

(No Model.)

2 Sheets—Sheet 1.

J. F. REINERT.

AUTOMATIC HOISTING, CARRYING, AND LOWERING MECHANISM.

No. 568,990.

Patented Oct. 6, 1896.

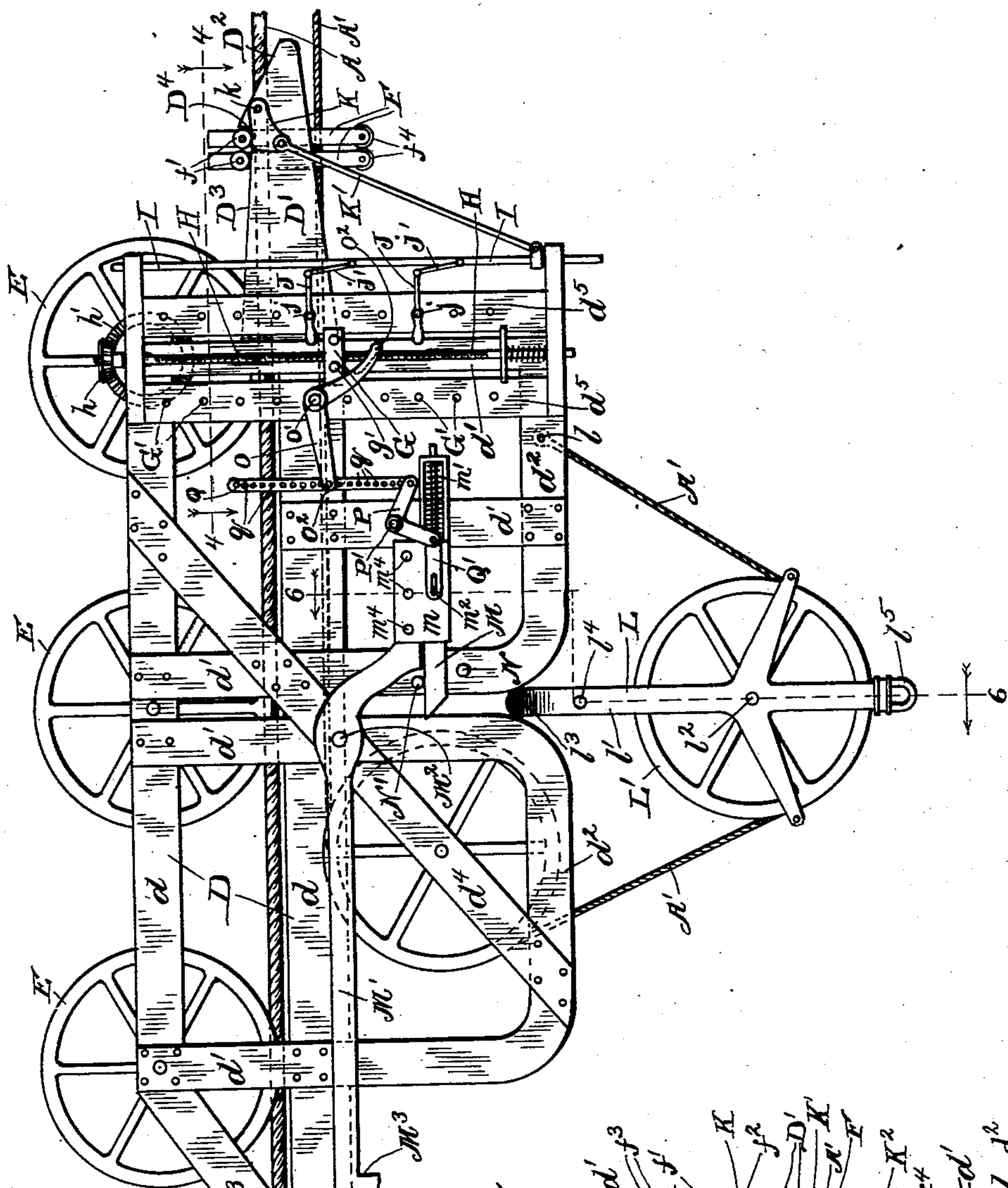


Fig. 1.

