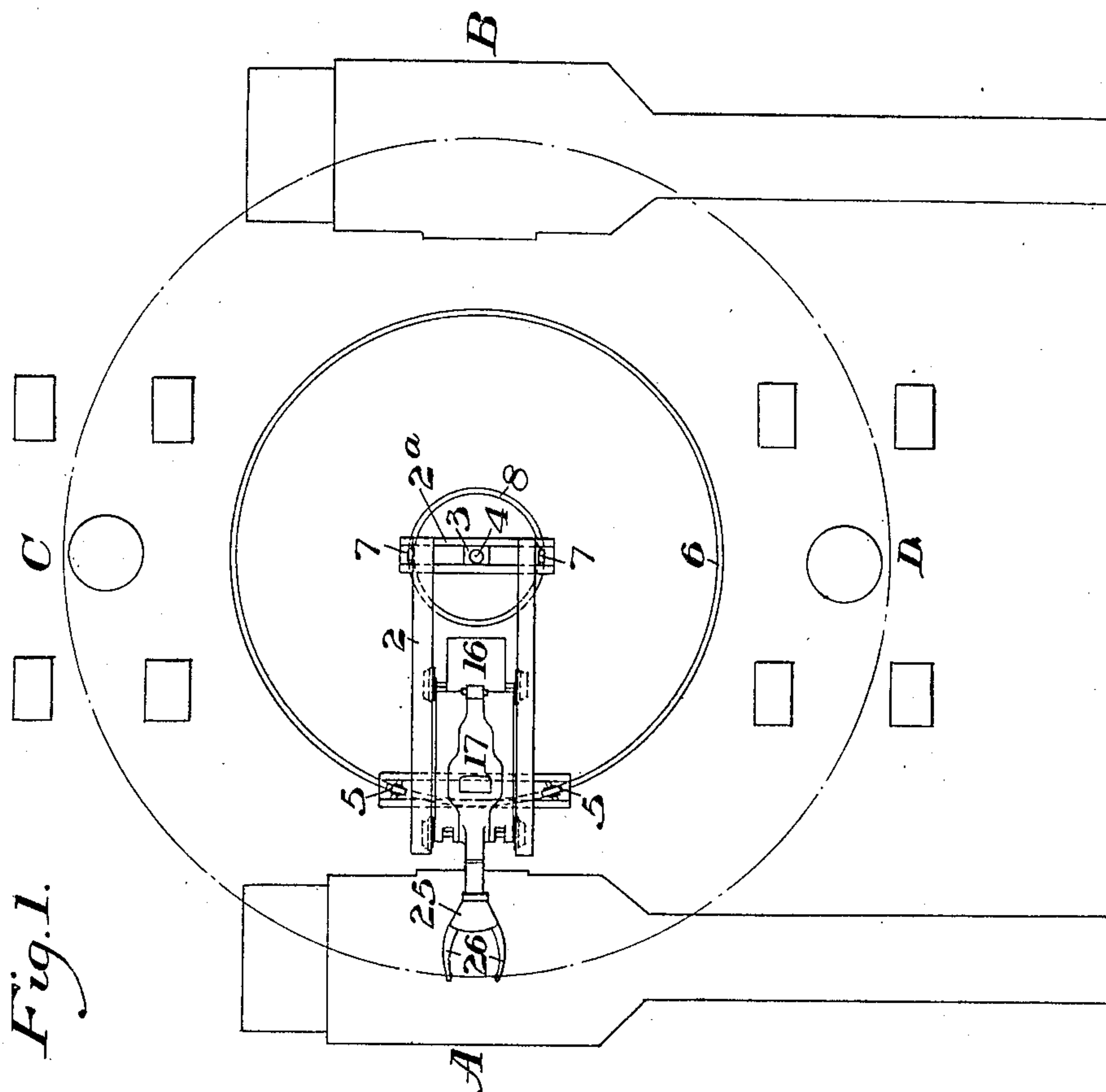


No. 888,175.

PATENTED MAY 19, 1908.

