Oct. 13, 1925. 1,557,047

E. F. GWYNN ET AL

MOTOR REVERSE CONTROL

Filed Dec. 24, 1923

FIG. 1

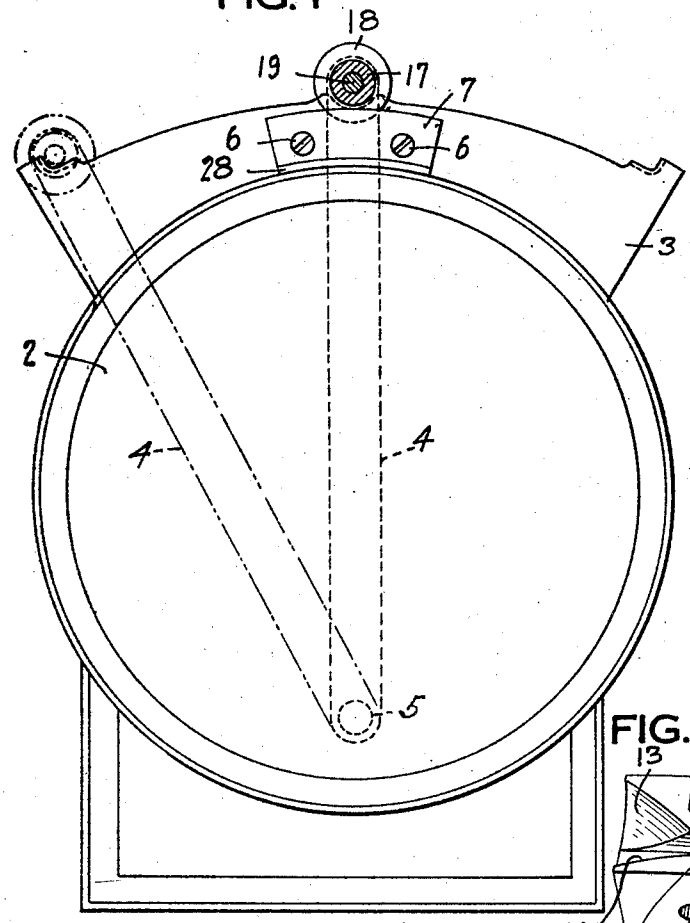



FIG. 2

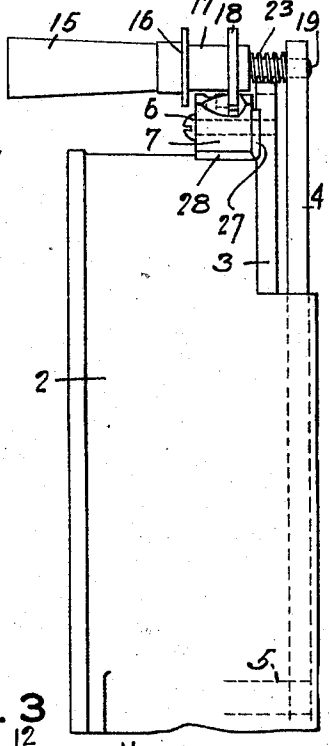



FIG. 3

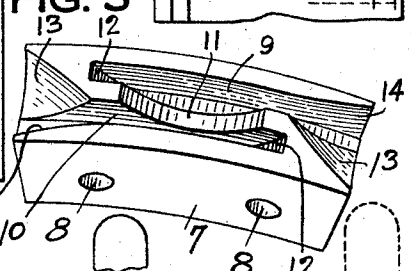



FIG. 4

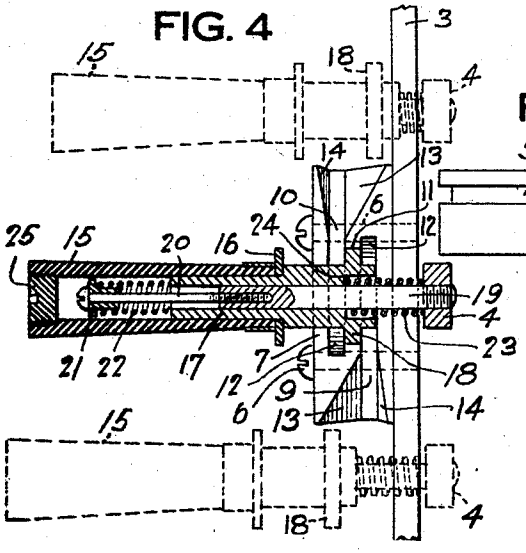
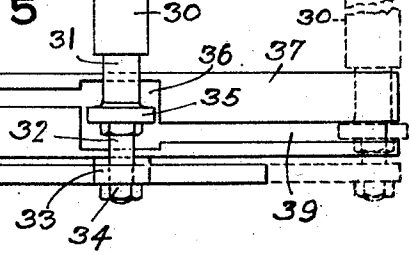



FIG. 5




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# UNITED STATES PATENT OFFICE.

