

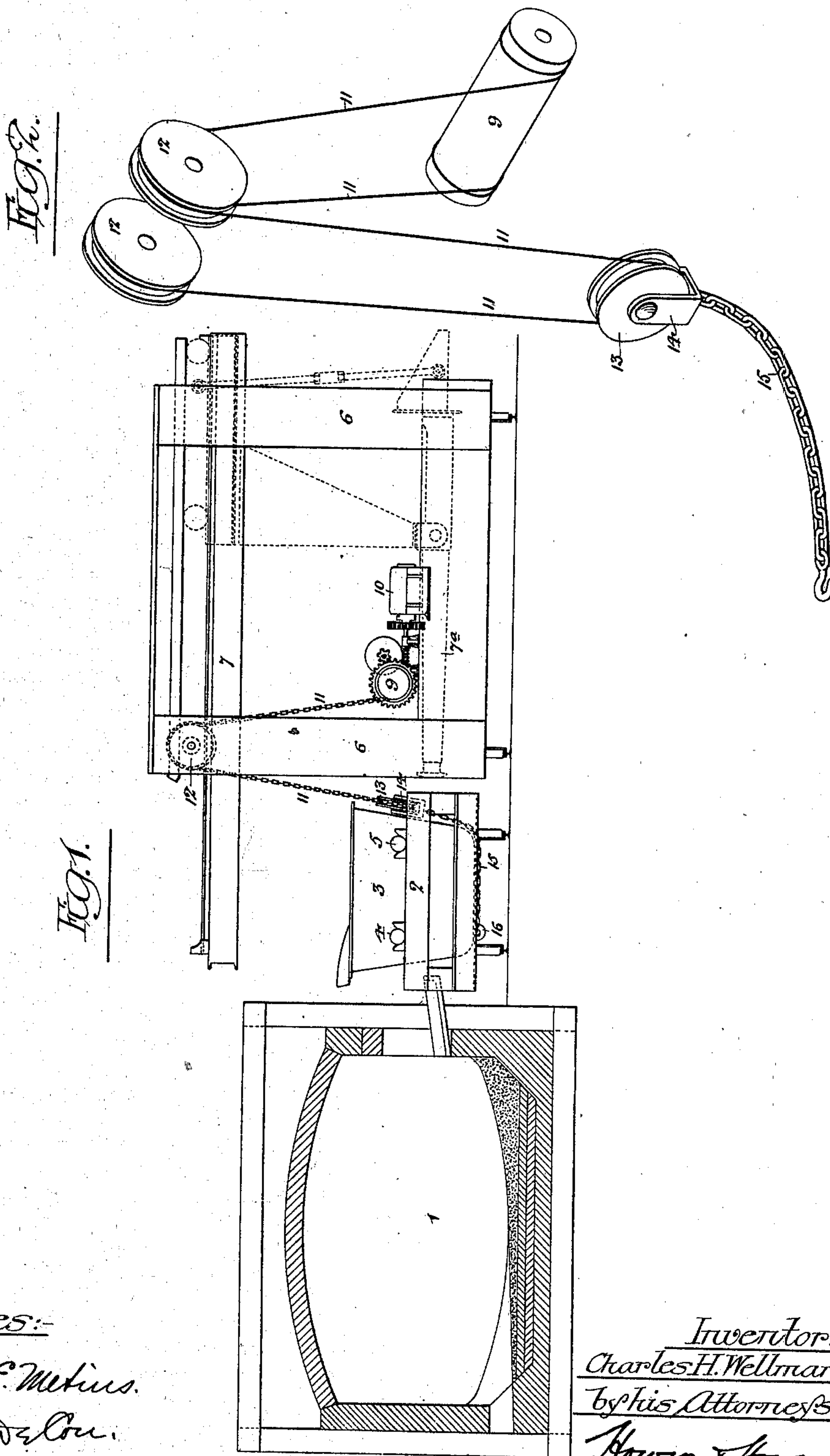
No. 723,094.

PATENTED MAR. 17, 1903.

C. H. WELLMAN.  
FURNACE CHARGING APPARATUS.

APPLICATION FILED APR. 8, 1902.

NO MODEL.





# UNITED STATES PATENT OFFICE.

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OHIO, A CORPORATION OF OHIO.

## FURNACE-CHARGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 723,094, dated March 17, 1903.

Application filed April 8, 1902. Serial No. 101,909. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. WELLMAN, a citizen of the United States, and a resident of Cleveland, Ohio, have invented certain Improvements in Furnace-Charging Apparatus, of which the following is a specification.

