

No. 717,052.

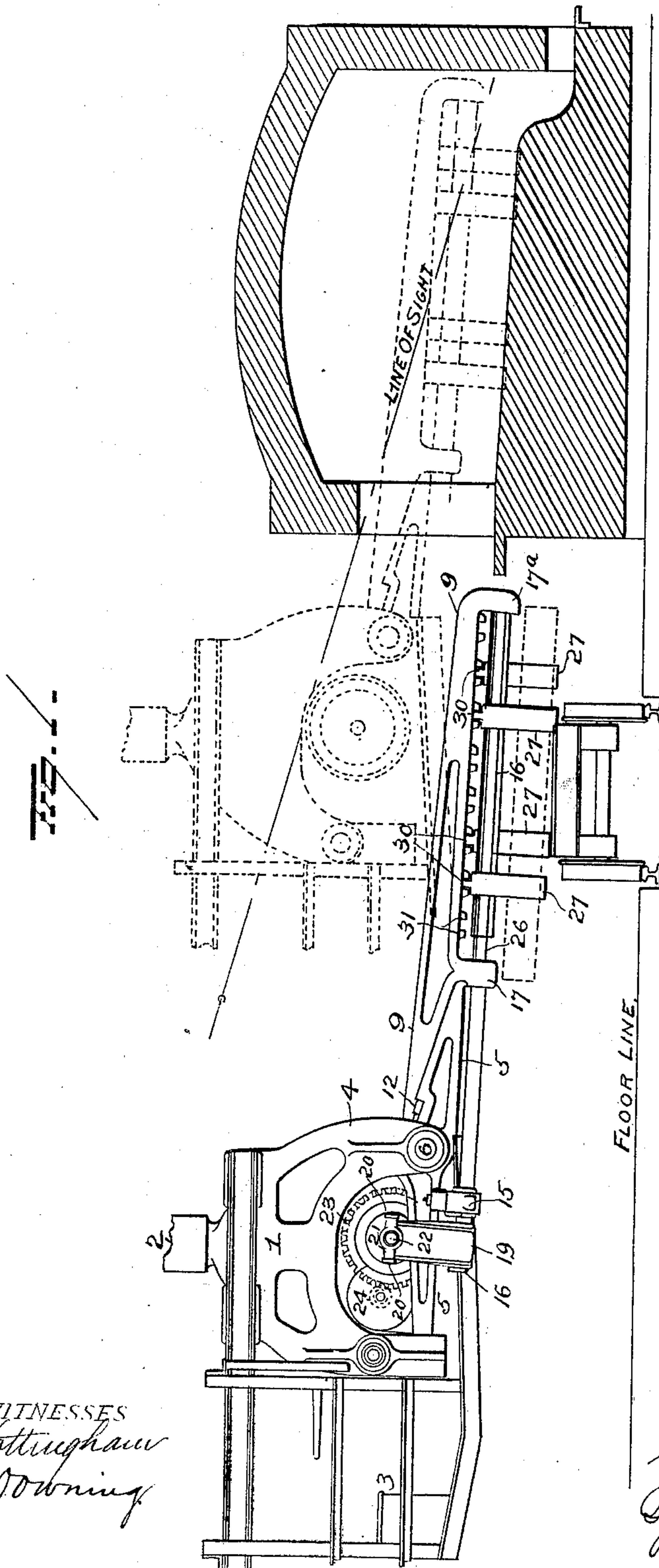
Patented Dec. 30, 1902.

C. L. TAYLOR.  
CHARGING CRANE.

(Application filed June 10, 1902.)

(No Model.)

