

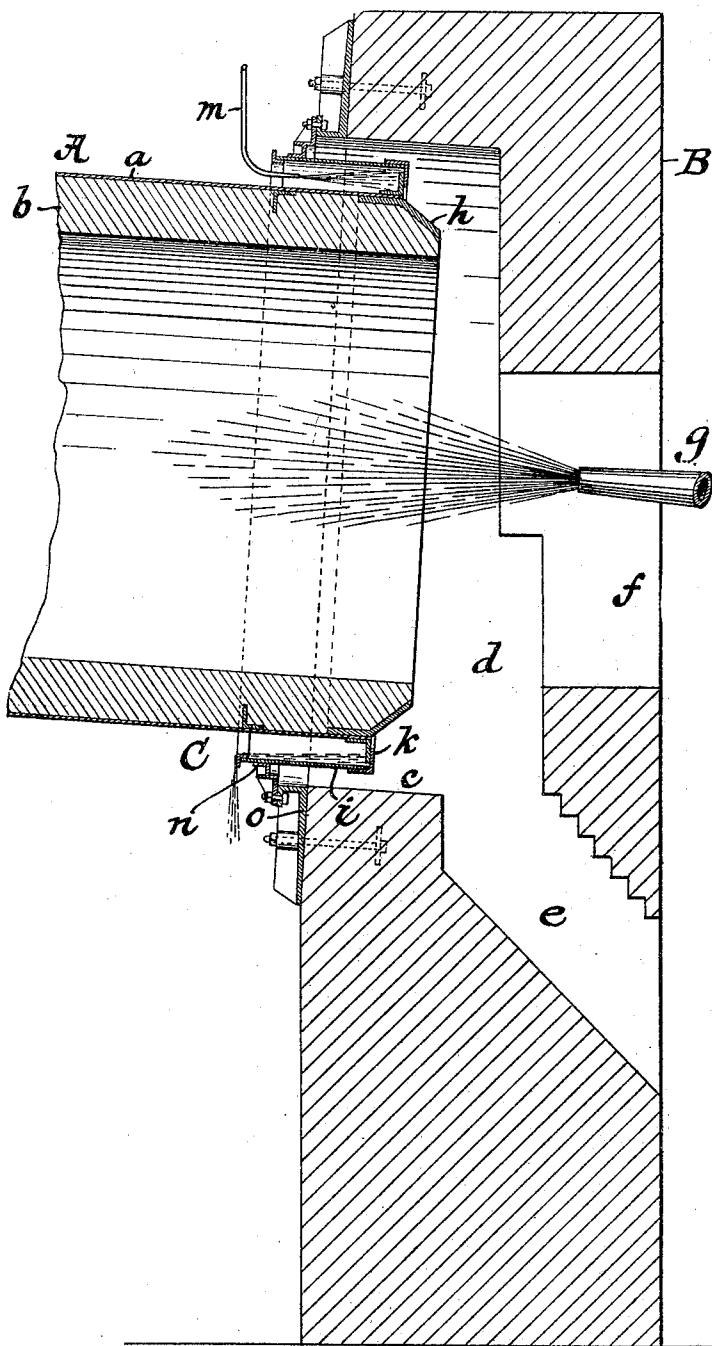
No. 628,940.

Patented July 18, 1899.

E. H. HURRY & H. J. SEAMAN.
ROTARY FURNACE.

(Application filed July 10, 1897.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

EDWARD H. HURRY, OF BETHLEHEM, AND HARRY J. SEAMAN, OF
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ROTARY FURNACE.

SPECIFICATION forming part of Letters Patent No. 628,940, dated July 18, 1899.

Application filed July 10, 1897. Serial No. 644,073. (No model.)

To all whom it may concern:

Be it known that we, EDWARD H. HURRY, a subject of the Queen of England, residing at Bethlehem, and HARRY J. SEAMAN, a citizen of the United States, residing at Catasauqua, Pennsylvania, have invented certain new and useful Improvements in Rotary Furnaces, of which the following is a specification.

This invention relates generally to rotary cylindrical furnaces which are subjected to great heat; and it relates more particularly to a means for cooling or keeping cool the end of such furnaces, and thus prevent the gradual burning off of the metallic cylinder.

The improvements in one of their useful applications may be employed in connection with a rotary furnace of the character shown in United States Letters Patent No. 550,619, granted to Hurry and Seaman December 3, 1895, and used, for instance, as in said patent, for the roasting of cement material in the manufacture of cement, in which a very high heat is required to form the clinker, the heat being preferably supplied by the combustion of a liquid or pulverized fuel fed by a "burner" (so called) or injector.

Without the use of some cooling means adjacent the end of the furnace subjected to the greatest heat the exterior metallic shell of the furnace, usually of considerable diameter and more or less expensive, quickly burns away, with the liability of the falling away of the unsupported fire-brick lining, and thus requiring the frequent addition of new shell portions or sections to replace the burned portions and the enforced idleness of the furnace during the renewing operation. In addition to the obvious expense entailed in the work of removing or cutting away the burned-out shell portions and the adding of the new shell, greater expense or loss and large waste of time are had by reason of having to entirely stop the manufacture carried on by the furnace to be repaired to allow it to cool off sufficiently to permit its shell being handled by the workman, as well as the time required to again get the furnace in operation. Practice has demonstrated that by the use of the improvements hereinafter described the burning off of the cylinder end may be wholly prevented.