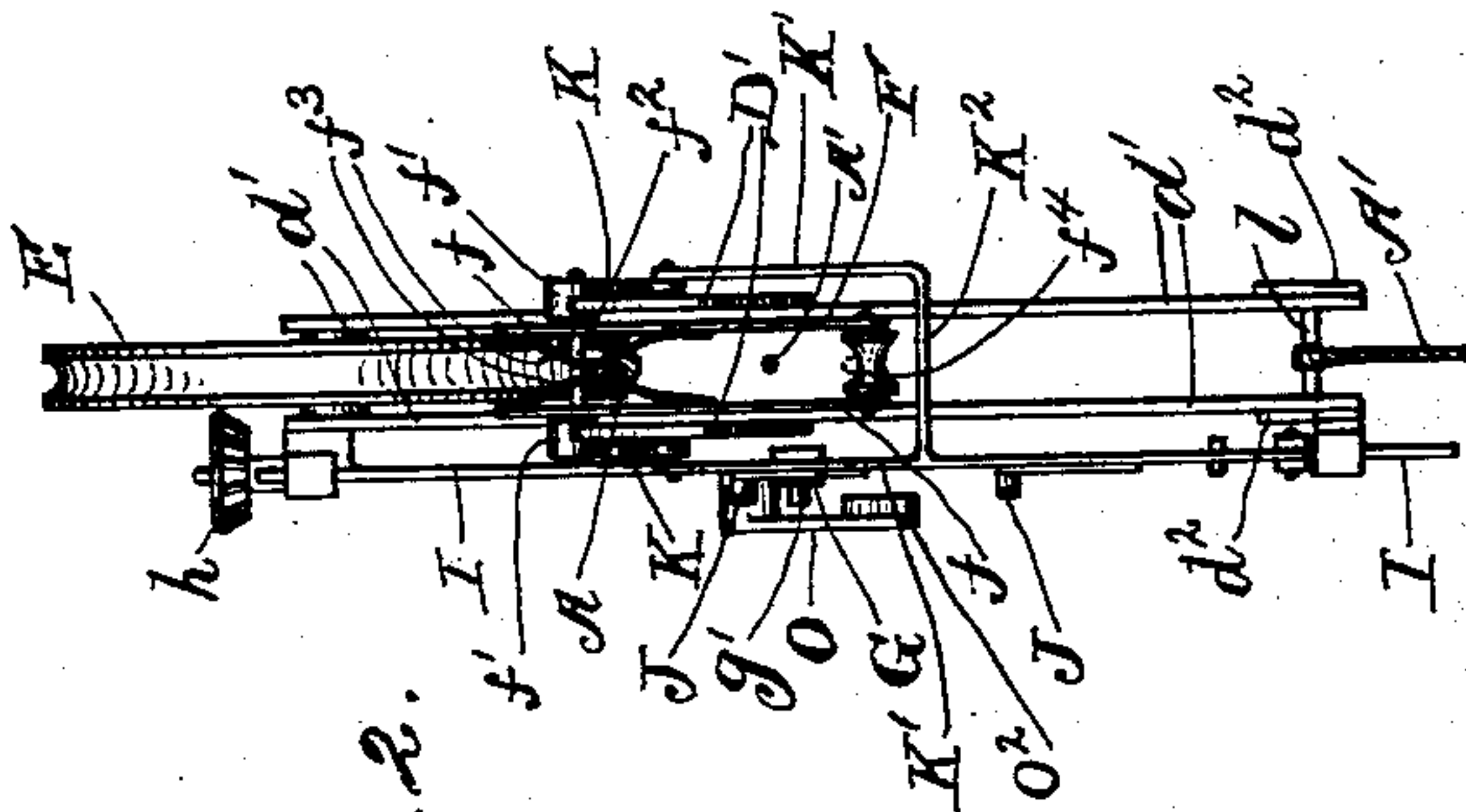


Fig. 2.

Witnesses:

