

No. 743,538.

PATENTED NOV. 10, 1903.

W. MICHAËLIS, JR.
ROTARY KILN.

APPLICATION FILED APR. 13, 1903.

NO MODEL.

Fig. 1

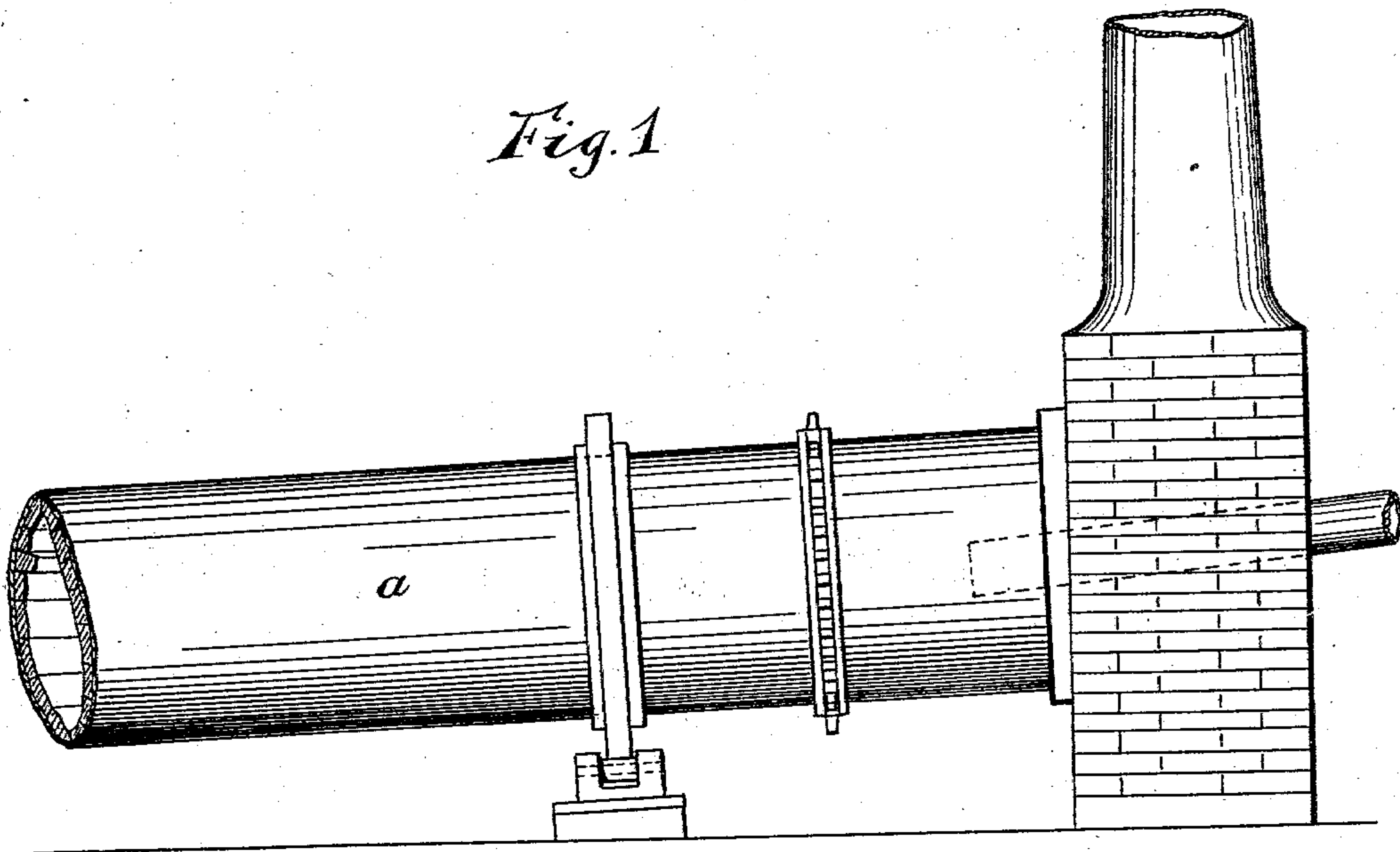


Fig. 3

