

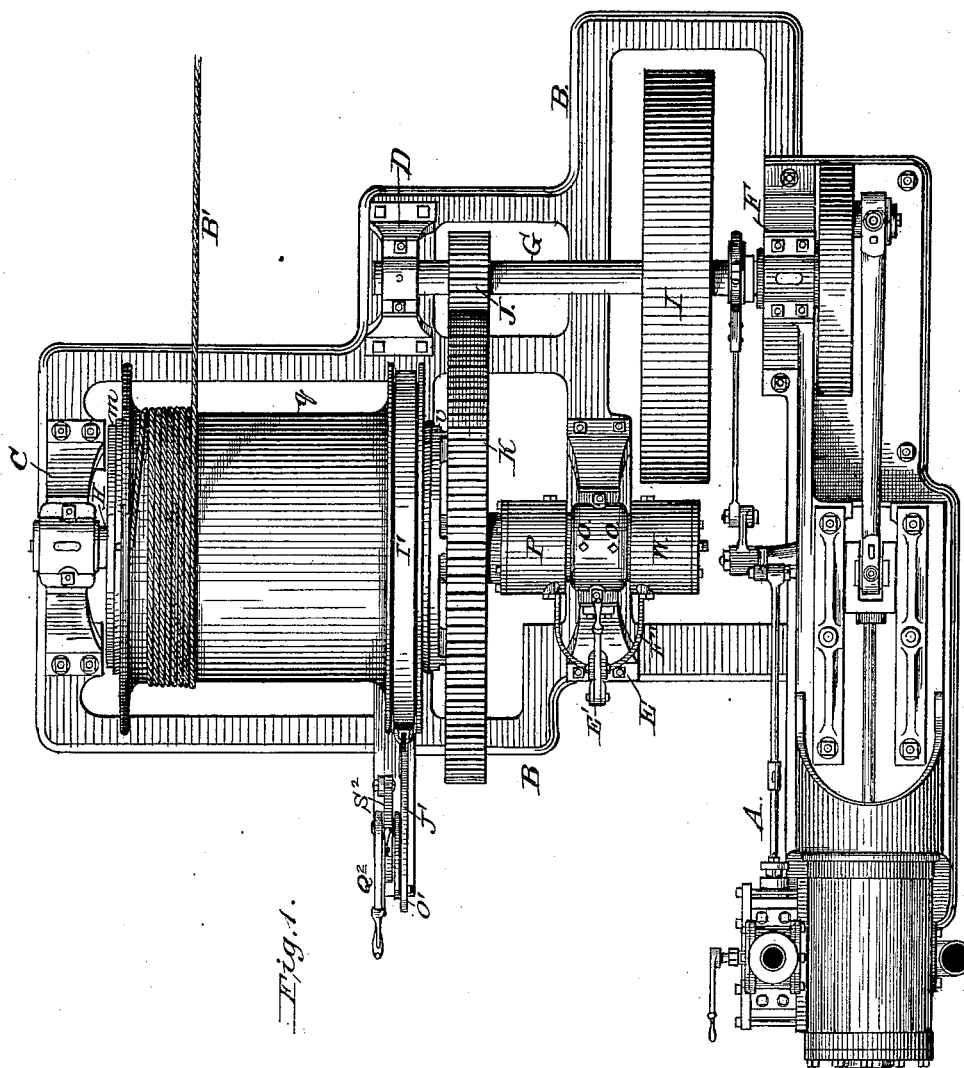
(No Model.)

4 Sheets—Sheet 1.

A. HENDEY.  
HOISTING MACHINE.

No. 266,149.

Patented Oct. 17, 1882.



Attest:  
H. A. Abbot.  
Geo. P. Varian

Arthur Hendey.  
Inventor.

By K. L. Perrine,  
Atty.

(No Model.)

