V. G. APPLE.

CIRCUIT CONTROLLER SWITCH AND CASING THEREFOR.

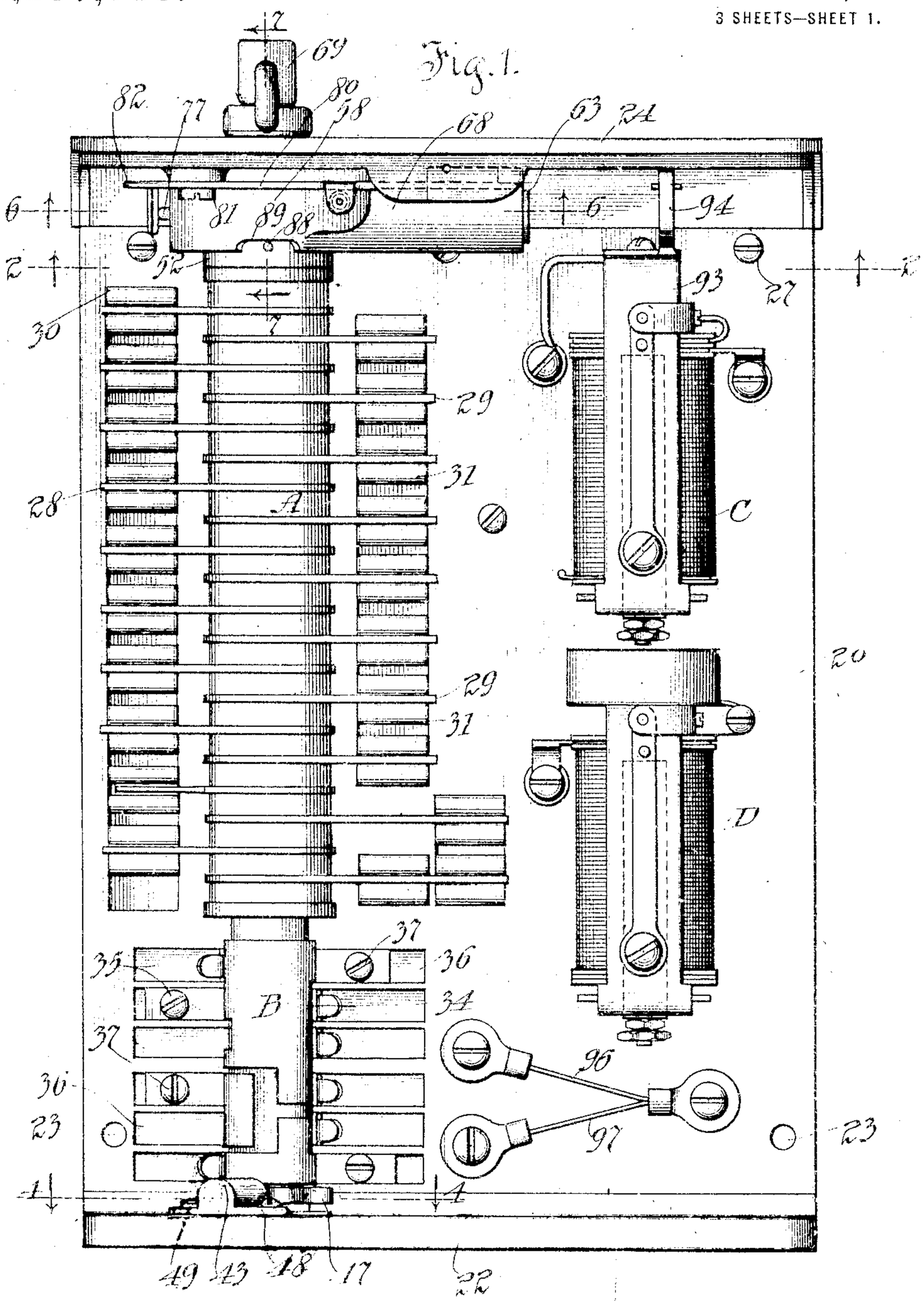
APPLICATION FILED MAY 19, 1914.

1,167,038.

Patented Jan. 4, 1916.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2.

