

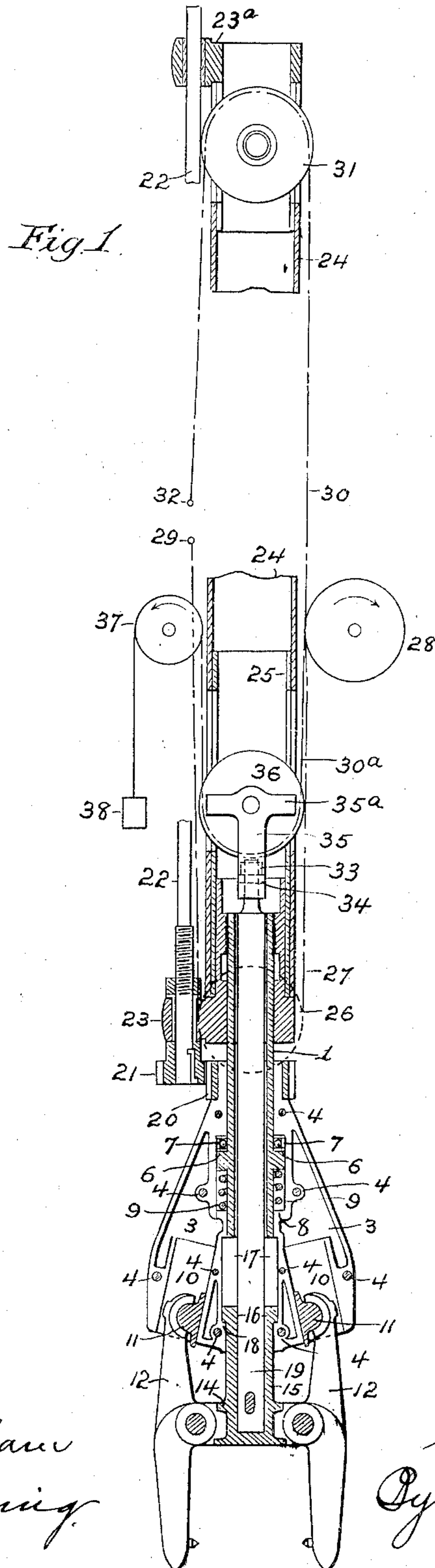
No. 864,936.

PATENTED SEPT. 3, 1907.

C. L. TAYLOR.
VERTICAL CHARGING MECHANISM.

APPLICATION FILED MAY 19, 1906.

2 SHEETS—SHEET 1.



WITNESSES

E. Nottingham
G. J. Downing

INVENTOR

C. L. Taylor
By H. A. Seymour
Attorney

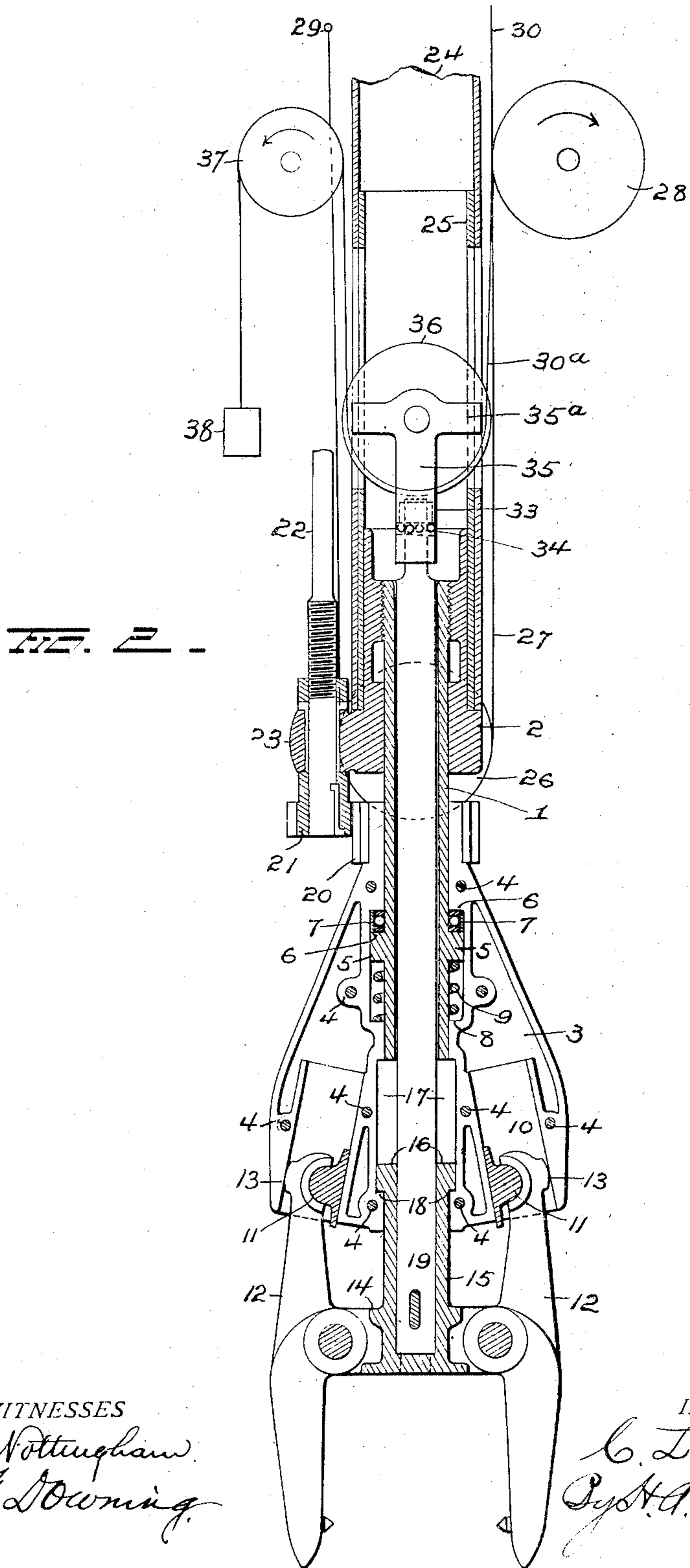
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UNITED STATES PATENT OFFICE.