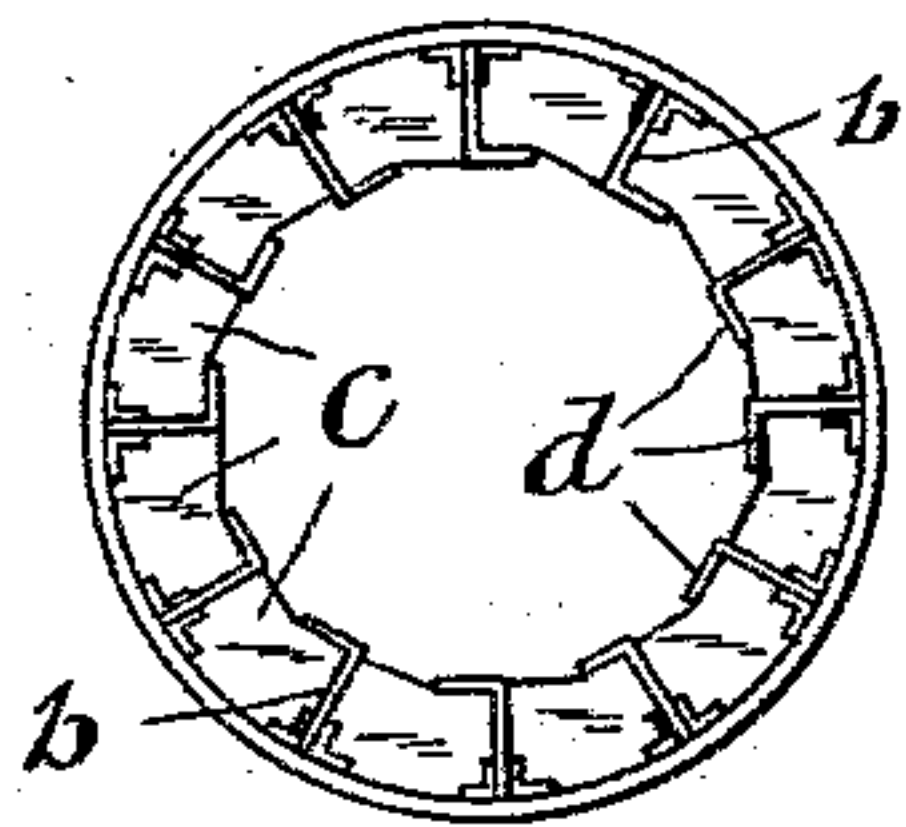


Fig. 2

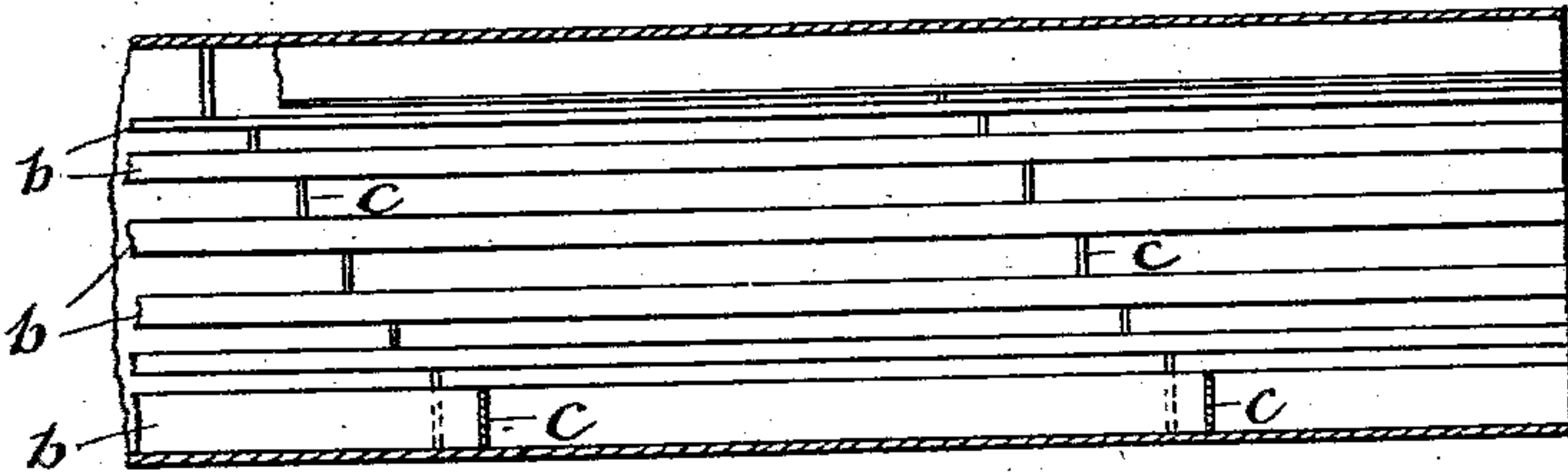


Fig. 4