D. KENDALL.
CRANE MECHANISM.
APPLICATION FILED APR. 4, 1907.

5 SHEETS—SHEET 1.



WITNESSES

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R. A. Balderson

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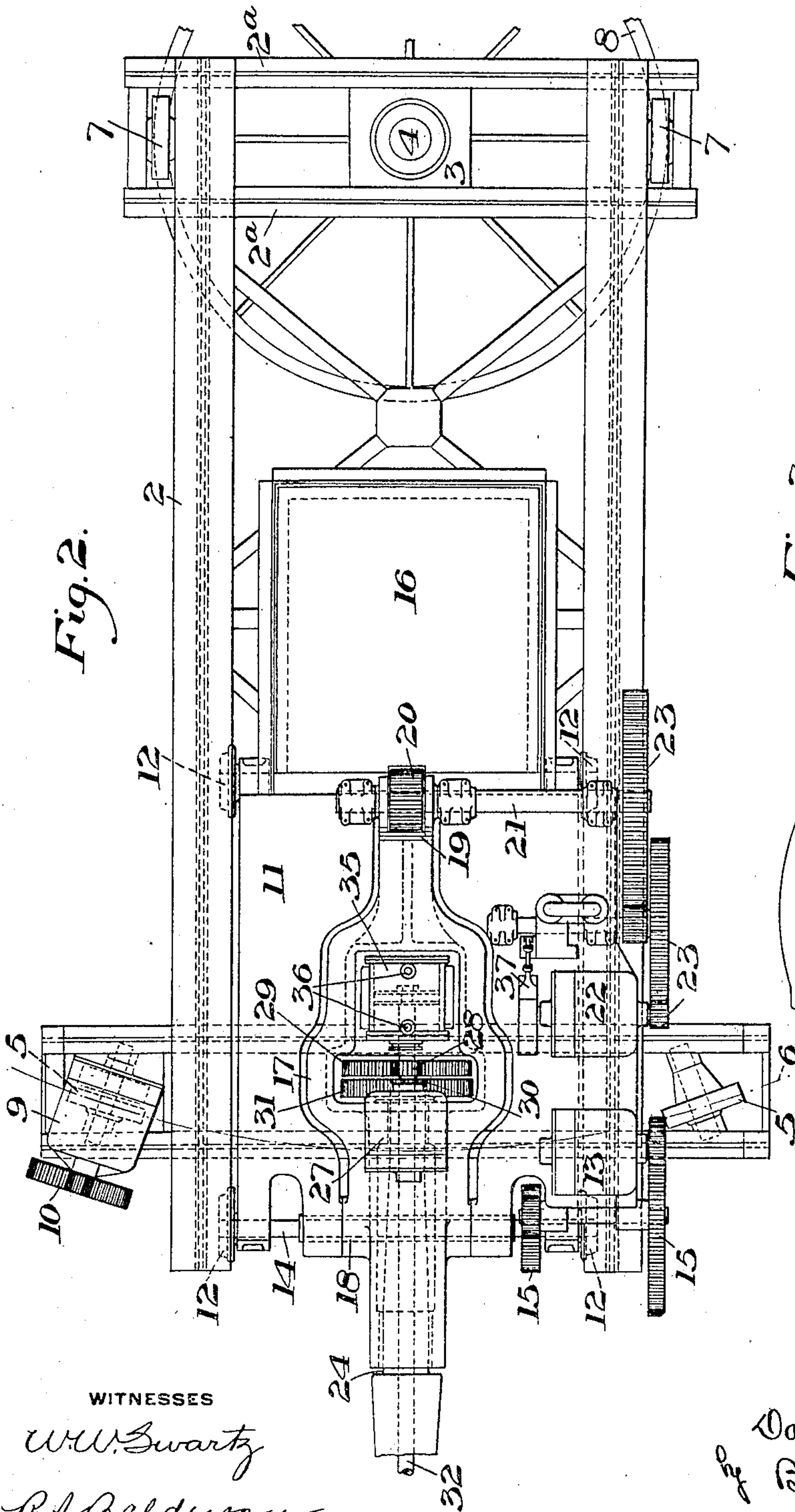
David Kendall,
by Baker & Byrnes,
his Atty.

