

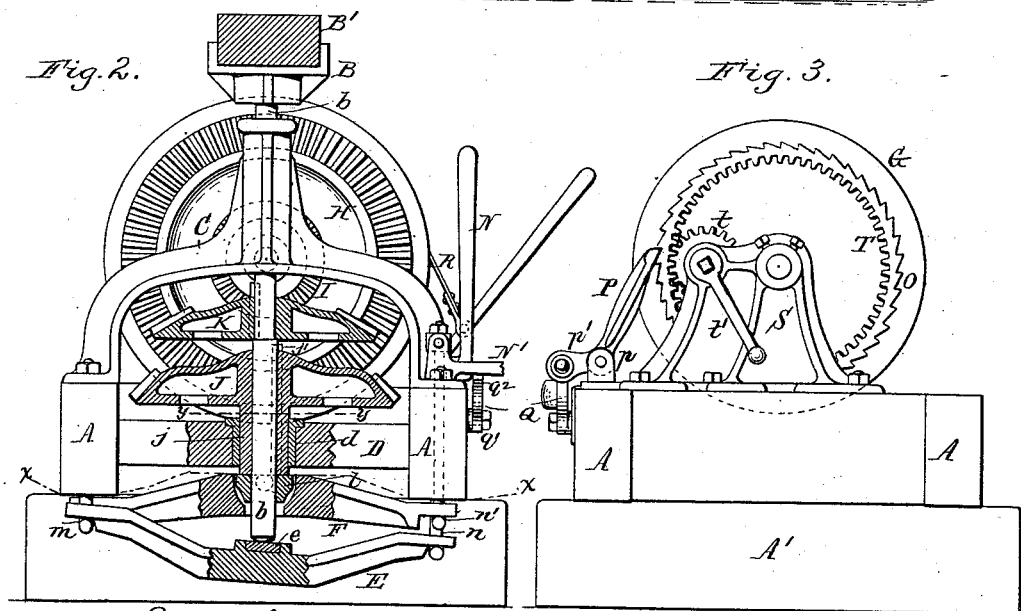
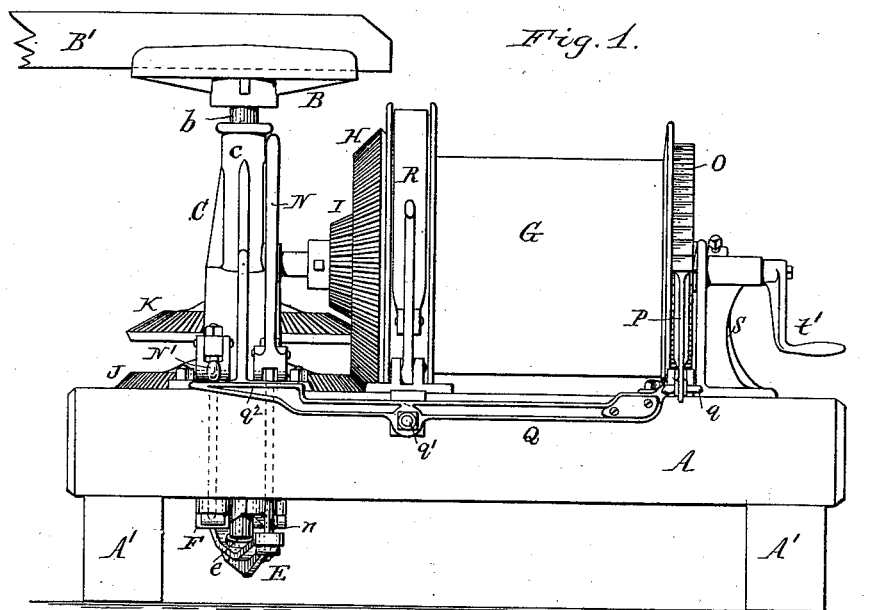
(No Model.)

2 Sheets—Sheet 1.

A. DOBBIE.
HOISTING MACHINE.

No. 345,489.

Patented July 13, 1886.



Chas. J. Buchheit }
Thos. L. Popp. } Witnesses.

A. Dobbee Inventor.
By Wilhelm Bonnet.
Attorneys.

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Fig. 4.

