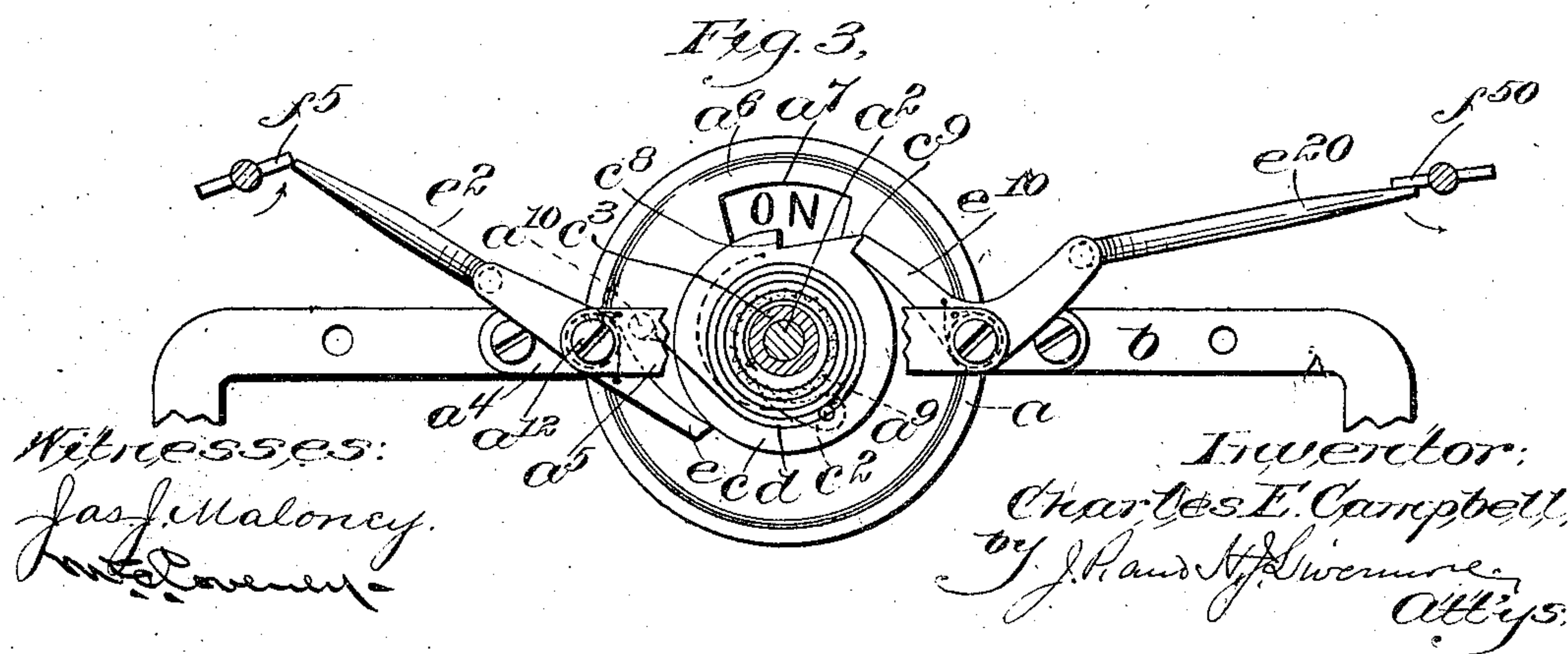
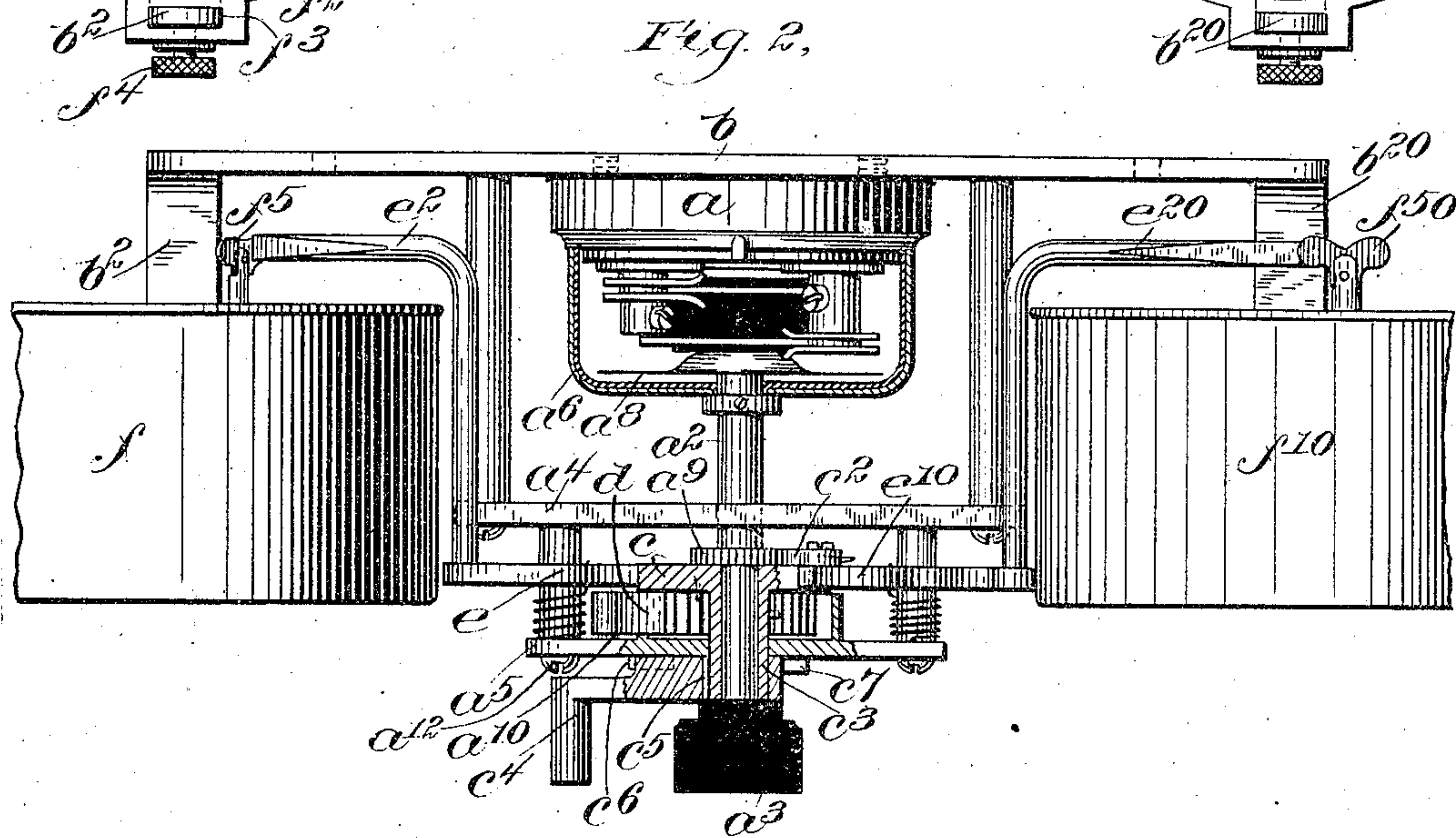
