

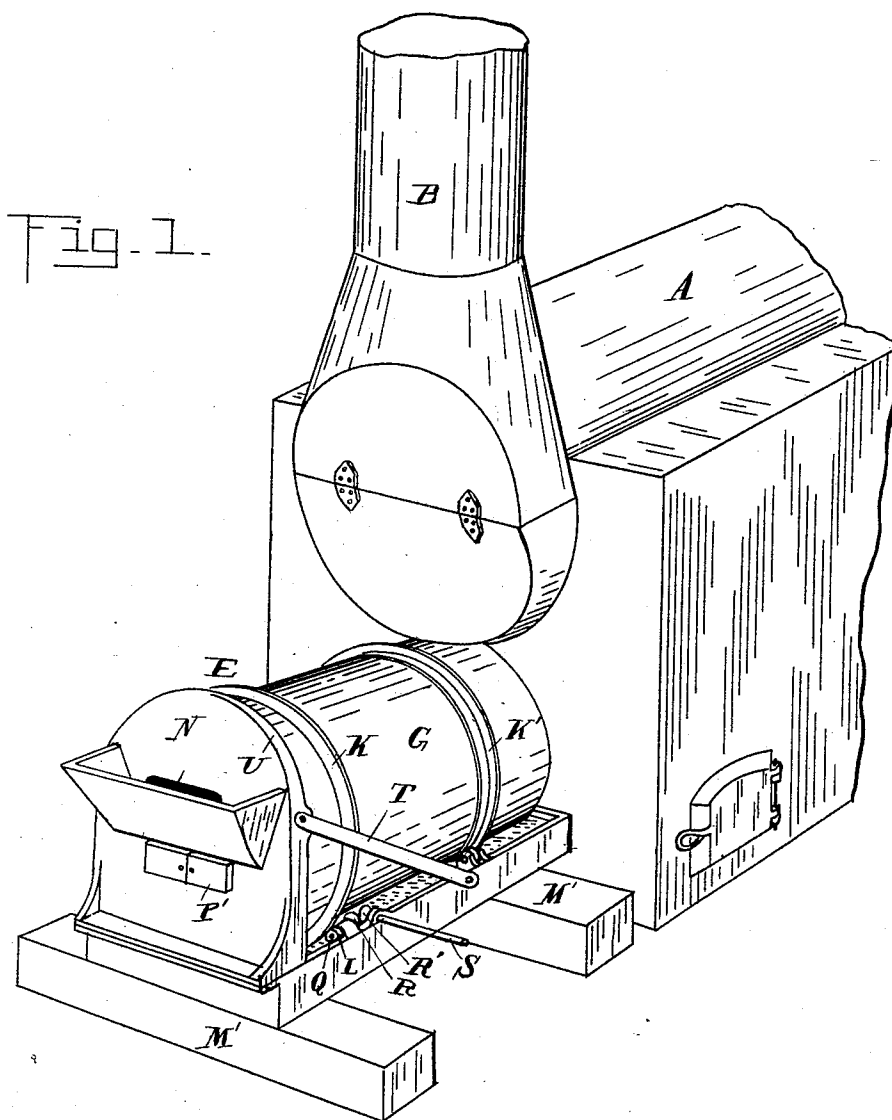
(No Model.)

R. H. NOGAR.
FURNACE.

3 Sheets—Sheet 1.

No. 425,821.

Patented Apr. 15, 1890.



Witnesses,
Law. A. Gregg.
A. Hamilton

Inventor
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By *Thos. Sprague & Co.*
Atty

