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C. F. AMOS

ELECTRIC TIMING SWITCH

Filed July 17, 1926

Fig. 1.

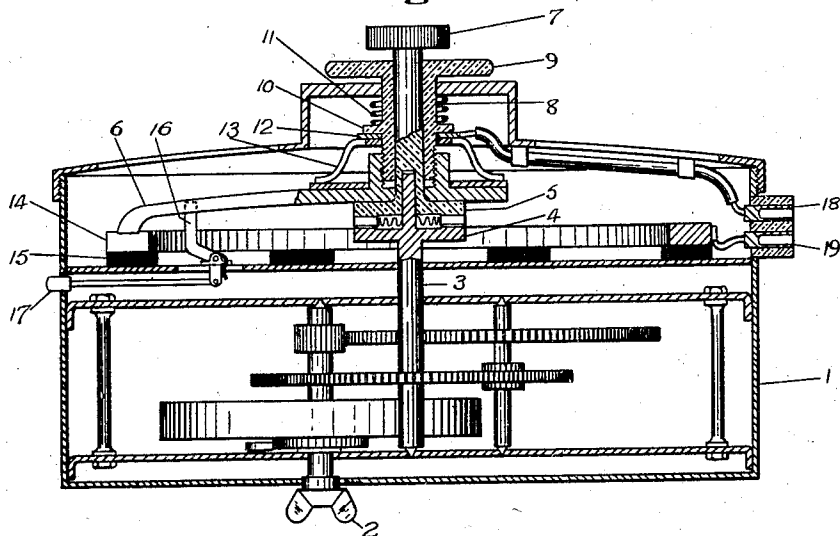


Fig. 2.

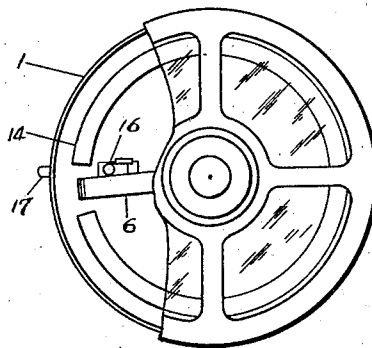


Fig. 3.

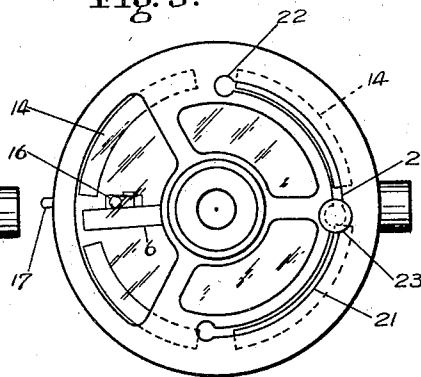


Fig. 4.

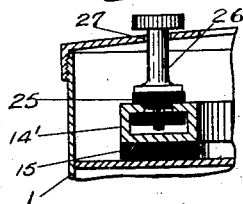


Fig. 5.

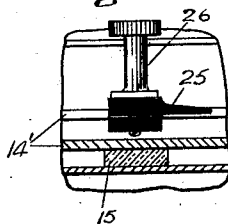


Fig. 6.

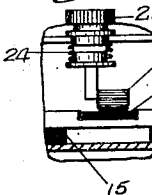
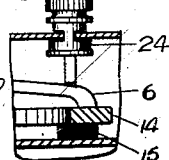


Fig. 7.



Inventor: C. F. AMOS.

By *Chaterin & Company*

ATTY'S

## UNITED STATES PATENT OFFICE.

CYRIL FREDRICK AMOS, OF ROCHESTER, ENGLAND.

## ELECTRIC TIMING SWITCH.

Application filed July 17, 1926, Serial No. 123,241, and in Great Britain May 25, 1926.

The invention concerns an electric timing switch, its object being to provide a simple and reliable switch which can be set to control an electric circuit for a predetermined time, and is more particularly suitable for use with electric toasters for the purpose of switching-off the toaster to prevent the toast from being burnt.

With this object in view, I provide a timing device somewhat similar to a clock, one hand of which is insulated and is adapted to be driven by the clockwork over an arcuate contact plate, the current passing there-through until automatically interrupted by the disengaging of the hand from the plate after a predetermined time. Means are provided for setting the hand (or contact arm) and for retaining it in set position until released at the appropriate time, and again for stopping the arm at selected points.

The invention will be more readily understood from the following description with reference to the accompanying drawings, wherein: Figure 1 is a sectional elevation showing the preferred form of device according to the invention, Figs. 2 and 3 are plan views to a reduced scale indicating alternative arrangements of the contact plate and adjacent parts, Figs. 4 and 5 shows an end and side view respectively of an adjustable stopping device to an enlarged scale, and Figs. 6 and 7 are similar views of an alternative stopping device such as is indicated in Fig. 3.

Referring more particularly to Fig. 1, in a casing 1 is arranged a clockwork mechanism, indicated more or less diagrammatically, adapted to be wound by a key 2 and to drive a spindle 3. On the upper end of spindle 3 is a part 4 of a multi-toothed clutch, the co-operating part 5 of which is of insulating material, carries a contact arm 6, and terminates in an operating knob 7 passing through the top of casing 1.