4 Sheets—Sheet 1.



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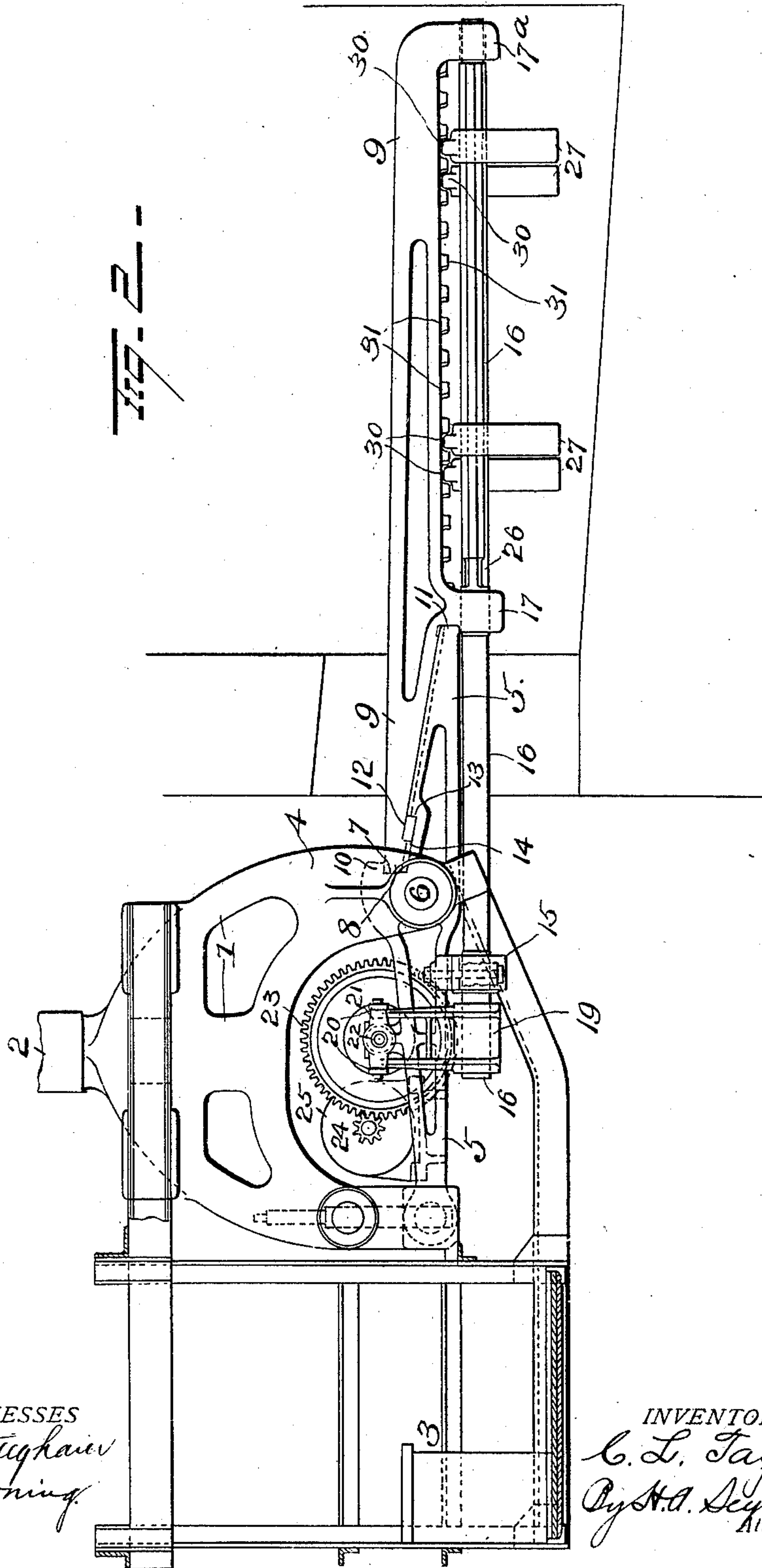
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(No Model.)

