E. Harris,

Tuyere,

No. 6,027. Patented Jan. 9, 1849.

Fig. 5.

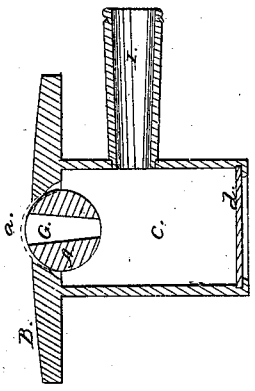


Fig. 4.

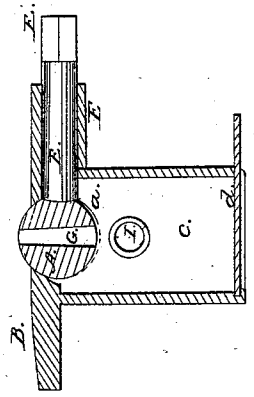


Fig. 3.

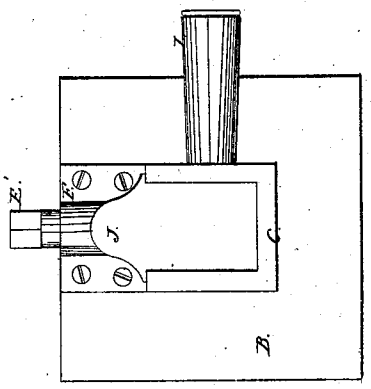


Fig. 2.

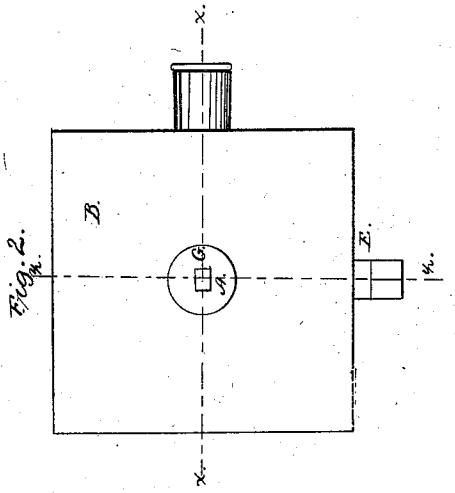


Fig. 7.

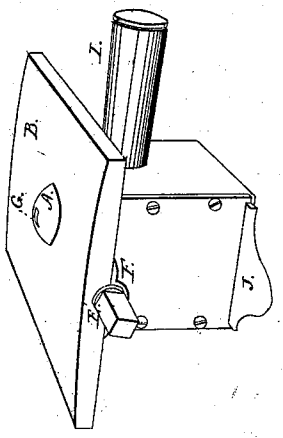
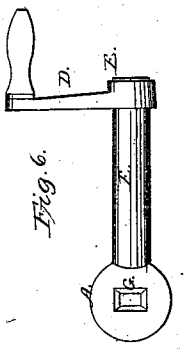


Fig. 6.



UNITED STATES PATENT OFFICE.

EPHRAIM HARRIS, OF SPRINGFIELD, MASSACHUSETTS.

ROTARY BLACKSMITH'S TWYER.

Specification of Letters Patent No. 6,027, dated January 9, 1849.

To all whom it may concern:

Be it known that I, EPHRAIM HARRIS, of Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Twyer for Blacksmiths' Forges, called the "Blacksmith's Globular Twyer-Iron and Fire-Regulator," which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1, is a perspective view of the twyer iron detached from the forge. Fig. 2, is a plan or top view of the same. Fig. 3, is a view of the same inverted. Fig. 4, is a vertical section on the line *z*, *z*, of Fig. 2. Fig. 5, is a vertical section on the line *x x* of Fig. 2. Fig. 6 is a plan of the globular twyer iron and handle connected.

Similar letters refer to like parts in the several figures.