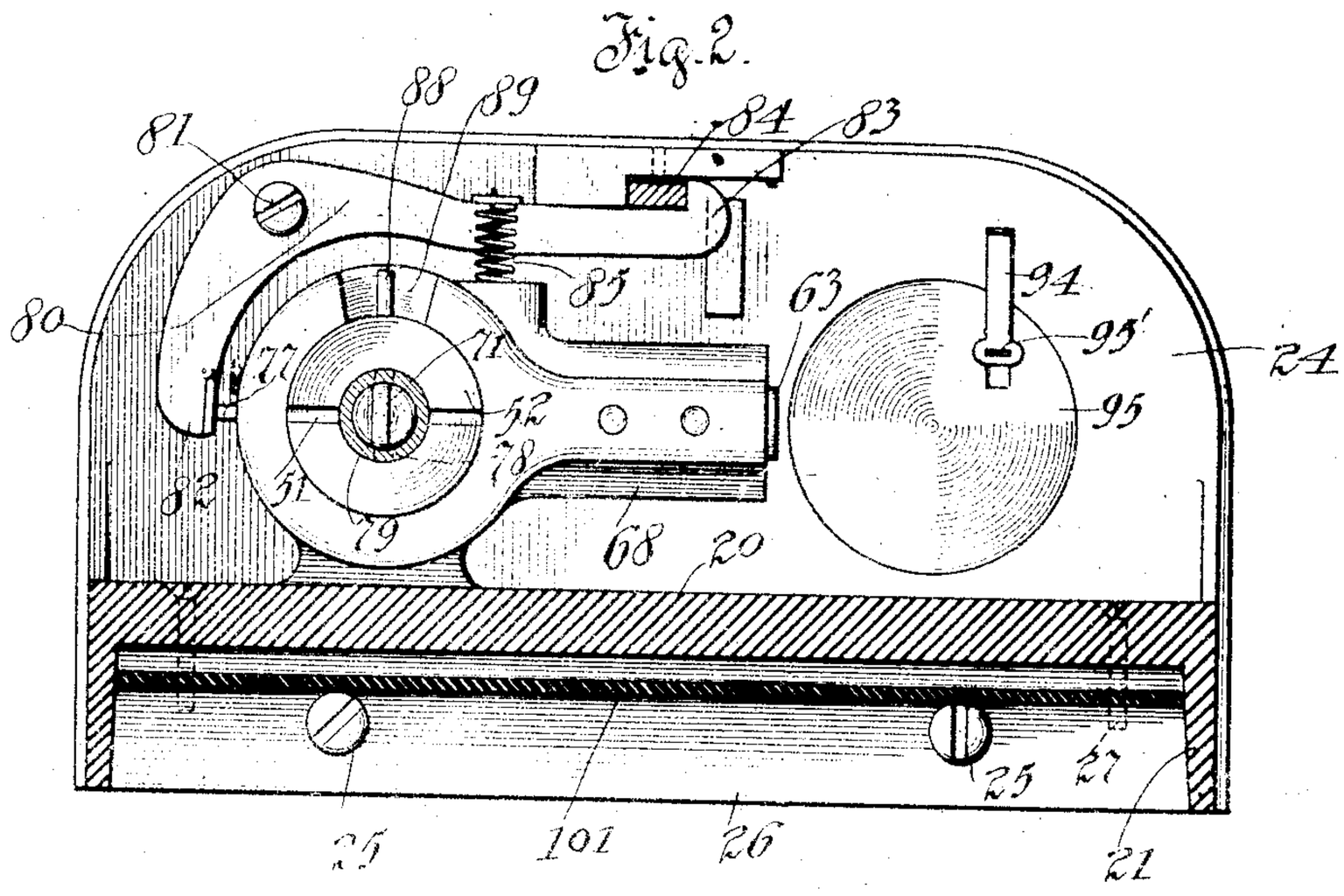


Fig. 3.

