

No. 46,725.

PATENTED MAR. 7, 1865.

E. C. STRANGE & G. R. HUNTLEY.
BOILER FURNACE.

Fig. 1

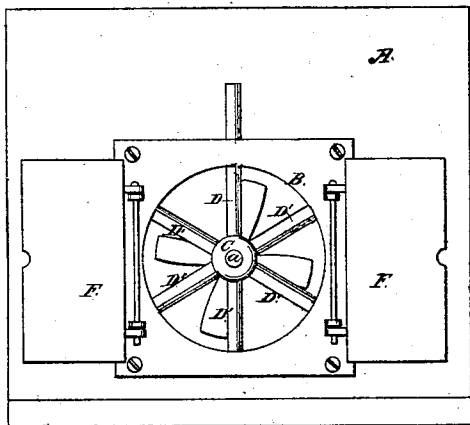


Fig. 2

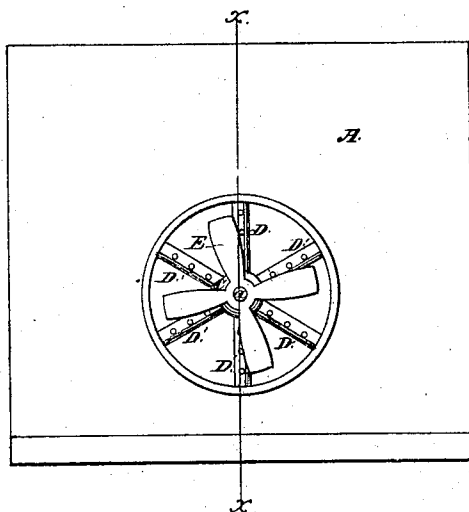
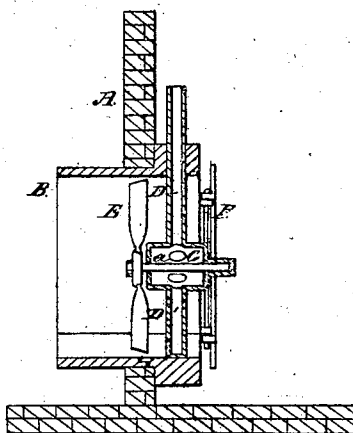


Fig. 3



Witnesses:

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UNITED STATES PATENT OFFICE.

EMERSON C. STRANGE AND GEORGE R. HUNTLEY, OF TAUNTON, MASSACHUSETTS.

BOILER-FURNACE.

Specification of Letters Patent No. 46,725, dated March 7, 1865.

To all whom it may concern:

Be it known that we, EMERSON C. STRANGE and GEORGE R. HUNTLEY, of Taunton, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Furnaces; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a front elevation of our improvement. Fig. 2, is an elevation thereof as seen from within the furnace. Fig. 3, is an elevation of a vertical cross section taken on the line *x* of Fig. 2.

Similar letters of reference indicate like parts.

This invention consists in devices for supplying currents of air and steam to furnaces of steam boilers and to other furnaces.

A represents the wall of a furnace in which coal or other fuel is consumed for the purpose of producing heat. An opening is made in the wall to receive a casing B, which may be circular or of any other shape, and of dimensions to suit the size of the furnace and the amount of work to be done therewith. The casing is furnished with doors F.

C is a hollow hub which is fixed and held centrally in the casing B, by means of pipes D, D' which extend radially therefrom to the casing B, in the interior wall of which they are securely fixed. Those ends of the pipes D' which are connected to the casing B are closed, but the ends which are connected to the hub C are open and communicate with the hollow space thereof. The pipe D is open throughout and passes through the casing so that it may be connected to a steam pipe leading from a steam boiler, or to the exhaust pipe of a steam engine.

The hub C has an axial perforation whose sides are closed, and which receives the shaft *a* of a wind wheel or blower E whose vanes are inside of the pipes D'. The blower-shaft *a* rotates freely within the hub C. The pipes D' are perforated on the sides opposite to the blower so that any steam or vapor forced or emitted through them will

strike its vanes and cause it to revolve after the manner of a wind wheel.

The operation of our improvement is as follows—the furnace to which our improvement is applied having been started and steam having been gotten up, in cases where the furnace is connected to a steam boiler, a current of steam is allowed to flow through the pipe D into the hub C whence it is distributed into the radial pipes D, through whose perforated sides it issues against the vanes of the wind-wheel E, which is thereby put in more or less rapid revolution according to the force of the steam. The revolution of the wheel will drive the air which lies before it into the furnace and thereby create a partial vacuum which will be filled with fresh air from without, and thus a steady and rapid current of atmospheric air will be supplied to the furnace while the wheel continues to rotate. The partial vacuum will also be promoted by the rapid passage of the steam from the pipes D' into the furnace. The currents thus supplied to the fire will be composed of mingled steam and air, and they will act upon the fire of the furnace, so far as relates to their mechanical effect, after the manner of a blast. The steam thus communicated to the fire, becoming highly heated, will be decomposed, and its elements will assist in the combustion of the fuel and its gases.

The casing B may be situated in the furnace wall either below or above the grate bars at the discretion of those who use our improvement, and the steam-pipe D may be connected to the exhaust pipe of a steam engine, thereby utilizing the exhaust steam, or the wheel E may be driven by compressed air passed through the pipe D.

When it is desired to shut off the atmospheric air from the furnace the doors F are to be closed, and steam alone, or whatsoever vapor is passed through the pipe D, will be admitted into the furnace. In that case the wind-wheel may be locked or it may be allowed to rotate so as to assist the distribution of the vapor.

We do not claim supplying steam to furnaces for the purpose of promoting the combustion of fuel and its gases, but,

We claim as our own invention and desire to secure by Letters-Patent,

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1. The combination of a wind wheel with a series of perforated pipes placed in the walls of a furnace, either above or below the grate bars thereof, substantially as and for
5 the purposes above set forth.

2. The combination of the open casing B provided with perforated pipes leading from a central hub as described, with doors F for

shutting off the supply of atmospheric air, substantially as above set forth.

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Witnesses:

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