

(No Model.)

4 Sheets—Sheet 1.

J. R. MORGAN.
OVERHEAD TRAVELING CRANE.

No. 522,913.

Patented July 10, 1894.

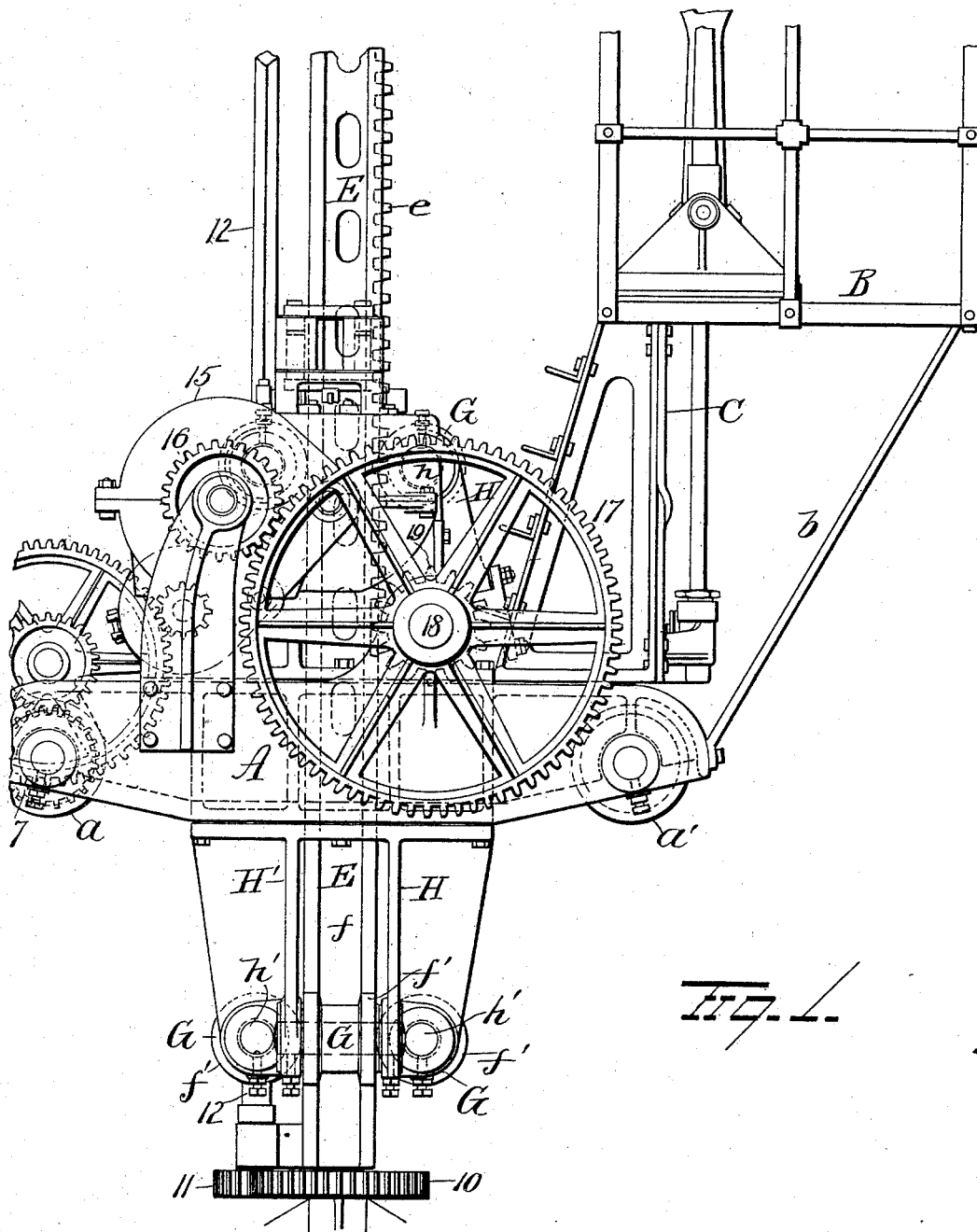


Fig. 1.

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G. F. Downing.