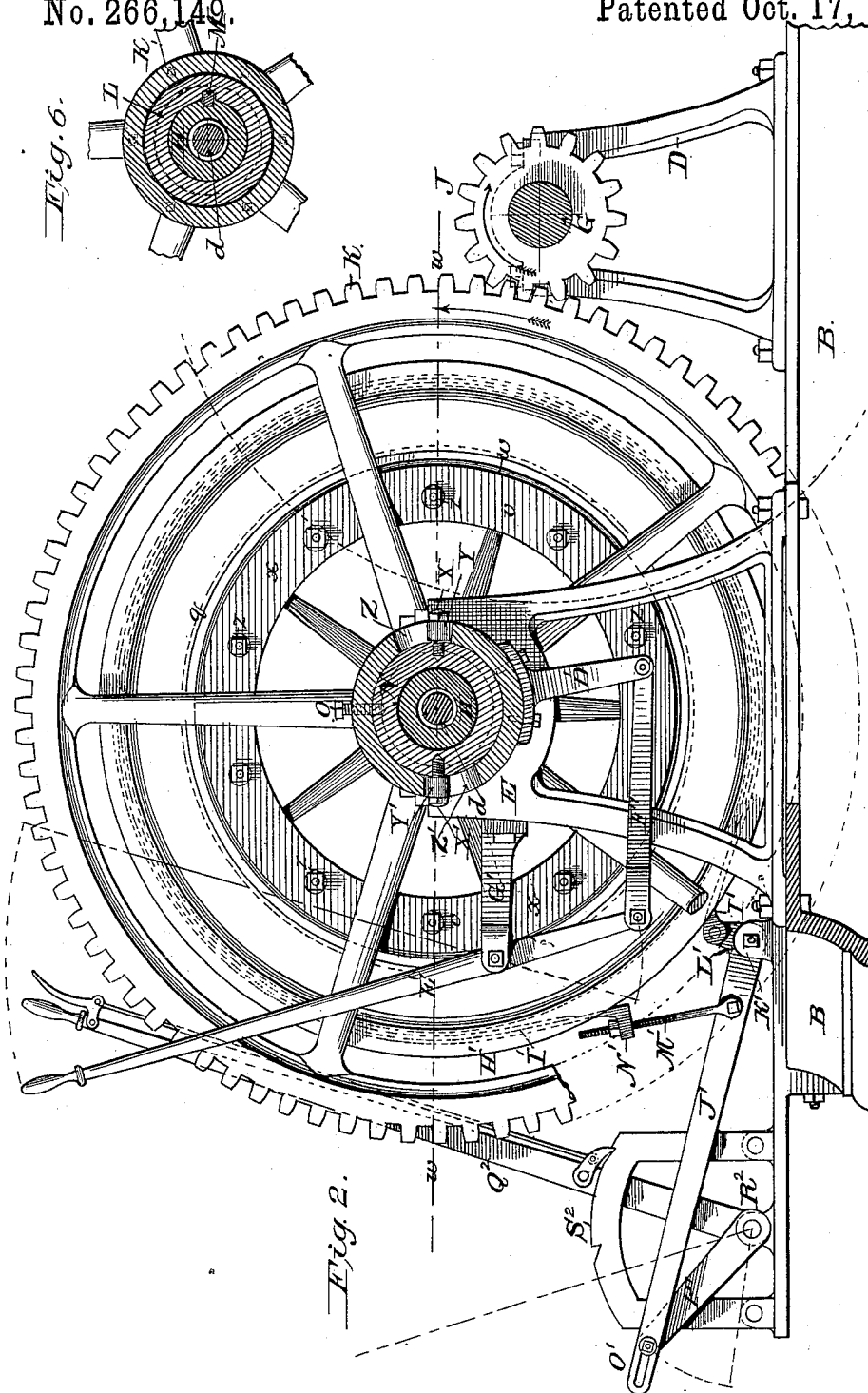
4 Sheets—Sheet 2.

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4 Sheets—Sheet 3.

