Sept. 25, 1923. 1,468,701

V. R. DESPARD

SWITCH MECHANISM

Filed March 6, 1917

Fig. 1.

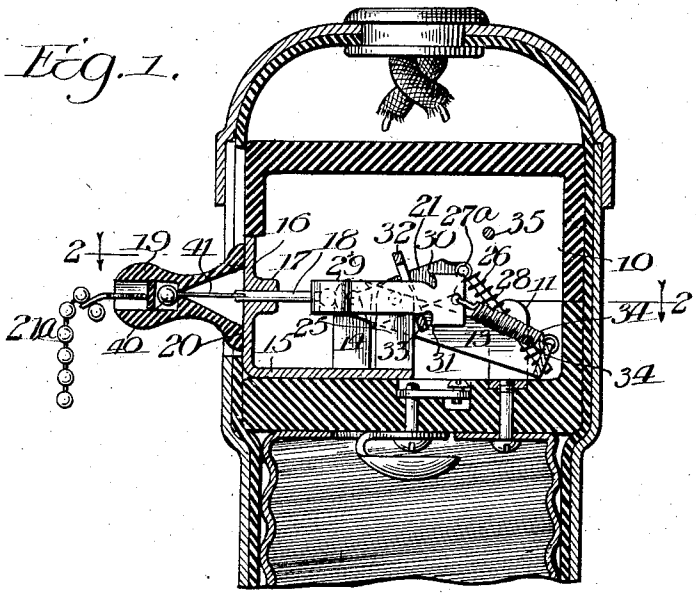


Fig. 2.

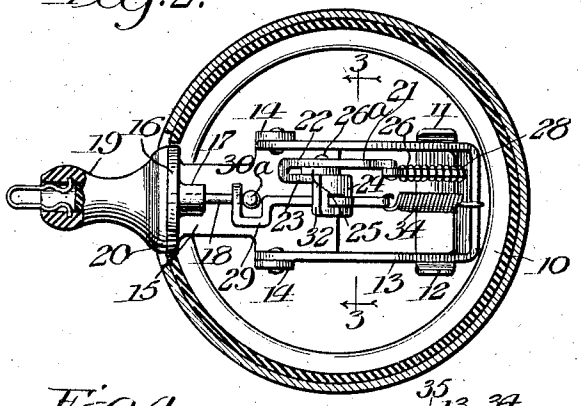


Fig. 3.

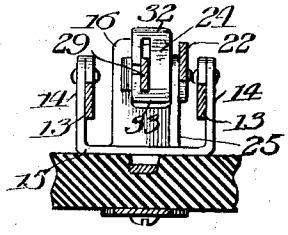
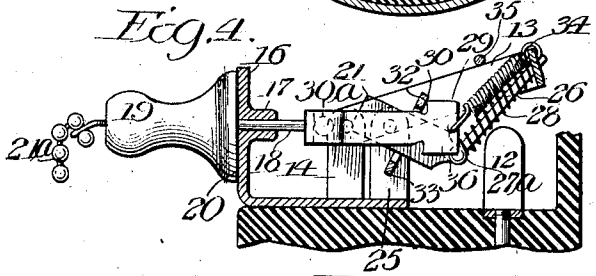


Fig. 4.



Inventor
Victor R. Despard
by Albert W. Zabel Atty

Patented Sept. 25, 1923. 1,468,701

UNITED STATES PATENT OFFICE.

VICTOR R. DESPARD, OF HINSDALE, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO McGILL MANUFACTURING COMPANY, OF VALPARAISO, INDIANA, A CORPORATION OF INDIANA.

SWITCH MECHANISM.

Application filed March 6, 1917. Serial No. 152,627.

To all whom it may concern:

Be it known that I, VICTOR R. DESPARD, a citizen of the United States, residing at Hinsdale, in the county of Du Page and State of Illinois, have invented a certain new and useful Improvement in Switch Mechanism, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to switch mechanisms, and has for its object the provision of an improved mechanism of this type applicable particularly for controlling electric circuits in such a manner that both a quick make and quick break can be had due to the manipulations of the device. The device thus includes what I might call a switch element adapted to be operated so as to secure a quick make and break, and this switch element is desirably actuated by means such as those for instance disclosed in my application Serial No. 140,248, filed Jan. 2, 1917.

I will describe one form which my invention may take more in detail by referring to the accompanying drawing, in which—

Fig. 1 is a longitudinal sectional view of a switch movement constructed in accordance with my invention;

Fig. 2 is a sectional view thereof on line 2—2 of Fig. 1;

Fig. 3 is a sectional view on line 3—3 of Fig. 2, and

Fig. 4 is a fragmentary view similar to that of Fig. 1 with the parts shown in their alternative position.

