

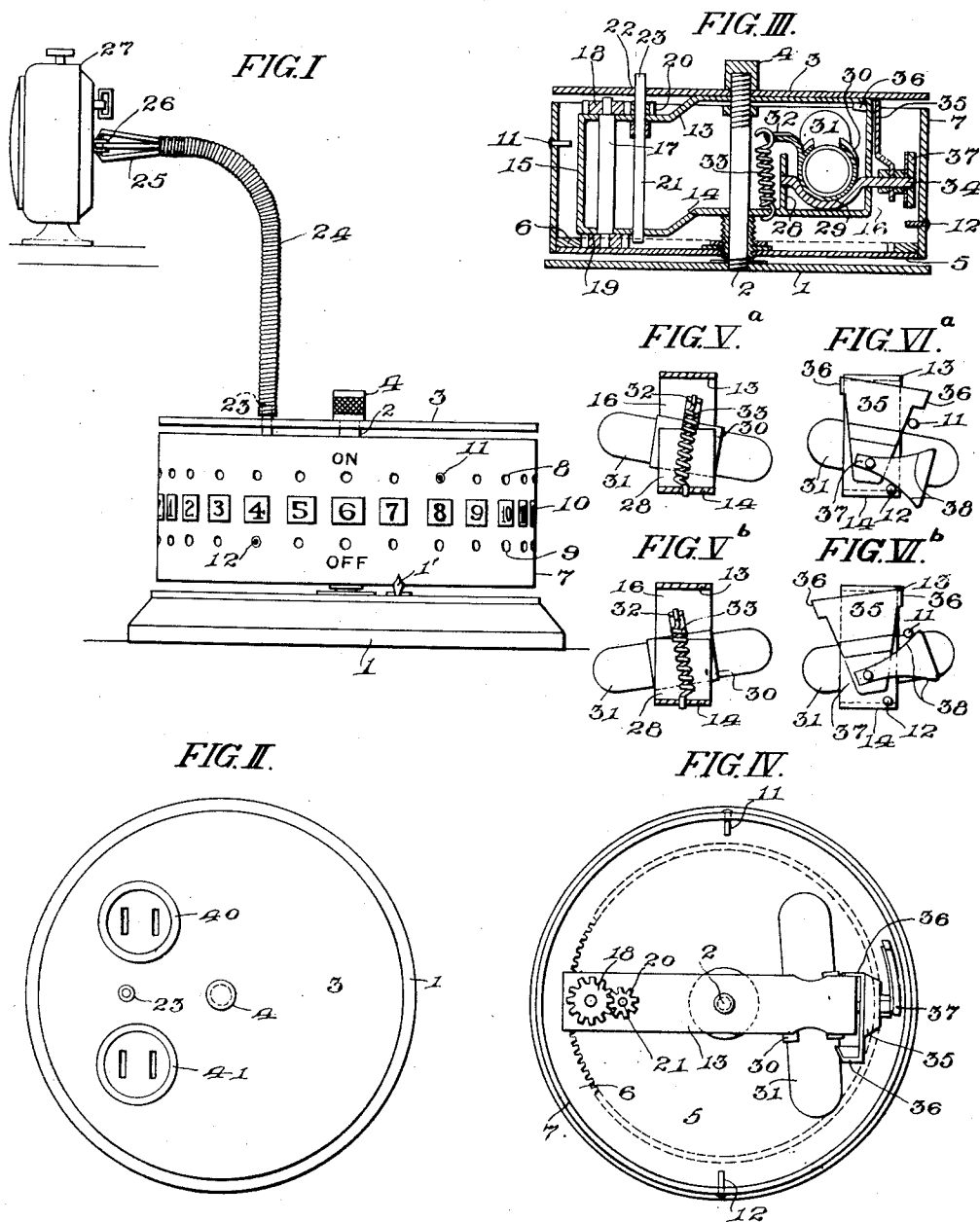
Dec. 10, 1940.

M. J. MADISON

2,224,792

SELECTIVE TIMER SWITCH

Filed May 24, 1939



MARTIN J. MADISON

INVENTOR

BY *J. Stuart Freeman*
ATTORNEY

UNITED STATES PATENT OFFICE

2,224,792

SELECTIVE TIMER SWITCH

Martin J. Madison, Philadelphia, Pa.

