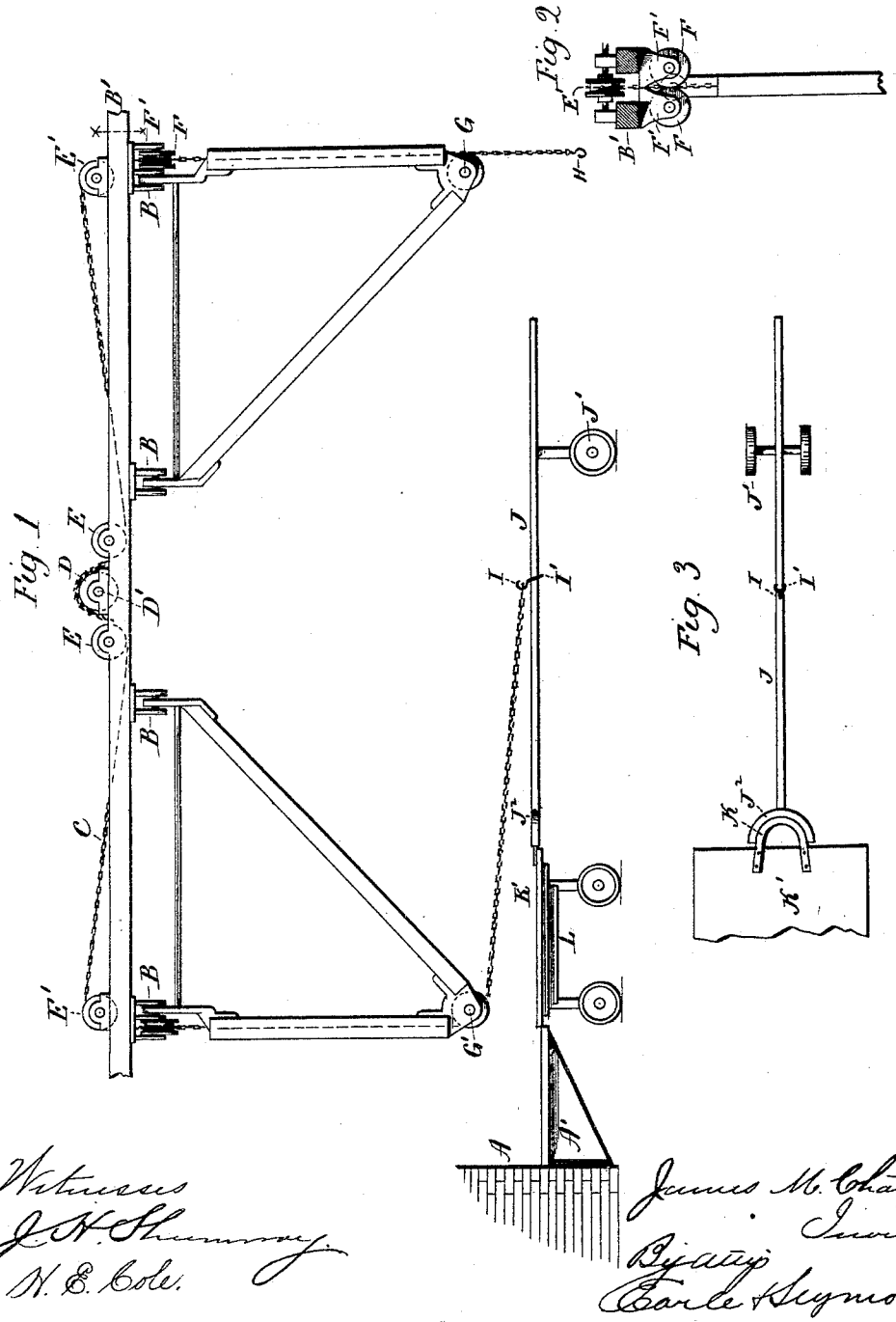
(No Model.)

J. M. CHATFIELD.

APPARATUS FOR CHARGING AND DISCHARGING ANNEALING FURNACES.

No. 491,768. Patented Feb. 14, 1893.



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UNITED STATES PATENT OFFICE.

JAMES M. CHATFIELD, OF THOMASTON, CONNECTICUT.

APPARATUS FOR CHARGING AND DISCHARGING ANNEALING-FURNACES.

SPECIFICATION forming part of Letters Patent No. 491,768, dated February 14, 1893.

Application filed August 1, 1892. Serial No. 441,839. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. CHATFIELD, of Thomaston, in the county of Litchfield and State of Connecticut, have invented a new Improvement in Apparatus for Charging and Discharging Annealing-Furnaces; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in side elevation of an apparatus constructed in accordance with my invention and designed for loading and unloading a single-ended annealing furnace. Fig. 2, a view in vertical section, on the line *x*—*x* of Fig. 1, of one of the swinging frames. Fig. 3, a plan view of the mounted thrust-rod as engaged with a tray for pushing the same into the furnace.

My invention relates to an improved apparatus for charging and discharging single and double-ended annealing furnaces, the object being to simplify and facilitate those operations, reduce the amount of manual labor required for them, and locate the apparatus where it will be out of the way, and give a free use of the floor around the furnace.

With these ends in view, my invention consists in an apparatus having certain instrumentalities, and details of construction as will be hereinafter described and pointed out in the claims.

The furnace A, is of ordinary construction, and furnished with but one door, which is not shown, for charging and discharging. It is provided with the usual platform A′. Above the furnace and preferably suspended from the roof of the foundry, I suspend two frames in line with the furnace-door, and arranged to be swung laterally to the same, so as to cover its width, for it will be understood that the furnace receives two trays or rows of trays side by side, the door of the furnace being thereto made correspondingly wide. The said frames are located in line with each other, but are reversed in position. As herein shown they are suspended from brackets B, depending from a heavy beam B′. It will not be necessary to detail the construction of these frames, as it may vary, but it may be observed that they are hung with their longer sides facing each other.