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## MOTOR REVERSE CONTROL.

Application filed December 24, 1923. Serial No. 682,485.

*To all whom it may concern:*

Be it known that we, EMMER F. GWYNN and HARRY H. JAMES, citizens of the United States, and residents of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Motor Reverse Controls; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to the control boxes ordinarily employed in electric elevators for operating the control board. Its object is to provide a novel and effective attachment for preventing the lever of the control box from being moved quickly from one operating position to the reverse position. The attachment herein described may be an integral part of the control box, but is preferably constructed as a separate device suitable for attachment to any existing form of control box.

Most of the troubles which are experienced with electrically operated elevators are caused when the operator tries to reverse the direction in which the car is traveling before the speed has been substantially reduced. If the car is traveling at full speed in either direction and the operator for some reason wishes to reverse quickly and go in the opposite direction, it is possible with ordinary control boxes for the operator to move the lever on the control box to the reverse position so quickly that the resistance magnets on the main control board do not release. Therefore, the armature of the motor will receive the full force of the running current when coming to a stop before reversing to the opposite direction, and in every such case one or more disturbances are set up in the electric system. Among these may be mentioned the blowing of fuses in the electric circuit which may cause the car to stop midway between floors, causing aggravating delays until the fuse has been replaced; the flashing of electric current across the brushes and commutator of the motor, by reason of the immense volume of current flowing at the time of quick reverse, which causes expensive repairs and is very detrimental to the life of the motor and other electric apparatus; the burning out of the armature windings which occurs in time after several reversing shocks of this kind; and the extra strain on the cables, gears, shafts, bearings and pulleys which shortens the life of all the wearing parts of the elevator and its equipment.

According to our present invention we provide a mechanical device which interrupts the movement of the control lever for a sufficient period of time to permit the resistance magnets on the main control board to be released. This device consists of a runway having off-set and overlapping grooves which are arranged to receive a member carried by the handle of the control lever and which stop the movement of the lever until the handle is moved to bring the member into the other groove. This general arrangement of off-set grooves may be modified by providing the overlapping ends of the grooves with terminal recesses which receive the projection of the lever handle, thus requiring that the lever be moved back a short distance from the end of the groove before being moved across to the other groove. Another modification consists in providing a central cavity which affords communication between the adjacent ends of the off-set grooves, and this cavity may be wider than the combined width of the two grooves. Such an arrangement is shown in our patent issued June 17, 1924, No. 1,497,847, of which the present application is in part a continuation.

In the accompanying drawing, Fig. 1 is a front elevational view of a well-known type of elevator control box equipped with a reverse control attachment constructed in accordance with our invention; Fig. 2 is a side view of the same control box and the control attachment; Fig. 3 is a perspective view of the runway shown in Figs. 1 and 2; Fig. 4 is a plan view, with parts in section, of the runway and handle, showing three different positions of the handle and the control lever; and Fig. 5 is a plan view showing a modified form of device similar to that described in our above-mentioned prior application.

In the drawing the numeral 2 indicates an elevator control box of ordinary construction having the usual flange 3 at the upper part of its rear side, and having the usual control lever 4 which is pivoted at 5, and is provided with a handle which moves in an arc corresponding to the curvature of the upper edge of the flange 3.

Secured to the flange 3 by means of screws 6 is a runway device 7, the construction of which is best shown in Fig. 3. The runway device 7 is provided with openings 8 to admit the screws 6 and is also provided with off-set grooves 9 and 10 which overlap and communicate with each other through a curved recess 11. The closed ends of the grooves 9 and 10 may extend beyond the recess 11, as shown at 12, and the outer ends of the grooves 9 and 10 preferably communicate with flared surfaces 13 and 14 which serve as guides to insure that the lever handle will cooperate properly with the grooves 9 and 10.

The construction of the control lever handle is best shown in Fig. 4. This handle consists of a hollow grip portion 15 which may suitably be composed of fibre and is provided with a fibre washer 16 to prevent the operator's hand from coming in contact with the runway device 7. A sleeve 17, provided with a projecting disc 18, is secured rigidly to the grip portion 15, and a pin 19 extends slidably through the sleeve 17 and is secured at its outer end to the handle 4.

The inner end of the pin 19 is drilled and tapped to receive a screw 20, the outer end of which carries a button 21. A spiral spring 22 is compressed between the head of the button 21 and the inner end of the sleeve 17. Another spiral spring 23 surrounds the pin 19 near its outer end and is compressed between the lever 4 and the bottom of a recess 24 formed in the outer end of the sleeve 17. The end of the grip portion 15 of the handle is closed by means of a plug 25.

The operation of the device described above may be illustrated by assuming that the control lever and handle are in the position shown in dotted lines at the top of Fig. 4, and that the handle is being moved toward the runway device 7. The disc 18 engages the flaring surface 13 and is guided into the groove 10. The continued movement of the handle in the same direction brings the disc 18 to the end 12 of the groove 10 and thus arrests the movement of the control lever and handle. The operator must then move the handle back slightly to bring the disc 18 opposite to the recess 11, and must then push the handle inward to bring the disc 18 into the groove 9 before he can continue moving the control lever in the motor-reversing direction.