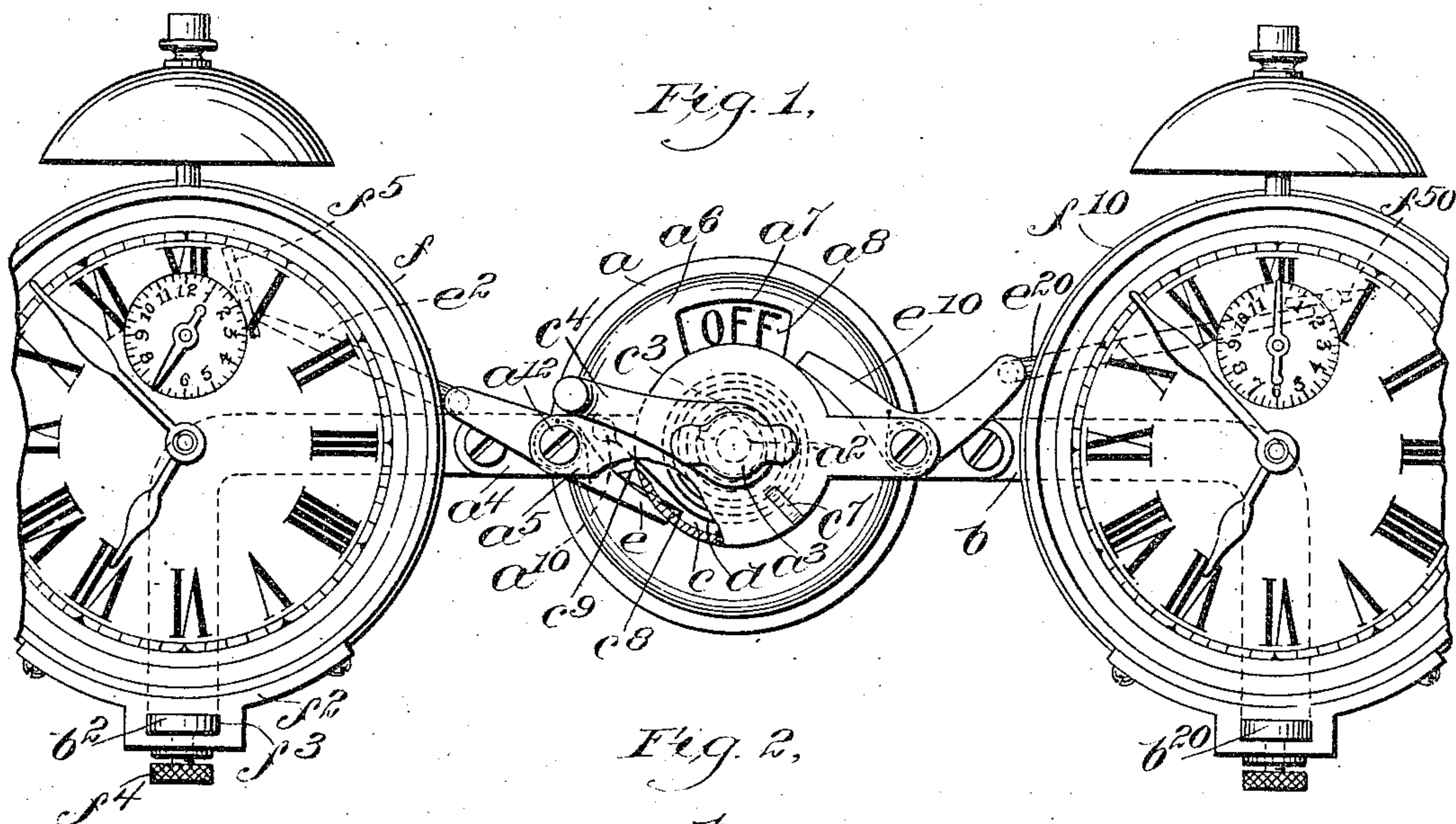


