Aug. 6, 1940. A. KUTTES 2,210,299

TIME CONTROLLED ACTUATING MECHANISM

Filed Nov. 28, 1938 2 Sheets-Sheet 1

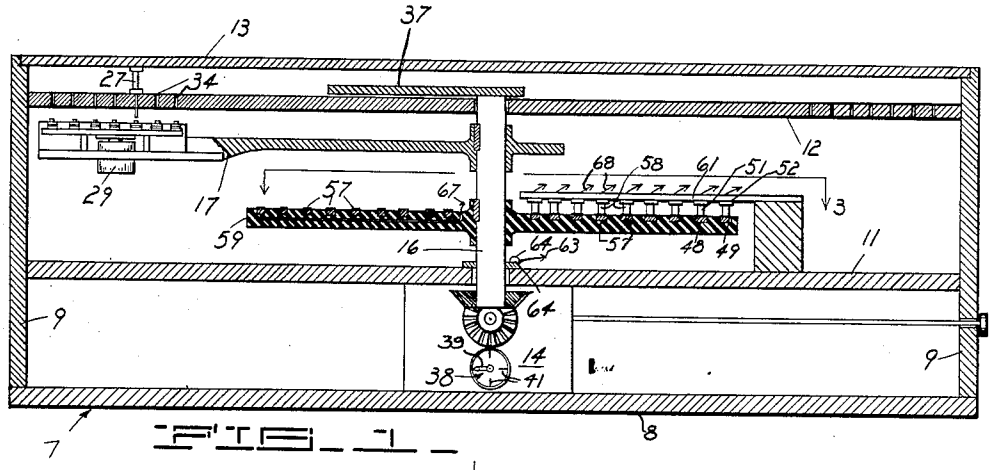


FIG. 1



FIG. 3

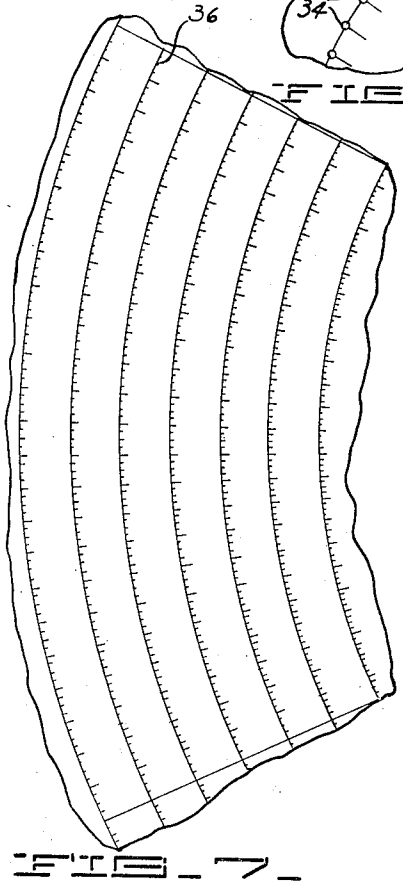


FIG. 7

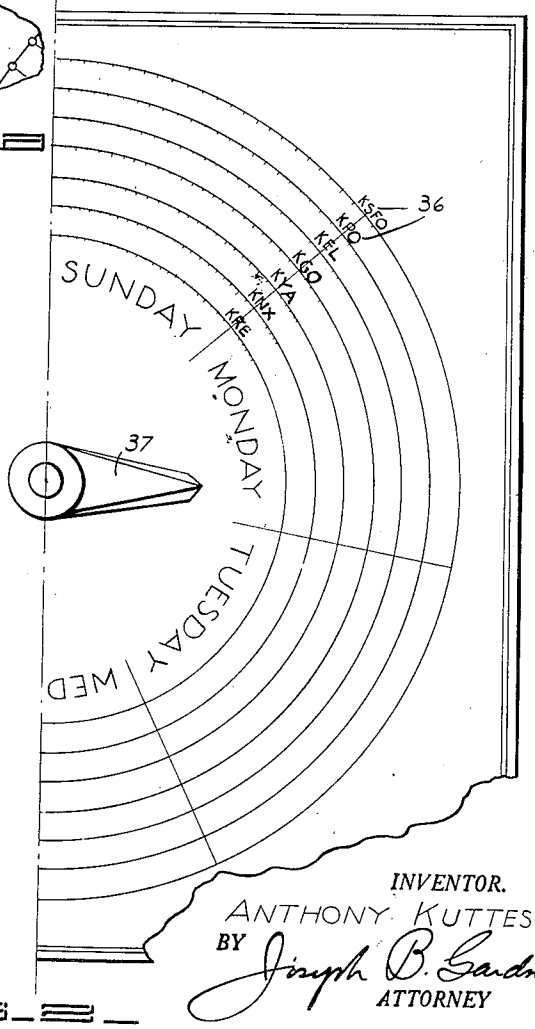


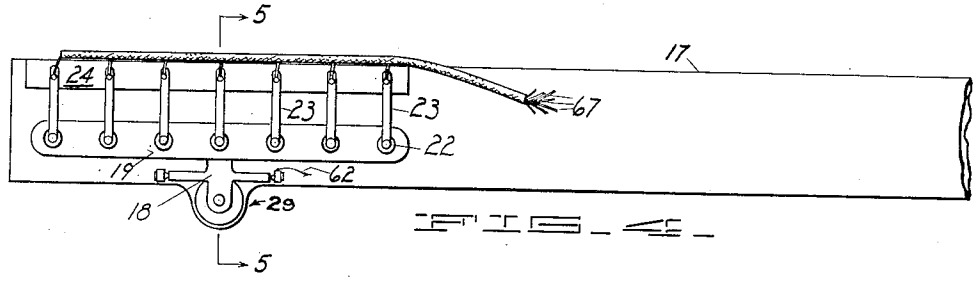
FIG. 2

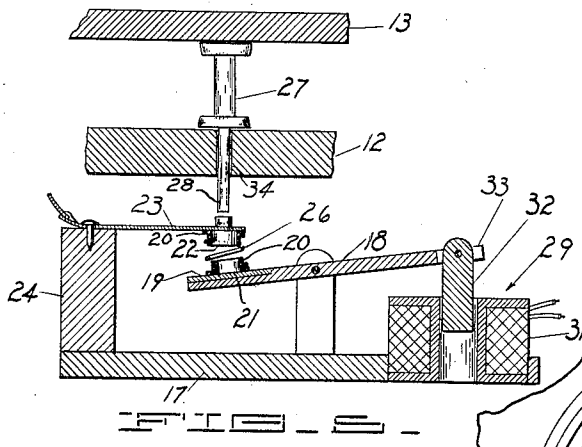
