

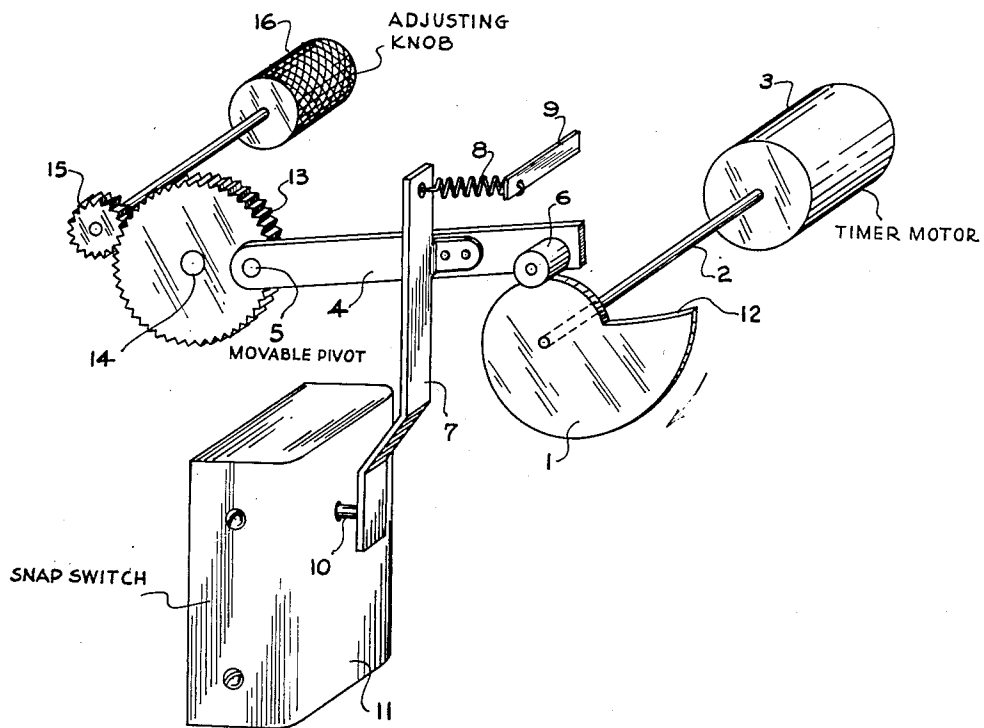
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CONTROL DEVICE

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CONTROL DEVICE

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This invention relates in general to automatic controls and is more particularly concerned with adjustable timing mechanism.

The primary object of this invention is to provide a timer mechanism which is simple and rugged in construction, which has relatively few moving parts and which is readily adjustable for varying the time of operation or percentage of operation of a controlled device.

While certain aspects of the invention are particularly adapted for a time switch mechanism, the principle of the invention is of broader application and may be embodied in other types of control mechanism such as thermostats, pressure controls, etc.

Another object of the invention is the provision of a simplified adjusting mechanism for adjusting the relationship between an actuating member and a control member for determining the position of the actuator member which causes actuation of a control device.

Other objects will appear from the following description and the appended claims.

For a full disclosure of the invention reference is made to the following detailed description and to the accompanying drawings, the single figure of which illustrates schematically one embodiment of the invention.

Referring to the drawing, reference character 1 indicates an actuator member or cam which is rotated in a clockwise direction by a shaft 2 of a timer motor mechanism 3 which preferably is of the well-known synchronous type. The cam 1 actuates a cam follower member 4 which is pivoted to a pivot pin 5 which pivot pin serves to bodily support the cam follower. The right hand portion of the cam follower is provided with a roller 6 which is mounted on a pivot pin secured to the follower member. This roller 6 is adapted to engage the cam 1 and causes the cam follower to oscillate about its pivot 5 upon rotation of the cam 1. The cam follower 4 is provided with a transversely extending bracket member 7. The upper end of this bracket member is attached to a biasing spring 8 which in turn is secured to a suitable support 9. The lower end of the bracket member 7 extends adjacent the plunger 10 of an enclosed snap switch 11. It will be apparent that as the cam follower member is oscillated, the portion 7 thereof will press the plunger of the snap switch in and out for operating the switch mechanism.

In operation the cam follower member is biased toward engagement with both the cam 1 and plunger 10 by the biasing spring 8. As the cam

rotates clockwise it will rotate the cam follower in a counter clockwise direction about pivot 5, this causing the bracket 7 to move outwardly away from the snap switch thereby permitting the spring pressed plunger 10 to travel outwardly for operating the snap switch in one direction. It will be noted that as the cam continues to rotate, the portion 7 of the cam follower disengages from the plunger 10 and thus there is no restriction in motion of the cam follower in the counter clockwise direction by the control device or snap switch mechanism 11. When the drop-off section 12 of the cam passes under the follower 6 the biasing spring 8 rotates the cam follower in the clockwise direction, thereby depressing the plunger 10 of the snap switch 11. The portion 7 of the cam follower strikes a suitable stop which as shown is the case of the snap switch 11. At this time the roller 6 of the cam follower will not be in engagement with the lower surface of the cam. However, as the cam continues to rotate, the roller 6 will eventually be engaged. Upon further rotation from this point the cam follower will be rotated counter clockwise as previously described for once more permitting plunger 10 to move outwardly for operating the enclosed snap switch.