The accompanying drawing is a vertical central longitudinal section of the exit and burner of a furnace constructed in accordance with our invention.

The rotary cylindrical furnace A may be of usual form, such as shown in said patent, set in a slightly-inclined position and mounted to rotate and be rotated in any suitable manner. The furnace consists of an exterior metallic shell *a*, supporting an interior lining of fire-brick or other heat-resisting material *b*. Its exit end projects through an opening *c*, somewhat larger than the diameter of the furnace, into an exit-chamber *d*, provided by a brick or stone structure B, having also a delivery-chute *e* and a burner-opening *f*, into which projects a burner or injector nozzle *g*, adapted to deliver liquid or pulverized fuel for combustion in the furnace.

In the present instance the exit end of the furnace is provided with an end shell *h*, the outer end of which is inclined slightly inwardly, as shown, to prevent accidental displacement of the fire-brick lining.

The furnace end is provided with the improved cooler C, consisting of a cylindrical jacket *i* of comparatively short dimension and extending with the furnace end through the opening *c* into the chamber *d*. The jacket is of sufficiently-greater diameter than the furnace-shell to leave an annular space between the two for the introduction of water thereto. The one end of the jacket is closed by an end wall *k*, rigidly attached to the furnace-shell, while the other end is open. The jacket of course partakes of the inclination of the furnace, so that if a supply of water be introduced into the open end of the jacket at its highest point at the upper side of the furnace, as by a feed-pipe *m*, it will meet the end wall of the jacket and pass in opposite directions around and down the outer surface of furnace-shell, accumulating, more or less, on the low part of the jacket below the under side of the furnace, according as the degree of inclination of the furnace may permit, the excess of water dripping off the open end of the jacket, as indicated in the drawing. As the feed-pipe has no connection with the furnace or the jacket, its support need not be shown. It will thus be seen that the furnace

end may by very simple means be maintained sufficiently cool as to absolutely prevent its burning off, the degree of heating permitted being entirely within the control of the attendant by simply regulating the quantity of water introduced into the jacket.

Instead of relying upon one water-feed pipe it is preferred to employ two such pipes, both situated one at each side of the vertical at the upper side of the furnace, so that the water will surely flow downwardly on both sides of the furnace within the jacket.

In order that the water may be retained in the lower portion of the jacket, its walls should be inclined upwardly to a horizontal line. Such is the arrangement shown in the drawing, where the axis of the furnace is inclined and the walls of the jacket are parallel therewith.

To prevent the ingress of air past and around the jacket through the opening *c*, said opening is closed by an annulus *n*, fitting the exterior of the jacket and firmly bolted to the horizontal flange of a surrounding bracket *o*, bolted to the wall structure *B*, the surface joint between the jacket and the annulus of course permitting the free rotation of the furnace and its jacket.

While the cooler-jacket is shown as arranged parallel with the furnace-shell, it is obvious that it may be otherwise arranged.

The improved cooling-jacket will be seen to be of the simplest character, permitting a constant supply of water to be fed over the furnace end without any complicated water connections, which would otherwise be necessary in employing a water-jacket with a rotating body, such as the furnace described. Its use, however, is not necessarily limited to a rotating body, as its simplicity will readily commend it to other structures.

What is claimed is—

1. The herein-described tubular structure provided adjacent its end with a jacket closed at its end nearest the end of said structure, open and unobstructed at the other end and

having its annular inclosing wall extending toward the rear of the furnace, inclined from the closed end upwardly with reference to a horizontal line, and a water-feed pipe for discharging a jet of water directly into the open unobstructed end of the jacket.

2. The herein-described rotary furnace provided adjacent its end with a jacket closed at its end nearest the end of said furnace, open and unobstructed at the other end and having its annular inclosing wall extending toward the rear of the furnace inclined from the closed end upwardly with reference to a horizontal line, and a water-feed pipe for discharging a jet of water directly into the open unobstructed end of the jacket.

3. The herein-described downwardly-inclined rotary furnace, provided adjacent its lower end with a surrounding jacket closed at its end nearest the end of said furnace, open and unobstructed at the other end and having its annular inclosing wall extending toward the rear of the furnace, inclined from the closed end upwardly with reference to a horizontal line, and a water-feed pipe for discharging a jet of water directly into the open unobstructed end of the jacket.

4. The herein-described downwardly-inclined rotary furnace, provided adjacent its lower end with a surrounding jacket closed at its end nearest the end of said furnace, open and unobstructed at the other end and having its annular inclosing wall extending toward the rear of the furnace inclined from the closed end upwardly with reference to a horizontal line, and a water-feed pipe for discharging a jet of water directly into the open unobstructed end of the jacket.

In witness whereof we have hereunto signed our names in the presence of two witnesses.

EDWARD H. HURRY.
HARRY J. SEAMAN.

Witnesses:

D. W. BENEDICT,
IGNATZ GRESSER.