(No Model.)

F. B. NORTON.

METHOD OF AND APPLIANCES FOR BURNING SOLID EMERY WHEELS.

No. 260,890. Patented July 11, 1882.

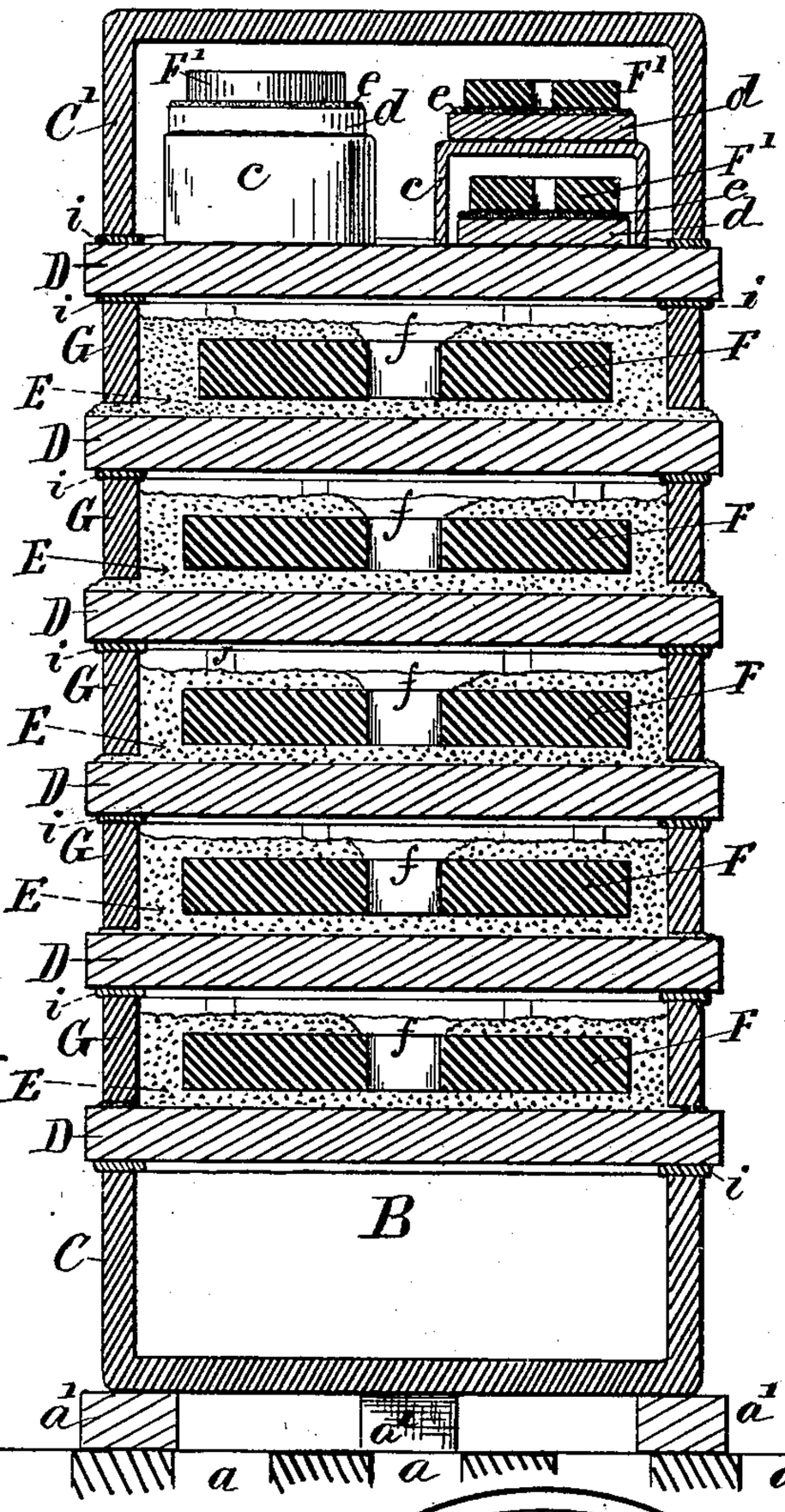
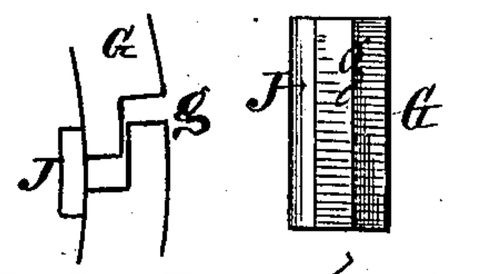


