

G. H. LAGORCE.

Improvement in Blast Heating Furnaces or Ovens.

No. 115,870.

Patented June 13, 1871

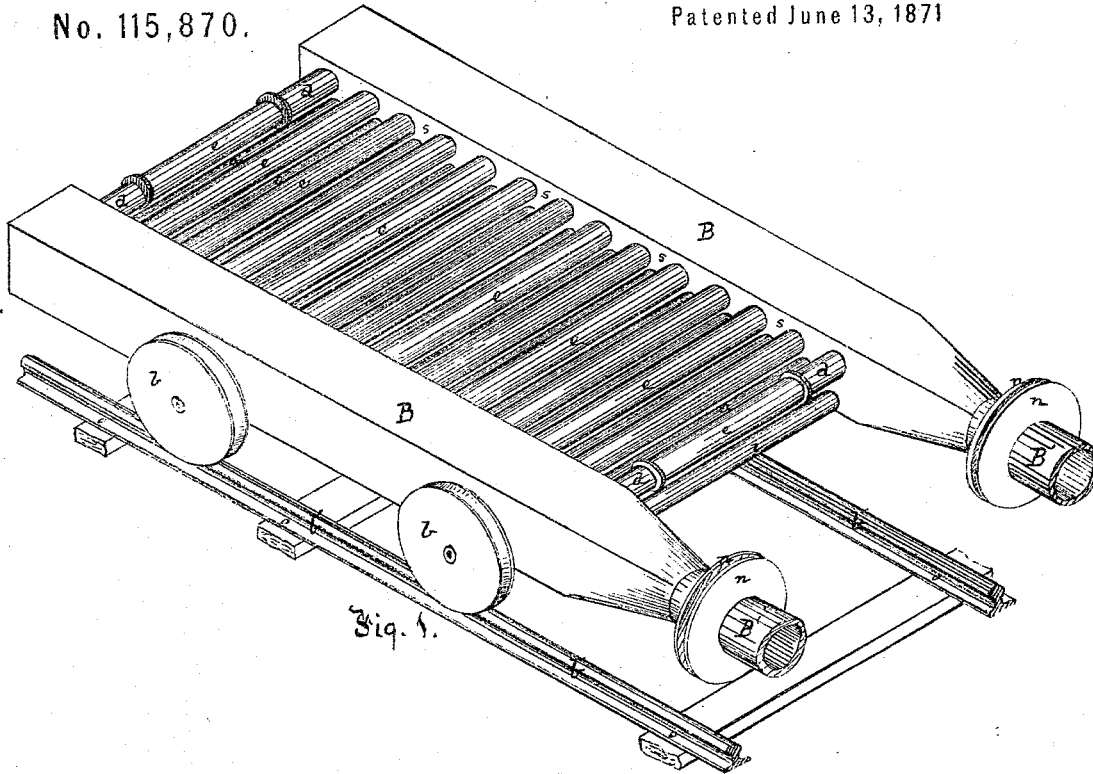


Fig. 1.

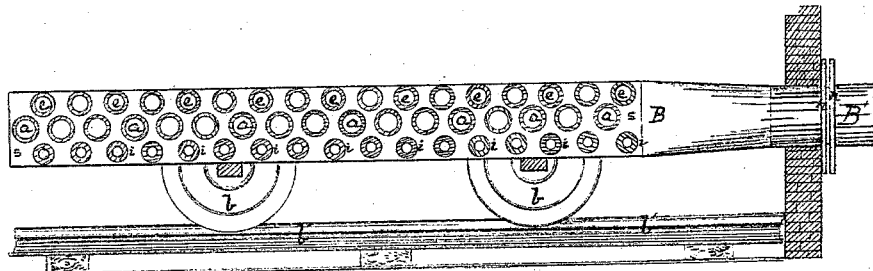


Fig. 2.

Witnesses:

R. W. H. H. H.
James S. Kay

Inventor:

Gabriel H. Lagorce,
by Bakewell, Christy & Kerr,
his Attys.

UNITED STATES PATENT OFFICE.

GABRIEL H. LAGORCE, OF NEWCASTLE, PENNSYLVANIA.

IMPROVEMENT IN BLAST-HEATING FURNACES OR OVENS.

Specification forming part of Letters Patent No. 115,870, dated June 13, 1871.

To all whom it may concern:

Be it known that I, GABRIEL H. LAGORCE, of Newcastle, in the county of Lawrence and State of Pennsylvania, have invented a new and useful Improvement in Blast-Furnace; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a perspective view of my blast-heating pipes as they appear when arranged ready for use; and Fig. 2 is a longitudinal section thereof.

