

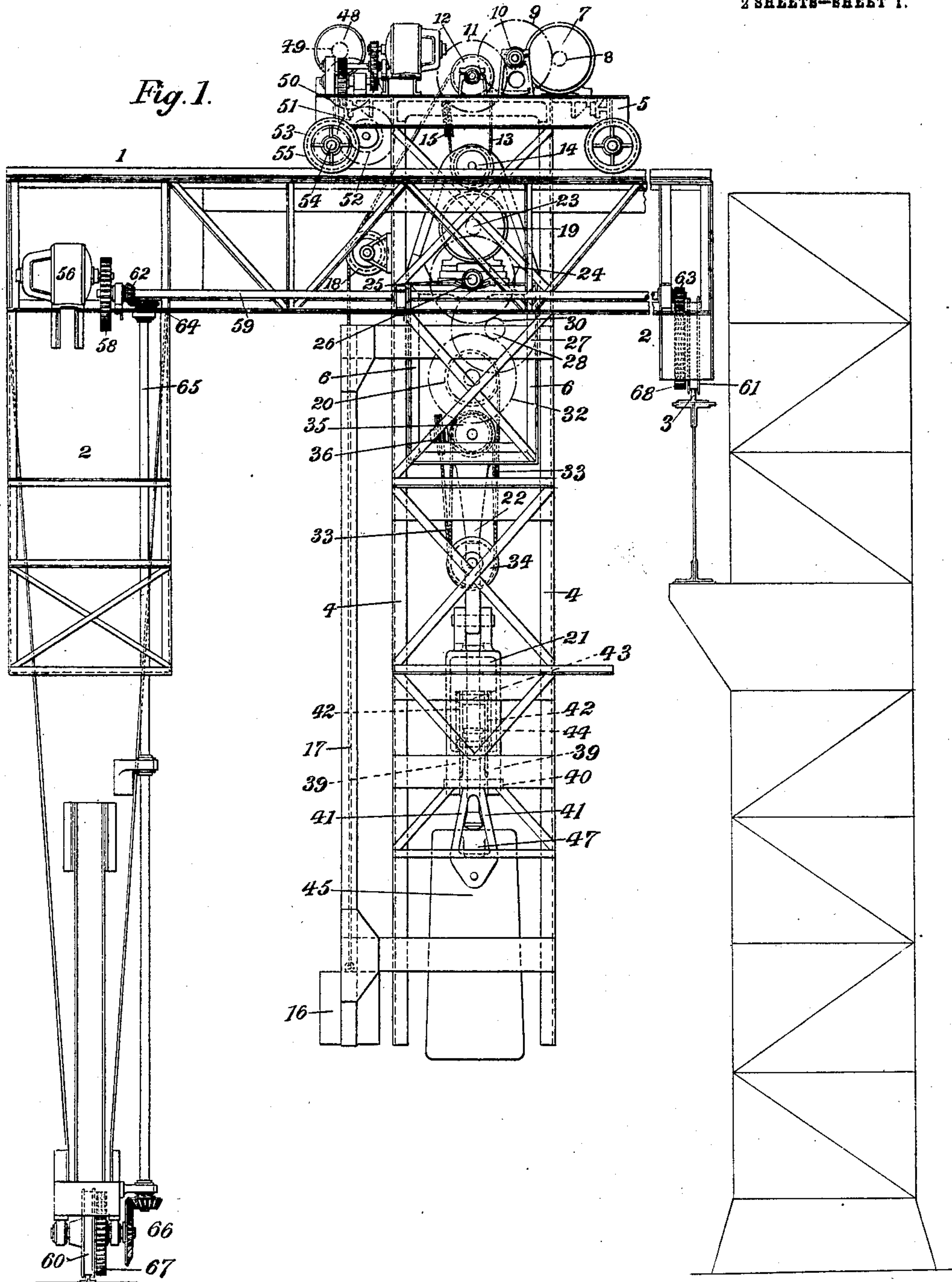
B. W. HEAD.  
INGOT STRIPPER.

APPLICATION FILED DEC. 14, 1908.

Patented May 18, 1909.

2 SHEETS—SHEET 1.

922,424.



