(No Model.) 3 Sheets—Sheet 1.

D. O. PAIGE.

ENAMELING OVEN OR KILN.

No. 457,821. Patented Aug. 18, 1891.

Fig. 1.

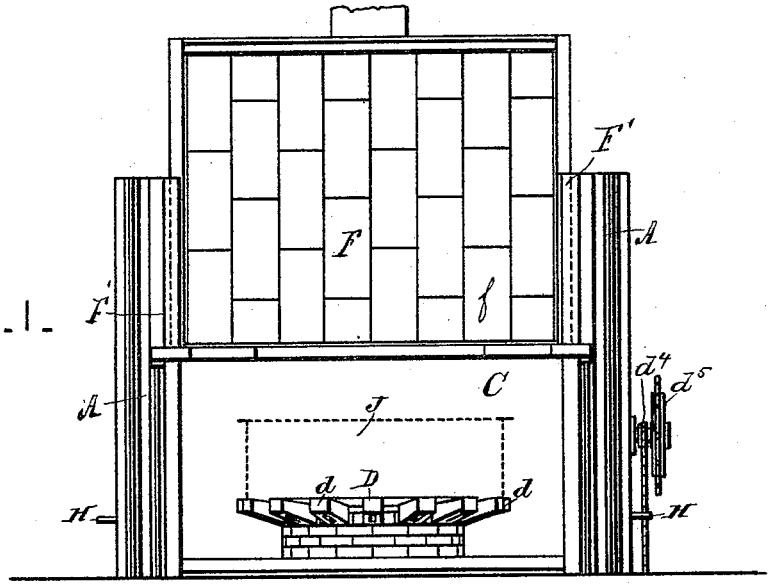

Fig. 2.

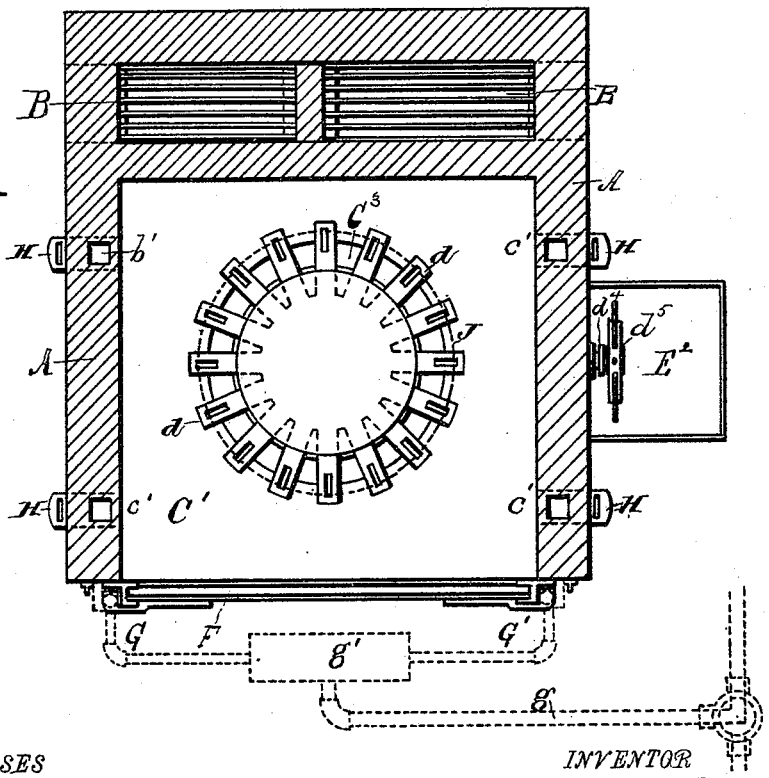

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Fig. 3.

