D. KENDALL.

CRANE MECHANISM.

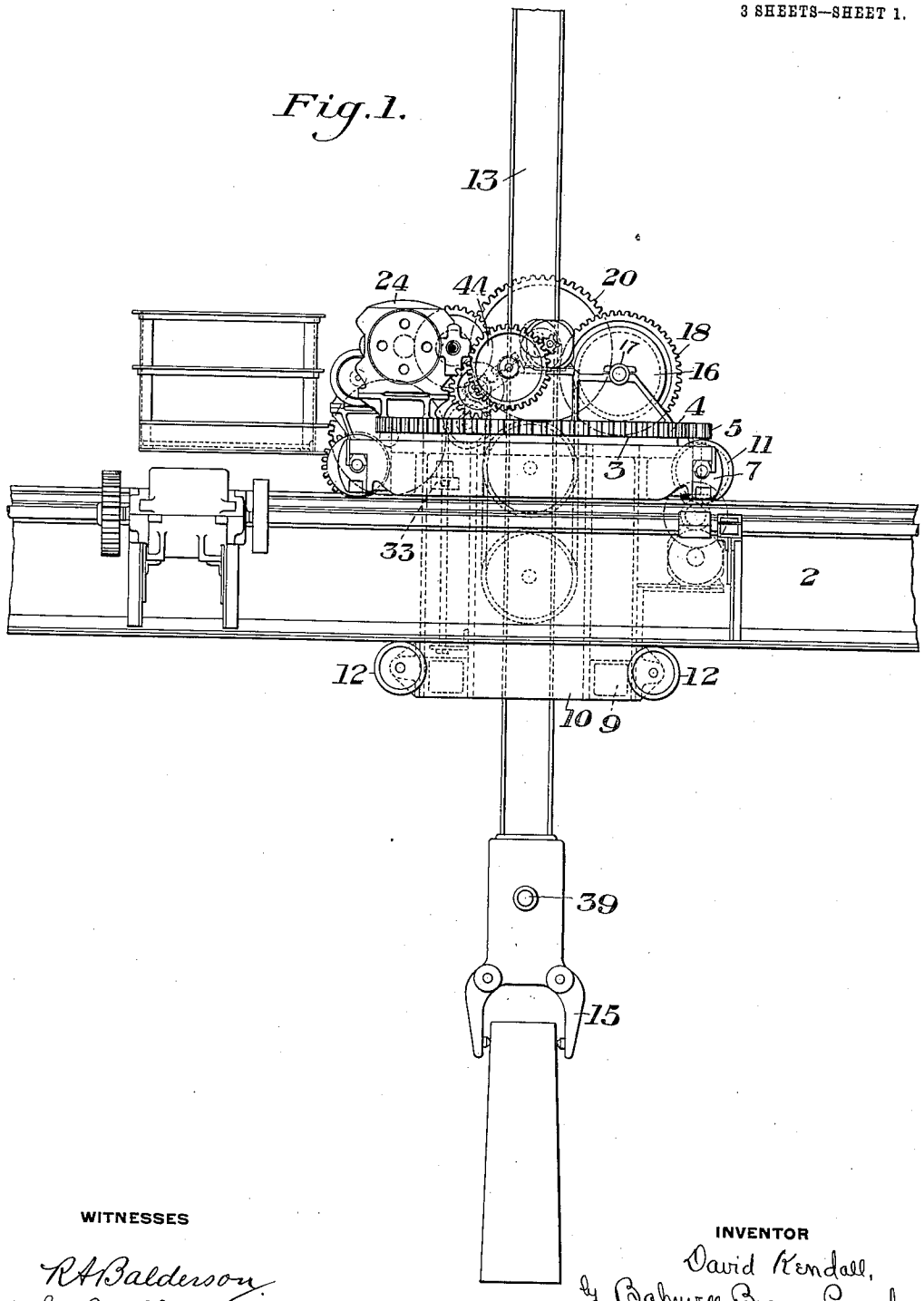
APPLICATION FILED MAY 18, 1908.

