No. 669,265. Patented Mar. 5, 1901.

E. NORTON & H. W. ROBINSON.

FURNACE FOR HEATING METAL BARS OR SHEETS.

(Application filed Oct. 22, 1900.)

(No Model.) 2 Sheets—Sheet 1.

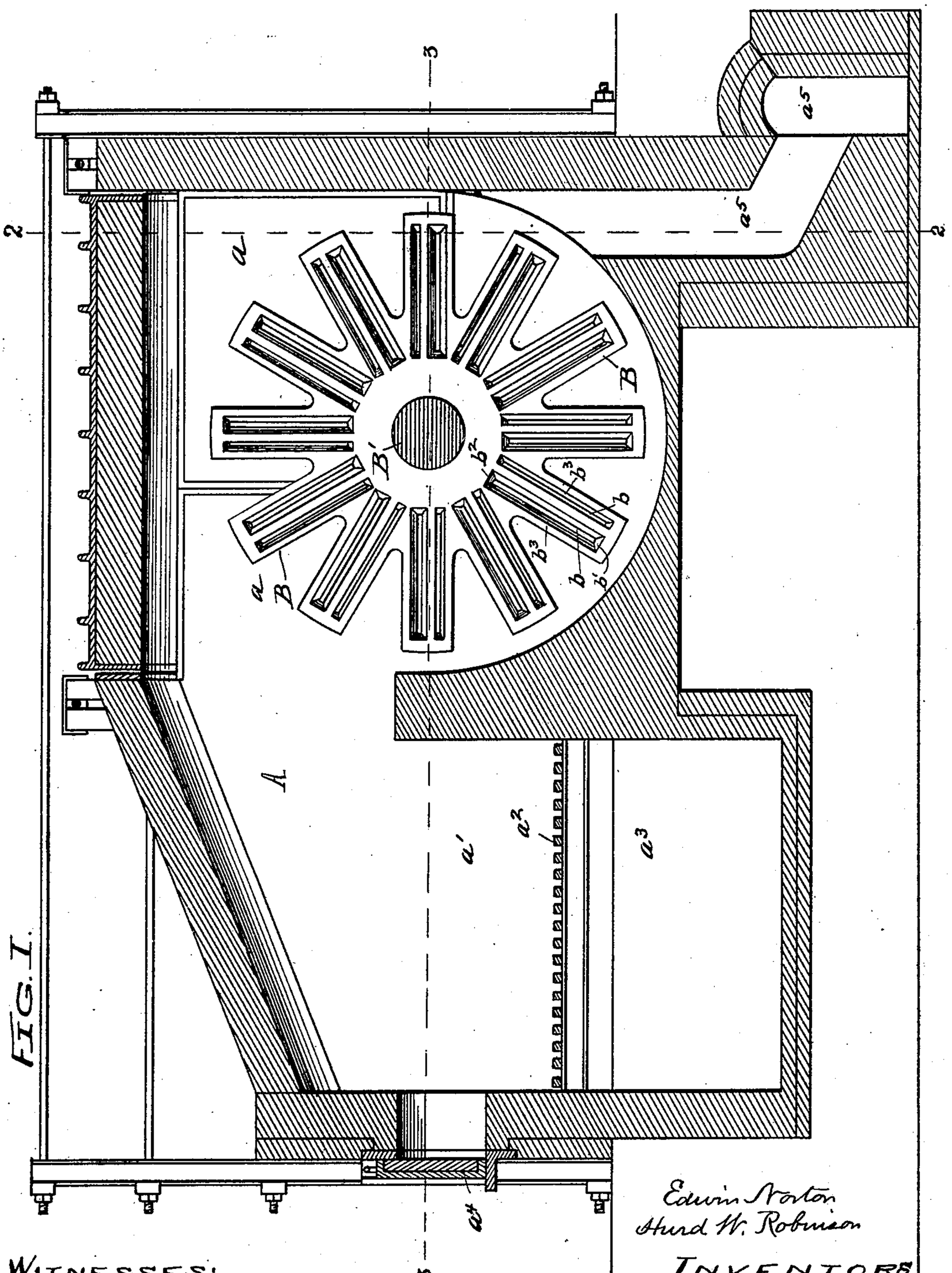

FIG. I.