4 Sheets—Sheet 2.



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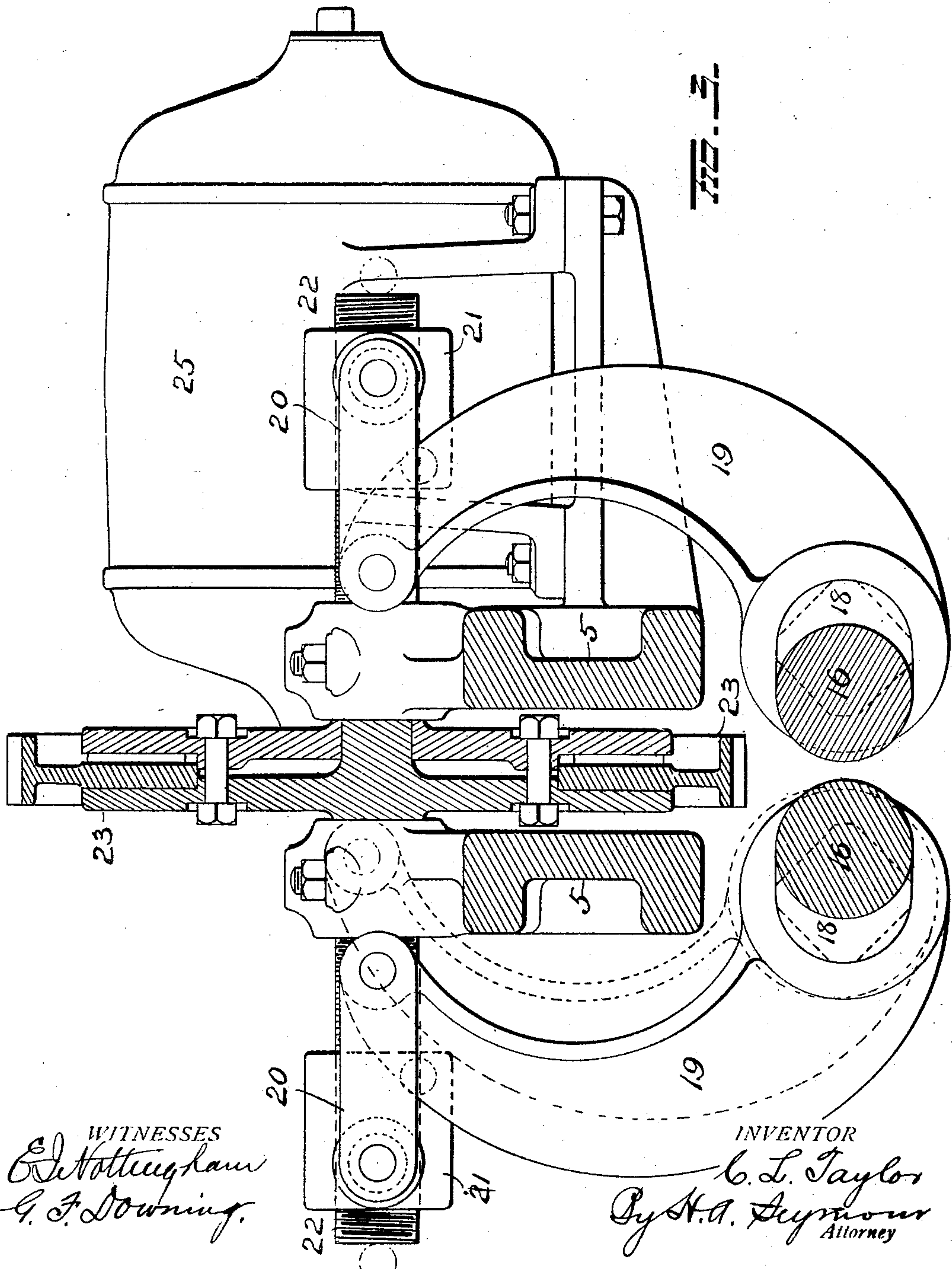
Patented Dec. 30, 1902.

C. L. TAYLOR.  
CHARGING CRANE.

(Application filed June 19, 1902.)

(No Model.)