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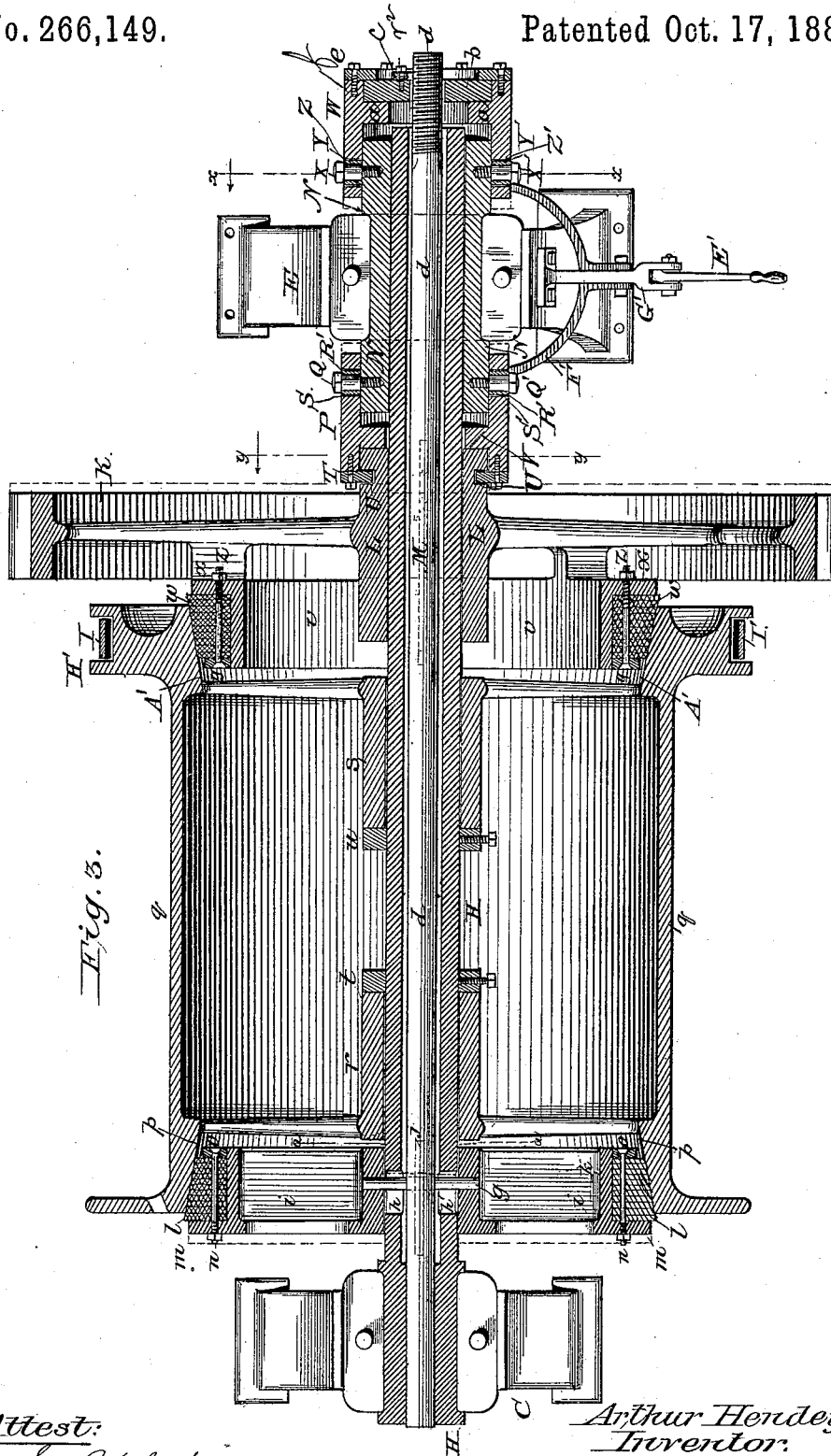


Fig. 3.