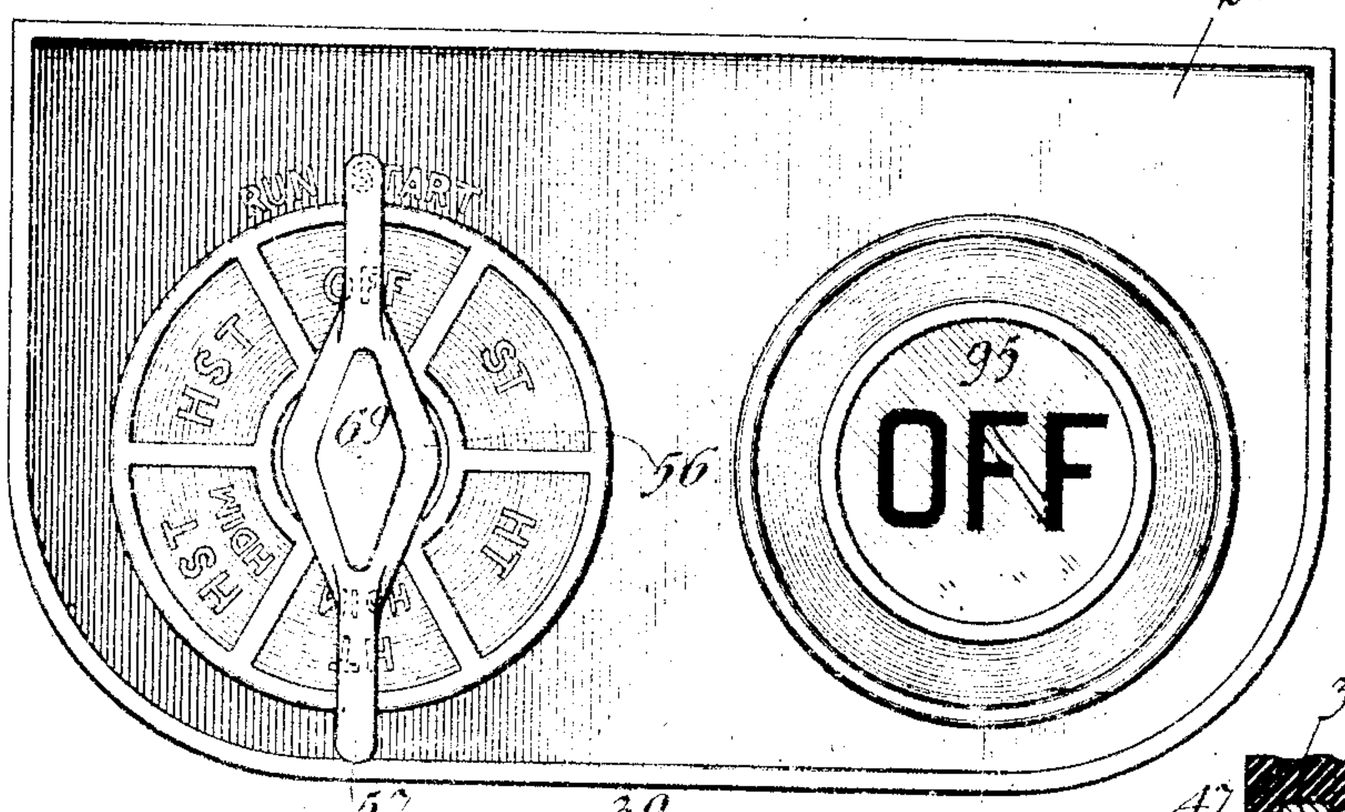


Fig. 10.

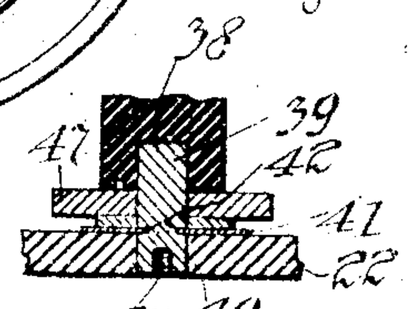
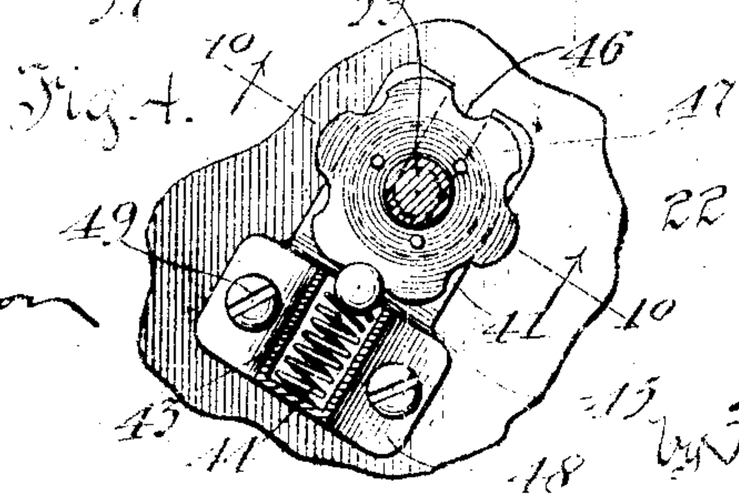


Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 5.