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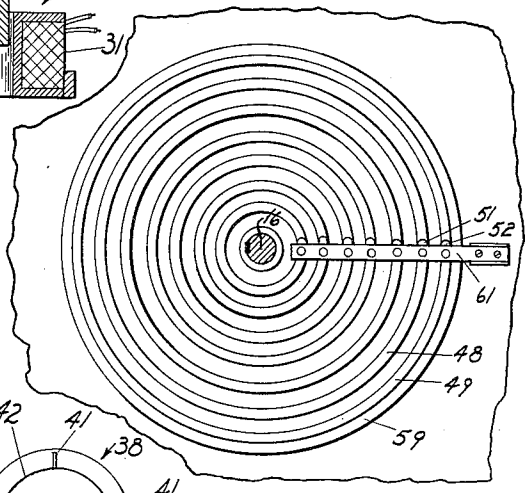
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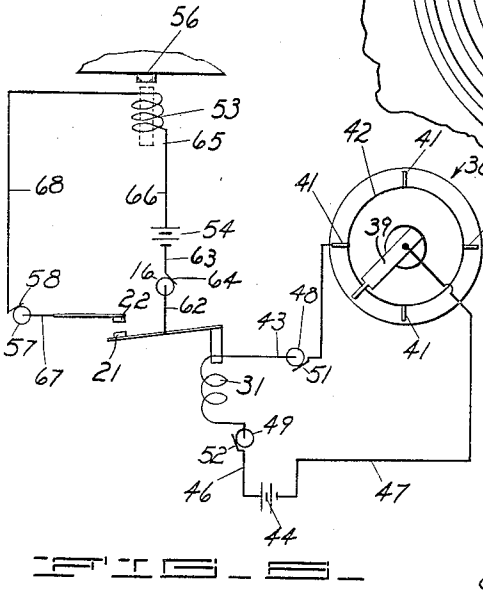
TIME CONTROLLED ACTUATING MECHANISM

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TIME CONTROLLED ACTUATING MECHANISM

Anthony Kuttes, Oakland, Calif.