R. J. Jaeger.

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By

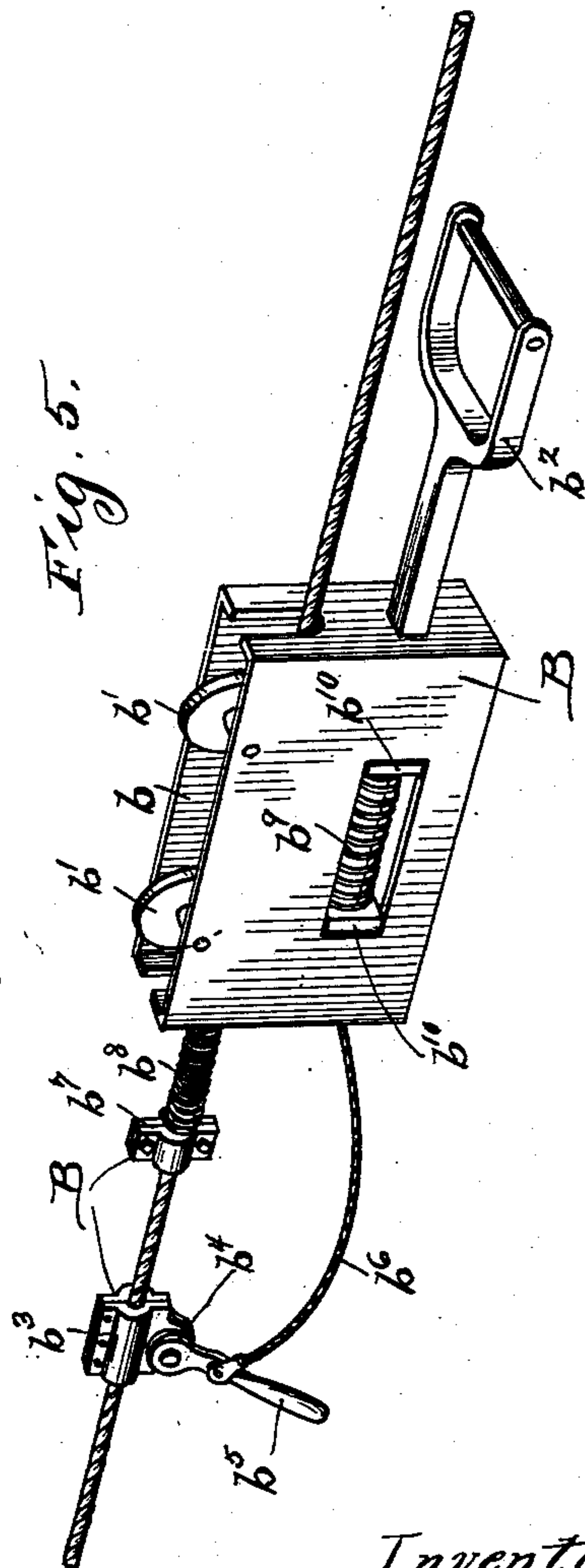
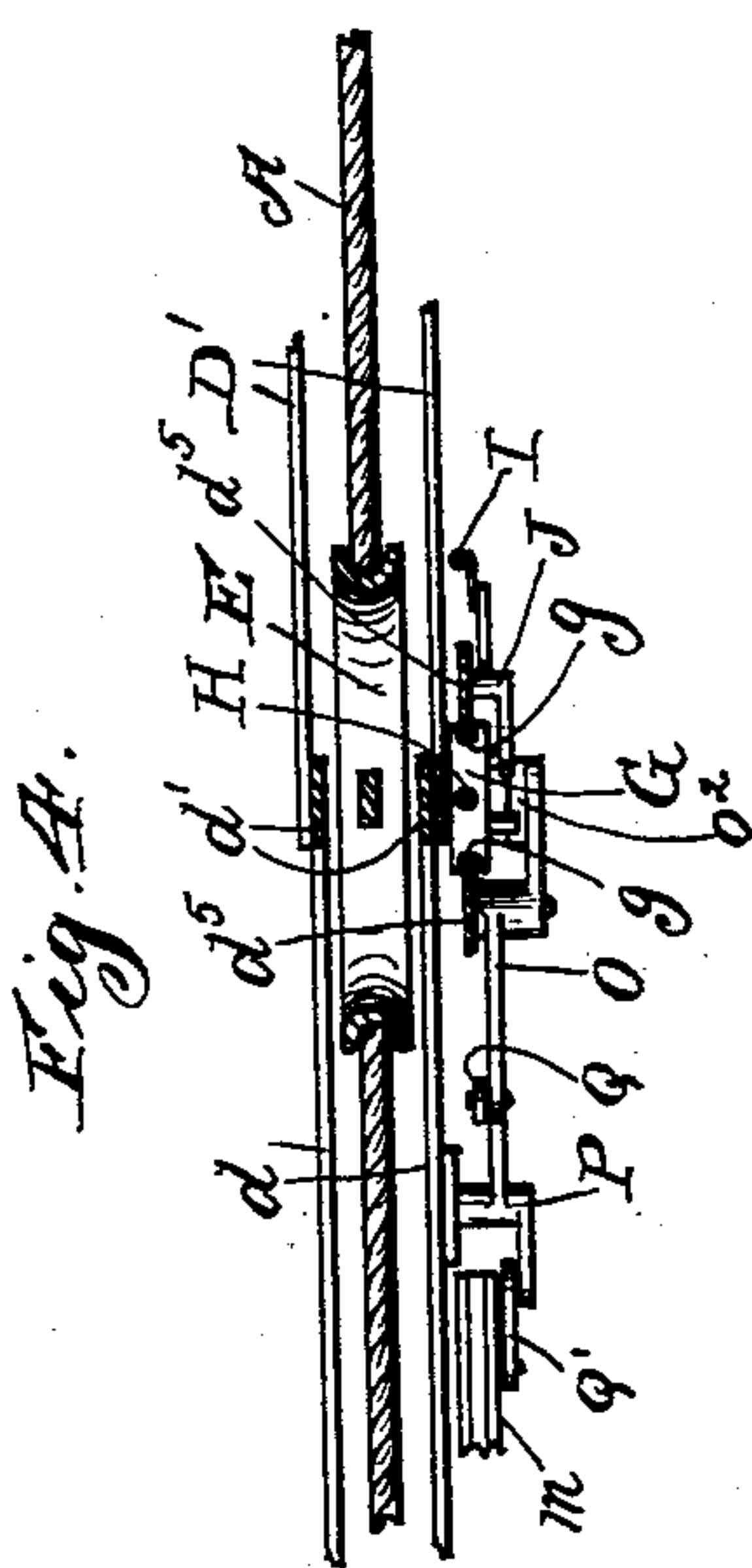