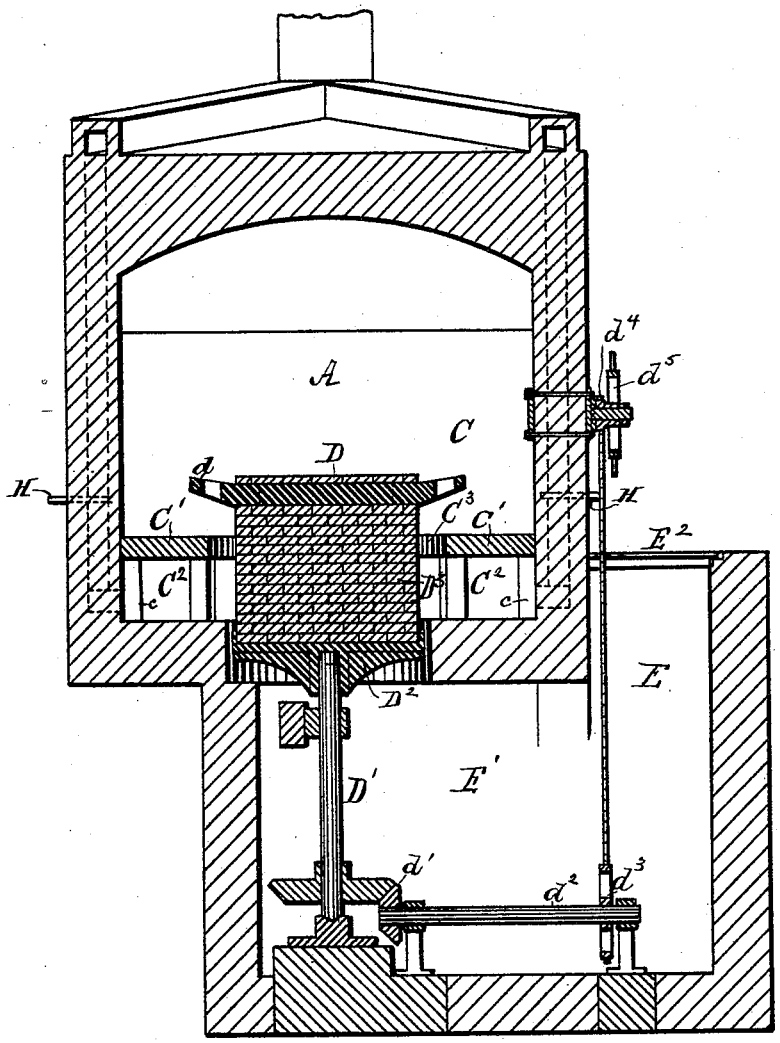

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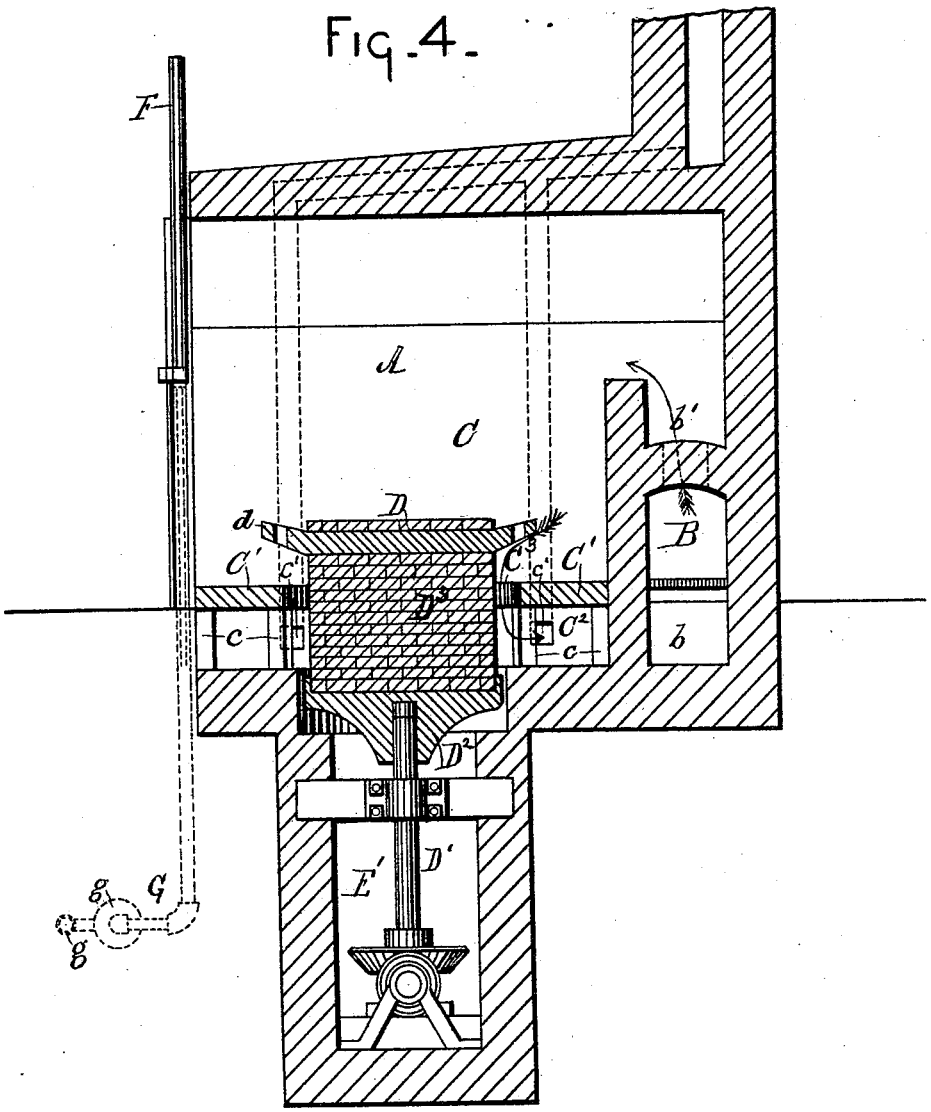
Fig. 4.



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UNITED STATES PATENT OFFICE.

DAVID O. PAIGE, OF DETROIT, MICHIGAN.

ENAMELING OVEN OR KILN.

SPECIFICATION forming part of Letters Patent No. 457,821, dated August 18, 1891.

Application filed September 11, 1889. Serial No. 323,661. (No model.)

To all whom it may concern:

Be it known that I, DAVID O. PAIGE, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Heating and Enameling Ovens; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

In the drawings, Figure 1 is a view in elevation of an oven with the door open and embodying my invention. Fig. 2 is a horizontal section of the same. Fig. 3 represents a section by a central vertical plane passed from side to side. Fig. 4 is a similar section by a plane passed from front to rear.

It is the purpose of my invention to produce an oven designed more especially for enameling articles by heat, but of equal value wherever it is desirable to subject articles, and especially a large article, to a uniformly-distributed heat throughout its entire extent.

My invention has for its more particular object an oven designed for enameling large cylindrical rings of metal, such as are employed in the manufacture of porcelain-lined sectional steel casks for use in the manufacture of vacuum-beer and for other purposes.

My invention consists, essentially, in the oven as shown, in which there is a central support with arms for sustaining the ring or cylinder to be heated, said support connected with a vertical shaft, and means exterior to the walls, whereby it may be rotated at any desired speed and so bring every part of the ring or cylinder into like conditions as to heat. The oven proper is provided with inlet-flues for the admission of heat from the furnace and with an annular exit-flue around said central support, whereby the heated products are brought into close relation with the ring or cylinder and caused to expand their heat directly thereon; also, in combination therewith of a sliding door and a double hydraulic lift for raising the same.

In carrying out my invention, A represents the body of my oven, which may be of any form, and its walls made up in any desired way, hollow or otherwise.

