

April 27, 1926.

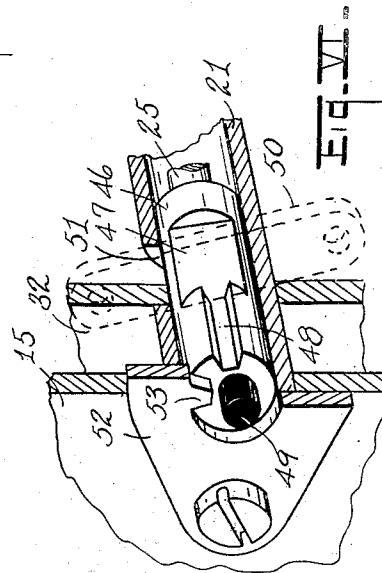
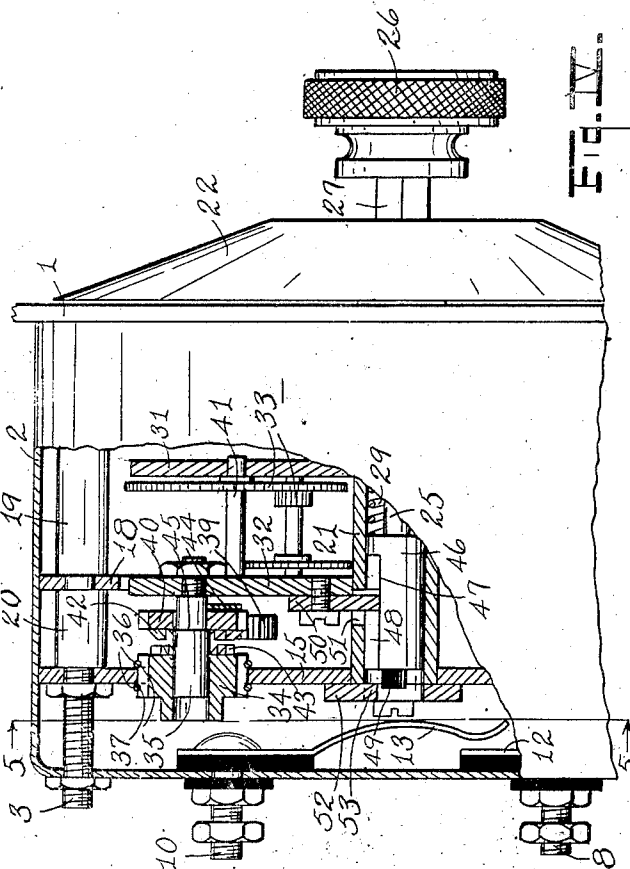
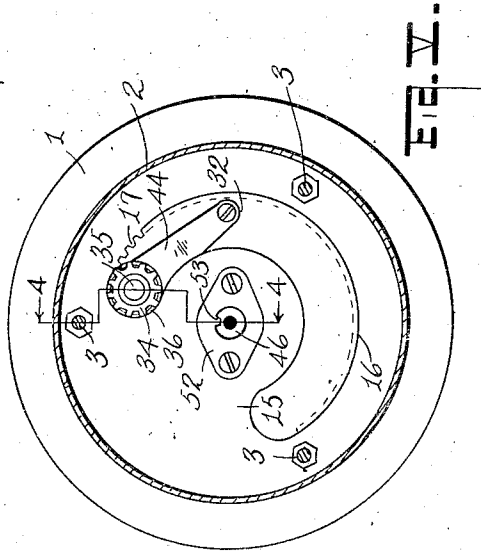
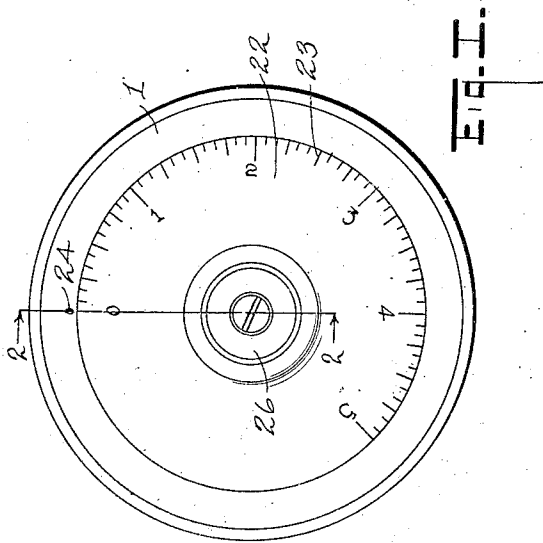
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P. HUSTED ET AL

