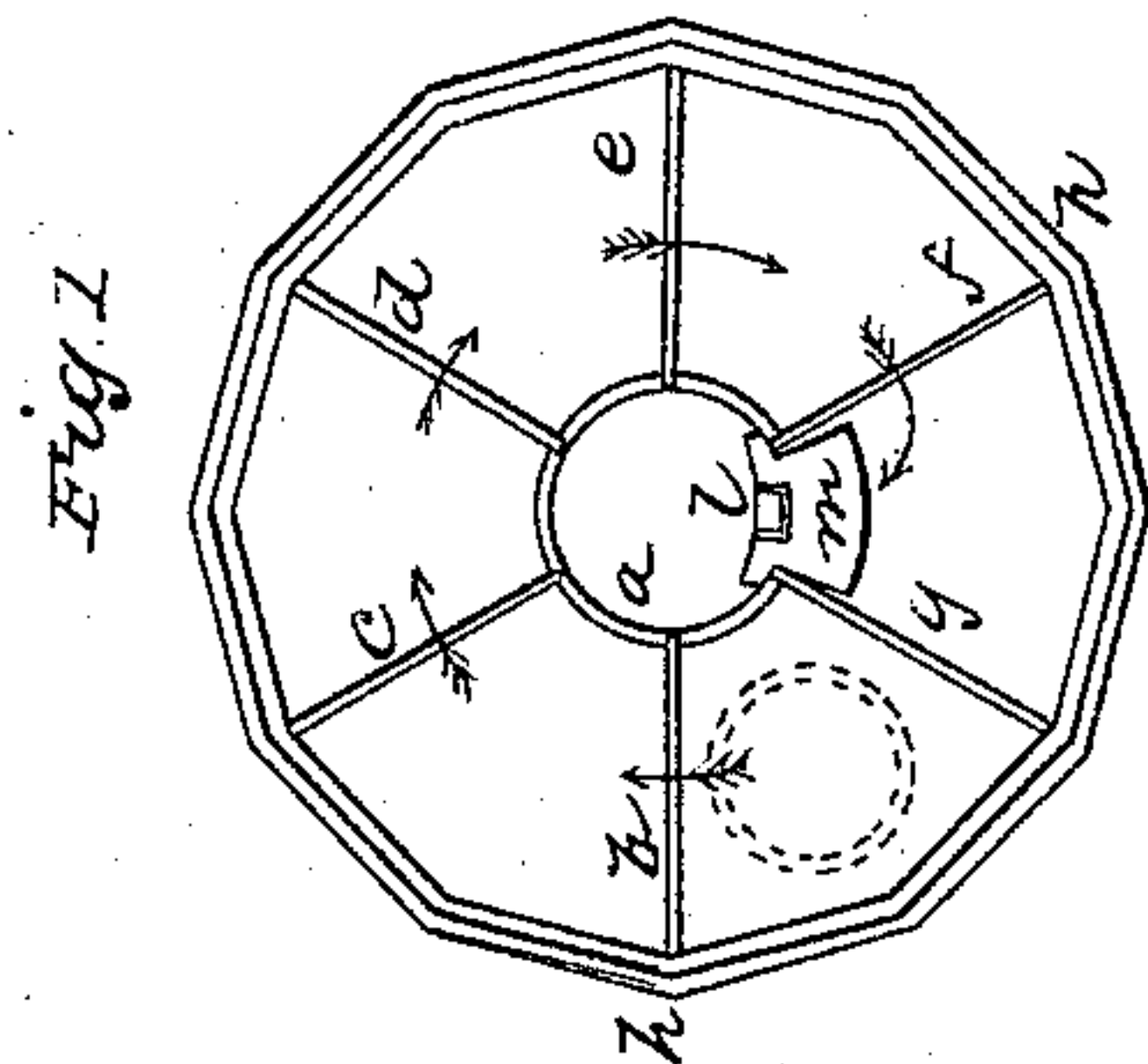