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(Application filed Oct. 22, 1900.)

(No Model.) 2 Sheets—Sheet 2.

FIG. 2.

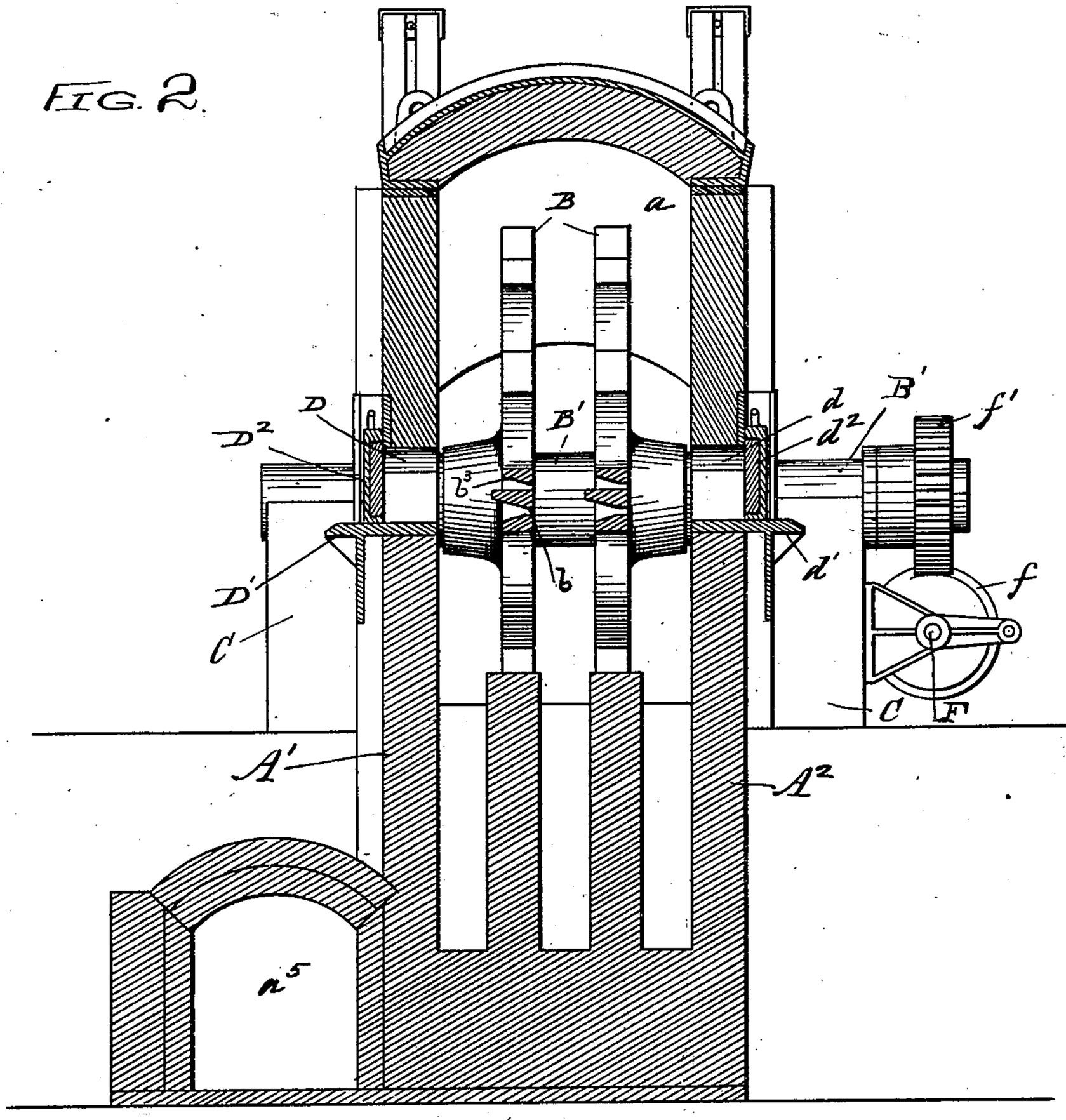
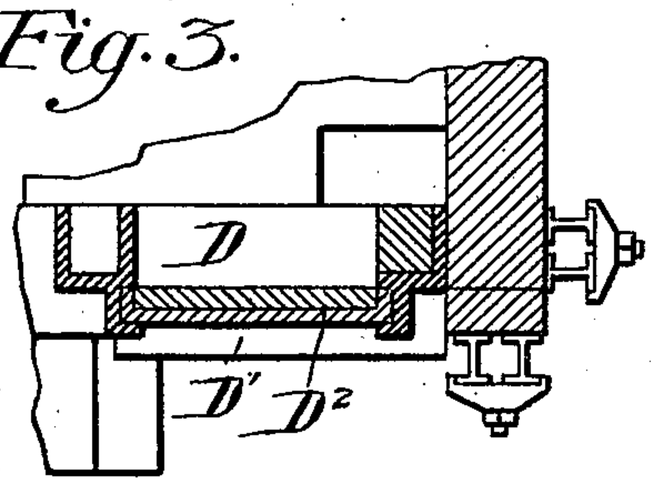


