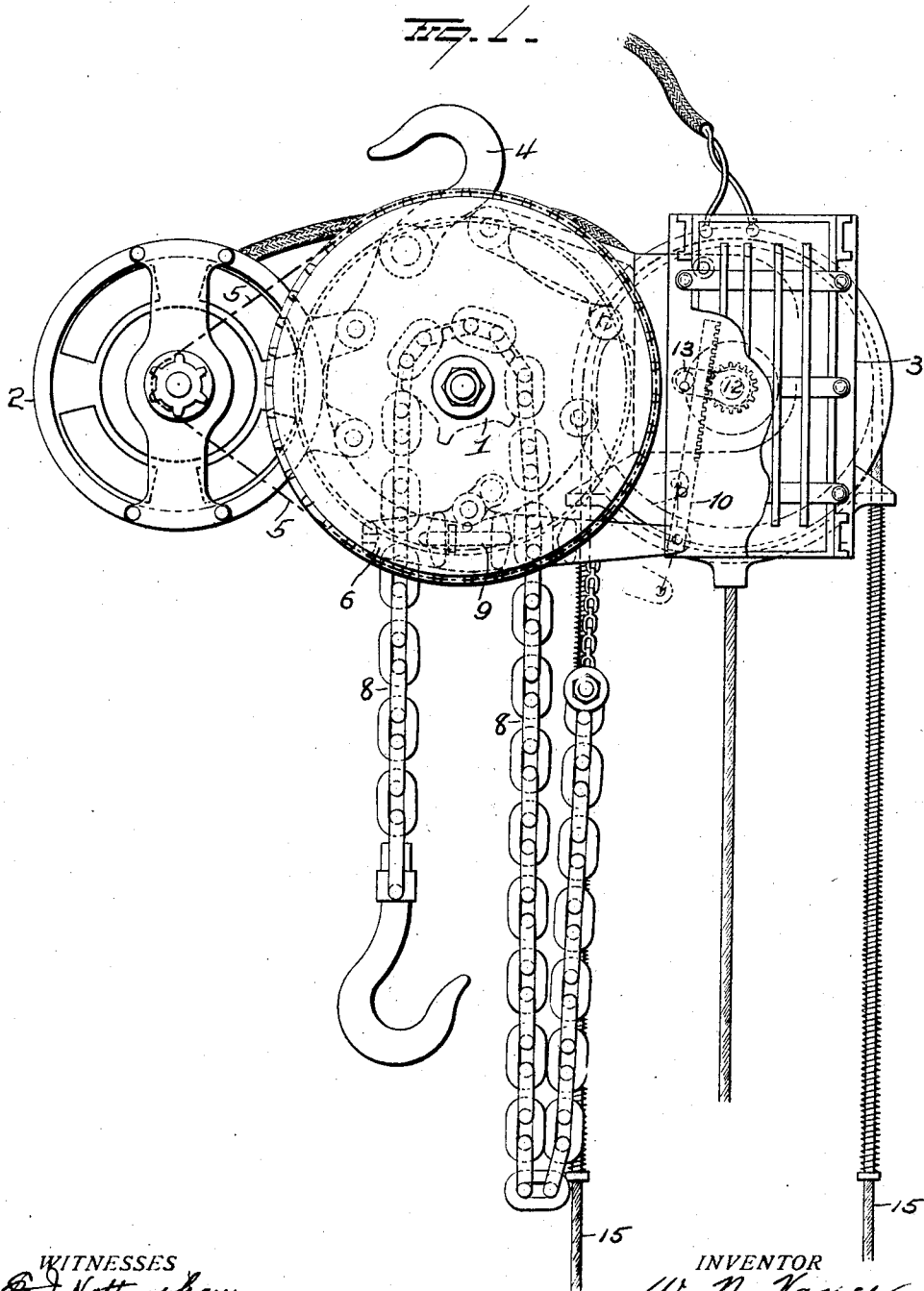


No. 836,789.

PATENTED NOV. 27, 1906.

