

No. 653,481.

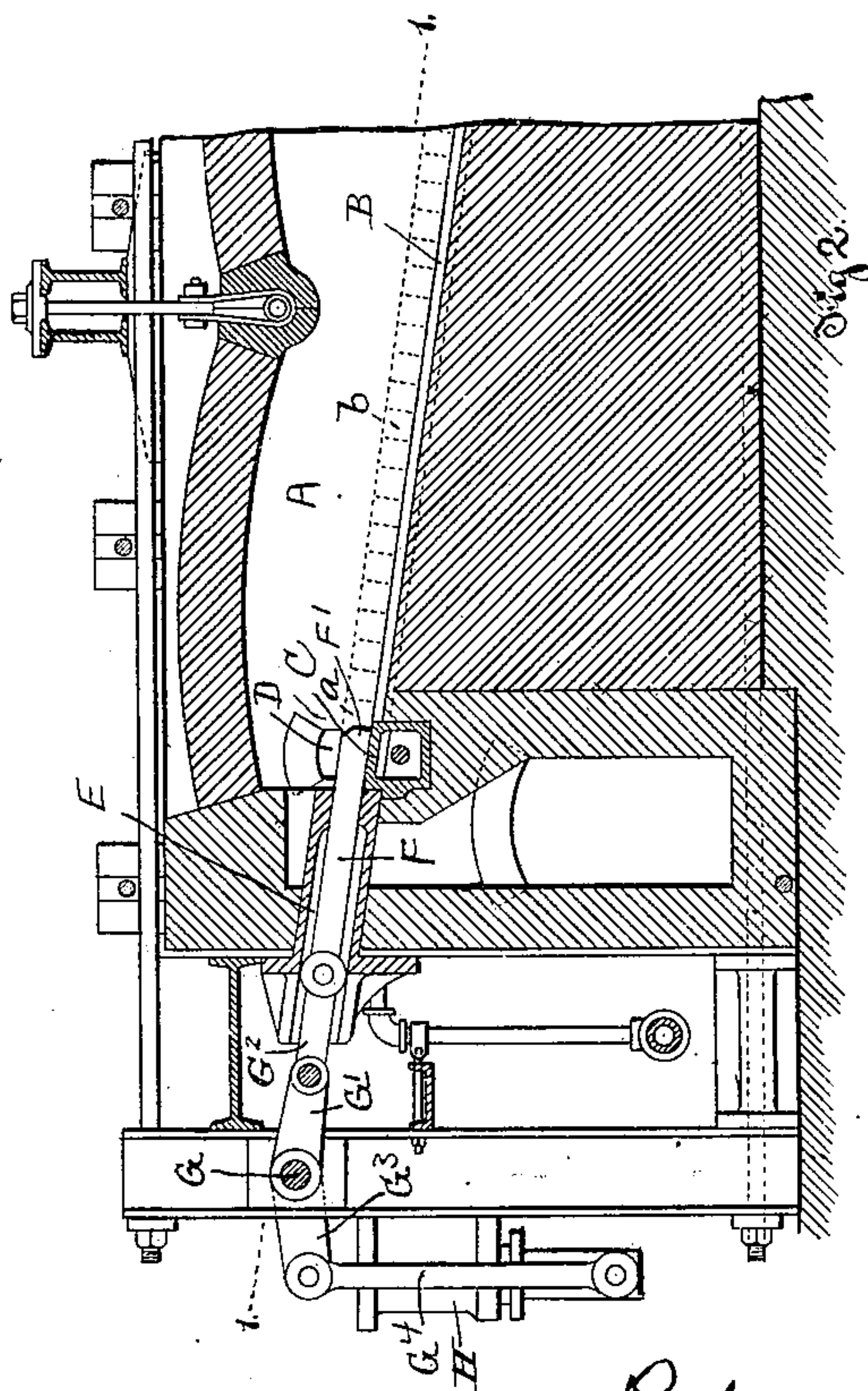
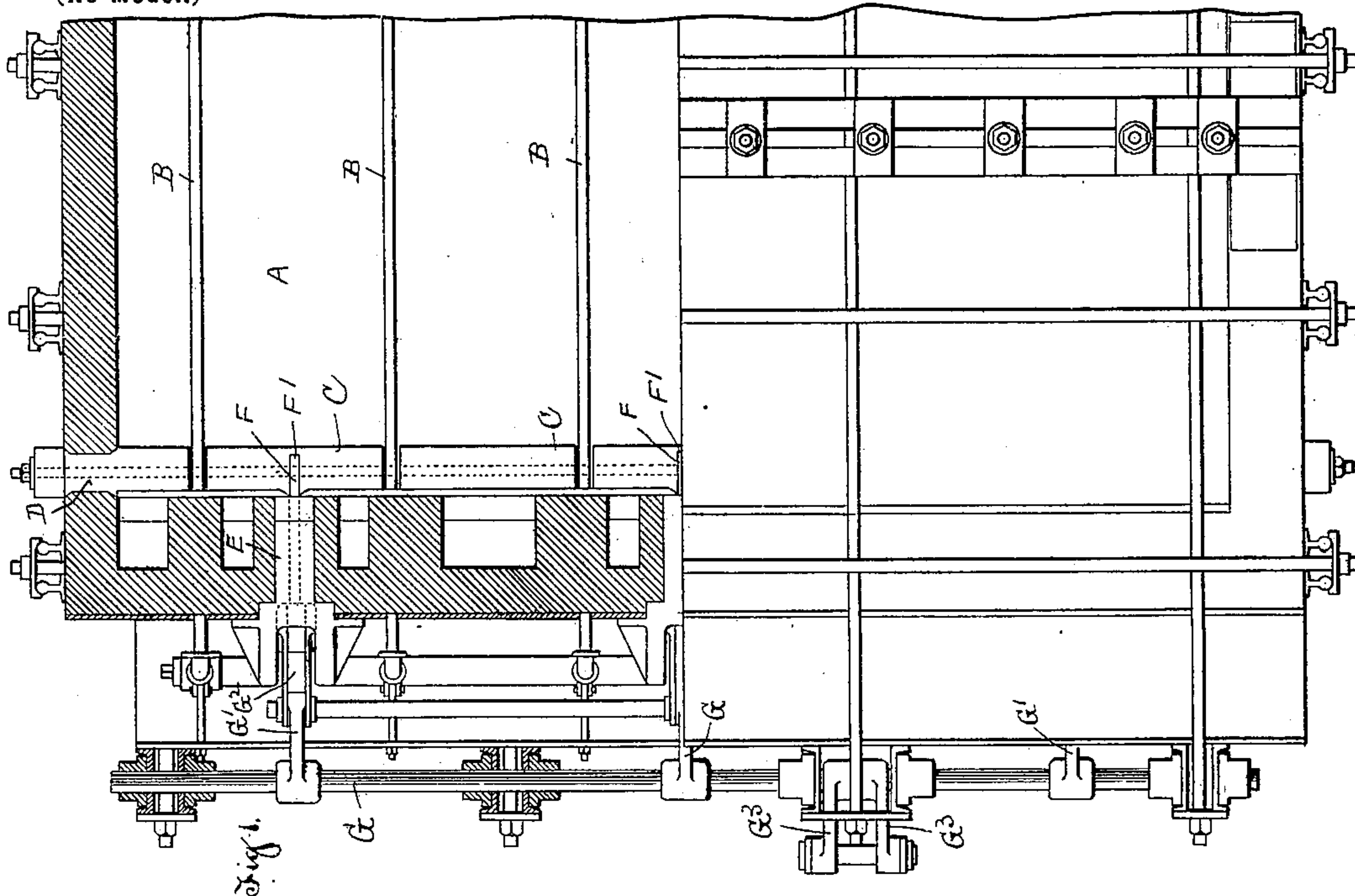
Patented July 10, 1900.

