

**No. 684,332.**

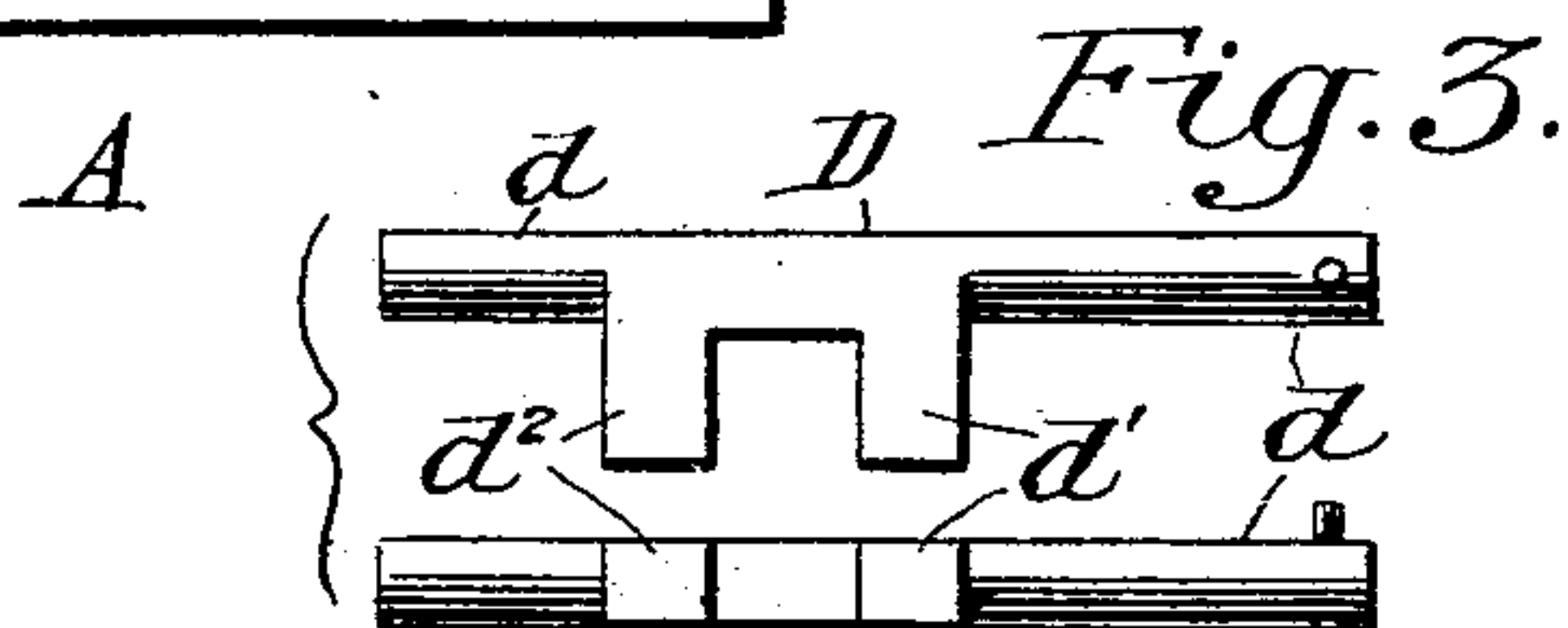
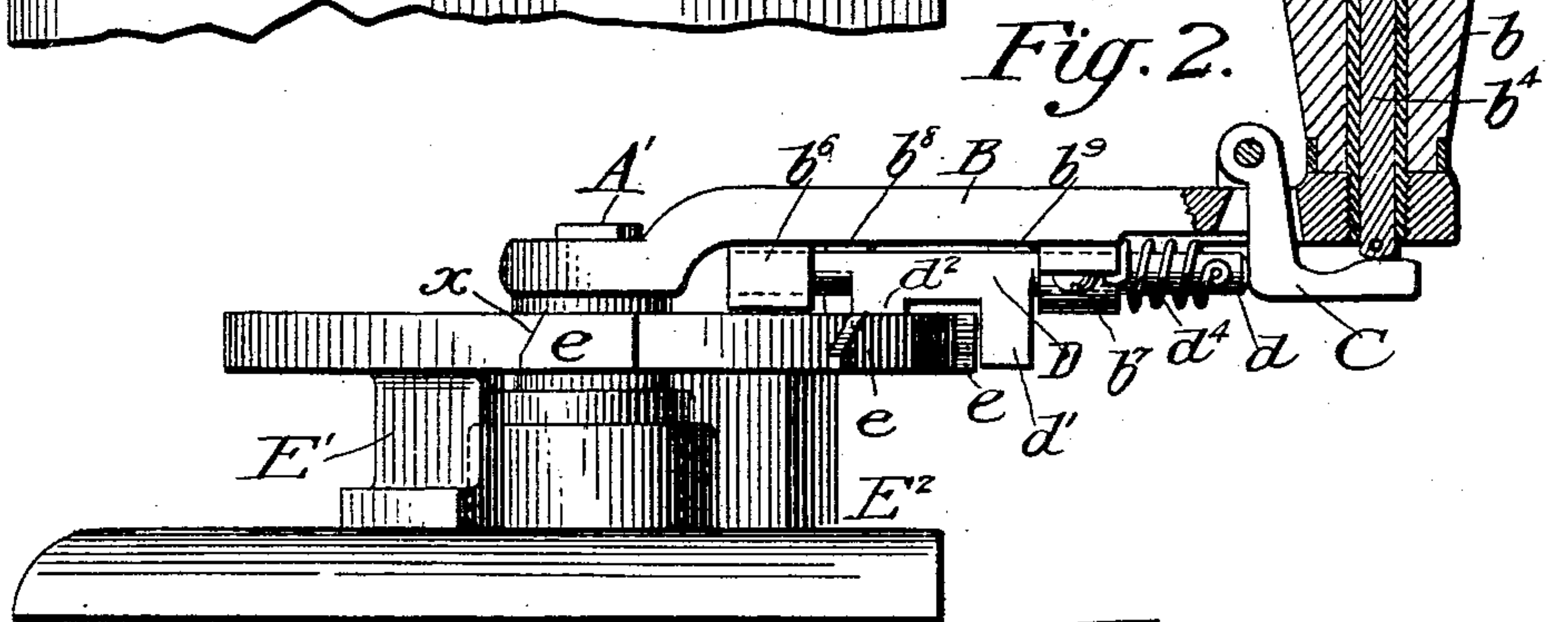