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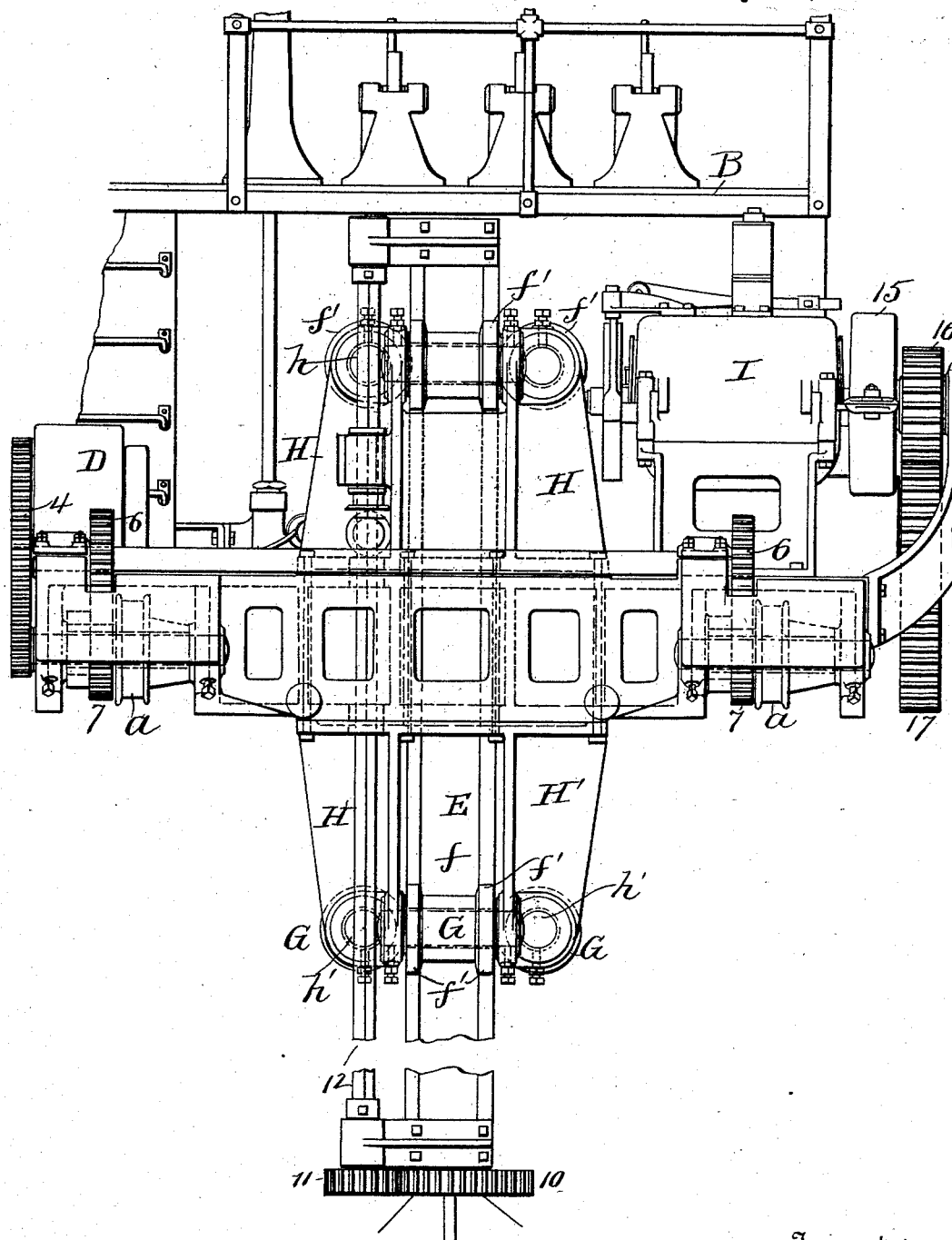
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4 Sheets—Sheet 2.

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4 Sheets—Sheet 3.