WITNESSES  
L. H. Grote  
M. E. Keri

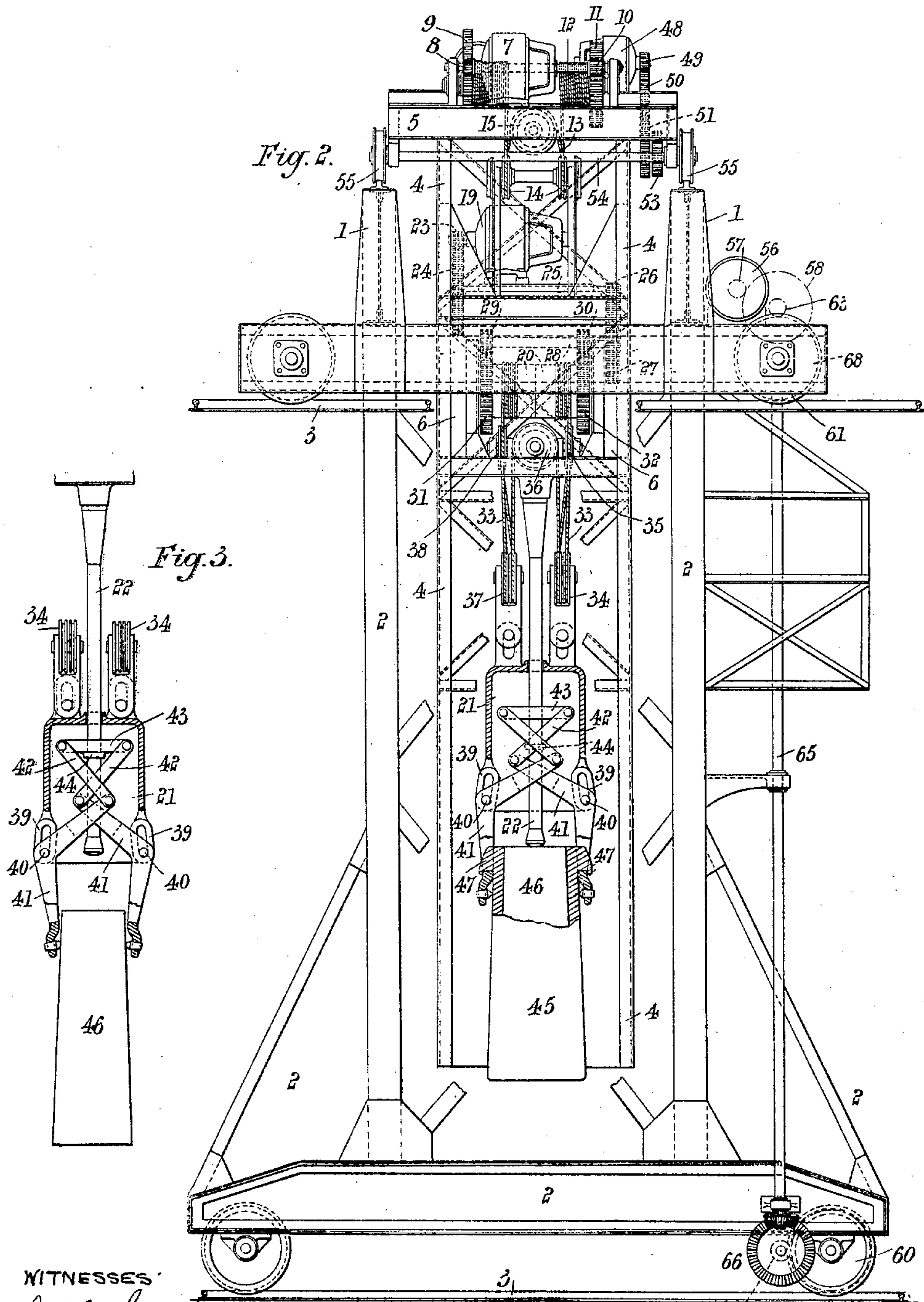
INVENTOR  
Benjamin Wrightson Head  
BY  
Hanson and Hanson  
ATTORNEYS

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# UNITED STATES PATENT OFFICE.

BENJAMIN WRIGHTSON HEAD, OF WESTMINSTER, LONDON, ENGLAND.

## INGOT-STRIPPER.

No. 922,424.

Specification of Letters Patent.

Patented May 18, 1909.

Application filed December 14, 1908. Serial No. 467,527.