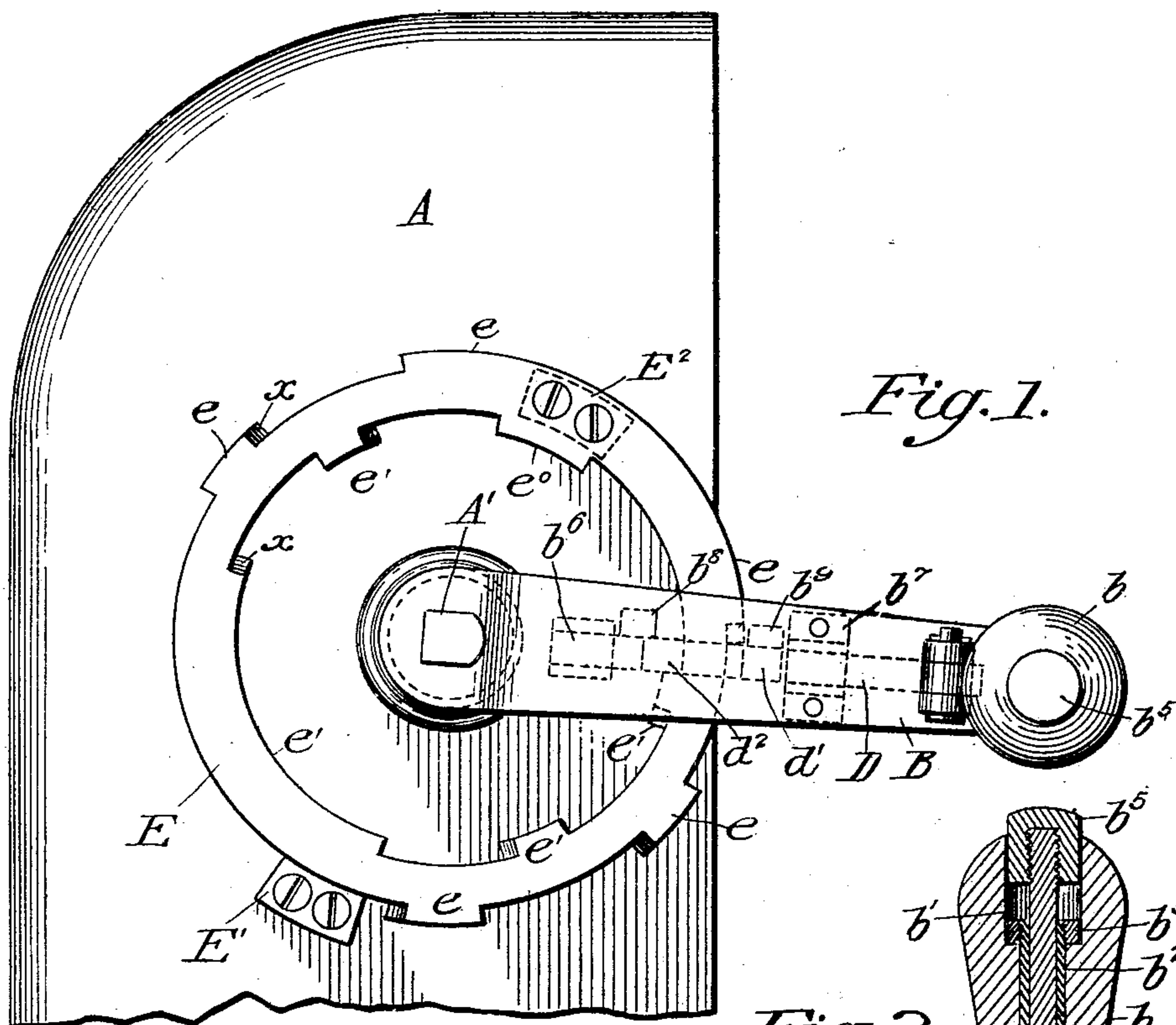
**Patented Oct. 8, 1901.**