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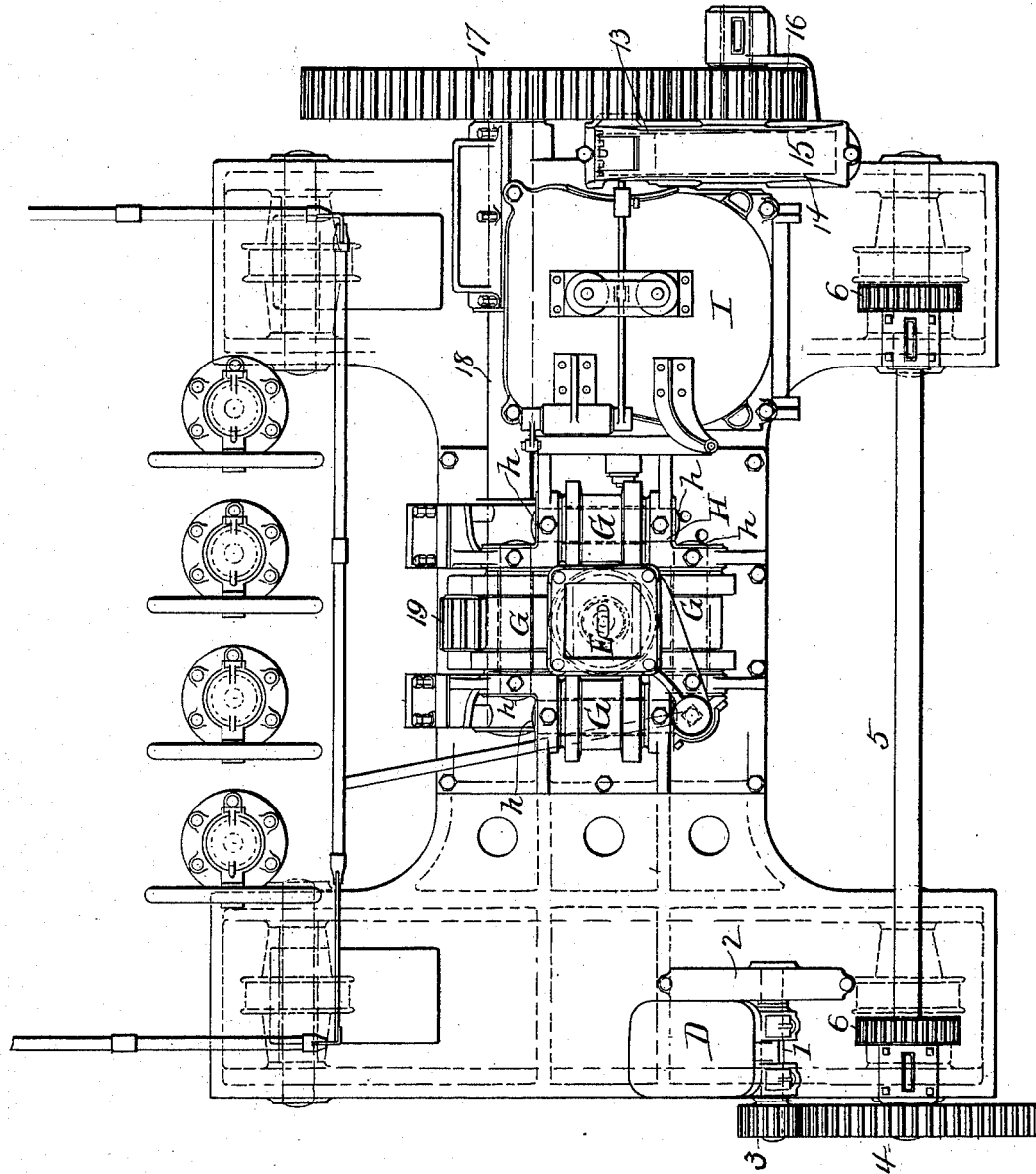


Fig. 3.

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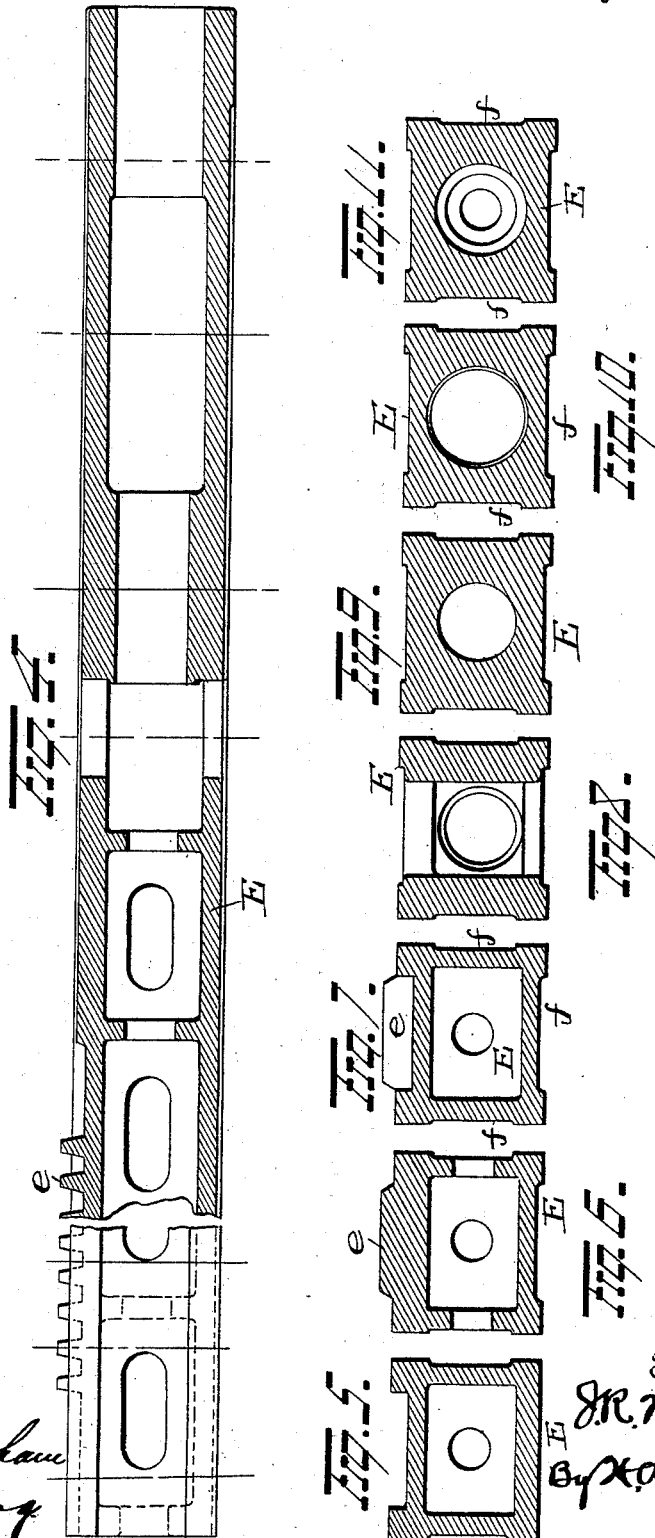
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4 Sheets—Sheet 4.