No. 871,671.

PATENTED NOV. 19, 1907.

C. E. CAMPBELL.  
TIME CONTROLLING DEVICE.

APPLICATION FILED SEPT. 22, 1905. RENEWED SEPT. 26, 1907.



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# UNITED STATES PATENT OFFICE.

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## TIME CONTROLLING DEVICE.

No. 871,671.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed September 22, 1905, Serial No. 279,649. Renewed September 26, 1907. Serial No. 394,712.

*To all whom it may concern:*

Be it known that I, CHARLES E. CAMPBELL, a citizen of the United States, residing in Lynn, in the county of Essex and State of Massachusetts, have invented an Improvement in Timed Controlling Devices, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a timed controlling device, the purpose of the invention being to obtain a simple and inexpensive controlling device for electric switches, or analogous controlling devices, to be automatically operated by a suitable timing element, it being practicable to utilize an ordinary alarm clock, or any timing element in which a movable member or motor is caused to move at a certain time, controlled by any suitable setting mechanism.

In the construction shown, the device is arranged to be operated by the winding handle of an ordinary alarm clock, these clocks being commonly constructed so that the alarm winding handle unwinds as soon as the alarm spring is released by the clock work.

The device embodying the invention is shown as embodied in a rotary electric switch mounted on a support which is provided with one or more brackets or supplemental supports adapted to hold a clock or clocks in such a position that the alarm winding member will move in the path of a retaining pawl, which holds the switch in a certain position against the operation of a motor such as an ordinary clock spring.

The automatic switch operating device may be independent of the manual operation of the switch, so that the switch can be set in any desired position, either on or off, prior to the setting of the automatic device, or may be operated in any way entirely independently of said device.

In the construction shown, the switch is provided with a rotating shaft, having the ordinary thumb piece, or handle, connected therewith; the automatic operating device being sleeved upon the shaft, and having a motor spring, one end of which is connected with the sleeve, and the other with the frame, so that when said sleeve is turned with relation to the shaft, the spring is wound. The said sleeve further has a

ratchet and pawl connection with the shaft, so that as the spring runs down, the shaft will be turned with the sleeve. The sleeve is further provided with one or more retaining shoulders, and the frame is provided with one or more detents or pawls cooperating with said retaining shoulders, and arranged to be tripped by the timing mechanism.

