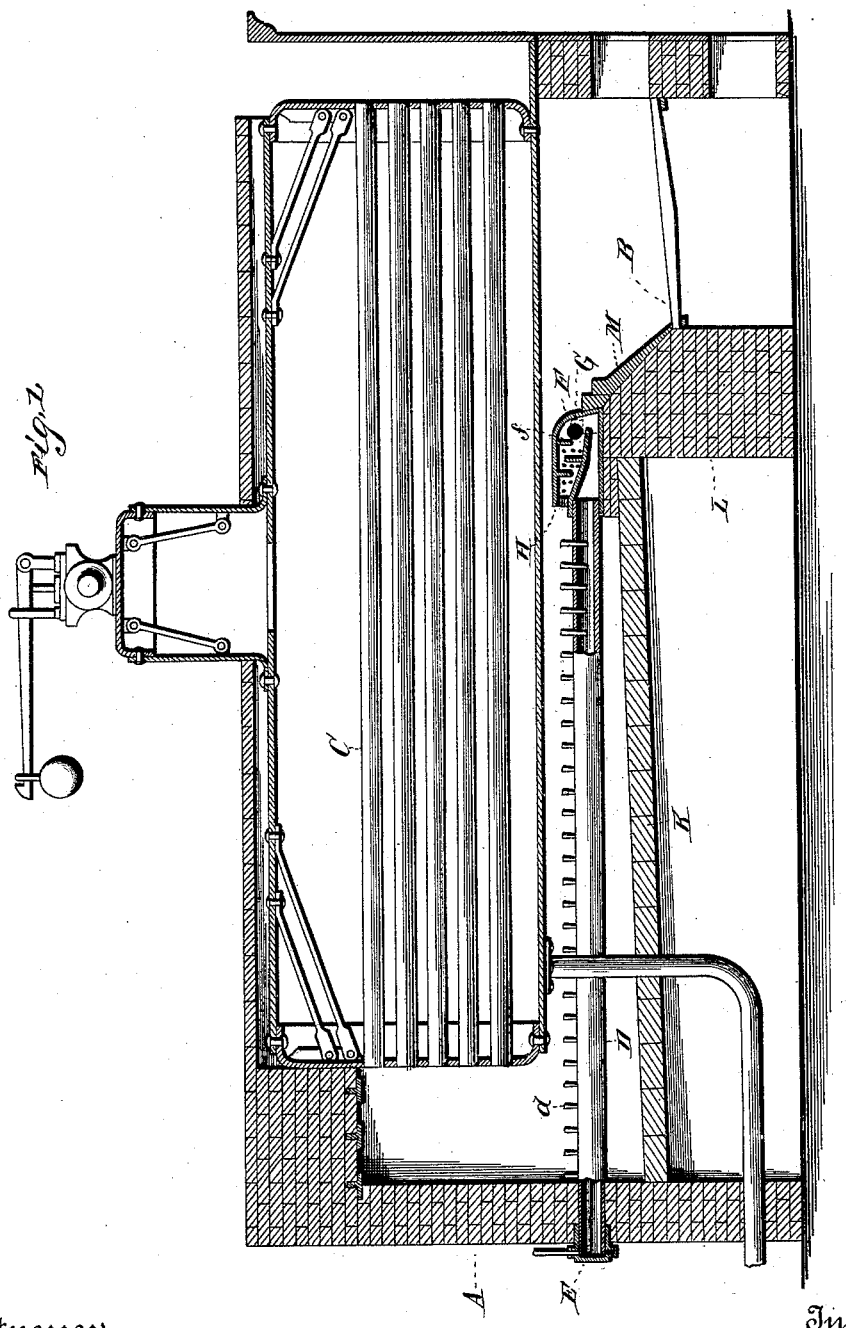
(No Model.) 2 Sheets—Sheet 1.

J. TOBIN.

AIR FEEDING DEVICE FOR FURNACES.