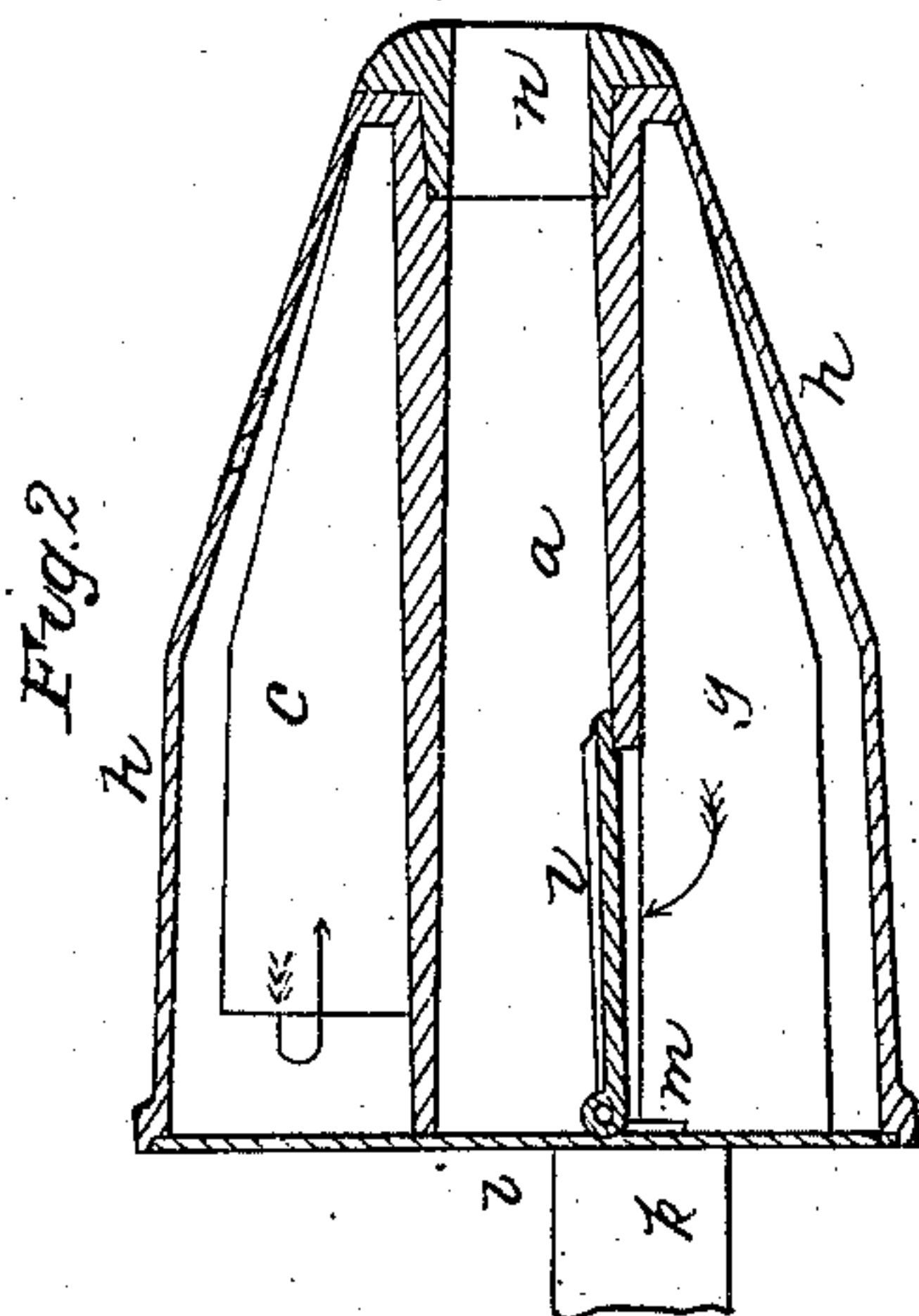