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UNITED STATES PATENT OFFICE.

JOHN R. MORGAN, OF ALLIANCE, OHIO, ASSIGNOR OF THREE-FOURTHS TO
THOMAS R. MORGAN, SR., THOMAS R. MORGAN, JR., AND WILLIAM H.
MORGAN, OF SAME PLACE.

OVERHEAD TRAVELING CRANE.

SPECIFICATION forming part of Letters Patent No. 522,913, dated July 10, 1894.

Application filed November 25, 1893. Serial No. 491,941. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. MORGAN, of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful
5 Improvements in Overhead Traveling 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
10 the same.

My invention relates to an improvement in overhead traveling cranes, and it consists in a traveling trolley carrying a hoisting rack bar.

15 My invention further consists in a traveling trolley, a rack bar carrying tongs or other devices for engaging ingots, &c., and means for moving said rack bar vertically.

20 My invention further consists in a traveling trolley, a hoisting rack bar, an actuating pinion engaging the rack bar, and guiding and supporting rollers engaging said rack bar above and below the point of engagement therewith of the driving pinion.

25 My invention further 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 of a trolley embodying my invention. Fig. 2 is an end view of
30 same and Fig. 3 is a plan view. Fig. 4 is a longitudinal sectional view of the rack bar, and Figs. 5, 6, 7, 8, 9, 10 and 11 are views in cross section thereof.

35 A represents a trolley frame mounted on flanged wheels *a, a'*, which latter are adapted to travel on rails secured on the upper face of a traveling bridge not shown. This trolley can be of any preferred construction and
40 shape, and is preferably provided at one end with an elevated platform B, carried on supports C and braced as at *b*. This platform or cage is for the use of the operator, and carries the levers or other devices by which the
45 movements of the bridge trolley and rack bar are controlled by the operator. The trolley is propelled back and forth on the bridge by the motor and gearing which are clearly shown in Fig. 3. The motor D is provided
50 on its armature shaft with a pinion which

latter meshes with a larger pinion on shaft 1, both of said pinions being inclosed by gear casing 2. Shaft 1 carries pinion 3 which in turn meshes with toothed wheel 4 fast on shaft 5. This shaft 5 extends crosswise the
55 trolley and is provided near its opposite ends with pinions 6 meshing with toothed wheels 7—fast on the flanged track wheels *a*. By means of this motor and gearing the trolley can be moved back and forth on the bridge
60 irrespective of the movements of the other parts of the apparatus.

The floor or platform of the trolley is provided centrally with an opening for the passage of the rack bar E which is preferably
65 made of cast steel, hollow and ribbed transversely, and longitudinally if necessary throughout its entire length, and is provided on one face with teeth *e* and at its lower end
70 with an opening for the insertion of a post carrying the tongs. The post and the tongs form no part of this invention but are fully shown, described and claimed in application, Serial No. 476,498, filed by Thomas R. Morgan, Sr., and William H. Morgan, June 3, 75
1893.

