H. A. MYERS.

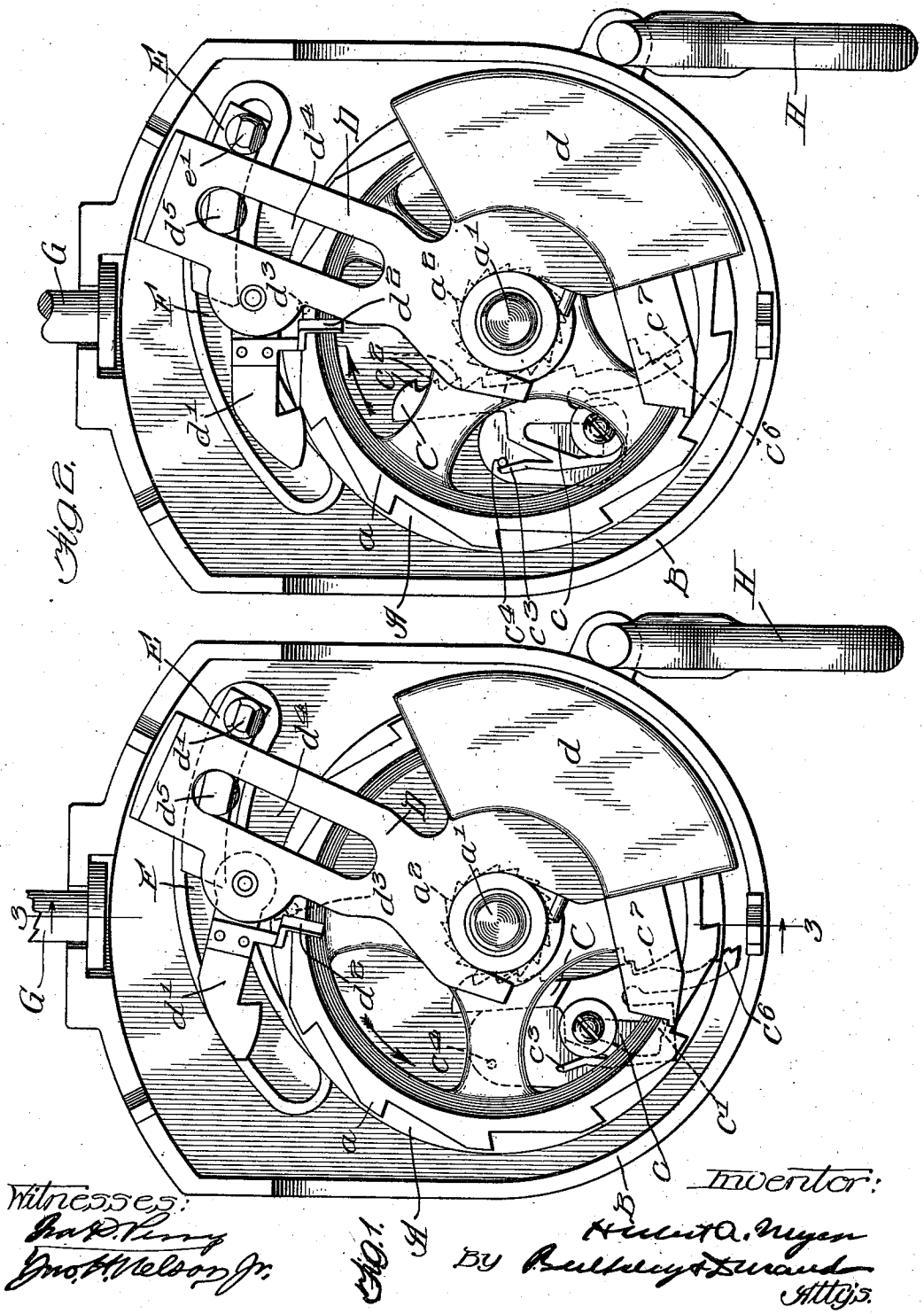
HOISTING DEVICE.

APPLICATION FILED DEC. 2, 1910.

1,014,327.

Patented Jan. 9, 1912.

