

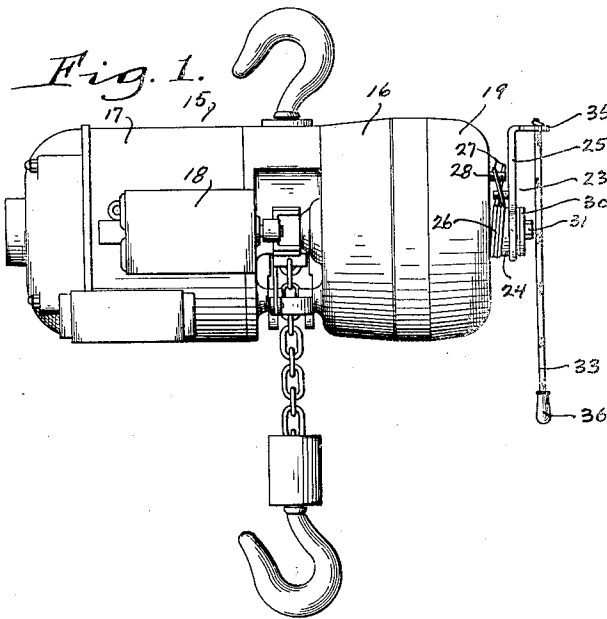
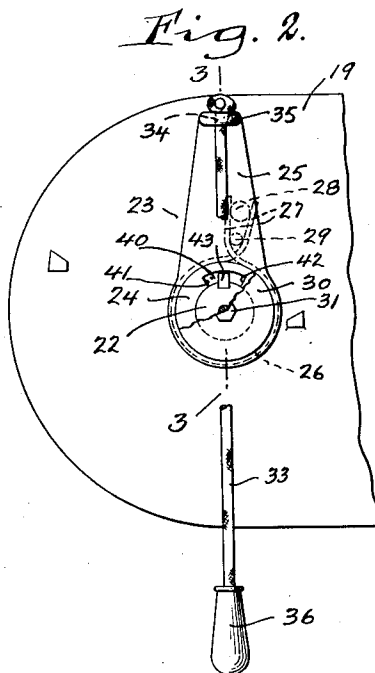
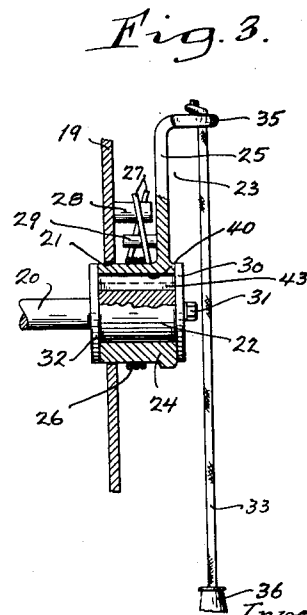
Jan. 27, 1942.

A. COTESWORTH ET AL

2,270,867

CONTROL FOR HOISTS

Filed Dec. 23, 1938



Inventors,
ALFRED COTESWORTH
KARL W. STINSON
and FRANK E. STAHL, deceased
by LILLIE M. STAHL
Administratrix

by Beau, Brooks, Buckley & Beau.
Attorneys

UNITED STATES PATENT OFFICE

2,270,867

CONTROL FOR HOISTS

Alfred Cotesworth, Kenmore, N. Y., Karl W. Stinson, Columbus, Ohio, and Frank E. Stahl, deceased, late of Tonawanda, N. Y., by Lillie M. Stahl, administratrix, Tonawanda, N. Y., assignors to Columbus McKinnon Chain Corporation, Tonawanda, N. Y., a corporation of New York

Application December 23, 1938, Serial No. 247,374

2 Claims. (Cl. 74—470)

Our invention relates in generally to controls for hoists and particularly to the controls for hoists of the electric type in which an electric motor forms an integral part of the hoist structure, and which motor is controlled by manually operated pull cords.

It is well known to those skilled in the art that electric motors of the single-phase, split-phase type or the capacitor type are least expensive of all types of electric motors; and, that if an inexpensive electric hoist is to be manufactured, it is necessary to use a motor of this type. The one great drawback, however, to a motor of this type is that when it is desired to reverse the rotation of its shaft, such reversal will not be brought about if the controls governing the passage of current to the motor are operated too rapidly, and it is necessary, therefore, that the motor shaft and armature come to a standstill before reversal can be effected.

One of the principal objects of our invention has been to provide means for delaying the operation of the controller switch of an electric hoist, and thereby permitting the motor shaft to come to a standstill between periods of reversal of said motor shaft.

Another object has been to provide a device of this nature which can be operated by means of a single pull cord.

Moreover, our device may be easily applied to existing hoists without the necessity of altering or redesigning such hoists.

Moreover, our invention is inexpensive to manufacture and does not, therefore, add materially to the cost of the entire hoist.

The above objects and advantages have been accomplished by the device shown in the accompanying drawing, of which:

Fig. 1 is a side elevation of an electric hoist with our invention attached thereto.

Fig. 2 is a fragmentary, front elevation of our device.

Fig. 3 is a transverse, sectional view thereof taken on line 3—3 of Fig. 2.

In the drawing, 15 represents the hoist having the usual casing 16 and motor 17. The controller switch 18 is secured to the side of the motor, as is customary in this type of hoist. The controls of the hoist, as is customary, are arranged at the end opposite the motor and are preferably outside the cover 19 at that end thereof.