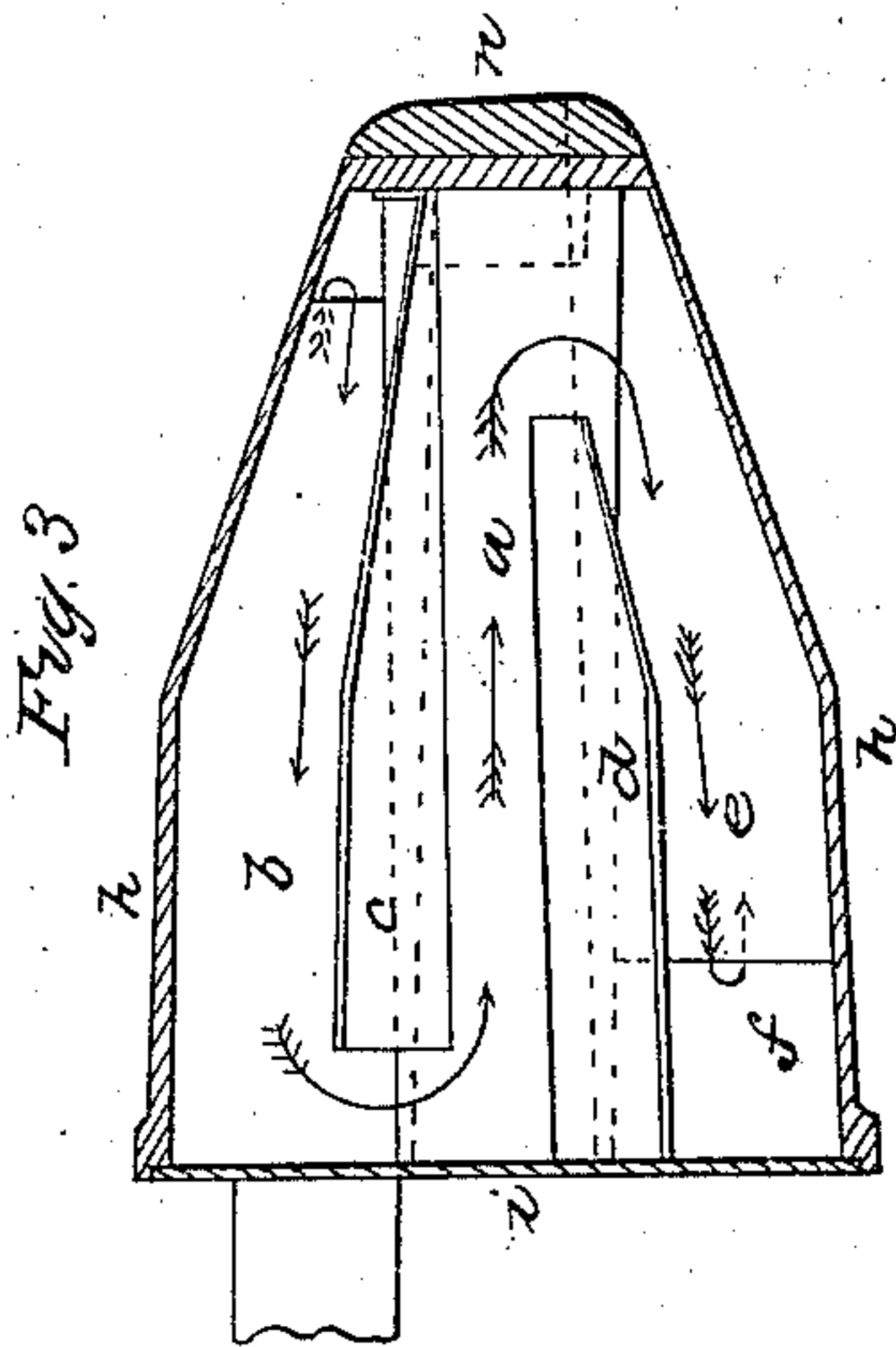