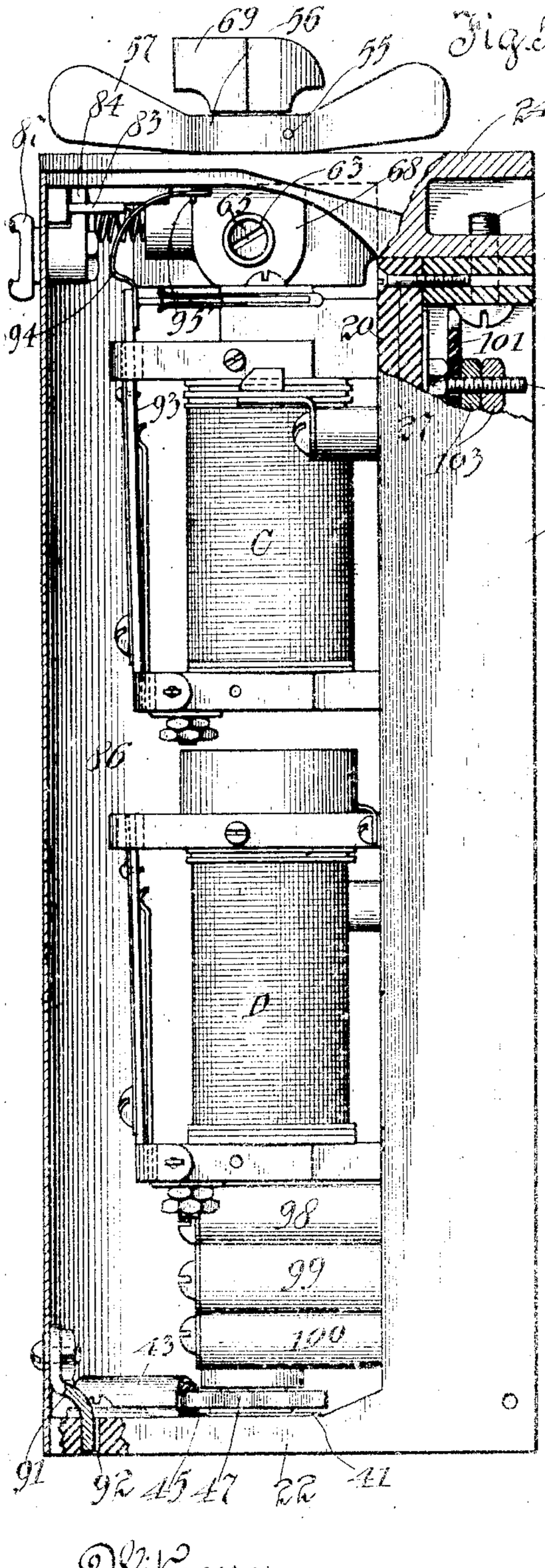


Fig. 9.

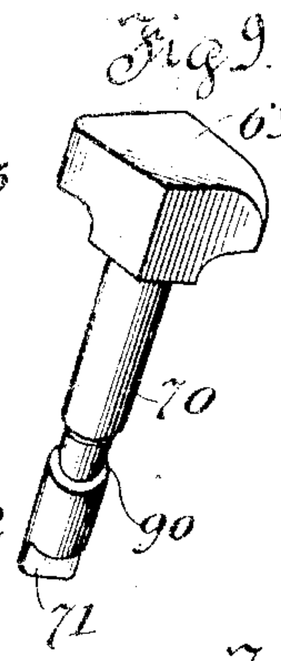


Fig. 8.

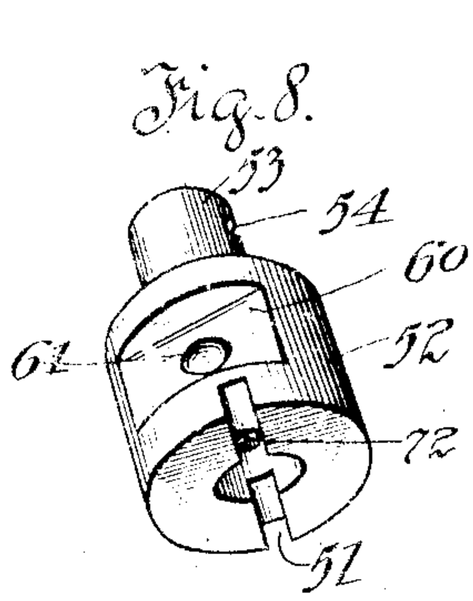


Fig. 6.