SWITCH CONTROL MEANS

Filed May 24, 1924

2 Sheets-Sheet 1



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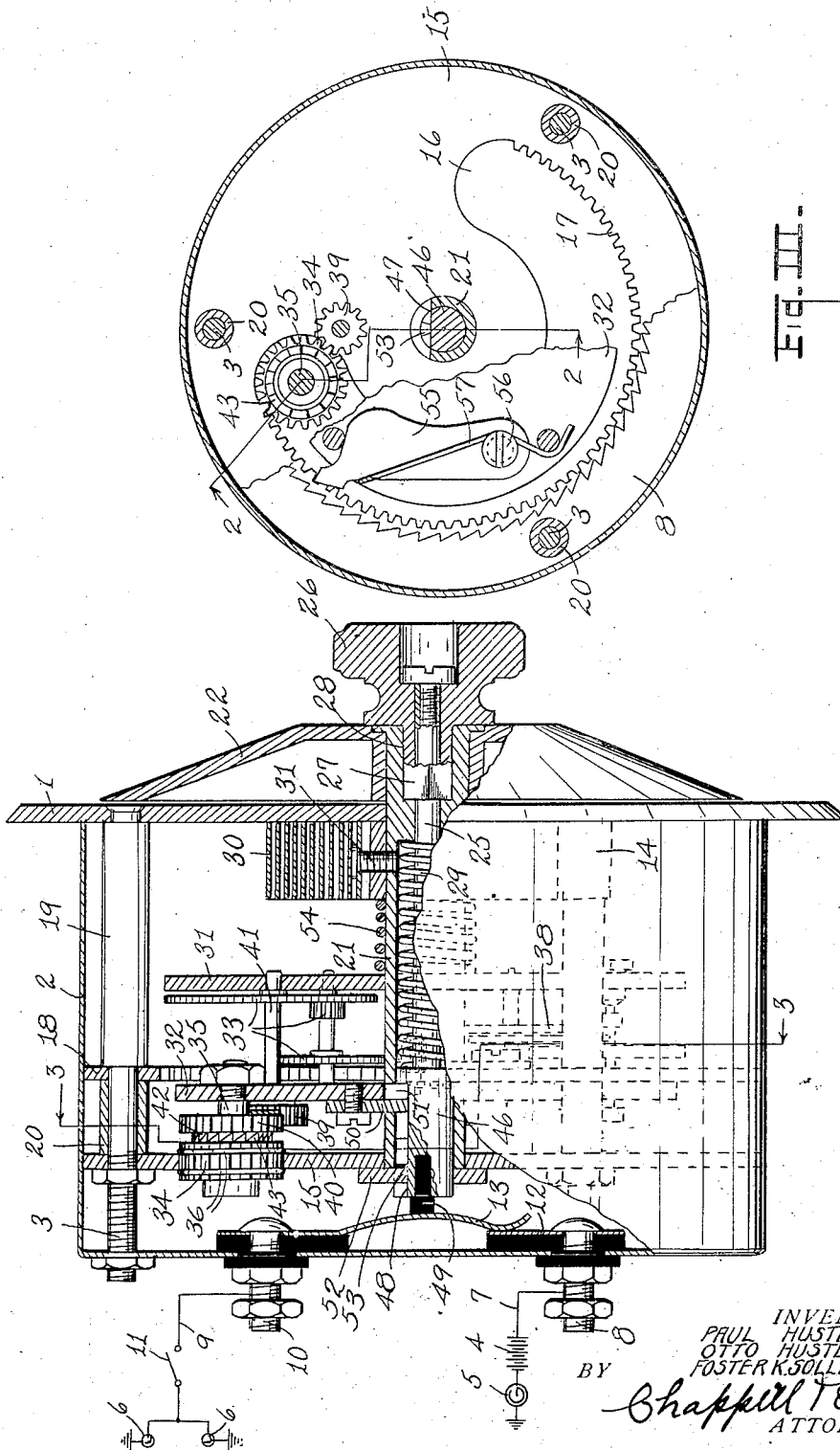
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2 Sheets-Sheet 2