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5 SHEETS—SHEET 2.

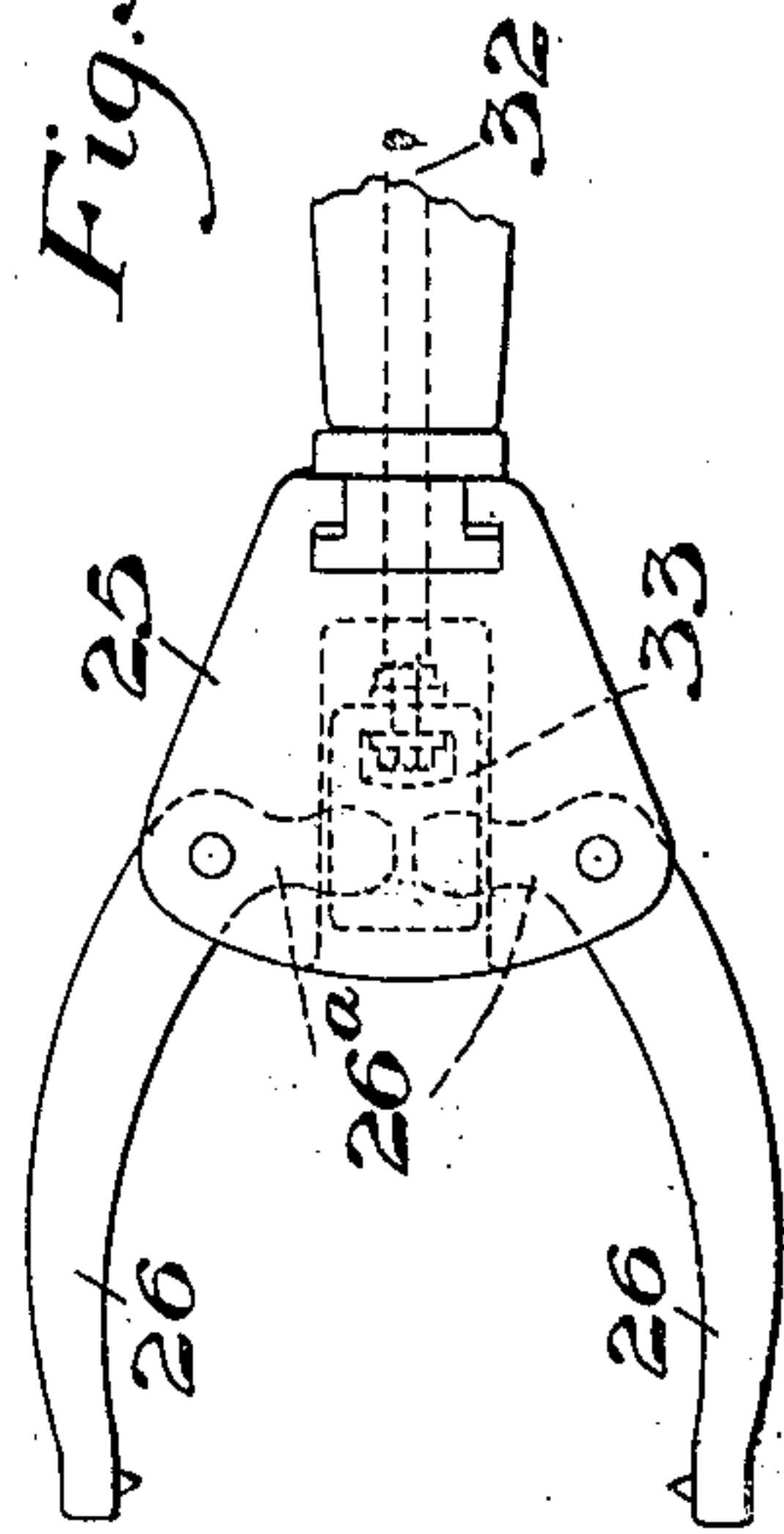


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Fig. 3.