Like letters of reference indicate like parts in each.

My improvement relates to the construction of an air-heating apparatus or stove to be used in connection with a furnace hot-blast for the usual purposes.

To enable others skilled in the art to make and use my improvement, I will proceed to describe the same.

The hollow trunks B are closed at their outer ends, and at their inner or opposite ends they are connected, one with the blast for the ingress of air, and the other with furnace for the egress of air. These pipes are arranged horizontally, or nearly so, on wheels *b*, the latter running on any suitable track or road-way, *b'*. The trunks B are connected together by a series of open hollow pipes, *a e i*, which extend across from one trunk to the other. The pipes and trunks may be connected by any suitable joint, but I prefer to cast with the trunks the usual thimbles *d* and fit the ends of the pipes accurately therein by the well-known operation of turning. In this way a tight joint can be secured without the necessary use of cement of any kind, and a joint, too, which will not break by expansion or contraction. The construction shown enables me to obviate certain objections which appertain to the ordinary arched or raised hot-blast pipes, and, among others, cheapness of construction is an important one. Also, the ordinary apparatus in use requires a large gas-chamber, in which the apparatus is put up; then, to clean it or repair damages, the entire works must be stopped and the pipes allowed to cool before anything can be done, and the work of cleaning and re-

pairs is both tedious and laborious. These and other like difficulties I overcome. The trunks B are connected with the blast and tuyere-pipes B', the one fitting into the other, and each provided with an annular flange, *n*, by which, with or without interposed packing, the two can be bolted or clamped together so as to make a tight joint. In Fig. 2 I have shown the front wall of the gas-chamber. It will be observed that the ends of the trunks project through this wall so that the connection is made outside. The opposite wall has a close door and a track or road-way, communicating with the track or road-way *b'*. Then, to make repairs or clean the pipes, I simply unbolt or unclamp the flanges *n*, remove the brick-work back of them, open the doors, run out the apparatus, and clean or repair it in a short time, (having previously got everything in readiness,) after which the apparatus can be run back into the gas-chamber, the doors closed, flanges *n* reconnected, brick-work restored, and operations resumed. The delay thus occasioned is short, and the fires need not be put out at all. Instead of the flanges *n*, other forms of connections may be employed, such that it will be unnecessary even to break the brick-work through which the ends of the trunk-pipes project. With the construction described, a small gas-chamber will suffice. Now, in order to get the largest aggregate pipe-surface possible, and bring the ends of such pipes within the area presented by the lateral face *s* of a trunk of a given size, I make the pipes *a e i* of different sizes—say one row, *a*, of a comparatively large size, eight inches in diameter, more or less; then, by making another row of pipes, *e*, of less diameter—say six inches, more or less—I am enabled to economize more perfectly the remaining unoccupied space of the lateral face *s* and arrange the two series of pipes more compactly. The little remaining area *s* of the lateral face of the trunk may then be occupied by the ends of another row of pipes, *i*, of still smaller diameter—say four inches, more or less. Such series of pipes of different sizes, and in any desired number, may be arranged in any desired order, whereby the inside face *s* of each trunk shall be economically occupied by the end connections of such pipes. In this way,

with a trunk having any given inside face or area, a greater amount of pipe-heating surface can be secured than if the pipes were all of uniform diameter. Also, by bringing the pipes so close together, and in such relation to each other, the draught of the burning gas will be not only upward between the pipes, but also around and over them, so as to heat the upper as well as the lower and side faces, and at the same time to keep the upper faces free from dust; being so perfectly concentrated, they are more uniformly acted on by the heat and kept at a more uniform and higher temperature than those of the usual construction. The heat also can be more easily required to keep it in good working order.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A blast-heating apparatus or stove mount-

ed on trucks so as to be removable at will from the gas-chamber, and replaced in like manner, substantially as described.

2. In a blast-stove mounted on wheels, the trunk-pipes B, constructed so as to be extended through the walls of the gas-chamber, and with suitable external connections, whereby the stove can be disconnected from the blast and furnace-pipes outside the chamber, substantially as described.

3. Two or more series of air-heating pipes of different diameters, arranged, with reference to each other, substantially as described.

In testimony whereof I, the said GABRIEL H. LAGORCE, have hereunto set my hand.

GABRIEL H. LAGORCE.

Witnesses:

A. S. NICHOLSON,

G. H. CHRISTY.