

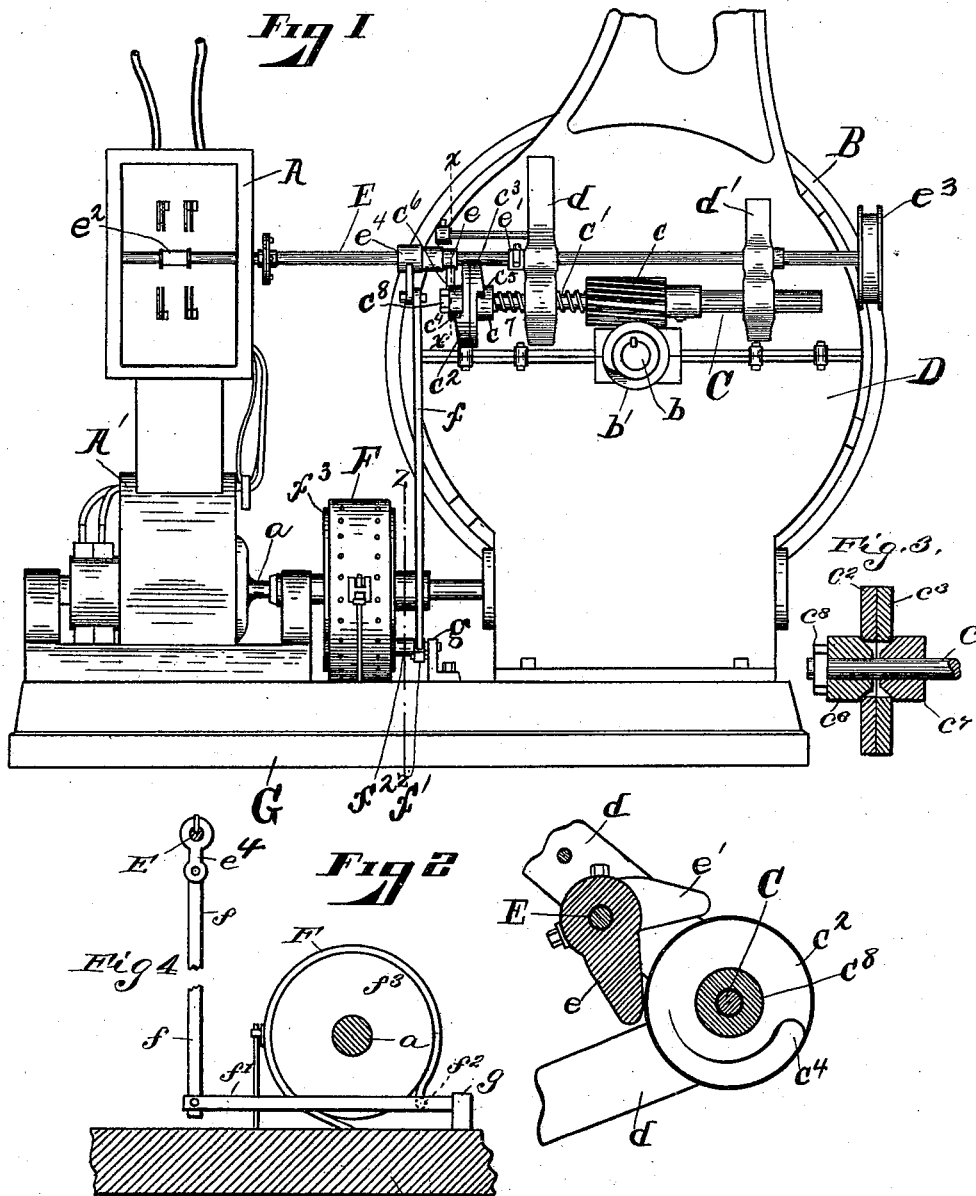
No. 649,262.

Patented May 8, 1900.

O. F. SHEPARD, JR.
ELEVATOR.

(Application filed Nov. 15, 1899.)

(No Model.)



WITNESSES

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ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 649,262, dated May 8, 1900.

Application filed November 15, 1899. Serial No. 737,104. (No model.)

To all whom it may concern:

Be it known that I, OSCAR F. SHEPARD, JR., a citizen of the United States, and a resident of Madeira, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Elevators, of which the following is a specification.

My invention relates to certain new and useful improvements in elevators.