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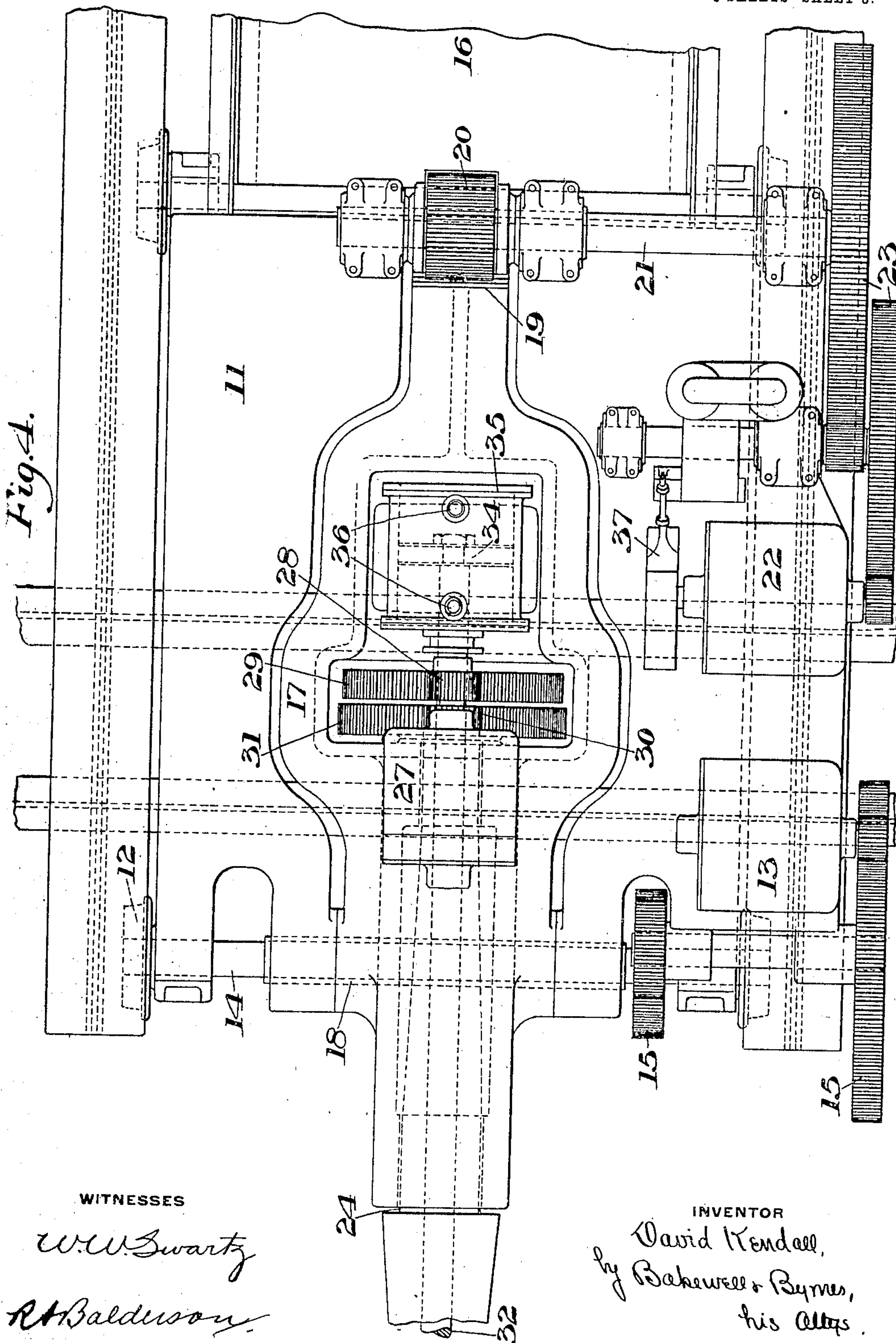
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5 SHEETS—SHEET 3.