909,804.

Patented Jan. 12, 1909.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

R. A. Balderson

G. B. Fleming

INVENTOR

David Kendall,

by Bakewell, Byrnes & Parmelee,

his Attys.

D. KENDALL.

CRANE MECHANISM.

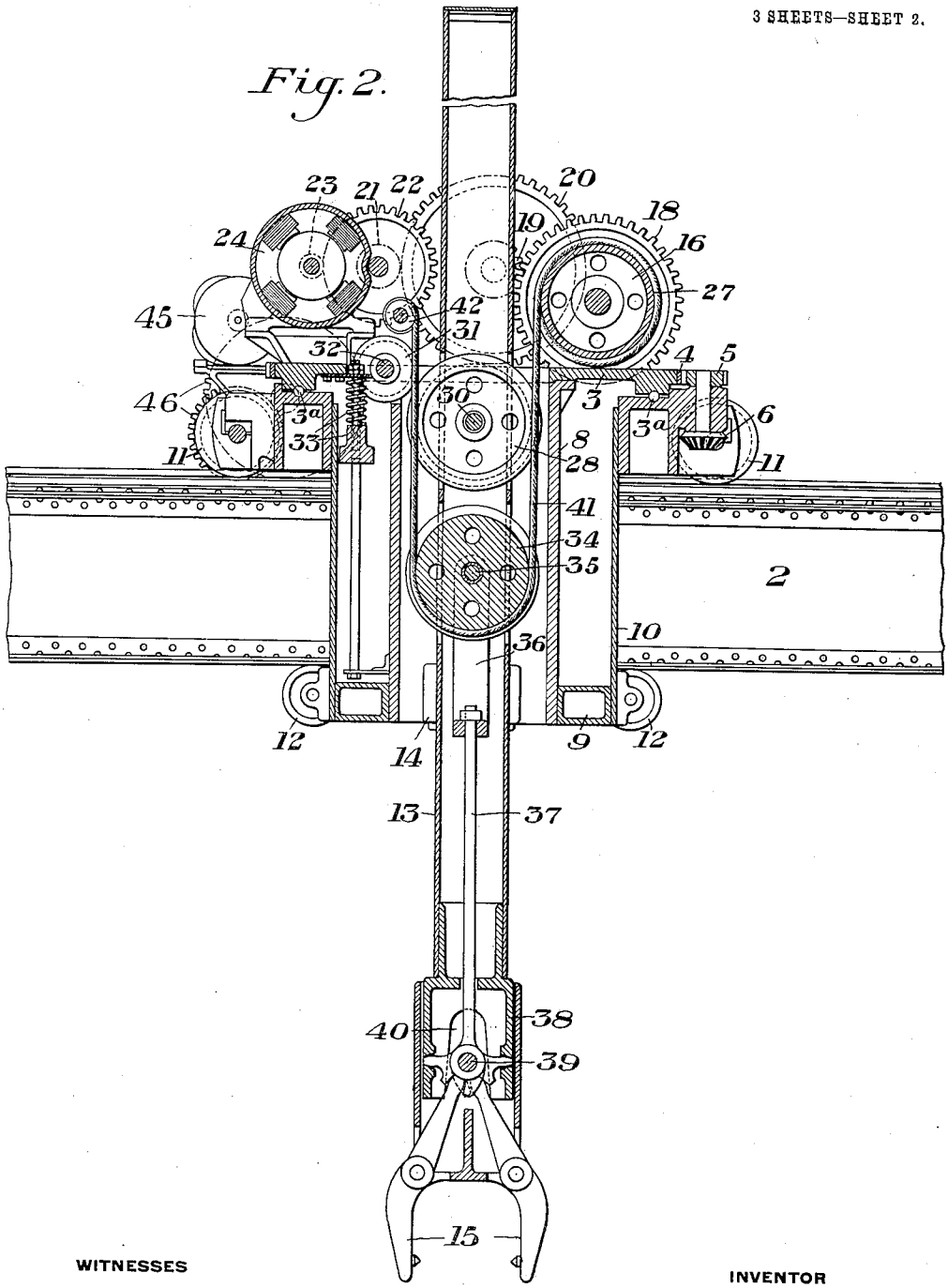
APPLICATION FILED MAY 18, 1908.