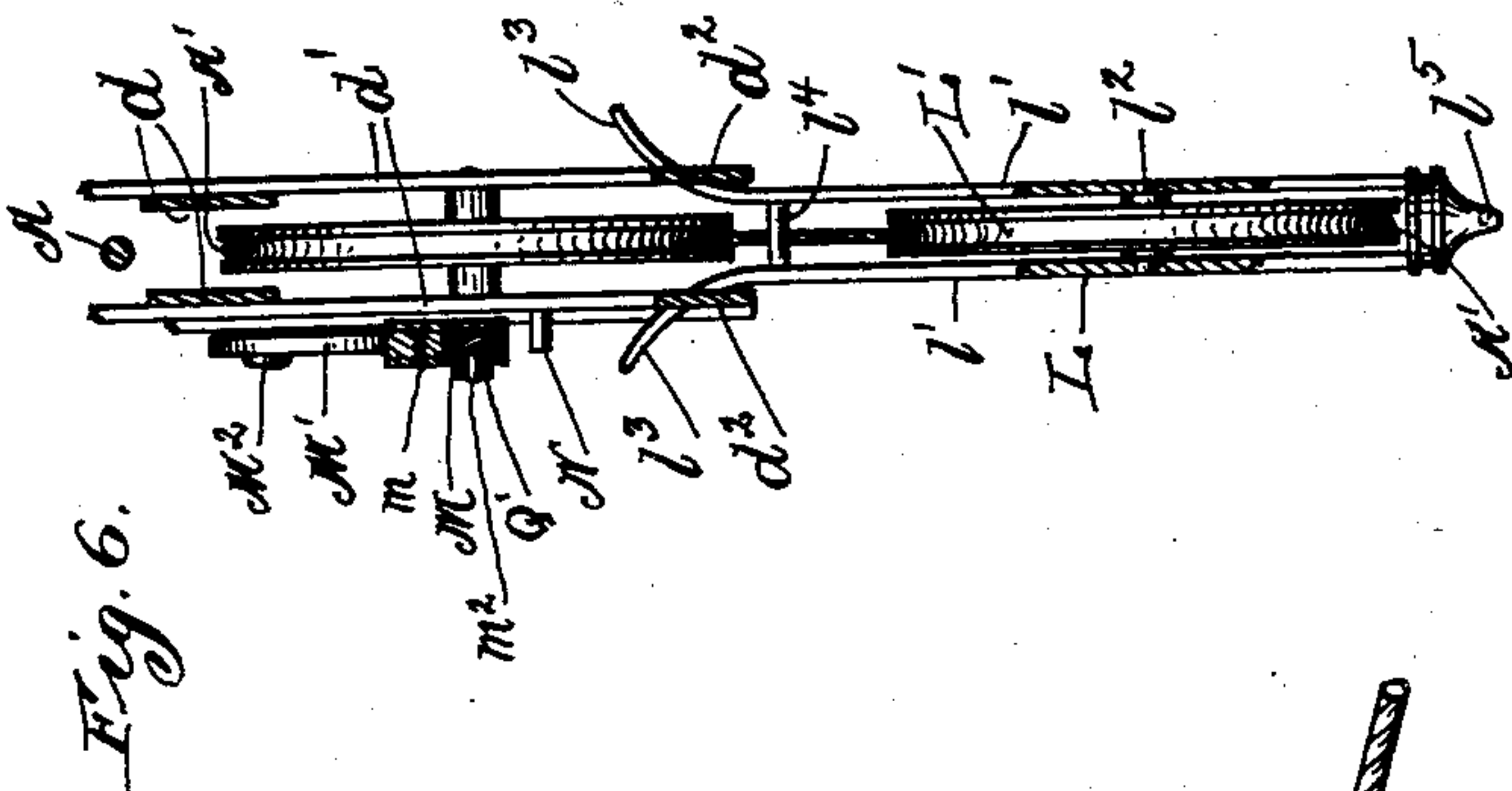
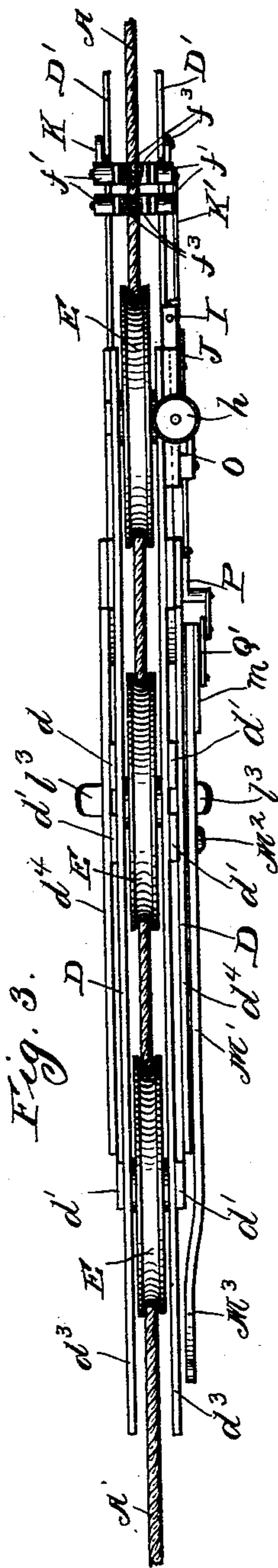
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2 Sheets.—Sheet 2.