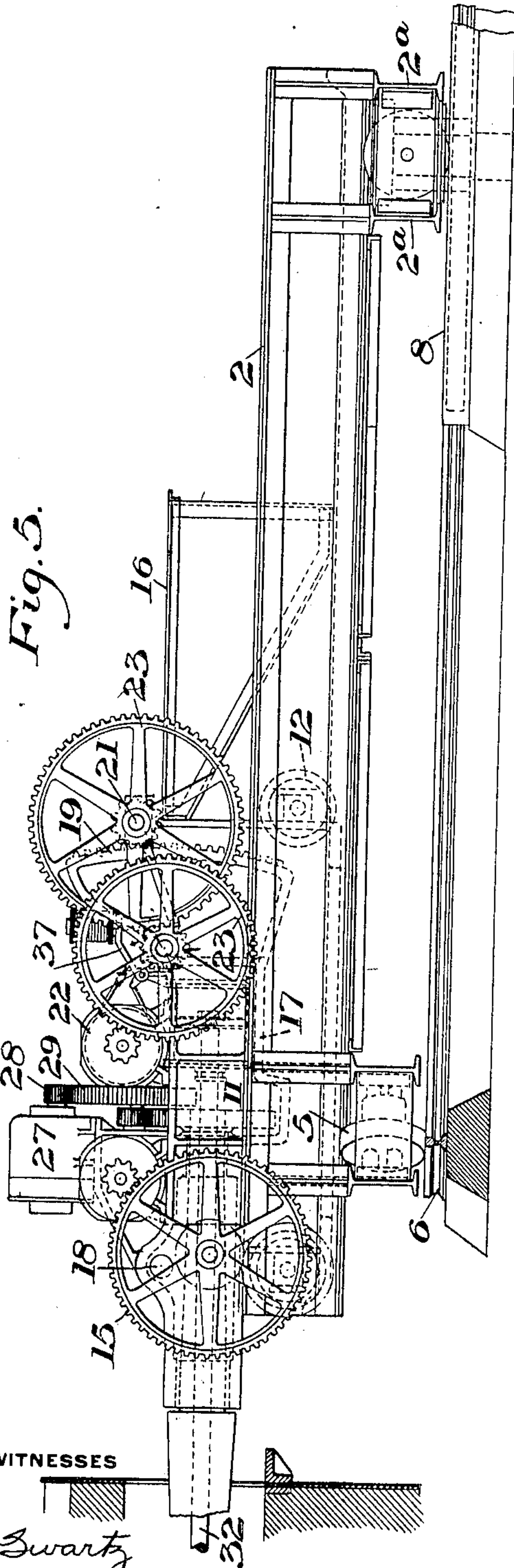


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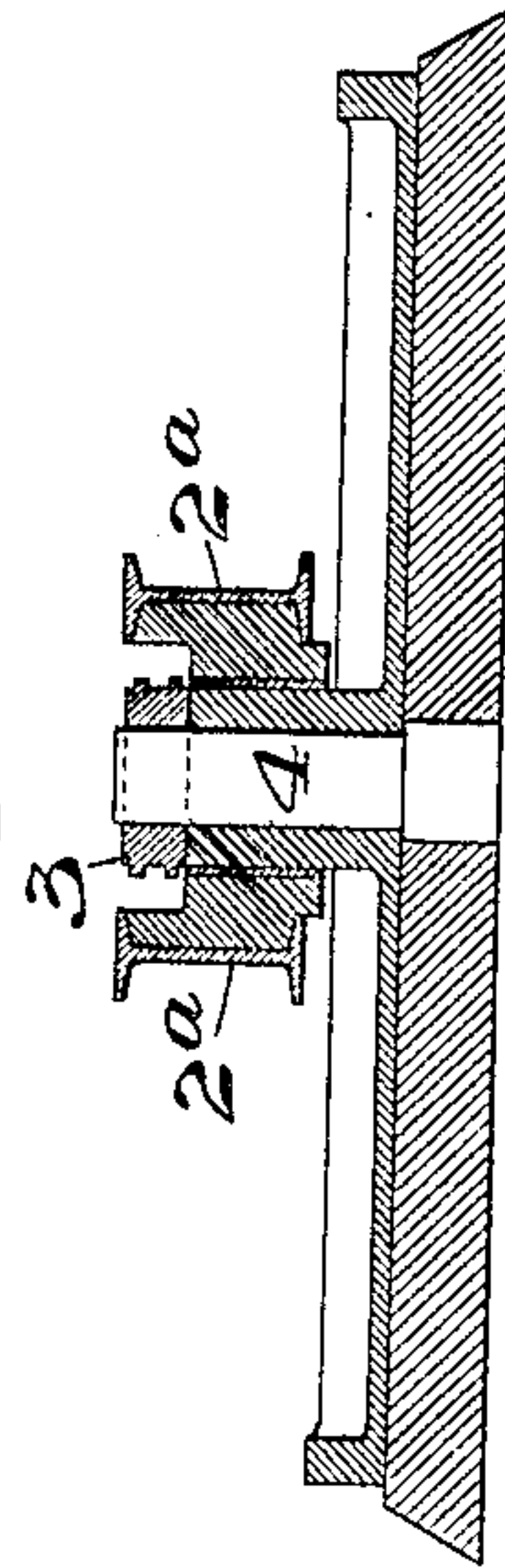
5 SHEETS—SHEET 4.