4 Sheets—Sheet 3.



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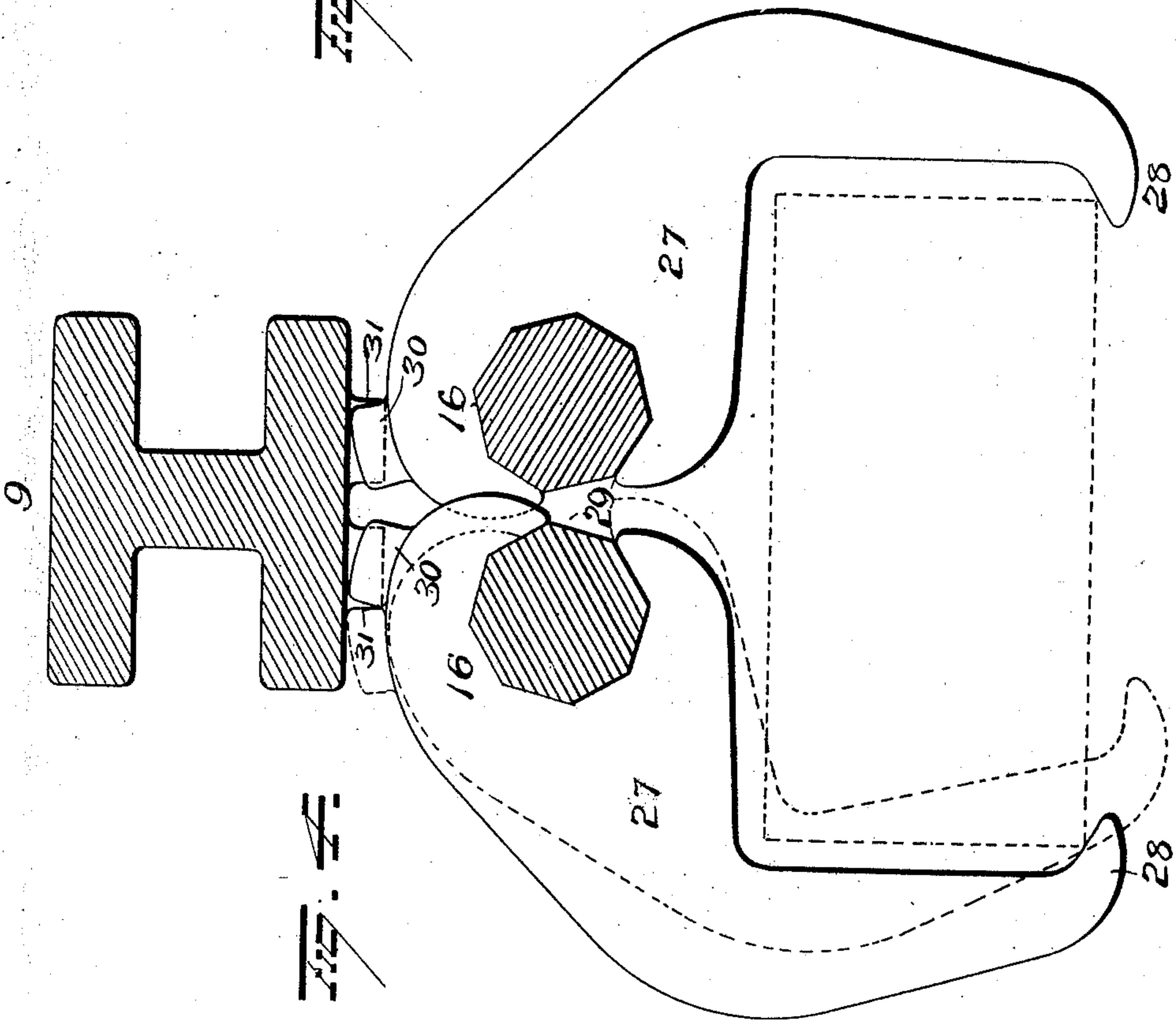
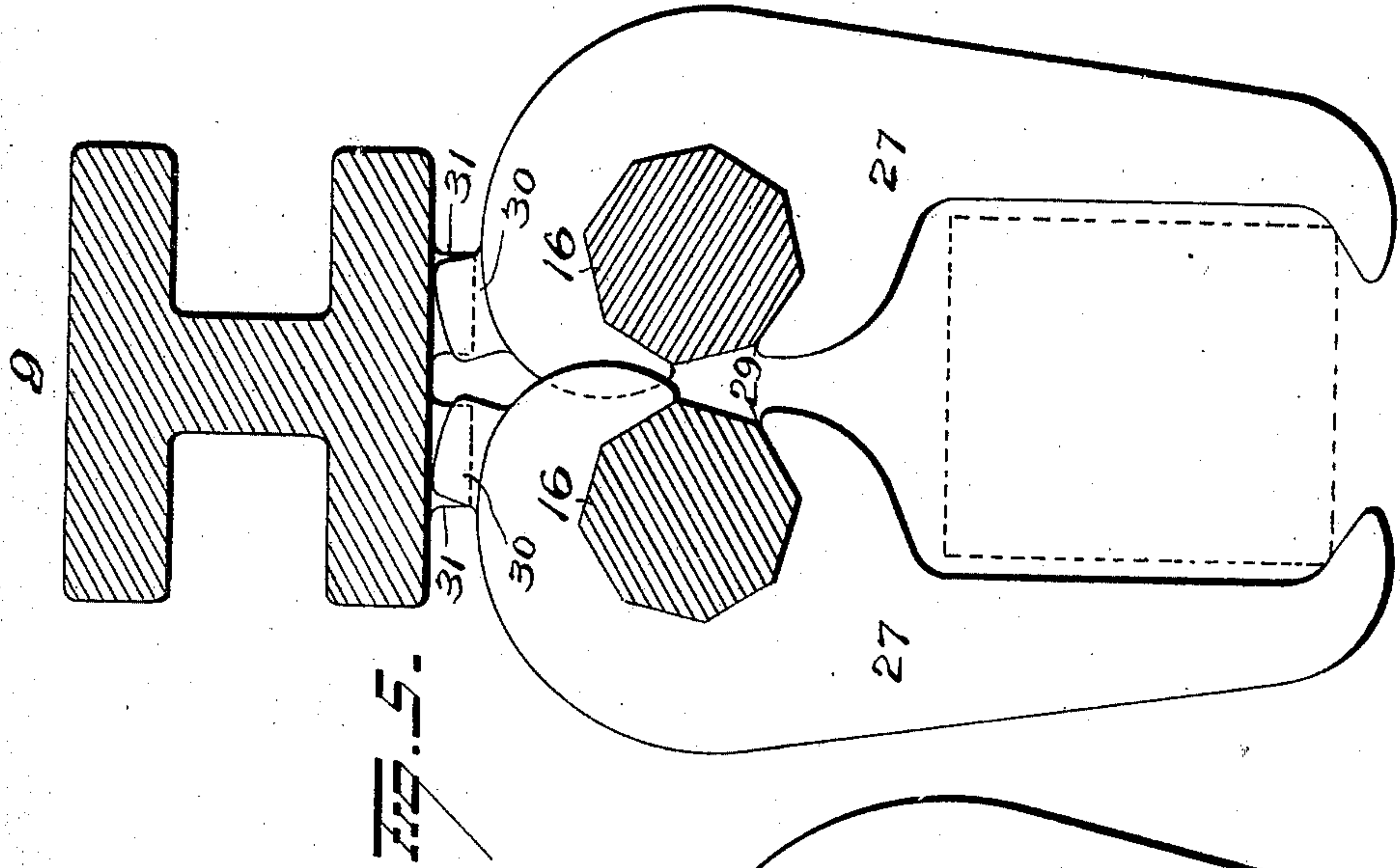
Patented Dec. 30, 1902.