FIG. 1.



FIGS. 5, 6 and 7

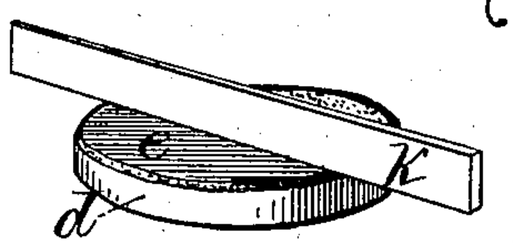


FIG. 8.

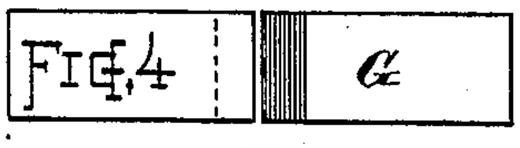


FIG. 4

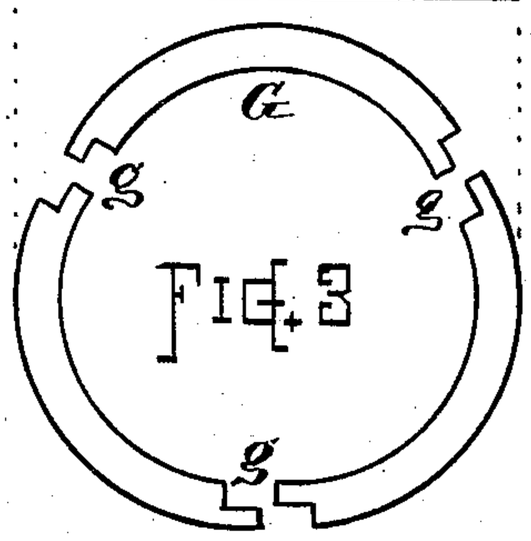


FIG. 3

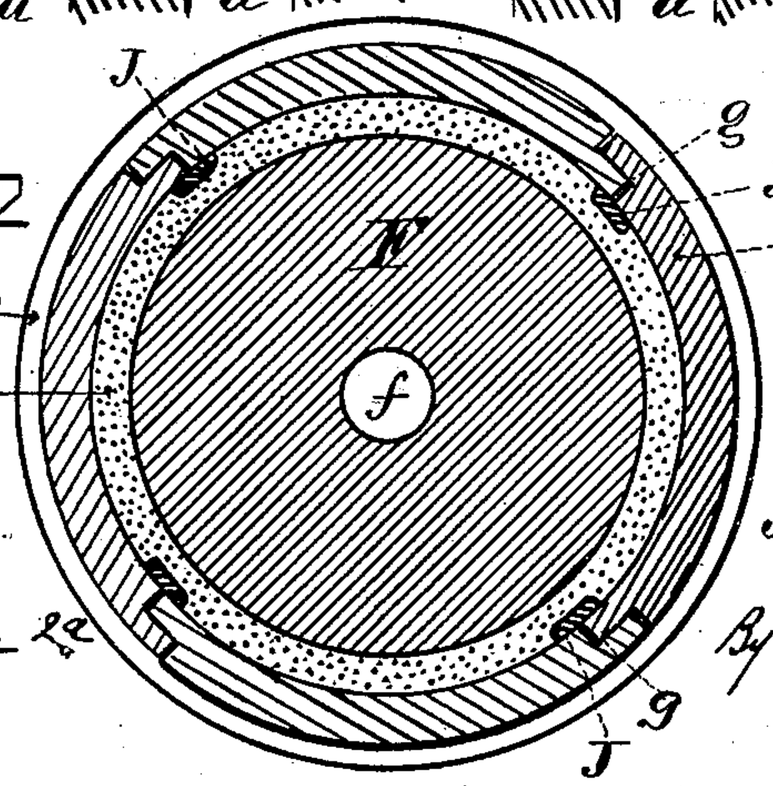


FIG. 2

WITNESSES—

Walter B. Allen.

