No. 617,917. Patented Jan. 17, 1899.

P. T. BERG.

CONTINUOUS HEATING FURNACE.

(Application filed Mar. 20, 1897.)

(No Model.) 2 Sheets -Sheet 1.

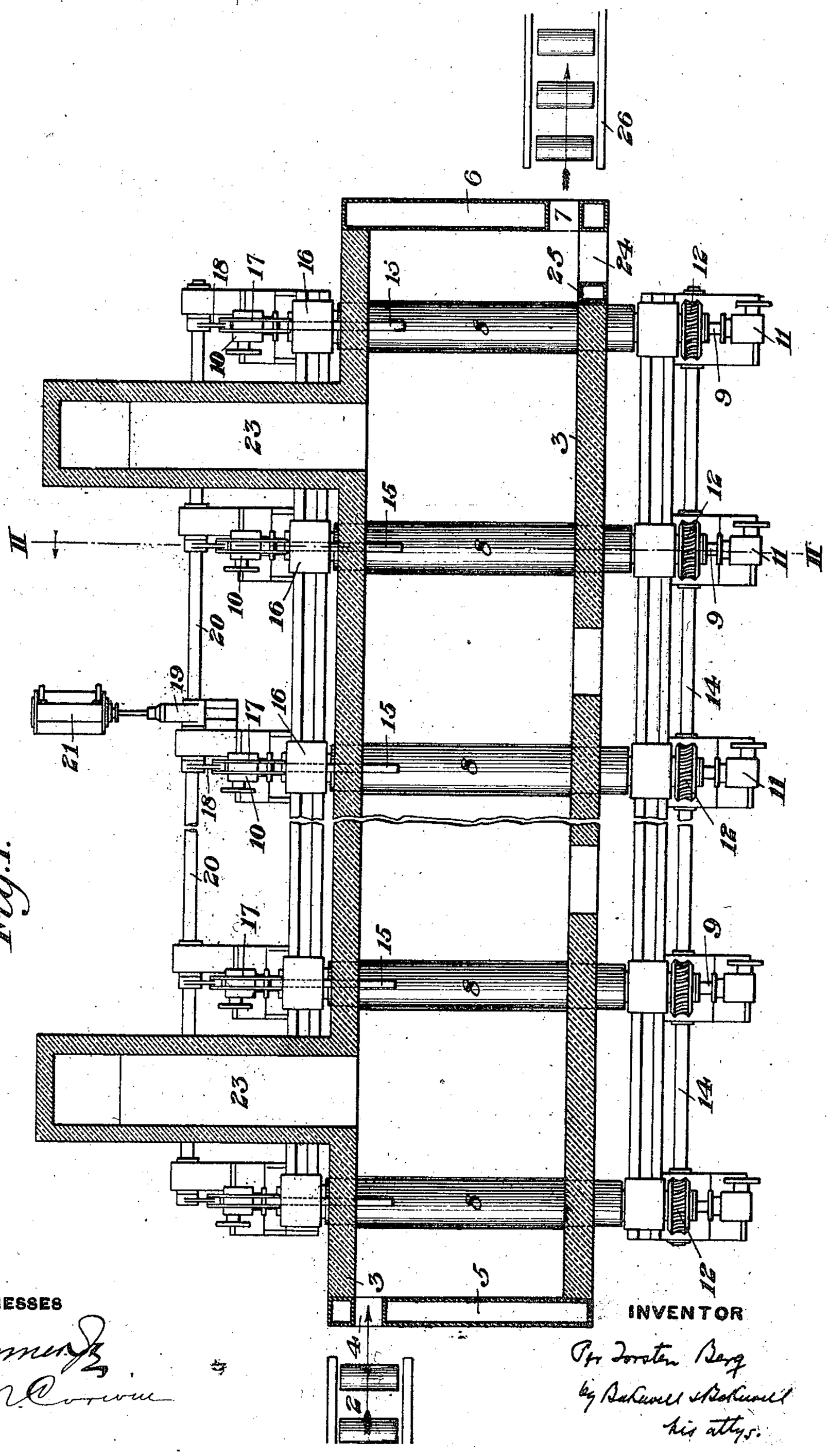

Fig. 1.