I have shown my device as being applied to a lamp socket 10 having the switch contacts 11 and 12 between which the circuit is to be closed through the agency of a switch element 13. This switch element 13 is preferably U-shaped and is pivoted upon the arms 14 forming part of the framework 15. This frame work also has an upwardly extending standard 16 pivoted with the bearing 17, which bearing accommodates the tension member 18 and keeps this tension member 18 in alignment. This tension member is actuated by the finger piece 19 similarly in manner to that disclosed in my aforesaid co-pending application. The tension member 18 when moved to the left by successive movements causes the switch element 13 alternately to make and break the circuit between the elements 11 and 12 by snap action.

In order to cause this movement by the tension member 18 the finger piece 19 may be pivoted about its lower annular face 20 in any direction, or the finger piece 19 may be bodily drawn toward the left.

In one form of the invention a flexible tension member 21^a such as a chain may be inserted in the spring catch placed in the open mouth of this finger piece 19 and any pull on the chain in any direction will cause movement of the tension member 18 to the left. The position of the switch element 13 is controlled by the position of the control element 21. This control element has the two arms 22 and 23 and a bracket 24 extending outwardly from the arm 23. The arms 22 and 23 are on opposite sides of the standard 25 so that by means of the spindle or rivet 26^a said control element 21 is pivotally mounted on the said standard. The arm 22 carries a link 26 which link is pivoted at 27^a, this link preferably being encircled by a spring 28. The link 26 projects through an aperture in the end face of the U-shaped switch element 13 and the spring 28 being a compression spring tends to separate the free extremities of both the arm 22 and the switch element 13.

In the operation of the device the control element 21 is rotated clockwise, for instance, from the position it occupies in Fig. 1 until the said arm 22 of said control element, the link 26 and the switch element 13 are in alignment, whereupon a slight further movement in the same direction will cause a snap action movement of these elements 21 and 13 due to the action of the spring 28 into the alternative position shown in Fig. 4. Of course, the link 26 passes loosely through the aperture in the outermost leg of this switch element 13, thus to keep the parts in their proper position. The circuit is thus broken by the movement mentioned.

Now, in order to re-establish the circuit by snap action the control element 21 must be moved contra-clockwise until the elements again pass the dead center, whereupon the device snaps into the position of Fig. 1. Now, in order to rotate the element 21, first in one direction and then in the other, and to have these movements caused by successive reciprocations of the tension element

18, I provide a somewhat loosely carried pawl device 29. This pawl device is drawn to the left by the tension element 18, this tension element having an enlargement 30a, so that the pawl element 29 may have a more or less universal connection with said tension element 18. This pawl device has two fingers, respectively the fingers 30 and 31. These fingers co-operate respectively with the arms 32 and 33 of the control element 21. The arms 32 are bent inwardly as shown more clearly in Figs. 2 and 3, and thus prevent twisting of the pawl element 29, but permit an entirely loose travel of this pawl element 29 longitudinally of said control element 21. The pawl element 29 furthermore is held by means of a spring 34 in its right hand position, this spring being preferably fastened to the end section of the U-shaped switch element 13. This spring 34 is considerably weaker, of course, than the spring 28, so that it does not seriously oppose the controlling functions of this spring 28.

The spring 34 is merely strong enough to retract the elements 29, 18 and 19 into their normal position, and at the same time to hold either of the fingers 30 or 31 in the proper position for the next actuation against the corresponding arm of the control element 21.

It will be noted, for instance, that when the switch element 13 is in the position of Fig. 1, the spring 34 has a tendency to pull the right hand extremity of the pawl element downwardly so that the finger 31 must necessarily co-operate directly with the arm 33. When the switch element 13 is in the alternative position against its stop 35 then spring 34 tends to draw this pawl element 29 upwardly so that the finger 30 is drawn against the arm 32. Of course, this pawl element 29 does not necessarily have to be maintained in alignment as in one position its right hand extremity might be slightly tilted upwardly and when the switch device is in its alternative position this right hand extremity might be slightly tilted downwardly.

Assuming that the pawl element 29 were drawn toward the left from the position shown in Fig. 4, but thereafter the snap action had moved the elements 21 and 13 into their alternative position, the arm 33 would impinge against the enlarged portion 36 of the pawl element 29, but the retractile effect of the spring 34 would then withdraw the element 29 to the right, so that the finger 31 finally snaps around the arm 33 into the position shown in Fig. 1.

The tension member 18 has between the head 40 and its right hand portion a small flexible wire portion 41 to permit bending in any direction when the finger piece 19 is tilted.

