

(No Model.)

F. H. DANIELS.

APPARATUS FOR CHARGING BILLETS, BARS, &c., INTO FURNACES.

No. 385,249.

Patented June 26, 1888.

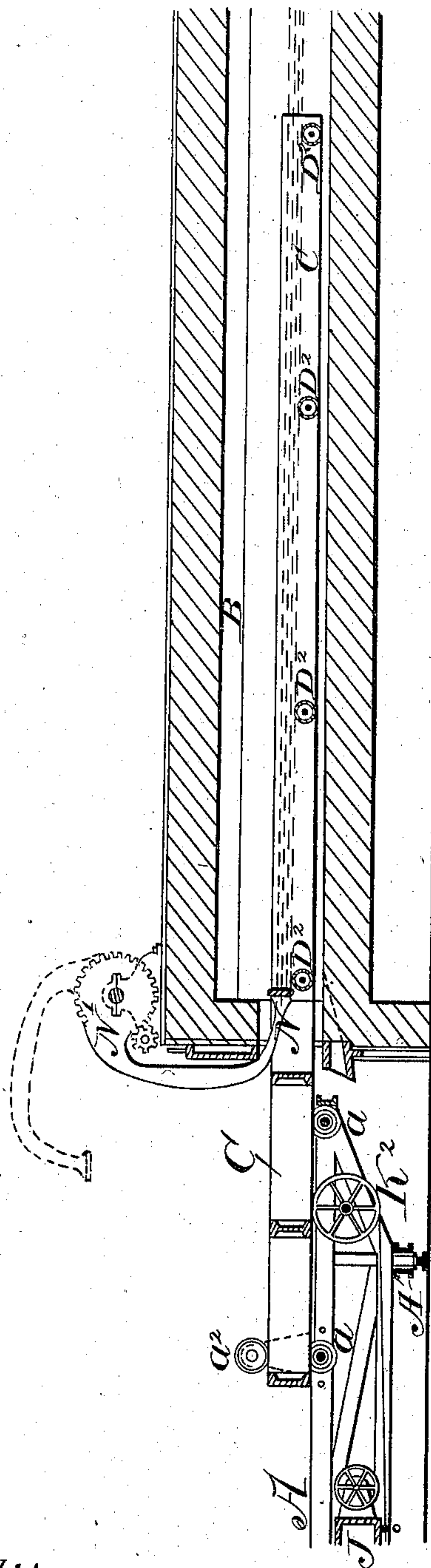


Fig:1.