III

主區

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UNITED STATES PATENT OFFICE.

PAUL HUSTED, OTTO HUSTED, AND FOSTER K. SOLLIDAY, OF GRAND RAPIDS,
MICHIGAN.

SWITCH-CONTROL MEANS.

Application filed May 24, 1924. Serial No. 715,751.

To all whom it may concern:

Be it known that we, PAUL HUSTED, OTTO HUSTED, and FOSTER K. SOLLIDAY, citizens of the United States, residing at Grand Rapids, county of Kent, State of Michigan, have invented certain new and useful Improvements in Switch-Control Means, of which the following is a specification.

This invention relates to improvements in switch control means.

Many cities have ordinances or regulations requiring that the parking lights of motor vehicles shall be turned on at a specified hour. This causes great inconvenience to drivers as to leave the lights on when not necessary exhausts the battery and particularly in city driving it is a difficult matter to keep the battery properly charged. Our improved switch control means is especially designed by us for controlling the lights of a motor vehicle, although it is well adapted for use in a great variety of relations, as lighting the lights in a store, residence or the like.

The main objects of this invention are:

First, to provide a switch control means by means of which the switch may be closed at any predetermined time.

Second, to provide an improved switch control means of the class described which may be quickly adjusted to operate the switch at the desired time.

Third, to provide a structure having these advantages which is very simple and economical in structure and at the same time compact and durable.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

We accomplish the objects of our invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of our invention is clearly illustrated in the accompanying drawing, forming a part of this application, in which:

Fig. I is a front view of a structure embodying the features of our invention.

Fig. II is an enlarged fragmentary view partially in section on a line corresponding to line 2—2 of Figs. I and III, the parts being shown in switch closing position.

Fig. III is a fragmentary view partially in section on a line corresponding to line 3—3 of Fig. II.

Fig. IV is a fragmentary view partially in section on a line corresponding to line 4—4 of Fig. V showing the parts in "set" position or with the switch open.

Fig. V is a sectional view on a line corresponding to line 5—5 of Fig. IV.

Fig. VI is a detail perspective view partially in longitudinal section, showing structural details.

In the drawing similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawings, we provide a housing which is adapted to be set into the instrument of a motor vehicle. This housing, in the embodiment illustrated, comprises a face plate 1 and a cup-like casing member 2 secured to the face plate by means of the threaded posts 3.

4 represents a battery, 5 a generator and 6 the lamps to be controlled.

The battery circuit 7 is connected to the binding post 8 projecting from the housing. The lamp circuit 9 is connected to the post 10, also projecting from the housing. The circuit 9 is provided with the usual switch 11.

Within, but insulated from, the housing is a fixed contact plate 12, the same being secured in position and connected to the circuit by means of the binding post 8. A coacting spring switch member 13 is insulated from the housing and secured in position therein by means of the binding post 10.

Upon the posts 3, we mount a plate or disc 15 having a segmental slot 16 therein, one

edge of the slot being toothed to provide a segmental rack 17. The posts 3 also carry an annular ratchet member 18, the posts 3 having spacing sleeves 19 and 20 thereon to space and position these parts 15 and 18.

A barrel 21 is rotatably supported by the face plate 1 and the plate or disc 15. This barrel projects through the face plate and carries on its projecting end the index or dial plate 22 which has time indicia 23 thereon adapted to coact with the indicia character 24 on the face plate—see Fig. I.