C. H. MORGAN.

MECHANISM FOR FEEDING BILLETS FROM THE CHARGING TO THE DELIVERY
ENDS OF FURNACES.

(Application filed Mar. 12, 1900.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

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MECHANISM FOR FEEDING BILLETS FROM THE CHARGING TO THE DELIVERY ENDS OF FURNACES.

SPECIFICATION forming part of Letters Patent No. 653,481, dated July 10, 1900.

Original application filed May 7, 1894, Serial No. 510,414. Divided and this application filed March 12, 1900. Serial No. 8,266. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. MORGAN, a citizen of the United States, and a resident of Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Mechanism for Feeding Billets from the Charging to the Delivery Ends of Furnaces, of which the following is a specification, accompanied by drawings forming a part of the same, the present application forming a division of the application filed by me on or about the 7th day of May, 1894, Serial No. 510,414, for an improvement in reverberatory furnaces.

Figure 1 of the accompanying drawings represents a top view of the charging end of a furnace for heating billets, one-half being represented in sectional view on line 1 1, Fig. 2, showing a mechanism embodying my invention for feeding billets from the charging to the delivery end of the heating-chamber. Fig. 2 is a central vertical sectional view of the charging end of a furnace.

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

My invention relates particularly to a feeding mechanism by which billets which have been entered into the heating-chamber of a furnace are pushed either upon a longitudinal track or upon the floor of a furnace from the charging to the delivery end of the heating-chamber; and it consists in the employment of a series of pushing-bars having a longitudinal reciprocating motion and passing through openings in the walls of the heating-chamber, which are restricted in their cross-section to substantially the size in cross-section of the pushing-bars, so that the pushing-bars substantially fill the openings.