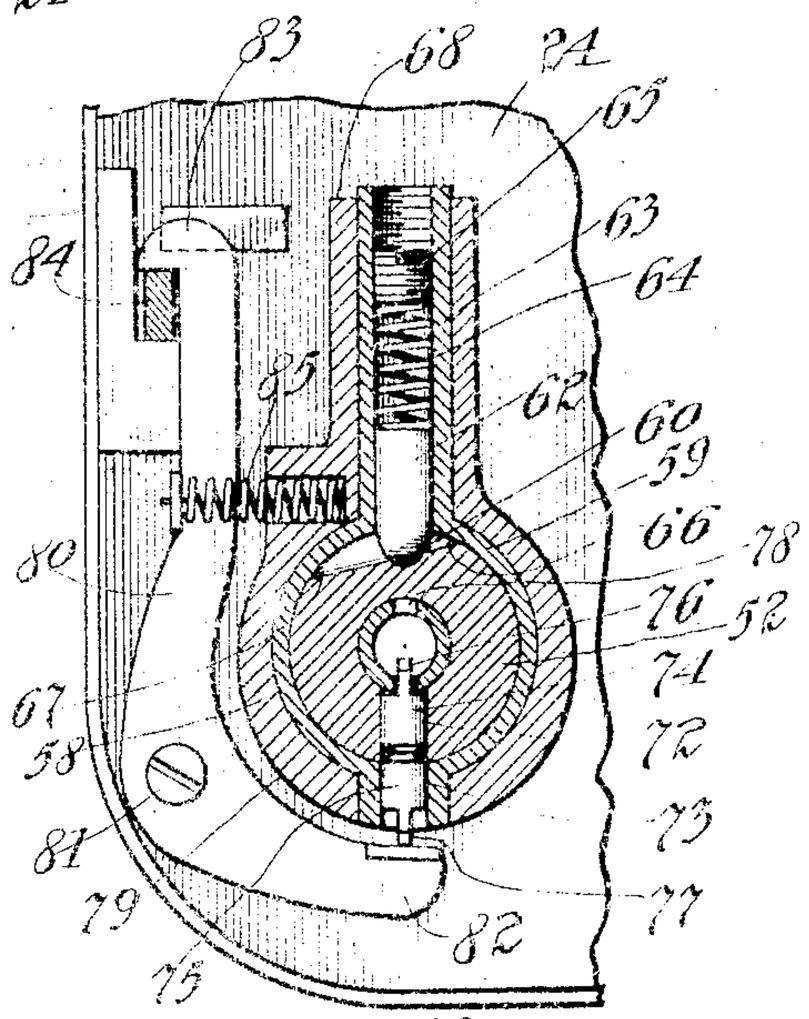
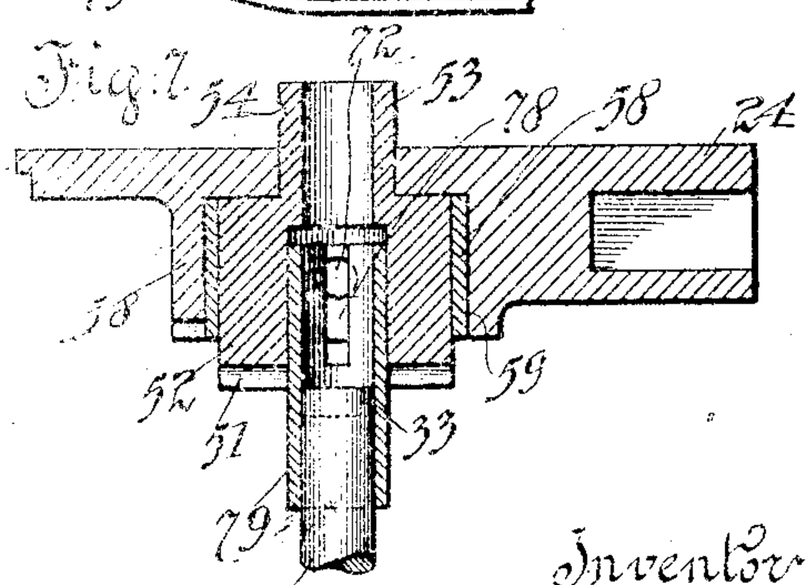


Fig. 7.



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UNITED STATES PATENT OFFICE.

VINCENT G. APPLE, OF DAYTON, OHIO, ASSIGNOR TO THE APPLE ELECTRIC COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO.

CIRCUIT-CONTROLLER SWITCH AND CASING THEREFOR.

1,167,038. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed May 19, 1914. Serial No. 839,579.

To all whom it may concern:

Be it known that I, VINCENT G. APPLE, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Circuit-Controller Switches and Casings Therefor, of which the following is a specification.

This invention relates to improvements in circuit controller switches and casings therefor.

More particularly my invention relates to a controller switch to be used on automobiles for operating the circuit connections of an engine starting system together with a switch for operating the automobile lights.

One of the objects of my invention is to provide a switch of the general character above referred to especially adapted to be used in connection with a single unit generator motor, and storage battery for starting an internal combustion engine and for subsequently arranging the circuits so that the dynamo will be properly connected to charge the batteries when the engine becomes self propelling.