W. N. VANCE.
PORTABLE ELECTRIC HOIST.
APPLICATION FILED JULY 9, 1906.

2 SHEETS—SHEET 1.



WITNESSES
B. Nottinghamham
G. F. Downing

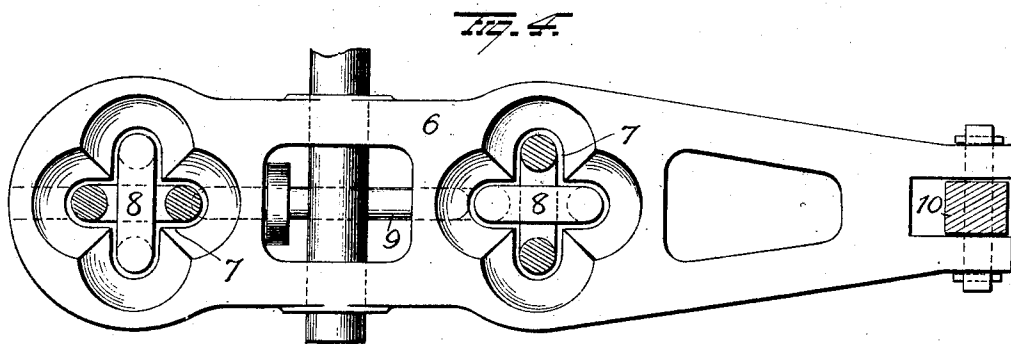
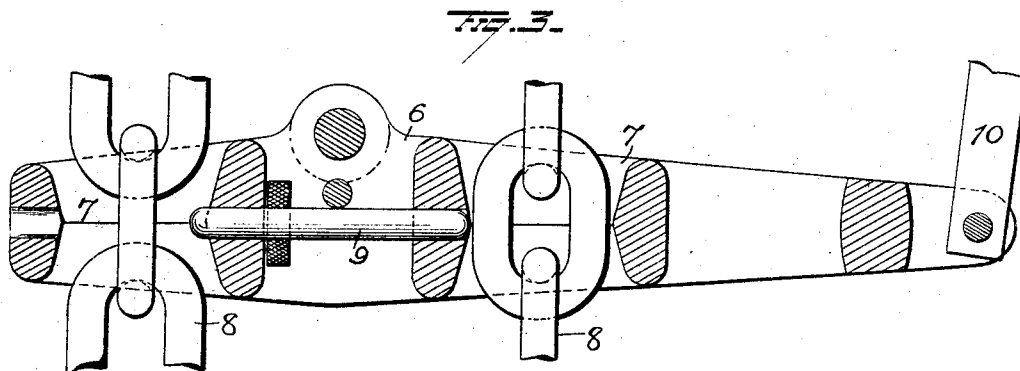
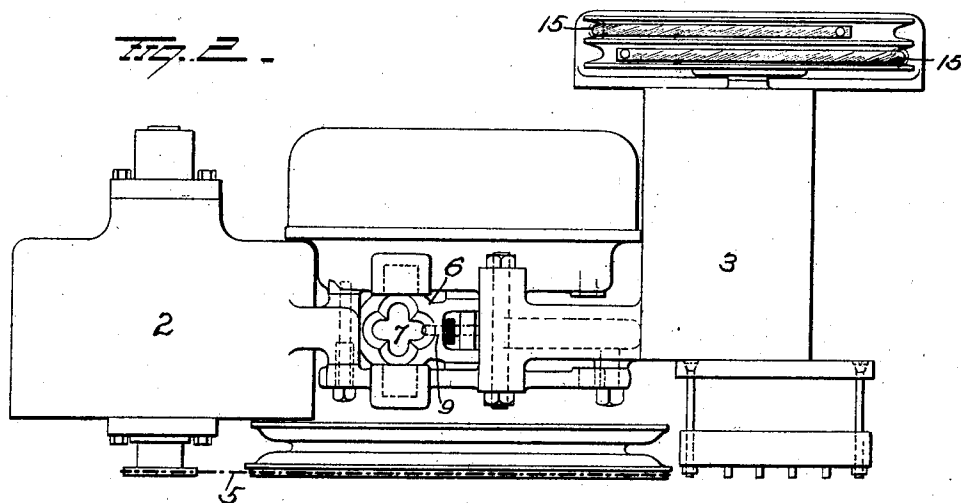
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2 SHEETS—SHEET 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

WALTER NOBLE VANCE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE
YALE & TOWNE MANUFACTURING COMPANY, OF STAMFORD, CON-
NECTICUT.

