

F. W. LACEY.
 CONTROLLER FOR ELECTRIC MOTORS.
 APPLICATION FILED MAR. 2, 1910.

1,007,456.

Patented Oct. 31, 1911.

Fig. 1.

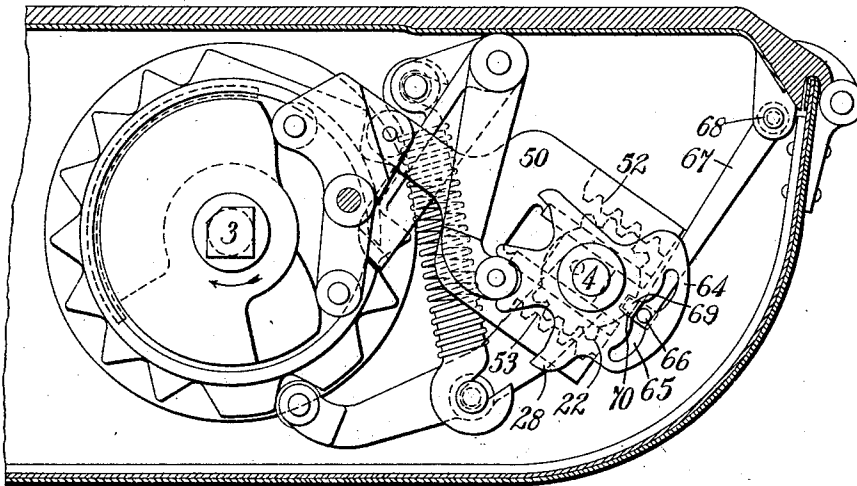
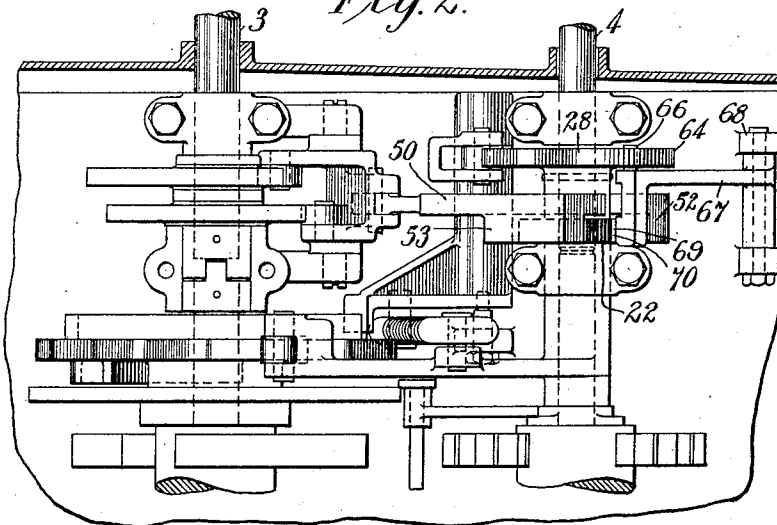


Fig. 2.



WITNESSES:

Frederick Miller
D. H. Mace

INVENTOR

Frederick William Lacey
 BY
Harley E. Carr
 ATTORNEY

UNITED STATES PATENT OFFICE.

FREDERICK W. LACEY, OF BOURNEMOUTH, ENGLAND, ASSIGNOR TO WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

CONTROLLER FOR ELECTRIC MOTORS.

1,007,456.

Specification of Letters Patent.

Patented Oct. 31, 1911.

Application filed March 2, 1910. Serial No. 546,854.

To all whom it may concern:

Be it known that I, FREDERICK WILLIAM LACEY, a subject of the King of Great Britain, and a resident of Bournemouth, Hampshire, England, have invented a new and useful Improvement in Controllers for Electric Motors, of which the following is a specification.

This invention relates to controllers for the motors of electrically propelled railway vehicles and particularly to that type of controller having main and reverser drums, the latter of which is arranged to be operated by the initial movement of the former.

In controllers of the above mentioned type, which are now well known, the reverser handle merely serves to set a mechanical connection between the two drums, so that, during the early part of the movement of the main drum from its off position, the reverser drum will be moved in the one or the other direction. It has been found in practice that it is possible to move the reverser handle to its off position and to even remove it altogether from the controller without the reverser drum being necessarily in the corresponding off position, with the result that the necessary correspondence between the position of the reverser handle and that of the reverser drum cannot be always insured. Under such circumstances, it may happen that certain contacts are left connected which might lead to very serious accidents.