*To all whom it may concern:*

Be it known that I, BENJAMIN WRIGHTSON HEAD, M. A., Cantab., A. M. I. C. E., a subject of the King of Great Britain and Ireland, of 47 Victoria street, in the city of Westminster and county of London, England, managing director of Wellman-Seaver and Head Limited, of the same address, have invented a new and useful Ingot-Stripper, of which the following is a specification.

My invention has for its object to provide improved and simple and efficient apparatus for manipulating ingots and their molds and for stripping ingots of their molds.

I will describe my invention with reference to the accompanying drawings, Figures 1 and 2 being elevations at right angles to each other, Fig. 2 being partly in section. Fig. 3 is a separate view of the gripping and lifting arrangement showing it gripping an ingot.

The apparatus according to my invention is supported and traversed in any usual, or suitable, way, upon an overhead structure 1 forming part of a carrier 2 capable of being moved on rails 3 to the required positions. The apparatus carried by the said overhead structure in the example illustrated consists of a framework 4 depending from a trolley 5 running on rails on the said overhead structure 1 and provided with guides along which a gear-casing 6, preferably counterbalanced, can be raised and lowered by hoisting gear driven by a motor carried by the trolley. This gear is shown as consisting of the pinion 8 driven by the motor 7 and gearing with a toothed wheel 9, the shaft of which carries a pinion 10 driving a toothed wheel 11 secured to a drum 12. One end of a rope 13, or chain, is connected to the drum 12 and is passed beneath one of a pair of pulleys 14 (on a shaft carried by the gear-casing 6) and over a jockey pulley 15 carried by the trolley 5 and from thence to beneath the other of the pair of pulleys 14 back to the drum 12 to which it is secured. The gear-casing 6 is counterbalanced by a weight 16 to which is connected one end of a rope, or chain, 17, which passes over a jockey pulley 18 carried by the framework 4, and is secured at its other end to the drum 12, preferably at its mid part. The said gear-casing 6 carries a motor 19 and reducing gear driving a divided drum 20, around which passes a rope, or pass ropes, for lifting and lowering, relatively to the gear-casing, a lower casing 21, through

which passes a ram 22 fixed relatively to the underside of the gear-casing 6. The said gearing and lifting and lowering arrangements are shown as being arranged as follows:—The shaft of the motor 19 carries a spur pinion 23 engaging a toothed wheel 24 secured to one end of a shaft 25, having secured at its other end a pinion 26 engaging a toothed wheel 27, secured to the shaft 28, to which pinions 29 and 30 are secured, these respectively gearing with toothed wheels 31 and 32 secured respectively to the parts of the divided drum 20. To one part of the divided drum 20 is secured a rope, or chain, 33, which is passed beneath one of a pair of pulleys 34, carried, with a slotted connection as shown, by the casing 21 and led from thence over one of two parts of a jockey pulley 35 (carried by the gear-casing 6) from which the rope, or chain, is led to the other of the pair of pulleys 34, and then over a jockey pulley 36 to one of another pair of pulleys 37 carried by the casing 21, similarly to the pair 34. The said rope, or chain, is then led to, and over, a jockey pulley 38 and back to the other of the pair of pulleys 37, and from thence to the other part of the divided drum 20 to which it is secured. The weight of the casing 21, when the rope, or chain, 33 is slackened, forces inward, by the grooves in the arms 39 acting on the pins 40, the arms 41, and a grip, proportionate to the weight of the said casing is obtained thereby on the ingot. A slotted connection is provided between the pulleys 34 and the casing 21 whereby the ropes are kept tight on the pulleys.

The means for engaging the molds and gripping the ingots may be of any suitable kind. The following is suitable, but I do not limit myself to the use of these particular means. The lower casing 21 has, at its lower end, slotted lugs 39 with which engage the pins 40 of bent levers 41, the lower arms of these levers being formed to engage lugs on the molds and also carrying dogs, or teeth, to grip the ingots. The upper ends of the said levers 41 cross each other within the lower casing 21 and are connected by crossed links 42 with a cross-head 43 capable of sliding upon the ram 22 and of coming against a collar 44 on the said ram 22 when the lower casing 21 is lowered from the gear-casing 6 to which the ram 22 is fixed.

Both the operations of stripping the in-



gots of their molds and of gripping the ingots are accomplished by raising and lowering the lower casing 21 relatively to the gear-casing 6 above and the ram 22 carried by it.

