

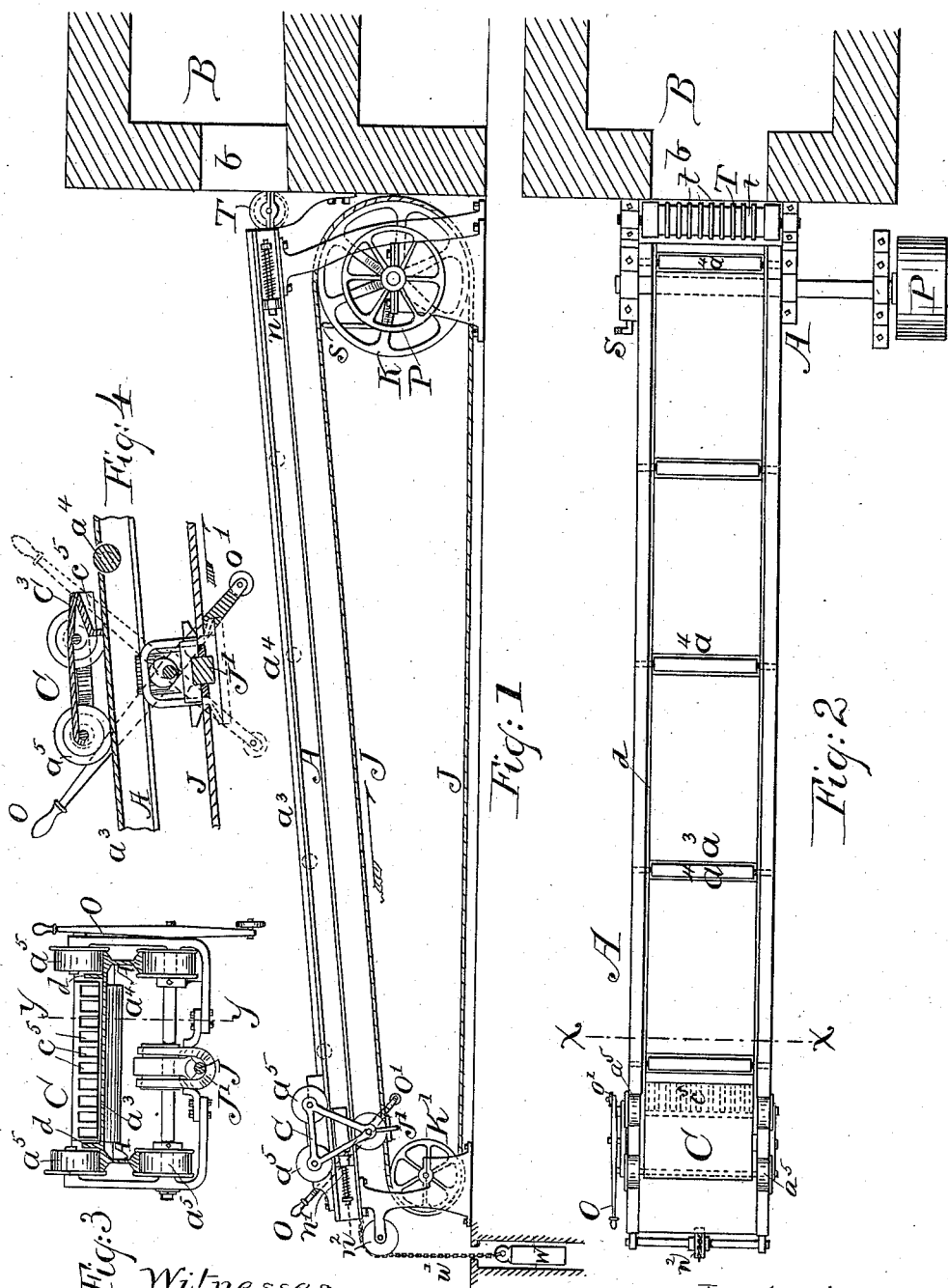
(No Model.)

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

No. 385,250.

Patented June 26, 1888.



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

SPECIFICATION forming part of Letters Patent No. 385,250, dated June 26, 1888.