From what has been described the nature of my invention will be readily clear to those skilled in the art

Having however thus explained my invention, what I claim as new and desire to secure by Letters Patent is:

1. A device of the character described comprising a switch element, reciprocating operating means for said switch element, and control means interposed between said reciprocatory means and said switch element whereby successive reciprocations of said reciprocatory means effect alternative make and break actuations of said switch element by snap action, said control means including a pawl device, and means comprising a yieldable element movable by said pawl device into position to move said switch element into circuit making or breaking position, said pawl device, upon movement of said switch element to either of said positions, assuming a position for moving said switch element to the other of said positions.

2. A device of the character described comprising a switch element, reciprocating operating means for said switch element, and control means interposed between said reciprocating means and said switch element whereby successive reciprocations of said reciprocating means effect alternative make and break actuations of said switch element by snap action, said control means including a spring having its free extremity associated with said switch element, a spring support movable in a direction opposite to the movements of said switch element carrying the opposite extremity of said spring, the movements of said spring support beyond dead center serving by snap action to move said switch element into its alternative positions, a loosely carried pawl device operable by said reciprocating means to move said spring support from one to the other of its alternative positions, and yielding means interposed between said pawl and said switch element for controlling the position of said pawl.

3. A device of the character described comprising a switch element, reciprocating operating means for said switch element, and control means interposed between said reciprocating means and said switch element whereby successive reciprocatins of said reciprocating means effect alternative make and break actuations of said switch element by snap action, said control means including a spring having its free extremity associated with said switch element, a spring support movable in a direction opposite to the movements of said switch element carrying the opposite extremity of said spring, the movements of said spring support beyond dead center serving by snap action to move said switch element into its alternative

positions, a loosely carried pawl device operable by said reciprocating means to move said spring support from one to the other of its alternative positions, means movable with the switch element for moving the pawl into alternative positions to effect said movement of the spring support, and means for retracting said pawl device.

4. A device of the character described comprising a switch element, reciprocating operating means for said switch element, and control means interposed between said reciprocating means and said switch element whereby successive reciprocations of said reciprocating means effect alternative make and break actuations of said switch element by snap action, said control means including a spring having its free extremity associated with said switch element, a spring support movable in a direction opposite to the movements of said switch element carrying the opposite extremity of said spring, the movements of said spring support beyond dead center serving by snap action to move said switch element into its alternative positions, and a loosely carried pawl device operable by said reciprocating means to move said spring support from one to the other of its alternative positions, said pawl device having a pair of fingers adapted alternately to engage said spring support.

5. A device of the character described comprising a switch element, reciprocating operating means for said switch element, and control means interposed between said reciprocating means and said switch element whereby successive reciprocations of said reciprocating means effect alternative make and break actuations of said switch element by snap action, said control means including a spring having its free extremity associated with said switch element, a spring support movable in a direction opposite to the movements of said switch element carrying the opposite extremity of said spring, the movements of said spring support beyond dead center serving by snap action to move said switch element into its alternative positions, a loosely carried pawl device operable by said reciprocating means to move said spring support from one to the other of its alternative positions, and means for retracting said pawl device, said pawl device having a pair of fingers adapted alternately to engage said spring support.

6. A device of the character described comprising a switch element, reciprocating operating means for said switch element, and control means interposed between said reciprocating means and said switch element whereby successive reciprocations of said reciprocating means effect alternative make and break actuations of said switch element by snap action, said control means comprising a yieldable element movable into position to move said switch element into circuit making or breaking position, and means for moving said yieldable element into either of said positions, comprising a pawl device loosely connecting said last mentioned means with said operating means.

7. A switch comprising a base, a switch frame supported by the base, a switch movement supported by said frame having a movable switch element, and means to move said switch element from one to its alternative position by snap-action, said means including an operating element, a spring directly connected to the operating element and to said switch element, and a lineally reciprocatory control element pivoted to said operating element.

8. A switch comprising a base, a switch frame supported by the base, a switch movement supported by said frame comprising a switch element, reciprocating operating means for said switch element, and control means interposed between said reciprocating means and said switch element whereby successive reciprocations of said reciprocating means effect alternative make and break actuations of said switch element by snap-action, said means including a pawl device, and a tension member connecting said pawl device and switch element whereby the position of said pawl device is determined by the position of said switch element.

9. A switch comprising a base, a switch frame supported by the base, a switch movement supported by said frame comprising a switch element, reciprocating operating means for said switch element, and control means interposed between said reciprocating means and said switch element whereby successive reciprocations of said reciprocating means effect alternative make and break actuations of said switch element by snap-action, said means including a pawl device for moving said switch element into a position determined by the position of said pawl device relative thereto, and a tension member connecting said pawl device and said switch element whereby said pawl device is moved, upon movement of said switch element into either of its positions, into a position determined by the position of said switch element relative thereto.

