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HOIST

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Fig. 1

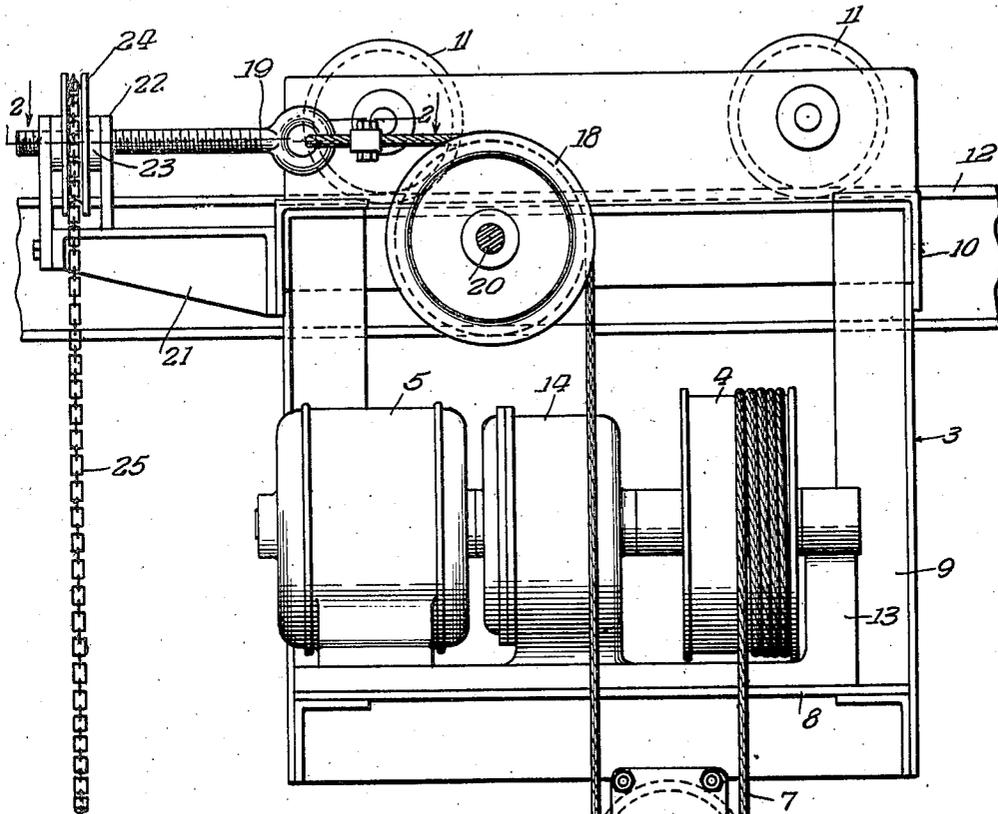
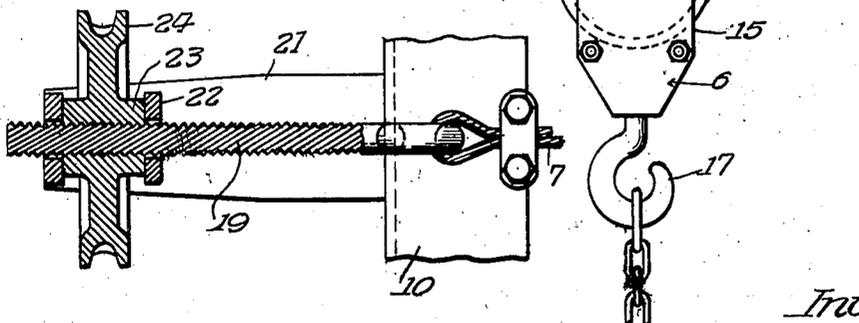


Fig. 2



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HOIST

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3 Claims. (Cl. 254—168)

The present invention relates generally to hoists. More particularly the invention relates to that type of hoist which is used for raising and lowering loads and comprises a drum, a reversible electric motor connected through speed reducing gearing to drive the drum in either direction, a hook equipped load carrying block, and a cable arranged to form a depending loop for the block and having one end thereof anchored and its other end attached to, and wrapped or wound around, the drum to the end that when the drum is driven in one direction so as further to wind the other cable end thereon the loop is shortened and the block and load thus raised and when the drum is reversely driven the loop is extended and the block and load are hence lowered.

In a hoist of this type the electric motor is operated until the load approaches the desired height and is then stopped. Because the hoist operator is generally unable to stop the electric motor at the proper moment it is extremely difficult to raise or lower the load to a precise predetermined height.

The primary object of this invention is to provide a hoist of the type under consideration embodying simple and novel means for minutely taking up or paying out the cable after stoppage of the electric motor in order to permit the load to be accurately adjusted to the desired height.

