R. A. Smith,

Hot Blast Oven.

No. 109356. Patented Nov. 15. 1870.

Fig. 1.

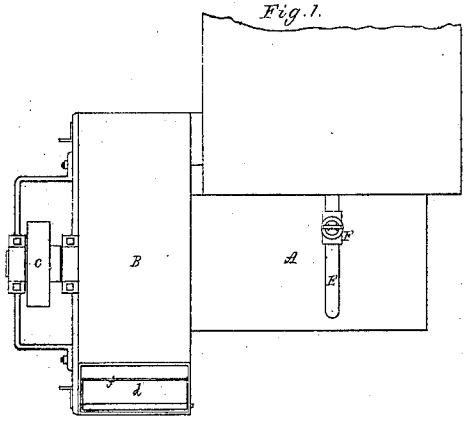


Fig 2

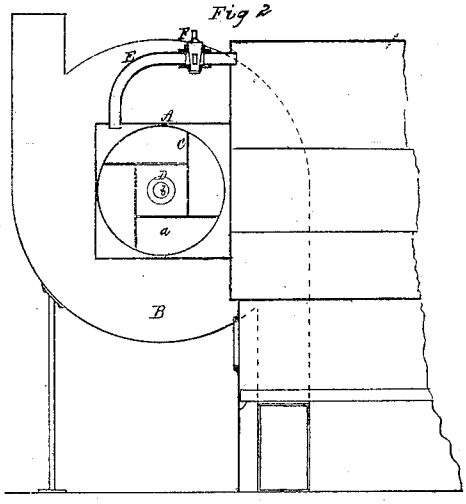


Fig. 5

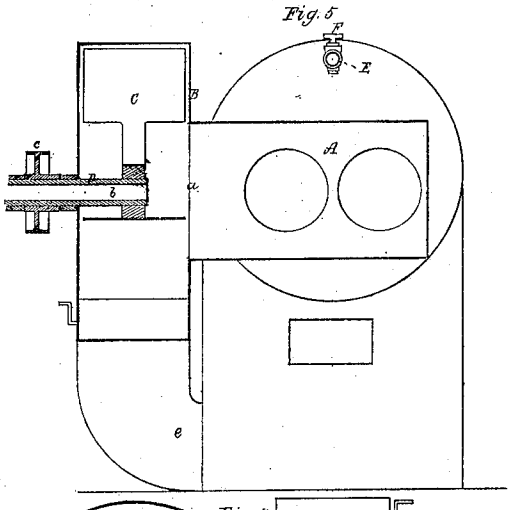


Fig. 3.

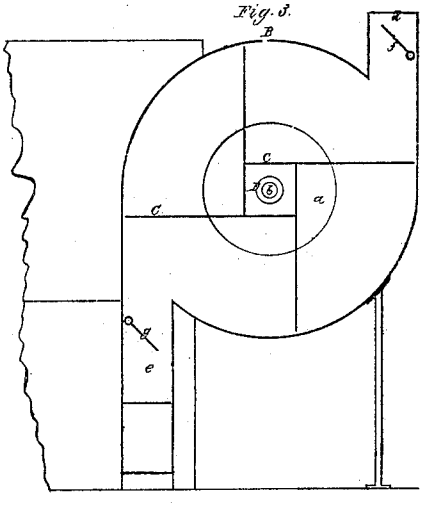
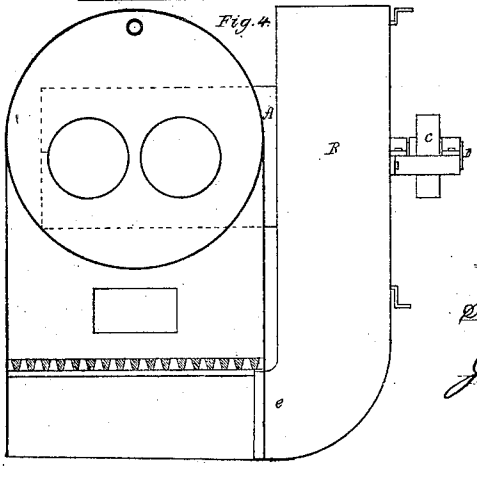


Fig. 4.



Witnesses.

S. N. Pipes.

J. P. Snow

Robert A. Smith.

by his attorney

R. H. Eddy

United States Patent Office.

ROBERT ALLEN SMITH, OF NEWBURYPORT, MASSACHUSETTS.

Letters Patent No. 109,356, dated November 15, 1870.

IMPROVEMENT IN BLAST APPARATUS FOR FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

To all persons to whom these presents may come:

Be it known that I, ROBERT ALLEN SMITH, of Newburyport, of the county of Essex and State of Massachusetts, have made a new and useful Improvement in Blast Apparatus for Furnaces; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing, of which—

Figure 1 is a top view of the apparatus containing my invention.

Figure 2 is a vertical section taken through its steam-pipe.

Figure 3, a vertical section of the blower.

Figure 4 is a rear elevation.

Figure 5, a transverse section of the apparatus, it being taken through the tubular shaft of the rotary fan.

The apparatus is designed to be arranged at that end of a furnace from which the smoke and volatile products of combustion are to escape after having performed their duty of heating the boiler or whatever the furnace may be applied to and intended to heat.

The said smoke and volatile products are to be received into the smoke-box A, which opens at one end, as shown at *a*, into the case B of a rotary fan or blast-wheel, C, fixed on a shaft, D, through which, axially, is an air-passage, *b*, the shaft, being supported in suitable bearings, and provided with a driving-pulley or wheel, *c*, all as represented.

The purpose of making the shaft tubular or with the passage *b* is to cause air, while the fan-wheel may be in revolution, to be drawn through the shaft, in order to keep it cool.

Were it not for the said air-passage the shaft would become so heated as to destroy the oil used in lubricating its bearings or journals.

From the blower-case B two educts, *d e*, are extended, each being provided with a damper or closing valve, arranged as shown at *f* or *g*.

One of these educts, viz., the upper one, is intended to communicate with the chimney, and the other with the ash-pit of the furnace.

A pipe, E, provided with a stop-cock, F, is to lead steam from the boiler or a steam-generator into the smoke-box A.

On putting the blast or fan-wheel in revolution and closing the lower damper, a draught of air will be created through the furnace, and the smoke and volatile products escaping therefrom will be forced into the chimney.

By closing the upper damper, more or less, and by opening the lower one, the smoke and volatile products may be returned to the furnace and forced through the fuel in combustion, or into the fire-chamber, so as to promote combustion of the smoke and gases, and thereby utilize them, the air or part thereof necessary to be thrown into the furnace being caused to pass through the blower-shaft.

By opening the cock of the steam-pipe a jet of steam may be thrown into the smoke-box A, and drawn therefrom with the smoke and gases by the blower, and thrown into the ash-pit, and thence be discharged into the fire of the furnace, the same being to facilitate or improve combustion of the fuel and its volatile products.

I make no claim to the subject of the United States Patent No. 94,512, but

What I claim as my invention or improvements may be stated as follows:

1. In a blast apparatus, as described, combined or to be combined with a furnace in manner as set forth, the shaft of the blast or fan-wheel as made with the air-passage extending through it, as specified.

2. The combination of the steam-duct, provided with a stop-cock, as described, with the blast apparatus, as set forth.

3. The combination and arrangement of the smoke-box, the steam-duct, and the blast apparatus made and provided with the two educts and their dampers, as specified.

ROBERT A. SMITH.

Witnesses:
R. H. EDDY,
J. R. SNOW.