No. 867,168. PATENTED SEPT. 24, 1907.

E. W. STULL.

CONTROLLER REGULATOR.

APPLICATION FILED MAR. 30, 1907.

Fig. 1

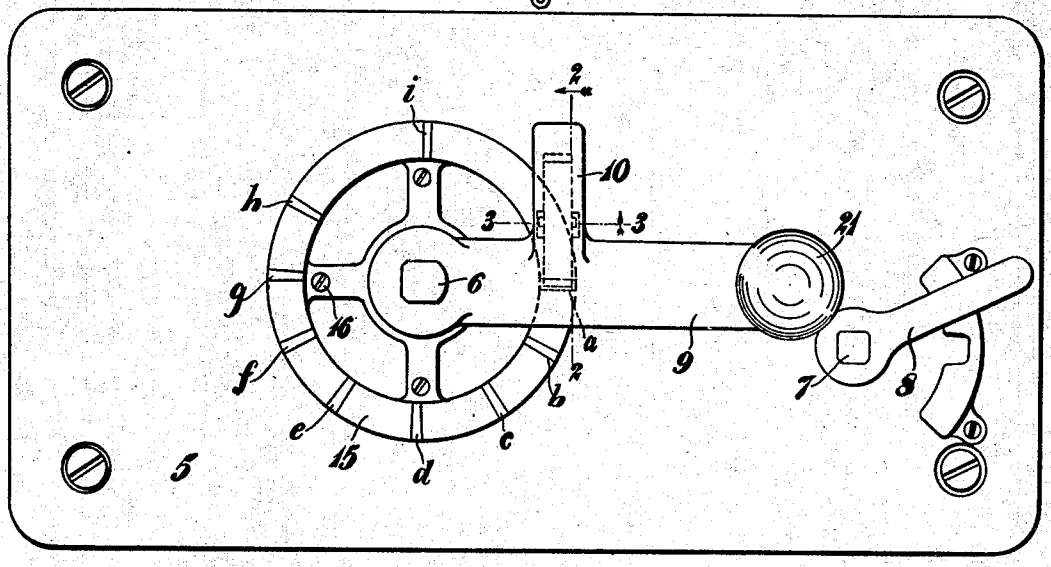


Fig. 2

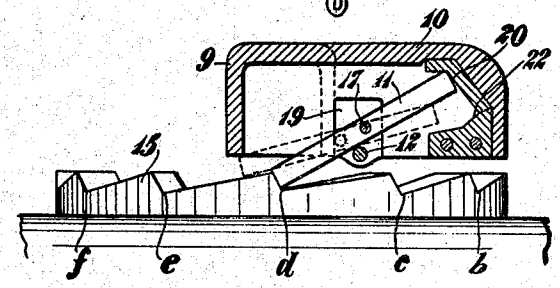
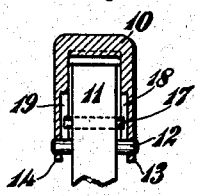


Fig. 3



Witnesses

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UNITED STATES PATENT OFFICE.

EMMETT W. STULL, OF NORWOOD, OHIO, ASSIGNOR TO ALLIS-CHALMERS COMPANY, A CORPORATION OF NEW JERSEY, AND THE BULLOCK ELECTRIC MANUFACTURING COMPANY, A CORPORATION OF OHIO, JOINTLY.

CONTROLLER-REGULATOR.

No. 867,168. Specification of Letters Patent. Patented Sept. 24, 1907.

Application filed March 30, 1907. Serial No. 365,451.

To all whom it may concern:

Be it known that I, EMMETT W. STULL, a citizen of the United States, residing at Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Controller-Regulators, of which the following is a full, clear, and exact specification.

My invention relates to motor controllers and particularly to means for regulating the operation of controllers for railway motors.

Great difficulty has been experienced with railway controllers because of the tendency of inexperienced or careless operators to move them rapidly from the "off" to the "full on" positions without pausing properly at the other predetermined positions. This rapid movement is apt to result in considerable damage to the motors and to the controller. Furthermore the sudden starting of the car due to this careless manipulation of the controller is extremely annoying to the passengers.

It is the object of my present invention to produce a positive step-by-step movement of the controller so as to prevent a too rapid supply of current to the motor or motors to be controlled, and to provide means for doing this which shall be both simple in appearance and operation and inexpensive to manufacture.

My invention therefore consists in certain details of construction and novel combinations of parts which will be apparent from the following description and drawing and which will be particularly pointed out in the appended claims.

Figure 1 is a plan view of a controller provided with my improved controller regulator; Fig. 2 is a section on the line 2—2 of Fig. 1; and Fig. 3 is a section on the line 3—3 of Fig. 1.

The controller proper may be of any desired type. Through the cap-plate 5 of the controller projects the upper ends of the shafts 6 and 7 of the main drum and the reversing switch respectively. The latter shaft is provided with the customary operating handle 8. The shaft 6 is provided with an operating handle 9 embodying my improved regulating device for producing a positive step-by-step forward movement of the drum.