If it is desirable to turn on the switch automatically at a certain time, and then turn it off automatically at a later time, two pawls may be employed, the release of one pawl permitting a rotation of the shaft sufficient to change the switch from off to on, for example, the other pawl being so situated as to catch the actuating member at the end of such movement. Upon tripping the other pawl, a further rotation is permitted, sufficient to again reverse the switch, so that by setting the device properly, lights, for example, can be turned on at one time, and turned off later without any manipulation beyond the original setting of the switch. Assuming, for example, that it is desirable to illuminate a show window in a store, between the hours of seven and twelve in the evening after the store has been closed, the time switch can be turned to the off position, and the automatic actuating device then set, and if alarm clocks are used, the alarm of one clock can be set at seven o'clock so as to release one pawl and turn the switch on, while the alarm of the other clock can be set at twelve o'clock so as to release the other pawl and turn the switch off.

Figure 1 is a front elevation of the switch controlling device embodying the invention, parts being broken away and shown in section; Fig. 2 is a horizontal section with parts shown in plan; and Fig. 3 is a detail similar to Fig. 1, showing the parts in a different position.

For purposes of illustration, the controlling device is shown as double acting, and under the control of ordinary alarm clocks; the automatic actuating device having sufficient movement to change the switch from one condition to the other, and then, by the next movement, to the original condition. It is obvious that if only one clock is to be used, the movement of the automatic actuating device may be limited to such an extent as to cause the switch member to move only half the distance.

The switch *a*, which is herein shown as an



ordinary bi-polar switch, is provided with the rotary shaft  $a^2$ , having the usual thumb piece or actuating device  $a^3$ ; the switch being of that type in which a quarter turn reverses the switch; the turning movement being always in the same direction.

As herein shown, the switch  $a$  is mounted on a frame  $b$ , the switch shaft  $a^2$  projecting forward through two cross-bars  $a^4$  and  $a^5$  which afford a bearing for the said shaft, the member  $a^5$  also constituting part of the support for the automatic operating member  $c$ . The switch is provided with the usual casing  $a^6$ , which has an opening  $a^7$  in the front, through which an indicator disk  $a^8$  is displayed; the said indicator disk bearing alternately the words "Off" and "On", so as to show the position of the switch. In the construction chosen for illustration, the only connection between the switch shaft  $a^2$  and the actuating member  $c$  is through the ratchet  $a^9$  upon the shaft  $a^2$  and the pawl  $c^2$ , pivotally connected with the actuating member. This connection in no way prevents the rotation of the shaft  $a^2$  in the proper direction to operate the switch, but admits of the movement of the shaft through the action of the actuating member  $c$ , when the latter has been wound and set. The said actuating member  $c$  is provided with a motor  $d$  herein shown as an ordinary clock spring connected at one end to the sleeve  $c^3$  which constitutes part of the actuating member  $c$ , and at the other end to a pin  $a^{10}$  connected with the front plate  $a^7$  which constitutes one of the bearing members for the sleeve  $c^3$ . The said sleeve  $c^3$  is provided with an actuating handle  $c^4$  shown as connected therewith by means of a key  $c^5$ , the throw of the said handle  $c^4$  being limited by stops  $c^6$  and  $c^7$ , the position of the stops being such, in the construction shown, as to admit of a movement sufficient to turn the switch substantially two quarter turns, that is, from "on" to "off" and from "off" to "on", or vice versa.

It is obvious that any movement or movements which may be required can be provided for by so placing the stops as to properly limit the movement of the handle  $c^4$ .

In order to control the automatic operation of the member  $c$ , the said member is provided with a shoulder  $c^8$ , which is arranged to be engaged by a pawl  $e$ , which is herein shown as pivoted upon a pin  $a^{12}$ , which projects between the frame members  $a^4$  and  $a^5$ . The pawl  $e$  is provided with a tail or projection  $e^2$ , which is curved as shown in Fig. 2, so as to extend round behind a clock  $f$  supported upon a projecting bracket  $b^2$ , connected with the frame  $b$ .

