B. Fish,

Tuyere,

No. 58,238. Patented Sep. 25, 1866.

Fig: 2.

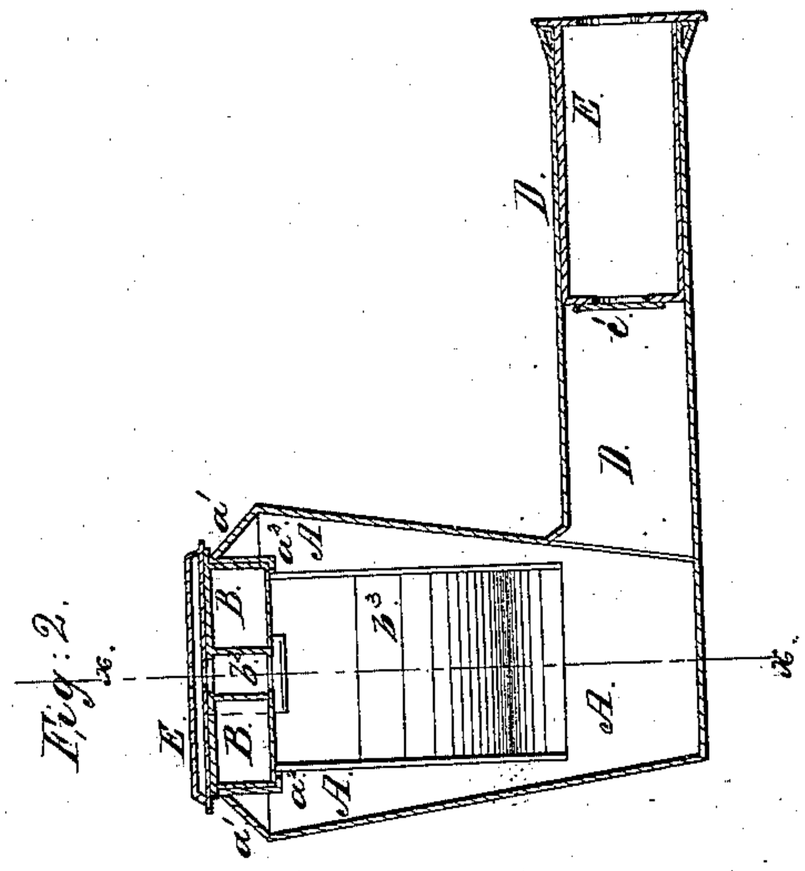


Fig: 3.

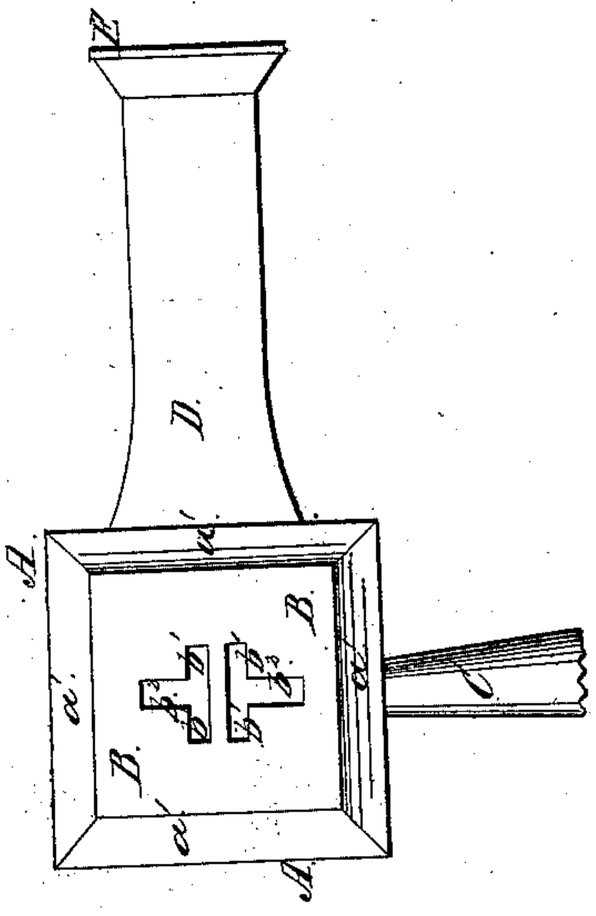
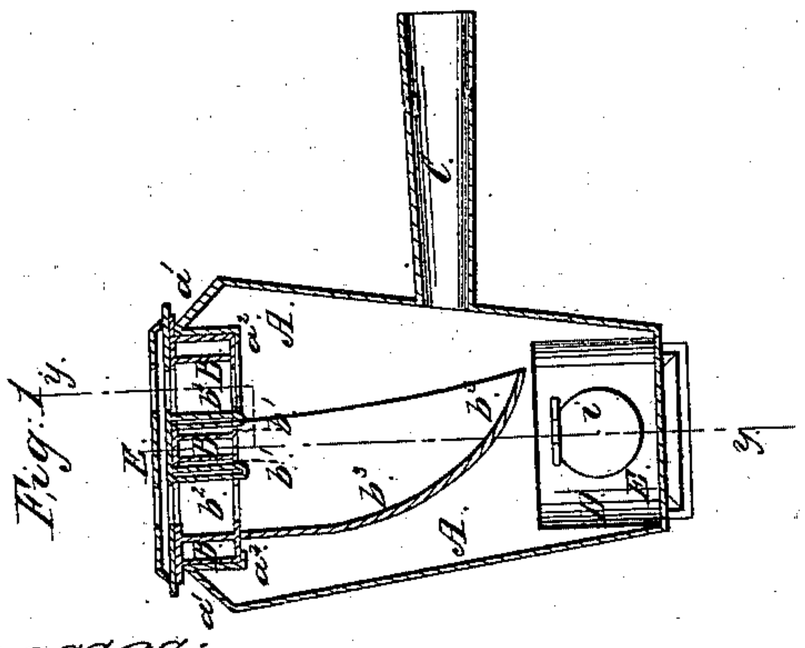