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Fig. 6.



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5 SHEETS—SHEET 5.

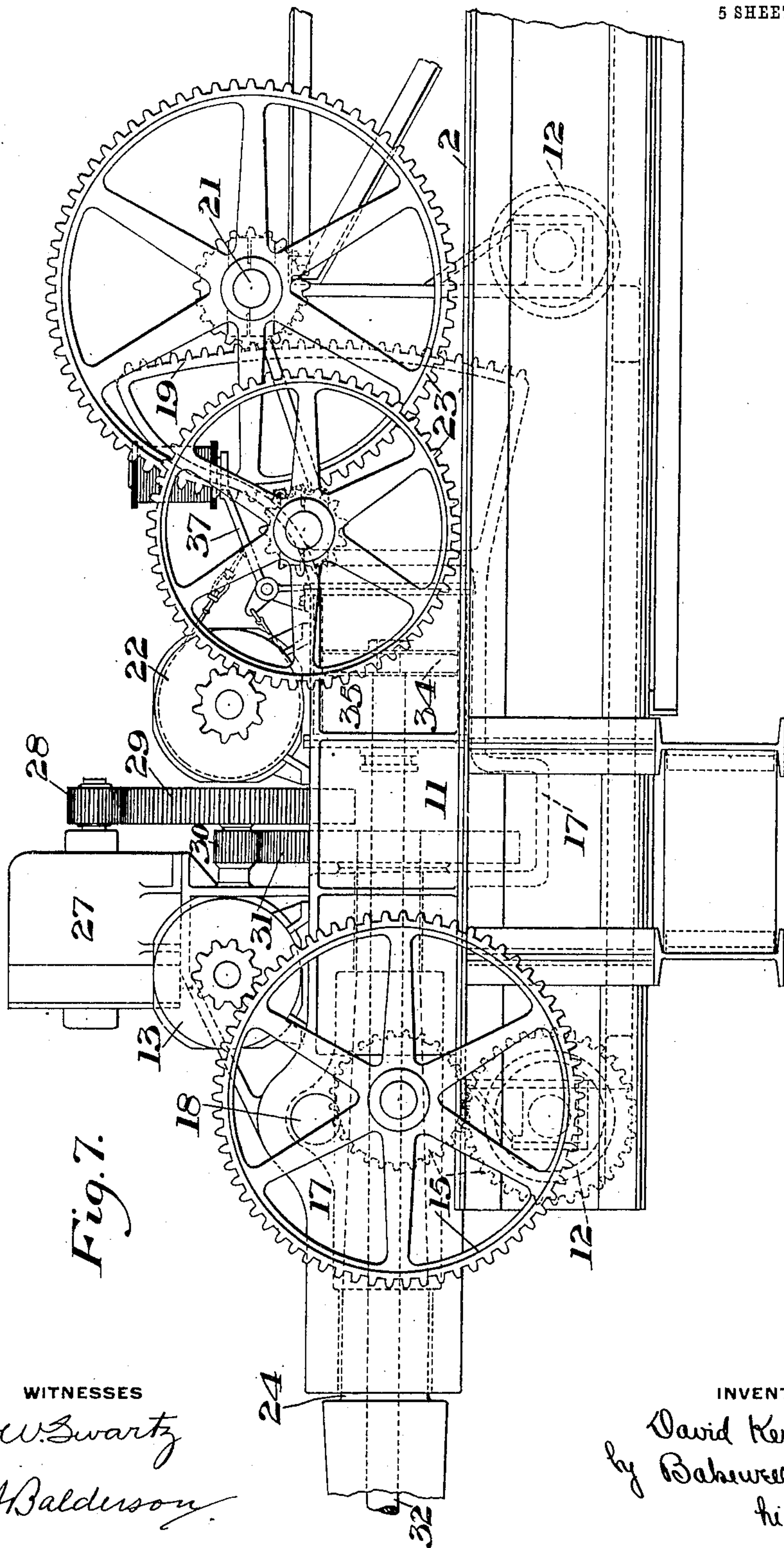


Fig. 7.

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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. 888,175.

Specification of Letters Patent.

Patented May 19, 1908.

Application filed April 4, 1907. Serial No. 366,329.

To all whom it may concern:

Be it known that I, DAVID KENDALL, of Alliance, Stark county, Ohio, have invented a new and useful Improvement in 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 plan view showing diagrammatically apparatus embodying my invention, and illustrating the arrangement and use of the same; Fig. 2 is a plan view of the crane mechanism; Fig. 3 is a detail view of the tongs or jaws which are removed from Fig. 2; Fig. 4 is an enlarged plan view showing the trolley or carriage; Fig. 5 is a side view; Fig. 6 is a transverse vertical section showing the center or pivot upon which the mechanism moves; and Fig. 7 is an enlarged side view of the front end of the bridge with the trolley or carriage thereon.

My invention has relation to crane mechanism which has been particularly designed for use in handling hot blooms or blanks, the object being to provide mechanism of this character by means of which the blooms or blanks may be withdrawn from a furnace and swung around and carried to a hammer or other tool and manipulated to facilitate the operation of the tool, and then carried back to the furnace for reheating. The mechanism may also be used in various other ways, and for other purposes.

The invention consists in a crane arm or bridge, which is arranged to swing about a fixed center, and having mounted thereon a movable trolley or carriage, carrying a tilting arm provided at its forward end with jaws or tongs adapted to be projected into a furnace, together with means for manipulating said arm and the jaws or tongs and for moving the trolley or carriage back and forth upon the crane or bridge or arm.