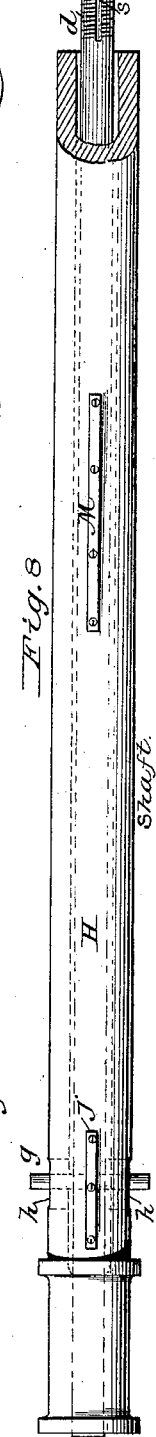
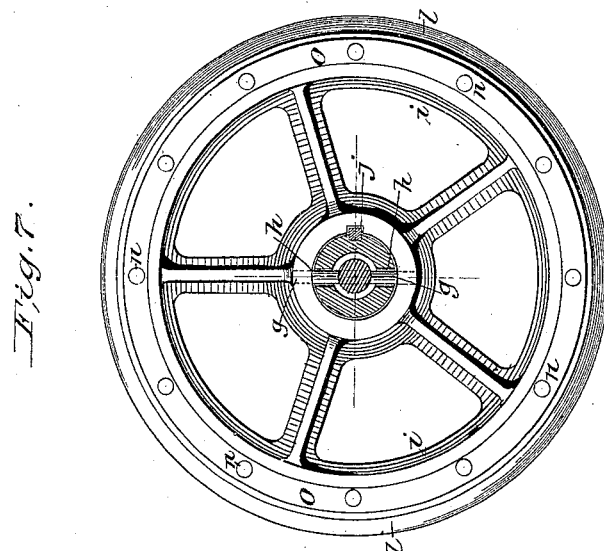
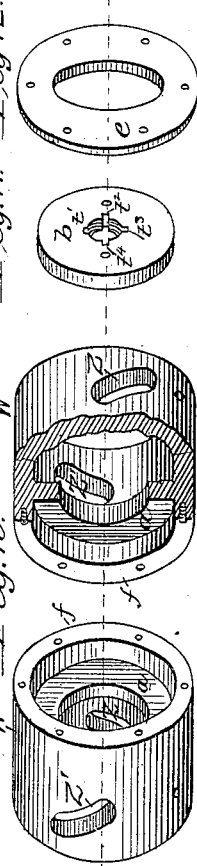
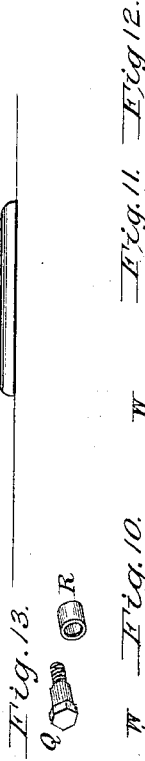
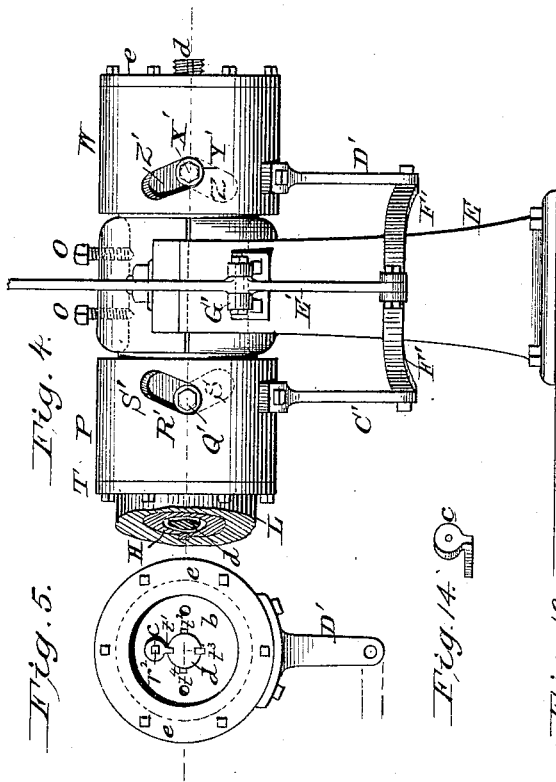
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# UNITED STATES PATENT OFFICE.