For the purpose of illustrating the nature of my invention and the method of putting the same in practice I have represented in the accompanying drawings a reverberatory furnace provided with a heating-chamber A, into which the billets to be heated are introduced at one end of the chamber and successively fed by a mechanical pushing mechanism toward the opposite or delivery end of the chamber, either upon the floor of the heating-chamber or, as shown in the present

instance, upon water-pipes or skids B, forming a longitudinal track through the heating-chamber. At the charging end of the furnace and adjacent to its end wall I preferably place a sole-plate C, adapted to receive the billets to be heated, which are in the present instance inserted into the heating-chamber A by an endwise movement through a charging-opening D in the side wall of the chamber. The end wall of the furnace next the sole-plate C is provided with a series of openings E to receive a series of pushing-bars F, which are capable of a longitudinal reciprocating motion through connected actuated mechanism, comprising in the present instance a rocking shaft G, having arms G' connected by links G² with the pushing-bars F and having arms G³ connected by links G⁴ with a reciprocating piston inclosed in a hydraulic cylinder H, by which the rocking shaft G is oscillated and a reciprocating motion imparted to the pushing-bars F.

The openings E are restricted in size and are but slightly larger in cross-section than the area in cross-section of the pushing-bars F, so that the openings E are substantially filled at all times by the pushing-bars. The reciprocating movement of the pushing-bars F is slightly greater than the thickness of the billets upon the sole-plate C, and at the backward reciprocating movement of the pushing-bars the tips F' of the bars are drawn back into the openings E in the end wall of the furnace only far enough to provide a clear space along the sole-plate C for the insertion of a billet, so the openings E are substantially filled at all times by the pushing-bars. When a billet has been inserted upon the sole-plate C, the forward movement of the pushing-bars F pushes the billet off the sole-plate upon the water-pipes or skids B into the position shown by the first billet *a* in the row of billets indicated by the broken lines *b* in Fig. 2. The pushing-bars F are then drawn back and a second billet inserted, when the forward movement of the pushing-bars is again repeated and the billet pushed forward toward the delivery end of the furnace, moving the adjacent billet along the pipes or skids B, and as each succeeding billet is inserted the entire series of billets ly-

ing on the water-pipes or skids B are simultaneously moved along one step nearer the delivery end of the furnace, and the several billets as they approach the end of the track
5 are received upon a horizontal hearth, from which they are removed through an opening in the side wall of the furnace in the usual and well-known manner in furnaces of this class.

10 In the furnace forming the subject of the accompanying drawings I have represented an opening D in one of the side walls of the furnace for the admission of a billet by an
15 endwise movement as a convenient means for inserting a billet in the heating-chamber in front of the tips F' of the reciprocating pushing-bars F. I do not, however, wish to confine myself to this method of inserting a billet in front of the pushing-bars, as the method
20 of entering billets into the heating-chamber of the furnace forms no part of my present invention, it having been described in my application for Letters Patent of the United States, Serial No. 510,414, of which the present
25 application is a division.

My present invention relates solely to the employment of openings in the wall of the heating-chamber and a series of reciprocating pushing-bars passing through said openings
30 and having a reciprocating motion therein, with the area in cross-section of the pushing-bars substantially equal to the area in cross-section of the openings, whereby the escape of heat from and the admission of outside
35 air to the heating-chamber of the furnace is substantially prevented, as the pushing-bars are not withdrawn during this reciprocating movement from the openings in the wall of the furnace. As the pushing-bars F and
40 their openings E are restricted in their cross-section to an area much less than that of the side of the billet, I employ a series of pushing-bars, three being shown in the present instance, all operated by the rocking
45 shaft G and a common actuating mechanism. I do not, however, limit myself to any particular number of pushing-bars, as the number may be increased from one up, depend-

ing upon the width of the furnace; but I prefer to use a series of narrow pushing-bars distributed along the length of the billet. 50

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

1. In a furnace for heating billets, the combination with a heating-chamber provided 55 with a series of restricted openings in one of its end walls, of a pushing mechanism consisting of a series of pushing-bars substantially of the same area in cross-section as said openings and capable of a longitudinal
60 sliding motion in said openings and mechanism by which said pushing-bars are simultaneously moved, substantially as described.

2. In a furnace for heating billets, the combination with a heating-chamber provided 65 with an opening in one of its end walls, of a pushing-bar substantially equal in its cross-section to the cross-section of said opening, and mechanism for imparting a longitudinal, reciprocating motion to said bar in said opening, by which the end of said bar is moved
70 forward to push the billet toward the opposite end of the heating-chamber and backward to provide a space for the introduction of another billet, with the end of said bar
75 held in said opening at the end of its backward movement, in order to keep said opening closed during the introduction of the billet to the heating-chamber, substantially as
80 described.

3. In a furnace for heating billets, the combination with a heating-chamber having restricted openings in one of its end walls for longitudinally-sliding pushing-bars, and an opening for the admission of a billet in front 85 of said pushing-bars, of pushing-bars entering said restricted openings and substantially closing the same, substantially as described.

In testimony whereof I have signed my name to this specification, in presence of two 90 subscribing witnesses, this the 15th day of February, 1900.

CHAS. H. MORGAN.

Witnesses:

AVA T. MURPHY,
RUFUS B. FOWLER.