Application May 24, 1939, Serial No. 275,363

2 Claims. (Cl. 200—38)

The object of the invention is to provide improvements in selective timer switches, such as can be produced at relatively low cost and consequently available, for instance, to the many users of so-called neon and similar signs, that should be illuminated only during certain hours, and likewise to users of that vast number and variety of apparatus, that involves periodical starting and stopping in accordance with a pre-arranged time schedule, such for instance, as the operation of an ordinary radio receiving set, to pick up any desired series of either connected or disconnected broadcasts throughout a given time cycle. However, it is to be understood that, while only signs and radio sets have been specifically referred to, the present invention is adapted to control the operation of an infinite number of devices of all sorts, due to its extreme elasticity of adjustment and portability.

Another object is to provide a device of this character, which is initially independent of any form of clock movement whatsoever, but which can be operatively connected so as to be actuated by any form of clock movement having a rotatable element, such for instance as the minute or hour hand of the ordinary clock, as well as by means of so-called electric clocks, the difference between the switch mechanism being driven by the hour or minute hand being merely one of a change in gear ratios and not one of operating principles.

A further object is to provide in a device of this character the combination of a movable, preferably substantially cylindrical, hollow member provided with properly spaced regions representing times and intervals of time, at which some suitable form of obstruction, such as a pin, lug or the like, may be selectively shifted into the path of a switch actuating member, driven past such first member in accordance with the movement of the actuating clock mechanism, whereby such switch upon engaging one obstruction is shifted into closed position, and upon subsequently engaging another obstruction is shifted into open position, and this actuation of the switch being repeatable as many times as may be desired during a given period, such for instance as a twenty-four hour day.

With the objects thus briefly stated, the invention comprises further details of construction and operation, which are hereinafter brought out in detail in the following description, when read in conjunction with the accompanying drawings, in which Fig. I is an elevational view of a device comprising one embodiment of the inven-

tion, operatively attached to an ordinary clock, representing any available type of time indicating mechanism, or its equivalent; Fig. II is a top plan view of the switch mechanism per se; Fig. III is a vertical diametrical section through the same; Fig. IV is a plan view of the device, taken on a plane immediately beneath the top cover plate shown in Figs. I and III; Fig. V^a is a fragmentary elevational view of the switch from the spring or left-hand side, as viewed in Fig. III, with said switch in one extreme position; Fig. V^b is a similar view showing the switch in opposite position; Fig. VI^a is a similar view of said switch from the right hand side, as viewed in Fig. III, and corresponding in position with that shown in Fig. V^b; and Fig. VI^b is a view of said switch similar to Fig. VI^a, but in the position indicated by Fig. V^a.

Referring to the drawings, one embodiment of the invention is shown as comprising a base 1, to the central portion of which is rigidly secured a vertically extending shaft 2, while to the upper end of said shaft is fixedly secured a cover plate 3, by means of a detachable nut 4. Rotatably mounted upon the lower portion of said shaft, slightly spaced above the base 1, is a rotatable disc 5, provided with an annular rack 6 and provided also upon its peripheral edge portion with an upwardly extending cylindrical member 7, which latter is provided with at least two vertically spaced rows of apertures 8 and 9. These apertures may be of any desired number and spacing, and preferably continue throughout the entire circumferential extent of said cylindrical member, and represent any desired sub-division of a 24-hour day, or other unit of time. In the drawing, one of the apertures 8 and one of the apertures 9, is shown in each case as being positioned upon the vertically opposite sides of hour-indicating numerals 10, but it is to be understood that said apertures may be more closely spaced in order to additionally represent various sub-divisions of each hour unit, as for instance, quarter-, half-, and three-quarter hour periods, or otherwise as may be desired.

In the operation of this device, lugs or pins of any suitable size and shape are inserted through pairs of upper and lower apertures, as for instance indicated by the pins 11 and 12, shown in Figs. I and III. As indicated in Fig. I, the upper row of apertures 8 and the lower row of apertures 9 represent respectively "on" and "off" supporting means for the switch actuating pins 11 and 12.