Our invention comprises a control shaft 20 which is suitably connected to the shaft (not shown) of the controller switch 18. The controller shaft extends through an aperture 21

formed in the cover 19 and is provided at its outer end with a head 22.

The control lever 23 of our invention is provided with a hub 24 which is rotatably mounted upon the head 22 of the control shaft and with a control arm 25 extending upwardly in its normal, neutral position from the hub 24. This control lever is retained in its normal position by means of a centralizing spring 26 which is mounted about the hub 24 and which is provided with upstanding ends 27. These ends are designed to straddle a stationary lug 28 carried by the cover 19 and a lug 29 carried by the arm 25 of the lever, whereby the lever will be retained in its neutral position with its arm 25 extending vertically. The control lever is retained in position and prevented from moving outwardly by means of a washer 30 which is secured in place to the control shaft by means of a cap screw 31, and said lever is prevented from moving inwardly by means of a collar 32, formed preferably on the control shaft 20.

Our invention is provided with a single control cord 33 which is attached at its upper end to the control lever by passing through an aperture 34 formed in the end 35 of the arm of the lever. The end 35 is preferably disposed at right angles to the arm 25 so that the operating cord 33 attached thereto will be suspended vertically from the bent end. A hand grip 36 is provided at the lower end of the cord.

So as to permit a limited amount of idle movement of the control lever upon the shaft 20, the hub 24 of the control lever is provided with a recess 40 forming abutments 41 and 42 at the ends thereof. A detent key 43 is carried by the head 22 of the shaft and is movable in the arcuate recess as the hub is rotated over the shaft and is engageable with either of the abutments 41 or 42 when such hub is moved to either position of contact with the detent key, whereupon further movement of the control lever will cause the control shaft to be operated by further movement of said lever.

From the foregoing it will be obvious that when our device is to be operated, the handle 36 of the control cord is grasped by the operator and the cord is moved from its normal vertical position to either side of such vertical position, depending upon the direction in which the lever is to be operated. If, for instance, the lever is to be operated clockwise to cause the load to be raised by the hoist, then the operator moves the handle to the right of the position shown in Fig. 2, and beyond the dead center of the connection of the

cord with the lever, whereupon the lever is then pulled downwardly to cause a clockwise rotation thereof. Before the control shaft 20 can be operated, the lost motion between the control lever and the shaft must be taken up by the passage of the recess 40 over the detent key 43 until the abutment shoulder 41 engages with the key after which, as hereinbefore pointed out, the control shaft will be operated by further operation of the control lever. When the hoist is now to be reversed, the operator releases the cord, allowing the control lever 23 and the control shaft to move back to their normal, neutral positions, as shown in the drawing, through the medium of the neutralizing spring 26, and the neutralizing spring of the reversing switch 18 (not shown), respectively. After such return movement, the operator moves the pull cord to the left of the center of the control shaft and pulls upon the control lever from this position, which will cause such lever to be operated in counterclockwise direction. This movement will take up the lost motion between the key 43 and the abutment 42. When the abutment shoulder 42 is brought in contact with the detent key 43, the continued counterclockwise movement of the arm will cause the control shaft to be operated as hereinbefore pointed out in connection with the opposite movement of the lever. During the changing of position of the control cord from the right-hand side of the lever axis to the left-hand side thereof, the lost motion produced by the passage of the slot over the detent key from its engagement with one abutment to the other abutment, causes sufficient time to elapse to allow the motor shaft and armature to come to a standstill before reversal is effected.

Obviously, some modifications of the details herein shown and described may be made without departing from the spirit of our invention or the scope of the appended claims, and we do not, therefore, wish to be limited to the exact embodiment herein shown and described, the form shown being merely a preferred embodiment thereof.

Having thus described our invention, what we claim is:

1. A control for single-phase, reversing electric motors of the type which continues its operation uni-directionally upon too rapid operation of the reversing means, comprising a control member 5 freely movable in two directions, a manually actuated control lever oscillatably mounted upon said control members for unrestrained idle relative movement therewith through a limited path in either direction, whereby to afford time delay 10 in the movement of said member to its actuating positions, said lever having a single, centrally arranged upstanding arm, a single operating rope suspended from the upper end of the arm of said control member and adapted to be moved to 15 either side of said member for operation, and interspaced detent means carried by said control member and said control lever for coupling said member and said lever at the extremities of said idle movement to positively actuate said member 20 to either actuating position.

2. A control for single-phase, reversing electric motors of the type which continues its operation uni-directionally upon too rapid operation of the reversing means, comprising a control shaft 25 freely movable in two directions, a manually actuated control lever oscillatably mounted upon said control shaft for unrestrained idle relative movement therewith through a limited arcuate path in either direction, whereby to afford time delay 30 in the movement of said member to its actuating positions, said lever having a single, centrally arranged upstanding arm, said arm being provided with an outwardly bent end, a single operating rope suspended from the bent end of said control lever and adapted to be moved to either 35 side of said shaft for operation, and interspaced detent means carried by said control member and said control lever for coupling said shaft and said lever at the extremities of said idle movement to positively actuate said member to either 40 actuating position.

ALFRED COTESWORTH.

KARL W. STINSON.

LILLIE M. STAHL,

Administratrix with the Will Annexed of Frank E. Stahl, Deceased.