Fig. 3.



WITNESSES:
Lew. E. Curtis
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UNITED STATES PATENT OFFICE.

EDWIN NORTON AND HURD W. ROBINSON, OF MAYWOOD, ILLINOIS,
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FURNACE FOR HEATING METAL BARS OR SHEETS.

SPECIFICATION forming part of Letters Patent No. 669,265, dated March 5, 1901.

Application filed October 22, 1900. Serial No. 33,952. (No model.)

To all whom it may concern:

Be it known that we, EDWIN NORTON and HURD W. ROBINSON, citizens of the United States, residing in Maywood, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Heating-Furnaces for Heating Metal Bars or Sheets Preparatory to Rolling the Same, of which the following is a specification.

Our invention relates to improvements in furnaces for heating metal bars or packs of sheets preparatory to rolling the same into thin sheets for tin-plate or other purposes, and more particularly to improvements upon the heating-furnace having a rotary rack or holder for the bars or sheets patented in Letters Patent No. 608,264, of August 2, 1898. In said previously-patented furnace the door for admitting and removing the bars or sheets is at the front side of the furnace parallel to the shaft or axes of the rotary holder, and the receptacles for the bars or sheets in the rotary holder are open to receive them at the ends of the radial arms forming said receptacles, so that as the bars or sheets are being carried around in the furnace their edges rest and scrape against curved guides on the bottom of the furnace, which in practical operation may sometimes tend to bend, distort, or injure the edges of the heated sheets and also increases the friction and power required to turn the rotary rack or holder.

The object of our invention is to overcome these objections and at the same time to provide a simple and durable construction of rotary holder which will successfully withstand the heat to which it is constantly subjected in the furnace.

Our invention consists in the means we employ to practically accomplish these results—that is to say, it consists of a rotary holder furnished with a series of pockets, slots, or receptacles having supports for the edges and sides of the bars or sheets to bear against, so that the slots, pockets, or receptacles are open for the admission or withdrawal of the sheets or packs only at their ends—that is, at the end of the rotary holder as contradistinguished from the periphery—in combination with a furnace having a door or opening for admission or withdrawal of the sheets or bars at its side instead of at its front, as in the furnace of said Patent No. 608,264. The faces of the radial slots or pockets in the rotary holder or in its radial arms are preferably beveled to facilitate the endwise entry of the bars or sheets into the same and to cause the bars or sheets to have only a narrow or limited bearing-surface on the holder at their opposite ends or edges. The rotary holder is preferably constructed of a pair of cast-iron wheels or radial-arm spiders, the wheels or spiders being placed at a suitable distance apart on their shaft, according to the length of the bars or sheets to be operated upon. The pair of radially-slotted wheels or spiders of the holder thus serve to carry or support the bars or sheets throughout their entire course in the furnace and prevents their edges from resting upon or scraping against the bottom of the furnace and at the same time gives a better opportunity for the heat, flame, and products of combustion to envelop and act uniformly upon the bars or sheets as they are carried around by the rotary holder.

In the drawings forming a part of this specification, Figure 1 is a central vertical longitudinal section of a furnace embodying our invention, showing the wheel or spider in elevation. Fig. 2 is a vertical cross-section on line 2 2 of Fig. 1, and Fig. 3 is a detail horizontal cross-sectional view taken through the doors on line 3 3 of Fig. 1.