Mounted within the barrel for longitudinal movement therein is a spindle 25 having a finger piece 26 on its outer end and a non-circular shank portion 27 engaging a correspondingly shaped opening 28 in the barrel, so that the barrel may be rotated from the finger piece and the spindle retracted to allow the spring switch 23 to disengage the contact 12, the parts being shown in closed position in Fig. II and in open position in Fig. IV. A coiled spring 29 urges the spindle to switch closing position.

The driving spring 30 is connected to the barrel by means of the screw 31, the outer end of the spring being secured to one of the posts 3 at 14. The spring 30 constitutes a driving means for the barrel which, as stated, carries the dial.

The barrel also carries a timing or control mechanism. The frame of this mechanism comprises the spaced plates 31 and 32 connected by suitable pillars and carrying the escapement mechanism designated generally by the numeral 38 and train of gears designated generally by the numeral 33. This frame also carries the pinion 34 meshing with the rack 17, so that movement of the frame and consequently of the barrel is controlled by the escapement mechanism acting through this pinion 34 coacting with the rack 17.

The pinion 34 is carried by the stub shaft 35 on the timing mechanism frame plate 32, the pinion being supported against longitudinal movement by the split rings 36 which engage the grooves 37 provided therefor in the periphery of the pinion, the rings coacting with the plate 15, as shown in Figs. II and IV. The pinion 34 is connected to the escapement 38 through the train of gears 33 and the pinions 39 and 40, the pinion 39 being mounted on the shaft 41 of the train of gears 33 while the pinion 40 is mounted on the stub shaft 35 for limited longitudinal movement thereon and is provided with a toothed clutch member 42 coacting with the toothed clutch member 43 of the pinion 34.

A spring 44 acts to hold the pinion 40 yieldingly against the shoulder 45 of the stub shaft. The stub shaft is slidable longitudinally through and is splined to the pinion 34. The spring 44 will yield in the

event the ends of the clutch teeth engage when the parts are being adjusted.

The spindle 25 has a head portion 46 which is provided with a transverse slot 47 and with a longitudinal slot 48—see Fig. VI. The end of the spindle has an insulating block 49 thereon adapted to engage the switch 13 when the spindle is projected to close the switch—as shown in Fig. II.

The timing means described is connected to the spindle by means of the plate 50 which is mounted on the plate 32 to project through a slot 51 in the barrel into engagement with the flattened portion of the spindle formed by the slot 47, the slot thereby connecting the parts so that they rotate together. This particular connection is designed for mechanical convenience and to permit relative axial movement of these parts.

A stop plate 52 is mounted on the frame plate 15 and has a stop lug 53 adapted to enter the longitudinal slot 48 of the spindle when brought into alignment.

The spring 54 arranged upon the barrel urges the timing mechanism frame rearwardly.

With the parts thus arranged and it is desired to set the mechanism, the finger piece 26 is pulled outwardly, withdrawing the spindle from engagement with the stop plate 52 and engaging it with the plate 50, continued movement shifting the entire escapement mechanism to disengage the clutch pinions. The spindle is then rotated which rotates the barrel, thereby winding the spring and also brings the groove 48 out of register with the stop 53, thereby holding the spindle in retracted position and out of engagement with the switch, as shown in Fig. IV, allowing the switch to open. The rotation of the timing frame carries the pinion 34 backward. When the finger piece is released the spring 54 returns the timing frame and the spring 44 engages the clutch pinions 34 and 40, thereby connecting the pinion 34 with the escapement mechanism. The rotatable parts are driven by the spring, the movement thereof being controlled by the escapement mechanism until the zero or initial position is reached when the groove 48 is brought into register with the stop lug 53 of the stop plate and the spindle is projected by the spring 29 engaging the switch member 13 and closing the switch.

In the event that it is desired to reset the mechanism before it is returned to zero it is only necessary to turn it to the desired point by means of the finger piece.