**E. A. WILDT.**  
**CONTROLLER HANDLE.**

(Application filed Feb. 27, 1901.)

(No Model.)

**2 Sheets—Sheet 1.**



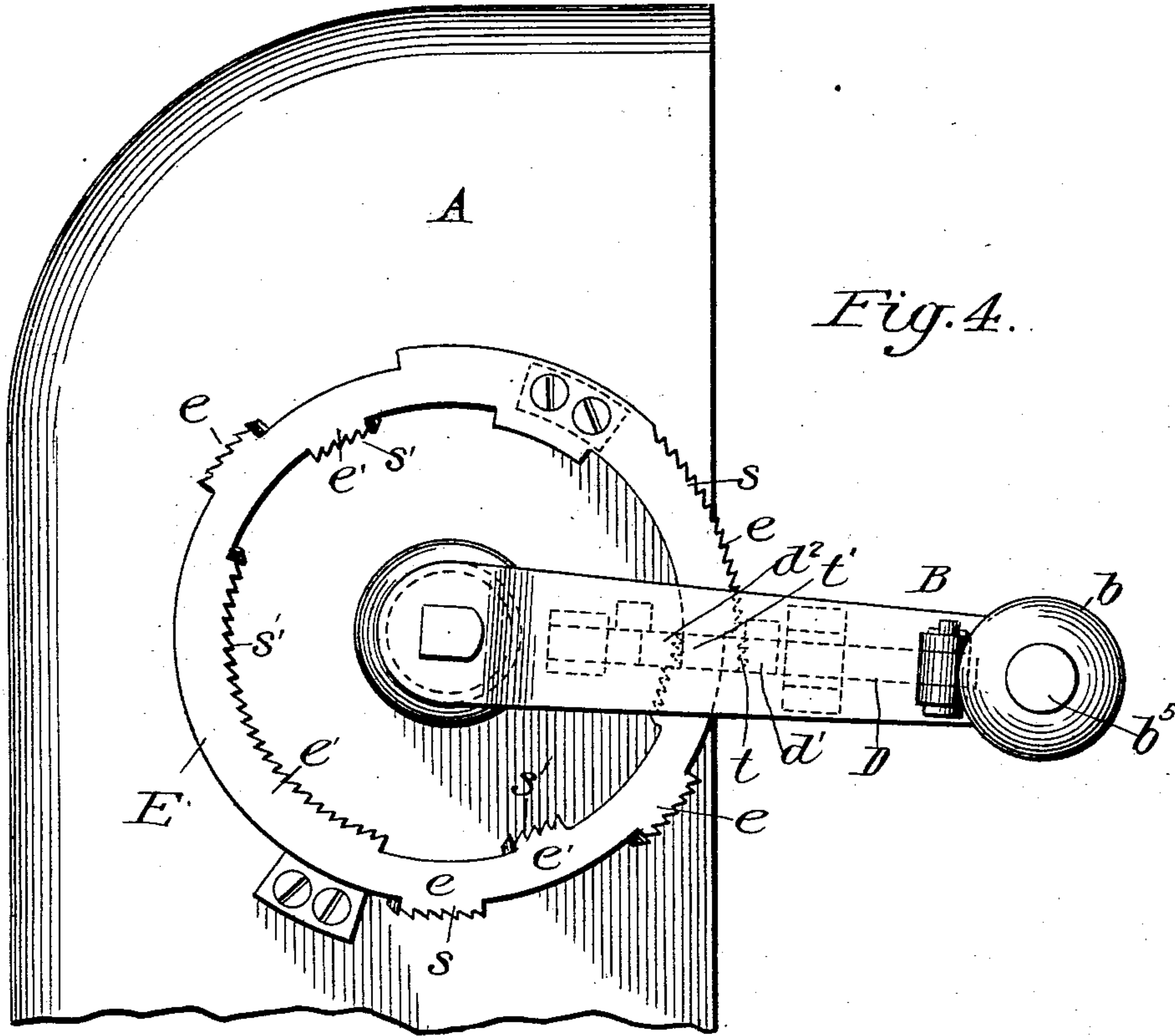
Witnesses:  
D. W. Edelin.  
Chas J O'Neill