The invention also consists in the novel construction, arrangement and combination of parts all substantially as hereinafter described.

Referring to the drawings, the numeral 2 designates a horizontal crane arm or bridge, which may be conveniently constructed of two parallel I-beams connected at their rear ends by transverse bars 2^a carrying a center block 3, which engages a fixed stud or pivot

4, (see Fig. 6), upon which the bridge turns as a center. The outer end portion of the bridge is provided with the wheels 5, which are arranged to travel on the circular track 6, and its inner end portion provided with the wheels 7 arranged to travel upon the inner circular track 8, the two tracks 6 and 8 being concentric with each other and with the pivot 4. The bridge is swung about the center 4 by means of an electric motor 9, which is geared to the axles of one of the wheels 5 by the gearing 10.

Mounted on the bridge is a movable car or trolley 11, which is supported by the wheels 12, which may be conveniently arranged to travel on the lower flanges of the bridge I-beams. This carriage or trolley is moved back and forth by means of an electric motor 13, which is connected to the axle 14, of one set of the wheels 12 through a train of gearing 15. This carriage or trolley carries an operator's platform 16, upon which may be located the usual controllers, (not shown), for the several motive devices. Said car or carriage also supports a tilting arm 17, which is fulcrumed to tilt vertically about the center 18. This arm at its inner end has a toothed segment 19, which is engaged by a pinion 20 of a shaft 21 connected to an electric motor 22, through the train of gearing 23. By means of this motor a gearing or shaft 21 and pinion 20 are actuated to raise and lower said arm 17. Sleeved in said arm is a shaft 24, adapted to rotate therein, and connected at its outer end to a tongs head 25, in which are pivoted the tongs or gripping arms 26. The shaft 24 is rotated by means of an electric motor 27, which is connected to the said shaft through the train of gearing 28, 29, 30 and 31.