909,804.

Patented Jan. 12, 1909.

3 SHEETS—SHEET 2.

Fig. 2.



WITNESSES

R. A. Balderson

G. B. Blaming

INVENTOR

David Kendall,

by Bakewell, Byrnes & Parmelee,

his Attys.

D. KENDALL.

CRANE MECHANISM.

APPLICATION FILED MAY 18, 1908.

909,804. Patented Jan. 12, 1909.

3 SHEETS—SHEET 3.

Fig. 3.

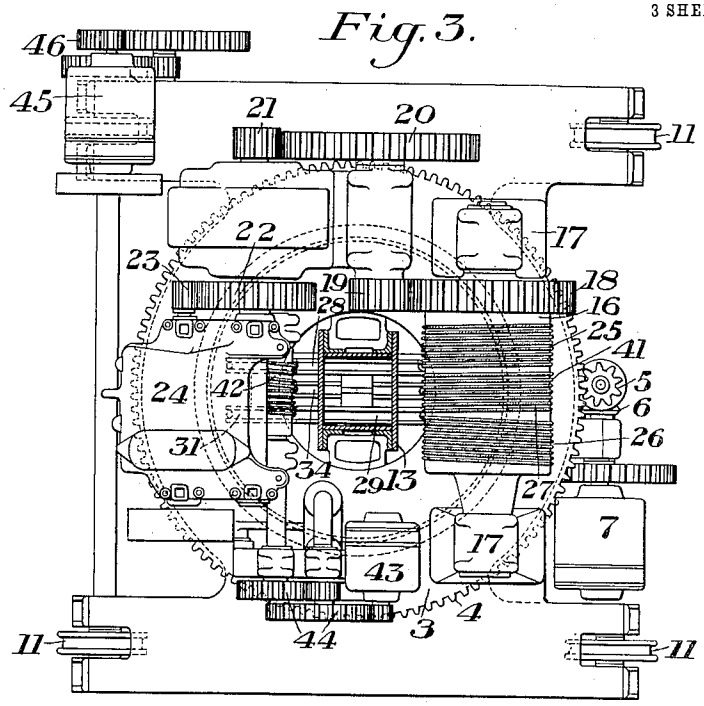
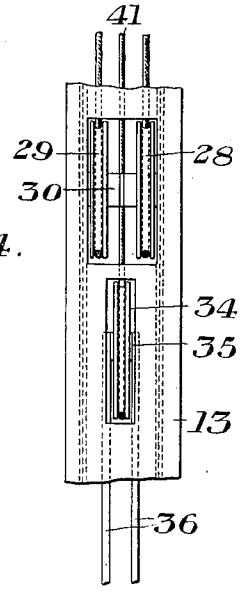


Fig. 4.



WITNESSES

R. A. Balderson.

G. B. Fleming

INVENTOR

David Kendall,

by Bakewell, Byrnes & Parmelee,

his Attys.

UNITED STATES PATENT OFFICE.

DAVID KENDALL, OF ALLIANCE, OHIO, ASSIGNOR TO THE ALLIANCE MACHINE COMPANY, OF ALLIANCE, OHIO, A CORPORATION OF OHIO.

CRANE MECHANISM.

No. 909,804. Specification of Letters Patent. Patented Jan. 12, 1909.

Application filed May 18, 1908. Serial No. 433,433.

To all whom it may concern:

Be it known that I, DAVID KENDALL, of Alliance, in the county of Stark and State of Ohio, have invented a new and useful Crane Mechanism, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of one form of crane mechanism, embodying my invention with the movable bridge broken away; Fig. 2 is a vertical section of the same; Fig. 3 is a plan view of the trolley; and Fig. 4 is a detail view of a portion of the charging bar.