Each face of the rack bar excepting the toothed face is grooved longitudinally as at *f* leaving narrow flat bearing faces for the rims
80 *f'* of the supporting rollers G. These rollers G are arranged in two series of four each, one series of rollers located in approximately a horizontal plane above the platform or floor of the trolley, and supported by the upwardly
85 extending brackets H. Each bracket H carries a rigid axle *h* on which its respective roller is mounted, the four rollers constituting the series completely embracing the rack bar and preventing the vibration or rotation
90 of same.

By grooving or channeling the bar, and constructing the rollers with rims to engage the narrow faces at the sides of the channels the bar is supported solidly against movement while the friction produced by the contacts is
95 reduced to a minimum. These upper supporting rollers are located at considerable elevation above the platform or floor of the trolley, and depending from the underside of the trolley is a series of brackets H' four in num-
100

ber, each of which carries at its lower end an axle *h'* carrying a roller *G*, the lower rollers embracing the four sides of the rack bar and effectually supporting same at a point below the trolley. These rollers as before stated effectually hold the rack bar solidly in position and prevent tilting and turning of the bar, and in fact prevent all independent movement except a direct vertical movement as in hoisting.

The rack bar carries at its lower end a post the upper end of which is swiveled to the bar while the lower end carries tongs or other devices ordinarily employed for grappling or lifting loads of various kinds. This post carries a pinion 10 which is engaged by the pinion 11 on shaft 12. By turning the shaft which is connected by suitable mechanism to an operating device in the operator's cage, the post with the grappling device can be turned to bring the hooks or tongs into position to engage the object to be lifted.

The rack bar is actuated vertically by the motor *I*, which with its gearing is also shown in Fig. 3. This motor is provided on its armature shaft with a pinion 13 which meshes with pinion 14 both of which are incased in the gear casing 15. The shaft carrying pinion 14 is also provided with pinion 16 which meshes with toothed wheel 17 fast on shaft 18. This shaft 18 as clearly shown in Fig. 1 is located well down to the floor or platform of the trolley and is provided with the pinion 19 engaging the teeth of the rack bar. By this arrangement it will be seen that the pinion for actuating the rack bar is located well down on the trolley and between the upper and lower series of guiding rollers. If desired I can provide the rack bar with teeth on two or more sides, but I find in practice that a bar provided with teeth on one side, and supported solidly above and below the actuating pinion, answers all purposes and is considerably less expensive.

I have also referred to the crane as an ingot crane, but I would have it understood that a traveling crane provided with a hoisting rack bar is well adapted for foundry purposes and particularly for hoisting ladles of molten metal, as the rigid rack bar prevents all swaying of the ladle except such as would naturally result from the loose connection between the holding or carrying device on the rack bar and the bail.

It is evident that many slight changes might be resorted to in the relative arrangement of parts herein shown and described without departing from the spirit and scope of my invention hence I would have it under-

stood that I do not confine myself to the exact construction shown; but,

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

1. In an overhead traveling crane the combination, with a traveling trolley, of a rack bar carried by the trolley, a pinion engaging said rack bar for moving same vertically, means for actuating the pinion, devices located above and below the bar actuating pinion for holding said bar against lateral movement, an operator's cage carried by the trolley and means in said cage for regulating the movements of the trolley and rack bar, substantially as set forth.

2. In a crane, the combination with an overhead trolley and means for propelling same, of a series of brackets extending upwardly from said trolley, a series of brackets projecting downwardly from said trolleys, rollers carried by said brackets and forming guides, a rack bar passing upwardly through the trolley and between the guides, and means located between the guides for actuating the rack bar.

3. In a crane, the combination with a traveling trolley and means for propelling same, of a rack bar having teeth on one face and grooves or channels on its other faces a driving pinion engaging the teeth of the rack bar, and guides engaging the rack bar outside the channels, substantially as set forth.

4. In a crane the combination with a traveling trolley having two series of brackets, one series extending upwardly and the other downwardly and rollers carried by said brackets the said rollers adapted to engage rack bar near the side edges of the latter, driven shaft located near the floor or platform of the trolley and a pinion on said shaft and meshing with teeth of the rack bar, substantially as set forth.

5. In a crane, the combination with a traveling trolley and means for propelling same, of a rack bar, rack bar actuating pinion, a motor and gearing for actuating said pinion, rollers supporting said bar above said actuating pinion, rollers supporting said bar below said actuating pinion, an operator's cage carried by the said trolley and means in said cage for regulating the movements of the trolley and rack bar.

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

JOHN R. MORGAN.

Witnesses:

H. W. HARRIS,
A. W. BRIGHT.