### AUTOMATIC HOISTING, CARRYING, AND LOWERING MECHANISM.

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# UNITED STATES PATENT OFFICE.

JOHN F. REINERT, OF ELGIN, ILLINOIS, ASSIGNOR OF ONE-HALF TO EUGENE G. HAMMOND, OF SAME PLACE.

## AUTOMATIC HOISTING, CARRYING, AND LOWERING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 568,990, dated October 6, 1896.

Application filed February 27, 1896. Serial No. 580,961. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN F. REINERT, residing at Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Automatic Hoisting, Carrying, and Lowering Mechanisms for Cables, of which the following is a full and complete description, sufficient to enable those skilled in the art to which it appertains to understand, make, and operate the same, particular reference being had in connection herewith to the drawings accompanying and forming a part hereof, in which drawings—

Figure 1 is a side elevation of an apparatus embodying the invention and of the cable on which the apparatus is mounted; Fig. 2, a front end elevation of such apparatus; Fig. 3, a top plan view thereof; Fig. 4, a horizontal sectional view on line 4 4 of Fig. 1; Fig. 5, a view of the anchor to which the apparatus is secured when engaged in hoisting, such anchor being mounted on and secured to the cable; and Fig. 6, a vertical sectional view on line 6 6 of Fig. 1, viewed in the direction indicated by the arrows.

A letter of reference applied to a given part in one figure of the drawings is used to designate such part wherever the same appears throughout the several figures.

A is a cable on which the automatic hoisting, carrying, and lowering mechanisms embodying this invention are mounted.

B is the anchor which I prefer to use in combination with the automatic hoisting, carrying, and lowering mechanisms, although I am not confined to the use of such particular anchor. Anchor B consists of the carriage *b*, pulleys *b'* *b'*, coupler *b*<sup>2</sup>, clamp *b*<sup>3</sup>, cam *b*<sup>4</sup>, lever *b*<sup>5</sup>, flexible connection *b*<sup>6</sup>, extending from lever *b*<sup>5</sup> to carriage *b*, clamp *b*<sup>7</sup>, and spring *b*<sup>8</sup>. Coupler *b*<sup>2</sup> is preferably mounted in carriage *b* with spring *b*<sup>9</sup> and plates *b*<sup>10</sup> *b*<sup>10</sup>, so that the shock, if any there be, of coupling and uncoupling the remainder of the apparatus embodying the invention therefrom will be distributed through such spring before being received by the carriage *b*.