My invention has relation to crane mechanism and more particularly to a soaking pit or vertical charging crane, the object of my invention being to provide simple and efficient mechanism of this character which can be readily operated and controlled.

The precise nature of my invention will be best understood by reference to the accompanying drawings, in which I have shown one embodiment thereof, and which will now be described, it being understood, however, that various changes may be made therein by those skilled in the art, without departing from the spirit and scope of my invention as defined in the appended claims.

In these drawings, the numeral 2 designates the usual movable crane bridge, which may be supported and moved in any usual or suitable manner. Mounted to travel on this bridge is a trolley or carriage which carries the operating parts. This trolley consists of a rotatable upper section 3, having peripheral gear teeth 4, engaged by the teeth of a pinion 5, driven by a gear connection 6 with an electric motor 7, mounted on the lower and non-rotatable portion of the trolley. The rotatable upper portion 3 may be mounted on ball-bearings 3^a or other antifriction devices, so that it will rotate freely and is provided with an extension 8, which passes downwardly between the girders 2 of the bridge, and which, at its lower end portion, bears within a ring 9, secured within a downward extension 10 of the lower section of the trolley frame. The lower section of the trolley frame is provided with a suitable arrangement of wheels 11, which travel on the usual tracks, supported on the bridge girders, and the extension 10 is provided at its lower end with wheels or rollers 12, which bear upwardly against the bottom flanges of said girders in order to give additional stability to the trolley and to prevent the derailment thereof.

13 designates a charging bar which extends vertically through the trolley, being provided with a guide 14, in the downward extension 8 of the rotatable upper trolley section. The lower end of the bar 13 is provided with gripping tongs 15, of any suitable design, those which I have shown being substantially the same as those described and claimed in the patent to Israel & Kirk, No. 841,528, dated January 15, 1907.

16 designates a hoisting drum which is suitably journaled in bearings 17, and which is rotated by the train of reduction gearing 18, 19, 20, 21, 22 and 23, with an electric motor 24. The drum 16 is provided with right and left grooved winding portions 25 and 26, at its respective end portions, and with an intermediate grooved winding portion 27. The bar 13 is raised and lowered by means of this main drum 16, by two ropes or cables which are secured at one end to said drum, and thence pass downwardly and around two sheaves 28 and 29, which turn on a shaft 30, fixed in the charging bar 13, the other end portions of the ropes or cables being thence extended upwardly and around sheaves 31, which rotate on a shaft 32, fixed to the upper rotatable portion of the trolley frame. These ropes or cables pass over these sheaves 31, and are connected to a suitable slack take-up device 33. This slack take-up device may be of any suitable character. As shown it is substantially similar to the patent to George W. Shem, Number 840,807, of January 8, 1907. The function of this device is simply to take up any slack in these two hoisting ropes or cables.

34 is a sheave which turns on a shaft 35, supported in a yoke 36, which is within the hollow charging bar 13, the sides of said bar being slotted to receive the sheave 34. This yoke 36 is slidably mounted in the bar 13, and has a depending stem or rod 37, which passes downwardly through the bar 13, and is secured to the tongs-operating frame 38 by a pin 39, working in the slots 40. Passing around the sheave 34 is a rope or cable 41, one end of which is secured to the drum 16, and is wound upon the intermediate winding portion 27 thereof. The other end

of this rope or cable is carried upwardly and is secured to a secondary winding drum 42. This drum 42 is operated by a motor 43, through the train of reduction gearing 44. 45 is the motor which moves the trolley through the gearing 46.