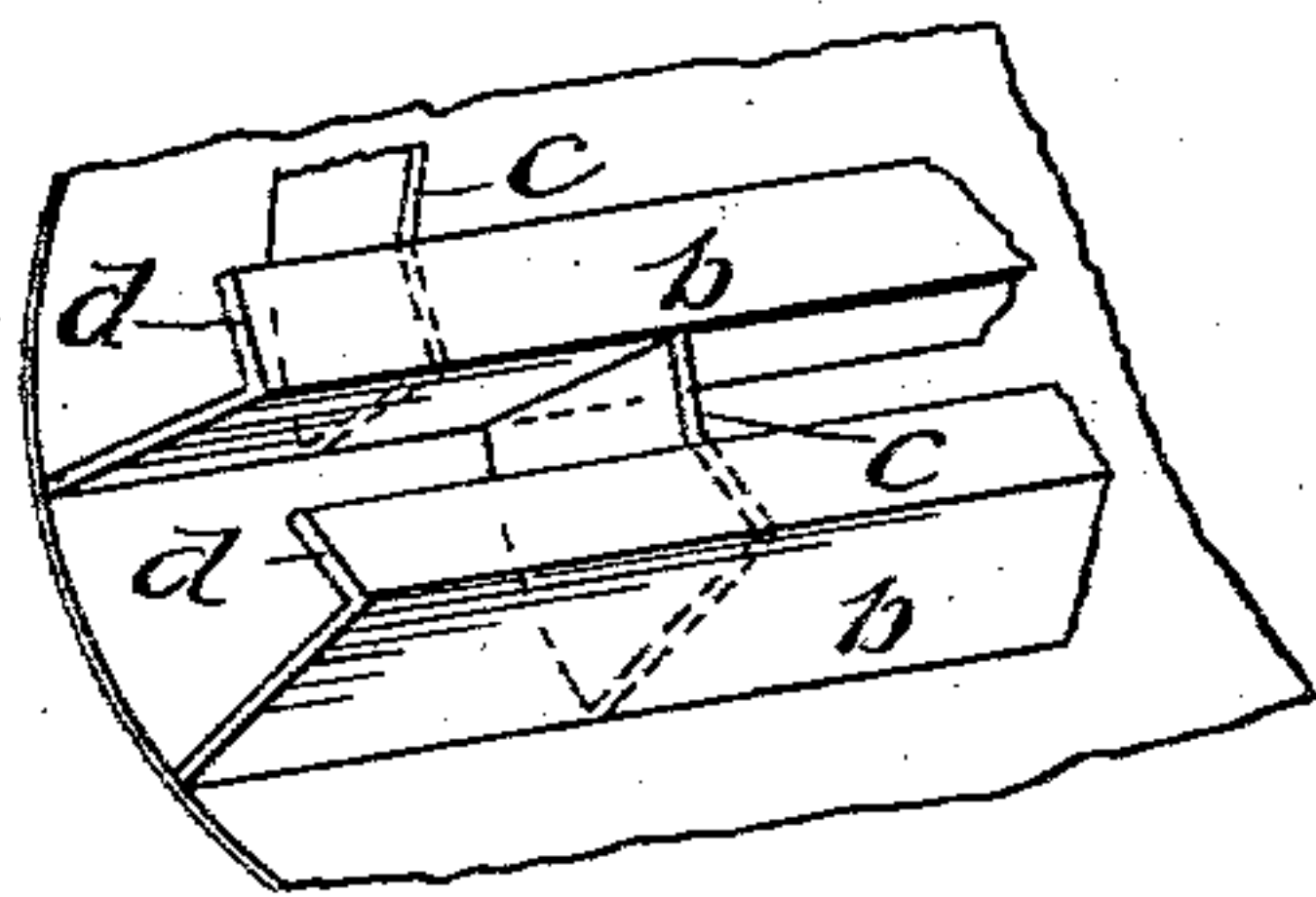
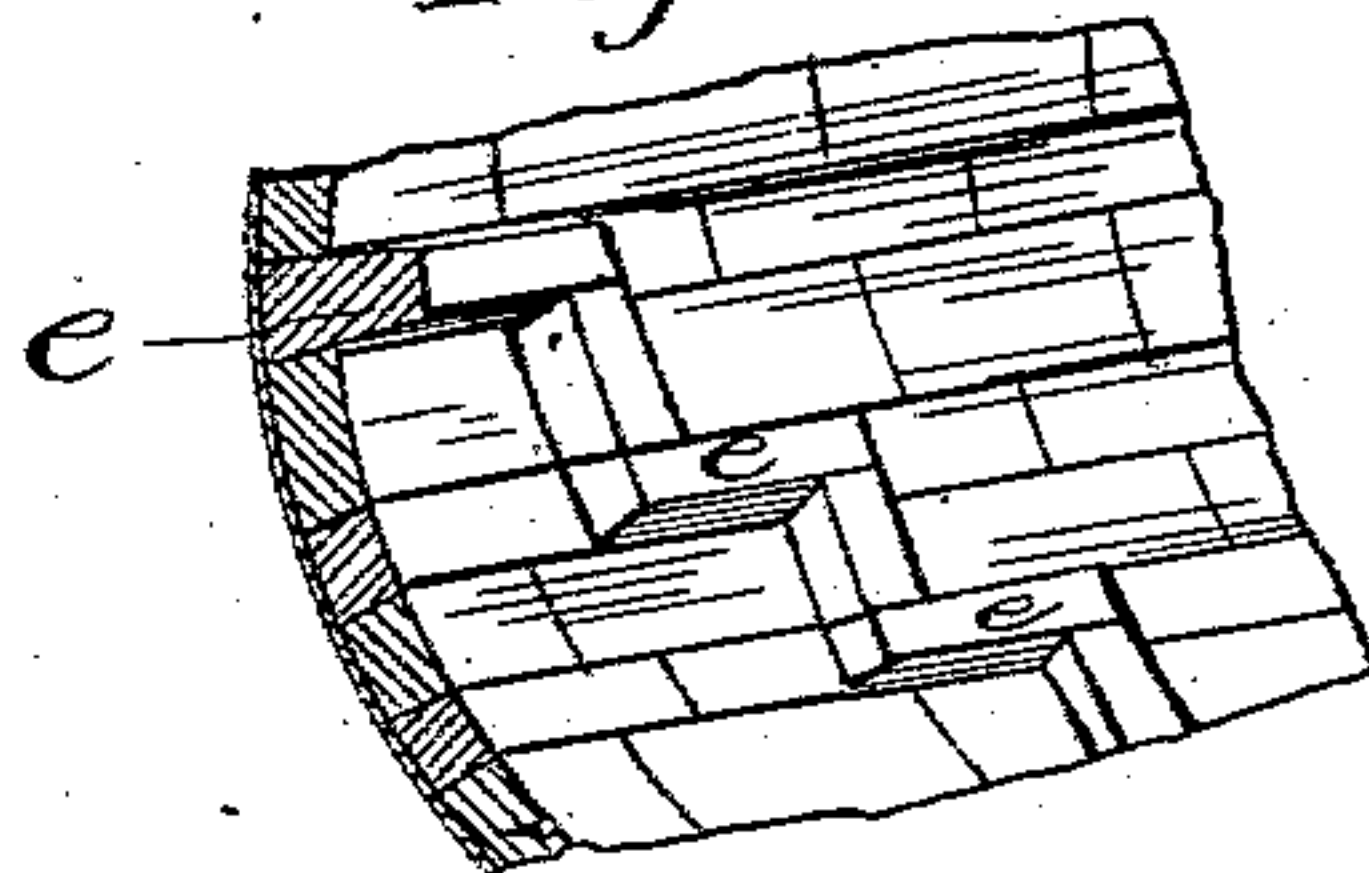


Fig. 5



Witnesses.