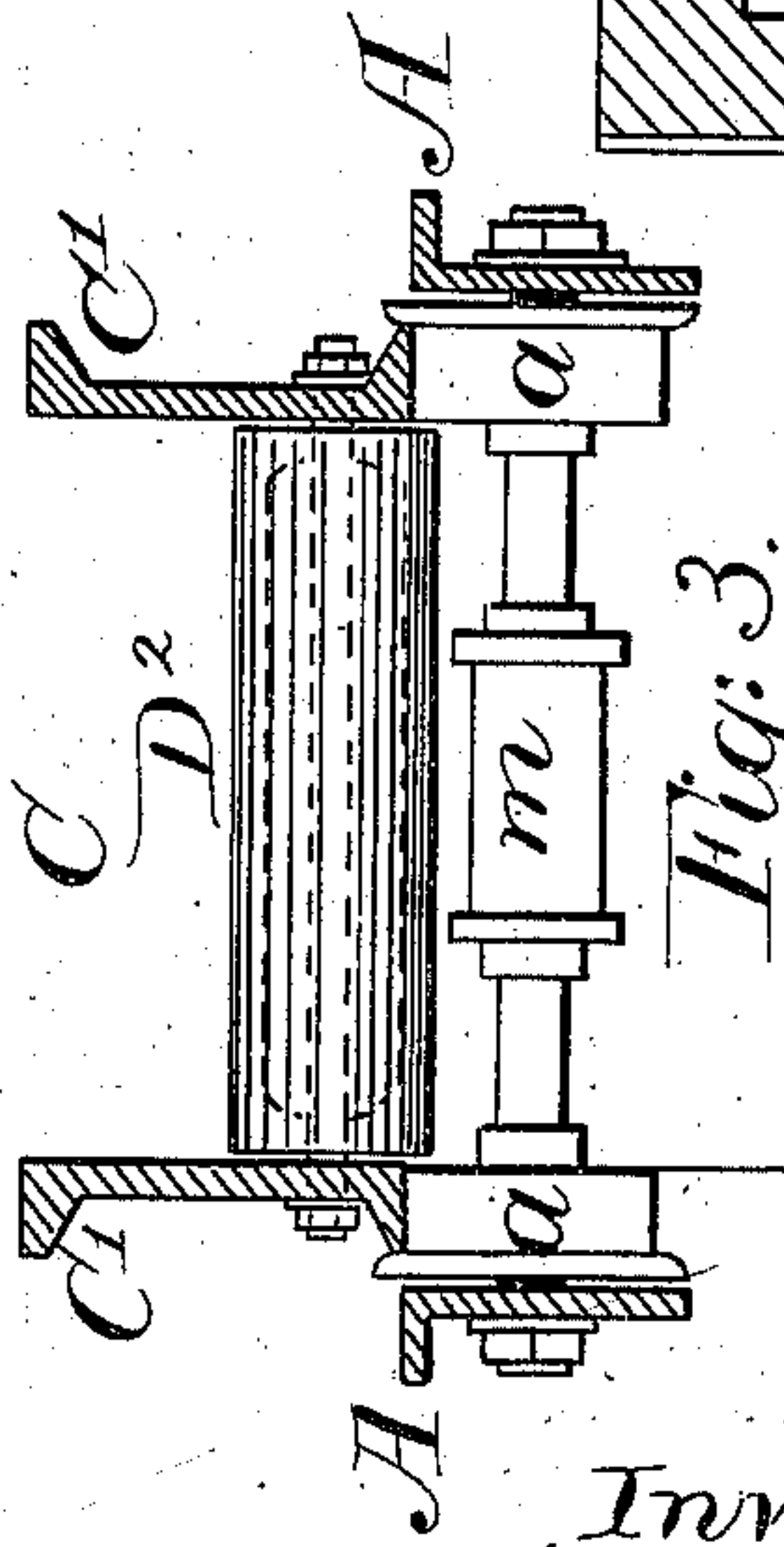


Fig:3.

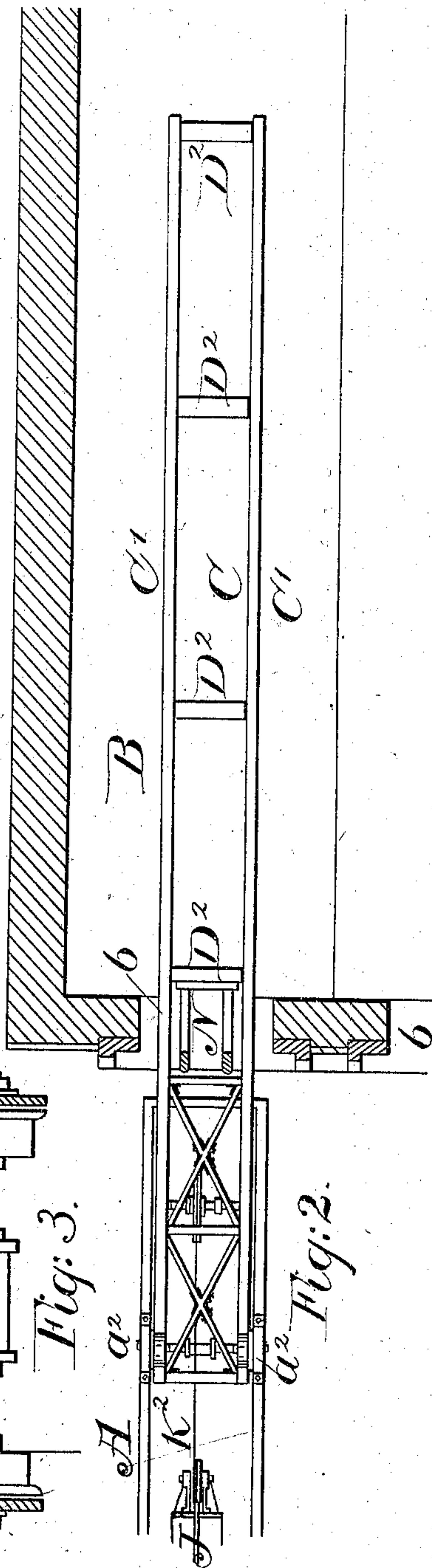


Fig:2.

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# UNITED STATES PATENT OFFICE.

FRED H. DANIELS, OF WORCESTER, MASSACHUSETTS.

## APPARATUS FOR CHARGING BILLETS, BARS, &c., INTO FURNACES.

SPECIFICATION forming part of Letters Patent No. 385,249, dated June 26, 1888.

Application filed November 10, 1887. Serial No. 254,782. (No model.)

*To all whom it may concern:*

Be it known that I, FRED H. DANIELS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Charging Billets or Bars into Heating-Furnaces, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of my present invention is to provide, in an apparatus for charging billets or bars of metal into a heating-furnace, an overhanging carrier for introduction of the material into the furnace without contact with the hearth; also, to provide means for preventing the tipping of the forward end of the carrier when advanced into the furnace.

Another object is to provide a stop or barrier to operate adjacent to the furnace entrance or in rear of the charge for forcing the charge from its supports on the carrier or effecting its deposit within the furnace.

These objects I attain by mechanism, the nature of which is herein illustrated and explained, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a vertical sectional view of such parts of a furnace and charging apparatus as will show the nature of my invention. Fig. 2 is a plan view of the same, and Fig. 3 is a transverse section of the charging-carrier and top of the support-frame.

