No. 730,667. PATENTED JUNE 9, 1903.

J. B. LINN.

CONTROLLER FOR ELECTRIC MOTORS.

APPLICATION FILED DEC. 28, 1900.

NO MODEL.

Fig. 1.

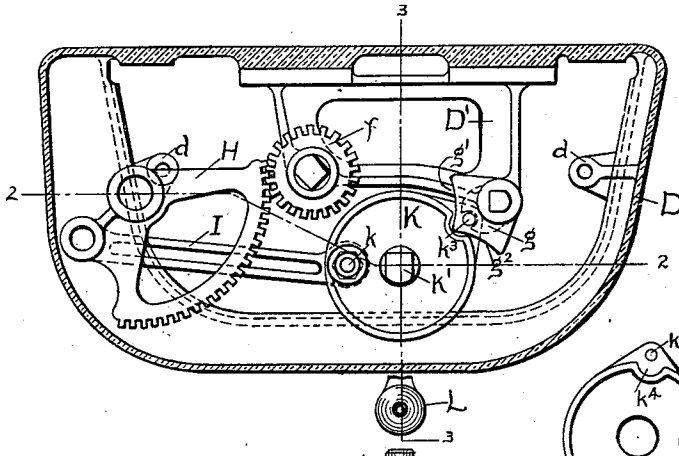


Fig. 4

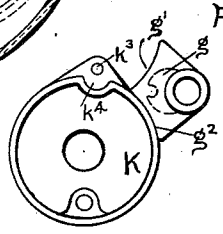


Fig. 2.

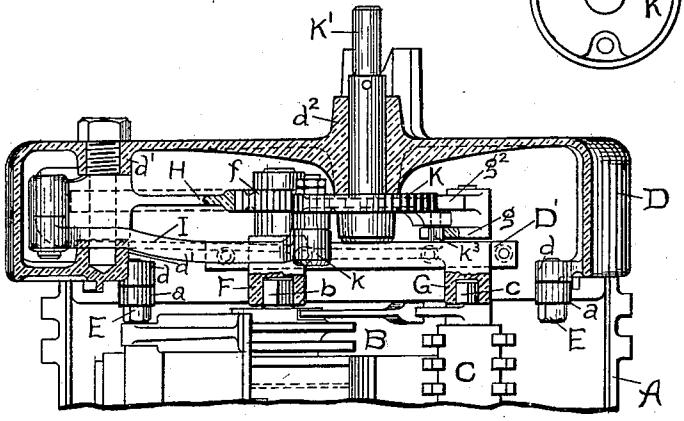
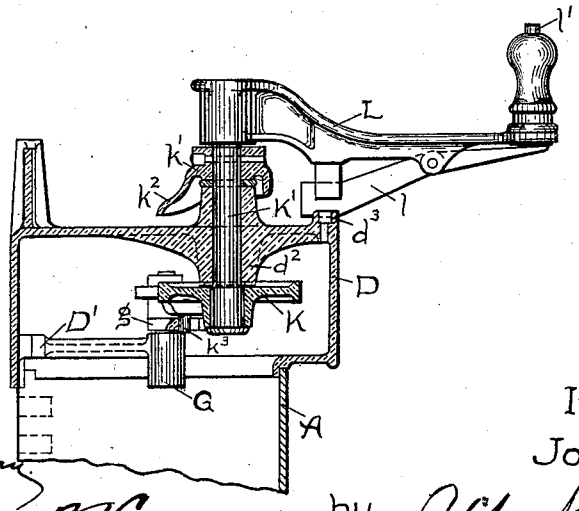


Fig. 3.



Witnesses:

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by Albert G. Davis

Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 730,667. Patented June 9, 1903.

UNITED STATES PATENT OFFICE.

JOHN B. LINN, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

CONTROLLER FOR ELECTRIC MOTORS.

SPECIFICATION forming part of Letters Patent No. 730,667, dated June 9, 1903.

Application filed December 28, 1900. Serial No. 41,322. No model.

To all whom it may concern:

Be it known that I, JOHN B. LINN, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Controllers for Electric Motors, of which the following is a specification.

This invention relates to controllers for electric motors; and its object is to provide an attachment for a standard controller whereby it can be used to control an electric motor in which frequent reversals of rotation are required, such as an electric crane or a hoisting-machine.

In the standard railway-controllers the motor can only be reversed by throwing over a special switch-handle separate from the controller-handle. The advantages of such an arrangement for railway-work have been often set forth and are now so universally recognized that they need not be repeated here; but in electric cranes and similar machinery it is desirable to be able to run the motor in either direction by simply swinging a single controller-handle one way or the other from a central "off" position. This enables the engineer to control his motor with one hand, leaving the other hand free to manage whatever other apparatus he may have charge of.

A controller with a cylinder large enough to accommodate a double set of contacts, one for forward and one for backward motion, would be exceedingly bulky, and therefore in many cases impracticable.

The object of my invention is to enable the compact standard controller to be used, with its small cylinder carrying one set of contacts and its reversing-switch enabling said contacts to be employed for forward and backward motion.

