UNITED STATES PATENT OFFICE.

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ELEVATOR-OPERATING MECHANISM.

1,071,309.


Application filed August 9, 1912. Serial No. 714,194.

To all whom it may concern:

Be it known that I, BYRON R. GOGGIN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Elevator-Operating Mechanism, of which the following is a specification.

This invention relates to improvements in elevator operating mechanism, and particularly to the invention disclosed in my United States Letters Patent issued the 28th day of January, 1913, under No. 1,061,576.

In the invention covered by the above-mentioned patent, I have shown and described an elevator-car operating mechanism in which are employed two electric motors operating continuously in opposite directions, in connection with a series of pulleys over which travels an endless cable. The direction of movement of the elevator-car is controlled in said invention by the difference in the speed of operation of the two motors.

My present invention is intended to cheapen the installation of electric elevator-car operating mechanism over that set forth in the above named patent, by cutting out one of the motors and using a single motor operating in reverse directions.

A further object is to simplify the installation and operation of the mechanism without impairing its efficiency.

In the accompanying drawings which form a part of this application I have illustrated my present invention in an approved form in the following views, only so much thereof being shown as is necessary to disclose my invention so that those skilled in the art to which it relates may practice the same.

In the drawings: Figure 1 represents in front elevation my present invention, showing a single cable as representing a unit, it being understood that as many cables will be employed as are necessary to support the elevator-car load; Fig. 2 is an elevational view at right angles to Fig. 1, in which I have indicated a portion of an elevator shaft and an elevator car or cage in operative relation to the hoisting mechanism which constitutes my invention.

Referring to the details of the drawings, 3 represents a cable, one end of which is secured to a hitch beam 4 which is secured in the lower part of the elevator shaft at a point below the lowest travel of the elevators for car and counterweight carrying frame. Passing upwardly from the hitch beam 4 the cable 3 passes over a sheave 5 which is mounted on a shaft 6 and journaled in the lower cross member 11 of a counterweight carrying frame 12. The cable 3 passes downwardly from the sheave 5 and under a wide sheave 8 on the main shaft of the motor 6, the latter being placed in the well below the elevator shaft 20. From the sheave 6 the cable passes over an idler pulley 7 which is suitably journaled at a point above and a short distance from the sheave 6.

Passing over the idler 7 the cable travels downwardly under the sheaves 6 and then upwardly through the depression 20 in the wall of the hatchway or shaft 20 to a point near the top of said depression where the cable passes over a pulley 8 suitably journaled at that point, thence the cable passes downwardly and under a sheave 9 mounted on a shaft 9 and journaled in the cross member 14 of an inner frame 14 which carries the counterweights 13 and is slidable mounted in the outer frame members 12. After passing under the pulley 9 the cable 3 travels upwardly and is shackled at its end to the hitch beam 10 fixed near the upper end of the hatchway. The upper cross bar 11 of the weight carrying frame 12 is provided with a coupling 15, to which is secured one end of the elevator-car carrying cable 16, the latter passing over the sheave 17 suitably journaled and supported in the upper portion of the hatchway, and arranged at right angles to the plane of the sheaves 5, 6, 8, and 9. The cable 16 also passes over the pulley 18 journaled in the upper portion of the hatchway over the center of the car or cage represented by dotted lines 19, and has its end hitched by a suitable coupling 19a to the top of said cage. The arrangement of the frame 12 and the frame 14 is such that there is a slight sliding movement possible between them so that any slack resulting from the change of the direction of travel of the cable 3 will be compensated or taken up by the vertical movement of the frame 14 within the frame members 12.

The operation of the construction above described will be as follows, it being understood that the hitch beams 4 and 10 are rigidly secured at or near the respective ends of the elevator shaft or hatchway. When the motor 6a with its sheave 6 travels
contra-clockwise, as indicated by the arrows in Fig. 1, a downward traction will be exerted on the frame 12 which, augmented by the weight of said frame plus the counterweights 13, will overbalance the weight of the elevator cage or car load and thus, by pulling the said frame 12 and its attachments to the bottom of the shaft, will raise the elevator car to the top of the shaft. It will also be obvious that by reversing the movement so that it will travel in the opposite direction to that indicated by the arrows, the cable 3 will be loosened or slackened in its traction or tension on the sheave 5, and thus the weight of the elevator cage or car being greater than the free weight of the counterweight frame 12, the car will descend and the counterweight raise.

In installing my improved elevator appliance, it will be understood that electro mechanical means will be provided for reversing the movement of the motor but this forms no part of my invention and hence is not shown nor described. The sheave 7 permits a double hitch around the sheave 6, an expedient well known in cable and pulley operating mechanism.

The advantages of economy in installation and simplicity in operation of my present invention over that disclosed in my patent above mentioned, will be apparent by comparison and I therefore do not set forth same herein. It will be understood, of course, that the counterweight carrying frame 12 will travel in the usual guideways provided in connection with elevator installation as at present practised, hence said guideways are not shown.

What I claim as new, is:

1. In elevator operating mechanism, including a hatchway, a car, a counterweight frame connected with said car, hitch-beams secured respectively in the upper and lower portions of said hatchway, a cable secured at one end to the lower hitch-beam, a sheave journaled in the lower portion of said counterweight frame and carrying said cable, a motor, a sheave driven by said motor and also carrying said cable, a weight carrying member slidably arranged in said counterweight frame, a sheave carried by said weight-carrying frame said cable arranged to travel over said sheave and having its end hitched to the hitch-beam in the upper portion of said hatchway.

2. In elevator operating mechanism, including a hatchway and a car arranged in said hatchway, a counterweight frame adapted to traverse the hatchway of said car, a weight-carrying member slidably mounted in said counterweight frame, a sheave mounted in said weight-carrying member, a sheave mounted on said counterweight frame, means connecting said counterweight frame to the car, hitch-beams arranged in the upper and lower portions respectively of the hatchway, a cable secured at its opposite ends to said hitch-beams and arranged to travel over the sheaves in said counterweight member and the weight-carrying frame, slideable in said counterweight member, a motor adapted to travel in opposite directions, and a sheave mounted on said motor and carrying said cable.

In testimony whereof I affix my signature in the presence of two witnesses.

BYRON R. GOGGIN.

Witnesses:

F. BENJAMIN,
G. W. HILTABRAND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D.C."