(No Model.) 3 Sheets—Sheet 1.

G. HOTTINGER.

METHOD OF COLORING CLAY WARE.

No. 446,683. Patented Feb. 17, 1891.

Fig. 1

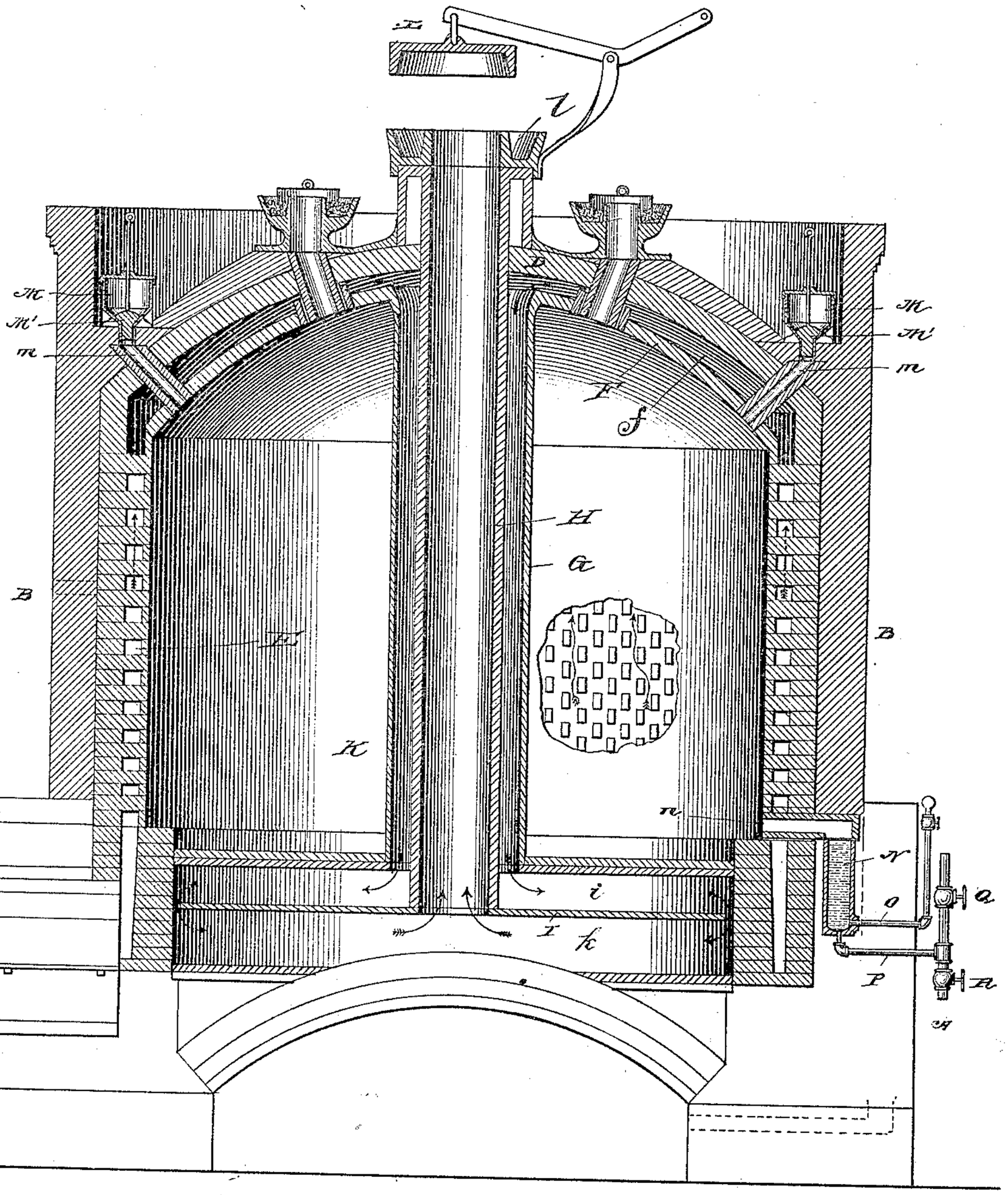

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Fig. 2.

