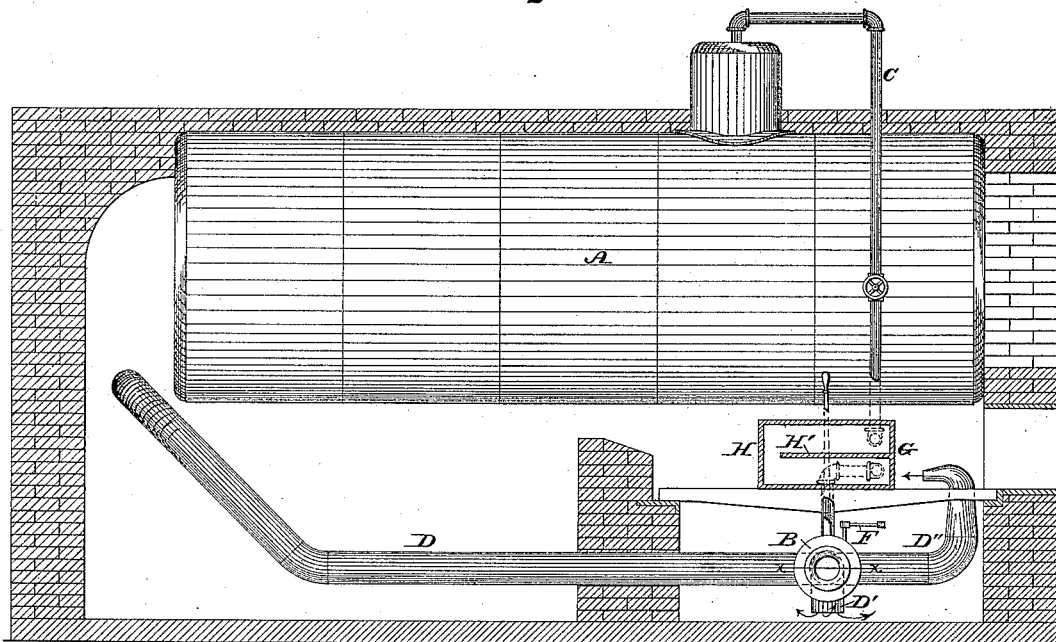


Fig. 2.

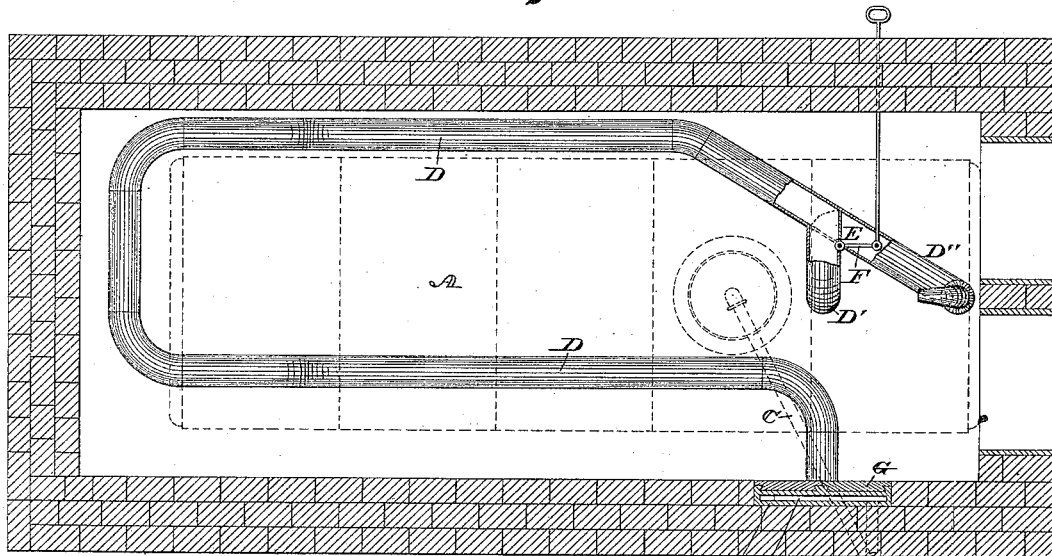
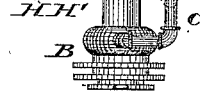
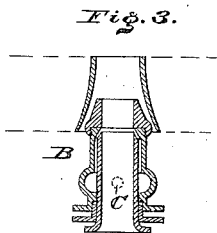


Fig. 3.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

THOMAS W. JENKINS, OF PHILADELPHIA, PENNSYLVANIA.