Inventor:  
Edward A. Wildt,  
by Jennie T. Goldborough,  
Attys.

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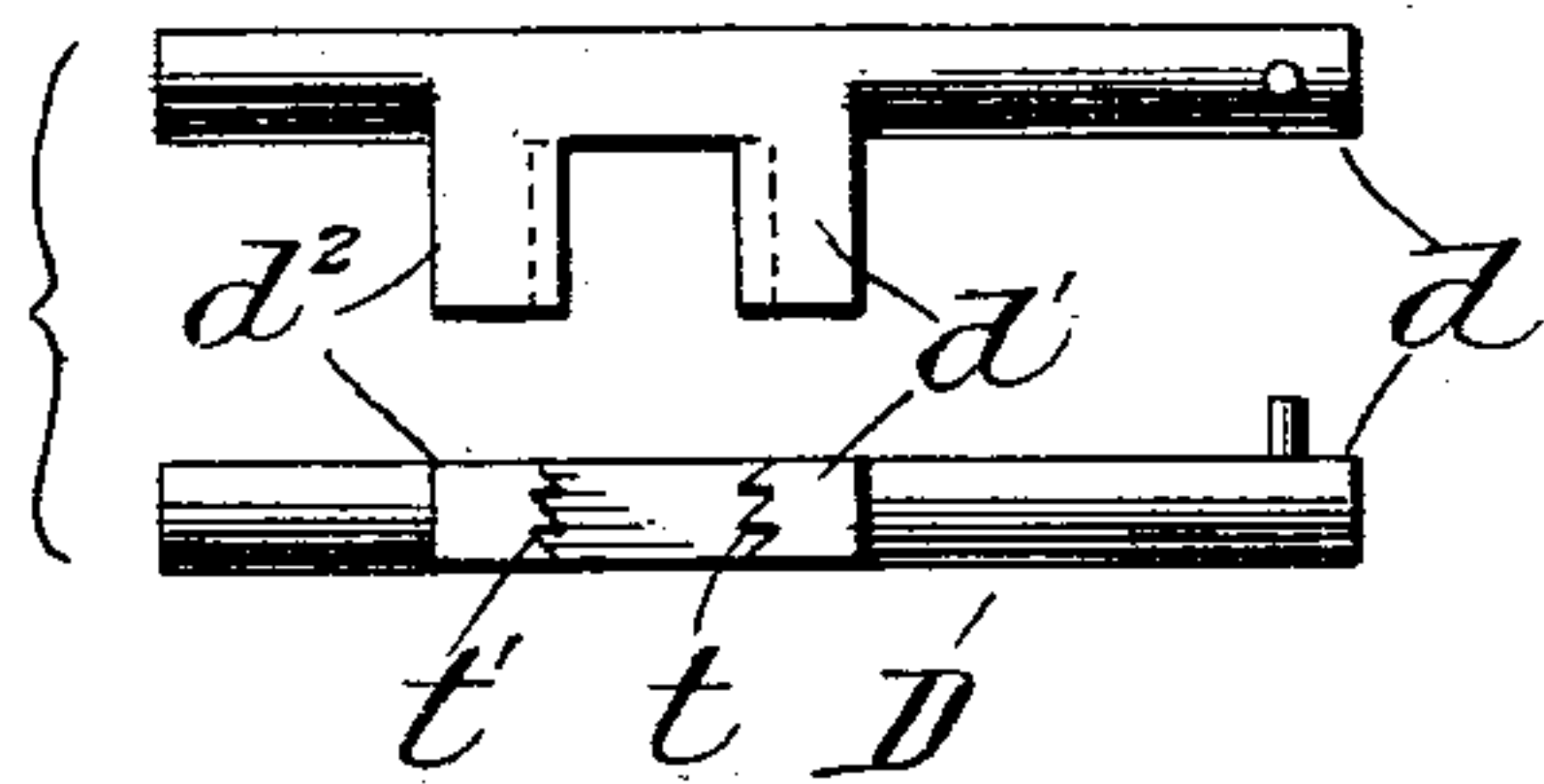
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*Fig. 4.*