An insulating sleeve 8 is journaled concentrically upon the clutch portion 5, one end of said sleeve being adapted to screw into the contact arm 6, while its other end passes through the top of casing 1 and is furnished with a head 9. About the center of sleeve 8 is suitably provided a collar 10, between which and the casing is inserted a compression spring 11, while beneath said collar is disposed an electrical conductor 12 and a resilient spider 13 the extremities of which bear upon the contact arm 6. The end of

the contact arm 6 is adapted to move over an arcuate contact plate 14, and it will be readily seen that by turning the head 9 while the contact arm is held stationary, for example by means of knob 7, the pressure of the contact arm upon the contact plate 14 can be adjusted.

The contact plate is mounted upon insulating blocks 15 and does not form a complete circle, but is interrupted at the point where a releasable stop 16 is provided, as is best shown in Fig. 2. Thus, when the arm 6 is retained by the stop 16, as is shown in the drawings, it is insulated from the contact plate 14. The stop 16 is pivotally mounted, and is resiliently held in its raised position, as shown in Fig. 1. If the button 17, which projects through the casing 1 and is connected with the stop 16, is pressed in, the stop 16 is moved out of the path of the arm 6 and allows the latter to move over the contact plate, urged by the clockwork drive.

The conductor 12 and the contact plate 14 are respectively connected to terminals 18, 19 on the casing 1, and in use the latter are interposed in one of the current supply leads to the toaster, so that the latter will only operate so long as the current passes through the contact arm 6 and contact plate 14. The operation of the simple form of the device above described is as follows:—

The arm 6 is first set in the preparatory position, if necessary, by raising knob 7 to disengage the clutch 4, 5 and then turning the knob until arm 6 engages behind stop 16. Knob 7 is then released and the clockwork is wound to the full extent. When ready to commence toasting, button 17 is depressed and arm 6 immediately moves in a clockwise direction, and current flows through the toaster as the arm moves over the contact plate. The clockwork is so devised that the arm 6 normally takes, say five minutes to move completely over the contact plate. Thus, after a period of five minutes the toaster is automatically cut off by the arm 6 again coming into coincidence with the insulating gap in the contact plate. If this is found to be too long or too short a period the pressure of the arm upon the contact plate is reduced or increased by adjusting head 9.

Further means for adjusting the timing of the device, and increasing its range of utility are illustrated more particularly in Figs. 3 to 7. In the construction shown by

Figs. 3, 6 and 7, insulating pieces 20 are inlaid in the surface of the contact plate to divide same into a number of arcuate portions. A slot 21 is formed in the top of the casing 1, being provided with recesses 22 above the insulated portions of the contact plate. A sliding stop 23 is provided in slot 21, said stop having an enlarged portion corresponding in size to recesses 22, and a reduced portion corresponding to the narrower width of the slot 21 (vide Figs. 6 and 7). A small spring 24 is carried by the stop 23, and in use the stop 23 is slid along the slot 21 until it coincides with a selected recess 22, into which it enters and is thus held fast. The arm 6 when released will then travel over the contact plate, the current being interrupted momentarily each time the arm passes over one of the insulating pieces, at one of which it is finally arrested by the stop 23.

Another form of adjustable stop is shown in Figs. 4 and 5, and in this instance the contact plate 14' may be continuous, but is of special form, being recessed to form a guide for an insulating wedge piece 25. The latter is provided with a clamping screw 26 passing through a slot 27 in the casing, and can be adjusted and clamped at any desired point of the contact plate, e. g. over a semi-circular arc thereof. The contact arm is suitably shaped at its extremity so that normally it rests upon the upper surface of the contact plate, but on reaching the wedge piece 25 it is raised slightly so as to break the contact, and comes to a standstill.

It will be readily seen that the electric timing devices above described will be of great convenience in use, and may be variously modified without departing from the spirit of the invention. For example, the top of the casing may be marked, or even a dial provided as in a clock, for co-operation with the arm or with the adjusting knobs for the purpose of showing, or more accurately predetermining the timing of the device. Further it may be preferred to incorporate the device permanently in an electric toaster, as will be apparent to those skilled in the art without further explanation.

I claim:—

1. An electric timing switch comprising a

pivotal contact arm, an arcuate contact plate for co-operation with said arm, clockwork means for driving said arm over said plate, means for setting said arm, releasable stop means for holding said arm in set position until released, and adjustable means for automatically stopping said arm out of contact with the contact plate at selected points.

2. An electric timing switch comprising a casing, a contact arm pivoted in said casing, an arcuate contact plate secured in said casing for co-operation with said arm, clockwork means for driving said arm over said plate, a clutch device interposed between said contact arm and driving means, a clutch operating member extending through said casing and connected to the contact arm, releasable stop means for retaining said arm in set position until released, an operating button for said stop means extending through the casing, and means for automatically disengaging said contact arm and plate after a predetermined interval.

3. An electric timing switch comprising a casing, a contact arm pivoted in said casing, an arcuate contact plate secured in said casing for co-operation with said arm, clockwork means for driving said arm over said plate, a clutch device interposed between said contact arm and driving means, a clutch operating member extending through said casing and connected to the contact arm, means for adjusting the pressure between said contact arm and plate, releasable stop means for retaining said arm in set position until released, an operating button for said stop means extending through the casing, and means for automatically disengaging said contact arm and plate after a predetermined interval.

4. In an electric toaster, a timing switch comprising a pivotal contact arm and an arcuate contact plate for co-operation therewith interposed in the toaster circuit, clockwork means for driving said arm over said plate, means for setting said arm, releasable stop means for holding said arm in set position until released, and means for automatically disengaging said arm from the contact plate after a predetermined interval.

CYRIL FREDRICK AMOS.