## AIR-FEEDING DEVICE FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 307,466, dated November 4, 1884.

Application filed November 15, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS W. JENKINS, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Feeding Air or Vapor to Furnaces, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a partial side elevation and partial vertical section of an air or vapor feeding device or a spark-preventing, smoke-consuming, and heat-intensifying device embodying my invention. Fig. 2 is a horizontal section thereof. Fig. 3 is a section of a detached portion in line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of means for directing air or vapor through the fuel of a furnace or over the same, or both, for the purpose of consuming smoke, preventing sparks, and intensifying the heat, as will be hereinafter fully set forth.

Referring to the drawings, A represents a steam-boiler, and B represents an air-injector or air-inlet, both of which are properly supported on the masonry of the boiler.

C represents a pipe which is connected with said injector and the dome of the boiler, and D represents a pipe which is attached to the inner end of the injector and passed into the furnace below the boiler, the pipe C supplying steam to the injector, thus causing a union or intermixture of air and steam, the vapor thus generated being directed into the pipe D.

The form of injector may be similar to that shown in the Letters Patent of the United States No. 279,269, granted to Horace W. Norwood, assignor, &c., on the 12th day of June, A. D. 1883, to which, however, I do not limit my invention. The pipe D enters the furnace at one side near the front, in the ash-pan thereof, then extends through the bridge to the rear, next passes to the opposite side, and returns to the front again, passing through the bridge and reaching the ash-pan, so as to be subjected to the heat of the furnace; and its front end is bifurcated, one branch, D', extending downwardly to near the bottom of the ash-pan, which is made air-tight, and the

other branch, D'', extending farther to the front and bent backward over the grate of the furnace. It will be noticed that the pipe or branch D' is located centrally within the ash-pan below the grate.

At the junction of the branches D' D'' is located a valve, E, which is adapted to close either branch, and has connected with it a lever or arm, F, the handle whereof is conveniently accessible at the side of the masonry or support of the boiler. It will be seen that when the valve E is turned so as to close the branch D'' the combined vapor of air and steam directed into and through the pipe D is caused to enter the branch D', and so injected into the ash-pan, whereby it commingles with the fuel and is consumed therewith. By moving the valve to the dotted position shown in Fig. 2 the vapor is caused to enter the branch D'', and so injected into the furnace above the grate, whereby it commingles with the products of combustion and is consumed therewith. By either provision the heat is intensified, the smoke being consumed and sparks prevented, and the consumption of fuel vastly reduced. If desired, the vapor may be simultaneously directed above and below the grate.

In order to superheat the steam prior to its union with the air, I employ a superheater, G, consisting of a box, H, which is supported on the masonry in such a manner as to be exposed to the products of combustion or fire, and located between the steam-dome and place of entrance of the steam into the injector, it being noticed that the pipe C is divided by the box and connected at two places with the same, so that as the steam enters the box in the condition it passes from the dome it leaves the same superheated, and so reaches the injector, thus increasing the heating-power of the created vapor, and this is further increased by the extension of the pipe D around the furnace, whereby, owing to lengthened surface of said pipe, the vapor is highly heated prior to its union with the fuel or products of combustion.

In the superheater is a diaphragm, H', which divides the box into chambers, which communicate with each other by means of an opening or space at one end of the diaphragm, the

two ends of the pipe C being connected with the chambers, the steam entering one chamber and traversing the same, then entering the other chamber and traversing its length prior to discharge, thus increasing the space through which the steam is passed during the super-heating operation.

It is evident that, though the device is shown in connection with a steam-boiler for heating the same, it may be used for other heating purposes, a suitable supply of steam being, however, always provided. As the vapor is injected into the ash-pan under pressure, said pan is made air-tight, and as the branch D opens downward into said pan, the bottom of the pan becomes a deflector, so as to distribute the vapor uniformly beneath the grate-surface and direct it to all points of the fuel.

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

1. A furnace having an air-tight ash-pan, in combination with an air or vapor feeding device provided with a pipe located centrally in said ash-pan below the grate and opening downward into said pan, the bottom whereof acts as a deflector, substantially as and for the purpose set forth.

2. A furnace with an air-tight ash-pan, in combination with an air or vapor feeding device provided with a pipe which is bifurcated at the discharge end, one branch opening downward into the ash-pan, whose bottom forms a deflector, and the other branch leading above the grate, substantially as and for the purpose set forth.

3. An air or vapor feeding device provided with a pipe which is admitted into an ash-pan of a furnace, passed through the bridge, then to the rear of the furnace, across and forward, and again through the bridge into the ash-pan, substantially as and for the purpose set forth.

4. A furnace having an air-tight ash-pan, in combination with an air or vapor feeding device provided with a pipe which is bifurcated at the discharge end, one branch opening into the ash-pan, whose bottom forms a deflector, and the other branch opening above the grate, the pipe having a valve common to both branches, substantially as and for the purpose set forth.

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Witnesses:

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