The tongs or gripping jaws 26 are opened and closed by means of a reciprocating rod 32, which extends through the arm 17, and through the shaft 24, and is provided with a head 33 at its forward end, (see Fig. 3), which is engaged by short arms 26^a of the tongs. The rear end of the rod 32 is connected to the piston 34 of a pneumatic or hydraulic cylinder 35 having the usual supply connections 36. An electric motor may be substituted for this cylinder, if desired.

37 indicates the usual electric brake for the motor 22.

In Fig. 1 I have shown the crane mechanism as located intermediately of two furnaces A and B, and have indicated diagrammatically two power hammers or other tools C and D. When thus arranged, the crane is used in the following manner: It is first moved to bring the tongs in position to be introduced into one of the furnaces which is effected by moving the carriage or trolley on the crane bridge. The tongs grasp the bloom or ingot, withdraw it from the furnace, and the crane arm or bridge is then swung around to carry the ingot or bloom under the hammer. When the ingot or bloom has been hammered upon one side, it may again be grasped by the tongs, which are then rotated by means of the motor 27 to invert the piece so that the hammer can operate upon the other side. The piece may then be again grasped by the tongs and carried to the other hammer, then back to one of the furnaces to be reheated. When the blank has been finished, in so far as the forging process is concerned, it may be placed on a suitable car or buggy by the crane, to be transported to any desired point.

The advantages of my invention result from the arrangement of the crane arm or bridge to swing in a circular path, in connection with the radially movable carriage or trolley having the vertically tongs-carrying tilting arm, and the means for rotating and actuating the tongs, whereby the various operations may be performed in an expeditious and economical manner, dispensing with the necessity for any manual labor in the handling of the blank.

It will be apparent to those skilled in the art, that various changes may be made in the details of the apparatus without affecting my invention. Thus, the crane or bridge arm may be variously constructed and mounted upon the circular tracks; the carriage or trolley may be of any approved form, and the various motive devices may be connected to the parts which they respectively operate by different means.

What I claim is:—

1. In mechanism of the character described, a circularly movable crane arm, circular tracks upon which said arm is mounted, a carriage or trolley movable on said arm, and a tiltable tong-carrying member mounted on the carriage or trolley; substantially as described.

2. In mechanism for handling metal billets, blooms, etc., a circularly movable crane arm, circular tracks upon which said arm is mounted, and a carriage or trolley arranged to reciprocate on said arm, a vertically-tilting tongs-carrier supported on the carriage or trolley, and tongs rotatably mounted in said carrier; substantially as described.

3. In mechanism for the purpose described, a circularly movable crane arm, a trolley mounted to travel on said arm, a tilting tongs-carrier mounted on the trolley, a tongs head rotatably mounted in said carrier, tongs pivoted to said head, and means for actuating the tongs; substantially as described.

4. In mechanism of the character described, a circularly movable crane arm, a carriage mounted to travel thereon and having an operator's platform, a vertically tilting tongs-carrier mounted on the carriage, tongs rotatably mounted in said carrier, and power means for operating the said parts; substantially as described.

5. In mechanism of the character described, an outer circular track, an inner circular track, a crane arm mounted to move on said tracks and having a pivot at the common center of said tracks, and a trolley carriage mounted on the crane-arm, the load on said arm being carried wholly by the two tracks, and the pivot acting to constrain the motion of the crane arm in a circular direction; substantially as described.

In testimony whereof, I have hereunto set my hand.

DAVID KENDALL.

Witnesses:

G. W. SHEM,
J. J. BROWN.