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CHARGING CRANE.

(Application filed June 10, 1902.)

(No Model.)

4 Sheets—Sheet 4.



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# UNITED STATES PATENT OFFICE.

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

## CHARGING-CRANE.

SPECIFICATION forming part of Letters Patent No. 717,052, dated December 30, 1902.

Application filed June 10, 1902. Serial No. 111,065. (No model.)

*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 Charging-Cranes; 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 machines for charging and discharging skelp-piles, ingots, &c., into and from furnaces, the object being to provide means constructed to pick up bodily piles, ingots, &c., and deposit them on the floor of the furnace or pick them up bodily and withdraw them from the furnace.

A further object is to provide a charging-crane with a detachable and removable carrying-frame so constructed that the same may be readily removed for repairs or replaced by a new one when its further use has become impaired by the intense heat to which it is subjected.

A further object is to provide the gripping-shafts with adjustable and detachable gripping-arms, whereby the latter may be adjusted to embrace and securely support piles, ingots, &c., of different sizes.

With these ends in view my invention consists in the parts and combinations of parts as will be more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation, showing my improved charging apparatus in full lines in the act of gripping an ingot and also in dotted lines showing it about to deposit the ingot in a furnace. Fig. 2 is a similar view, on a large scale, of my apparatus. Fig. 3 is a view in vertical section through the shafts 16 in front of the arms 19 and through the carrying-frame 5 and pinion 23, the screws 22 and nuts 21 thereon being shown in elevation. Fig. 4 is a view in vertical section through removable section 9 of the carrying-frame 5 and the shafts 16; and Fig. 5 is a view similar to Fig. 4, showing different-shaped gripping-arms.