The present invention has for its object to provide an improved form of operating and interlocking mechanism for controllers of the kind described in which the above disadvantages are avoided and in which it is impossible to move the reverser handle to its off position unless the reverser drum is also moved to a corresponding position, and also in which the latter drum is effectually locked in its "off" position, after having been moved thereto.

The invention is particularly applicable to controllers having operating mechanism between the main and reverser drums of the kind set forth in United States Letters Patent 611,465, granted September 27, 1898 to Westinghouse Electric & Manufacturing Co., upon an application filed by Harry P. Davis, and it will be described, for the sake of convenience, as applied to such a controller.

In the accompanying drawings, Figure 1 is a plan view similar to Fig. 3 of the drawings of the above-mentioned Letters Patent and Fig. 2 is a view in side elevation, partly sectional, corresponding to Fig. 2 of the drawings of the said Letters Patent.

Reference may be had to the specification of the aforesaid Letters Patent for such description of structural details as may be desired in addition to what is set forth herein.

Referring now to the drawings, the pinion 22 upon the shaft 4 of the reverser drum is adapted to be moved in the one or other direction by means of the racks 52 and 53 of the forked head 50, which is actuated by the initial movement of the main controller drum shaft 3, in the manner set forth in the above mentioned patent.

When the reverser shaft is in the position shown in Fig. 1, which is the off position, the tips of the teeth of the pinion 22 are in engagement with the tips of the teeth of both the racks 52 and 53, and the shaft and its drum are thus locked against movement. It has been found in practice, however, that accidental rotative movement of the reverser drum is liable to occur, when the gear parts are in the positions indicated, in case the gear teeth have become worn or in case they were not accurately formed and adjusted before being placed in service.

In the preferred manner of applying the present invention to a controller of the type illustrated in the drawing, the shape of the head 28 is so modified as to comprise an extension or quadrant 64 having a slot 65 of special form to receive a pin 66 which is carried by one end of an arm 67, the other end of said arm being pivotally mounted on the controller casing at 68. The arm 67 also carries a projection 69 which is adapted to enter a notch 70 in the pinion 22 to lock the said pinion when the latter and its attached reverser drum are in the off position. The shape of the slot 65 is such that, when the head 28 is moved, by means of the reverser handle, into the one or other of its extreme positions, corresponding to forward or reverse direction of rotation of the motors, the pin 66 withdraws the projection 69 from the notch 70 and thus unlocks the pinion 22 and allows it to be rotated by the one or other of the racks 52 and 53 in the one or other direction when the main controller handle is moved, in a

manner well understood. When the reverser handle is in its "off" position, the pinion 22 will be effectively locked in a corresponding position, and, should the pinion and its attached drum be displaced when the reverser handle is in the one or other of its extreme positions, that is to say, when the pinion 22 is unlocked by reason of the withdrawal of the projection 69 from the notch 70, it will be impossible to return the reverser handle to its off position since the projection 69 and the notch 70 will no longer register with each other. In the event of such displacement taking place, it will be impossible for the reverser handle to be returned to its off position or removed until the displacement of the pinion 22 has been corrected.

It will be understood that any other suitable means for operating the projection 69 for locking and unlocking the pinion 22 of the reverser drum may be substituted for the pin 66 and the slot 65.

I claim as my invention:

1. A controller of the kind described provided with mechanism independent of the main drum for locking the reverser drum in its off position and for preventing the reverser drum handle from being returned to the off position and removed except when said drum is in the off position, substantially as described.

2. In a controller, the combination with a main drum, a reverser drum and interposed operating means for the latter, of means independent of the main drum for locking the reverser drum in its off position and for preventing the reverser drum

handle from being returned to the off position and removed except when said drum is in its off position.

3. The combination with a reverser drum shaft having a pinion and an accentuating head, a main drum shaft, a double rack for said pinion, and interposed cam and lever mechanism, of a locking projection for said pinion, and means for moving said projection into and out of locking engagement as the reverser drum shaft is rotated.

4. In a controller, the combination with a reverser drum shaft having a pinion, of means for imparting a limited rotative movement to said pinion in either direction, a pivoted arm having a projection to engage and lock said pinion in its off position, and means operated by the reverser drum handle to move said pivoted arm into and out of locking position.

5. In a controller, the combination with a main drum, a reverser drum and interposed operating and interlocking mechanism embodying a position-accentuating slotted head and a recessed operating pinion for the reverser drum, of a pivoted lever arm having a pin and a projection which are adapted, respectively, to coöperate with the head slot and the pinion recess to lock the reverser drum in its off position.

In testimony whereof, I have hereunto subscribed my name this fourteenth day of February, 1910.

F. W. LACEY.

Witnesses:

CLEMENT GEO. HERNDON,
J. A. INNES DUFF.