Geo. M. Rice 2d

INVENTOR—

Franklin B. Norton

By Chas. H. Burleigh

Atty.

UNITED STATES PATENT OFFICE.

FRANKLIN B. NORTON, OF WORCESTER, MASSACHUSETTS.

METHOD OF AND APPLIANCES FOR BURNING SOLID EMERY-WHEELS.

SPECIFICATION forming part of Letters Patent No. 260,890, dated July 11, 1882.

Application filed April 26, 1882. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN B. NORTON, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in the Method of and Appliances for Burning Solid Emery-Wheels; and I declare the following to be a description of my said invention sufficiently full, clear, and exact to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My present invention relates to certain improvements in the method of baking or burning solid emery-wheels, and to certain improved devices employed in the burning operation, the object being to render the process more convenient and more certain in its results; to produce wheels of uniform grade and of equal texture, strength, and quality throughout, also to permit free expansion of the wheels while undergoing the burning operation; to avoid warping or twisting of the wheels by unequal pressures or overheating, and to prevent injury from direct fire contact at any particular point on the wheel. These objects I attain by the process and means such as hereinafter described, the particular subject-matter claimed being definitely specified.

In the drawings, Figure 1 represents a vertical central section through a "stand" of wheels, as arranged in accordance with my invention, ready for burning within the kiln. Fig. 2 represents a horizontal section of the same. Fig. 3 is a plan view of a sectional ring for surrounding the wheel in the stand. Fig. 4 is a side view of the sectional ring. Figs. 5 and 6 are detail views of the ring-joint, and Figs. 7 and 8 represent views of the tile or "bat" employed for supporting the small wheels, showing the manner of forming the surface or bed for the wheel to rest upon.

In my process of burning solid emery-wheels an ordinary pottery-kiln is employed, the wheels being arranged therein in piles or stands, such as herein shown and described, and the firing of the kiln being conducted substantially in the same manner as for burning stoneware or other pottery.

The essential features of my invention comprise the manner in which the stands of wheels are built up and the arrangement of the wheels therein; also the appliances for forming the stands and supporting the wheels during the process of burning.

In the reference, A denotes the floor or hearth of the kiln, with fire-openings *a* from the furnaces beneath.

B indicates the stand, which is built up in the following manner: A sagger, C, is supported at a few inches' height from the floor A by pieces of brick *a'*. Upon the top of this sagger C is placed a circular tile, D, of refractory brick material, and some three inches (more or less) in thickness. This tile D is covered to the depth of about one inch (more or less) with loose comminuted quartz or quartz-sand E, the top surface whereof is, by the aid of a suitable instrument, leveled off perfectly true and even to form a supporting-bed for the emery-wheel F, which is laid thereon at a central position, as shown, said wheel having been previously molded, dried, and dressed to the proper shape and size required. A ring, G, of refractory brick material, having an inner diameter some two to four inches (more or less) greater than the diameter of the wheel F, is then placed around the periphery, resting on the outer edge of the tile D and extending above the top level of the wheel to about one-half its height. Said rings G are formed in sections with overlapping joints, as at *g*, which can slide against each other to permit expansion of the circle without separating the parts. When the ring-sections have been placed in position bars J, of potters' clay, are placed on the inner side of the ring G to cover the joints *g*, and the intervening space between the ring G and wheel F is filled in with loose quartz-sand or comminuted material, such sand being also filled in upon the top surface of the wheel to a depth of one inch, more or less, thereby covering or burying it entirely, with the exception of the central eye, *f*, which is left open in the manner illustrated.