The operation is as follows: The bar 13 is raised and lowered by means of the main hoisting drum 16, and motor 24. When the bar 13 is lifted, the tongs 15 close on the ingot and grasp it tightly and lift it up and to the desired point by proper movement of the trolley and crane bridge. To open the tongs, the motor 43 is operated, thereby winding the rope or cable 41 on the secondary drum 42. When this motor is operated in a hoisting direction, the tongs-operated frame 38 is lifted and the tongs opened. The sheaves 29 and 34 are of the same diameters as are also the three winding portions of the main drum 16. Therefore, when the charging bar 13 is being raised, after it has grasped an ingot, the sheave 34 and yoke 36 and the rod or stem 37 will be lifted at the same rate of speed as the charging bar. As the ingots are of rectangular shape, and are liable to be placed in any position, it is necessary that the tongs may be able to rotate or revolve so as to properly grasp the ingot. This has been accomplished in previous cranes with which I am familiar by rotating the tongs alone. In the crane above described, the tongs, the charging bar and the upper section of the trolley frame are all rotated by the operation of the motor 7.

The advantages of my invention will be apparent to those skilled in the art. The arrangement of the hoisting drum and cables for operating the charging bar are such as to give a direct upward lift on said bar, while the provision of the secondary hoisting drum and motor enables the tongs-operating frame to be given an independent movement. The entire arrangement is simple in its construction and operation.

What I claim is:

1. In crane mechanism of the character described, the combination of a movable trolley formed in two sections, one of which is rotatably mounted on the other, said sections having depending extensions, the extension on the rotatable section being guided by the extension on the non-rotatable section, a vertical charging bar extending through said extensions having a gripping device at its lower end, a hoisting drum mounted on the trolley, sheaves journaled to the charging bar, and flexible connections passing around said sheaves and connected to the hoisting drum, another sheave movably guided by the charging bar and connected to the gripping device, and independently operated hoisting mechanism for the last named sheave, substantially as described.

2. In crane mechanism of the character described, a movable carriage or trolley formed in two sections one of which is rotary with respect to the other, and having depending hollow extensions in guiding and bearing engagement with each other, a vertically movable charging bar extending upwardly through the trolley, sheaves journaled to said charging bar, hoisting mechanism having flexible connections to said sheaves, a sheave loosely guided in said bar, tongs mechanism suspended from said sheave, and independent hoisting mechanism for the sheave, substantially as described.

3. In crane mechanism of the character described, a crane bridge, a trolley mounted thereon and having its frame formed in two sections, one of which is rotatably mounted on the other, the relatively fixed section having an extension which depends through the bridge, and the rotatable section having a depending extension which has a bearing and guiding engagement with the first named section, a charging bar extending upwardly through said extensions, hoisting mechanism connected to said bar and tongs actuating mechanism carried by said bar; substantially as described.

4. In crane mechanism of the character described, a movable carriage or trolley having a frame formed by a fixed and a rotatable section, a vertically movable charging bar extending upwardly through the trolley or carriage, hoisting means for raising and lowering said bar, tongs, and tongs-operating means carried by said bar, an independent hoisting device for the tongs-operating mechanism, means for causing the charging bar and tongs mechanism to turn with the movable section of the trolley, and means for rotating said section the rotatable section having a guide bearing on the fixed section below its point of support on the fixed section, substantially as described.

5. In crane mechanism of the character described, a movable trolley or carriage formed in two sections, one of which is rotatably mounted on the other, said sections having depending extensions, the extension on the rotatable section being guided by the extension on the non-rotatable section, substantially as described.

6. In crane mechanism of the character described, a bridge, and a trolley or carriage movably mounted thereon and formed in two sections, the upper section being rotatably mounted on the lower section, the lower section having a depending extension through the bridge and formed with a guide at its lower portion, and the upper section having an extension provided with a bearing in said guide, substantially as described.

7. In crane mechanism of the character described, a crane bridge, a trolley or car-

riage movably mounted thereon, and formed in two sections, one of which is rotatably mounted on the other, each of said sections having an extension to the lower side of the bridge, the extension on the relatively fixed section having a guide for the extension on the rotatable section, and bearing devices carried by the extension on the relatively fixed section and engaging the lower surface of the bridge, substantially as described.

In testimony whereof, I have hereunto set my hand.

DAVID KENDALL.

Witnesses:
G. W. SHEM,
EDWIN N. DIEHL.