D is the frame of the apparatus embodying the hoisting, carrying, and lowering mechanisms. Frame D preferably consists of horizontal plates *d* *d*, vertical plates *d'* *d'*, hori-

zontal plates *d*<sup>2</sup> *d*<sup>2</sup>, braces or diagonal plates *d*<sup>3</sup> *d*<sup>3</sup> and *d*<sup>4</sup> *d*<sup>4</sup>, and guide-plates *d*<sup>5</sup> *d*<sup>5</sup>.

E E E are the main carrying-wheels of the apparatus, rotatably mounted in frame D so as to travel on cable A.

D' D' are plates adjustably secured to the frame D at the front end of the apparatus, such plates being designed to pick up, when the apparatus is moving forward, the guides and supports of the hoisting and drawing cable A' from the cable A on which they are suspended, and when the apparatus is going backward, that is, returning from the dump of the gravel-pit, (when the apparatus is employed about a gravel-pit,) to drop such guides F onto the cable A at substantially regular intervals in order that such guides may support the cable A'.

D<sup>2</sup> is the upper and sharply-inclined edge of plates D' D', respectively. D<sup>3</sup> is a less sharply inclined upper edge of such plates D' D', and D<sup>4</sup> is the shoulder formed by the junction of the inclined faces or edges D<sup>2</sup> D<sup>3</sup>.

As the guides F are picked up from the cable A they are forced back onto the inclined face D<sup>3</sup> of the plates D' D', being there held until discharged therefrom in the manner hereinafter described on the return of the apparatus from the place of discharge of the load thereof to the place of loading.

*f f* are the side plates of the guide F.

*f'* *f'* are rollers rotatably mounted on shaft *f*<sup>2</sup> outside of plates *f f*.

The inclined edges D<sup>2</sup> D<sup>3</sup> of plates D' D' come in contact with the rollers *f'* *f'* as such guides F F are picked up by the plates D' D' in the forward movement of the apparatus.

*f*<sup>3</sup> *f*<sup>3</sup> are springs mounted between the plates *f f*, so as to come in contact with cable A and maintain the guides F F, respectively, in a stationary position on the cable A.

*f*<sup>4</sup> is a roller rotatably mounted between the side plates *f f* of guide F. The cable A' travels or moves over the roller *f*<sup>4</sup>, when the guide F is in position on cable A, as such cable A' moves the apparatus forward and backward on cable A, that is, from the place of loading to the place of unloading and return. As the apparatus moves forward with a load thereon to the place of discharge of the load the plates D' D' run under the rollers *f'* *f'* of



guide F, and such guide, being held stationary on the cable A by springs  $f^3 f^3$ , (together with the inertia thereof, tending to hold such guide stationary,) will be raised from the cable A onto inclined face  $D^2$  of plates  $D' D'$ , and from thence onto face or edge  $D^3$  of such plates, and the guide F will be carried on such plates to the dump or place of discharge of the load. When the apparatus is on its way from the dump or place of discharge of the load to the gravel-pit or place of loading, I desire to have the several guides F F discharged from the plates  $D' D'$  successively and at regular intervals, so that the hoisting and hauling cable A' may be held and guided thereby, and to effect this I have the following-described mechanism: In guide-plates  $d^5 d^5$  there is mounted the traveler G, having grooves  $g g$  and the pin  $g'$ . Traveler G is so placed on guides  $d^5 d^5$  as to move or be moved up or down by the rotation of screw H, extending through it. Screw H is rotatably mounted in frame D with beveled gear-wheel  $h$  at the upper end thereof engaging with beveled gear-wheel  $h'$  on the wheel E. Hence the movement of the apparatus to and from the place of loading causes the screw H to turn in one or the other direction and a given number of times, thus raising or lowering the traveler a given distance. As this construction is built or put together the traveler is lowered in the movement of the apparatus from the place of unloading to the place of loading.