To prevent injury to the parts in the event that the finger piece is abruptly released with the parts in retracted position, we provide a governor pawl 55 which is pivoted at 56 and held yieldingly out of engagement with the ratchet 18 by means of the spring 57. However, under the centrifugal action

of the rapidly rotating parts, this governor pawl is thrown into engagement with the ratchet segment.

With the parts arranged as illustrated and described, the device is used as follows:

Assuming that it is desired to close the circuit at 7 o'clock, the operator determines the time elapsing between the setting time and the time for closing the switch, for instance, when set at 3 o'clock in the afternoon the operator would turn the dial until the numeral 4 registered with the zero position. Owing to the escapement control the parts will reach zero or switch closing position at 7 o'clock.

Our improved control mechanism is especially designed by us for the control of electric circuits of motor vehicles. It is, however, of general application and has many uses.

We have illustrated and described our improvements in an embodiment which we have found very practical. We have not attempted to illustrate or describe certain embodiments or adaptations which we contemplate as we believe the disclosure made will enable those skilled in the art to which our invention relates to embody or adapt the same as may be desired.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. In a structure of the class described, the combination of a casing provided with a face plate, a cross plate disposed transversely within said casing and having a segmental slot toothed at one end to provide a rack, a barrel rotatably mounted on said plates, a driving spring connected to said barrel, a longitudinally slotted manually adjustable spindle rotatable with and mounted for longitudinal movement in said barrel, said barrel and spindle having registering transverse slots, a spring for actuating said spindle arranged within said barrel, a stop plate mounted on said cross plate and having a stop lug adapted to enter said longitudinal groove in said spindle when aligned therewith, a normally open switch adapted to be engaged by said spindle when the spindle is actuated by said spring, a timing means comprising a frame mounted on said barrel for axial movement thereon and having a driving lug engaging said slots in said barrel and spindle, said lug and slot in said spindle providing a lost motion connection for said spindle and frame, an escapement mechanism carried by said frame, a driving pinion coacting with said rack and supported against axial movement thereby, a shaft on said frame slidable in said driving pinion, a driven pinion on said shaft, said pinions being provided with coacting clutch members adapted to be engaged and disengaged by the axial movement of

said frame, a spring for yieldingly supporting said driven pinion, a train of gears carried by said frame connecting said driven pinion with said escapement mechanism, and a spring mounted on said barrel acting to return said frame to clutch engaging position.

2. In a structure of the class described, the combination of a control switch, a casing provided with a face plate, a cross plate disposed transversely within said casing and having a segmental slot toothed at one edge to provide a rack, a barrel rotatably mounted on said plates, a driving spring connected to said barrel, a longitudinally slotted manually adjustable spindle rotatable with and mounted for longitudinal movement in said barrel, said barrel and spindle having registering transverse slots, a spring for actuating said spindle to switch closing position, a stop plate mounted on said cross plate and having a stop lug adapted to enter said longitudinal groove in said spindle, when aligned therewith, a timing means comprising a frame mounted on said barrel for axial movement thereon and having a driving lug engaging said slots in said barrel and spindle, said lug and slot in said spindle providing a lost motion connection for said spindle and frame, an escapement mechanism carried by said frame, a driving pinion coacting with said rack, an operating connection for said driving pinion and escapement mechanism comprising a clutch adapted to be engaged and disengaged by the axial movement of said frame, and a spring acting to return said frame to clutch engaging position.

3. In a structure of the class described, the combination of a segmental rack, a rotatably mounted barrel, a driving spring connected to said barrel, a longitudinally slotted manually adjustable switch control member rotatable with and mounted for longitudinal movement in said barrel, said barrel and control member having registering transverse slots, an actuating spring for said switch control member arranged within said barrel, a stop adapted to enter said longitudinal groove in said control member when aligned therewith, a timing means comprising a frame mounted on said barrel for axial movement thereon and having a driving lug engaging said slots in said barrel and control member, said lug and slot in said control member providing a lost motion connection for said control member and frame, an escapement mechanism carried by said frame, a driving pinion coacting with said rack and supported against axial movement thereby, a shaft on said frame slidable in said driving pinion, a driven pinion on said shaft, said pinions being provided with coacting clutch members adapted to be engaged and disengaged by

the axial movement of said frame, a spring for yieldingly supporting said driven pinion, a train of gears carried by said frame connecting said driven pinion with said escapement mechanism, and a spring acting to return said frame to clutch engaging position.