CLARENCE L. TAYLOR, OF ALLIANCE, OHIO, ASSIGNOR TO THE MORGAN ENGINEERING COMPANY, OF ALLIANCE, OHIO.

VERTICAL CHARGING MECHANISM.

No. 864,936.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed May 19, 1906. Serial No. 317,750.

To all whom it may concern:

Be it known that I, CLARENCE L. TAYLOR, of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Vertical Charging Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in vertical charging mechanism, designed for use in connection with overhead traveling cranes, and it consists in the parts and combination of parts and in the details of construction as will be more fully described and pointed out in the claims.

In the accompanying drawings; Figure 1 is a view in section of my improved mechanism, the inner face of one half of the tongs carrying frame being shown in elevation, the drum and hoist ropes or chains being shown diagrammatically, and Fig. 2 is an enlarged view of the lower portion of Fig. 1.

1 represents a hollow stem screwed at its upper end into casting 2.

The tongs frame 3 is made in half sections, one of which only is shown in the drawing, the other being a duplicate of the one shown and secured to the same by bolts 4. The tongs carrying frame thus constructed, embraces the lower end of stem 1, the collar 5 on said stem resting within an annular recess formed in the tongs frame. Interposed between said collar 5, and the internal annular shoulder 6 on the tongs frame 3 is the roller bearing 7 which supports the tongs frame and weight carried thereby, and permits the tongs frame to be freely rotated on the stem by the mechanism to be hereafter described.

Located within the annular recess in the tongs frame below the collar 5 on the stem 1, and supported at its lower end against the shoulder 8 forming the bottom of said annular recess, is the spring 9 which is designed to absorb shock or jar due to careless handling of the apparatus. The annular recess in the tongs frame is considerably larger than the collar 5, thus permitting an endwise movement of the stem 1 within the tongs frame, the spring 9 below the collar, aided by gravity, always tending to hold the shoulder 6 of the tongs frame down on the roller bearing 7, and absorbing the shock due to the sudden or violent contact of the tongs frame with an ingot or other object.

Each half section of the tongs frame is provided with upwardly converging slide ways 10, the ways of one section conforming and alining with those in the other section, so that when the two sections are assembled on the stem 1, internal inclosed slide ways are formed for the reception of the sliding shoes 11 to which the upper ends of the tongs levers are loosely and removably con-

nected. The shoes 11 slide on the inner faces of the slide ways 10, while the projections 13 on the outer faces of the tongs levers 12, rest in close proximity to the outer faces of the slide ways, and prevent any separation of the shoes 11 and levers 12, and move in contact with said surfaces during the opening movement of the tongs levers.

