

F. ANDREW.
CURRENT CONTROLLER.
APPLICATION FILED APR. 27, 1908.

937,201.

Patented Oct. 19, 1909.

Fig 1

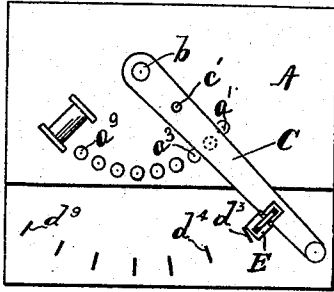


Fig 2

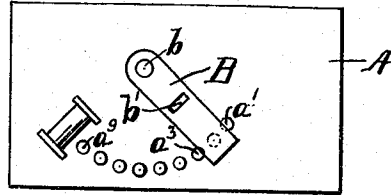


Fig 3

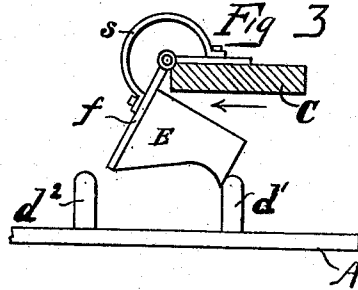


Fig 5

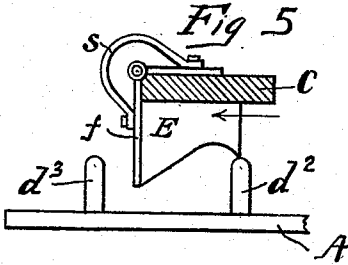


Fig 4

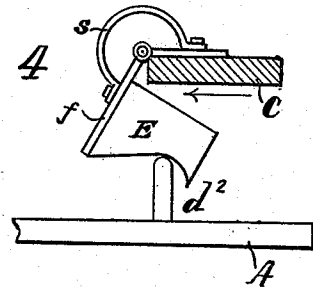
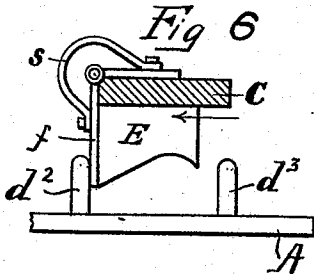


Fig 6



Witnesses

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CURRENT-CONTROLLER.

937,201.

Specification of Letters Patent.

Patented Oct. 19, 1909.

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To all whom it may concern:

Be it known that I, FRANK ANDREW, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Current-Controllers, of which the following is a specification.

My invention relates to electric current controlling devices or switches employing a series of cumulative resistances whereby the electric current is admitted to the circuit in regularly increasing increments by cutting out resistance coils as the switch bar moves over its arc of travel.

The object of the improvement is to compel and limit the action of the switch bar to successive movements from contact to contact with positive stoppages at each contact between such movements; also to so regulate the required movements as to insure a proper seating with the successive contacts and a quick movement from contact to contact so as to avoid or minimize sparking.

To this end my improvement consists in the combination with a pivoted switch bar and concentrically arranged contacts, of an operating handle provided with a catch device acting automatically to arrest the movement of the switch at each successive contact; and so constructed and operating as to release only by a slight backward movement of the operating handle independently of the switch-bar, permitting the catch to assume a position allowing the switch to be advanced to the next contact and so on in succession.

My invention is illustrated in preferred form in the accompanying drawings.

Figure 1 is a plan view of a starting block with my invention attached. Fig. 2 is a plan view of a starting block shown in Fig. 1; with the operating handle and a board of stops concentric with the contacts of the block removed. Fig. 3 shows the position of the catch relative to the stops when disengaged by the slight receding movement and about starting forward in the direction of the arrow. Fig. 4 shows the position of the catch relative to the stops when somewhat further advanced than in Fig. 3 with the catch partly over the stop and about to be tilted up behind its rear projection for engagement of its forward end by the next succeeding stop. Fig. 5 shows the position of the catch relative to

the stops in its travel in the direction of the arrow when the tilting traction has reached its maximum upward limit. Fig. 6 shows the position of the catch relative to the engaged stop when it has come to a full stop in its motion in the direction of the arrow and is seated against the handle as an abutment preventing further forward movement until the handle is slightly receded as shown in Fig. 1.

Referring now to the drawings, A, designates a switch board and, B, a metallic switch-bar pivoted at *b* and adapted to contact successively with a concentric series of metallic blocks or pillars *a*¹, to *a*⁹ inclusive, arranged in the usual manner with highest resistance at *a*¹ graduated to no resistance at the opposite end of the series.