Another object of the invention is to provide a hoist of the last mentioned character in which the means for taking up or paying out the cable consists of a threaded element on the anchored end of the cable and a nut which is mounted on the element and operates in response to turning thereof to shift the element longitudinally for cable adjusting purposes.

A further object of the invention is to provide a hoist which is generally of new and improved construction and is more efficient than previously designed hoists of like character by reason of the fact that it includes a micrometric type adjustment whereby the load may be adjusted to a nicety after stoppage of the electric motor.

Other objects of the invention and the various advantages and characteristics of the present hoist will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by claims at the conclusion hereof.

In the drawing which accompanies and forms a part of this specification or disclosure and in

which like numerals of reference denote corresponding parts throughout the several views:

Figure 1 is a side view of a hoist embodying the invention; and

Figure 2 is a horizontal section taken on the line 2—2 of Figure 1 and illustrating in detail the construction and design of the means for taking up or paying out the anchored end of the cable in connection with adjustment of the load after stoppage of the electric motor.

The hoist which is shown in the drawing constitutes the preferred form or embodiment of the invention. It is designed or adapted to raise or lower loads and comprises a supporting structure 3, a drum 4, an electric motor 5, a load carrying block 6 and a block supporting cable 7.

The supporting structure 3 is in the form of a carriage and embodies a horizontally extending rectangular platform 8, uprights 9 at the corners of the platform, and a rectangular angle bar type frame 10 at the upper ends of the uprights. In addition to the aforementioned parts the supporting structure comprises wheels 11 which are mounted adjacent the frame 10 and are adapted to travel on a horizontally extending track 12 so that the hoist may be shifted horizontally. Instead of being in the form of a carriage the supporting frame may be fixed or stationary, depending upon the work to be performed by it.

The drum 4 is disposed over the platform and is carried by a bearing bracket 13 so that it is rotatable about a horizontal axis. The bracket 13 rests upon the platform 8 and is secured to the latter in any suitable manner.

The electric motor 5 is of the reversible type and serves as a medium for driving the drum 4 in either direction. It is drivably connected to the drum by way of a gear type speed reducer 14. The latter and the motor 5 are mounted on the platform 8 of the supporting structure 3.

The block 6 is disposed beneath the supporting structure. It is of conventional or standard design and comprises a frame 15, a sheave 16 and a hook 17. The sheave 16 is rotatably mounted on the frame and extends vertically. The hook 17 is connected to, and depends from, the lower portion of the frame and serves as a medium for attaching the load or work to the block.

The cable 7 is arranged to form a depending loop, the lower portion of which is reeved through the block 6 and extends around the sheave 16. One end of the cable is fixedly attached to the drum 4 and is wound or wrapped around the drum. The other end of the cable is adjustably

anchored as hereinafter described. When the drum 4 is driven by the electric motor 5 so as to wind up the wound or wrapped end of the cable the loop is shortened with the result that the block and any load carried thereby are caused to raise. Reverse rotation of the drum in response to reverse drive of the electric motor 5 results in downward extension of the loop and resultant lowering of the block and load. The so-called anchored end of the cable 7 extends around a vertically extending sheave 18 at the upper portion of the supporting structure 3 and is suitably attached to the eye of a horizontally extending eye bolt 19. The sheave 18 is rotatably mounted on a horizontally extending shaft 20 which is carried by the side members of the frame 10. The shank of the eye bolt projects outwards of one end of the supporting structure 3 and overlies a laterally extending bracket 21 on the adjacent end of the angle bar frame 10 of the supporting structure. It is threaded from one end thereof to the other and extends through aligned or coaxial holes in the upper ends of a pair of laterally spaced upstanding lugs 22 on the bracket 21. A nut 23 is mounted on the shank of the eye bolt 19 and is positioned or disposed between the lugs 22. The central portion of the nut is in the form of an elongated hub, the ends of which bear against the inner faces of the lugs 22 and prevent axial displacement of the nut. The outer portion of the nut is shaped to form a pulley 24 having a grooved periphery. An endless flexible element 25 extends around the pulley 24 and is adapted when pulled to rotate the nut 23. When the nut is rotated in one direction the eye bolt is moved axially or longitudinally away from the supporting structure and causes take-up of the anchored end of the cable and resultant upward adjustment of the block and load. Reverse rotation of the nut causes the eye bolt to move axially in the direction of the supporting structure and results in the anchored end of the cable being paid out and resultant downward adjustment of the block and load. The endless element is formed of a chain and depends from the pulley 24. It is sufficiently long so that it may be readily grasped by the operator of the hoist. The nut 23 and the eye bolt 19 constitute a micrometric type adjustment whereby the anchored end of the cable may be taken up or paid out to effect vertical adjustment of the block 6 after stoppage of the electric motor 5. The endless element 25 and the pulley 24 constitute simple means whereby the operator of the hoist may readily turn the nut 23 in either direction in connection with adjustment of the block and load. By reason of the fact that the hoist includes the micrometric type adjustment of the load, after being brought, by manipulation of the drum, to approximately the desired height, may be accurately adjusted.