WITNESSES

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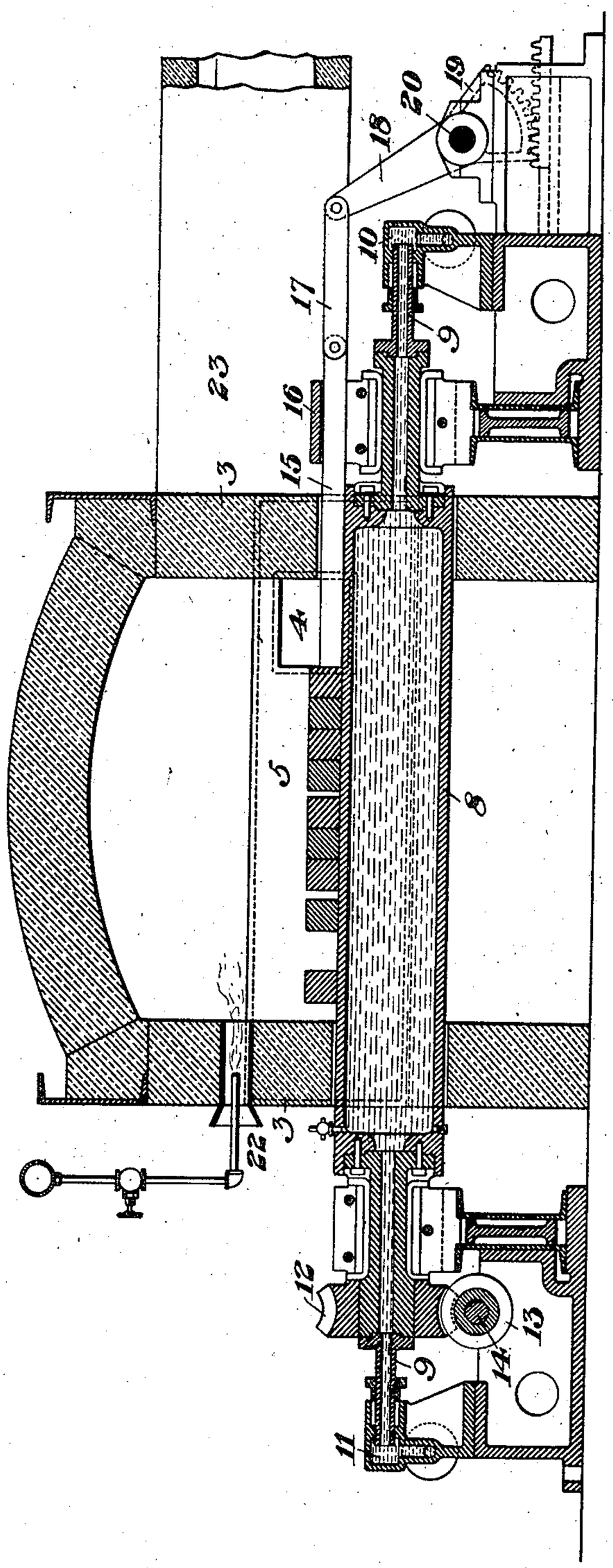
(No Model.) 2 Sheets—Sheet 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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CONTINUOUS HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 617,917, dated January 17, 1899.

Application filed March 20, 1897. Serial No. 628,384. (No model.)

To all whom it may concern:

Be it known that I, PER TORSTEN BERG, of Munhall, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Continuous Heating-Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a horizontal sectional view, partly broken away, of my improved heating-furnace; and Fig. 2 is a cross-section on the line II II of Fig. 1.

My invention relates to the furnaces employed for heating metal, and more particularly to those used for reheating metal after it is passed through one mill and preparatory to passing to the next, and it is designed to improve the construction of such furnaces and to provide a furnace wherein several bars or strips of metal may be stored and heated, the bars being supplied and drawn away from the furnace as desired, the furnace having end entrance and exit openings out of line with each other and having means for moving the metal laterally, so as to bring the bars successively into alinement with the exit-opening.