The point at which the above operation occurs is dependent upon the position of the movable pivot pin 5. In the embodiment disclosed this pin is carried by a gear 13 which is journaled at 14 substantially parallel with the pivot pin 5 but laterally spaced therefrom. Thus rotation of the gear 13 serves to bodily move the pivot pin 5 which in turn shifts the position of the cam follower 4. The gear 13 may be operated by a pinion 15 which in turn may be manually adjusted by means of a knob 16.

It will be noted that as the gear 13 is rotated in a counter clockwise direction from the position shown, it will carry the pivot pin 5 in a direction tending to rock the cam follower 4 about the plunger 10 as a pivot, this rocking occurring in a counter clockwise direction. This rocking of the cam follower in this direction will raise the roller 6 from the surface of the cam 1. As a result the cam must rotate a greater degree before it once again engages the cam follower. Thus rotation of the gear 13 in a counter clockwise direction has the effect of delaying the time at which the snap switch plunger is permitted to move outwardly by the cam follower. It follows that opposite movement of pivot pin 5 advances the time at which the snap switch is initially actuated.

While the invention is particularly adaptable

to a time switch mechanism as shown, it will be readily appreciated that the novel adjusting mechanism shown may be operated by other types of actuators than a time operated cam. It will also be apparent that the mechanism can be used for actuating other types of control devices than the snap switch shown.

Inasmuch as many variations may be made in the construction without departing from the scope of the invention, it is desired to be limited only by the appended claims.

What is claimed is:

1. In a controller, in combination, a movable actuator member, a control device, a follower member having a first portion in abutting relation to said actuator member and a second portion in abutting relation to the control device, said first portion being adapted to disengage the actuator member and said second portion being adapted to disengage the control device upon movement of the follower member in a single direction, biasing means for biasing the follower member toward engagement with the actuator member and control device, a pivot for said follower member, said pivot being constructed and arranged to bodily support said follower member, and adjustable means for moving the pivot of said follower member in a manner to vary the position of said actuator member at which the control device is actuated by said follower member.

2. In a controller, in combination, a rotary cam, means for rotating the cam, a control device, a follower member having a first portion in abutting relation to said cam and a second portion in abutting relation to the control device, said first portion being adapted to disengage the cam and said second portion being adapted to disengage the control device upon movement of the follower member in a single direction, biasing means for biasing the follower member toward engagement with the cam and control device, a pivot for said follower member, said pivot being constructed and arranged to bodily support said follower member, and adjustable means for moving the pivot of said follower member in a manner to vary the position of said cam at which the control device is actuated by said follower member.

3. In an electric circuit controller, in combination, a movable actuator member, a snap switch mechanism having an operating member, a follower member having a first portion adapted to be actuated by said actuator member and having a second portion arranged to actuate said operating member, a pivot for said follower member, a rotatable support for said pivot, said rotatable support having an axis of rotation parallel with said pivot but spaced laterally therefrom, and means for rotating said support to vary the position of said actuator at which the snap switch mechanism is actuated by said follower member.

4. In an electric circuit controller, in combination a movable actuator member, a stationary snap switch mechanism having an operating member, a follower member having a first portion in abutting relation with said actuator member and adapted to disengage the same, said follower member also having a second portion adapted to actuate said operating member, means biasing the follower member toward engagement

with said actuator member, a pivot for said follower member, said pivot being constructed and arranged to support said follower member, and adjustable means for moving the pivot of said follower member in a manner to vary the position of said actuator member at which the snap switch mechanism is actuated by said follower member.

5. In an electric circuit controller, in combination, a movable actuator member, a snap switch mechanism having an operating member, a follower member having a first portion adapted to be actuated by said actuator member and having a second portion in abutting relation to said operating member and adapted to engage and disengage the same, means biasing the follower member toward engagement with said operating member, a pivot for said follower member, said pivot being constructed and arranged to support said follower member, and adjustable means for moving the pivot of said follower member in a manner to vary the position of said actuator member at which the snap switch mechanism is actuated by said follower member.

6. In an electric circuit controller, in combination, a movable actuator member, a snap switch mechanism having an operating member, a follower member having a first portion in abutting relation to said actuator member and a second portion in abutting relation to the operating member, said first portion being adapted to disengage the actuator member and said second portion being adapted to disengage the operating member, a pivot for said follower member, said pivot being constructed and arranged to bodily support said follower member, and adjustable means for moving the pivot of said follower member in a manner to vary the position of said actuator member at which the snap switch mechanism is actuated by said follower member.

7. In an electric circuit controller, in combination, a cam, means for rotating the cam, a stationary snap switch mechanism having an operating member, a follower member having a first portion adapted to engage the cam and having a second portion arranged to actuate said operating member, a pivot for said follower member arranged to support the same, a rotatable support for said pivot, said rotatable support having an axis of rotation parallel with said pivot but spaced laterally therefrom, and means for rotating the support to vary the angular position of the cam at which the snap switch mechanism is actuated by said follower member.

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