2 SHEETS—SHEET 1.



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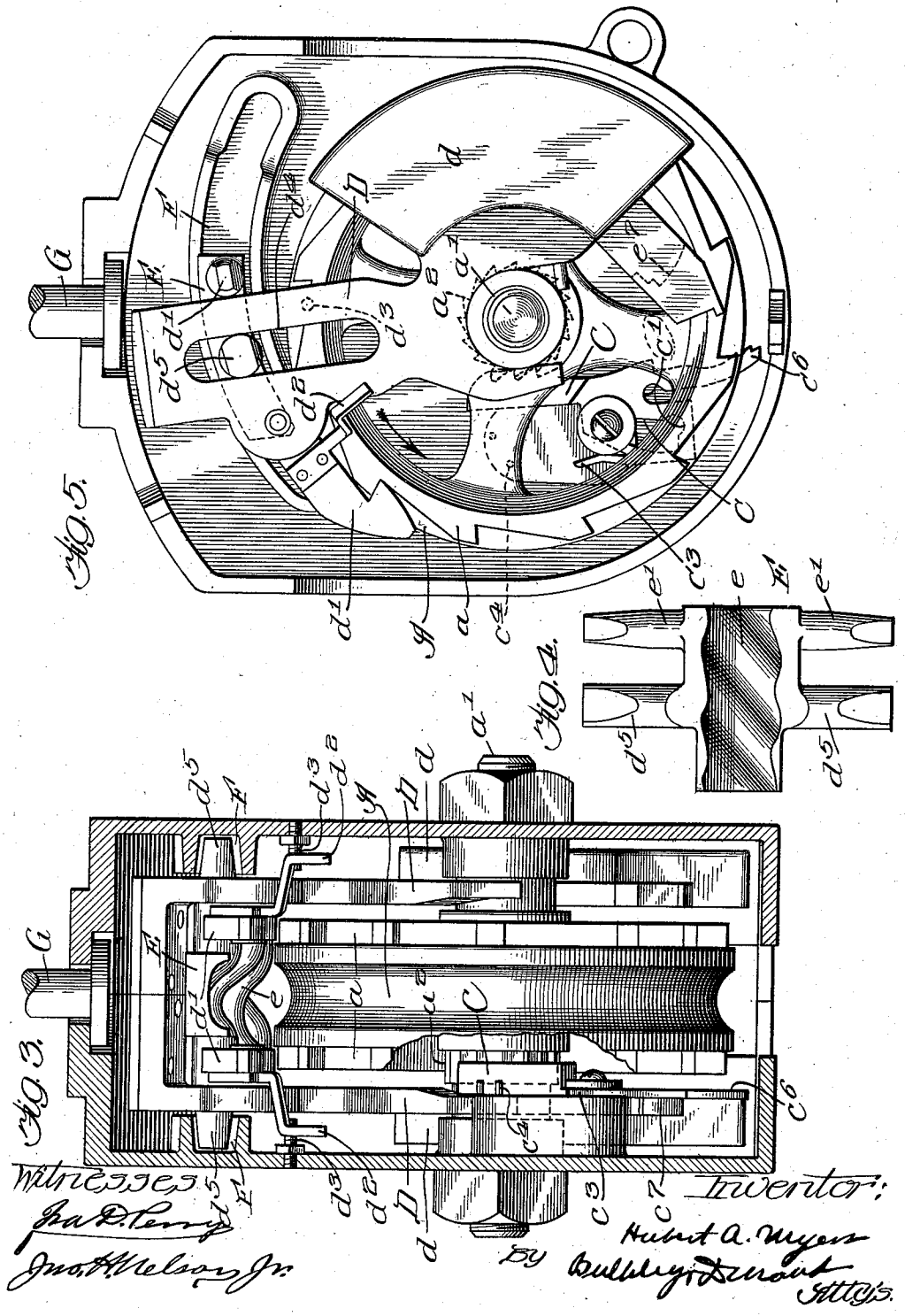

UNITED STATES PATENT OFFICE.

HUBERT A. MYERS, OF GOSHEN, INDIANA.

HOISTING DEVICE.

1,014,327. Specification of Letters Patent. Patented Jan. 9, 1912.

Application filed December 2, 1910. Serial No. 595,216.

To all whom it may concern:

Be it known that I, HUBERT A. MYERS, a citizen of the United States of America, and resident of Goshen, Indiana, have invented a certain new and useful Improvement in Hoisting Devices, of which the following is a specification.

My invention relates to hoisting devices of the kind in which means are provided for controlling the operation thereof by manipulating the hoist rope. In the use of a device of this character, it is possible to raise the load to the desired height, discontinue the pull on the rope, and allow the load to hang without danger of falling. This is by reason of provision being made for automatically clutching the rope as soon as the load starts downward. After the load has been disposed of, a pull on the rope will release the clutch and allow the rope to be lowered for another load. The hoisting device comprises, of course, a sheave over which the rope runs, and which is supported in an elevated position.