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Att'y.

UNITED STATES PATENT OFFICE.

WILHELM MICHAËLIS, JR., OF CHICAGO, ILLINOIS.

ROTARY KILN.

SPECIFICATION forming part of Letters Patent No. 743,538, dated November 10, 1903.

Application filed April 13, 1903. Serial No. 152,474. (No model.)

To all whom it may concern:

Be it known that I, WILHELM MICHAËLIS, Jr., a citizen of Germany, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rotary Kilns, of which the following is a specification.

My invention relates to rotary kilns and rotary driers for use in the manufacture of cement. Rotary kilns are of great length, into which is introduced the slurry from which is extracted the moisture by evaporation, producing the calcined clinker, which is afterward ground or pulverized. The kiln in present use is simply a long cylinder in two sections set to have more or less pitch toward the discharge end, at which is also introduced the heat. At the end of the cylinder at the point of highest temperature the walls are protected with fire-brick. Beyond this point the ordinary kiln is free and clear, permitting the slurry an uninterrupted flow.

Now the objects of my invention are to retard the movement of the slurry through the kiln and increase the surface area of the liquid in contact with the heat-current, thereby increasing the evaporation, economizing in the application of heat or rather to increase the output of the kiln with the same amount of fuel.

I attain the objects of my invention by means of shelves or brackets set radially against the inner shell of the cylinder, and by means of partitions arranged spirally with reference to each other divide the brackets into parts or series adapted to discharge the contents of one series of brackets into the next adjoining series. It is obvious that as the rotating cylinder constantly agitates and lifts upon the shallow brackets the liquid slurry and discharges it into the next series a considerably larger surface area of the liquid is exposed to the current of heat than in the ordinary kiln now in use, by which the evaporation is increased in the same relative proportion as the surface area of the liquid has been expanded. As these shelves or brackets are impracticable in that portion of the kiln or cylinder which is lined with fire-brick, I provide a means for the application of the same principle in a modified form in that portion of the kiln which serves the

purpose, first, of facilitating the evaporation, and, secondly, facilitating the discharge of the dry calcined clinker.

In the drawings, Figure 1 is a side elevation of a rotary kiln. Fig. 2 is a longitudinal section of a portion of the cylinder. Fig. 3 is a transverse section of the same. Fig. 4 and Fig. 5 are plan views of inner portions of the cylinder.

a is the rotary kiln, which consists of a long cylinder mounted with a decided pitch toward the discharge end.

b b are brackets rectangular in form radially mounted on the inner shell of the cylinder longitudinally, divided by partitions *c c*, as shown in the drawings. The partitions *c c* divide the brackets in series in such a manner that radially the line of partitions takes the form of a spiral. The liquid being lifted up on the shelves by the rotary motion of the cylinder, it follows that it will run toward the discharge end of the drum and when the partition is reached will overflow into the shelf in the next adjoining series. The brackets *b b* partake of the nature of troughs having a side *d*, which holds the liquid and carries it up. Any solid matter in the troughs will drop out as the brackets reach a vertical position in the moving cylinder.

In that portion of the cylinder which is lined with fire-brick I arrange the lining so that the alternate spaces are composed of brick *e*, having a wedge shape projecting sufficient to form short shelves and set radially against the inner shell of the cylinder, also arranged spirally. These projecting shelves carry up the clinker and permit it to slide off, thus loosening it up and letting it fall through the heat-current and gradually advancing it through the cylinder.

Having thus described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. In a rotary kiln, in combination, a rotatable cylinder having a section lined with fireproof material, fireproof shelves projecting from the inner surface of said section and arranged spirally, rectangular lifting and agitating brackets radially mounted on the inner shell of the unlined portion of said cylinder, partitions arranged spirally with reference to each other dividing said brack-

ets into parts or series and means for imparting motion to said cylinder, substantially as specified.

2. In a rotary kiln, a cylinder rotatably
5 mounted on bearings, retarding, lifting and agitating devices in series in one portion of said cylinder, and agitating and lifting devices in the other portion of said cylinder adapted to accelerate the outward movement

of the contents of said cylinder, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

WILHELM MICHAËLIS, JR.

Witnesses:

H. HUNSBERGER,
S. P. MCKELVEY.