The nature of my invention and improvement consists in the employment of a perforated ball A in combination with a convex socketed hearth plate B and flanged air chamber C for regulating the fires of blacksmiths' forges by increasing or diminishing the quantity of air admitted to the fire by simply turning the ball in its socket, which is effected by means of a handle D (Fig. 6) applied to a rotary shaft E projected horizontally from the convex surface of the ball and forming part of it, a suitable box or bearing F being attached to the hearth plate or top of the air chamber in which the shaft E turns; said improvement also preventing the accumulation of cinder over and around the aperture at which the air is admitted, the whole arrangement being an improvement on Lanbach's patented twyer.

The outer surface of the ball A is everywhere equi-distant from its center, except a portion of its surface around the larger end of a conical or pyramidal opening G that passes through the center of the ball at right angles to the axis of the horizontal shaft E on which it turns—this portion or segment of the surface of the ball (represented at *a* in Figs. 4 and 5) being nearer the center than the remaining segment through which the small end of the opening passes, being thus shaped or made oblate at one of its poles for the purpose of forming a circular opening or space around the larger end of the pyramidal or conical opening when it is brought uppermost as seen in Fig. 5 and next the fire, when a large fire is required. A round shaft is cast on the convex surface of said ball of sufficient length to extend through the box F (attached to the underside of the convex hearth plate which forms the flange of the air chamber) having its outer end E′ made square to receive the wrench or handle by which it is turned. The aperture for the admission of the air that passes through the ball at right angles to the shaft may be made of any required form to answer the intended purpose. A tapered form, however, answers best as this form will admit a large or small quantity of air by simply turning the ball one revolution on its axis. The spherical portion of the ball is fitted into a socket formed in the center of the hearth plate, which also forms the top plate of the ordinary air box of the common twyer; which socket is a round hole of less diameter than the ball through which a segment of the ball will protrude. The tube I to receive the nozzle of the bellows is inserted into the side of the air chamber in the usual manner.

The bottom of the air chamber is provided with the usual sliding door J to let out any cinders that may chance to fall into the said chamber through the opening in the ball and to admit air for reducing the temperature of the hearth plate and ball when the bellows is not in action.

The upper surface of the hearth plate is made convex instead of concave by which the twyer iron is not so liable to become choked and the hearth is more easily kept free from an accumulation of cinder.

By making a segment of the ball to turn in the aperture in the apex of the hearth plate and above the level of the same not only can the admission of the air to the fire be regulated with the utmost nicety but the fire can be agitated without the use of a poker.

The spaces between the sides of Lanbach's rotating prism and the interior surface of the air cylinder is liable to become choked to such extent as to prevent the turning of the prismatic agitator and to stop the passage of the air from the cylinder to the fire.

By turning the ball so as to bring the small end of the aperture to a vertical position the air will ascend vertically. If the ball be turned a few degrees the air will

issue in an oblique direction. By turning it until the aperture is crossed by the inner edge of the convex hearth plate the stream of air will be reduced. By turning it still farther the entrance of the air will be stopped entirely. The ball being truend until the large end of the aperture is uppermost, the air will be admitted to the fire in a central vertical column combined with a thin circular column the two columns uniting and forming a large column adapted for large fires.

To regulate the fire to any degree required it is only necessary to turn the ball which will alter the position of the aperture in relation to the hearth plate which becomes the cut off.

I do not claim the invention of a revolving or vibrating hearth for blacksmiths' forges, as these have been made and used, but,

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

The employment of a revolving perforated spheroid oblate at one of its poles—as a rotary central bottom for blacksmiths' forges, in combination with the convex hearth and attached air chamber, constructed, arranged, and operated substantially in the manner and for the purpose herein set forth performing the combined office of a fire regulator and coal agitator.

In testimony whereof I have hereunto signed my name before two subscribing witnesses.

EPHRAIM HARRIS.

Witnesses:
O. A. SEAMANS,
JOHN F. COMSTOCK.