*Fig. 5.*



Witnesses:

*N. W. Edelin.*

*Chas. J. O'Neill*

Inventor:

*Edward A. Wildt,*  
*by Lemie & Goldborough,*  
*Attys.*



# UNITED STATES PATENT OFFICE.

EDWARD A. WILDT, OF SCRANTON, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO FRANK SILLIMAN, JR., OF SAME PLACE.

## CONTROLLER-HANDLE.

SPECIFICATION forming part of Letters Patent No. 684,332, dated October 8, 1901.

Application filed February 27, 1901. Serial No. 49,130. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD A. WILDT, a citizen of the United States, residing at Scranton, in the county of Lackawanna, State of Pennsylvania, have invented certain new and useful Improvements in Controller-Handles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to controller-operating mechanism, and has for its object to provide a simple, effective, and certain locking means for the controller-handle that may be applied to any controller, whereby said handle is locked after each operation in its forward or "on" position and can only be advanced another "point" when the lock is released by a specific act of the motorman.

It is the purpose of my invention to insure a gradual supply of current to the motor to avoid sudden and dangerous shocks to the machine and prevent unnecessary and excessive waste of current in starting the motor.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a controller having my operating mechanism applied thereto. Fig. 2 is a side elevation thereof. Fig. 3 shows detail views of the locking-yoke. Fig. 4 is a view corresponding to Fig. 1, showing a modified form of locking-handle. Fig. 5 shows details of the modified locking-yoke.

As illustrated, my invention is adapted to be applied to any of the well-known types of controllers which have a cylinder rotated on a vertical axis by means of a crank or handle.

In the drawings, A represents the controller-casing, from the top of which projects the end of the commutator-shaft A'. Fitted to the end of said shaft is a handle B, provided with a knob *b*, which is secured to the shank by means of a hollow stud *b*<sup>2</sup>, passing through the knob and fastened therein by a nut *b*<sup>3</sup>, which engages the bottom of a recess *b*<sup>1</sup> in said handle. Fitted in the hollow stud *b*<sup>2</sup> is a push-rod *b*<sup>4</sup>, which is provided at its end with a button *b*<sup>5</sup>, occupying the recess *b*<sup>1</sup> and normally projecting a slight distance above the top of the knob *b*. Pivoted in ears on the

handle B is a bell-crank lever C, which passes through a slot in the shank and projects beneath the end of the push-rod *b*<sup>4</sup>.