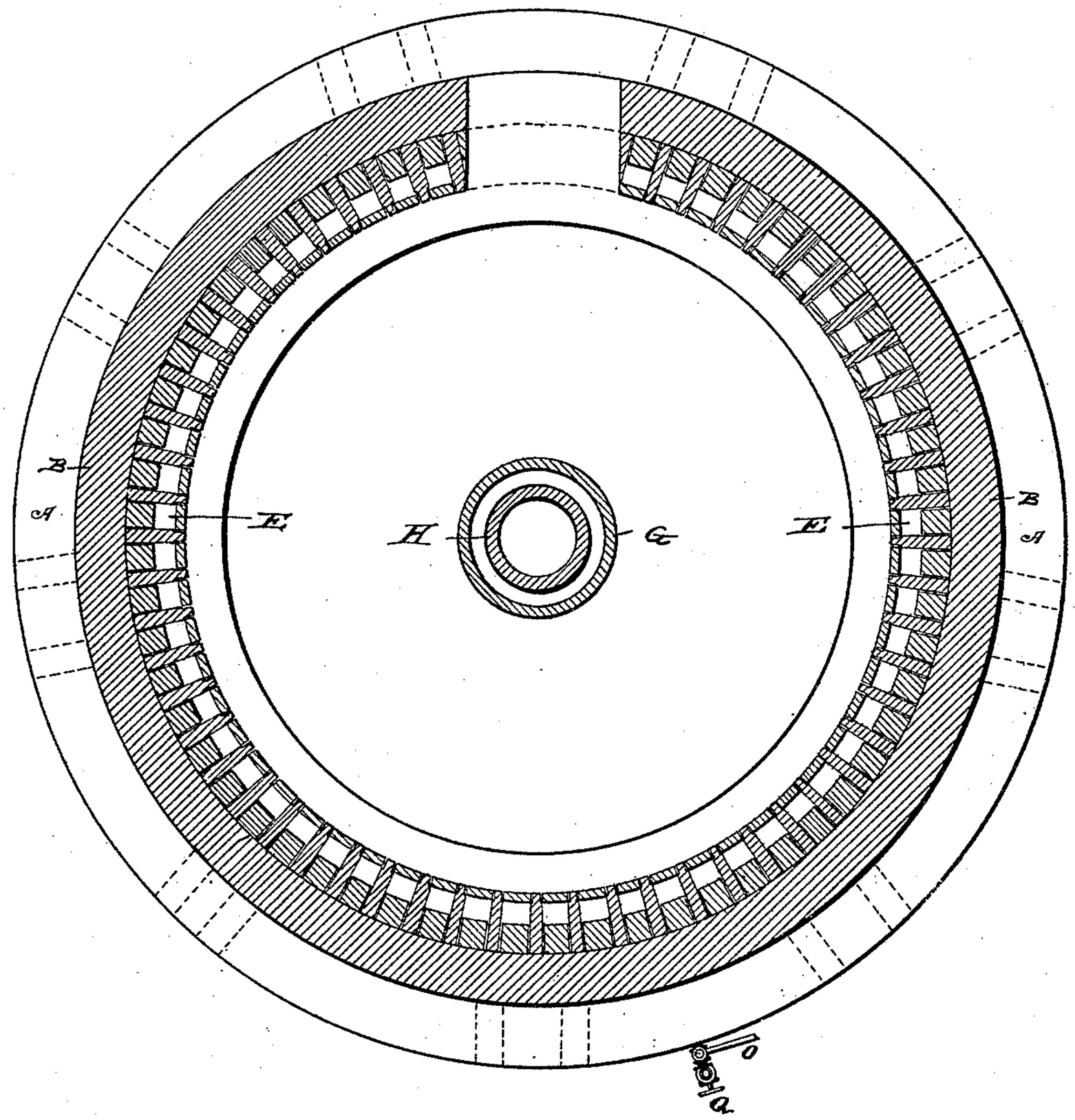

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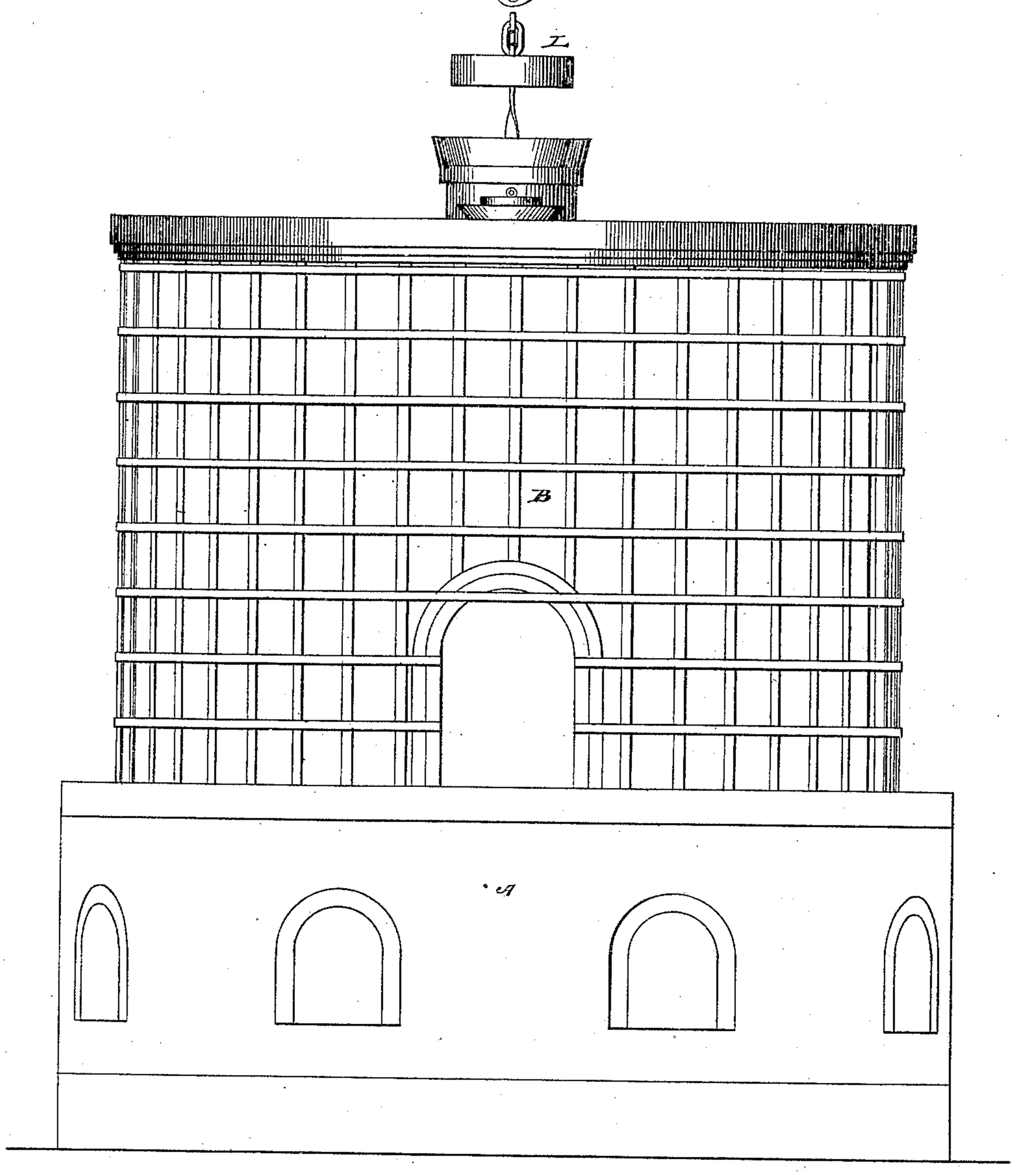
Fig. 3.



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UNITED STATES PATENT OFFICE.

GUSTAV HOTTINGER, OF CHICAGO, ILLINOIS.

METHOD OF COLORING CLAY-WARE.

SPECIFICATION forming part of Letters Patent No. 446,683, dated February 17, 1891.

Application filed September 2, 1890. Serial No. 363,770. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV HOTTINGER, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Methods of Tinting or Coloring Clay-Ware, of which the following is a specification.

My invention relates to tinting or coloring clay-ware, such as bricks, terra-cotta building material, &c.; and the invention consists in introducing into the kiln, preferably near the top thereof and adjacent to the side walls, a coloring or tinting agent, such as tar, and causing the same to spread over the side walls of the kiln, while steam is introduced into the kiln, preferably toward the bottom thereof and adjacent to the side walls, whereby the coloring ingredients of the tar or other agent are taken up by the moist atmosphere and distributed throughout the kiln, thus tinting or coloring the ware. This operation is performed, preferably, when the ware is nearing the finishing-point and while the kiln is yet hot enough to volatilize the liquid portions of the coloring agent, so as to secure a uniform diffusion thereof and a thorough impregnation of the wares therewith.

My invention consists, further, in certain novel means for introducing the coloring ingredient and moistening agent into the kiln.