ARTHUR HENDEY, OF DENVER, COLORADO.

## HOISTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 266,149, dated October 17, 1882.

Application filed February 20, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR HENDEY, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Hoisting-Machines; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a plan. Fig. 2 is an enlarged vertical longitudinal section taken on the line *x x* of Fig. 3. Fig. 3 is an enlarged horizontal cross-section taken upon the line *w w* of Fig. 2, the engine and frame not being shown. Fig. 4 is an enlarged detached view of the outer collars and their operating devices. Fig. 5 is an enlarged view of shaft cap and nut. Fig. 6 is an enlarged cross-section taken upon the line *y y* of Fig. 3, showing outer collar, hub, groove and feather, hollow shaft, and rod in section. Fig. 7 is an enlarged inside elevation of one of the friction-wheels, with the hollow shaft shown in section taken upon the line *a a* of Fig. 3. Fig. 8 is an enlarged view of the shaft, showing the feathers and part of the end broken away, exposing the rod. Fig. 9 is an enlarged isometrical projection of the collar. Fig. 10 shows isometrical projections of the two outer collars, part of one of which is broken away to show its internal construction. Fig. 11 is an isometrical projection of the nut for the rod. Fig. 12 is an isometrical projection of one of the end caps. Fig. 13 shows isometrical projections of the steel pin and roller. Fig. 14 is an isometrical projection of the key *c*, for locking the nut *b* to the rod *d*.

My invention relates more particularly to that class of hoisting-machines in which a load is lowered or elevated by a line which is wound around a drum that is operated by a steam-engine or other suitable power; and it consists of a drum, friction-wheels, and certain other novel mechanical combinations and arrangements, which I will now proceed to describe, and point out particularly in the specification and claims.

A represents an engine, of any suitable form

and construction for furnishing the required power, and B the frame upon which the engine and hoisting-machine rest.

C, D, E, and F are the standards that sustain the bearings for the shafts G and H. The shaft G carries a balance-wheel, I, and a pinion, J, that engages with the gear K, through which the power of the engine is transmitted. The gear K has a hub, L, and is mounted upon the shaft H, to which it is secured by a feather, M, which permits the required movement lengthwise of the shaft to which it transmits the power of the engine. The shaft H is hollow from end to end, and is seated in a bearing on the standard C at one end, and is inclosed within a collar, N, at the other, within which it revolves. The collar N is seated in a bearing upon the standard E, to which it is secured and held by two set-screws, O O, and is connected to the hub L of the gear K by an outer collar, P, which is secured to the collar N by means of two steel pins, Q and Q', that are secured to the collar and provided with anti-frictional sleeves R and R', fitted in diagonal slots S and S', and secured to the hub L by means of an end cap, T, set in a groove, U, near the end of the hub and bolted to the end of the outer collar, permitting a free revolution of the hub, but controlling its movement lengthwise. An inner flange, V, extends inward and sets against the end of the hub. At the opposite end of the collar N an outer collar, W, is secured, in the same manner as the outer collar P, by steel pins X and X', secured to the collar N, and provided with anti-frictional sleeves Y and Y', passing through diagonal slots Z and Z'. The outer collar W passes beyond the end of the collar N, and is provided with an internal flange, *a*, against which a round nut, *b*, is screwed down on the rod *d*, and secured by a key, *c*. A cap, *e*, covers the projecting flange *f* of collar W and the outer rim of the nut *b*, thus making between the cap *e* and the internal flange, *a*, a chamber in which the nut *b* is confined, but allowed a free revolution.

The frictional wheel *i* is of suitable diameter, and has a hub of any required length to secure a proper bearing upon the shaft H, upon which it moves, controlled by the spline *j*.