No. 421,990. Patented Feb. 25, 1890.



Witnesses:
Chas. L. Dayton,
R. A. Balderson.

Inventor:
John Tobin,
By his Attorneys,
Higdon & Higdon

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

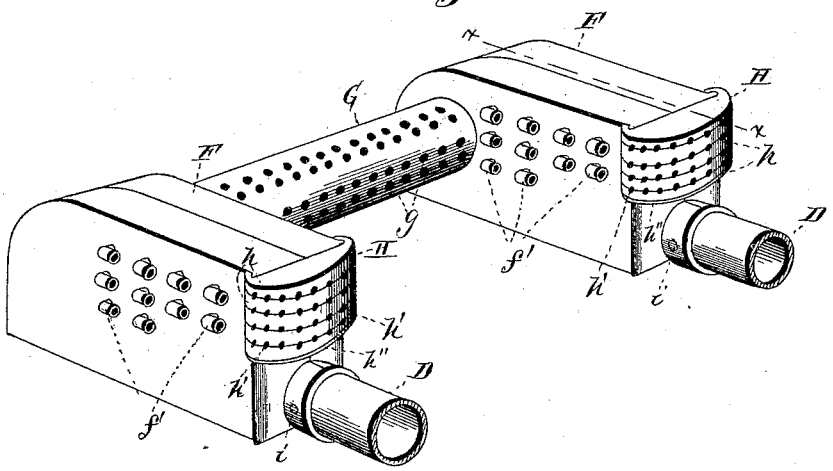


Fig. 3.

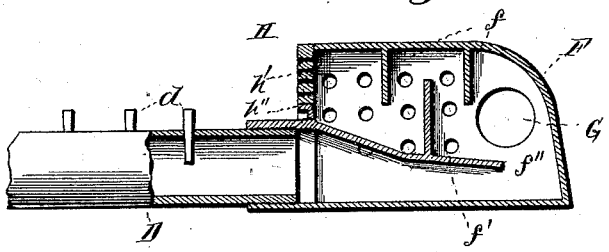
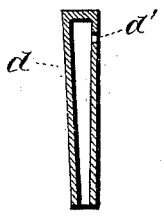


Fig 4.



Witnesses:
Chas. L. Taylor,
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Inventor;
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UNITED STATES PATENT OFFICE.

JOHN TOBIN, OF KANSAS CITY, MISSOURI.

AIR-FEEDING DEVICE FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 421,990, dated February 25, 1890.

Application filed November 30, 1889. Serial No. 332,100. (No model.)

To all whom it may concern:

Be it known that I, JOHN TOBIN, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Air-Feeding Devices for Steam-Boiler and other Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in air-feeding devices for steam-boiler and other furnaces; and it consists in the novel construction and arrangements hereinafter fully set forth and described, its object being to give a supply of fresh and heated air at the proper place to insure combustion of the inflammable gases given off by the fuel in the furnace.

In the drawings which illustrate the manner of carrying out my invention, Figure 1 is a sectional view of an ordinary steam-boiler, showing the location of the radiating-pipes, &c., with my improved air-feeding device properly secured in position. Fig. 2 is a detail in perspective of the hoods or caps F, showing more clearly how they are connected by perforated pipe G. Fig. 3 is a sectional view of one of the pipes or hoods F, taken on line *x x* of Fig. 2; and Fig. 4 is a sectional detail view of the heat-conducting pins *d*, which are secured in the air-supply pipe D.

Referring to the drawings by letter, A represents the end wall of the furnace, in which air-supply pipes D are secured, said air-supply pipes being made large enough to furnish air to said furnace.

d are conducting-pins passing through the upper sides of the pipe D. These serve to heat the air as it comes through the supply-pipe D.

B is a suitable grate, on which the fires are built.

C represents the boiler smoke-tubes in position. E is a door or valve, which regulates the supply of air in its passage through the supply-pipes D.