Another object of my invention is to provide a simple, sturdy and rugged casing for supporting and inclosing the switches and other apparatus.

Further objects are to provide such a casing a part of which is readily separable to permit removal of the switch parts for inspection or repair, and locking means to prevent unauthorized tampering with the apparatus and operation of the switches.

Other and further objects will appear from the following specification and drawings wherein:

Figure 1 is a front elevation of my improved controller with the hood removed: Fig. 2 is a horizontal sectional view on the line 2—2 of Fig. 1. Fig. 3 is a plan view of my controller. Fig. 4 is a fragmentary sectional view on the line 4—4 of Fig. 1. Fig. 5 is a side elevation of my controller with parts broken away. Fig. 6 is a fragmentary horizontal sectional view on line 6—6 of Fig. 1. Fig. 7 is a fragmentary vertical sectional view on the line 7—7 of Fig. 1. Fig. 8 is a perspective view of a part of the controller locking mechanism. Fig. 9 is a perspective view of the lighting switch operating knob and controller key, and; Fig. 10 is a fragmentary horizontal sectional view on line 10—10 of Fig. 4.

In the drawings, the numeral 20 indicates a vertically arranged base board or wall having rearwardly extending side lips 21 and a forwardly extending shelf or bottom wall 22 at its lower end. This base part comprising the rear and bottom walls of the controller inclosing casing is formed of a hard, strong insulating material such as bakelite or the like and is adapted to be secured to a suitable support by screws or bolts taking through the holes 23. It has been found that bakelite is best adapted for this particular purpose as it is sufficiently strong to carry the various parts of the controller and is readily molded or formed in its proper shape.

The upper wall of the casing comprises an aluminum casting 24 secured to the base through the medium of the vertically arranged screws 25 taking through the horizontal bar 26 which in turn is secured to the rear of the base board 20 by the screws 27.

The general arrangement of the controller blades, the lighting circuit commutator, its brushes, etc. is similar to that illustrated and described in my Patent No. 1,070,657 issued August 19th, 1913 and entitled controller switch. In the present instance as in my earlier patent the dynamo and battery switch comprises the vertical hollow post indicated in general by the letter A with its radiating switch blades 28, 29, adapted to engage with the spring sockets 30 and 31. This dynamo controller post is hollow and receives a concentric lighting circuit commutator operating rod 32 slotted at its upper end 33 and at its lower end carrying commutator B against which press the various commutator brushes 34. The base board 20 is provided with a plurality of horizontal grooves as at 36 to receive the horizontal base portions of the brushes, 34, whereby a single screw as 37 taking through the base of each brush into the board serves to hold the brushes securely in place and at the same time serve as a binding post for electrical connections at the rear of the board.

The lower end of the lighting circuit commutator is bored out as at 38 to receive a stub shaft 39 which projects upwardly through an opening 40 in the lower wall 22

of the casing and is secured in place by engagement of the slotted plate 41 with the annular groove 42 near the lower end of the shaft. One end of the slotted plate 41 carries an upwardly projecting cylinder 43 which incloses a spring 44 which pressed forward a ball 45 which engages in turn with a series of grooves 46 arranged around the periphery of a wheel 47 rigidly secured to the lower end of the commutator B. These grooves 46 are arranged so that the commutator positively snaps from one position to another thereby insuring its always stopping in a proper position. Wings 48 extend outwardly from the cylinder 43 and are provided with holes through which take the screws 49 engaging with the base or bottom wall 22 of the casing.

It is evident from the above description that the lower end of the controller body as a whole may be removed laterally from the casing when the upper end is disconnected. By removing the screws 49, the slotted plate 41 is slid out of engagement with the annular groove 42 permitting the stub shaft 38 to be dropped down out of the way releasing the commutator B and permitting its lateral movement. The lower end of the stub shaft 38 is drilled and tapped as at 50 so that a screw may be connected therewith to aid in assembling and dismounting the controller.

The upper end of the post A is slotted to engage with the downwardly extending rib 51 on the lower end of the hollow cylinder 52. This cylinder has a tubular, upwardly extending part of reduced diameter 53 which extends through an opening in the top wall 24 of the casing. A tangential groove or slot 54 is provided in the tubular extension 53 to engage with a tapered pin 55 which extends through the hub 56 of a wing shaped handle 57. Oscillation of the wing shaped handle 57 results in the oscillation of the switch carrying spindle A thereby placing the switch blades either in the "running" or the "starting" position. An annular flange 58 extends downward from the top wall 24 of the casing and is bushed as at 59 to provide a bearing for the cylinder 52.