Application filed November 10, 1887. Serial No. 254,783. (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 an improved apparatus for charging metal bars or billets into heating-furnaces, having means for guiding the bar or bars and an endless cable or actuating-belt for propelling or carrying forward the billets, as more fully hereinafter described; also, to afford, in connection with the guiding and charging devices, a gripping-clutch or facilities for clutching the charger to the operating belt or cable for putting the mechanism into action; also, to provide facilities for automatically releasing the grip when the charger has reached the desired limit of action. These objects I attain by mechanism the nature and operation of which are explained in the following description, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a side view of a furnace-charging mechanism illustrating my invention. Fig. 2 is a plan view of the same. Fig. 3 is a transverse section at line *x x*, Fig. 2; and Fig. 4 is a vertical section at line *y y*, Fig. 3.

Referring to parts, A denotes the frame or charging-way, provided with a top or platform, *a*³, and preferably having transversely-disposed rolls *a*⁴ at convenient intervals, which rolls can turn loosely in suitable bearings on the frame.

B indicates the furnace, into which the billets or material is to be charged, which furnace may be of the kind ordinarily employed for heating billets for delivery to rolling-mills.

C indicates the charging head or carrier for forcing the billets forward into the furnace. Said carrier is arranged to move forward and backward along the charging-way, and is preferably provided with flanged guiding and sup-

porting wheels *a*⁵, that run on the rails or side bars of the frame, one pair of said wheels being below the rails, so that the carrier cannot lift from the charging-way while being propelled forward.

An endless belt or cable, J, preferably of wire rope, is provided for advancing the carrier along the charging-way, said carrier being provided with a clutching mechanism for gripping and releasing the cable as required to effect movement of the carrier. The charging-way is placed in front of the entrance *b* of the furnace B, and is preferably inclined, as indicated, for the double purpose of directing the billets upward as they are projected into the furnace and for inducing the carrier to run back by gravity.

The driving belt or rope J is disposed beneath or adjacent to the carrier, so as to run parallel, or substantially so, with the direction of the carrier-guiding tracks on the frame. Said rope J is supported on suitable pulleys, K and K', one of which is combined with mechanism for transmitting the motion or driving power thereto—as, for instance, by a belt running on a pulley, P, fixed to the shaft of wheel K—or, if preferred, other well-known mechanical means may be employed to effect equivalent action. The cable or belt J runs in the direction indicated with a continuous motion. The gripping mechanism J' of the carrier C is furnished with a hand-lever, O, whereby it can be conveniently operated for seizing and releasing the rope J.

A guide device or roll, T, is arranged adjacent to the entrance-door *b* of the furnace B for supporting and directing the billets at that position. Said roll is fitted with a groove or series of grooves, *t*, extending around its circumference and made of a size convenient for receiving and properly supporting the billets, bars, or material to be charged into the furnace.

The carrier C is made with a front piece, barrier, or plate, C³, having a forwardly-overhanging top for engaging the ends of the billets, said plate C³ being preferably divided into a series of recesses or pockets, *c*⁶, each of a size and form adapted for the reception of the end of a billet. These recesses *c*⁶ correspond in number and alignment with the guiding-

grooves t in the roll T, so that a billet stepped in one of said recesses and resting in a corresponding groove of the roll T will, when projected forward, be guided in a direct and proper course into the furnace. The charging-way is preferably provided with side flanges, $d d$, which serve as fenders for keeping the material from being forced off at either side of the way.

Spring-buffers n and n' , fixed on the frame A at the respective ends or limits of the carrier movement, serve to stop the motion of the carrier without undue shock.

A stop device, S, near the head of the frame, and arranged for engagement with a lug or anti-friction roll, O', on an arm of the clutch-operating lever O, serves for throwing off the grip on the operating cable or belt when the carrier C has reached the desired extent of advance movement.

A weight, W, when desired, is combined with the carrier C for facilitating the backward movement of the same. Said weight can be arranged in a well or pit and connected to the carrier C by a chain, w' , passing over a sheave, n^2 , substantially as indicated in Figs. 1 and 2.