Rotatably mounted upon the shaft 2, between the fixed disc 5 and cover 3, is a substantially

rectangular hollow frame, comprising vertically spaced, oppositely extending arms 13 and 14, connected together at their oppositely extending free end portions by vertically arranged bars 15 and 16. At one end said frame is provided with a vertically extending shaft 17, provided upon its upper and lower ends, respectively, with gears 18 and 19, the lower of said gears being in mesh with the rack 6, while the upper of said gears is in mesh with a smaller gear 20 carried by a second vertically extending shaft 21, also supported by said frame arms 13 and 14 and in addition extending freely upwardly through an aperture 22 in the cover 3, to provide a projecting end portion 23 to which is preferably detachably secured one end of a flexible shaft 24, the opposite end of which shaft is provided with resilient fingers 25, adapted to detachably but normally firmly grip that shaft 26 of a clock or equivalent mechanism 27, which rotates in accordance with the minute hand or the hour hand thereof, the only difference being that if the minute hand shaft is engaged, a different ratio of reduction gears 20, 18, 19 and 6, is required than if the hour hand shaft is thus engaged.

The opposite end portion of the lower frame arm 14 to that which supports the shaft 17 and 21 is provided with an up-standing arm 28, spaced inwardly from the vertical arm 16, and together therewith forms a pivotal support for a cradle 29 within and to which is secured any suitable supporting means 30 for a switch element, which in this instance comprises a mercury switch 31, said switch supporting means 30 being also provided with an extension 32, between which and said frame arm 14 extends a contraction spring 33, the purpose of which is to yieldingly maintain said switch element 31 in either of its angularly opposite positions, as indicated, for instance, in Figs. V^a and V^b, as well as in Figs. VI^a and VI^b. The cradle 29 is provided with a radially outward extension 34, which carries first an upwardly extending arm 35, provided with laterally directed offsets 36, for alternately engaging the upper portion of the frame arm 16, to limit the degree of movement of said cradle and the switch carried thereby, while said cradle extension is provided in the second place with a substantially horizontally extending actuating lever 37, provided with oppositely directed upper and lower divergent cam surfaces 38, which alternately extend into the path of the relatively movable time-designating pins 11 and 12, as indicated in Figs. VI^a and VI^b.

In the operation of this device, the same may rest upon any suitable support, such as a shallow base plate (Fig. III) or a higher block base (Fig. I), while the actuating clock mechanism may rest upon the same or other convenient support. As the particular time indicating hand of said clock mechanism rotates in the usual manner, it causes a rotation of the shaft 21 and 17 through the interposed flexible shaft 24. This, in turn, effects a rotation of the cylindrical

member 7 with respect to a fixed pointer 1' and also the frame 13-16, switch element 31 and actuating lever 37 carried thereby. Thus, as said lever with its attached switch element in "off" position, encounters a pin 11 in one of the upper row of apertures, said lever is shifted by said pin so as to shift said switch element into "on" position, where it remains until said lever next encounters a pin 12 in one of the lower row of apertures 9, thereby causing said switch element to be again shifted into "off" position. Similarly, this actuation of the switch element into "on" and "off" positions may be effected as many times as desired during a twenty-four hour or other specified period, as indicated by the indicia and spacing of the apertures 8 and 9 upon the cylindrical member 7.

Finally, by suitably wiring said switch 31 to a pair of twin receptacles 40 and 41 carried by the cover plate 3, shifting of said switch respectively connects or disconnects an electrically actuated or energized device, connected through one of said receptacles to a source of current connected to the other of said receptacles.

Further than the foregoing, it is to be understood that this disclosure represents merely one construction, whereby the invention can be put into practice, wherefore there are probably innumerable variations of all substitutions for the same, which still fall within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent of the United States is:

1. A hollow rotary member adapted to be moved at constant speed and provided with time indicating indicia, a relatively stationary supporting member within said first member, an electric mercury switch carried by said stationary member within said hollow member, selectively positioned means carried by said rotary member corresponding to desired times and time intervals as indicated by said indicia and engageable with said switch in adjustable sequence, to automatically tilt said switch in opposite directions to on and off positions at predetermined time intervals.

2. A hollow rotary cylindrical member comprising the outer wall of a casing and having spaced rows of regularly spaced apertures identified by time-indicating indicia, pins adapted to be inserted through and project from said apertures in selective arrangement, a relatively stationary member within said first member, a tiltable mercury switch carried by said stationary member within said hollow member and alternately in the paths of said pins when in said apertures, and means adapted to be attached to and rotatable with the hands of a clock movement, and connected through reduction gears to said rotary member, to actuate said rotary member and thereby said switch in accordance with said clock hands.

MARTIN J. MADISON.