4. In a structure of the class described, the combination of a segmental rack, a rotatably mounted barrel, a driving spring connected to said barrel, a longitudinally slotted manually adjustable switch control member rotatable with and mounted for longitudinal movement in said barrel, said barrel and member having registering transverse slots, a spring for actuating said control member, a stop adapted to enter said longitudinal groove in said control member when aligned therewith, a timing means comprising a frame mounted on said barrel for axial movement thereon and having a driving lug engaging said slots in said barrel and control member, said lug and slot in said control member providing a lost motion connection for said control member and frame, an escapement mechanism carried by said frame, an operating connection for said driving pinion and escapement mechanism comprising a clutch adapted to be engaged and disengaged by the axial movement of said frame, a spring acting to return said frame to clutch engaging position, a ratchet segment mounted within said frame, and a governor pawl mounted on said frame to coact with said ratchet segment.

5. In a structure of the class described, the combination of a segmental rack, a rotatably mounted barrel, a driving spring connected to said barrel, a longitudinally slotted manually adjustable switch control member rotatable with and mounted for longitudinal movement in said barrel, said barrel and member having registering transverse slots, a spring for actuating said control member, a stop adapted to enter said longitudinal groove in said control member when aligned therewith, a timing means comprising a frame mounted on said barrel for axial movement thereon and having a driving lug engaging said slots in said barrel and control member, said lug and slot in said control member providing a lost motion connection for said control member and frame, an escapement mechanism carried by said frame, an operating connection for said driving pinion and escapement mechanism comprising a clutch adapted to be engaged and disengaged by the axial movement of said frame, and a spring acting to return said frame to clutch engaging position.

6. In a structure of the class described, the combination of a switch control member mounted for rotative and longitudinal movement and adapted to be manually adjusted, a driving spring, a spring for actuating said

control member longitudinally, means for holding said member in retracted position when rotated from its initial position, timing means comprising a frame mounted for rotative and axial movement, said control member and frame being connected to rotate together and having a lost motion connection whereby independent axial movement is permitted, an escapement mechanism carried by said frame, a driving pinion coacting with said rack and supported against axial movement thereby, a shaft on said frame slidable in said driving pinion, a driven pinion on said shaft, said pinions being provided with coacting clutch members adapted to be engaged and disengaged by the axial movement of said frame, a spring for yieldingly supporting said driven pinion, a train of gears carried by said frame connecting said driven pinion with said escapement mechanism, a spring acting to return said frame to clutch engaging position, a ratchet segment mounted within said frame, and a governor pawl mounted on said frame to coact with said ratchet segment.

7. In a structure of the class described, the combination of a switch control member mounted for rotative and longitudinal movement and adapted to be manually adjusted, a driving spring, a spring for actuating said control member longitudinally, means for holding said member in retracted position when rotated from its initial position, timing means comprising a frame mounted for rotative and axial movement, said control member and frame being connected to rotate together and having a lost motion connection whereby independent axial movement is permitted, an escapement mechanism carried by said frame, a driving pinion coacting with said rack and supported against axial movement thereby, a shaft on said frame slidable in said driving pinion, a driven pinion on said shaft, said pinions being provided with coacting clutch members adapted to be engaged and disengaged by the axial movement of said frame, a spring for yieldingly supporting said driven pinion, a train of gears carried by said frame connecting said driven pinion with said escapement mechanism, and a spring acting to return said frame to clutch engaging position.

8. In a structure of the class described, the combination of a switch control member mounted for rotative and longitudinal movement and adapted to be manually adjusted, a driving spring, a spring for actuating said control member longitudinally, means for holding said member in retracted position when rotated from its initial position, timing means comprising a frame mounted for rotative and axial movement, said control member and frame being connected to rotate together and having a lost

motion connection whereby independent axial movement is permitted, a rack, a pinion mounted on said frame to coact with said rack, an escapement mechanism carried by said frame, driving connections for said escapement to said rack adapted to be engaged and disengaged by the axial movement of said frame, a spring acting to return said frame to clutch engaging position, a ratchet segment mounted within said frame, and a governor pawl mounted on said frame to coact with said ratchet segment.