The clock  $f$  is shown as provided with a socket member  $f^2$  having a channel  $f^3$  to fit over the bracket  $b^2$ , and with a thumb screw  $f^4$  by which the clock may be secured in position. By this construction the clock can

be readily slipped off for winding and setting. The position of the projection  $e^2$  is such that when the pawl  $e$  is in engagement with the shoulder  $c^8$ , as shown in Fig. 1, the said projection will be in the path of movement of the alarm winding handle  $f^5$ , the rotation of which when the alarm spring begins to run down, will cause it to act upon the projection  $e^2$  so as to trip the pawl  $e$ .

In Fig. 1 the switch is shown as turned off, while the actuating member  $c$  is wound ready to operate, the pawl  $e$  being in engagement with the shoulder  $c^8$ .

The clock shown at the left hand side is indicated as having the alarm set for seven o'clock, at which time of course the winding handle  $f^5$  will begin to rotate, owing to the running down of the alarm spring when released. This movement of the handle  $f^5$  will trip the pawl  $e$ , as shown in Fig. 3, thus permitting the member  $c$  to rotate through the action of its spring  $d$ , carrying with it, through the pawl  $c^2$  and ratchet  $a^9$ , the shaft  $a^2$  of the switch. The movement thus provided for is limited by a stop, so that the shaft  $a^2$  will be carried only far enough to turn the switch "on". In cases where only a single operation is required, the limiting stop may be made permanent, it being obvious that the switch may automatically be turned from "on" to "off", or from "off" to "on", as may be desired, by simply setting the switch in the desired position with the usual actuator  $a^3$ , either before or after winding the motor spring  $d$ , but prior to the automatic operation thereof.

In the construction shown, however, the limiting stop is indicated as a detent or pawl  $e^{10}$ , corresponding to the pawl  $e$ , and having a projection  $e^{20}$ , arranged to be engaged by the alarm winding handle  $f^{20}$  of another clock  $f^{10}$  supported on a bracket  $b^{20}$ .

While the pawl  $e^{10}$  might cooperate with the shoulder  $c^8$ , I have indicated the member  $c$  as provided with a supplemental shoulder  $c^9$ , this construction being more convenient on account of the position of the second pawl  $e^{10}$ . After the member  $c$  has moved far enough to turn the switch "on", as indicated in Fig. 3, the shoulder  $c^9$  brings up against the pawl  $e^{10}$ , and the switch remains "on" until the said pawl is tripped by the other clock. This renders it practicable to set the switch in advance, so that it can be automatically turned on at one time and off at a later time, without further attention on the part of the user.

While the construction chosen to illustrate the invention, which is shown in the drawings and specifically hereinbefore described, is simple and practicable, it is obvious that modifications in the construction and arrangement of the switch, the nature of the timing element, etc., may be made without departing from the invention.



The spring for the alarm mechanism of the clock may be regarded as a motor adapted to operate at any predetermined time, for which any equivalent may be substituted; and the actuating member *c* and its spring constitute a motor for directly operating the switch, the latter motor being under the control of the former.

What I claim is:

1. A switch controlling device, comprising a support, a rotary electric switch having an operating shaft mounted on said support, a motor and a stop therefor loosely mounted with relation to the switch operating shaft, a pawl and ratchet connection between said switch shaft and the motor and its stop, a clock mechanism, and a retaining pawl co-operating with the motor stop and adapted to be released by the clock mechanism, whereby the switch may be automatically operated at a predetermined time or manually operated independently of the motor and its stop.

2. A switch controlling device, comprising a support, a rotary switch having an operating shaft mounted on said support, a bracket connected with said support, a clock mechanism arranged upon said bracket, a sleeve loosely mounted on the switch shaft and having a ratchet and pawl connection therewith, an actuating handle for the switch shaft independent of said sleeve, a motor connected with said sleeve and adapted to rotate said

switch shaft through the ratchet and pawl connection, and a retaining device for said sleeve and its attached motor adapted to be tripped by the action of the clock mechanism whereby the switch may be automatically operated at a predetermined time or manually operated independently of the motor and its tripping mechanism.

3. The combination with a support, of a rotary electric switch mounted thereon, an alarm clock also mounted thereon, an actuating member loosely mounted on the rotary part of said switch and having a ratchet and pawl connection therewith, a spring connected at one end with said actuating member and at the other end with said support, a handle for turning said actuating member with relation to said rotary portion, a stop on said loosely mounted actuating member, a pawl coöperating with said stop and having a part projecting towards and into the path of the alarm winding handle of the clock, and a handle for turning the rotary portion of the switch independently of said actuating member and its stop mechanism.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES E. CAMPBELL.

Witnesses.

MARGARET E. COVENEY,  
HENRY J. LIVERMORE.