My invention relates to machinery for providing metallurgical furnaces with a supply of fluid metal, and especially to that class of furnace-charging machinery in which the supply of fluid metal is contained in a ladle mounted upon a truck so as to be capable of being tipped or tilted thereon in order to pour its contents into the furnace, the object of my invention being to so construct apparatus of this class as to simplify the construction and lessen the size and weight of the ladle-carrying truck and to relieve the ladle-tipping mechanism from the injurious effects of the heat radiated from said ladle. This object I attain by mounting the power mechanism whereby the tipping of the ladle is effected upon a movable structure separate from the ladle-truck and transmitting motion from said power mechanism to the ladle by means of suitable interposed tackle.

In the accompanying drawings, Figure 1 is a view, partly in section and partly in elevation, of furnace-charging apparatus constructed in accordance with my invention; and Fig. 2 is a perspective diagram of the tackle whereby motion is transmitted from the power mechanism to the ladle.

In Fig. 1 of the drawings, 1 represents an open-hearth furnace, which may be of any ordinary construction, and 2 represents a wheeled truck running upon a track laid in front of the furnace or row of furnaces, this truck carrying the ladle 3, in which is contained the supply of molten metal to be charged into the furnace, said ladle having at each side fore-and-aft trunnions 4 and 5, which normally rest in suitable boxes or sockets on the truck, so as to rigidly support the ladle on said truck, the forward trunnions, however, serving as pivot-trunnions when it is desired to tip or tilt the ladle in order to pour its contents into the furnace. Upon other rails parallel with those upon which the

ladle-truck runs is supported a crane 6, which in the present instance is of the gantry type and has a boom 7, serving for the support of a trolley, from which depends a structure, such as shown by dotted lines in Fig. 1, for carrying a charging-bar 7<sup>a</sup>, which is intended for manipulating a charging-box, whereby metal in solid form can be dumped upon the hearth of the furnace, a charging-machine of this character being set forth in Letters Patent No. 569,075, dated October 6, 1896.

Suitably mounted upon the crane 6 is also a hoisting-drum 9, an electric motor 10, and suitable interposed gearing whereby said motor is caused to operate the drum, although any desired power mechanism for operating the drum may be used, the electric motor being preferred for convenience.

Wound upon the drum 9 are the opposite ends of a hoisting rope or chain 11, which passes around sheaves 12, suitably mounted upon the upper portion of the crane structure, the bight of said rope or chain passing around a sheave 13, which is mounted in a yoke 14, connected by a rope, chain, or other flexible connection 15 to an eye 16 on the bottom of the ladle adjacent to the front of the same. When, therefore, the drum 9 is operated so as to wind up the rope or chain 11, the rear of the ladle 3 will be elevated and said ladle will be caused to swing upon its forward trunnions 4, so as to tip or tilt and pour its contents into the furnace, the ladle being permitted to drop back into its normal position when the hoisting rope or chain is unwound from the drum.

Although I prefer to combine the hoisting mechanism with the crane structure of a charging-machine, as shown in Fig. 1, so as to adapt the latter for charging the furnace with metal either in solid or molten form, said hoisting mechanism may be mounted upon a movable structure independent of that of the charging-machine, if desired, the main feature of this part of my invention being the mounting of the hoisting mechanism upon a structure independent of the ladle-carrying truck, so that it cannot be injured by heat radiating from the ladle and so that



the truck may be of the simplest possible construction, more convenient to transport, and of less weight than if the hoisting mechanism was mounted directly upon it. Although I prefer also to use the single hoisting-chain connected to the ladle, independent chains connected at one end to the drum and at the other end to the ladle may be used, if desired, or a single chain only of such construction may be employed.

The forward end of the chain has a hook whereby it can be readily hooked to the eye on the under side of the ladle, whereby the application or removal of the hoisting-tackle can be readily effected, and where two chains are employed each of them may be thus equipped.

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

1. In apparatus for charging furnaces with molten metal, the combination of a wheeled truck constructed to run upon rails below the charging-door of the furnace and having a ladle pivotally mounted thereon, with a wheeled structure mounted independently of the ladle-truck, hoisting mechanism on said structure, and interposed tackle whereby said hoisting mechanism can be connected

to the ladle so as to tilt the same, substantially as specified.

2. The combination in apparatus for charging furnaces with molten metal, of a wheeled truck having a ladle pivotally mounted thereon, a wheeled structure independent of said truck, hoisting mechanism on said structure, and tackle connecting said hoisting mechanism to the ladle and comprising a sheave carried by a yoke having a flexible connection with the ladle, and a hoisting rope or chain the bight of which receives said sheave, said rope or chain then passing over guide-sheaves on the hoist-carrying structure, and thence to the hoisting-drum, substantially as specified.

3. The combination of the wheeled truck, the ladle having fore-and-aft trunnions seated on said truck, and a hoisting device having flexible connection with said ladle, substantially as specified.

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

CHARLES H. WELLMAN.

Witnesses:

C. W. COMSTOCK,  
W. A. JONES.