When the hoist is to be used the block 6 is lowered so as to bring the hook 17 into a position wherein it may be applied to the load. Lowering of the block is effected by operating the electric motor 5 so that it drives the drum 4 in such direction as to cause unwinding of the wrapped or wound end of the cable. After attachment of the hook 17 of the block 6 to the load the load may be hoisted or raised by reversely driving the electric motor 5. Reverse drive of the motor causes the drum 4 to wind up the end of the cable that is attached thereto and this, as previously pointed out, results in shortening of the cable loop and raising of the block. When

the load is elevated to approximately the desired height the motor 5 is stopped. In the event that the load is not disposed at the precise desired height the nut 23 is turned in one direction or the other, depending upon whether it is necessary to take-up or pay out on the anchored end of the cable. Rotation of the nut relatively to the eye bolt is effected by pulling downwardly on one side of the endless element 25. If it is necessary minutely to raise the block in order to position the load at the proper elevation or height the end is turned so as to shift the eye bolt 19 away from the supporting structure 3. Outward displacement of the eye bolt in response to turning of the nut causes the anchored end of the cable to be drawn upwards. Should it be necessary to lower the block 6 in order properly to position the load the nut is reversely rotated. Reverse rotation of the nut causes the eye bolt 19 to move inwards, that is, towards the supporting structure 3, and results in paying out of the anchored end of the cable.

The herein described hoist is essentially simple in design as well as efficient in operation. By including a micrometric type adjustment the hoist may be effectively used in instances where it is essential to place the load at a precise predetermined point.

The invention is not to be understood as restricted to the details set forth since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. A hoist comprising a supporting structure having mounted thereon a lug with a horizontal aperture therethrough, a drum rotatably mounted on the structure, a prime mover on said structure for driving the drum in either direction, a load carrying block beneath the drum, a cable arranged to form a depending loop with the bottom portion thereof reeved through the block, and having one end thereof attached to and wound around the drum, and means on the structure for anchoring the other end of the cable while at the same time permitting it to be minutely taken up or paid out for block and load adjusting purposes, comprising an elongated horizontally disposed externally threaded element connected to said other end of the cable and extending through the aperture in the lug, a nut mounted on the element and disposed adjacent the side of the lug that is remote from said other end of the cable, a vertically extending pulley fixed to the nut, and a manually manipulable flexible endless element trained around the pulley for rotating the latter and the nut.

2. A hoist comprising an overhead supporting structure having mounted thereon a lug with a horizontal aperture therethrough, and in addition a vertical sheave adjacent the lug, a drum rotatably mounted on the structure, a prime mover on said structure for driving the drum in either direction, a load carrying block beneath the drum, a cable arranged to form a depending loop with the bottom portion thereof reeved through the block, and having one end thereof attached to and wound around the drum and its other end trained over the sheave, and means for anchoring said other end of the cable while at the same time permitting it to be minutely taken up or paid out for block and load adjusting purposes, comprising an elongated horizontally dis-

posed externally threaded element connected to said other end of the cable and extending through the aperture in the lug, a nut mounted on the element and disposed adjacent the side of said lug that is remote from the sheave, a vertically extending pulley fixed to the nut, and a vertically elongated, flexible, endless element having the upper end thereof trained around the pulley, and adapted to be manually pulled in order to effect rotation of the pulley and nut.

3. A hoist comprising an overhead supporting structure having an upstanding apertured lug at one end thereof and a vertical sheave inwards of the lug, a drum rotatably mounted on the structure, a reversible electric motor on said structure for driving the drum in either direction, a load carrying block beneath the drum, a

5 cable arranged to form a depending loop with the bottom portion thereof reeved through the block and having one end thereof attached to, and wound around, the drum and its other end trained over the sheave, and means for anchoring said other end of the cable while at the same time permitting it to be minutely taken up or paid out for block and load adjusting purposes, comprising an elongated horizontally disposed externally threaded element connected to said other end of the cable and extending through the aperture in the lug, a nut mounted on the element and abutting against the outer face of said lug, a vertically extending pulley fixed to the nut, and a flexible element trained around the pulley and adapted to rotate the latter and nut.

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