*g* is a pin passing through the rod *d*, and through the slots *h* and *h'* in the shaft H, the

ends of the pin being fastened in the hub of the frictional wheel *i*, the slots *h* and *h'* allowing the lateral movement of the friction-wheel *i*. This wheel has a face, *k*, of any required breadth to receive a frictional band, *l*, of any suitable material, preferably of paper-pulp, cut in rings of suitable diameter, and clamped against the projecting flange *m* by bolts *n* and a ring, *o*. The face of the frictional band *l* is beveled to meet the internal beveled frictional surface *p* at one end of the drum *q*. The drum *q* is provided with hubs *r* and *s*, and revolves freely upon the shaft *H*, being held in place by the collars *t* and *u*, which are held to the shaft by set-screws, as shown in Fig. 3 of the drawings.

The gear *K* is provided with a frictional wheel, *v*, secured to its radial arms, preferably cast of the same piece of metal; but, if desired, it may be constructed separately and secured to the gear in any desired manner. Like the frictional wheel *i*, the frictional wheel *v* is faced with a frictional band, *w*, clamped to the projecting flange *x* by means of a ring, *y*, and suitable bolts, *z*. This band is beveled to meet the internal beveled frictional surface, *A'*, at the brake end of the drum *q*. The drum *q* is provided with a wire or other suitable rope, *B'*, with one end secured to the drum and the other to a cage or other object to be hoisted or lowered.

To the under side of each of the outer collars, *P* and *W*, dependent arms *C'* and *D'* are bolted or otherwise suitably secured, and are connected with each other and a lever, *E'*, by a fork, *F'*, the fulcrum of the lever being at the outer end of a bar, *G'*, of suitable length, secured to the standard *E*. The end of the bar *G'* is forked, and between these forks the lever *E'* is held by a bolt passing through the ends and the lever.

A brake is provided for the drum, convenient for the operator, by constructing a groove, *H'*, on the outside of the end flange of the drum next the gear, in which a strap, *I'*, is placed and secured to a lever, *J'*, pivoted upon the frame beneath the groove at *K'*. The lever *J'* has a short arm, *L'*, projecting upward from the pivotal point, to which one end of the strap is secured, the opposite end of the strap being secured to the lever *J'*, at a suitable distance from the fulcrum, by a screw-threaded rod, *M'*, bolted to the lever and passed through an eye, *N'*, secured to the end of the strap, where it receives a nut by which the slack of the strap is taken up. The lever *J'* extends back any suitable distance required to obtain the necessary power, and terminates in a slotted end, *O'*, that receives a bolt connecting it with the arm *P'* of the lever *Q'*, that is pivoted at *R'*, and provided with a pawl for engagement with notches on the stand *S'* for holding the lever. By this brake the movement of the drum is controlled by the lever *Q'* without other assistance, and it is designed to use this brake alone in lowering the cage or other thing by reason of gravity.

In operating this hoisting-machine the engine is kept running forward and never reversed. When hoisting a load the lever *E'* is drawn outward, thereby throwing in the fork *F'* and revolving the outer collars, *P* and *W*, around the collar *N*, which are respectively thrown to the left and right for a distance, say, of half an inch, by means of the pins *Q* and *Q'* and slots *S* and *S'*. The outer collar *P* forces the hub *L* along the shaft *H*, thus carrying the gear *K* to the left from the position shown by dotted lines in Fig. 3 of the drawings, and bringing the face of the friction-wheel *v* in contact with the frictional surface *A'* of the drum. At the same time and by the same movement the outer collar *W* forces the nut *b* outward, thereby drawing the rod *d* through the hollow shaft *II*, moving the pin *g* laterally toward the right in slots *h* and *h'*, and drawing the wheel *i* from the position shown in dotted lines in Fig. 3 of the drawings into contact with the frictional surface of the drum, thus clamping the drum between the frictional wheels *l* and *v*, which receive motion from the gear *K*. To reverse the movement of the drum and lower a load, the operator, with one hand on the lever *Q'*, tightens the brake-strap, and at the same time with his other pushes in the lever *E'*, thereby withdrawing the frictional wheels from contact with the drum. Gravity here asserts itself, and the descent of the load is controlled by the brake.