Extending from the main body of the handle 9 is a laterally projecting housing 10, in which a pawl 11 rests on a pin 12 which extends through depending bosses 13 and 14. The notched ring 15 may be either integral with the cap-plate 5 or rigidly attached thereto as by means of screws 16. The notches *a* to *i* inclusive of the ring 15 correspond to the operative controller positions. The projecting ends of a pin 17, fixed in the pawl 11, engage slots 18 and 19 in the sides of the housing 10 to limit the movement of said pawl relative to said housing.

The parts are shown in full lines in Fig. 2 with one end of the pawl 11 against the steep forward side of the notch *d* and the other end against the upper part of the inclined surface 20 at the end of the housing 10, thus preventing further forward movement of the handle 9. The center of gravity of the pawl is now on the rear side of the pin 12. Upon relieving the forward pressure on the knob 21 of this handle, gravity causes the upper end of the pawl 11 to drop from the surface 20 to the surface 22 within the housing 10, in this movement tilting or turning on the pin 12 to raise the lower end of the pawl clear of the notch *d*. When the pawl 11 strikes the surface 22, at which time it is out of the notch *d*, gravity causes it to slide down said surface and over the pin 12 into the position shown in dotted lines, Fig. 2, so that when the handle 9 is thereafter moved forward the pawl 11 will not catch in the notch *d* but in the notch *e*. In this forward sliding movement of the pawl 11 the center of gravity of said pawl 11 is brought to the forward side of the pin 12 so that the lower end of the pawl 11 tilts down to rest upon the notched ring 15. When the handle 9 is now moved forward, the pawl 11 slides down the rear side of the notch *e* until it strikes the forward steep side of said notch, whereupon the further forward movement of the handle 9 causes the pin 12 to elevate the upper end of a pawl 11 until it strikes the surface 20, thus again arresting the forward movement of the handle. Upon again releasing the forward pressure on the knob 21, the pawl 11 will be released from the notch *e* and the handle may be moved forward until stopped by the notch *f*. It is impossible to move the controller forward otherwise than in this step-by-step manner, which may be continued until the controller reaches the "full on" position. The handle 9 may be moved backward without any hindrance from the pawl 11 and notched ring 15.

Many modifications may be made in the precise arrangements here shown and described without departing from the spirit and scope of my invention, and all such I aim to cover in the following claims.

What I claim as new is:—

1. In combination, a controller handle, a pawl carried thereby, and a fixed notched member coöperating with said pawl to regulate the movement of said handle, said pawl being arranged to be withdrawn from the notches of said member by a turning movement and advanced to clear the notch from which it has just been withdrawn by a sliding movement, said movements occurring successively when the forward pressure on the handle is released.

2. In combination, a controller handle, a pawl carried thereby, and a fixed notched member the notches of which are arranged to be successively engaged by said pawl to stop temporarily the forward movement of the handle, said pawl being arranged to be both withdrawn from said notches and advanced to clear the notch from which it has just been withdrawn by the action of gravity.

3. In combination, a controller handle, a pawl resting on a support in said handle, and a fixed notched member with which said pawl coöperates, said pawl being arranged

to be withdrawn by gravity from the notches of said member by turning about said support and advanced by gravity by sliding on said support so as to clear the notch from which it has been withdrawn.

4. In combination, a controller shaft, an operating handle therefor, a fixed notched member, and a pawl carried by said handle and arranged to be actuated by gravity to engage the notches of said member to stop the forward movement of the handle and to be released from said notches by gravity when the forward pressure on the handle is relieved.

5. In combination, a controller handle, a fixed notched member, and a pawl carried by said handle and arranged to be actuated by the same force to engage the notches of said members successively in the forward movement of the handle and to be released from said notches when the forward pressure on the handle is relieved.

6. In combination, a controller handle, a fixed notched member, and a pawl carried by said handle and arranged to be moved by the same force to engage the notches of said member to stop the handle as the latter is moved forward, and to be released therefrom subsequently.

7. In combination, a controller handle, a fixed notched member, a pawl carried by said handle and arranged to be moved by the same force to engage the notches of said member successively as the handle is moved forward, to be released therefrom subsequently, and to be moved forward into position to engage the next notch after being so released.

8. In combination, a controller handle, a support in said handle, a pawl resting on said support and arranged to have its center of gravity shifted from one side of said support to the other, and a fixed notched member with which said pawl coöperates to allow forward movement of the handle in an intermittent manner only.

9. In combination, a controller shaft, an operating handle therefor, a fixed notched member, and a pawl tiltable on a support carried by said handle and arranged to have one end tilted downward by gravity to engage the notches of said member to stop the forward movement of the handle at predetermined points and tilted upward by gravity out of such engagement when the forward pressure on the handle is released.

10. In combination, a controller shaft, an operating handle therefor, a fixed notched member, and a pawl carried by said handle and so arranged that as the handle is moved forward into an operative position the center of gravity of the pawl is thrown to one side of its support to stop said forward movement and immediately thereafter thrown to the other side of said support to allow forward movement.

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

EMMETT W. STULL.

Witnesses:
GEO. B. SCHLEY,
FRED J. KINSEY.