SINNOTT & McINTYRE.

Tuyere.

No. 58,145.

Patented Sept. 18, 1866.



Witnesses
Geo. M. Allen
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UNITED STATES PATENT OFFICE.

THOMAS SINNOTT, OF BROOKLYN, AND JAMES MCINTYRE, OF NEW YORK, N. Y.

IMPROVEMENT IN TUYERES.

Specification forming part of Letters Patent No. 58,145, dated September 18, 1866.

To all whom it may concern:

Be it known that we, THOMAS SINNOTT, of Brooklyn, in the county of Kings and State of New York, and JAMES MCINTYRE, of the city and State of New York, have invented, made, and applied to use a certain new and useful Improvement in Tuyeres; and we do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a rear elevation of the tuyere, the inclosing-plate or cover being removed. Fig. 2 is a vertical longitudinal section of said tuyere; and Fig. 3 is a plan representing the wings that surround the blast-pipe, the casing being removed or in section.

Similar marks of reference denote the same parts.

Tuyeres have heretofore been made hollow, having in view the heating of the blast previous to its entry into the fire. These devices, however, are not fully operative, either in heating the air or in keeping the tuyere cool; and in some cases explosions have occurred in the blast-pipe in consequence of gases from the fire drawing back into such pipe when the blast is stopped or shut off. This has particularly been the case where the blast-pipe descends to the tuyere.

The nature of our said invention consists in a series of radial wings in the blast-chamber, which cause the blast to travel back and forth in passing around and then into the central pipe leading to the fire. By this means the air becomes highly heated in consequence of traveling through the tuyere a considerable distance, and we make use of a valve introduced in the blast-pipe in such a manner as to prevent gases passing back into the blast-pipes when the blast is shut off. We also make use of a movable nozzle at the end of the blast-pipe, which may be replaced if burned out or injured.

In the drawings, *a* is a central blast-pipe, around which radial wings *b*, *c*, *d*, *e*, *f*, and *g* are placed, and outside of these is the surrounding case *h*, which, for convenience, is tapered toward one end, and is fitted at the other end with the end or cap plate *i*, in which is an

opening receiving the pipe *k*, that conveys the blast to the tuyere.

The blast enters from the pipe *k* into the space between the wings *b* and *g*, travels toward the point of the tuyere, thence through an opening formed by stopping the wing *b* short of the front end; thence the blast travels back between *b* and *c* and through the opening left by stopping the wing *c* short of the cap-plate *i*, and thence travels forward again between *c* and *d*, and so on back and forth any desired number of times, according to the number of wings or partitions, and finally passes from the space between *f* and *g* into the blast-pipe *a*, and thence to the fire. This mode, in which the air is caused to travel backward and forward, is illustrated by the arrows, and represented most clearly in Fig. 3.

As the air thus travels in the tuyere it becomes highly heated, and much better adapted to promote combustion than a cold or partly-heated blast, and the tuyere is prevented from becoming so highly heated as usual; and, in order that the heat may be conducted from the nose of the tuyere and aid in more fully heating the air, we make the wings, casing, and blast-pipe of one casting.

The spaces left at the ends of the respective wings should be larger at *c* than at *b*, and so on, to allow the expanded air to pass freely.

To prevent gases drawing back from the fire into the blast-pipe, we apply a valve, *l*, of light metal, hinged to a block, *m*, that is formed tapering, as seen in Fig. 1, so as to sit between the divisions *f* and *g* and be held in place by them and the cap-plate *i*. This valve is very easily constructed, is not liable to get out of repair, and can be easily replaced.

n is a movable nozzle fitted at the end of *a*, which, coming in contact with the fire, will be burned out the most quickly. It is made with a tapering pipe sitting within *a*, and can be taken out and replaced with facility.

This movable nozzle *n* also allows for the variation of the size of aperture for the escape of air, as one nozzle may be substituted for another with facility without disturbing the tuyere.

What we claim, and desire to secure by Letters Patent, is—

1. A series of wings or divisions around the blast-pipe, with openings at alternate opposite ends, to cause the air or blast to travel back and forth within the tuyere, for the purposes and as set forth.

2. The valve *l*, attached to the block *m*, in combination with the blast-pipe *a*, for the purposes set forth.

3. The movable nozzle *n*, in combination with the tuyere, as and for the purposes specified.

In witness whereof we have hereunto set our signatures this 12th day of October, A. D. 1865.

THOS. SINNOTT.
J. MCINTYRE.

Witnesses:

GEO. D. WALKER,
CHAS. H. SMITH.