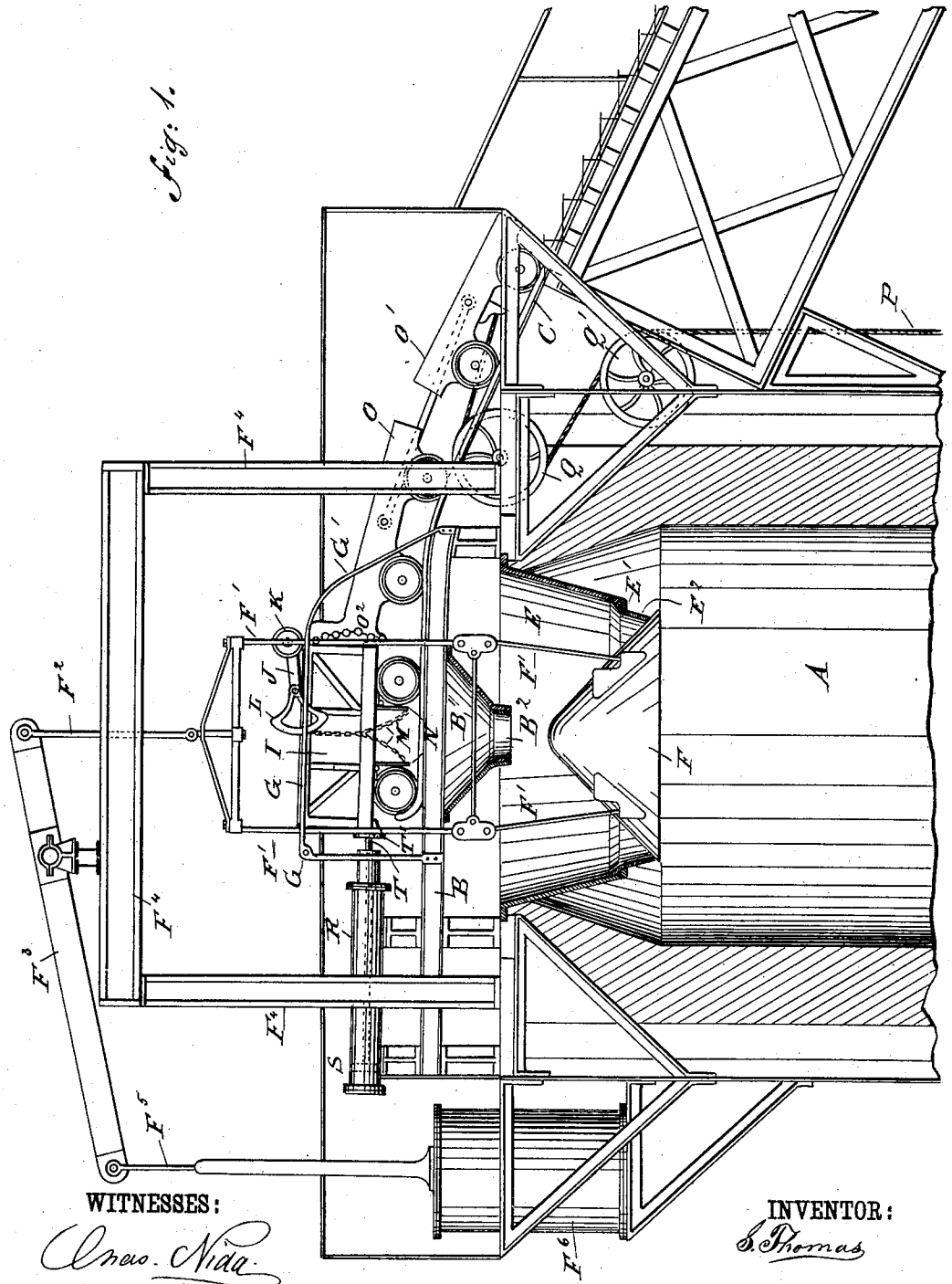
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S. THOMAS.

APPARATUS FOR FILLING BLAST FURNACES.

No. 377,873. Patented Feb. 14, 1888.

Fig. 1.