To this end the invention consists in an attachment fitting on top of a standard controller and comprising connected mechanism to engage with the shafts of the contact-cylinder and reversing-switch, and thereby enable both to be actuated by one handle.

In the drawings, Figure 1 is a sectional plan view of my invention with the casing in section. Fig. 2 is a sectional elevation on the line 2 2, Fig. 1. Fig. 3 is a cross-sectional view on the line 3 3, Fig. 1. Fig. 4 is a detail plan view of the reversing-switch lock.

The upper portion of a standard controller A is shown in Figs. 2 and 3, the main contact-cylinder being indicated (in Fig. 2 only) at B and the reversing-switch at C, the shaft of each being provided with the usual squared end *b c*.

A casing D, somewhat wider and longer than the controller-casing, fits on top of the latter, being secured thereto by bolts E passing through registering lugs *a d*. Inside of the casing D are supported two sockets F G, rotatable in suitable bearings and adapted to fit down over and engage with the ends *b c* of the controller-shafts. These rotatable sockets are conveniently mounted in a bracket D′, secured to the back of the casing D.

The socket F for the main contact-cylinder of the controller has a gear-wheel *f* secured to it, meshing with a sector-gear H, rotatably journaled in bearing *d′* near one end of the casing D. Pivoted to the sector-gear is a link I, the other end of which is pivotally attached at the point *k* to a disk K, secured to a shaft K′, which extends up through a bearing d^2, formed in the top of the casing D and carries a handle L, by which the disk can be turned. A spring-latch *l*, operated by a thumb-piece *l′* and engaging with a notched quadrant d^3, serves to retain the handle in any desired position. The shaft is supported in the bearing d^2 by a collar *k′*, which may have a petticoat-flange k^2 to protect the bearing from moisture or dirt.

The link I is pivoted to the disk K at such a point *k* that when the controller is in the off position the pivot stands on the dead-center—that is, with its longitudinal axis in line with the axis of the disk—and one end of the sector-gear H is in mesh with the gear-wheel *f*. Hence a movement of the handle L in either direction will exert a pull on the link and cause the sector-gear to rotate the gear-wheel and the cylinder of the controller.

In order to shift the reversing-switch from the forward to the backward position, or vice versa, as the handle L passes the central position, I provide the socket G with a toothed flange *g*, which can be engaged by one or

more teeth k^3 on the disk K at the proper instant to turn the socket G. A locking device is also provided to prevent the reversing-switch from moving while the handle L is being carried over either half of its path. I prefer to use for this purpose a flange on the socket having two faces g' g^2, each curved to fit accurately the edge of the disk K, so that the flange is locked in position while either face is in engagement with the disk. At a point in radial line with the tooth k^3 a notch k^4 is formed in the edge of the disk to permit the point of the flange between the two faces g^2 g' to enter it and swing past when the switch is reversed. The reversing takes place when the pivot k is on the dead-center, as shown in Fig. 1.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. An attachment for a controller, comprising a detachable connected mechanism to engage with the contact-cylinder and the reversing-switch and enable both to be controlled by one handle, said connecting mechanism being readily removable as a whole from engagement with said contact-cylinder and reversing-switch.

2. An attachment for a controller, comprising a casing containing connected mechanism whereby the contact-cylinder and reversing-switch can be controlled by one handle, said casing fitting on top of the controller-casing.

3. An attachment for a controller, comprising a casing adapted to fit on the upper end of the controller-casing and containing rotatable sockets to engage with the shafts of the contact-cylinder and the reversing-switch, and mechanism for operating said sockets by one handle.

4. An attachment for a controller, comprising a casing adapted to fit on the upper end of the controller-casing, sockets mounted rotatably in said casing to engage with the shafts of the contact-cylinder and the reversing-switch, a rotatable shaft, and connecting means between said shaft and the two sockets for rotating one of them in the same direction when the disk moves either way from a given position, and rotating the other socket in one direction or the other and locking it.

5. An attachment for a controller, comprising a casing adapted to fit on top of the controller-casing, and containing bearings, a shaft journaled in a bearing and extending up through the top of the attachment-casing, a disk on the lower end of the shaft, two sockets journaled in bearings, a gear-wheel on one of said sockets, a segment-gear meshing with the gear-wheel, a link connecting the segment-gear with the disk, and interoperating teeth on the disk and the other socket.

6. An attachment for a controller, comprising a casing adapted to fit on top of the controller-casing, a shaft extending up through the top of the attachment-casing, a disk on the lower end of the shaft having a smooth edge, two sockets rotatably mounted in the casing, gearing connecting one of said sockets with the disk, interoperating teeth on the other socket and the disk, and a flange on the socket having two faces each curved to fit the edge of the disk, said disk having also a notch to permit the point between the curved faces to swing past when the teeth operate to rotate the socket.

In witness whereof I have hereunto set my hand this 26th day of December, 1900.

JOHN B. LINN.

Witnesses:
FRED RUSS,
BENJAMIN B. HULL.