This improved apparatus is designed to be carried on the traveling trolley of an over-

head traveling crane; but as the crane and trolley form no part of the present invention they are not shown or specifically described.

The frame 1 of the charging device depends from the post 2. This post may be a rack-bar or other suitable device carried by the traveling trolley on the bridge and connected by gearing with suitable elevating devices, whereby the frame 1 may be elevated and lowered. This frame 1 carries at its rear the operator's cage 3, in which are located the controllers for the several motors employed for actuating the traveling bridge, the trolley thereon, the elevating and lowering motor, and the motor for actuating the gripping or grappling shafts and arms thereon.

The frame 1 may be of any approved shape and is provided on its front side with the depending brackets or arms 4, between and to which the carrying-frame 5 is pivoted, as at 6. This frame 5 projects in front and in rear of the brackets 4 and is connected at its rear end to any suitable mechanism for tilting or rocking it on its bearing 6. The front end of this carrying-frame 5 is approximately V shape in side elevation, as shown in Fig. 2, and is provided on its upper face near and in front of its pivotal bearing 6 with a recessed or cut-away portion 7 to receive a correspondingly-shaped projection 8 on the removable section 9 of the carrying-frame 5. The rear end of this removable frame 9 rests under the shoulder 10 of the section 5, while the front end of the latter rests within the recess 11 of the section 9. Hence with the parts thus assembled they may be locked by the insertion of the wedge 12 between the shoulder 13 on the section 5 and the shoulder 14 on the section 9. By simply removing wedge 12 and moving section 9 outwardly on section 5 the interlocking members of the two parts 5 and 9 are disengaged, thus leaving section 9 free to be removed. The part 5 of the carrying-frame in rear of pivot 6 is bifurcated, as shown clearly in Fig. 3, and each member thereof carries a bearing 15, in which the gripping-shafts 16 are journaled, the latter being also supported at their front ends and intermediate points by the bearings 17 and 17<sup>a</sup>, the latter being integral with the section 9 of the carrying-frame.



Secured to the cam or crank sections 18 of the shafts 16, at the rear or inner ends of the latter, are the curved arms 19, which project upwardly in a plane above the frame 5, as shown in Fig. 3, and are connected at their upper ends by links 20 with the nuts 21, carried by the double screw 22. This screw is mounted in bearings on the upper face of the bifurcated section of part 5 of the carrying-frame and carries the pinion 23, which latter is engaged by the pinion 24 on the armature-shaft of the motor 25, also carried by section 5 of the carrying-frame. By rotating the motor in one direction the nuts 21 will be moved outwardly, thus partly rotating the shafts 16 in one direction, and by reversing the direction of rotation of the armature-shaft of the motor 25 the direction of rotation of shafts 16 will be reversed, thus rotating the shafts in the opposite direction.

The shafts 16 from points in front of bearings 17 are made angular in cross-section, as shown in Figs. 4 and 5, and each is cut away at 26 to permit of the placement thereon of the gripping or grappling tongs or arms 27. These tongs or arms may be of any approved form and are provided at their lower ends with toes 28, which take under the pile or ingot, and when a pile or an ingot is so engaged by the series of arms on each shaft it will be securely held against movement or displacement.

Each shaft 16 is shown as provided with two arms 27, and each of the latter has a hub, with a slot 29 therein conforming in size to the cut-away portions 26 of the shaft 16. Each hub is also provided with an opening conforming in shape and size to the cross-section of the shafts 16. Hence the arms 27 can be placed on the shaft 16 at the cut-away portions 26 thereof and then adjusted lengthwise the shaft to take in ingots or piles of any length. From this construction it is evident that if a grappling arm or tongue becomes damaged or warped by the intense heat to which it is subjected when in use it can be readily removed and replaced by a new one without serious loss of time.

