

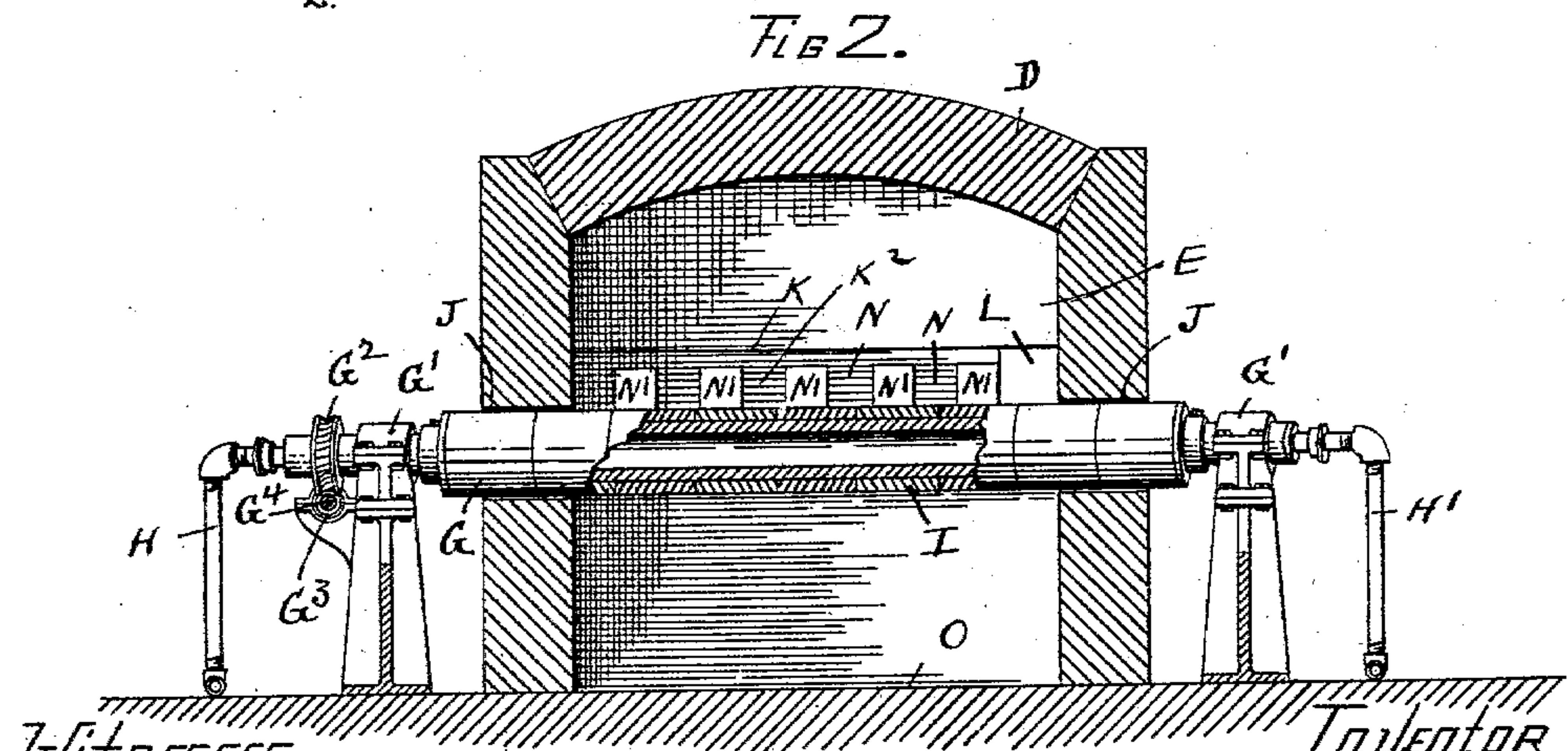
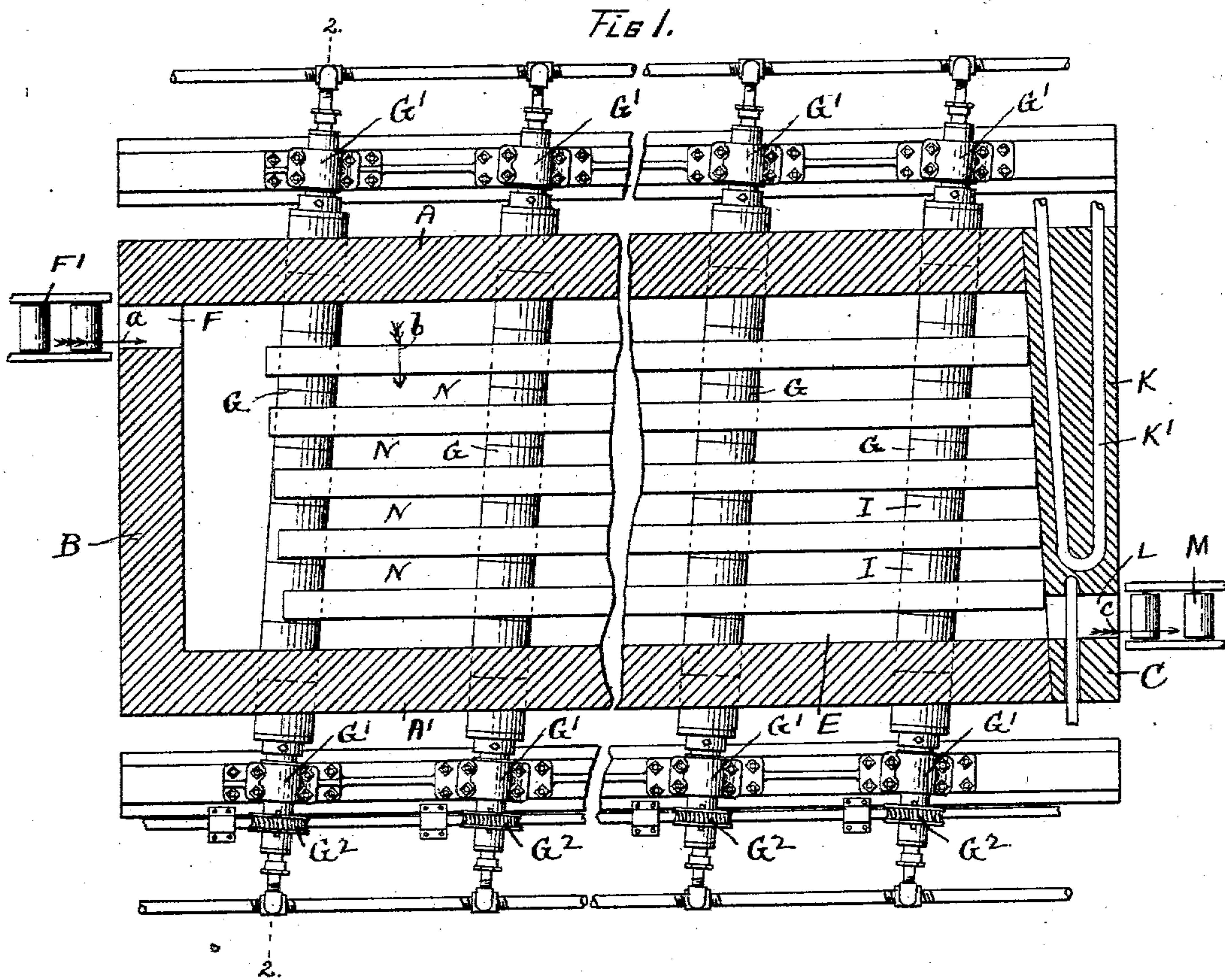
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V. E. EDWARDS.
FURNACE FOR HEATING BILLETS.