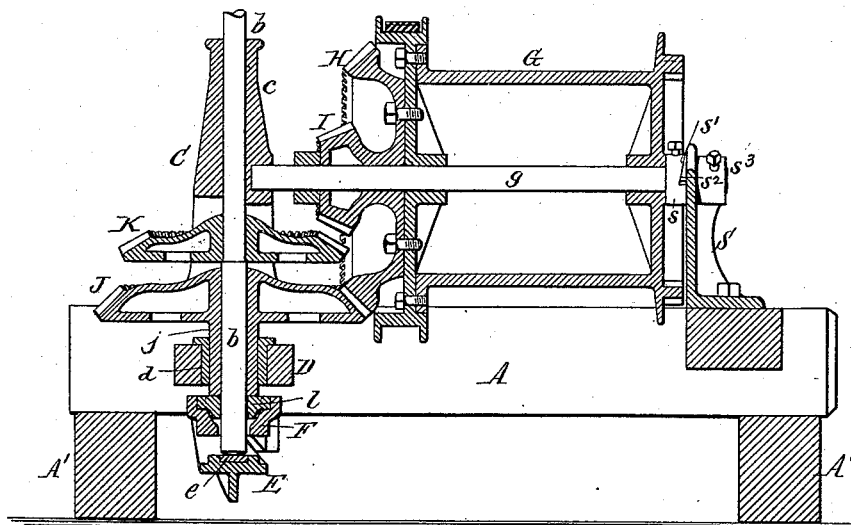


Fig. 8.

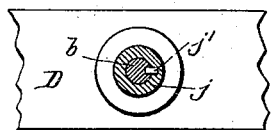


Fig. 9.

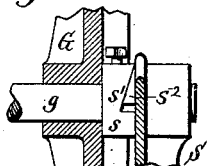


Fig. 7.

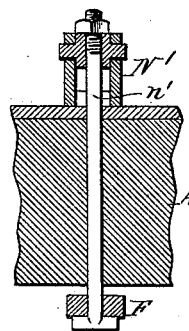


Fig. 5.

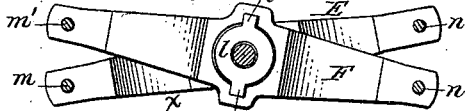
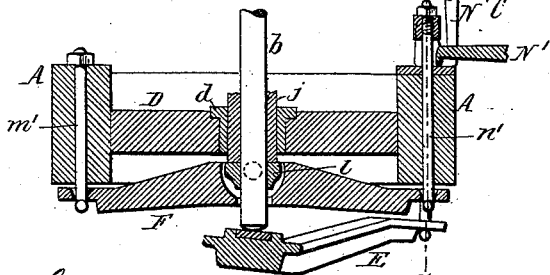


Fig. 6.



Class Buchheit
Theo. L. Popp. } Witnesses.

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UNITED STATES PATENT OFFICE.

ARCHIBALD DOBBIE, OF THOROLD, ONTARIO, CANADA.

HOISTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 345,489, dated July 13, 1886.

Application filed December 17, 1885. Serial No. 185,980. (No model.)

To all whom it may concern:

Be it known that I, ARCHIBALD DOBBIE, of Thorold, in the Province of Ontario and Dominion of Canada, have invented new and useful Improvements in Hoisting-Machines, of which the following is a specification.

This invention relates to an improvement in that class of hoisting-machines which are employed for hoisting heavy loads in building operations and for various other purposes, and which consist, essentially, of a drum, around which the rope or chain is wound to which the load is attached, and which is provided with driving mechanism which can be connected with the drum for raising the load and disconnected from the drum when the load has been raised to the desired height, and with a brake whereby the descent of the load can be controlled. A machine of this character is described and shown in Letters Patent of the United States, No. 263,126, granted to me August 22, 1882, to which reference is here made for a more complete description of the same.

The object of my present invention is to so construct the driving mechanism that the drum can be revolved at a rapid speed or slow speed, at desire, according to the weight of the load to be elevated; also, to provide the machine with a ratchet-and-pawl mechanism which is automatically thrown in or out of engagement simultaneously with the driving mechanism; also, to render the drum lengthwise adjustable in order to compensate for the wear of the gear-wheels.

My invention consists to these ends of the improvements, which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a side elevation of my improved hoisting-machine. Fig. 2 is a sectional elevation of the driving end of the machine. Fig. 3 is an elevation of the rear end of the machine. Fig. 4 is a longitudinal vertical section of the machine. Fig. 5 is a horizontal cross-section in line *x x*, Fig. 2. Fig. 6 is a longitudinal sectional elevation of the lower movable bridge-trees. Fig. 7 is a cross-section in line *x x*, Fig. 6. Fig. 8 is a horizontal section, on an enlarged scale, in line *y y*, Fig. 2. Fig. 9 is a detached elevation, on

an enlarged scale, of the adjusting device of the drum.