My invention relates to that particular construction in which the clutch for gripping and releasing the rope is operated by the sheave. Thus in the use of a device of this kind, the entire mechanism is controlled simply by the manipulation of the hoist rope.

Devices of this kind can be used for a variety of purposes, and are called hay cars when used for handling hay in barns.

The objects of my invention are to provide a device of this kind in which improved and more efficient means are employed for clutching or gripping the rope, which means are operated positively by the sheave, and in which the automatic action of the mechanism, to alternately hold and release the rope, is more certain and reliable than heretofore, as will hereinafter more fully appear. It will also be seen that this is an improvement on the construction disclosed in my prior application, Serial Number 543,089, filed February 10, 1910, in which I have claimed my invention broadly.

To these and other useful ends my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a hoisting device or hay car embodying the principles of my invention, showing one half of the housing removed to bring the mechanism into view, and illustrating the positions of the various parts when the rope is being lowered to get a load, the arrow indicating the direction of rotation of the sheave for this purpose. Fig. 2 is a similar view showing the position of the parts after the rotation of the sheave is reversed, and while the load is being raised by a downward pull on the hoist rope. Fig. 3 is a section through the housing or casing on line 3—3 in Fig. 1, but not through the mechanism, the latter being shown in elevation, a portion of the sheave being broken away to show the rack device by which the sheave controls the element on which the clutch is mounted. Fig. 4 is a bottom or face view of the clutch block or shoe that bears upon the rope when the pull is discontinued after raising the load. Fig. 5 is a view similar to Fig. 1, showing the position of the parts when the rope is gripped by the clutch or brake shoe, which condition has been brought about by rotation of the sheave in the direction indicated by the arrow, after the parts were first placed in the condition shown in Fig. 2.

As thus illustrated, the sheave A has ratchet teeth a and an axle a', which latter is mounted in bearings on the two part housing B. The ratchet wheel a^2 is rigid with the sheave and turns therewith. The rack C has a slot c that is formed with a notch or lateral recess c' at the lower end thereof, and has teeth c^2 that are adapted to engage the ratchet wheel a^2. The said rack has a cam finger c^3 that engages the pin c^4 on the bearing when the rack is raised to throw it out of engagement with the ratchet wheel a^2 and thereby permit the sheave to rotate in the direction shown in Fig. 2. A stationary pin or support c^5 extends through the slot c to guide and support the rack. The notch or recess c' allows the rack to fall away from the ratchet wheel, as shown in Fig. 2. The rack C also has a cam finger c^6 which engages the cam c^7 on the oscillating element D. This element is mounted to oscillate on the axle of the sheave, and has a weight d that tends to keep it in the position shown in Fig. 1. While the sheave is rotating in the direction shown in Fig. 1, the finger c^6 reaches below the cam c^7, as shown; but when the rotation is reversed, the upward movement of the rack C draws the finger c^6 upward and slightly toward the cam c^7, thus forcing the element D into the position shown in Fig. 2. This also, as stated, throws

the rack C out of engagement with the ratchet wheel a^2, and at this time it is supported by the finger c^6 resting on the cam c^7, as shown. The element D has a pair of dogs d' that are adapted to engage the ratchet teeth a, when the element D is in the position shown in Fig. 2; but with the parts as shown in Fig. 1, the dogs are held out of engagement by their fingers d^2 that engage pins d^3 on the housing. The element D has solts d^4 that engage the pins d^5 on the side of the movable clutch block or shoe E, which latter has a face e formed to fit the spiral formation of the rope. The said clutch block has a second pair of pins d' that are of about the same shape and size as the pins d^5. The housing is provided interiorly with the eccentric cam tracks F in which the pins d^5 and e' travel or slide back and forth. As the block or shoe E travels back and forth, the pins d^5 move up and down in the slots d^4, by reason of the eccentricity of the tracks or ways F. Rotation of the sheave in the direction shown in Fig. 5, when the parts have been put in the condition shown in Fig. 2, brings the block or shoe E nearer to the rope, as the dogs engage the teeth a and pull the element D along in this direction. As the tracks or ways F are closer in this direction to the sheave, the block or shoe E is wedged tighter and tighter against the rope to hold the load against falling when the pull on the rope is discontinued. This action also, of course, restores the rack C to the position shown in Figs. 1 and 5. When the rope is pulled again, to release the clutch, the parts then assume the position shown in Fig. 1, the rope being released, and the dogs d' being automatically thrown out of engagement with the teeth a on the sheave. Then when the rope is lowered to get another load the parts remain as shown in Fig. 1. The weight d preserves this relation of the parts while the sheave is rotating for this purpose. Thus the sheave will turn freely to allow the rope to descend for another load. It will also turn freely when the motion is reversed to raise the load. However, when the motion is again reversed, as in easing off on the rope, the clutch mechanism operates to automatically grip the rope and prevent the load from falling. While the sheave is rotating in the direction indicated in Fig. 2, to raise the load, the dogs d' rest on the teeth a, but do not catch, the element D being held in a slightly advanced position by the engagement of the finger c^6 with the cam c^7, as shown. Then when the motion is reversed to hold the load stationary, the dogs catch on the teeth a and cause the clutching or gripping of the rope, as shown in Fig. 5. This is all accomplished, it will be seen, by simply manipulating the hoist rope.