PORTABLE ELECTRIC HOIST.

No. 836,789.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed July 9, 1906. Serial No. 325,388.

To all whom it may concern:

Be it known that I, WALTER NOBLE VANCE, a citizen of the United States of America, residing at No. 120 Lincoln Park Boulevard, Chicago, Illinois, have invented certain new and useful Improvements in Portable Electric Hoists, of which the following is a specification.

My invention relates to an improvement in portable electric hoists, the object of the invention being to so arrange the motor and controller with relation to the hoist-block that the vertical space occupied by the mechanism will not be increased over that taken up by the ordinary chain-block.

A further object is to provide devices that will automatically prevent overhoisting or overlowering and also stop the motor in the event the hoist-chain becomes stretched or worn so that its pitch is increased.

With these ends in view my invention consists in the parts and combinations of parts, as will be more fully explained, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in front elevation of my improved hoist. Fig. 2 is a top plan view, the suspending hook and chain or load sheave and shaft of the latter being removed, so as to show the safety-stop 6. Fig. 3 is a view in longitudinal vertical section through the safety-stop, showing the position of the chain-links therein; and Fig. 4 is a plan view of the safety-stop.

1 represents a chain-block, preferably the well-known "triplex block" manufactured by the Yale & Towne Manufacturing Company.

2 is an electric motor of any approved type or construction rigidly secured to one side of the block 1, and 3 is a controller located on the opposite side of the block, these three members being so connected and arranged that when the apparatus is suspended from its hook 4 they all rest in the same horizontal plane; consequently do not take up any more head-room than the ordinary triplex block, which in some situations and buildings is an important matter.

The motor is preferably geared up to the hoist 1 by the chain 5, which permits of a certain amount of flexibility and which also permits of the use of the regular hand-wheel used on the manually-operated blocks; but,

if desired, gear-wheels can be employed in lieu of the chain.

I make no claim in this application to any particular form of motor and controller nor to the means employed in connecting them to the block, as my invention comprehends simply the relative arrangement of the motor, controller, and block and the safety device for automatically actuating the controller for stopping the motor under certain conditions, which will be more particularly referred to later on.

6 is the safety-stop, which consists of a lever pivoted to the block below the chain or load sheave and provided near each end with a guide-opening 7 for the passage of the two ends of the hoist-chain 8. In hoists of the character herein referred to the chain or load sheave is provided with link-recesses constructed to receive the links alternately edgewise and flatwise, and as more than one-half of the periphery of the sheave is engaged by the links of the hoist-chain the chain is securely held against the possibility of slipping on the sheave.

In all chain hoists where the chain passes over pocketed wheels the chain must be properly guided, so as to work smoothly in the pockets. Normally when the chain is running properly it is evident that the links will approach the sheave alternately sidewise and edgewise. The guide-opening 7 in the ends of the safety-stop are constructed to guide the chain so that it will reach the pocketed sheave in this manner.

Mounted to slide in the safety stop or lever 6 is the reciprocating or sliding rod 9, which latter is of a length sufficient to project into both guide-openings 7 in the safety stop or lever 6. The number of link recesses or pockets in the chain or load sheave is such that with a chain of normal pitch when a link is edgewise in one guide 7 the chain-link in the guide at the opposite end of the safety stop or lever will be flatwise. Consequently when the link which is passing through the guide edgewise is opposite the rod 9 it will engage the latter and move it longitudinally toward the other guide; but as the link in that guide-opening is flatwise with relation to the periphery of the chain-sheave the movement of the rod 9 is not interfered with, nor does the rod interfere with the passage of the chain-link through the guide-opening. If, how-

ever, the chain becomes stretched or worn, so that its pitch is increased, which will have the effect of lengthening the chain, then when such lengthening is sufficient to make it dangerous the relation of the chain-links in the two guides will be changed, so that when the edge of one link pushes on the rod the latter will be moved longitudinally into the other guide, but, owing to the increased length of the chain, it will encounter the edge of another link. This simultaneous engagement of the sliding rod with two links blocks the movement of the chains and causes the safety-stop 6 to rock on its fulcrum.