Overlying the switch bar B, and pivoted to the same stud *b*, is a handle bar C, which engages the switch bar B by means of a depending pin *c*¹ extending into a slot *b*¹ of the switch bar, of sufficient width to allow a certain amount of lost motion in the operation of the switch-bar by the handle-bar as hereinafter described.

Upon the switch board A, concentric with the contact pillars *a*¹, to *a*⁹ inclusive, is arranged a corresponding series of vertical stops *d*¹, to *d*⁹ inclusive, over which the handle-bar C is extended.

Hung upon a pivoted link *f*, extending downward at the front side of the handle-bar C is a catch block E, of approximately trapezoidal section, as shown, which, by means of a spring *s* is normally held in position relative to the handle as shown in Fig. 3. These Figs. 3, 4, 5, and 6, in the order named, indicate the successive positions of the catch E in relation to the stops *d* as the handle C is moved forward in the direction indicated by the arrows. In Fig. 3 the catch is shown in its normal or first position of rest when about to begin a forward movement. It is held in this position by its spring *s*, against deflection in either direction. Moving forward, the catch rides above the stop *d*² without contact until the rear projection of the catch touches the stop as shown in Fig. 4. Continued movement of the handle causes the rear projection of the catch to ride upon the stop forcing the catch into the position shown in Fig. 5, in which its head is depressed below the plane of the next stop; and, as the movement progresses, the catch is caught against the stop

as shown in Fig. 6, and prevents further movement in this direction. At this advanced position of the handle bar, the pin c^1 of the handle bar, by contact with the left side of the slot b^1 of the switch, has carried the switch forward to full and exclusive contact with the corresponding contact a^2 .

To release the contact and enable the handle-bar to be advanced, it is only necessary to draw the handle-bar slightly backward, whereupon the catch E is forced by its spring into the first position, as shown in Fig. 3, ready to be again advanced forward; and so on through the series of contacts. But in these slight backward movements of the handle bar necessary to release the catch, the pin c moves back in the slot of the switch bar as a lost motion, so that the position of the switch bar in relation to its contact is not disturbed thereby. In moving the handle forward, the switch bar is carried along by the contact of the pin after the movement of the handle is fully underway, and is carried forward rapidly to the point of the handle's arrest; which is the proper resting position of the switch bar on its contacts. In moving the handle back from any advanced position to the original starting point or to any intermediate position the indirect rear surface of the catch strikes the curved tops of the stops and it readily yields and glides over automatically with practically no resistance or displacement.

It will be readily understood that this device, while primarily intended for use to control the electric current, may nevertheless be used in all other cases where by manipulation, for example, of a stop cock or throttle valve the turning on of force through pipes or otherwise is made gradual.

I claim as my invention and desire to secure by Letters Patent of the United States:

1. In an electric current controller embodying an oscillating handle and a series of engaging stops, a catch-block pivotally mounted upon the handle and held normally out of contact therewith in such relation that when engaging a stop said catch-block is forced to its seat against the handle as a fixed abutment, and upon a slight retrograde movement of the handle or catch-block swings outward automatically carrying its engaging face clear of the stop just engaged, permitting the block to pass over the same to engagement with the next succeeding stop.

2. In a controller embodying a movable handle and a series of engaging stops, a spring-actuated catch block pivoted in such relation to the handle that when in engagement with a stop it rests against the handle as a fixed abutment, but upon the slight retrograde movement of the handle the catch block by direct force of its spring swings upon its pivot carrying its engaging face above the stop permitting the catch-block to pass over to engagement with the next succeeding stop.

3. In a controller of the character indicated, in combination with the movable handle and the series of engaging stops, a catch-block pivotally hung upon and below the handle with its forward or engaging end normally held above the plane of the stops and its rear or tripping end a little below said plane, so that in the forward movement of the handle the forward part of the catch block passes over the stop but the contact of the projecting rear end with said stop depresses the forward end of the stop into engaging position in relation to the next succeeding stop, and the continued movement forces the blocks into seating contact with the handle as a fixed abutment thereof, positively preventing further movement; but upon slightly receding the handle the catch block automatically returns to its normal position ready to clear the last engaged stop upon resumption of the forward movement.

4. In a circuit controller of the character indicated embodying an operating handle oscillating over a series of stops, engaging successively therewith upon the forward movement, and being released from engagement by a slight retrograde movement of the handle, a switch bar pivoted to swing concentrically with the handle and pass over and upon a series of contacts corresponding with the said series of stops, and engaging said handle by a connection permitting such limited amount of lost motion as to allow the retrograde movement of the handle without displacing the switch from the contact.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANK ANDREW.

Witnesses:

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CARROLL H. RICHARDS.