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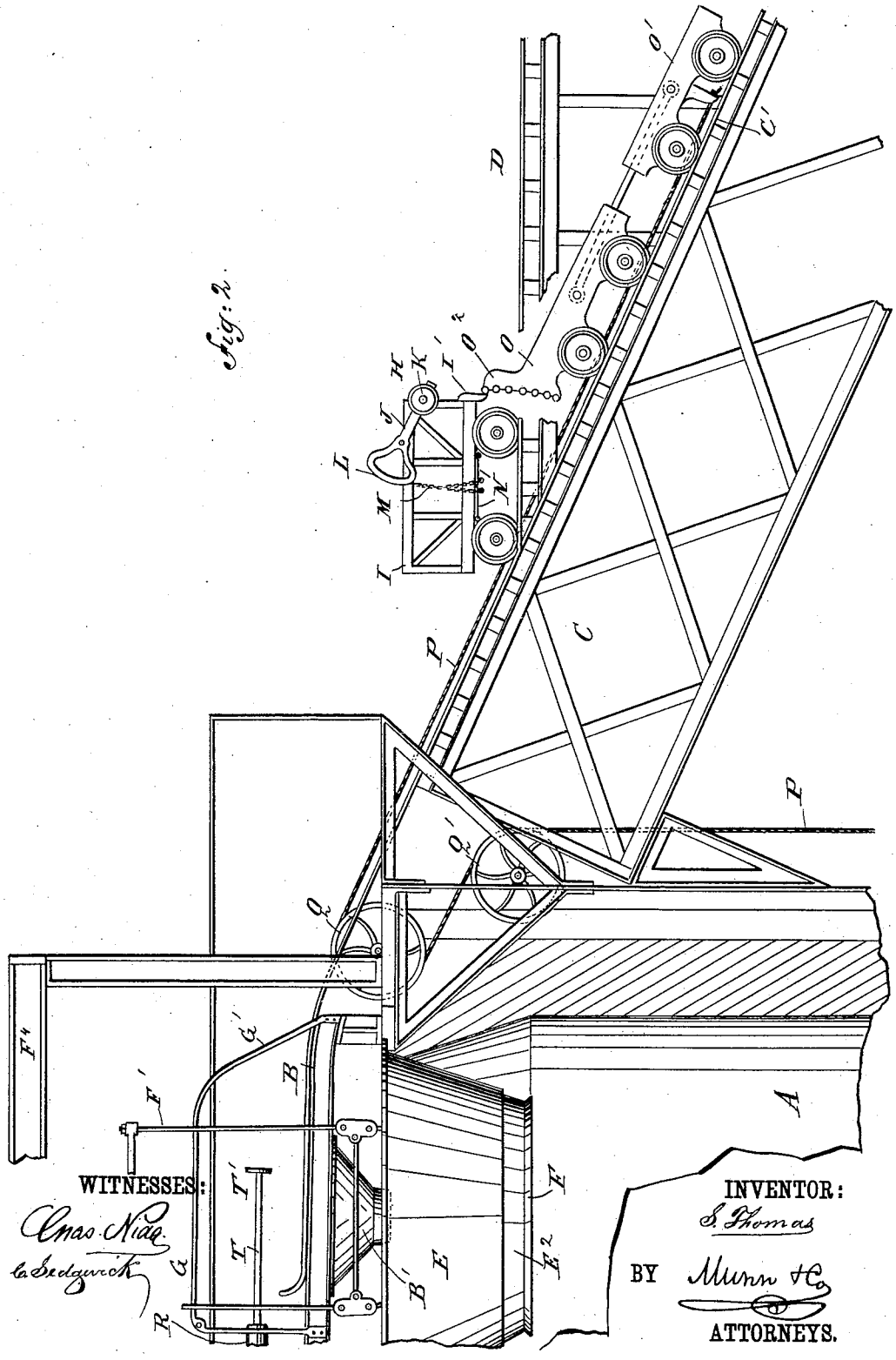
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Fig: 2.



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UNITED STATES PATENT OFFICE.

SAMUEL THOMAS, OF CATASAUQUA, PENNSYLVANIA.

APPARATUS FOR FILLING BLAST-FURNACES.

SPECIFICATION forming part of Letters Patent No. 377,873, dated February 14, 1888.

Application filed December 31, 1886. Serial No. 223,144. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL THOMAS, of Catasauqua, in the county of Lehigh and State of Pennsylvania, have invented new and Improved Apparatus for Filling Blast-Furnaces, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved apparatus for filling blast-furnaces which is simple in construction and automatic in operaion.

The invention consists of a track leading to the top of a furnace and provided with an inclined frame, of a car having a dumping mechanism operated by the said inclined frame, of means for returning the car after dumping its contents, and of means for pushing the loaded car to the top of the furnace.

The invention also consists of various parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a sectional side elevation of my improvement, showing the car in the act of dumping; and Fig. 2 is a similar view of part of the same with parts broken out.

On the top of the furnace A, of any approved construction, is erected the horizontal track B, which continues at one end into the downwardly-inclined track C, which is connected with the track D, leading to the store-room containing the materials used in the blast-furnace. The narrower track, C′, is placed within the track C and extends below the junction of the tracks C and D.