Referring to parts, A indicates the supporting-frame, which is made of suitable form to support the operative parts, and B indicates the furnace into which the material is to be charged, which furnace may be of the ordinary well-known kind as employed in rolling-mill plants. The upper part of the frame is provided with a series of guiding-rolls,  $a$ , on which the carrier C is supported as it runs forward and back, the frame being of sufficient length to uphold the carrier when it is run out of the furnace. The carrier consists, preferably, of two long beams,  $C'$ , arranged at the desired distance apart, and connected by rigid bracing near their rear ends, and having between them a series of transverse supports,  $D^2$ , upon which

the billets or materials to be charged are laid. These supports are in the present instance metal rolls rotatably journaled in connection with the respective beams  $C'$ , as indicated. Suitable counter supporting-rolls,  $a^2$ , are fixed to the main supporting-frame to overcome or resist the upward tendency of the rear end of the carrier when its load is projected forward into the furnace to such an extent that the leverage would tend to lift the rear extremity. The rolls  $a^2$  extend over the beams  $C'$ , and are firmly connected by their supporting-brackets with the frame A, thereby preventing any upward movement of the rear end of the carrier.

The carrier C is advanced into and retracted from the furnace longitudinally by means of a chain belt running on wheels  $K^2$  and guide-sheaves  $m$ , or by any other suitable operating mechanism adapted to give reciprocative action to the carrier. As the carrier C, with its load, is advanced into the furnace-chamber, it moves forward without contact with the furnace-hearth or other part of the furnace, the beams projecting or overhanging, as shown in Fig. 1, being supported by the frame A and its rolls  $a^2$  at proper level and in proper lateral alignment.

N indicates a removable or adjustable barrier adapted to be entered into the mouth or door  $b$  of the furnace in rear of the load of billets, (which are indicated by dotted lines I in Fig. 1,) for the purpose of preventing backward movement of the charge of billets, or any of them, when the carrier is retracted. Said barrier in the present instance is supported upon a shaft that works in bearings fixed to the wall of the furnace or to a frame adjacent thereto, so as to swing up and down for carrying the engaging end of the barrier to and from working position. A gear and pinion, as at  $N'$ , or other suitable mechanism, is combined with said barrier for moving it to and from working position at will and under control of the operator.

In some instances the projecting portion of the charge-carrier C may be made shorter than the material to be charged, the billets being permitted to extend forward past the end of the carrier, not far enough, however, to give their forward ends preponderance.

In the operation, while the carrier is at re-



tracted position, the billets or materials to be charged are placed upon the charger between the beams C', resting upon the rolls D<sup>2</sup>. The carrier is then advanced and its forward end 5 containing the load or charge is projected into the furnace. The barrier N is then dropped or swung down, so as to introduce it at the entrance of the furnace in rear of the billets. The carrier is then retracted, while the barrier 10 prevents backward movement of the charge. Hence the rolls D<sup>2</sup> are drawn out from beneath the load, thus depositing and leaving the billets within the furnace.

The apparatus may be made for charging 15 from one to forty billets at a time, as desired. The side bars, C', may be of channel beams or other suitable shapes of metal bars, of a size and strength suitable to meet the requirements of service in any particular case.

20 In cases where it is desired to shift the carrier from one position to another wheels A' may be provided for supporting the frame upon the floor, ground, or platform in front of the furnace.

25 In lieu of making the barrier N to swing up and down on an axial shaft, it may in some instances be arranged to slide to and from its working position, suitable guides being provided for directing its course of movement.

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

1. In apparatus for charging heating furnaces, the combination, with the furnace and the guiding-frame, of a charge-carrier composed 35 of longitudinal beams and transverse supporters, adapted to overhang from said frame when in advanced position, and means for imparting movement to said carrier, to project the load forward into the furnace without contact with the hearth or other portion 40 thereof, as hereinbefore set forth.

2. In apparatus for charging heating fur-

naces, the combination of a reciprocating carrier, adapted to support a charge of billets and carry forward the same into a heating-furnace, 45 and an adjustable barrier adapted to be introduced at the rear of the charge of billets, to prevent backward movement of the same when the charging-carrier is withdrawn from the furnace. 50

3. In an apparatus for charging heating-furnaces, the combination, with the furnace, of the supporting-frame provided with guiding-rolls, the reciprocating carrier-beams having between them rotatable transverse sup- 55 porters, whereon the billets or charge is placed and supported while advanced into the furnace, and a stop or barrier that engages with the charge and effects the deposit thereof within the furnace, substantially as set forth. 60

4. In a charging apparatus, in combination with a heating-furnace, a charge-carrier, an adjustable barrier adapted to be introduced at the furnace-entrance in rear of the charge or 65 billets on said carrier, and mechanism for elevating and depressing said barrier into and from the furnace-entrance, substantially as set forth.

5. In a charging apparatus, the combination of an overhanging charge-carrier mounted for 70 reciprocative action, having guides for said carrier, a supporting-frame, and a counteracting guide or roll, as  $a^2$ , connected with said frame, for sustaining the rear end of said charge-carrier against upward movement when 75 the charger is projected forward, substantially as set forth.

Witness my hand this 15th day of October, A. D. 1887.

FRED H. DANIELS.

Witnesses:

CHAS. H. BURLEIGH,  
ELLA P. BLENUS.