The tongs levers 12 are pivoted to the cross head 14, which is provided centrally with an upwardly projecting sleeve 15, having a collar 16 at its upper end, the said collar resting and moving within the annular recess 17 in the tongs frame 3. When the cross head 14 and sleeve 15 are in their lowermost positions, or in positions where the tongs levers are closed, as shown in the drawings, the collar 16 rests on the annular shoulder 18 and forms a solid unyielding support for the tongs frame.

Secured to the sleeve 15 of cross head 14, and passing upwardly and through the stem 1, is the tongs actuating rod 19. By elevating this rod, the cross head will be elevated, and the projections 13 on the levers engaging the outer surfaces of the slide ways 10 will cause the upper ends of the tongs levers to approach each other, and the lower or grasping ends of the tongs to separate. The tongs are lowered on an ingot, while in their open position, and when in such position the cross head 14 is up in contact with, or in close proximity to the tongs frame 3 and if by carelessness or accident the cross head or tongs, in descending should forcibly engage an ingot or other object, the spring 9 will yield and thus gradually check the downward movement of the stem and absorb the shock due to such forcible contact.

The upper end of the tongs frame 3 is provided with a pinion 20, which is in mesh with a pinion 21 fast on shaft 22. This shaft is preferably angular in cross section and is journaled at its lower end in bearing 23 carried by the casting 2 and at its upper end in the bearing 23^a secured to the casing 24 near the upper end of the latter, and slidingly engages a driven gear (not shown) coupled up to a motor on the trolley which carries the mechanism. By rotating shaft 22, pinion 21 engaging pinion 20 turns the tongs casing on the stem. The gear 20 is made wider than gear 21, and normally is removed from the lower end of casting 2 so as to permit of the independent vertical movement of the stem within the tongs on the frame as above described. The casting 2 is secured to the lower end of the tubular or cylindrical casing 24 reinforced at its lower end by the shorter tube 25.

Secured to the opposite sides of casting 2 are the sheaves 26, only one of which is shown. Two ropes pass from the hoist drum 28 mounted on and carried by the trolley (not shown), down and around these sheaves and up to the point 29 on the trolley where the ends are

secured. A rope or cable 30 is wound several times around drum 28, and one end thereof passes up over sheave 31 in the upper end of casing 24 and down to the fixed point 32 on the trolley where it is firmly secured, while the other end of rope or cable 30 indicated by the reference character 30^a passes downwardly from drum 28 as shown, under sheave 36 and up to drum 37 as will be more fully explained later on. By this arrangement it will be seen that by rotating the drum in the direction indicated by the arrow, ropes 27 will be wound thereon and the apparatus elevated at a speed equal to one half the circumferential speed of the drum, and a rotation in the opposite direction will cause that portion of the rope or cable 30 passing up to sheave 31 to wind on the drum and thus positively force the mechanism downwardly. By this arrangement a positive motion is given in both directions.

Secured to the upper end of the tongs actuating rod is the nut 33 against the lower face of which a roller bearing 34 carried by the sheave hanger 35, bears. This sheave hanger 35 has an opening therein for the passage of the reduced upper end of rod 19, and carries the roller bearing, which as above explained, sustains the weight of the rod and permits the latter to be rotated when the tongs carrying frame is rotated.

That portion of rope or cable which passes around sheave 31 at the upper end of the casing 24 is passed or wrapped once or twice around hoist drum 28 and then leads down (30^a) and around sheave 36 mounted in the sheave carrier 35, then up to auxiliary drum 37, around which it is wound several times and then down, and connected to counterweight 38. With this arrangement it will be seen that, by rotating hoist drum 28 in the direction of the arrow ropes 27 and 30^a wind and rope 30 unwinds at equal speeds, and by reversing the direction of rotation of drum 28 ropes 27 and 30^a will unwind and rope 30 wind at equal speeds thus permitting the tongs casing to be hoisted or lowered without opening or closing the tongs. If however the auxiliary drum 37 be independently rotated in the direction of the arrow, the sheave 36, and cross head 14, will be lifted thus opening the tongs. The sheave hanger 35 has wings or lugs 35^a which rest in slots in the casing 24 for preventing rotation of the hanger when the tongs frame is rotated.

The drums above described are designed to be carried by a trolley or other suitable support and are to be actuated by suitable motors, and the casing 24 may be mounted in suitable guides on the trolley, and arranged to prevent any swinging or lateral deflection of the tongs. These details form no part of my present invention, and such parts on the trolley as are necessary for an understanding of the invention are shown diagrammatically only.