In carrying out my invention, by preference I place the coloring material in an elevated reservoir at the top of the kiln and connect said reservoir by a valve-controlled passage with the interior of the kiln, the passage terminating near to the side walls thereof, so that the coloring agent, which will usually be in liquid form, will trickle down over the walls, and the moistening agent, preferably water, I introduce in the preferred construction into a chamber having a passage at the upper end thereof into the kiln and tap the bottom of the chamber by an overflow-pipe, whereby I am able to maintain a body of water in the chamber while excluding the outside air, and this water is converted into steam by the radiated heat from the walls of the kiln and the highly-heated atmosphere inside the kiln. The overflow-pipe also prevents the water from rising to the level of the passage and discharging into the kiln. To secure the best results, I also construct the kiln in a peculiar manner, the novelty consisting in causing the products of combustion used in firing to pass into the checker-work arranged inside the casing or external walls of the kiln, and thence through a passage formed by the arched top or dome and an internal arched wall to a vertical passage formed by the uptake-flue and an exterior annular lining, and thence through a horizontal passage formed by a shelf projecting outwardly from the bottom of the uptake, around the edges of which the products of combustion pass and finally escape through the uptake. The latter is provided with a hinged cover, which is adapted to be packed with wet sand. A thorough diffusion of the heat is thus secured, and consequently the ware is burned to the same degree of hardness throughout the kiln.

