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TIMERS

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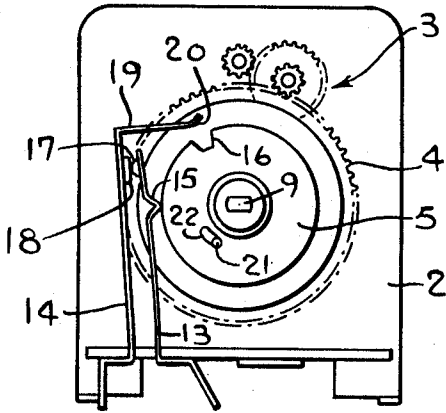


FIG. 1

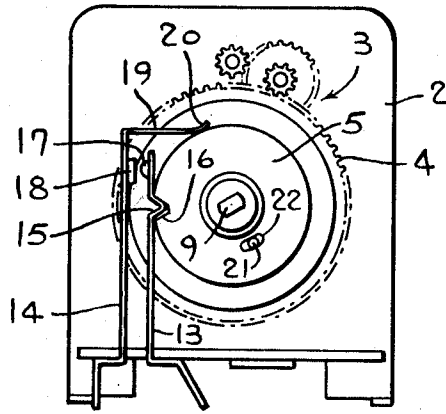


FIG. 2

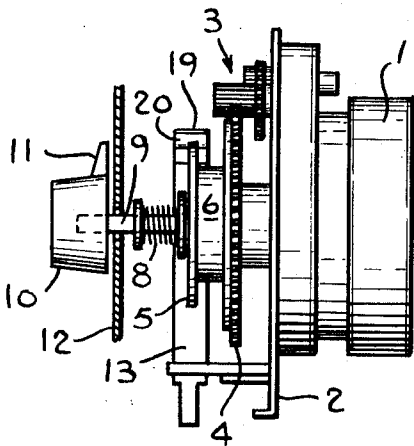


FIG. 3

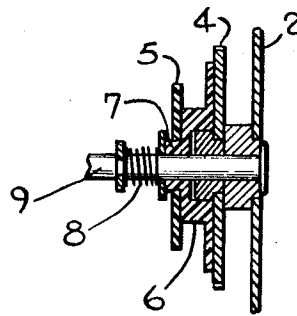


FIG. 4

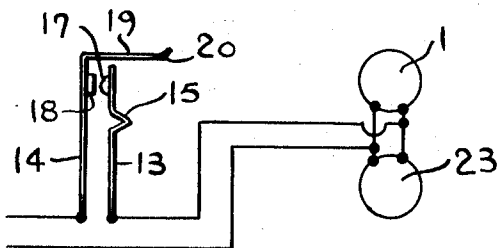


FIG. 5

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1

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TIMERS

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2 Claims. (Cl. 200—38)

This invention relates to timers. In timer construction as heretofore made, such for example, as interval timers, it is the usual practice to provide two blades or leaves which project from a support and which have contacts. One of the blades rests on a cam and constitutes a cam follower and has a projecting portion which drops into a notch cut in the cam. The cam is usually known as a "jump type" cam. It is driven by a synchronous motor through suitable reduction gearing, and the cam itself is manually set for the desired interval of time. When this interval has elapsed the projecting portion of one of the blades, the cam follower blade, drops into the notch of the cam and opens the contacts.

It is the usual practice to make these blades of spring strip stock, and it has been found that where the blades are supported merely at their ends that it takes very accurate adjustment to insure the correct working of the device. For example, if the blade opposite the cam operated blade is not adjusted properly, it may be so far out that the cam operated blade can never engage it. On the other hand, if it is positioned too far in, through an error in adjustment, the contacts will never open. Further than this, even if it is approximately correctly adjusted, there is a tendency for the blade opposite the cam following blade to vibrate and perhaps cause chattering of the contacts.

Various attempts have been made to remedy these defects. The principal one consists in providing a pin which extends outwardly from a supporting plate, and which engages the blade opposite the cam follower blade when the contacts open, thus preventing the cam follower blade from moving inwardly beyond the desired position and maintaining contact.

This invention is designed to overcome the above noted defects and objects of this invention are to provide a timer construction in which the cam follower blade has a projecting portion that drops into a notch when the cam is in proper position, and in which the blade opposite the cam follower blade has a projecting end portion that is approximately at right angles to the main body of the blade and rests upon the cam itself, when the cam has opened the contacts, to thus provide a stop for the blade opposite the cam follower blade, and to prevent chattering of the contacts, and also to insure correct operation of the timer.

Further objects are to dispense wholly with any projecting pin or stop for engagement with the blade opposite the cam follower blade, so that all that is necessary is to provide the two blades and eliminate the stop entirely, with one of the blades arranged to rest upon the cam itself when the contacts are open, both of the blades being biased towards the cam.

An embodiment of the invention is shown in the accompanying drawings in which:

Figure 1 is a face view of the device with the cover and associated parts removed, the contacts being shown in closed position, and the cam being set for the desired interval of time.

2

Figure 2 is a view similar to Figure 1 showing the contacts in open position after the lapse of the interval of time hereinabove mentioned.

Figure 3 is a side elevation with parts broken away and parts in section.

Figure 4 is a sectional detail through the cam and the adjacent portions of the device.

Figure 5 is a wiring diagram.