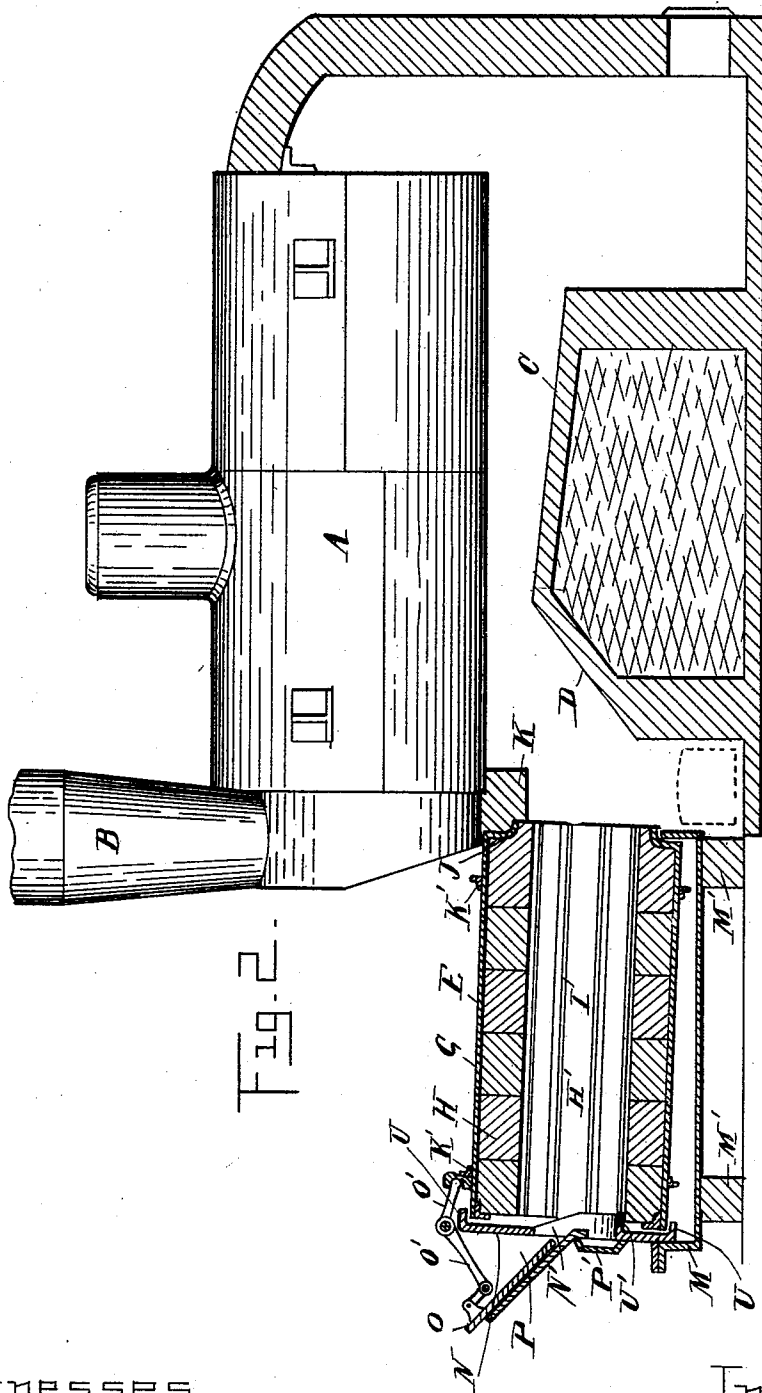
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R. H. NOGAR.
FURNACE.

No. 425,821.

Patented Apr. 15, 1890.



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(No Model.)

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R. H. NOGAR.
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Fig. 3.

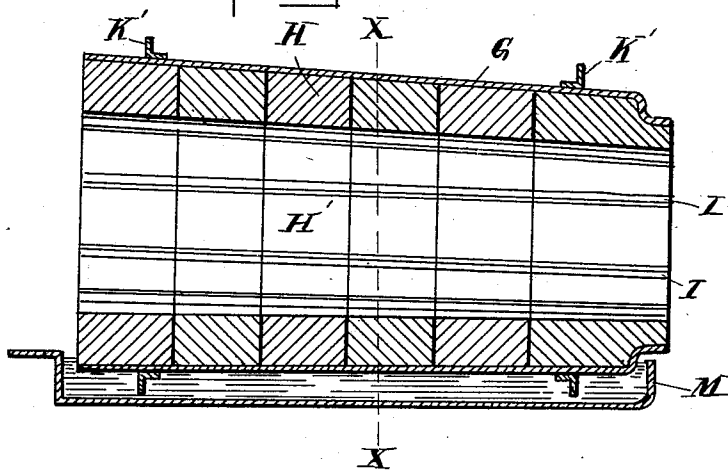
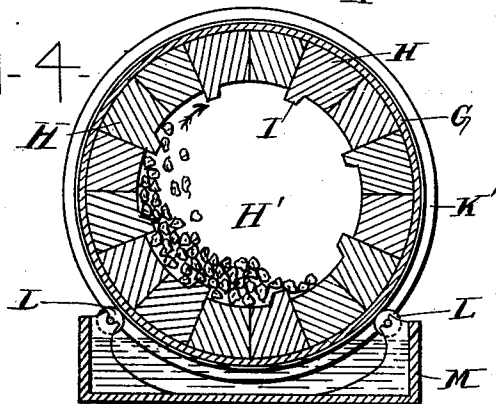


Fig. 4.



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UNITED STATES PATENT OFFICE.

RUSSELL H. NOGAR, OF DUNDEE, MICHIGAN.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 425,821, dated April 15, 1890.

Application filed August 7, 1889. Serial No. 320,014. (No model.)

To all whom it may concern:

Be it known that I, RUSSELL H. NOGAR, a citizen of the United States, residing at Dundee, in the county of Monroe and State of Michigan, have invented certain new and useful Improvements in Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to new and useful improvements in furnaces designed to be used in connection with a steam-generator; and the invention consists in the peculiar construction of a rotating furnace having inner projecting ledges, whereby the coal is continually fed upon the fire by the rotation of the furnace, and by means of a slight inclination to the rear the fuel is fed from end to end; further, in the peculiar construction and arrangement of this rotating furnace with suitable rollers and a liquid bath to keep the exterior of the furnace cool, and, further, in the peculiar construction, arrangement, and combination of the various parts, all as more fully hereinafter described and then definitely claimed.