9. In a structure of the class described, the combination of a switch control member mounted for rotative and longitudinal movement and adapted to be manually adjusted, a driving spring, a spring for actuating said control member longitudinally, means for holding said member in retracted position when rotated from its initial position, timing means comprising a frame mounted for rotative and axial movement, said control member and frame being connected to rotate together and having a lost motion connection whereby independent axial movement is permitted, a rack, a pinion mounted on said frame to coact with said rack, an escapement mechanism carried by said frame, driving connections for said escapement to said rack adapted to be engaged and disengaged by the axial movement of said frame, and a spring acting to return said frame to clutch engaging position.

10. In a structure of the class described, the combination of a switch control member mounted for rotative and longitudinal movement and adapted to be manually adjusted, an index member operatively associated therewith, a driving spring, a spring for actuating said control member longitudinally, means for holding said member in retracted position when rotated from its initial position, timing means comprising a frame mounted for rotative and axial movement, said control member and frame being connected to rotate together and having a lost motion connection whereby independent axial movement is permitted, a rack, a pinion mounted on said frame to coact with said rack, an escapement mechanism carried by said frame, driving connections for said escapement to said rack adapted to be engaged and disengaged by the axial movement of said frame, and a spring acting to return said frame to clutch engaging position.

11. In a structure of the class described, the combination of a switch control member mounted for rotative and longitudinal movement and adapted to be manually adjusted, a driving spring, a spring for actuating said control member longitudinally, means for holding said member in retracted

position when rotated from its initial position, timing means for said control member comprising a rotatably mounted frame, a rack, a pinion mounted on said frame to coact with said rack, an escapement mechanism carried by said frame, driving connections for said pinion to said escapement, a ratchet segment mounted within said frame, and a governor pawl mounted on said frame to coact with said ratchet segment.

12. In a structure of the class described, the combination of a switch control member mounted for rotative and longitudinal movement and adapted to be manually adjusted, a driving spring, a spring for actuating said control member longitudinally, means for holding said member in retracted position when rotated from its initial position, timing means for said control member comprising a rotatably mounted frame, a rack, a pinion mounted on said frame to coact with said rack, an escapement mechanism carried by said frame, and driving connections for said pinion to said escapement.

13. In a structure of the class described, the combination of a switch control member mounted for rotative and longitudinal movement and adapted to be manually adjusted, an index member operatively associated therewith, a driving spring, a spring for actuating said control member longitudinally, means for holding said member in retracted position when rotated from its initial position, timing means for said control member comprising a rotatably mounted frame, a rack, a pinion mounted on said frame to coact with said rack, an escapement mechanism carried by said frame, and driving connections for said pinion to said escapement.

14. In a structure of the class described, the combination of a manually adjustable switch control member mounted for rotative and axial movement, a spring for actuating said member axially to switch closing position, means for holding said member in retracted position when it is rotated from its initial position, means for rotating said member comprising a driving spring, a timing means comprising a segmental rack, a rotatable support, a pinion carried by said support coacting with said rack, and an escapement mechanism operatively associated with said pinion.

15. In a structure of the class described, the combination of a switch control member, means for timing the actuation thereof comprising a rotatable support, a segmental rack, a pinion carried by said support coacting with said rack, an escapement mechanism operatively associated with said pinion, and means for manually adjusting said timing means having timing indicia operatively associated therewith.

16. In a structure of the class described, with said rack, and an escapement oper-
the combination of a control member, a atively associated with said pinion.
spring for actuating said member axially to In witness whereof we have hereunto set 10
switch closing position, means for holding our hands.
5 said member in retracted position, means for
releasing said member at a predetermined
time comprising a rack, a pinion coacting

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