A chain C, passing over a sprocket-wheel D, extends down under the sheaves E, E, located on opposite sides of the said sprocket-wheel with which they keep the chain engaged, and thence in line with the said beams and frames, and over the sheaves E′, E′, which are substantially in line with the upright sides of the frames. The sprocket-wheel D, is mounted on a driven shaft D′, provided with clutch mechanism which is not shown, and having suitable power connections adapting it to be driven in either direction. From the sheaves E′, E′, the ends of the chain pass downward, respectively, through two pairs of sheaves F, F, mounted in bearings F′, F′, (Fig. 2) depending from the said beam B. From the sheaves F, F, the ends of the chain respectively pass down over the sheaves G, G, mounted in the extreme lower ends of the frames, which the chain pulls against when in use as the points of purchase. As shown I have provided one end of the chain with a simple hook H, while its other end is connected with a hook I, offsetting from a clutch-ring I′, slipped over the round thrust-rod or pole J. The said rod is mounted to the rear of its longitudinal center upon a single pair of truck wheels, J′, and has its forward end furnished with a fork J^2. The clutch-ring I′, before mentioned, is adapted in size to slip freely on the pole when held at a right angle thereto, but made so small that when tilted it will cramp upon and clutch the rod so that the harder it is pulled upon, the tighter it will grip the rod. The fork J^2 of the pole is conformed to the shape of the bridles or loops K, attached to the trays K′, each tray being provided at one end with a bridle or loop, by means of which it is handled. The trays are brought to, and taken away from, the furnace door, by a truck L, corresponding in height to the platform A′.

In charging the furnace, a loaded tray is backed up to the platform, on the truck. Then the end of the chain which passes over the swinging frame adjacent to the furnace, is connected with the hook offsetting from the clutch-ring on the thrust-rod. Now if the sprocket-wheel D, is started so as to draw in the said end of the chain, the mounted thrust-

rod will be drawn toward the furnace door, pushing the tray over the truck and platform and into the furnace, the load being borne by the lower end of the said frame, which at this time is swung to one side or the other from plumb, according to which side of the furnace the tray is to be pushed into. To discharge the furnace the end of the chain passing over the other frame is drawn out, and by means of a poker or other convenient tool the hook at its end is connected with a tray in the furnace. The sprocket-wheel D, is then operated to draw in the chain, whereby the tray is drawn out of the furnace, and over the platform thereof, onto the truck abutted against the same, the load being this time borne by the lower end of the frame last mentioned, which will be swung to one side or the other from a plumb line, according to the position of the tray to be drawn out of the furnace. It will thus be seen that by employing two frames located in line and reversed in position that I can readily charge and discharge a single-ended furnace in such a manner as to reduce the amount of labor required, and the exposure to the fierce heat of the furnace.

In adapting my invention to the charging and discharging of double-ended furnaces, I employ only one swinging frame, that being arranged with relation to the furnace the same as the right hand frame of Fig. 1 of the drawings. In double-ended furnaces the trays are coupled together in line as is well known, the line being preserved by attaching a tray to its rear end when a tray of annealed metal is detached from its forward end. It will therefore be apparent that by connecting the end of the chain with the foremost tray in the furnace, the line may be drawn through the same, and the foremost tray detached, after which the chain will be connected with the next tray behind, and so on. I have not made a special illustration of this use of my invention, as it is thought that it is too obvious to require it.

Apparatus constructed in accordance with my invention is obviously easy to operate, as little power is required to swing the suspended frames to one side or the other to bring them into line with the trays in the furnace. Furthermore, the apparatus gives a free use of the floor around the furnace, as the frames are suspended from above, and are thus quite out of the way. When not in use, they may, if found desirable, be swung up into, and secured in, inclined or horizontal positions, in which they will occupy still less room. The ease and convenience with which the frames are operated and the advantages secured by having a free floor space around the furnace, enables the operations of charging and discharging it to be conducted with much greater facility than with apparatus of prior construction which has been attached to the floor about the furnace.

I would have it understood that I do not limit myself to the exact construction herein shown and described, but hold myself at liberty to make such changes and alterations therein as fairly fall within the spirit and scope of my invention.

I am aware that a prior patent shows an apparatus employing a suspended frame from which purchase is derived for handling the work in charging and discharging a furnace. I do not, therefore, broadly claim the use of a suspended frame for that purpose.

Having fully described my invention, what I claim as new and desire to secure by Letters-Patent, is:—

1. An apparatus for loading and unloading annealing furnaces, comprising one or more frames suspended above the furnace in line with the door thereof, and arranged to be swung laterally to the same, but otherwise fixed in position, a chain running over, guided upon, and getting its purchase from the said frame or frames, and means for operating the chain by power, substantially as set forth.

2. An apparatus for loading and unloading annealing-furnaces, comprising two independent frames suspended in line in reverse position above the furnace in line with the door thereof, and arranged to be swung laterally to the same, a chain running over, guided upon and getting its purchase from the said frames, and means for operating the chain by power in opposite directions, substantially as set forth.

3. An apparatus for loading and unloading annealing furnaces, comprising a frame suspended above the furnace in line with the door thereof, and arranged to swing laterally thereto, a chain running over, guided upon and getting its purchase from the said frame, means for operating the said chain by power, and a pair of sheaves located near the suspension point of the outer end of the frame, and receiving the chain between them, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JAMES M. CHATFIELD.

Witnesses:
SAMUEL S. LAMB,
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