Like letters of reference refer to like parts in the several figures.

A A represent the longitudinal sills of the bed-frame, and A' A' cross-pieces on which the sills rest, these parts being suitably connected together by bolts, so as to form a rigid bed-frame for the machine.

b represents the vertical driving-shaft of the machine, provided at its upper end with a cross-head, B, carrying the sweep B', to which the draft-animals are attached when the machine is driven by animal-power. The upper portion of the vertical shaft *b* turns in a bearing, *c*, which is formed on an arched standard, C, which extends across the bed-frame of the machine, and is secured with its feet to the sills A. The lower portion of the shaft *b* is held in a vertical position by a bridge-tree, D, which is attached to the sills A, and is provided with a bearing, *d*. The lower end of the vertical shaft *b* rests in a step-bearing, *e*, formed in a bridge-tree, E, arranged below the fixed bridge-tree D, and made movable, so that it can be raised and lowered, together with the shaft *b* resting thereon.

F represents a bridge-tree similar to the bridge-tree E, and arranged above the latter and below the fixed bridge-tree D.

G represents the drum upon which the rope or chain is wound, and which is mounted upon a horizontal shaft or arbor, *g*, so as to turn on the same.

H I represent two bevel gear-wheels of different diameters secured to the end of the drum which is adjacent to the driving-shaft *b*. These gear-wheels are preferably cast in one piece, as represented in Fig. 4.

J K represent two bevel gear-wheels of different diameters mounted upon the driving-shaft *b*, so as to turn therewith, and meshing with the gear-wheels H I of the drum, so as to turn the latter. Either of the wheels J and K can be thrown into engagement with its corresponding drum-wheel H I at desire. When the wheels J and H are in engagement, the wheels K and I are out of engagement, as represented in Figs. 1, 2, and 4, and the drum is rotated slowly. When the wheels K and I are in engagement, the wheels J and H are out of

engagement and the drum is rotated fast. The upper wheel, K, is secured to the upper portion of the driving-shaft *b* by a key or other suitable device. The lower wheel, J, is provided with a downwardly-extending sleeve, *j*, which is fitted loosely on the lower portion of the shaft *b*, in such manner that the latter can slide vertically in the sleeve *j* and wheel J, while the rotary movement of the shaft *b* is transmitted to the wheel J by a suitable feather, *j'*, with which the shaft *b* is provided. The sleeve *j* is journaled in the bearing *d* of the stationary bridge-tree D, and rests with its lower end upon an annular step-bearing, *l*, which is attached to the upper movable bridge-tree, F. The bearing *l* is preferably provided with pivots *l'*, which are journaled in recesses formed in the bridge-tree F, so that the bearing can adjust itself to the sleeve *j* as the bridge-tree is raised or lowered. The bridge-trees E and F are pivoted on one side of the shaft *b* by means of T-headed bolts *m m'*, which are secured to the bed-frame of the machine, and are supported at their opposite ends by vertical adjusting-rods *n n'*, which are provided at their lower ends with T-heads, upon which the ends of the bridge-trees rest. The upper ends of the adjusting-rods *n n'* are provided with adjusting elbow-levers N N', which are pivoted to the adjusting-rods *n n'* and rest upon the bed-frame, so that by giving each lever a quarter-turn in one or the other direction the bridge-tree connected with such lever can be raised or lowered, as may be desired. Upon placing the lever N in a vertical position, as represented in Fig. 2, the bridge-tree E is lowered, thereby lowering the shaft *b* and throwing the wheel K out of engagement with the wheel I, while by placing this lever in a horizontal position the shaft *b* would be raised and the wheel K be placed in engagement with the wheel I. Upon placing the lever N' in a horizontal position the bridge-tree F is raised, thereby raising the wheel J on the shaft *b* and placing it in engagement with the wheel H, while by placing the lever N' in a vertical position the bridge-tree F and the wheel J are lowered, so as to throw the latter out of engagement with the wheel H. By this mechanism either pair of wheels may be placed in engagement or out of engagement, at desire, thereby affording ready means for changing the speed of the drum. The bridge-trees E and F cross each other, as represented in Fig. 5.