In the center on top of the blast-furnace A is held the downwardly-extending hopper E, of any suitable form and provided on its lower end with an inwardly-projecting flange, E′, which supports a ring, E^2, which can be closed at its lower end by the bell or distributer F, hung on the frame F′, pivotally connected by the link F^2 with a lever, F^3, fulcrumed in suitable bearings secured to the frame F^4, erected on the top of the furnace A. The lever F^3 is pivotally connected at its outer end to the pitman F^5, connected in the usual manner with a piston-rod and piston operating in the cylinder F^6, supported on the rear of the furnace A.

On the under side of the supports of the track B is secured the hopper B′, in the lower end of which can be placed a removable ring, B^2, so as to decrease the opening of the lower end of the hopper B′, which discharges upon the bell F. On the track B is placed the dumping device, which consists of a frame, G, on each side of the track B, and having an inclined side, G′, which operates the dumping mechanism H, secured to the stock-car I, which runs on the tracks B and C and on the track D, leading to the store-house.

The dumping mechanism H on the car I consists of a lever, J, pivoted to each side of the car and provided on its outer weighted end with a friction-roller, K, and on its inner end with a segment, L, the periphery of which is near the center of the car I. To the segment L is secured a chain or rope, M, which passes over the said periphery of the segment and connects at its lower end with the hinged drop-bottoms N of the stock-car I. (See Fig. 2.)

On the track C′ travel two short cars or dummies, O and O′, coupled together, of which the car O is provided with the pushing-head O^2, preferably constructed with a series of rollers which operate on the draw-head I′ of the stock-car I. To the car O′ is fastened the rope or cable P, which passes over the pulley Q, mounted on the top of the furnace A, and then passes over the pulley Q′ and downward, and is connected at its lower end with a drum or similar device for winding up or unwinding the said rope.

On the track B, or on the top of the furnace A, is mounted a cylinder, R, which is closed at its outer end, and in which operates a piston, S, attached to the piston-rod T, extending into the center of the track B, and at such a height above the said track that its head T′ comes in contact with the front end of the stock-car I when the latter enters the horizontal track B. The outer closed end of the cylinder R may be provided with safety-valves to regulate the pressure of the air in the said cylinder.

Suitable steps placed along the tracks B and C lead up to the top of the furnace A.

The operation is as follows: In the position shown in Fig. 2 the loaded stock-car I has been

pushed to the junction of the tracks C and D, and the dummies O and O′, which are below the track D, are now moved upward by winding up the rope P, so that the pushing-head O^2 of the front car, O, comes in contact with the draw-head I′ of the stock-car I, whereby the latter is moved upward on its track C and upon the horizontal track B. When the car I passes toward the center of the furnace A, then the friction-roller K of the headed lever J comes in contact with the inclined side G′ of the frame G and causes the lever J to swing in such a manner that its segmental end moves downward, whereby the hinged drop-bottoms N of the car I are opened and the contents of the car I are discharged into the hopper B′, which delivers the contents upon the cone-shaped bell or distributer F. As the latter closes on the ring E^2, the contents are held in the hopper E until it is desirable to empty the charge into the furnace A. This is accomplished by lowering the bell or distributer F by means of its connections with the cylinder F^6, in which the piston is operated in the usual manner. When the car I moves forward on the horizontal track B, as above described, its front end pushes the piston-rod T and its piston S inward, so as to compress the air in the cylinder R. When the car I has been emptied, as before described, and the two cars O and O′ have returned down their inclined track C′ to a position below the track B, then the stock-car I is set in motion and pushed backward on the track B and upon the inclined track C by the action of the compressed air in the cylinder R on the piston S, which is forced outward, bringing the head T′ against the car with sufficient pressure to overcome its inertia, thereby setting the car in motion. When the stock-car I leaves the track B, its bottom drop-doors, N, are again closed as the weighted levers J return to their normal position, this being caused by the downward movement of their weighted outer ends.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the stock-car I, of the weighted lever J, pivoted on the said car and having the segmental end L, the chain M, connected with the said end L, and the drop-bottoms N, pivoted on the bottom of said car, substantially as shown and described.

2. The stock-car I and the dumping mechanism H, consisting of the weighted lever J, pivoted on the said car and having the segmental end L, the friction-roller K, attached to the said lever J, and the chain M, attached to the said end L and connected with the drop-bottom N of the car, adapted to be operated by the frame G, erected on the top of the furnace A, and having the inclined side G′, on which operates the said friction-roller K of the dumping mechanism H, substantially as shown and described.

3. The stock-car I, having the head I′ and traveling on the tracks D and C, in combination with the dummies O and O′, coupled together, of which the dummy O has the pushing-head O^2, and means for moving the said dummies O and O′ on the narrow track C′, placed within the track C, substantially as shown and described.

SAMUEL THOMAS.

Witnesses:
FRANK B. KEISER,
EDWIN THOMAS.