I is a vertically-movable rod attached to the pivotally-mounted levers J J, so that the rocking of such levers or fulcrums  $j j$  (that is, the rocking of any one of such levers) actuates such rod. The ends of the levers J J are in the path of the traveler G, and such levers are rocked or turned on their fulcrums, respectively, by the traveler G as it moves in its guides  $d^5 d^5$ . The rocking or partial turning of the levers J J, or any one thereof, moves the rod I longitudinally. The connection  $j'$  between lever J and rod I may be flexible, as a chain or cord, so that the movement of the lever J in one direction will not affect the rod I, while the movement of such lever J in the other direction will raise such rod I. The raising of the rod I is designed to actuate the cam K, such cam being pivotally attached to plate  $D'$  by pivot  $k$  and connected to the rod I by connection  $K'$ . Connection  $K'$  is a rod or bar, and the downward movement of the traveler G forces down the end of lever J adjacent thereto and in the path thereof, thus raising the other end of such lever J, and so raising (through connection  $j'$ ) the rod I, and raising rod or bar  $K'$  turns the cam K on its fulcrum  $k$ . The inclined face  $D^3$  of plates  $D'$  is sufficient (as such plates are adjusted on frame D) to cause the guides F F thereon to run toward the shoulder  $D^4$  and onto the cam K, so that one of such guides is at all times (when any thereof are upon the plates  $D'$ ) upon the cams K

K, and the turning of such cams by the raising of the rod I, as hereinbefore described, forces such guide F, which is thereon, off the plates  $D'$ , leaving such guide in proper position on cable A. The cam K on one side of the plate  $D'$  is secured to the cam K on the other side of the other plate  $D'$  by tie-rod or brace  $K^2$ , so that such cams will move in unison.

$L'$  is a hoisting-pulley rotatably mounted in frame L, so that the hoisting and hauling cable A', which is secured at one end to frame D, as by extending over bolt  $l$ , passes partially around the periphery thereof, as illustrated in Fig. 1 of the drawings. Frame L consists of plates  $l' l'$ , between which the pulley  $L'$  is rotatably mounted on axle  $l^2$ . Plates  $l' l'$  flare outwardly at the upper end thereof, as at  $l^3 l^3$ .

$l^4$  is a bolt extending between the plates  $l' l'$  at a point therein adjacent to, but below, the flaring parts  $l^3 l^3$ .

$l^5$  is the point of attachment of a load to frame L. When a load is secured to frame L, and such frame is hoisted to the frame D by hoisting-cable A', the bolt  $l^4$  is brought into engagement with catch M on such frame D.

M is a bolt or catch moving laterally in the frame formed by plate  $m$  and yieldingly held in an extended position by spring  $m'$ .

$m^2$  is a pin secured in the bolt or catch M and extending through the slot  $m^3$  in plate  $m$ .

$M'$  is a lever fulcrumed to frame D on pivot  $M^2$  and having catch or latch  $M^3$  at the outer end thereof, while the plate  $m$  is secured at the inner end thereof, as by bolt  $m^4$ .

N N' are projections on frame D, limiting the movement of the lever  $M'$ . Such projections N N' may be obtained by bolts or pins, as illustrated in the drawings, Fig. 1. Lever  $M'$  is engaged or in position to engage with coupler  $b^2$  when frame L is not in engagement with the catch M; but when frame L, with or without a load thereon, is resting on the catch M the inner end of the lever  $M'$  is thereby brought downward as far as the projection N in frame D will permit, and thereby the end  $M^3$  of the lever  $M'$  is carried upward, (such lever  $M'$  turning on fulcrum  $M^2$ ), so as to be out of engagement with coupler  $b^2$  and out of proper position to engage therewith.

As the frame L is hoisted by hoisting-cable A' the flaring ends  $l^3 l^3$  of such frame guide it so that the bolt  $l^4$  comes into suitable contact with the catch M, and such catch is thereby forced back against the resiliency of spring  $m'$  into a retracted position until such bolts  $l^4$  pass beyond the catch M, when such catch is returned to its initial position by the spring  $m'$ , and then by slacking up on cable A' the frame L with its load settles back onto catch M and is supported thereby.

To obtain the automatic release of bolt  $l^4$  from catch M on the return of the apparatus from the dump or place of unloading to the gravel-pit or place of loading, I pivotally se-



cure lever O to frame D by pivot or bolt O', so that the traveler G will engage therewith, or so that pin  $g'$  on such traveler will engage therewith in the downward movement of the traveler. It will be observed that the lever O is bent outward at O<sup>2</sup>, and in the upward movement of the traveler the pin  $g'$  will raise the lever O until the pin can pass behind the bend o<sup>2</sup> in the lever, when the lever will fall by gravity to its initial position.

P is a bell-crank pivotally secured to frame D, as on pivot P', and Q is a connection extending between one of the arms of the bell-crank P and one of the lever O. The other arm of the bell-crank P is attached to spring m<sup>2</sup> by connection Q'. It thus occurs that the downward movement of the traveler G turns the lever O partially on its fulcrum O', thus raising connection Q, actuating the bell-crank P, and retracting the catch M.