B B represent the furnaces for heating the oven proper. They are provided with the usual fuel and ash-pit doors *b*, leading to the exterior.

C is the oven proper.

b' represents draft-flues leading from the furnaces into the oven.

C' is the horizontal partition or floor provided with suitable supports *c* beneath, so as to leave under the floor a space C^2, and from this space exit-flues *c'* lead to the chimney or stack.

In the oven, and preferably, though not necessarily, at its center, is a spider D, with radiating arms *d*, designed to support a ring or cylinder to be heated and enameled. It is supported upon a central shaft D', and between the shaft and the spider I prefer to provide a supporting-platform D^2 and interposed fire-brick masonry D^3. The shaft is by suitable bevel-gears and counter-shafting *d' d²* engaged with a sprocket-wheel d^3. This in turn is connected by a chain with the pulley d^4, which is manipulated directly by a hand-wheel d^5, and so an operator on the outside may revolve the spider at any desired speed.

The mechanism for imparting motion to the spider from the exterior may of course be varied without departing from my invention. That shown is, however, very simple, and through the medium of the well or passage E E' all parts of the mechanism are accessible without cooling off or entering the chamber, and a door E^2 closes the passage-way, so as to shut off cool air that would otherwise enter from this source.

C^3 is an annular passage through the floor around the spider for the escape of the heated products, which are thus compelled to pass adjacent to the spider and so utilize the heat to the greatest extent in heating the ring or other object on the spider.

F is a door arranged to be lifted and to slide in ways and guides F'. It is provided with a filling of tiles *f* of fire-clay or other refractory material. It may be lifted by any convenient means; but I prefer to lift the same by two hydraulic lifts, one at each upright edge of the door. Such hydraulic lifts are indicated by the dotted lines in Figs. 2 and 4 at G G'. They are both fed from one pipe *g*, which leads to a pump or accumulator, the

water being brought into a common fitting or chamber g', from which it leads off independently to the two lifts G G'. I would have it understood that I do not in this patent lay any claim to the said door provided with two hydraulic lifts fed by a single pipe, for the same forms the subject-matter of another application by me for Letters Patent, filed September 11, 1889, Serial No. 323,660, where it is specially claimed.

The operation of this apparatus is as follows: The object to be heated or enameled, and for the purpose of this explanation I will presume it to be a cylindrical ring or cylinder, is placed by any suitable means upon the spider D, and preferably in such position that the throats between the arms shall form passage-ways for passage of the heated products down through as well as down around the outside of the ring. The door being then closed, an operator slowly rotates the spider, thus causing all parts of it to come under similar conditions as to heat and as a consequence the uniform heating of every part. This is of special value in enameling, as too great a heat at any point would cause the composition to melt and run or even burn before it would be properly vitrified at cooler points. When sufficiently heated, the door is opened through the medium of the hydraulic lifts and the ring or other object is removed. Should the heat require modulation at any time to a higher or a lower degree or should the draft at any time be capricious and follow certain lines to the disadvantage of other parts of the oven, check-dampers H are provided in the various flues, whereby the same may be properly manipulated.

In the drawings, a ring or cylinder such as I have mentioned is shown at J by dotted lines in Figs. 1 and 2.

What I claim is—

The herein-described apparatus for heating or enameling metallic rings or cylinders, &c., consisting of an oven having a floor provided with an opening, a rotary support projecting into the oven through said opening, which forms an annular space around said support for the passage of heated air, furnaces connected by flues with the space beneath the oven-floor, a chimney communicating with said space below the oven, means, substantially as described, for operating the rotary support from the exterior of the oven, and a well or passage through which the operating mechanism of the rotary support extends and by which it is accessible without cooling the oven, substantially as specified.

In testimony whereof I sign this specification in the presence of two witnesses.

DAVID O. PAIGE.

Witnesses:
C. J. SHIPLEY,
A. J. BENES.