Pivotaly secured to the end of the safety stop or lever 6 on the controller side of the apparatus is the rack-bar 10. This rack-bar 10 projects into the controller-casing, and the teeth thereon mesh with pinion 11 on the controller-shaft 12; the upper end of the link being held in contact with the pinion 11 and guided in its movements by the arms 13, carrying a roller, the latter resting in a position to bear on the rear face of rack-bar 10.

With this arrangement it will be seen that when the safety stop or lever 6 is rocked on its fulcrum by the locking of the chain by the sliding rod 9 the rack-bar 10 will be moved longitudinally, and the teeth thereon engaging the pinion 11 will automatically rotate the controller-shaft and in a direction to shut off the power, and thus bring the hoist to a stop.

The link may operate to shut off the power by moving either up or down. Consequently the automatic stop becomes effective both in hoisting and lowering a load and prevents overhoisting or overlowering.

The controller and the motor are connected up by wires to a generator, and the controller-shaft is provided with operating-cords 15, by which the motor may be controlled by the operator, the safety-stop operating only when the pitch of the chain becomes changed or when engaged by the hoist-hook in elevating or by the tail end of the chain in lowering.

It is evident that many slight changes might be resorted to in the relative arrangement of parts shown and described without departing from the spirit and scope of my invention. Hence I would have it understood that I do not wish to limit myself to the exact construction and arrangement of parts shown and described; but,

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

1. In an electric hoist, the combination with a load or chain sheave mounted in a frame, a motor secured to said frame at one side and an electric controller secured to said frame at the other side, the armature of the motor, the load-sheave of the hoist and the controller-shaft being in substantially the

same horizontal plane, of means connecting the motor and load or chain sheave, and means for actuating the controller.

2. The combination with a chain-block, a motor, a controller, and gearing for transmitting motion from the motor to the load or chain sheave of the block, of a safety stop having guide-openings for the passage of the hoist-chain, the said openings being constructed to guide the chain alternately flatwise and edgewise to and from the link-recesses in the periphery of the chain-sheave.

3. The combination with a chain-block, a motor, a controller, and gearing for transmitting motion from the motor to the load or chain sheave of the block, of a pivoted lever having openings therein for the passage of the two ends of the hoist-chain and means connecting said lever and the controller-shaft, whereby when the lever is rocked the shaft is rotated.

4. The combination with a chain-block, a motor, a controller and gearing for transmitting motion from the motor to the load or chain sheave of the block, of a pivoted lever having guide-openings for the two parts of the chain, a sliding rod located between and projecting into said openings a chain passing through said guides and around the chain or load sheave and means connecting said lever and the controller-shaft.

5. The combination with a chain-block, a motor, controller, and gearing for transmitting motion from the motor to the load or chain sheave of the block, of a pivoted lever having guide-openings for the two ends of the chain, a chain passing through said openings and around the sheave, a sliding rod carried by the pivoted lever and adapted to project into both guide-openings in said lever, and a rack-bar pivoted to said lever and meshing with a pinion on the operating-shaft of the controller.

6. The combination with a chain-block, a motor, controller and chain connecting the armature-shaft of the motor and a chain-sheave on the driven shaft of the chain-block, of a pivoted lever having guide-openings for the passage of the two parts of the chain, a chain passing through said openings and around the sheave, a sliding rod carried by the pivoted lever and adapted to project into both guide-openings in said lever, and a rack-bar pivoted to said lever and meshing with a pinion on the operating-shaft of the controller.

In testimony whereof I, WALTER NOBLE VANCE, have signed my name to this specification, in the presence of two subscribing witnesses, this 12th day of June, 1906.

WALTER NOBLE VANCE.

Witnesses:

WM. A. CUDLIPP,
F. C. SQUIRES.