- 10 The object of my invention is to provide a mechanism for automatically stopping the elevator-car at a lower and an upper predetermined limit which at the time it severs connection with the source of power simultaneously throws the brake to its point of maximum grip upon the shaft which conveys the power to the drum-shaft and leaves the brake at that point, even though the momentum of the parts be not instantaneously checked with the cutting off of the power, and in which the operating device by which the operator controls the car is connected by simple and direct means to the switch for making connection with the source of power.
- 25 This object is attained by the means described in the annexed specification and illustrated in the accompanying drawings, in which—

- Figure 1 shows my invention as applied to an electric elevator, the motor, controller, 30 brake, and drum being shown in side elevation with the operating-shaft for controlling the switch and the automatic limitation device embodying my invention attached thereto. Fig. 2 is a sectional detail view, 35 upon an enlarged scale, taken through line *x x* of Fig. 1 looking toward the right. Fig. 3 is a detail central longitudinal sectional view taken upon line *y y* of Fig. 2. Fig. 4 is a transverse sectional detail view taken upon 40 line *z z* of Fig. 1, connecting-rod *f* being broken in two and the parts being brought together to economize space.

- Referring to the parts, the controller A and the motor A' are of ordinary construction and 45 need not be specifically described. Drum B, upon which the cables for elevating the car are to be wound in the usual manner, is mounted upon a horizontal shaft *b*, which is journaled in the sides of a housing D. Shaft 50 *a* of the motor is connected by suitable gearing to shaft *b* of the drum. This gearing is

hidden by housing D in Fig. 1 and no view is given showing it, as it may consist of any suitable gearing now in use. Shaft *b* has a worm *b'* keyed to its end, which meshes with 55 a wheel *c*, which is secured to a shaft C, which is journaled in brackets *d d'*, which project out from the housing D. Shaft C is screw-threaded at the end *c'*, so that when it is rotated by the worm *b'* it is also given a lateral 60 motion to the left or to the right, according as the shaft *a* rotates.

Upon the end of shaft C are secured two disks *c² c³*, which have segmental lugs *c⁴* and *c⁵* to engage arms *e* and *e'*, secured upon shaft 65 E, which is journaled in brackets *d d'* above shaft C and carries at one end controller-switch *e²* and at the other end sheave *e³*, upon which are wound the cables by which the operator in the car controls the travel of the 70 car. The disks *c²* and *c³* are secured upon the shaft C by collars *c⁶* and *c⁷*, which have beveled or cone-shaped edges to pass through the disks, between the shaft and the disks, and are tightened together by means of nut *c⁸* 75 upon the end of the shaft, so that the positions of lugs *c⁴* and *c⁵* may be adjusted in relation to shaft C by loosening the nut *c⁸*, turning the disks, and again tightening the nut.

The proper positions of disks *c² c³* upon 80 shaft C and of arms *e* and *e'* upon shaft E are determined as follows: When the switch *e²* is thrown up, the car is ascending and the shaft C is moving out or, as shown in the drawings, to the left. Arm *e* and disk *c²* should be so 85 adjusted and secured upon their shafts that just before the car reaches its upper limit lug *c⁴* contacts with arm *e*, throws it down, and carries the switch down to center, as shown in Fig. 1, cutting off current from motor. 90 When switch *e²* is thrown down, the car is descending and the shaft C is moving toward the right. Just before the car reaches its lower limit lug *c⁵* contacts with arm *e'*, throwing it up and carrying the switch up to cen- 95 ter, again cutting off current.

Upon the shaft E, between bracket *d* and the controller, is secured a lever *e⁴*, which is pivoted to a rod *f*, which is pivoted at its other end to a lever *f'*, which at its other end 100 is pivoted to a standard *g*, secured to the bed-plate G. To lever *f'*, between the points where

it is pivoted to the standard *g* and the rod *f*, is secured an arm *f*², which is secured to the brake-strap *F*, which surrounds the brake-pulley *f*³, which is secured to shaft *a* between the motor and the housing *D*.

Lever *e*⁴ is fixed upon the shaft *E* in a position such that when the controller-switch is thrown to center, cutting off current, as shown in Fig. 1, the lever is at the lowest point in its path. In this position brake *F* is at its point of maximum grip upon the brake-pulley.

It will be seen now that in operation when the car reaches either its upper or its lower limit the current is thrown off and the brake is thrown to its point of maximum grip automatically and simultaneously. If the brake should not be of strength sufficient to stop the momentum of the brake-pulley, the rotation of shaft *C* due to the further rotation of shaft *a* does not affect the grip of the brake upon the brake-pulley, since there is no connection between shafts *C* and *E* after the disks *c*² or *c*³ have struck the arms *e* or *e*¹.

