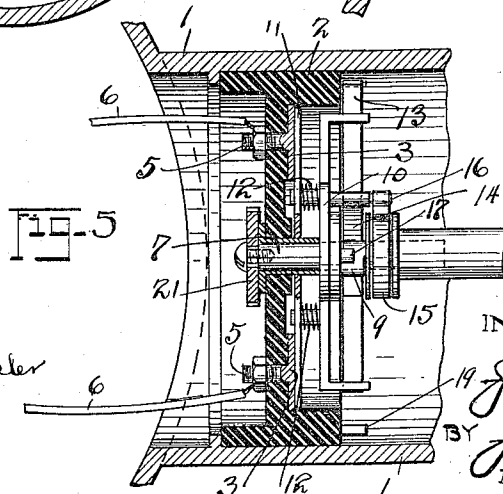
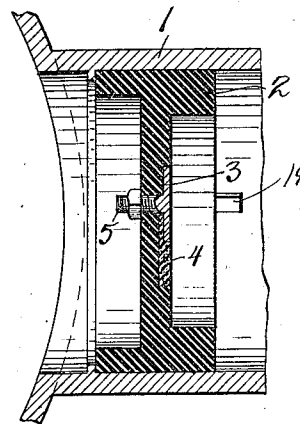
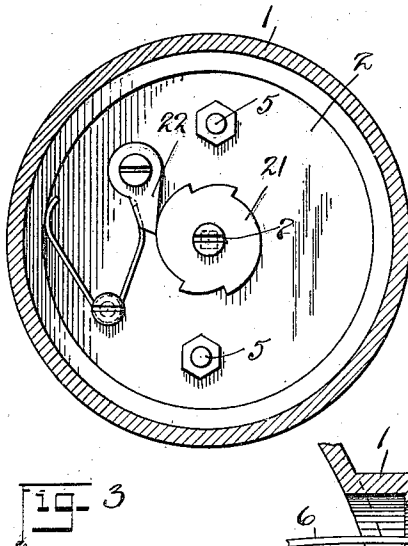
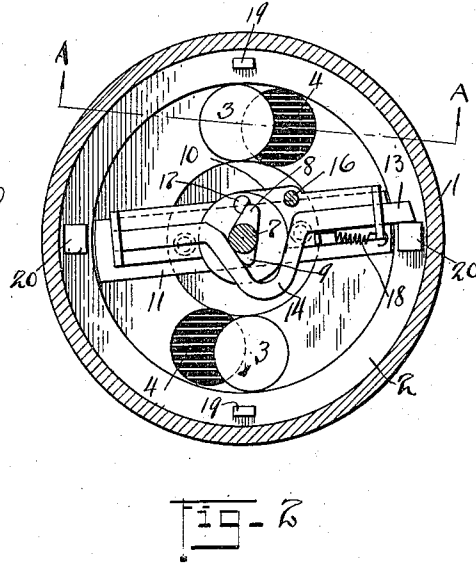
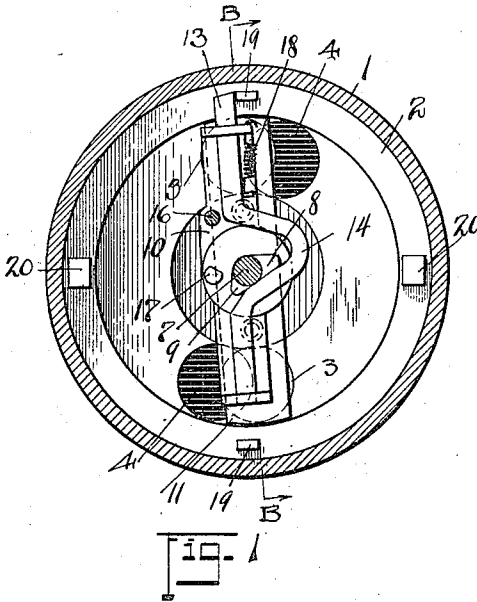


J. C. DUNFEE.
ELECTRIC SWITCH.
APPLICATION FILED MAR. 2, 1912.

1,042,414.

Patented Oct. 29, 1912.



WITNESSES:-

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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

1,042,414.

Specification of Letters Patent.

Patented Oct. 29, 1912.

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To all whom it may concern:

Be it known that I, JOHN C. DUNFEE, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Electric Switches, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from the other inventions.

My invention relates to electric switches and its general object is the provision of a switch which may be conveniently operated by manipulation of a controlling member and which will be operated to break the circuit upon release of the controlling member.