15 In the drawings which accompany this specification, Figure 1 is a perspective view of my improved furnace attached to a steam-generator. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a vertical central section through a modification of the rotating furnace detached, and Fig. 4 is a cross-section on line X X in Fig. 3.

35 A is the boiler, of any desired construction, preferably of that type known as "return-flue" boilers, having a smoke-stack B at its front end and suitably set upon a foundation.

40 C is an arch arranged under the boiler, having an incline D at or near the middle, and E is my furnace, arranged in front of the boilers. This furnace consists of a cylindrical combustion-chamber, which latter preferably consists of a sheet-metal shell G, lined with fire-brick H or other non-combustible material, leaving within the tubular combustion-chamber H'. I preferably arrange on the interior of the furnace suitable offsets or lugs I, extending the entire length of the cylinder. The cylinder is preferably provided at the forward end with a shoulder J, which engages into suitable shoulders K in the forward end

of the setting of the boiler, and on the outside it is provided with suitable flanges K', which bear upon the rollers L beneath the cylinder, preferably in the bath-pan M, which stands upon a suitable foundation M'. At the forward end this cylinder is closed by the head N, having an aperture N', below which is located the inclined feed-plate O, (shown in Fig. 2,) which may be automatically shaken by means of the lever O' by arranging stops or cams at stated intervals upon the outside of the cylinder, which, as the cylinder revolves, will strike against the lever O' and shake the feed-plate O, and the space P between the head N and the feed-plate O, being filled with coal, will feed the fuel to the combustion-chamber within.

P' is a draft-door located in the head.

70 The shaft Q, upon which one of the rollers L is journaled, is preferably provided upon its end with the bevel gear-wheel R, which meshes with the pinion R' on the drive-shaft S. Suitable braces T may be arranged to hold the head tightly against the rear end of the rotating furnace. A suitable flange U is provided upon the forward side of the head, into which the cylindrical furnace turns, and a suitable flange U' extends forwardly through said head into the lower inner side of the discharge-chamber to prevent the ashes and coal from falling between the rotating furnace and the head. The parts being thus constructed and arranged, and a fire being started in the combustion-chamber, air is supplied through the draft-doors, and the driving mechanism being started the furnace E is slowly rotated. At intervals the lever O', striking against the cams, will shake the feed-plate O and feed the fuel into the combustion-chamber. The coal is fed gradually to the rear end thereof by the inclination of the furnace, or by making the combustion-chamber tapering, as shown in Fig. 3. As the fire is carried up the side of the combustion-chamber as the furnace revolves, it will fall back upon the fire below, thus bringing all the coal upon the top of the fire, making sure of its complete combustion before it is finally discharged into the ash-pit at the rear of the furnace.

100 My furnace gives most perfect combustion, and hence little smoke. It is especially adapted

to fine fuel—like sawdust, screenings, &c.—although ordinary coal may be used with the best of results. No raking is required by the attendant, and the feeding consists in simply keeping full the hopper, which may be done by an elevator, if desired.

It is evident that my furnace may be applied to nearly any steam-generator, whether already in use or being newly built.

The heat from the ash-pit passes over the arch and is used to assist in heating the boiler.

What I claim as my invention is—

1. In combination with a rotary furnace, a head closing one end of said furnace, a hopper arranged to feed through said head, a shaking attachment, as the feed-plate O, and means, substantially as described, for operating said feeder by the rotary motion of the furnace, substantially as described.

2. In combination with a rotary furnace, a head closing one end of said furnace, a hopper feeding through the head, a feed-plate in said hopper, a cam surrounding the rotary furnace, and a lever connected to the feeder and operated by the cam, substantially as described.

3. A tubular furnace having means, such

as the mechanism described, for rotating the same, and consisting of an outer shell of metal, an inner lining of fire-proof material, such as fire-brick, and of ribs or lugs, such as I, substantially as described.

4. A tubular furnace having means, such as the mechanism described, for rotating the same, and a bath-pan containing a cooling-fluid, into which the lower edge of the furnace dips, substantially as described.

5. In combination with a steam-generator, a rotating tubular furnace arranged in front thereof and inclined or tapered to give the fuel a progressive motion, an ash-pit at the end of said furnace, a feed-hopper, mechanism, substantially as described, for shaking said hopper at intervals, a draft-door having a lip extending to the under side of the furnace, and a shoulder engaging into a recess in the boiler-setting, the parts arranged to operate as and for the purpose described.

In testimony whereof I affix my signature, in presence of two witnesses, this 10th day of June, 1889.

RUSSELL H. NOGAR.

Witnesses:

GEO. A. GREGG,
P. M. HULBERT.