F are caps or hoods secured on the end of supply-pipe D next to the furnace, which rest on the bridge-wall L. These caps or hoods are seated on the fire-bridge wall L, two or more to each furnace. These are placed a certain distance apart and connected together by a suitable cross-pipe, each end of which is opened to the interior of its respective hood, from which it receives a supply of air. This pipe is provided with a number of small holes or perforations, whose aggregate area exceeds that of cross-sectional area of the pipe G. These holes or perforations are so arranged in said pipe G as to open from the furnace, and are arranged radially from the center of the pipe, so as to more efficiently distribute and mix the air with passing gases. Said hoods F, covering the end of pipes D at air-bridge L, are provided with a number of suitable diaphragm-plates *f* and *f''*, arranged so as to elongate the passage of air through the hoods and cause it (the air) to absorb the heat from the outside of said hoods.

The air, as it enters the hoods F from the main air-pipes D, is caused to pass along the bottom side of the hoods F by the horizontal diaphragm-plate *f''*. It then ascends and is thrown down and up by the other vertical diaphragms *f*, issuing in its highly-heated state from a grating or distributer formed of a number of separate movable bars H. These facilitate cleaning when necessary, said bars H having perforations *h'*, these perforations being made one-half in each grate in such a manner that when they are placed together, as shown in Fig. 2, the perforations forming the exits for heated air are round and in radial position. These hoods may be made of any suitable material—cast-iron partly sheathed or protected with fire-clay, asbestus, or other suitable material. The cross connecting air-pipe G is also protected from the direct action of the flames on its side next to the furnace by suitable cement, asbestus, or fire-clay covering. These parts may also be made of fire-clay alone, and having a series of metal conducting-pins passing through the hoods F and air-pipes D to convey the heat from outside gases passing from the furnaces to the air on its passage to the distributers or exit.

The heat-conducting pins and diaphragm-plates may be made hollow or tubular to increase their heating capacity to the air-feed. The sides of hoods F are perforated and fitted with short nozzle-pipes *f'*, being made removable and serving for heat conductors and distributers.

Having thus fully described my invention,

what I claim as being new, and desire to secure by Letters Patent, is—

1. The air-feeder for steam-boiler furnaces, comprising the pair of perforated hoods arranged on the bridge-wall and having the diaphragms *f f'*, the perforated cross-pipe G, connecting said hoods, and the pipes D, communicating with the hoods and extending through the wall of the furnace to the outer air, the said pipes D having the valves E at their outer ends, substantially as described.

2. An air-feeding device for boiler-furnaces, composed of supply-pipes D, which are provided with heat-conducting pins *d*, said supply-pipes D being provided with hoods on the end which rests on fire-bridge wall L, said hoods provided with diaphragms *f f'* and heat-conducting pins *d*, which serve the purpose of heating the air, and also changing the direction of its course to that of the gases coming from the furnace, substantially as set forth and described.

3. An air-feeding device for steam-boiler and other furnaces, provided with supply-pipes D, which are provided with doors or valves E, which regulate the quantity of said supply-pipes D, having conducting-pins *d* to convey the heat from the outside of the tubes and hoods to the air in its passage to its outlets, substantially as set forth and described.

4. An air-feeding device for steam-boiler or other furnaces, &c., provided with the supply-pipes D, conducting-pins *d*, hoods F, which are connected by pipe G, said hoods F having the horizontal and vertical diaphragms *f* and *f''*, resulting in the prevention of smoke by the more perfect combustion of the inflammable gases, and consequent economy of fuel by the arrangement of air-feed to the gases, substantially as set forth and described.

5. An air-feeding device for steam-boiler or other furnaces, &c., having the supply-pipes D, provided with hoods F, these being connected by perforated cross-pipe G, said hoods being also provided with grates H, which have perforations *h'*, these grates being made in such a manner that they may be removed at any time for cleaning of said hoods F, substantially as set forth and described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN TOBIN.

Witnesses:
J. E. HIGDON,
R. A. BALDERSON.