O represents a ratchet-rim, which is secured to the rear end of the drum G.

P represents the detent-pawl, which is engaged with the ratchet-rim O, for preventing the load from running down, and which is pivoted to a support, *p*, secured to the bed-frame of the machine. The pawl P is provided with an outwardly-projecting short arm, *p'*, which is connected with a lever, Q, by means of a bolt, *q*, formed at the end of said lever, and passing through an opening in the arm *p'* of the pawl. The lever Q is pivoted at *q'* to the side of the bed-frame, and has its

opposite or short arm provided with a straight upper bearing-surface, *q''*, which is arranged directly underneath the elbow-levers N N', so that the latter, in being depressed to a horizontal position, will depress the adjacent short arm of the lever Q, raise the opposite end of the long arm, and thereby throw the pawl P in engagement with the ratchet-rim O. The long arm of the lever Q, which is connected with the pawl P, preponderates in weight, so that when both elbow-levers are placed in a vertical position the long arm of the lever Q will drop and throw the pawl P out of engagement with the ratchet-rim O. The connection between the lever Q and pawl P is sufficiently loose to permit the pawl to ride freely over the ratchets. When both levers N N' are raised, both wheels J and K are disconnected from the wheels H and I, thereby disconnecting the motive power from the drum and permitting the load to be lowered under the control of the brake R. Upon placing the levers N N' in this position the pawl P is automatically thrown out of engagement with the ratchet-rim O, for the purpose of permitting the load to be lowered. Upon connecting the motive power again with the drum by depressing either of the levers N N' the pawl P is automatically thrown in engagement with the rim O, so as to operate as a detent in raising the load. By this mechanism the pawl is automatically placed in its operative position when required for use and automatically disengaged when not required.

S represents a standard which is secured to the bed-frame, and which supports the rear end of the shaft *g*.

s is a collar mounted on the shaft *g*, between the drum G and the standard S, and provided on its rear side with a notch, *s'*, having an inclined or spiral bottom.

s'' represents a tooth or projection formed on the standard S, and provided with an inclined or spiral face which bears against the inclined side of the collar *s*, as represented in Fig. 9. By turning the collar *s* on the shaft *g* in the proper direction the inclined adjacent faces of the collar *s* and tooth *s''* move the drum forwardly on the shaft *g* when the collar *s''*, at the front end of the drum, has been loosened. This mechanism affords means for nicely adjusting the position of the drum on the shaft *g*, for the purpose of taking up any wear which may take place in the wheels H I and J K.

T represents a gear-rim formed on the inner side of the ratchet-rim O, and *t* is a pinion which gears with the rim T, and is secured to the end of a shaft which is journaled in the standard S. This shaft is provided with a hand-crank, *t'*, whereby the pinion *t* can be turned for taking up the slack of the rope.

I claim as my invention—

1. The combination, with the drum, of two concentric bevel-wheels, H I, of different diameters, attached to one end of the drum, a driving-shaft, *b*, arranged at right angles to the axis of the drum, two bevel-wheels, J K,

mounted on said shaft, and means, substantially as described, whereby the wheels of either corresponding pair can be caused to mesh with each other and rotate the drum, substantially as set forth.

2. The combination, with the drum provided with the gear-wheels H I, of the driving-shaft b, a movable bridge-tree, E, supporting said shaft, a gear-wheel, K, secured to said shaft, a gear-wheel, J, mounted loosely on said shaft, and a movable bridge-tree, F, supporting the wheel J, substantially as set forth.

3. The combination, with the driving-shaft b and the gear-wheel J, mounted loosely on the same, of the movable bridge-tree F, and an annular step-bearing, l, pivoted in said bridge-tree and supporting the wheel J, substantially as set forth.

4. The combination, with the drum provided with gear-wheels H I, and a ratchet-rim, O, the movable driving gear-wheels J K, adapted to be thrown in and out of gear with the gear-wheels of the drum, and the levers N N', whereby the driving gear-wheels are shifted, of a detent-pawl, P, adapted to engage with the ratchet-rim O, and a lever, Q, connected with the pawl P and actuated by the shifting-levers of the driving-wheels, substantially as set forth.

Witness my hand this 1st day of December, 1885.

A. DOBBIE.

Witnesses:

JNO. J. BONNER,
CARL F. GEYER.