The switch forming the subject of the present invention constitutes in general an improvement of the switch described and claimed in the co-pending application of Franklin Schneider, Serial No. 608,381, filed February 13, 1911.

To the accomplishment of these and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing: Figure 1 is an elevation of the switch, partly in section, the parts being shown in "on" position; Fig. 2 is a view similar to that of Fig. 1, with the parts shown in "off" position; Fig. 3 is a rear elevation taken when the parts are in "on" position; Fig. 4 is a section on the line A—A in Fig. 2; Fig. 5 is a section on the line B—B in Fig. 1, with certain parts shown in elevation.

My improved switch mechanism may be conveniently mounted, as shown in the drawing, within a casing 1 in which is rigidly secured a base 2 of insulating material upon which the permanent contacts are mounted. These contacts comprise preferably two spaced disks 3 of conducting material which constitute preferably the head of bolts 5 which extend through the base 2 and form binding posts on the rear side of the base, to which may be secured the wires 6 of a circuit to be controlled. Disks 4 of

carbon are embedded in the base 2 so that they lie flush with the face of the base 2, and the disks 4 are recessed so that the disks 3 may partly overlap the disks 4, the disks 3 also lying flush with the face of the base 2. The exposed portion of the disks 4 lie in advance of the disks 3 in the direction of rotation of the contact piece to be described.

A rotatable spindle 7 is journaled in the base 2 and within the casing it is provided with a cam 8 and a smaller cam 9. A frame 10 is mounted on the spindle 7 but is rotatable relatively thereto and from the frame is supported a piece 11 pressed toward the base 2 by springs 12, this piece being adapted in one rotative position of the frame to bridge the contacts 3. A catch 13 is supported on the front of the frame 10 and is reciprocable transversely of the frame's axis of rotation, the catch 13 being formed near its center with a bent-up portion 14 adjacent which lie the cams 8 and 9 on the spindle 7. A coil spring 15 is secured at its inner end to the spindle 7 and at its outer end to a post 16 provided on the frame 10. The frame further is provided with a pin 17. A spring 18 tends to hold the catch 13 in its outer position, in which position it engages one or the other of the diametrically opposite lugs 19 adjacent the contacts, or one or the other diametrically opposite lugs 20 which are thicker than the lugs 19. On the rear of the spindle 7 is secured a ratchet wheel 21 provided at opposite points with teeth and having a smooth circumferential surface between the teeth; a spring-pressed pawl 22 bears against the ratchet wheel 21.

The operation of the switch is as follows: Assume the catch to be in engagement with the right hand lug 20 in Fig. 2, in which case the circuit will be broken. The cam 8 will be in engagement with the pin 17 on the frame, and hence will prevent complete uncoiling of the spring 15 which will have been previously put under some tension. It will be noted that the tension of the spring tends to rotate the frame 10 clockwise, and that, in the "off" position of the switch, such rotation is prevented by the engagement of the pin 17 with the cam 8. Consequently the spindle and frame, with its contact piece, could be rotated counter clock-wise together, and the carelessness of the operator might result in such backward

rotation until the contacts were bridged. In order to obviate the necessity of the operator's constantly holding the switch in "off" position, the ratchet wheel 21 is preferably, but not necessarily, secured to the spindle, and its teeth are so placed that the pawl 22 will engage one of the teeth when the switch is in "off" position. If the spindle be rotated clock-wise from the position illustrated in Fig. 2, the cam 9 will withdraw the catch to a certain extent but not sufficiently to disengage it from the lug 20; after the cam 9 has passed out of contact with the catch the spring 18 draws the catch into outer position again. The cam 9 is short enough to freely pass the pin 17 on further rotation of the spindle, but upon such further rotation the longer cam 8 completely withdraws the catch from lug 20. As soon as the catch is disengaged from the lug, the coil spring snaps the frame around relatively to the spindle one-quarter of a revolution, for as soon as the catch is freed from the cam 8 by its partial revolution, it flies out again and will engage the succeeding lug 19. In this position the circuit is complete, this position of the parts being illustrated in Fig. 1, although the catch is shown in engagement with the upper lug 19 instead of with the one succeeding the lug 20, with which the catch is engaged in Fig. 2. If, from the position shown in Fig. 1, the spindle be further rotated clock-wise, the long cam 8 will withdraw the catch from engagement with the lug 19 and the frame will fly around until the circuit is broken and the catch engages the succeeding lug 20. If, however, instead of being further rotated clock-wise when the catch is in engagement with the lug 19, the spindle be released, the tension of the coil spring will cause a rotation of the spindle in a counter clock-wise direction until the cam 8 engages pin 17, and during this counter clock-wise movement of the spindle the cam 9 contacts with the catch 10 and withdraws it to such an extent that it will disengage itself from the narrow lug 19 and the frame will fly forward to "off" position with the catch engaging the succeeding lug 20. If the ratchet wheel 21 be used, it will be so proportioned that when the switch is in "on" position the pawl 22 will not be in engagement with any of the teeth but will bear on the smooth circumference between the teeth, and therefore the spindle will be free to rotate in either direction.