5 To strip the mold from the ingot, the lower casing 21 is raised independently of the gear-casing 6 and ram 22 so that the cross-head 43, to which the upper ends of the levers 41 are connected by the links 42, is raised from

10 the collar 44 on the ram 22 when the lower ends of the said levers 41 move outward in consequence of the weight of the cross-head 43. When the apparatus is in correct position above the mold 45 and ingot 46, the

15 gear-casing 6 and the lower casing 21 are lowered together, and the lower arms of the levers are closed. On further lowering the lower casing 21, relatively to the gear-casing 6, by contact of the cross-head 43 with the

20 collar 44 on the ram 22, the said arms engage the lugs 47 on the mold (see Fig. 2). The gear-casing 6 and the lower casing 21 are then raised together and lift the mold 45 and

25 mold 45 are raised independently of the gear-casing 6 so that the ram 22 forces the ingot 46 from the mold 45.

To grip an ingot (see Fig. 3), the lower casing 21 is lowered until the cross-head 43

30 comes against the collar 44 on the ram 22, and, when the said lower casing 21 is lowered farther, the arms of the levers move inward so that the dogs, or teeth, thereon grip the ingot 46. The gear-casing 6 and lower casing 21 are then raised together, thus lifting

35 the ingot which is gripped with a force proportionate to its weight, together with a force determined by the angle of the slots in the lugs 39 and applied by the weight of the

40 lower casing 21 and its adjuncts. When the ingot 46 has been brought over the soaking pit, or other place where it is to be deposited, the gear-casing 6 and lower casing 21 are lowered together and then the grip on the

45 ingot 46 is released by raising the lower casing 21 independently of the gear-casing 6.

The traversing of the trolley 5 and of the whole apparatus may be effected in any suitable way. I have shown the traversing

50 of the trolley as being effected by the motor 48, pinion 49, intermediate toothed wheels 50 and 51, the pinion 52 on the shaft of the wheel 51 engaging the toothed wheel 53 fixed to the axle 54, on which a pair of the

55 wheels 55 is mounted.

The traversing of the whole apparatus is shown as being effected by the motor 56, the pinion 57 of which engages a toothed wheel 58 secured to the shaft 59 which transmits

60 motion to the traveling wheels 60 and 61 by means of the pinions 62 and 63, the pinion 62 engaging a bevel wheel 64 secured to a shaft 65 which, through the bevel gear 66 and spur gear 67, drives the traveling wheel 60. The

pinion 63 drives a toothed wheel 68 secured 65 to the axle of the traveling wheel 61.

Although I have described guides as being used for the vertical motion, I do not limit myself to the use of such guides, as the apparatus will work without them, but I prefer 70 to use them.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:— 75

1. In apparatus for manipulating ingots and their molds, and for stripping ingots of their molds, a suspended gear-casing carrying a ram and capable of being lowered and raised, and a lower casing and means for 80 lowering and raising it from the gear-casing, in combination with means in connection with said lower casing for engaging the mold and for grasping the ingot, the said engaging means being such that the weight 85 of the lower casing causes the said engaging means to tighten the grip upon the ingot.

2. In apparatus for manipulating ingots and their molds, and for stripping ingots of their molds, an overhead trolley, a gear- 90 casing suspended therefrom and carrying a ram and capable of being lowered and raised from the trolley and a lower casing and means for lowering and raising it from the gear casing, in combination with means in 95 connection with said lower casing for engaging the mold and for grasping the ingot, the connection of said engaging means with the lower casing being such that the weight of the lower casing acts upon the said engaging 100 means to tighten the grip upon the ingot.

3. In apparatus for manipulating ingots and their molds and for stripping ingots of their molds, an overhead trolley, a gear casing supported thereby and adapted to be 105 lowered and raised with relation thereto, a lower casing adapted to be lowered and raised from said gear casing, in combination with a ram passing through the lower casing, lugs at the lower end of the latter having in- 110 clined slots therein, crank levers provided with pins engaging in said slots, the lower arms of said levers being adapted to engage the molds and also to grip the ingots, the upper ends of said levers crossing each other 115 within the lower casing, a cross head slidable upon the ram and cross links connecting the same to said levers, the said ram having on it a collar upon which the cross head bears when the lower casing is lowered from the 120 gear casing, substantially as described.

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

BENJAMIN WRIGHTSON HEAD.

Witnesses:

H. D. JAMESON,  
F. D. RAND.