APPLICATION FILED NOV. 8, 1901.

NO MODEL.



WITNESSES

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FURNACE FOR HEATING BILLETS.

SPECIFICATION forming part of Letters Patent No. 720,904, dated February 17, 1903.

Application filed November 8, 1901. Serial No. 81,549. (No model.)

To all whom it may concern:

Be it known that I, VICTOR E. EDWARDS, a citizen of the United States, residing in Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Furnaces for Heating Billets, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 represents a furnace for heating billets embodying my invention and shown in sectional plan view by removing the roof of the heating-chamber in order to disclose the heating-chamber and the feed-rolls for moving the billet transversely across the heating-chamber. Fig. 2 is a vertical sectional view on line 2 2, Fig. 1.

Similar reference-letters refer to similar parts in the different views.

The object of my present invention is to provide means for imparting a longitudinal movement to the billet, by which it is carried into the heating-chamber, and also a sidewise movement by which it is moved transversely across the heating-chamber and into a position in alinement with the delivery-opening; and I accomplish this object by the introduction into the heating-chamber of a series of positively-driven rolls having their axes placed obliquely to the sides of the heating-chamber and by providing a stop by which the longitudinal movement of the billet is arrested while supported upon the rotating rolls.

Referring to the accompanying drawings, A A' denote the side walls of the furnace; B, the end wall at the receiving end of the furnace; C, the end wall at the delivery end of the furnace; D, the roof, and E the heating-chamber into which billets are inserted through a receiving-opening F in the end wall B, in front of which are placed conveyer-rolls F'. The billet is entered through the opening F into the heating-chamber E, adjacent to the side wall A, and is supported upon a series of positively-driven rolls G, arranged in a horizontal plane just below the receiving-opening F and having their axes placed obliquely to the axes of the heating-chamber

or to the side walls A A'. The rolls G are supported in bearings G' outside the walls of the furnace, and they are rotated by means of worm-gears G², which are engaged by worm G³, Fig. 2, upon a rotating shaft G⁴. The rolls G are hollow throughout their entire length and are connected at their opposite ends with water-pipes H H', through which a circulation of water from any suitable water-supply is maintained through the interior of the rolls, and the exteriors of the rolls are provided with sectional coverings I, preferably of cast-iron, to protect from injury due to excessive heat or wear. The rolls G pass through openings J in the side walls A A' and extend transversely across the heated chamber, thereby forming a support for the billets.

Inserted in the end wall C in the plane of the billets as they are supported upon the rolls G is a block K, preferably of metal and inclosing a water-pipe K', cast therein to provide for a circulation of water in order to cool the block. The inner surface K² of the block K is arranged in a vertical plane, preferably at an oblique angle to the axis of the heating-chamber, the inclination of the surface K² being opposite to that of the rolls G. The end wall C at the end of the block K and adjacent to the side wall A' is provided with a delivery-opening L, through which the heated billet is delivered from the heating-chamber, preferably upon conveyer-rolls M.

As the billet is entered through the receiving-opening F by an endwise movement in the direction of the arrow *a*, the advancing end of the billet is received on and supported by the rolls G, and the longitudinal movement of the billet in the heating-chamber is continued until its advancing end strikes the inner surface K² of the stop-block K, when a continued rotation of the rolls G will continue the sidewise movement of the billets in the direction of the arrow *b*, causing them to be moved transversely across the heating-chamber until they are brought into alinement with the delivery-opening L. Each of the billets upon striking the stop-block K is moved transversely to the heating-chamber

by a continuous slow but uniform movement, so that the open spaces N between the billets originally produced by the interval between the introduction of each successive
 5 billet through the opening F may be maintained during the movement of the billets transversely across the heating-chamber, thereby allowing hot gases to pass freely between the billets. During the transverse
 10 movement of the billets their surfaces in contact with the rolls constantly vary, so that the cooling of the billets in spots by their contact with the rolls is avoided. The rolls G pass through the heating-chamber at sufficient distance above the bottom O of the
 15 heating-chamber to provide for a free circulation of hot gases beneath the billets and heat is applied uniformly to the top, bottom, and sides of each billet. The shaft G⁴ is rotated by its connection with a steam-engine
 20 or other suitable motive power, (not shown,) and any of the well-known devices for varying the speed of the shaft G⁴, and thereby controlling the speed imparted to the billets in
 25 their transverse movement across the heating-chamber, may be employed. My improved feeding mechanism renders the furnace substantially automatic after the billets have been inserted through the opening F, as the
 30 rolls G not only carry the billets forward into the heating-chamber, but they also move them transversely thereto and longitudinally through the delivery-opening L in the direction of the arrow c, and the amount of heat
 35 imparted to the billets is determined by controlling the speed of the rolls G and varying the time required to move the billets transversely to the heating-chamber.

