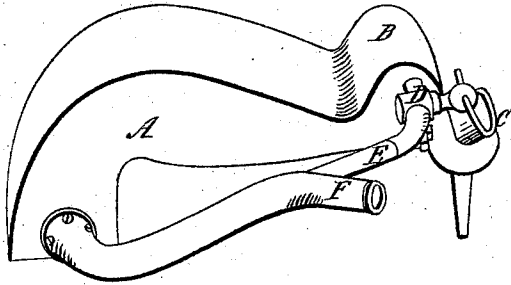


R. COOK.  
Blast Furnace.

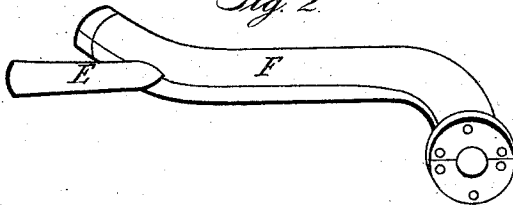
No. 7,211.

Patented Mar. 26, 1850.

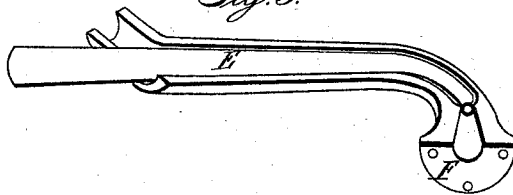
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



# UNITED STATES PATENT OFFICE.

RANSOM COOK, OF SARATOGA SPRINGS, NEW YORK.

IMPROVEMENT IN BLAST-PIPES FOR CONVEYING HEATED AIR AND GASES TO FURNACES.

Specification forming part of Letters Patent No. 7,211, dated March 26, 1850.

*To all whom it may concern:*

Be it known that I, RANSOM COOK, of the town of Saratoga Springs, county of Saratoga, and State of New York, have invented a new and Improved Tuyere or Blast-Pipe; and I hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification.

The nature of my invention consists in a mode of partially arresting and returning to the fire the escaping products of combustion, so that the combustible gases and particles of carbon may be there consumed, with the double benefit of effecting a saving in fuel and abating the nuisance created by the smoke. My method of doing this is by what I denominate a "double tuyere or blast-pipe." This tuyere is constructed of two pipes, one of which enters within the other before reaching the end from which the blast emerges.

Figure 1 shows my method of applying said tuyere to a heating-oven or a reverberatory furnace. A is the heating-oven. B is the gas-chamber, where the escaping products of combustion are gathered and partially arrested in their progress to the chimney. C is the flue or commencement of the chimney. D is a stop-cock. E is the smaller or interior pipe of the tuyere, connected with the gas-chamber. F is the external pipe of this tuyere, in the upper end of which the blast enters.

Fig. 2 is a representation of this tuyere as disconnected from the heating-oven. A blast of air entering either of these pipes at the end where they branch or separate will create a draft through the other pipe, moving in the same direction as the blast and discharging through the orifice common to both pipes. When, therefore, this tuyere is attached to the heating-oven, as shown in Fig. 1, the blast en-

tering at the pipe F will, in passing over the end of the pipe E, create a partial vacuum at its lower orifice, causing a draft through the pipe E, and in this way the smoke and other products of combustion will be drawn from the gas-chamber, and, mingling with the atmosphere of the blast, will be returned to the fire-box of the heating-oven. As these arrested gases, mixed with fresh oxygen, are made to enter the fire-box beneath the grate, they must subsequently pass through the fire and be thoroughly exposed to combustion.

Fig. 3 is a sectional view of this double tuyere, the upper half of the exterior pipe being removed. The contraction of the outer pipe close to the end of the inner one, as shown in this figure, is adopted for the purpose of creating a draft through the interior pipe with the use of a much less volume of air in the blast than would be otherwise required.

I do not claim the discovery of this method of creating a partial vacuum or draft through one pipe or aperture by the rapid movement of a fluid in another pipe with which the first is connected, having its mouth or orifice in contact with the fluid in motion; but

What I claim as my invention applicable to heating and smelting operations, and which I desire to secure by Letters Patent, is—

The application of this method of creating such draft or partial vacuum to the return of the smoke and other escaping products of combustion to the fire, in order that such of them as are combustible may be there consumed, the method or means consisting substantially in the manner of employing the blast-pipe F, inclosing the hot-air pipe E, as herein set forth.

RANSOM COOK.

Witnesses:

T. P. BROWN,  
SAML. TEN EYCK.