Fig: 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

BENJAMIN FISH, OF MECHANICSBURG, PENNSYLVANIA.

IMPROVEMENT IN TUYERES.

Specification forming part of Letters Patent No. **58,238**, dated September 25, 1866.

To all whom it may concern:

Be it known that I, BENJAMIN FISH, of Mechanicsburg, in the county of Cumberland and State of Pennsylvania, have invented a new and useful Improvement in Tuyere-Irons; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those 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 vertical section of my improved tuyere, taken through the line *x x*, Fig. 2. Fig. 2 is a vertical section of the same, taken through the line *y y*, Fig. 1. Fig. 3 is a top view of the same, the cap being removed.

Similar letters of reference indicate corresponding parts.

My invention has for its object to furnish an improved tuyere for blacksmith's use, by means of which the size of the fire may be regulated according to the requirements of the work, to which the cinders will not adhere, and which will not leak; and it consists, first, in the grate and tongue or spout, constructed and arranged as hereinafter described, in combination with each other and with the air-chamber of the tuyere; second, in the cap, constructed as hereinafter described, in combination with the grate, for the purpose of diminishing the extent of the fire; third, in the combination of the stopper, constructed and arranged as hereinafter described with the dirt-flue.

A is the air-chamber, which is made of cast-iron, is thirteen inches in height, eight inches square at its top, and six inches square at its bottom. The top a' of the air-chamber A is beveled or drawn in, and has an inwardly-projecting flange, a^2, for the bottom of the grate B to rest upon, as shown in Figs. 1 and 2. The thickness of this is five-sixteenths of an inch, except the beveled top, which is one and one-eighth inch thick.

C is the blast-pipe, which is cast solid with the air-chamber A, is eleven inches in length and one-fourth of an inch in thickness. This pipe C is made tapering, its interior diameter at the outer end being one and three-fourth inch, and at the inner end one and one-fourth inch.

The dirt-flue D is made of cast metal, is of the same width at its inner end as the width of the lower end of the air-chamber A, and tapers to a square at its outer end, the interior diameter of which is one and three-fourth inch.

E is a stopper, made so as to fit into the mouth of the flue D, as shown in Fig. 2. The stopper E should fit air-tight into the flue D, and for this purpose packing or an elastic washer may be used at its head. The stopper E is four inches long, and has a hole through it one inch in diameter, closed at the inner end by a valve, e'.

When the bellows is in operation, the air within the air-chamber A keeps the valve e' tightly closed; but when the bellows is not in operation, the natural draft of the fire tends to form a vacuum within the air-chamber A. The air, pressing inward to fill this vacuum, opens the valve e', and thus allows enough cold air to pass in to keep the grate B cool and prevent the adherence of clinkers.

The grate B is four inches square, is one and one-eighth inch thick, and is firmly cemented at the top, so as to prevent leakage. The grate B is slotted for the passage of the air, the parts b' of the slots being one and one-fourth inch long, and one-fourth of an inch wide, and the parts b^2 five-eighths of an inch long and one-fourth of an inch wide.

For laying the steel on plowshares, and for long straight work that requires long heats, I replace the grate B with one having a slot extending two-thirds the entire length of the said grate, but similar in all other respects to the one, B, already described. Upon the lower part of the grate B is formed a tongue or spout, b^3, extending down a little below the mouth of the pipe C. The bottom of this spout, or its side opposite the pipe C, is curved, as shown in Fig. 1, so as to receive the blast from the said pipe C, and guide it up to the slots b' and b^2. But the other two sides are vertical, as shown.

A space is left between the lower end of the spout b^3 and the side wall of the air-chamber A, so that the dirt and cinders that fall through the slots in the grate B may pass down unobstructed to the lower part of the air-chamber A, and be removed through the dirt-flue D.

E is a cap, which is made to fit closely upon

the top of the grate B. This cap is four and a fourth inches square and half an inch thick. The cap E is slotted to correspond with the slots b^2 through the grate B, and is provided with two downwardly-projecting tongues which fit into the slots b' of the grate B, and tightly close them. By the use of this cap the size of the fire is contracted two-thirds.

I claim as new and desire to secure by Letters Patent—

1. The tongued grate B, constructed and arranged as herein described, in combination with the air-chamber A of the tuyere, substantially as and for the purpose set forth.

2. The cap E, constructed as herein described, in combination with the grate B, substantially as and for the purpose set forth.

BENJAMIN FISH.

Witnesses:
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