One side of the cylinder 52 is cut away as at 60 and provided with a depression 61 which is engaged by the plunger 62 sliding within the cylinder 63 and pressed forward under the influence of the spring 64 adjustable through the medium of the screw 65. The engagement of the spring pressed plunger 62 normally holds the controller handle in a neutral or "off" position. It will be noted from the sectional view shown in Fig. 6 that when the controller handle is oscillated to the starting position, the spring pressed plunger 62 will ride up on the acute angle 66 so that when the handle is released the tendency of the spring pressed plunger is to return the controller handle to neutral position. On the other hand the angle 67 is considerably less so that when the handle is oscillated into the running position the plunger does not cause the handle to return to neutral position. The cylinder 63 is inclosed within a downwardly extending projection 68 formed as a part of the top wall casting, extending radially from the annular flange 58.

The lighting switch is operated through the medium of a removable knob 69 carrying an elongated key spindle 70 the lower end of which is flattened out as at 71 to engage with the slot 33 on the upper end of the commutator spindle 32. The shank 70 is of a diameter somewhat less than the bore of the tubular projection 53 of the controller cylinder and when the shank 70 is inserted in the bore of the controller operating mechanism it extends downward into engagement with the slot 33, thereby providing a handle through which the commutator for the lighting circuit may be rotated into any desired position. Removal of the knob 69 obviously prevents operation of the lighting controller commutator.

In order that the removal of the lighting circuit operating knob 69 may not only lock the lighting circuit in any desired position, but likewise lock the controller handle in neutral position, thereby preventing unauthorized starting of the car, I have provided an interlocking mechanism whereby the lighting circuit, the starting motor circuit, and the removable hood of the casing inclosing the switches and their kindred parts may all be locked in position by the removal of the knob 69. Conversely the insertion of the spindle 70 within the axial opening in the controller handle disables the locking mechanism and permits the operation of the lighting circuit controller, the starting motor controller as well as unlocking the catch which secures the removable hood of the casing in position.

A radial hole 72 is drilled in the head 52 through to its central opening. A similar hole 73 of the same diameter as the hole 72 is drilled radially in the flange 58 so as to register exactly with the opening 72 when the controller is in the neutral or "off" position. Slidably positioned within these two alining openings are two short stubby shafts 74 and 75 rounded off at their contacting ends and flattened as at 76 and 77 at their opposite ends. The flattened end 76 of the inner section 74 engages with the vertical slot 78 of the tubular part 79 which surrounds the lighting circuit controlling shaft 32, is carried by the spindle A, and extends upward within the tubular opening in the cylindrical head 52.

A bell crank 80 pivoted at 81 upon the

lower face of the top wall 24 is shaped so that its shorter end 82 engages with the flattened out end 77 of the stub shaft 75. Its opposite end is hooked as at 83 to engage, when pressed outwardly by the spring 85, with the pivotal latch 84 carried by the removable front wall 86 of the casing and operated by the rotation of a small handle or thumb nut 87. When the longer end 83 of the bell crank 80 is pressed outwardly by the spring 85 the latch is locked from rotation and its engagement with the latch plate 84′ carried by the upper wall 24 prevents removal of the front wall 86 of the casing. Outward movement of the longer end 83 of the bell crank under the pressure of spring 85 results in an inward movement of the shorter end 82, pressing against the two alining stub shafts 74 and 75.

The length of the two stub shafts 74 and 75 is such that when the two are pressed inwardly by the short end 82 of the bell crank the juncture or connecting point of the two shafts is within the inner wall of the annular flange 52 and the outer of the two shafts 75 serves as a lock between the parts 52 and 58 preventing rotation or oscillation of the controller switches. A pin 88 projecting radially from the cylindrical head 52, engages the arcuate slot 89 in the flange 58 limits the oscillation of the controller spindle A between the "starting" position and the "running" position.

The key spindle 70 intermediate its ends is provided with an annular groove 90, of sufficient depth when in engagement with the flattened end 76 of the stub shaft 74, so that the outer end of shaft 74 is in line with the joint between the cylindrical head 52 and the inner wall of the bushing 59. When in this position it is obvious that the controller spindle A is free to rotate to starting or running position, and since the stub shaft 75 is forced outwardly against the action of the spring 85 the hook 83 upon the longer end of the bell crank 80 is moved inwardly, releasing the latch 84 so that the hood for the casing is readily removed. The latch 84 cooperating with the finger 91 on the lower end of the hood which engages with the opening 92 in the lower wall of the casing holds the hood in place and entirely inclose the mechanism.