A flat or luting of clay, *i*, is then laid around the top edge of the ring G, and a second tile, D, is laid thereon, the ring G being of sufficient height to leave some inch or two of vacant space between the top of the sand E, which covers the wheel F, and the bottom of the tile

D above it. Several courses of wheels are in like manner arranged one above another until the stand has reached the desired height, each wheel F being laid upon a level bed of quartz-sand, independently supported by a tile, D, and surrounded by a sectional ring, G, the periphery of the wheels being buried in quartz-sand in the manner illustrated.

The several joints between the tiles and ring are protected by clay flats *i* and bars J, so that fire cannot work in through said joints to impinge on any part of the wheels, which are completely inclosed within a refractory casing away from direct action of the flames. Upon the top of the stand I burn the smaller wheels F′, which I arrange as follows: A small tile or bat, *d*, is leveled off with a surfacing of loose quartz-sand, *e*, by heaping it with such sand, and then passing a straight-edge, *k*, across it, as indicated in Fig. 8, taking off the surplus and leaving a true plane surface, upon which the wheel F′ is laid. Several of these small bats *d* and wheels F′ are placed upon the upper large tile, D, each one being covered by a small sagger, *c*, as indicated, and upon each of these small saggers another bat and wheel is placed. The whole of these small wheels F′ are then covered by a large sagger, C′, in an inverted position, and resting on a flat of clay beneath its edge. The stand is then complete, ready for the firing operation.

The rings G may be made in three, four, or any convenient number of sections desired. These sections, with their lapped joints, permit of the easy expansion of the wheels when heated, without subjecting them to great or unequal pressure, while they confine the loose quartz-sand and prevent it from working away from the wheel, and permitting the fire to impinge directly against the wheel at any portion of it. The clay bars J protect the opening and prevent the exit of sand in case the sections separate at the joints *g*.

The tiles D support the respective wheels independently of each other, and give a firm level bed for each wheel to rest upon, so that said wheels are not liable to become warped, while the mass of sand E serves to insure an equal distribution of heat to all parts of the wheel, giving uniformity of action and preventing overburning any portion thereof, thus effecting the production of a superior class of wheels and rendering the operation of successfully burning large-sized wheels comparatively safe, inexpensive, and easy.

The stand may comprise any desired or convenient number of wheels, either more or less than here shown, according to the requirements of the kiln or number of wheels to be made, and the rings G and tiles D may be made to conform to the respective regular sizes of wheels manufactured.

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

1. The improvement in the art of burning solid emery-wheels, which consists in supporting the wheel by a level bed of quartz-sand upon a tile, enveloping its periphery in such sand, and subjecting it to the kiln-fires within a close protecting casing, substantially as hereinbefore set forth.

2. In an apparatus for burning solid emery-wheels, the rings G for surrounding and protecting the wheels within the kiln, provided with overlapping joints *g*, adapted for permitting expansion of the ring and contents, substantially as hereinbefore set forth.

3. The tile or bat of refractory brick material, provided with a leveled surfacing of loose quartz sand, employed as a bed for solid emery-wheels during the process of firing or burning, as set forth.

4. The combination, in an apparatus for burning emery-wheels, of the tiles D, the sectional rings G, and the quartz-sand filling E, as hereinbefore set forth.

5. The method of forming kiln-stands for the burning of solid emery-wheels hereinbefore described—viz., with the saggers C, tiles D, sectional rings G, clay flats *i*, and comminuted-quartz filling E, arranged in the manner shown, and embracing the wheels, substantially as set forth.

6. The combination, with the sectional ring G and comminuted filling material E, of the clay joint-bars J, as and for the purpose set forth.

Witness my hand this 19th day of April, A. D. 1882.

FRANKLIN B. NORTON.

Witnesses:
CHAS. H. BURLEIGH,
JOHN HOWES.