The housing is supported overhead by a swivel G, and a ring or eye H is mounted on the housing to support one end of the rope, if it is desired to use a sheave below in the bend of the rope for multiplying power, as is often done in the use of devices of this kind.

What I claim as my invention is:

1. In a hoisting device, a sheave, a shoe for clamping the rope to the sheave, a ratchet mechanism whereby rotation of the sheave in one direction will operate the shoe, means for rendering the said mechanism inoperative, and a device operated by the rotation of the sheave in the other direction to place said mechanism in operative condition.

2. In a hoisting device, a sheave, a shoe for clamping the rope to the sheave, a ratchet mechanism whereby rotation of the sheave in one direction will operate the shoe, means for rendering the said mechanism inoperative, and a device operated by the rotation of the sheave in the other direction to place said mechanism in operative condition, said device comprising a rack operated by a ratchet wheel that rotates with the sheave.

3. In a hoisting device, a sheave, a shoe for clamping the rope to the sheave, a ratchet mechanism whereby rotation of the sheave in one direction will operate the shoe, means for rendering the said mechanism inoperative, and a device operated by the rotation of the sheave in the other direction to place said mechanism in operative condition, said device comprising a movable element for controlling the position of said shoe, and a portion of which serves as medium of connection between the shoe and said ratchet mechanism.

4. In a hoisting device, a sheave, a shoe for clamping the rope to the sheave, a ratchet mechanism whereby rotation of the sheave in one direction will operate the shoe, means for rendering the said mechanism inoperative, and a device operated by the rotation of the sheave in the other direction to place said mechanism in operative condition, there being a pair of eccentric tracks or ways in which said shoe slides.

5. In a hoisting device, a sheave, a shoe for clamping the rope to the sheave, a ratchet mechanism whereby rotation of the sheave in one direction will operate the shoe, means for rendering the said mechanism inoperative, and a device operated by the rotation of the sheave in the other direction to place said mechanism in operative condition, said means comprising a projection for throwing the dogs of said mechanism out of engagement with the ratchet teeth on the sheave.

6. In a hoisting device, a sheave, a shoe for clamping the rope to the sheave, a

ratchet mechanism whereby rotation of the sheave in one direction will operate the shoe, means for rendering the said mechanism inoperative, a device operated by the rotation of the sheave in the other direction to place said mechanism in operative condition, said device comprising a ratchet wheel that rotates with the sheave, a ratchet toothed rack that engages said ratchet wheel, means operated by the said rack to change the position of the shoe, and means for throwing the rack out of engagement with the said ratchet wheel.

7. In a hoisting device, a sheave, a shoe for clamping the rope to the sheave, a ratchet mechanism whereby rotation of the sheave in one direction will operate the shoe, means for rendering the said mechanism inoperative, and a device operated by the rotation of the sheave in the other direction to place said mechanism in operative condition, said device comprising a rack and pinion, and a weighted element operated by the rack.

8. In a hoisting device, a sheave, a shoe for clamping the rope to the sheave, a ratchet mechanism whereby rotation of the sheave in one direction will operate the shoe, means for rendering the said mechanism inoperative, a device operated by the rotation of the sheave in the other direction to place said mechanism in operative condition, said mechanism comprising ratchet teeth on said sheave, an element movable about the axes of said sheave, and a ratchet dog on said element, which element has a sliding connection with said shoe.

Signed by me at Bryan, Ohio, this 25th day of November 1910.

HUBERT A. MYERS.

Witnesses:
A. L. GEBHARD,
HAZEL GABRIEL.