In the present instance the charger is shown as adapted for charging from one to ten billets at a time, there being ten pockets, c^5 , and ten grooves, t , in the roll T. I do not, however, wish to confine the invention to any particular number of grooves and pockets, as the capacity of apparatus can be made more or less to meet the requirements of different situations, conditions, or work.

In the operation the billet or charge is placed on the platform or rolls a' of the charging-way, the forward end of each billet resting in a groove, t , on the roll T, while the rear end is stepped into a corresponding pocket, c^5 , in the front of the carrier C or placed in front thereof to be engaged by the carrier in its forward movement. The attendant then swings back the lever O, clutching the grip of the carrier onto the rope J. The action of the rope then moves the carrier forward along the supporting way or frame A and thereby projects the billet into the furnace. When the carrier C has reached its forward limit of action, the lower end, O', of the clutch-operating lever O strikes the stop-guard S and is swung backward, as indicated by dotted lines, Fig. 4, thereby releasing the clutch from the rope J as the carrier reaches the buffer n . The momentum of the carrier is overcome and backward impetus imparted thereto by the spring-buffer n' , and the carrier is immediately retracted or run backward down the inclined way by its own gravity or by aid of the weight W, connected therewith. The stop or spring-buffer n' arrests the backward movement of the carrier when it has reached its normal position. The momentum imparted by the forward movement of the carrier is sufficient to throw the billets beyond the roll T and into the furnace B to some distance, thus depositing them on the hearth at such position as desired.

The distance to which the billets are projected can be regulated by variation in the degree of speed at which the cable J is operated.

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

1. The combination, with a furnace for heating billets preparatory to rolling them into wire rods, hoops, or other small shapes, of a stationary charging-way provided with a roller table or platform, a carrier running on guides along said way and having a front plate for engaging the rear ends of the billets for projecting them forward, a guide for directing the billets to their place of deposit within the furnace, and means for imparting motion to said carrier, substantially as set forth.

2. In an apparatus for charging billets or bars into a heating-furnace, the combination of a stationary charging-way whereon the billet is received, a movable carrier having a head-plate for projecting the billets forward into the furnace, an operating belt or cable for imparting motion to said carrier, a grip-clutch for connecting and releasing said carrier and cable, and a guide adjacent to the furnace-entrance for directing the billets, substantially as set forth.

3. The charging-way disposed with its platform and guide-bars upwardly inclined toward the furnace-entrance, in combination with the carrier having its traveling rolls mounted on said inclined guides for operation, as set forth, whereby retractive action is attained by permitting the carrier to roll down the incline after the billet has been projected forward into the furnace.

4. The combination, with a heating-furnace, of an inclined charging-way having charge-supporting rolls and guide-tracks, the carrier mounted to travel on said tracks, an endless cable or operating-band, a grip-clutch for connecting said carrier and cable, a clutch-operating lever, and an automatic trip mechanism for releasing said grip, substantially as set forth.

5. In a charging apparatus, a carrier having a series of recesses or pockets for separately receiving the several billets, in combination with a charging-way and means for advancing said carrier for projecting the billets forward into the furnace.

6. In a charging apparatus, the combination of a charging-way whereon the billets are placed, the carrier C, provided with a series of pockets or depressions, c^5 , for engaging and confining the ends of the respective billets, a grooved guiding-roller adjacent to the furnace-entrance, the guiding-spaces of which correspond in alignment with the pockets in said carrier, and means for advancing and retracting said carrier, for the purpose set forth.

7. In a charging apparatus for charging billets into a heating-furnace, the combination, with a charging way or guide, a carrier for projecting the billets forward, and an endless operating-band, of a grip-clutch for connecting and releasing said carrier to and from the

driving-band, and a retracting-weight connected with said carrier for returning it to normal position, substantially as set forth.

5 8. The charging-way having side flanges, *d*, in combination with the carrier C, having a front plate for propelling the billets or bars arranged to run along the charging-way between said flanges, and a roll having guiding-grooves *t*, for directing the bars into the entrance of the furnace.

10 9. The combination, with the charging-way

and the carrier mounted for traveling forward and backward thereon, of the automatic clutch-releasing device, the retracting-weight, and elastic buffers, substantially as and for the purpose set forth.

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

FRED H. DANIELS.

Witnesses:

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