I have described the feeding mechanism as
 40 employed in connection with a heating-chamber E; but heated billets may be introduced into the chamber E through the opening F and retained in the chamber long enough to allow the heat to be equally diffused through
 45 the entire mass of metal before they are delivered through the opening L, the chamber E in such case serving to prevent the undue cooling of the billets during the period of diffusion.

50 What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a furnace, the combination with an inclosed chamber provided with an opening near one corner of said chamber for the admission of a billet and an opening near the
 55 diagonally opposite corner for the delivery of a billet, of a series of rotating rolls inclosed within said chamber with their upper surfaces in a plane to support billets thereon and having their axes placed obliquely to the line of motion of a billet as it advances through said admission-opening, substantially as described.

2. The combination with an inclosed chamber having an opening at one end for the admission of a billet, and an opening at the opposite end for the delivery of a billet, said

openings being out of alinement, of a series of rotating rolls inclosed within said chamber and between said admission and delivery
 70 openings, said rolls having their axes inclined to the line of motion of a billet as it passes through said admission and delivery openings, substantially as described.

3. The combination with an inclosed chamber having an opening in one of its walls for the admission of a billet by an endwise movement into said chamber at one side thereof, of a series of rotating rolls inclosed in said
 80 chamber with their axes placed obliquely to the line of motion of a billet as it passes through said admission-opening, whereby a longitudinal and a sidewise movement is imparted to a billet, substantially as described.

4. The combination with an inclosed chamber having an opening at one end for the admission of a billet into said chamber and at one side thereof, of a series of rotating rolls arranged to support the billet thereon, and having their axes placed at an oblique angle
 90 to the line of motion of the billet as it passes into said chamber, whereby the billet is moved lengthwise and a stop for limiting the longitudinal movement of the billet, substantially as described.

5. The combination with an inclosed chamber having an opening at one end for the admission of a billet, of a series of rotating rolls inclosed in said chamber, and having their axes placed obliquely to the line of motion of
 100 a billet entering through said admission-opening and a stop for limiting the longitudinal movement of the billet, said stop having a contacting surface placed obliquely to the line of longitudinal motion of the billet, but
 105 at an angle opposite to that formed by said rolls, substantially as described.

6. The within-described mechanism for moving a billet by synchronous movements lengthwise and crosswise the inclosed chamber of a furnace, and comprising a series of
 110 rotating rolls with their axes placed obliquely to said chamber and means for limiting the lengthwise movement of the billet, substantially as described.

7. The combination with an inclosed chamber having an opening at one end for the admission of a billet by a longitudinal movement, and an opening at the opposite end for the delivery of a billet by a longitudinal movement in the same direction, with said openings out of alinement, of a series of rolls adapted to support a billet as it moves from the admission to the delivery opening and means for rotating said rolls at a predetermined speed, said rolls having their axes placed obliquely to the line of longitudinal motion of the billet, whereby they are moved lengthwise and crosswise to said chamber with spaces between the billets supported on
 120 said rolls determined by the interval between the introduction of successive billets, substantially as described.

8. The combination with an inclosed chamber

ber of a series of feed-rolls inclosed in said chamber and having their axes placed obliquely to the side walls of the chamber and adapted to support a series of billets thereon, 5 and sectional, removable, outer shells or coverings for said rolls, substantially as described.

10 9. The combination with an inclosed chamber having an opening for the admission of billets thereto, of a series of feed-rolls inclosed in said chamber and adapted to support a series of billets thereon, said feed-rolls hav-

ing their axes placed obliquely to the billets supported thereon, and means for rotating said rolls whereby lengthwise and sidewise 15 movements are synchronously imparted to the billets, and their area of contact with the rolls constantly varied.

Dated this 30th day of October, 1901.

VICTOR E. EDWARDS.

Witnesses:

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