10. A switch comprising a base, a switch frame supported by the base, a switch movement supported by said frame including a switch element, reciprocating operating means for said switch element, and control means interposed between said reciprocating means and said switch element whereby successive reciprocations of said reciprocating means effect alternative make and break actuations of said switch element by snap action, said control means including a spring having its free extremity associated with said switch element, a spring support

movable in a direction opposite to the movements of said switch element carrying the opposite extremity of said spring, the movements of said spring support beyond dead center serving by snap action to move said switch element into its alternative positions, and a loosely carried pawl device operable by said reciprocating means to move said spring support from one to the other of its alternative positions, said pawl device having a pair of fingers adapted alternately to engage said spring support.

11. A switch comprising a base, a switch frame supported by the base, a switch movement supported by said frame within the base including a switch element, reciprocating operating means for said switch element, and control means interposed between said reciprocating means and said switch element whereby successive reciprocations of said reciprocating means effect alternative make and break actuations of said switch element by snap-action, said control means including a loosely carried pawl device, and a tension member connecting said pawl device and said switch element whereby the position of said pawl device change in accordance with the position of the switch element, the direction of movement of the switch element being dependent upon the position of the pawl device relative thereto.

12. An electric switch comprising a frame, a plunger element mounted to slide therein, a controller member carried by said plunger element and having a limited pivotal movement thereon, said controller member being provided with horns, a spring reversing member having projections for engagement by said horns and adapted to be rotated by movement of the controller member, a spring connected to said reversing member, and means for transmitting movement of the spring to a movable switch member.

13. An electric switch comprising a frame, a manually operated member mounted to be substantially lineally reciprocated relative thereto, a movable switch member, a control member carried by said manually operated member and having a pivotal movement thereon, said control member having abutments thereon, a spring reversing member having abutments operatively engaged alternately by the corresponding abutments on the control member to effect oscillation of the reversing member from one operating position to another upon successive operations of the control member, and a spring interposed between said reversing member and said switch member to effect snap action movement of said switch member from either alternative position to the other in accordance with the movements of said spring reversing member.

14. An electric switch comprising a frame, a manually operated member mounted to be substantially lineally reciprocated relative thereto, a movable switch member, a control member associated with said manually operated member and having a pivotal movement thereon, said control member having abutments thereon, a spring reversing member having abutments operatively engaged alternately by the corresponding abutments on the control member to effect oscillation of the reversing member from one operating position to another upon successive operations of the control member, and a spring interposed between said reversing member and said switch member to effect snap action movement of said switch member from either alternative position to the other in accordance with the movements of said spring reversing member.

15. A switch comprising a base, a switch frame, a switch movement supported by said frame having a movable switch element, means to move said switch element from one of its alternative positions to the other thereof by snap action, said means comprising an operating element having alternative operating positions, and a lineally reciprocatory control element connected with said operating element, and a spring for moving said operating element to the alternative operating position after each actuation of said switch, said spring connecting said operating element and said switch element.

16. In a device of the character described, a movable switch member, and means for moving said switch member, comprising a member having substantially an endwise reciprocating movement, said member having opposite lateral projections thereon, a spring for moving said switch member with a snap action, and means for tensioning said spring to move said switch member into either open or closed position having a portion loosely engaging said member having the reciprocating movement and comprising abutments engaged alternately by said projections for tensioning said spring to alternately move said switch member in opposite directions.

17. In a device of the character described, a movable switch member, means for moving said switch member, comprising a member having substantially an endwise reciprocating movement, said member having opposite lateral projections thereon, a spring for moving said switch member with a snap action, and means for tensioning said spring to move said switch member into either open or closed position having a portion loosely engaging said member having the reciprocating movement and comprising abutments engaged alternately by said projections for tensioning said spring to alternately move said switch member in

opposite directions, and resilient means for holding said member having the reciprocating movement in engagement with alternate abutments corresponding to the alternative positions of said switch member.

18. A switch comprising a base, a switch frame, a switch movement supported by said frame having a movable switch element, means to move said switch element from one of its alternative position to the other thereof by snap action, said means comprising an operating element having alternative operating positions, and a lineally reciprocatory control element connected with said operating element, and means including a resilient member for moving said operating element to the alternative operating position after each actuation of said switch, said resilient member connecting said operating element and said switch element.

In witness whereof, I hereunto subscribe my name this 23rd day of February, A. D., 1917.

VICTOR R. DESPARD.

Witnesses:
HAZEL A. JONES,
MAX W. ZABEL.