A locking-yoke D, comprising a round pin *d*, having two spaced lugs *d*<sup>1</sup> *d*<sup>2</sup> formed thereon, is mounted in bearings *b*<sup>6</sup> *b*<sup>7</sup> on the under side of the handle. A spiral spring *d*<sup>4</sup>, secured at one end to bearing *b*<sup>7</sup> and at the other to pin *d*, serves to keep said pin in its retracted position and also to rotate or swing it in its bearings until it is checked by depending detents *b*<sup>8</sup> and *b*<sup>9</sup> on the handle.

Fixed to the top of the controller by means of brackets E' E<sup>2</sup> is a locking-ring E, which is concentric with the shaft A' and is positioned below the handle B in such relation thereto that the depending lugs *d*<sup>1</sup> *d*<sup>2</sup> of yoke D straddle said ring at all times. The outer and inner peripheral edge of said ring is provided with spaced lugs or projections *e* *e*<sup>1</sup>, respectively, which are arranged in alternating relation, so that the lugs *e* on the outside lie opposite the spaces between contiguous lugs *e*<sup>1</sup> on the inside of the ring, whereby successive locking-stops are provided for the yoke and handle as said handle is advanced to the successive points in turning on the current. The reverse edge of each lug *e* *e*<sup>1</sup> is beveled, as at *x*, to permit the yoke D to swing in the bearings and ride freely over the lugs during the reverse movement of the controller-handle in order that there may be no obstruction to the handle whatever in "turning off" the current.

The operation of the device described is as follows: The initial step in "turning on" the current is accomplished by grasping the knob of handle B while the latter stands at the "off" position adjacent to lug *e*<sup>0</sup> and rotating said handle until lug *d*<sup>2</sup> strikes the first stop *e*<sup>1</sup> on the inner edge of ring E, as in Fig. 1. This brings the controller to the first point and applies the first increment of current to the motor. In order to advance the controller to the second point, the motorman must depress push-rod *b*<sup>4</sup>, which rocks bell-crank C and forces yoke D inward against the tension of spring *d*<sup>4</sup> until lug *d*<sup>2</sup> clears lug *e*<sup>1</sup> on the ring, when a rotatory motion of the handle brings the forward lug *d*<sup>1</sup> of the yoke against the next external lug *e* on the



ring E, which position constitutes the second point. The push-rod is then released, the yoke D is retracted by spring  $d^4$ , and lug  $d'$  on the yoke clears lug  $e$  on the ring, and the handle may be advanced to the third point, where lug  $d^2$  engages the second lug  $e'$  in the inner edge of ring E, and thereby prevents any further advance of the handle until the push-rod is again operated to slide yoke D inward to disengage said lugs  $d^2$  and  $e'$ .

The successive operations involve the same steps and necessitate a forward or backward movement of the yoke D before the handle can be advanced from one point to the next. It will be seen, therefore, that the motorman is forced to apply the current gradually and by the specific increments of the controller-points, as it is necessary for him to operate or release the push-rod after each point is reached before he can advance the handle to the next succeeding point.

Provision is made for freely reversing the motion of handle D from any point in advance of the off position, inasmuch as the yoke B swings freely over the lugs  $e e'$  on the ring as the handle is retracted to cut off the current.

In the modification illustrated in Figs. 4 and 5 the general structural features of the controller-operating means are the same as those heretofore described; but I employ additional locking means between the handle D and the locking-ring E in order to render it impossible to move the handle more than one point at a time. To secure this object, I provide the peripheral faces of the lugs  $e e'$  on the ring E with ratchet-teeth or serrations  $s s'$ , respectively, which are adapted to be engaged by corresponding teeth  $t t'$  on the inner faces of the spaced lugs  $d' d^2$  of yoke D. It will be observed that the yoke must be retained in its retracted position by the operating-spring during its entire movement past any one of the external lugs  $e$ ; otherwise the teeth  $t$  on the lug  $d'$  will engage teeth  $s$  on such lug  $e$  and lock the handle against further movement. Furthermore, in order to pass one of the internal lugs  $e'$  it is necessary that the yoke be moved against the spring by depressing the push-rod  $b^4$  and that the yoke be held in this position until lug  $d^2$  has completely cleared lug  $e'$ ; otherwise teeth  $t'$  will lock with the teeth  $s'$  on lug  $e'$  and stop the handle. It is necessary, therefore, that the yoke be held in its retracted position by the spring during its movement past the external lugs  $e$  and that it be held in its advanced position against the tension of the spring by depressing the push-rod  $b^4$  while it passes the internal lugs  $e'$ . Any attempt to release or actuate the push-rod  $b^4$  before the yoke clears its engaging stop  $e$  or  $e'$  will immediately result in the engagement of the ratchet-teeth  $s$  and  $t$  on  $s'$  and  $t'$  and the consequent locking of the handle.