In the drawings, 2 represents a series of driven rolls leading from a mill or blooming-shear and by which the blooms or bars are carried into the reheating-furnace 3 through the entrance-opening 4 at one side of the furnace, this opening being made in a water-cooled end plate 5. The furnace, as shown, is of general rectangular form, its exit end being closed by a water-cooled plate 6, having an outlet-opening 7 at the side of the furnace opposite to that of the entrance-opening 4. Extending transversely through the furnace at suitable intervals are a series of reversible water-cooled rollers 8, upon which the metal bars rest during the heating. The protruding ends of these rollers are provided with pipes 9, which lead through stuffing-boxes into water supply and exhaust chambers 10 and 11, respectively, so that a continuous water-circulation may be maintained through the rollers. At one end of the rollers are provided worm-wheels 12, which intermesh with worms or screws 13 upon a longitudinal shaft 14, by which a slow rotary movement is given to the rollers. At one side of the furnace and over the water-cooled rollers are provided a series of pushers 15, consisting of bars sliding longitudinally in bearings 16 and connected by links 17 with levers 18, which are swung by rack-and-pinion mechanism 19, secured to the common shaft 20 of the levers and actuated by a hydraulic cylinder 21. A series of gas-burners 22 pass in through one side wall of the furnace, and from the opposite side wall lead the chimney-flues 23. Doors 24 are provided in one side wall of the furnace, the end one of these doors next to the plate 6 being formed in a water-cooled plate 25. From the exit-opening 7 the reheated metal is taken on driven feed-rollers 26 to the finishing-mill.

The operation of my improved furnace will be apparent to those skilled in the art. The metal being cut in suitable lengths by the blooming-shears passes over the feed-rollers 2 through the opening 4 into the furnace and rests upon the water-cooled rollers 8. As each piece enters it is moved laterally by the pushers, which are then withdrawn, thus leaving space for the next entering piece. I preferably give the metal in the furnace a slow back-and-forth movement by actuating the rollers through the shaft 14 and reversing the motion of this shaft at certain intervals. When the bar is sufficiently heated and is ready for further reduction the end of the bar may be drawn by the operator working through door 24 in plate 25 into alinement with the opening 7, and the rollers then being actuated this piece passes out onto the feed-rollers 25. It is evident that the piece may be moved into position by the pushers themselves acting through the intermediate bars of metal, if desired. As the bars in the furnace are slowly moved back and forth by the rollers those portions of their surface which rest upon the rollers are constantly changing, the longitudinal movement of the bars being limited by the end plates 5 and 6. The heat is thus equalized upon the bars and rollers, and blackening of these portions of the bars resting upon the water-cooled rollers is avoided.

The advantages of my invention are numerous, since the action of the device is practi-

cally automatic, the bars are uniformly and thoroughly reheated, and the apparatus is simple and effective in its working.

Many changes may be made in the form and arrangement of the device without departure from my invention, since

I claim—

1. A heating-furnace having therein a single series of transverse rollers arranged to allow metal bars to lie thereon, said furnace having entrance and exit openings out of alinement with each other laterally.

2. A heating-furnace having a series of transverse rollers therein, and power-actuated pusher-bars extending through the side walls of the furnace and arranged to move the metal laterally along the length of the rollers.

3. A heating-furnace having end plates provided with entrance and exit openings out of alinement with each other, a series of transverse rollers in the furnace, and means for rotating said rollers in either direction.

4. A heating-furnace having therein a single horizontal series of transverse rollers arranged to allow metal bars to lie thereon, means for water-cooling the said rollers, means for rotating the same in opposite directions so as to give a slow back-and-forth movement to the bars, and stops arranged to limit the endwise movement of the bars.

5. A heating-furnace having at its ends entrance and exit openings out of lateral alinement with each other, transverse feed-rollers within the furnace, and power-actuated pushers extending through the side wall and arranged to move the metal laterally on the rollers, said furnace having feed-rollers extending from its exit-opening.

6. A heating-furnace having entrance and exit openings out of alinement with each other, a series of transverse power-actuated rollers within the furnace, pusher-bars extending through the side walls of the furnace, and means for actuating said bars to move the metal lengthwise of the rollers.

In testimony whereof I have hereunto set my hand.

P. T. BERG.

Witnesses:
M. S. MURPHY,
C. BYRNES.