In the accompanying drawings, Figure 1 is a central vertical section of the kiln, some of the parts shown in elevation and a section of the interior wall broken away. Fig. 2 is a longitudinal sectional plan view below the line 2 2 of Fig. 1, and Fig. 3 is a side elevation.

In the drawings, A indicates the base of the kiln, in which are placed the fuel-doors covering muffles.

B is the casing, and D the arched dome or top.

E represents the checker-work through which the products of combustion pass, and F an arch to provide between its top and the dome D a passage *f* for the products of combustion to a vertical flue formed by the annular wall G and an uptake-flue H. At the bottom of the uptake is a horizontal shelf I, dividing the space beneath the bottom of the baking-chamber K into two horizontal flues *i k*, through which the products of combustion pass and escape through the uptake, the course being indicated by arrows in Fig. 1. The usual pivoted cover L is employed, and it has the annular seat *l*, adapted to be packed with sand.

At the top of the kiln and near the junction of the dome with the checker-work I locate reservoirs, one or more, which are marked M, having a valve M′ and a passage *m* leading from the valve-chamber to the interior of the kiln and terminating near the side walls. In this reservoir I place the coloring or tinting agent, which may be tar in a liquid form and

either in the distilled or crude state. By manipulating the valve the tar is allowed to trickle down on the side walls of the kiln.

N represents a water-chamber communicating by the passage *n* with the interior of the kiln, and in this chamber a body of water or other moistening agent will be contained. Water will be delivered to the bottom of this chamber through the valve-controlled pipe O, and an overflow-pipe P, having its discharge end situated slightly below the passage *n*, is tapped from the bottom of the chamber. The vertical portion of the overflow-pipe will be provided with the valves Q R, the former permitting the overflow to be regulated and the second the withdrawal of the water from the chamber. The water-chamber, with its accessories, will preferably be located in the same vertical plane as the reservoirs, and one or more may be employed.

When the ware has been subjected to the heat until such time as the burning is nearly completed, the valves will be manipulated to permit the coloring agent to pass into the kiln, and then the water being turned on it will be converted into steam, which will pass into the kiln, where it will become highly heated, owing to the temperature of the interior of the kiln, and at the same time the volatile portions of the coloring material will be released by the high temperature, and, combining with the moisture of the steam introduced, will permeate every portion of the kiln, passing through the interstices of the ware and into the pores thereof, thus giving to the ware an even tint, the shade imparted when tar is used as the coloring agent being a blue, bluish gray, or dark brown, according to the color of the clay employed and the mixtures used.

I do not of course limit my invention to the coloring agent above described, nor to the exact means of introducing and volatilizing the same, nor to the exact construction of the kiln, although I have found the best results to be attained with a kiln constructed as above described.

I claim—

1. The herein-described method of tinting or coloring clay-ware, which consists in introducing into the kiln after the burning of the ware is completed a coloring agent in a liquid form and in the presence of a moistened atmosphere.

2. In means for tinting or coloring clay-ware, the combination, with the kiln wherein the ware is burned or baked, of a reservoir to contain a liquid coloring agent and communicating by a valve-controlled passage with the interior of the kiln, and means for supplying steam to the interior of the kiln.

3. In means for tinting or coloring clay-ware, the combination, with the kiln wherein the ware is burned or baked, of one or more reservoirs located above the top of the kiln and communicating with the interior thereof by a valve-controlled passage whereby to discharge a liquid coloring agent into the kiln, and a water-chamber exterior to the kiln and communicating with the interior thereof by a passage leading from the top of the chamber, substantially as described.

4. In means for tinting or coloring clay-ware, the combination, with the kiln wherein the ware is burned or baked, of one or more reservoirs located above the top of the kiln and communicating with the interior thereof by a valve-controlled passage whereby to discharge a liquid coloring agent into the kiln, and a water-chamber exterior to the kiln and communicating with the interior by a passage leading from the top of the chamber, substantially as described.

GUSTAV HOTTINGER.

Witnesses:
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C. C. LINTHICUM.