In said drawings, A represents the furnace, having a heating-chamber a, fire box or chamber a', grate a^2, ash-pit a^3, fuel-door a^4, and flue a^5, leading to the smoke-stack. The rotary rack or holder comprises a pair of slotted wheels or spiders B B, secured to a shaft B', which extends through the sides A' A^2 of the furnace and is journaled in suitable bearings C C outside thereof. The wheels or spiders B B are furnished each with a series of pockets, receptacles, or slots b, closed at their outer ends b', as well as at their inner ends b^2, so that the closed ends of these slots or pockets may afford support or stops for the edges of the bars or sheets to bear against as the holder revolves. The closed pockets or slots b b each have beveled faces b^3 b^3 to facilitate the endwise insertion of the bars or packs of sheets into them through the door-opening D in the

side of the surface. The door-opening D is at one side of the shaft B′ and preferably on a level therewith, so that the pockets, slots, or receptacles *b b* in the wheels or spiders B B will be horizontal at the time the bars or sheets are to be inserted therein. To facilitate the insertion of the bars or sheets into the slots or receptacles *b b* of the holder, the furnace is provided at its door-opening with a feed-table D′. The door-opening is closed by a sliding door D^2. The heated bars or sheets may be withdrawn from the furnace and holder through the door-opening D; but we prefer to provide the furnace with a door-opening *d*, table *d′*, and door d^2 on its opposite side A^2 and in line with those on the feed side, at which the heated bars or sheets may be taken out of the furnace.

The faces b^3 b^3 of the slots, pockets, or receptacles *b* support the sides of the bars or sheets, the outer ends *b′* of said pockets support the outer edges of the bars or sheets, and the inner ends b^2 of said pockets support the inner edges thereof as the holder rotates.

The holder B or its shaft B′ is given a slow intermittent or step-by-step rotary movement from or through the driving-shaft F, which is furnished with a worm *f*, meshing with a gear *f′* on the shaft B′ of the holder.

Two slots or receptacles are preferably formed parallel to each other in each of the radial arms of the spiders B, as the arms may thus be made individually larger and stronger and better adapted to withstand the heat of the furnace.

We claim—

1. In a sheet or bar heating furnace, the combination with the heating-chamber of the furnace, of a rotary holder mounted therein on a shaft extending through the sides of the furnace, and provided with a series of slots or receptacles closed at their inner and outer ends or edges to form supports for the edges of the bars or sheets as the holder revolves, said furnace being provided with a door at the side thereof through which said shaft extends for the insertion of the bars or sheets into the furnace and holder, substantially as specified.

2. The combination with a furnace-chamber, of a rotating holder therein furnished with a series of pockets or receptacles having supports for the sides and edges of the bars or sheets as the holder revolves, substantially as specified.

3. The combination with a furnace-chamber, of a rotating holder therein furnished with a series of pockets or receptactes having supports for the sides and edges of the bars or sheets as the holder revolves, said furnace having a door in its side for the insertion of the bars or sheets in a direction parallel to that of the axis of said rotating holder, substantially as specified.

4. The combination with a furnace-chamber, of a rotary sheet or bar holder therein, consisting of a pair of wheels or spiders furnished each with a series of slots closed at their outer ends, and a door at the side of the furnace, substantially as specified.

5. The combination with a furnace-chamber, of a rotary sheet or bar holder therein, consisting of a pair of wheels or spiders furnished each with a series of slots closed at their outer ends and a door at the side of the furnace, said door being provided with a feed-table, substantially as specified.

6. The combination with a furnace-chamber, of a rotary sheet or bar holder therein, consisting of a pair of wheels or spiders furnished each with a series of slots closed at their outer ends and a door at the side of the furnace, said slots having beveled faces, substantially as specified.

7. The combination with a furnace having opposite sides A′ A^2 furnished each with a door through the same of a rotary holder comprising a shaft B′ and a pair of slotted wheels or spiders B B having the slots thereof radially located, and each slot thereof being in turn brought opposite said doors as the holder rotates, whereby the sheets or bars may be passed in at one side, and out at the other side of the furnace through the rotary holder, substantially as specified.

EDWIN NORTON.
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Witnesses:
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