In order to permit an uninterrupted re-

versal of the controller-handle, the ratchet-teeth  $s s'$  and  $t t'$  are beveled or inclined in the direction of motion in reversing, and as the handle is swung around to cut off or diminish the current-supply the teeth  $t$  and  $t'$  on the yoke D snap past the corresponding teeth  $s$  and  $s'$  on the ring E without impeding the motion of the handle.

It will be seen that my invention is simple in construction and involves no nicety of adjustment, requiring the frequent attention of a skilled workman. It is efficient in operation, and while the mode of manipulating it may be quickly mastered by any ordinarily skilled operator no amount of misapplied ingenuity will be effective to defeat its purpose. Furthermore, it is adapted to be applied to any standard controller, even when the same is in use, as it is only necessary to remove the old handle, secure the ring in position on the controller, and substitute the modified locking-handle, which is made interchangeable with the ordinary handle.

Having thus described my invention, what I claim is—

1. In a controller, an operating-handle, a stop mechanism therefor comprising a fixed and a movable member, and coöperating interlocking means on said fixed and movable members, so disposed relatively to each other that during the forward movement of the handle said movable member must be advanced to permit one operation of the handle and retracted to permit a succeeding operation thereof.

2. In a controller, an operating-handle, a sliding locking device on said handle, and stops or projections on the controller to engage the locking device in its forward and retracted positions, respectively, whereby said locking device during the forward movement of the handle must be advanced to permit one operation of the handle and retracted for a succeeding operation.

3. In a controller, an operating-handle, a sliding locking-yoke on said handle, and a ring on said controller having lugs alternately disposed on its inner and outer edges to engage said yoke in its advanced and retracted positions, respectively.

4. In a controller, an operating-handle, a sliding and swinging locking-yoke on said handle, detents on said handle to limit the swing of said yoke in one direction, and a ring on said controller having lugs alternately disposed on its inner and outer edges to engage said yoke in its advanced and retracted positions, respectively.

5. In a controller, an operating-handle, a sliding and swinging locking-yoke on said handle, a spring on said yoke to retract and swing the same, detents on said handle to limit the swing of said yoke in one direction, and a ring on said controller having lugs alternately disposed on its inner and outer edges to engage said yoke in its advanced and re-



tracted positions, respectively, said lugs having an incline on one side to swing said yoke during the reverse movement of said handle.

6. In a controller, an operating-handle, a knob on said handle, a push-rod in said knob, a bell-crank engaged by said push-rod, a spring-actuated swinging and sliding yoke engaged by said bell-crank, detents on said handle to limit the swing of said yoke in one direction, and a ring on said controller having lugs to engage said yoke in its advanced and retracted positions, respectively, whereby said handle is locked after its successive advance operations, but is free to move throughout its reverse operations.

7. In a controller, an operating-handle, a sliding locking-yoke on said handle, a ring on said controller having lugs alternately disposed on its inner and outer edges to engage said yoke in its advanced and retracted positions, respectively, and cooperating detents on said yoke and said lugs to lock the handle in intermediate positions.

8. In a controller, an operating-handle, a sliding and swinging locking-yoke on said handle, detents on said handle to limit the

swing of said yoke in one direction, a ring on said controller having lugs alternately disposed on its inner and outer edges to engage said yoke in its advanced and retracted positions, respectively, and cooperating detents on said yoke and said lugs to lock the handle in intermediate positions.

9. In a controller, an operating-handle, a sliding and swinging yoke on said handle, beveled teeth on said yoke, a spring on said yoke to retract and swing the same, detents on said handle to limit the swing of said yoke in one direction, a ring on said controller having lugs alternately disposed on its inner and outer edges to engage said yoke in its advanced and retracted positions, respectively, said lugs having beveled teeth on their peripheral faces to engage the corresponding teeth on the yoke to lock the handle in intermediate positions.

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

EDWARD A. WILDT.

Witnesses:

P. T. REILLY,  
J. B. GOLDEN.