A similar series of movements take place when the control lever is moved through the runway from the position shown in dotted lines at the bottom of Fig. 4, the disc 18 in this case entering the groove 9 and, after being stopped at the end of this groove, being thus moved through the recess 11 into the groove 10. The springs 22 and 23 hold the disc 18 in locked position in the central recess 11 of the runway device when the control lever is left in its neutral position, this arrangement being shown in full lines on Fig. 4.

Our runway device and handle may be applied to any existing form of control box. In some control boxes there is a recess on the flange 3 adjacent to the casing of the box, and in such a case this recess should be filled with a piece of leather or other suitable material as indicated at 27. Also, some control boxes are so constructed that there will be a space between the bottom of the runway device and the top of the control box, and if this space exists it should be filled with leather or some other flexible material as shown at 28, Fig. 2.

Fig. 5 shows a modified form of our device including a telescopic handle 30 having a sleeve 31 inserted therein, this sleeve receiving a bolt 32 which may be connected to the control lever 33 by means of a nut 34 or otherwise. A disc 35 is mounted on the neck of the sleeve 31. When the elevator motor is at rest and the control lever is in its neutral position, the disc 35 is received in a cavity 36 formed in the top of a control box 37, or in a separate piece adapted for attachment to an ordinary control box. Grooves 38 and 39 communicate with the cavity 36 and are of proper width to receive the disc 35.

The operation of the device shown in Fig. 5 is essentially similar to that of the device shown in Figs. 1 and 4. When it is desired to operate the motor, the operator grasps the handle 30 and pushes in this handle to bring the disc 35 into registry with the groove 39 and moves the handle to the position shown in dotted lines, Fig. 5. This starts the motor in one direction and when it is desired to reverse the motor, the operator moves the handle in the opposite direction with the disc 35 moving in the groove 39 until it reaches the cavity 36, whereupon if the operator desires to reverse the motor he pulls out the handle until the disc 35 registers with the groove 38, and then moves the handle in the groove 38 to the opposite end of the path of travel of the control lever.

It will be observed that the operator, no matter how inexperienced, cannot operate the control lever in an improper manner, and that he is compelled to stop the movement of the lever midway between its limits of movement, thereby giving the resistance magnets time to release before the circuit is completed in the reverse direction. We are aware that control devices having off-set grooves have heretofore been employed for various purposes, but we consider that we are the first to provide an attachment of this kind which is suitable for application to existing control boxes. We also consider

that we are the first to provide such a device with the arrangement of slots and guide surfaces herein described.

While we have shown and described the construction which we now prefer to employ, it will be understood that various changes in the construction and arrangement of parts may be made within the scope of our invention as set forth in the appended claims.

We claim as our invention.

1. A motor reverse control device comprising a member shaped for attachment to a motor control box for electric elevators, the said member having offset grooves formed therein and having recesses at the ends of said grooves, said member also having an opening providing communication between said grooves.

2. A motor reverse control device comprising a member having offset overlapping grooves formed therein and having a recess providing communication between said grooves, said recess being so placed as to leave recesses at the inner ends of said grooves, and flaring surfaces formed at the outer ends of said grooves and forming guide-ways.

3. A motor reverse control device comprising a solid arcuate block of metal having openings therethrough to admit attaching screws, and having offset overlapping grooves formed therein, the partition between said grooves being formed with an opening to provide communication between said grooves, said last-named openings being so placed as to leave recesses at the inner ends of said grooves, and flaring surfaces formed at the outer ends of said grooves and forming guideways.

4. A motor reverse control device comprising a handle adapted for attachment to the operating lever of a control box for electric elevators, said handle comprising a tubular grip member, a lateral projection secured rigidly to said grip member, a pin extending into said grip member and adapted to be attached to the operating lever of a control box, a stop device engaged by said projection when at a mid point on said pin, and oppositely disposed springs arranged to maintain said projection at said intermediate position on said pin.

5. A motor reverse control device comprising a handle adapted for attachment to the operating lever of a motor control box for electric elevators, the said handle comprising a tubular grip member, a sleeve rigidly secured to said member and having a circular lateral projection, a pin extending slidably into said sleeve and having its outer end adapted for attachment to the operating lever of the control box, a screw extending from the inner end of said pin and having an enlargement at its outer end, a spring extending between the inner end of said sleeve and the said enlargement, and another spring surrounding said pin, between the said operating lever and the said sleeve, the said springs serving to maintain the said circular projection in predetermined position.

In testimony whereof we, the said EMMER F. GWYNN and HARRY H. JAMES, have hereunto set our hands.

EMMER F. GWYNN.
HARRY H. JAMES.