It is evident that many slight changes might be made in the relative arrangement of parts shown and described without departing from the spirit and scope of my invention hence I would have it understood that I do not wish to confine myself to the exact construction of parts shown and described, but,

Having fully described my invention what I claim as new and desire to secure by Letters-Patent, is:—

1. In a vertical charging mechanism, the combination with a stem, of tongs carrying frame mounted to rotate and have a limited longitudinal movement on said stem,

tongs adapted to close by gravity and means for opening and closing said tongs.

2. In a vertical charging mechanism, the combination with a stem, of tongs carrying frame mounted to rotate and have a limited longitudinal movement thereon, a spring tending to restrain the downward movement of the stem in the frame, tongs constructed and arranged to close by gravity and means for opening said tongs.

3. In a vertical charging mechanism the combination with a depending stem and flexible suspension means for same, of tongs frame having a limited sliding movement on said stem, a spring interposed between the stem and frame and tongs levers carried by said frame.

4. In a vertical charging mechanism, the combination with a depending stem, and means for elevating and lowering same, of a tongs frame adapted to have a limited sliding movement on the stem, and also rotate thereon, and gearing for rotating the frame.

5. In a vertical charging mechanism, the combination with a depending stem having a collar thereon and means for elevating and lowering said stem, of a two part tongs frame bolted around the stem and inclosing the collar, a roller bearing interposed between the top of the collar and a shoulder on the tongs frame and supporting the latter, a spring interposed between the lower face of the collar and a shoulder on the tongs frame, and means for rotating the frame.

6. In a vertical charging mechanism, the combination with a depending stem having a peripheral collar thereon, and means for raising and lowering said stem, of a two part frame embracing the stem and having a recess to receive the collar, roller bearing located within said recess and resting on the upper face of said collar, a spring within said recess and bearing against the lower face of said collar, tongs levers the upper ends of which are mounted in inclined ways in the tongs frame, a cross head to which said levers are pivoted, and means for lifting said cross head.

7. In a vertical charging machine, the combination with a depending stem having a peripheral collar, and means for raising and lowering said stem, of a two part tongs frame embracing the stem and having a recess to receive the collar the said recess permitting a limited sliding movement of the stem in the frame, tongs levers the ends of which rest in inclined ways in the frame, a cross head to which said levers are pivoted, means for raising and lowering said cross head and means for rotating the frame on the stem.

8. In a vertical charging machine, the combination with a stem, means for raising and lowering same, a shaft mounted in bearings connected with the stem and a pinion on said shaft, of tongs frame mounted to slide and rotate on said stem, a pinion secured to said frame and having a sliding engagement with the pinion on the shaft, tongs levers the ends of which engage inclined ways in the frame, a cross head to which said levers are pivoted and means for raising and lowering said cross head.

9. In a vertical charging mechanism, the combination with a casing or tube and a stem secured to the lower end thereof, of sheaves located near the lower end of said casing, a sheave near the upper end of same, ropes fast at one end, passing under the lower sheaves and up to a drum, and a second rope fast at one end, passing up over the top sheave and down to the drum, and ingot grasping means carried by the lower end of the stem.

10. In a vertical charging mechanism, the combination with a casing or tube, a stem secured to the lower end thereof, ingot grasping means carried by the lower end of the stem and a rod for opening and closing the tongs, of flexible means for elevating and lowering the casing and stem, and flexible means independent of the elevating and lowering means for lifting the tongs opening and closing rod.

11. In a vertical charging mechanism, the combination with a casing or tube, a stem secured to the lower end thereof, ingot grasping means carried by the lower end of the stem, and a rod within the stem for opening and closing the tongs, of hoist ropes, and a drum, the ropes being secured at one end to a fixed part of the apparatus, passing down under the lower sheaves and thence up to the hoist drum, a second drum, a rope passing several times

and have a limited longitudinal movement on said stem,

around same and connected at one end to a counterweight, the other end of said rope passing down under a sheave carried by the opening and closing rod and from thence up to the hoist drum.

- 5 12. In a vertical charging mechanism, the combination with a casing or support carrying ingot grasping levers, and a rod for opening and closing said levers, of a pair of sheaves journaled to the casing or support near the lower end of the latter, a sheave journaled to said casing or support near the upper end of the latter, a main hoist drum, an auxiliary drum, ropes fixed at one end and passing under the lower sheaves on the support and up to the

hoist drum, a second rope fixed at one end and passing over the upper sheave on the support, down and around the hoist drum, thence down under the sheave on the tongs 15 opening and closing rod, up and around the auxiliary drum, and a counterweight secured to the free end of said latter rope.

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

CLARENCE L. TAYLOR.

Witnesses:

A. L. ROBERTS,

N. C. FETTERS.