In order to hold the arms or tongs 27 in place and against longitudinal movement on their shafts after they have been properly placed, I provide each arm with an upwardly-projecting lug 30, which latter normally rests between depending lugs 31 on the carrying-frame 9, the latter being provided with lugs 31 throughout its length, so as to permit of the necessary adjustment of the arms 27 on the shafts 16. In the ordinary movements of the arms 27, as in opening or closing on a pile, ingot, &c., the distance traveled by the lugs 30 is not sufficient to carry them out of the planes of the lugs 31. Hence in order to change the adjustment of the arms on the shafts the latter are turned so as to carry the toes 28 well in toward each other. When grasping a pile or ingot, the inner faces of the

depending members of the arms are approximately vertical, as shown in full lines in Fig. 4. Hence in order to change the relative positions of the arms the latter must be turned to abnormal positions, as shown in dotted lines, and when in these positions the lugs 30 are outside of the planes of the lugs 31, thus leaving the arms 27 free to be shifted endwise on the shafts. With this device I may use different size and shaped arms for different sizes of piles or ingots, as shown in Figs. 4 and 5, and with the construction described it becomes a very simple and easy matter to change from one set of arms to another, as the necessities of the work demand.

With my improved device a solid mass or a pile of plates of any size can be picked up and safely deposited on the floor of the furnace or can be discharged from the furnace and deposited on a car or rolls, as the case may be.

It is evident that changes in the construction and relative arrangement of the several parts might be made without avoiding my invention, and hence I would have it understood that I do not restrict myself to the particular construction and arrangement 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 charging-crane, the combination with a depending frame, and an operator's cage and a carrying-frame carried thereby, the carrying-frame having a removable end section, of tongs-shafts and an actuating-motor carried by said carrying-frame.

2. In a charging-crane, the combination with a depending frame, and a carrying-frame projecting therefrom, of tongs-shafts and shafts-actuating motor supported on said carrying-frame.

3. In a charging-crane, the combination with a depending frame, and a carrying-frame pivoted thereto, of tongs-shafts mounted in bearings on said carrying-frame and shafts-actuating motor supported on said carrying-frame.

4. In a charging-crane, the combination with a depending frame and a carrying-frame pivoted thereto, of tongs-shafts mounted in bearings on said carrying-frame, a motor on said carrying-frame on one side of the axis of the latter, and tongs or arms on the shaft on the opposite side of the axis of the carrying-frame.

5. In a charging-crane, the combination with a depending frame and a carrying-frame pivoted thereto, the latter having a removable front section, of shafts journaled in bearings on said carrying-frame, a motor also mounted on said frame and connected with the shafts for actuating the latter, and tongs or arms carried on the shafts.

6. In a charging-crane, the combination with a carrying-frame, shafts, and arms or tongs on said shafts, of a motor, a double



screw actuated thereby and means connecting the screw and shafts whereby the latter may be rocked.

- 5 7. In a charging-crane, the combination with a carrying-frame, shafts and tongs or arms on said shafts, of a motor, a double screw, nuts on said screw and means connecting the nuts and shafts whereby the latter are turned when the screw is rotated.
- 10 8. In a charging-crane, the combination with a carrying-frame, of two shafts each non-circular in cross-section and arms or tongs adjustable lengthwise said shafts.
- 15 9. In a charging-crane, the combination with a carrying-frame, of two shafts each non-circular in cross-section, arms or tongs on said shafts and means for preventing accidental movement of the arms or tongs lengthwise the shafts.
- 20 10. In a charging-crane, the combination with a carrying-frame, of two shafts angular in cross-section and each having a reduced or cut-away portion, and arms or tongs the hubs

of each of which has a bore corresponding to the cross-section of the shafts and also having an opening to permit of its placement on the shaft at the cut-away portion thereof. 25

11. In a charging-crane, the combination with a carrying-frame, of two shafts angular in cross-section, and arms or tongs on said shafts the said arms or tongs being adjustable lengthwise the shafts. 30

12. In a charging-crane, the combination with a carrying-frame having lugs depending from its underside, of shafts mounted in said frame, and adjustable arms or tongs on said shafts the said arms or tongs having lugs which normally rest between the depending lugs on the carrying-frame. 35

In testimony whereof I have signed this specification in the presence of two subscribing witnesses. 40

CLARENCE L. TAYLOR.

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