As in my previously referred to patent two relay magnets C and D are mounted within the controller casing and operate upon the dynamo battery circuit. Relay magnet C serves as automatic means for cutting the dynamo into circuit with the storage batteries at the time when the electromotive force, equals or exceeds, that of the batteries. The second electro-magnet D serves as a means for decreasing the electromotive force, at a given speed of the dynamo, when the storage batteries have been partially or completely charged, thereby automatically decreasing the current supplied to the batteries when they no longer require the full current that can be produced by the dynamo.

The armature 93 of the relay C is connected through the medium of a spring finger 94, with an indicating device 95 carried by the top wall of the casing. This indicating device responds to movement of the armature 93, displaying the letters O F F when the dynamo is not in circuit with the batteries and displaying the characters O N when the dynamo is in circuit. The face of the indicating device is positioned upon the top wall of the casing for ready inspection and is removable from the base of the casing together with the wall 24. As indicated in Fig. 2 the spring finger 94 engages with a downwardly extending lip 95, on the indicating device so that it is readily disengageable for the removal of the top wall.

The two fuses 96 and 97 are carried by the three pillars 98, 99, 100, extending forward from the base 20. The connections for the various instrumentalities carried by the front wall extend rearwardly therethrough as indicated in the broken away part of Fig. 5 and the connections made between the various terminals at the rear face of the wall are protected by the sheet of insulating fiber 101. The various binding posts as 102 extend through this sheet of fiber and the nuts 103 serve to connect the lead wires at the rear face of the controller.

When the lighting switch and key 69 is in position the lock between the controller spindle A and annular flange 58 is disabled so that the controller may be rocked into starting position and then moved into running position. Obviously the rotation of the key 69 operates the lighting circuit commutator B and the casing cover lock operated by the bell crank 80 is released.

The removal of the key 69 when the controller is in neutral position permits the inward movement of the two stub shafts 74 and 75 under the action of the spring 85 securely locking the controller in neutral position and obviously preventing the operation of the lighting circuit controller B. At the same time the lock 83 engages with the casing lock 84 and prevents removal of the casing cover. Since the annular groove 90 in spindle 70 of the lighting switch key 69 engages with the flattened end 76 of the stub shaft 74, it is obvious that the lighting key cannot be removed unless the controller spindle A is in neutral or "off" position.

Whereas I have described and illustrated a particular embodiment of my invention, it is evident that various changes may be made in the structural details and general arrangement without departing from the spirit and scope thereof.

Having described my invention, what I claim is:

1. A controller, comprising a base part; a removable hood, therefor; a switch, therein; a second switch; a removable operating handle, therefor; means, for locking the first mentioned switch and hood; and means, operated by said removable handle for disabling said locking means.

2. A controller, comprising a base part; a removable hood, therefor; a switch, therein; a second switch; a removable handle, therefor; means, for locking the first mentioned switch to prevent its movement; and means, operated by the attachment of said removable handle for disabling said locking means.

3. A controller, comprising a base part; a switch, carried by said base part; a second switch; a removable handle, therefor; means, for locking the first mentioned switch to prevent its movement; and means, operated by the attachment of said removable handle to disable said locking means.

4. The combination with a base part; of a controller, carried thereby; a second controller, concentric therewith; a spindle, for operating said second controller positioned concentrically within the first mentioned controller; a handle, for operating the first mentioned controller; a removable handle, positioned concentrically within the first mentioned handle for operating said second controller; means, when the first mentioned controller is in "off" position for locking the same against oscillation; and means, operated by said removable handle for disabling said locking means.

5. The combination with a base part; of a removable hood, therefor; a controller drum, carried thereby; a second controller drum, concentric therewith; a spindle, for operating said second controller drum positioned concentrically within the first mentioned controller drum; a handle, for operating the first mentioned controller drum; a removable handle, positioned concentrically within the first mentioned handle for operating said second controller drum; means, for locking the first mentioned controller drum against oscillation and said hood from removal; and means, operated by said removable handle for disabling said locking means.

6. In a controller the combination of two switches, a removable handle for one and a lock for the other, and means actuated by the attachment of said removable handle for disabling said lock.

7. In a controller the combination of two switches, a tubular operating post for one and a post for the other positioned within the tubular post, a stationary member surrounding a portion of the tubular post and having a radial opening adapted to register when both switches are in "off" position with radial openings in both switch posts, a removable handle for the inner post and locking means positioned within said radial openings and arranged to be disabled by the removable handle.

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

VINCENT G. APPLE.

In the presence of—
E. V. MARTIN,
M. N. O'CONNOR.