I have shown and described the best means for embodying my invention known to me; but it is obvious that many mere mechanical changes might be made in the means described without departing from the spirit or scope of my invention.

What I claim is—

1. In an elevator the combination of a drum and drum-shaft, a main shaft for conveying power to the drum-shaft and a brake-pulley mounted thereon, a brake upon the pulley, a second shaft in gear with the drum-shaft to be simultaneously rotated and moved back and forth by it, lugs upon the second shaft, a shaft carrying a switch for controlling the transmission of power to the main shaft and a sheave by which the operator controls the switch, arms mounted on the controlling-shaft so as to be struck by said lugs to throw the switch to cut off the power automatically at predetermined points, and a lever mounted on the controlling-shaft and coupled to the brake by which the brake is thrown on when the power is cut off, substantially as shown and described.

2. In an elevator the combination of a drum-shaft, mechanism for rotating the shaft, a shaft carrying a switch for controlling the transmission of the motive power to said mechanism to rotate the drum-shaft and a sheave by which the operator controls the movement of said switch, a second shaft to be simultaneously rotated and moved back and forth by the drum-shaft and having lugs to contact with arms upon the controlling-shaft and automatically throw the switch at predetermined points, and said arms upon the controlling-shaft, substantially as shown and described.

3. In an elevator the combination of a drum and a drum-shaft, a main shaft for conveying power to the drum-shaft and a brake-pulley mounted thereon, a brake upon said pulley, a second shaft geared to the drum-shaft

so as to be simultaneously rotated and moved back and forth by it, lugs upon said second shaft, a shaft carrying a switch for controlling the transmission of power to the main shaft and having arms to be struck by said lugs to cut off power at predetermined points, and a lever secured to said controlling-shaft and coupled to the brake whereby the brake is thrown on simultaneously with the cutting off of the power, substantially as shown and described.

4. In an elevator the combination of an electric motor whose shaft is geared to a drum, the drum-shaft and its drum, a brake-pulley and brake upon the motor-shaft, a worm upon the drum-shaft, a second shaft journaled adjacent to the drum-shaft, having a wheel to mesh with the worm and being screw-threaded so that it is simultaneously rotated and moved back and forth by the drum-shaft, disks upon said second shaft having projecting lugs, a shaft journaled adjacent to the second shaft carrying a switch for controlling the transmission of an electric current to the motor and having two arms one to be struck by one of said lugs when the second shaft has reached a certain limit in one direction and the other to be struck by the other lug when said shaft has moved to the reverse limit to cut off the current, a lever upon said controlling-shaft coupled to the brake whereby the brake is thrown on simultaneously with the cutting off of the current, substantially as shown and described.

5. In an elevator the combination of an electric motor, a drum and a drum-shaft journaled in the sides of a housing and actuated by the motor, the housing, a worm upon the drum-shaft, a second shaft journaled in brackets upon the housing with a wheel in mesh with the worm and screw-threaded so that the worm imparts a rotary and back-and-forth motion thereto and carrying two lug-bearing disks, said brackets, a third shaft journaled in said brackets adjacent to the second shaft having two arms one to be engaged by one of said lugs when the second shaft is moving in one direction and the other to be engaged by the other lug when the shaft is moving in the reverse direction, a switch at one end of the third shaft for controlling the transmission of the electric current to the motor and a sheave at the other end of said shaft by which the operator controls the transmission of current to the motor, substantially as shown and described.

6. In an elevator the combination of a motor having a brake-pulley mounted upon its shaft, a brake surrounding the pulley, a drum-shaft journaled in the sides of a housing and actuated by the motor, the housing, a worm upon the drum-shaft, a shaft journaled in brackets upon the housing having a wheel in mesh with the worm and being screw-threaded in the brackets to be moved back and forth as well as rotated by the drum-shaft, lug-bearing disks upon said movable shaft, said

brackets, a second shaft journaled in the brackets adjacent to the movable shaft, a switch at one end of second shaft to control the transmission of the electric current to the
5 motor-shaft, a sheave by which the operator controls the switch at the other end of second shaft, arms upon the second shaft to be engaged by the lugs at each limit of travel of the movable shaft, and a lever secured upon said second shaft coupled to the brake where- 10 by the brake is thrown on simultaneously with the cutting off of the power, substantially as shown and described.

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Witnesses:

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