To adjust the connection between the bolt or catch M and the traveler G so that such bolt will be retracted at the proper time by the downward movement of the traveler, holes G' G' are made in the guide-plate d<sup>5</sup>, into the proper one of which holes the fulcrum O' is inserted and the holes q q are placed in connection Q, so that the end of the lever O, attached to such connection Q, as by pin O<sup>2</sup>, can be so attached at a correspondingly suitable place.

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

1. A carrier having mechanism at the forward end thereof arranged in the forward movement of the carrier to extend under and pick up from the cable on which the carrier is moving a guide for a second cable, in combination with a guide for a hoisting and hauling cable consisting of side plates, a roller rotatably mounted between the side plates for the hoisting and hauling cable to travel on and springs between the plates arranged to grasp the main cable on which the carrier travels, with projections outside the side plates, with which projections the mechanism for picking the guide for the cable engages; substantially as described.

2. A carrier, a cable on which the carrier travels, plates adjustably secured to the forward end of the carrier so as to extend each side of the cable, such plates having inclined upper edges, a guide for a hoisting and hauling cable consisting of side plates, a roller rotatably mounted between the side plates on which roller the hoisting and hauling cable travels, springs between the plates arranged to grasp the cable on which the carrier is mounted, rollers rotatably mounted outside of the side plates so that the inclined upper edge of the plates mounted on the carrier will extend thereunder in the forward movement of the carrier; substantially as described.

3. A carrier, a cable on which the carrier travels, plates adjustably secured to the forward end of the carrier so as to extend, ver-

tically, each side of the cable, such plates having inclined upper edges, a guide for a hoisting and hauling cable, such guide consisting of side plates, a roller rotatably mounted between the side plates, springs between the plates arranged to grasp the cable carrying such guide, rollers rotatably mounted outside of the side plates so that the inclined upper edge of the plates mounted on the carrier will extend thereunder in the forward movement of the carrier, and means for automatically forcing such guide off of such vertical plates onto the cable, in the backward movement of the carrier; substantially as described.

4. A carrier, a cable on which the carrier travels, plates secured to the forward end of the carrier extending vertically each side of the cable, such plates having inclined upper edges, with a shoulder against which a guide for a hoisting and hauling cable will be in contact when one or more of such guides are mounted on such plates, cams rotatably mounted on such plates, a traveler connected to and actuated by the supporting-wheels of the carrier and a connection between such carrier and the cams whereby at determined intervals the cam is actuated, and such cam arranged to raise the guide over the shoulder against which the guide is in contact; substantially as described.

5. A carrier, a cable on which the carrier travels, a traveler connected to and actuated by the supporting-wheels of the carrier, a yieldingly-extended catch, levers actuable by the movement of the carrier in one direction and a connection between such levers and the yieldingly-extended catch; substantially as described.

6. A carrier, a cable on which the carrier travels, a traveler connected to and actuated by the supporting-wheels of the carrier, levers actuable by the movement of the carrier in one direction, a yieldingly-extended catch mounted on a fulcrumed lever, the movement whereof is limited on its fulcrum, and a connection between the levers actuated by the traveler and the yieldingly-extended catch, whereby when a load is released from the carrier by the automatic retraction of the catch, the fulcrumed lever is in position so that the free end thereof may engage with a coupler; substantially as described.

7. In an automatic hoisting, carrying and unloading apparatus, the combination of a frame, wheels rotatably mounted in the frame to travel on a cable, guides mounted on such cable for carrying a second cable, a hoisting-frame having a pulley rotatably mounted therein, a cable secured to the frame of the apparatus, passing under the pulley in the hoisting-frame, back to and over a pulley in the frame of the apparatus, and from thence through the guides to a motor actuating such cable, a fulcrumed lever in the frame of the apparatus, catches on the ends of the fulcrumed lever, one of such catches arranged



to engage with the hoisting-frame and the other with an anchor, and when the catch is engaged with the hoisting-frame the weight of such hoisting-frame disengaging the catch  
5 at the other end of the fulcrumed lever from the anchor; substantially as described.

8. An anchor attachable to a cable for holding a carrier in position on the cable while a load is being hoisted thereto consisting of a

carriage, a coupler mounted in the carriage, a clamp secured to the cable, a cam in such clamp, a lever actuating the cam and a flexible connection between the lever and the carriage; substantially as described.

JOHN F. REINERT.

In presence of—

FLORA L. BROWN,

CHARLES TURNER BROWN.