Referring to the drawings it will be seen that a synchronous motor has been indicated by the reference character 1, and is carried rearwardly of the plate 2. This motor, through reduction gearing, part of which is shown and indicated generally by the reference character 3, drives the main gear 4. The main gear in turn drives the cam 5.

The construction illustrated is what is commonly known as a "jump type" cam. The cam 5 rests or bears against the shouldered portion of a driving member 6, and fits over the hub 7 of such member and is driven by this member. The driving member 6 is interposed between the cam 5 and the main driving gear 4, and constitutes a slip joint or slip connection between the driving gear 4 and the cam 5. A spring 8 bears against the hub portion 7 of the driving member 6 and holds it in frictional engagement with the main gear 4. A shaft 9 extends through the cam and driver or driving member 6 and main gear 4, and has a tight fit with, or is otherwise secured to, the driving member 6 so that it will move the driving member 6 and the cam 5 whenever the shaft 9 is manually rotated.

For manual adjustment the hand knob 10 is secured to the extended portion of the shaft 9 and is provided with a pointer 11 to indicate on a scale, not shown, formed on the cover plate 12, the interval of time for which the device is set.

Fingers or contact members are indicated by the reference characters 13 and 14. The contact member or finger 13 is provided with a folded and projecting portion 15 which is adapted to fit into or drop into a notch 16 formed in the cam 5. The cam itself is preferably formed of insulating material.

Both of the contact fingers are of spring strip stock, and are provided with contacts 17 and 18, as may be seen from Figures 1 and 2.

Both of the spring fingers or contact fingers 13 and 14 are biased towards the cam, or to the right as viewed in Figures 1 and 2. The contact finger 14 is provided with an extension 19 which extends over the outer end of the contact finger or leaf 13, and is provided with a rounded or upturned end 20 which rides upon or bears upon the circular portion or periphery of the cam 5 when the contacts are in open position as shown in Figure 2.

The drive is through a pin 21 carried by the driving member 6 and projecting outwardly through a short slot or arcuate opening 22 formed in the cam 5. This construction is old and forms no part of the invention. It is provided so as to insure a quick break and complete opening of the contacts. For example, as seen in Figure 1, when the pin 21 is driven by the synchronous motor in a counterclockwise direction it engages one end of the slot 22, and drives the cam 5. However, when the projecting portion 15 of the finger 13 snaps into the notch 16 of the cam it does so with a quick motion and moves the cam 5 a slight amount in a counterclockwise direction. This provides a quick break.

Referring to the wiring diagram shown in Figure 5 it will be seen that the contact members 13 and 14 of the cam operated switch are connected in series with the load 23 and the driving motor 1, the driving motor and the load being connected in parallel. The purpose of

3

this arrangement is to stop the motor when the load circuit is opened.

In using the device the operator merely sets the cam through the medium of the hand knob 10, as shown in Figure 1, to thus close the circuit and allow the motor to drive the cam. This also closes the supply circuit to the load. When the interval of time has elapsed for which the cam has been set, the cam follower blade or finger 13 moves to the right as viewed in Figure 2, and moves away from the other finger or blade 14, and thus opens the circuit. The finger 14 cannot follow the finger 13, except for a very slight distance, as its projecting portion 19 immediately engages the rounded or circular portion of the cam 5 and thus arrests further motion of the blade 14.

It will be seen that this invention eliminates the use of a stop or a pin for preventing vibration of the blade 14 on the one hand, and also for preventing the blade 14 from following the blade 13 over beyond the desired position. Instead this invention provides a very simple means whereby the only requirement is the provision of extension 19 of the blade 14 which rests directly on the cam when the contacts are open as shown in Figure 2, thus eliminating any additional construction or complication.

Although this invention has been described in considerable detail, it is to be understood that such description is intended as illustrative rather than limiting, as the invention may be variously embodied and is to be interpreted as claimed.

I claim:

1. An interval timer comprising a switch construction including a cam having a circular portion provided with a notch, said cam being circular throughout except for said notch, motor means for driving said cam, a pair of spring blades biased towards said cam and supported adjacent one end and having outwardly projecting free ends and having cooperating contacts, the free end of one of said blades having a portion adapted to enter the

4

notch of said cam, the other of said blades constituting a cooperating blade and having a portion bent angularly with reference to the body portion of such blade and resting directly upon the circular portion of said cam when the cam follower blade is within the notch of said cam, whereby motion of the cooperating blade towards the cam follower blade is limited by the direct engagement of the angularly bent portion of said cooperating blade with the circular portion of said cam.

2. An interval timer comprising a switch construction including a cam having a peripheral portion provided with a depressed portion, said motor means being connected in series with said switch construction motor means for driving said cam, a pair of spring blades secured at one end and having free ends adjacent the peripheral portion of said cam and biased toward said cam, one of said blades constituting a cam follower blade and having a part adapted to engage the depressed portion of said cam, the other of said blades constituting a cooperating blade and having a portion bent angularly with reference to the body portion of the blade, the angularly bent portion of said cooperating blade resting directly upon the peripheral portion of said cam when said cam follower blade has moved away from the cooperating blade; whereby the coaction between said cam and the angularly bent portion of the cooperating blade limits the motion of the cooperating blade toward the cam follower blade.

30

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35