The switch may be conveniently used with an electric drill, for instance, so that by continued rotation of the handle of the drill, which may be connected with the spindle, the operator may alternately throw the switch on and off without removing his hand from the handle of the tool, and each time that the handle is operated the spring

is thereby coiled for the next operation. If, however, when the switch is in "on" position, the operator releases the handle either from carelessness or from accident, the spindle will rotate counter clock-wise and the switch will automatically be thrown to "off" position and all danger will be averted.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In a device of the character described, the combination of two contacts; a movable piece adapted in a first position to bridge said contacts and in a second position to break contact with said contacts; tension means for moving said piece; a catch for restraining such movement; and means adapted to render said tension means operative, said means being adapted, on movement in one direction, to release said catch when said piece is in second position, and being adapted, on movement in either direction, to release said catch when said piece is in first position.
2. In a device of the character described, the combination of two contacts; a rotatable piece adapted in successive positions to alternately make and break contact with said contacts; tension means for rotating said piece; a catch for restraining such movement; and a spindle adapted to render such tension means operative, said spindle being adapted on rotation in one direction, to trip said catch when said piece is in "off" position, and being adapted, on rotation in either direction, to trip said catch when the piece is in "on" position.

3. In a device of the character described, the combination of two contacts; a rotatable piece adapted in successive positions to alternately make and break contact with said contacts; a catch for restraining rotation of said piece; a rotatable spindle; tension means connecting said piece and said spindle; and means for tripping said catch, said means being operable by rotation of the spindle against said tension means when the piece is in "off" position, and being operable by rotation of the spindle in either direction when the piece is in "on" position.

4. In a device of the character described, the combination of two contacts; a rotatable piece adapted in successive positions to alternately make and break contact with said contacts; a catch for restraining rotation of said piece; a rotatable spindle; tension means connecting said piece and said spindle; a cam on said spindle adapted to trip

said catch when the piece is in either position; and a second cam on the spindle adapted to trip the catch only when the piece is in "on" position, said cams being
 5 operative on rotation of the spindle in opposite directions.

5. In a device of the character described, the combination of two contacts; a rotatable piece adapted in successive positions to alternately make and break contact with said
 10 contacts; a catch for restraining rotation of said piece; a rotatable spindle; a spring connecting said piece and spindle and tending to rotate them in opposite directions; a cam
 15 on said spindle operative on rotation of the spindle against tension to trip said catch when the piece is in either position; and a second cam on the spindle operative on rotation of the spindle by tension to trip said
 20 catch only when said piece is in "on" position.

6. In a device of the character described, the combination of two contacts; a rotatable piece adapted in successive positions to alternately make and break contact with said
 25 contacts; a catch for restraining rotation of said piece; stops engaging said catch at successive positions of said piece, the stop at the "off" position of said piece being
 30 wider than the stop at the "on" position; a rotatable spindle; a spring connecting said piece and spindle and tending to rotate them in opposite directions; a cam on said spindle operative on rotation of the spindle
 35 against tension, said cam being of a length

adapted to disengage said catch from either of said stops; and a second cam on the spindle operative on rotation of the spindle by tension, said second cam being of a length adapted to disengage said catch from only
 40 the narrower of said stops.

7. In a device of the character described, the combination of two contacts; a rotatable piece adapted in successive positions to alternately make and break contact with said
 45 contacts; a catch for restraining rotation of said piece; stops engaging said catch at successive positions of said piece, the stop at the "off" position of said piece being wider than the stop at the "on" position; a rotatable spindle; a spring connecting said piece
 50 and spindle and tending to rotate them in opposite directions; a cam on said spindle operative on rotation of the spindle against tension, said cam being of a length adapted to disengage said catch from either of said
 55 stops; a second cam on the spindle operative on rotation of the spindle by tension, said second cam being of a length adapted to disengage said catch from only the narrower of said stops; and a pin adapted to engage said first cam to limit rotation of
 60 said spindle by tension.

Signed by me this 27th day of February 1912.

JOHN C. DUNFEE.

Attested by:

ROBERT H. SEE,
 JNO. F. OBERLIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."