For the purpose of taking up the wear of the frictional surfaces of the drum *q* and friction-wheels *i* and *v*, the end of the rod *d* is provided with one or more grooves, *s'*, and the nut *b* with four grooves, *t'*, *t''*, *t'''*, and *t''''*, so as to permit of an adjustment of a quarter-turn of the nut on the rod *d*. In taking up the wear the collars *t* and *u* are loosened and the drum forced up against the friction-wheel *v* and the collars set. The nut *b* is then screwed up on the rod *d*, thereby drawing the friction-wheel *i* to the required position, which being attained, and the grooves of the rod and nut brought to a register, the key *e* is inserted in the grooves and held in place by a screw, *v''*, passing through the head of the key into the nut *b*.

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

1. In a hoisting-machine, the standards *E* and lever *E'*, fork *F'*, and arms *C'* and *D'*, in combination with the outer collars, *P* and *W*, having the diagonal slots, and inner collar, *N*, having the flanges *V* and *a*, and outer caps, *T* and *e*, for operating against the flange on the hub of the gear *K* and the nut *b* on the rod *d*, said inner collar, *N*, being provided with pins having anti-frictional rollers, which pins enter the slots in the outer collars and allow of a partial diagonal revolution of said outer collars around the inner collar, *N*, substantially as described.

2. The hollow shaft *II*, having the slots *h* and *h'*, and working in the bearing *C* and collar *N*, and upon which is mounted the drum *q*, gear *K*, and friction-wheels *i* and *v*, in com-

5 combination with the rod *d*, having the pin *g* working longitudinally in the slots *h* and *h'* of the shaft, the ends of said pin being fastened in the hub of the friction-wheel *i*, one end of the rod *d* having a screw upon which is screwed the nut *b*, held in place by the key *c*, said nut *b* being between the inner flange, *a*, of the outer collar *W* and the outer plate *e*, substantially as and for the purpose described.

10 3. The hollow shaft *H*, in combination with the rod *d*, having the nut *b* fastened to one end and provided with the slots *S* in one end, and the nut *b*, provided with the grooves, for the purpose specified, said rod *d* being  
15 moved longitudinally back or forward through the shaft *H* by the action of the flange *a* and outer cap *e* of the outer collar *W* against the nut *b* when said outer collar is moved diagonally around the inner collar, *N*, substantially  
20 as described.

4. The combination of the diagonally-slotted outer collar *P* with the gear *K* and friction-wheel *v*, said gear *K* and friction-wheel *v* being moved laterally by the diagonal revolution  
25 of the outer collar *P* around the inner collar, *N*, and causing said friction-wheel *v* to engage with the friction-flange *A'* of the drum when moved one way and be removed from said friction-flange when moved the other, substantially  
30 as described.

5. The combination of the diagonally-slotted outer collar *W* and rod *d*, secured to the friction-wheel *i*, said rod *d* being moved longitudinally back or forward through the shaft  
35 *H* by the diagonal revolution of the outer collar *W*, and causing the friction-wheel *i* to engage with the friction-flange *p* of the drum, substantially as described.

6. In a hoisting-machine, the drum, the hollow shaft *H*, mounted in suitable bearings,  
40 through which runs the rod *d*, which engages at one end with the friction-wheel *i* and at the other with the outer collar *W*, the inner collar, *N*, mounted in suitable bearings, and around which diagonally revolve the outer collars,  
45 *P* and *W*, the pins in said inner collar having anti-frictional rollers and working in the diagonal slots in the outer collars, *P* and *W*, the diagonally-slotted outer collars, *P* and *W*, having inner flanges, one of which engages  
50 with the rod *d* and imparts motion to said rod, the other engaging with the gear *K* and friction-wheel *v*, the two friction-wheels operated by the movement of the rod *d* and collar *P*,  
55 and the lever for moving said outer collars, substantially as described.

ARTHUR HENDEY.

Witnesses:

WM. A. ARNOLD,  
H. L. PERRINE.