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7 Claims. (Cl. 200—35)

The invention relates to mechanisms arranged to operate a plurality of devices or control a plurality of electric circuits or the like in a pre-selected manner at pre-selected time intervals.

An object of the invention is to provide an apparatus or mechanism of the character described which will effect the operation of a plurality of devices or units of machinery or apparatus in a manner whereby the operation of each of said units may be pre-selected as to operating time for a long period in advance, such as during a day or week cycle, and to accomplish this with an apparatus which is considerably simpler and less expensive than other types of similar apparatus heretofore available and which will at the same time be sturdy in construction and substantially positive and fool-proof in operation.

Another object of the invention is to provide an apparatus of the character described which is particularly adapted for use in connection with radio receivers and may, when so applied, be used to select any of a plurality of broadcasting stations at predetermined time intervals throughout the full period of a day or a week.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawings and description may be adopted within the scope of the invention as set forth in the claims.

Referring to said drawings:

Figure 1 is a vertical cross-sectional view of a time controlled actuating mechanism constructed in accordance with the present invention.

Figure 2 is a fragmentary plan view of the apparatus shown with a top cover plate removed.

Figure 3 is a horizontal sectional view taken substantially on the plane of line 3—3 of Figure 1.

Figure 4 is an enlarged plan view of a part of the mechanism.

Figure 5 is a vertical cross-sectional view of the part of the mechanism illustrated in Figure 4, and is taken substantially on the plane of line 5—5 of Figure 4.

Figure 6 is a schematic wiring diagram of the electrical circuit involved in the mechanism.

Figure 7 is an enlarged fragmentary plan view similar to Figure 2.

Figure 8 is a fragmentary view similar to Figure 7, but further enlarged.

The time controlled actuating mechanism of the present invention and as disclosed in the accompanying drawings consists briefly in a plurality of electric switches which are adapted for connection in a plurality of control circuits, and which are displaced in unison with a constant rate of speed in synchronism with time through predetermined paths of movement, and means mounted at predetermined distances along the course of movement of said switches cooperating with means for causing an engagement of said switches by said first means and operation of said switches at predetermined time intervals.

Referring more particularly to the accompanying drawings the apparatus comprises a support 7, here in the form of a box-like enclosure having a bottom wall 8, side walls 9, intermediate horizontal walls 11 and 12, and a removable top cover 13. Mounted within the support at the bottom thereof is a clock motor 14 which may be of either a spring or electric type, and which is geared to a vertical center shaft 16 to provide a constant speed rotation of said shaft in synchronism with time, whereby said shaft will make one complete revolution in a desired period or cycle of operation. For the present purpose of disclosure and desirably where the apparatus is adapted for use in pre-selection in radio programs, the shaft is geared to the motor to rotate one complete revolution in one week. Carried by the shaft 16 for rotation therewith is an arm 17 which is positioned intermediate the walls 11 and 12 and adjacent to and spaced from the wall 12, and is adapted to rotate with the shaft with a plane substantially parallel to the wall 12. Mounted on the arm 17 adjacent the outer end thereof is a member 18, which is provided with a part 19 movable vertically with respect to the arm 17 and to and from the wall 12. Carried on the part 19 of the member 18 are a plurality of switch contact members 21 which are spaced radially from each other relative to the arm. A second set of contact members 22 are supported by means of spring arms 23 carried on an upstanding part 24 of the arm 17 directly over the contact members 21 (see Figure 5). Mounted between the contact members 21 and 22 but insulated therefrom by means of washers 29 and resiliently resisting their engagement is a helical spring 26 which normally holds the contact members apart, even when the part 19 of the member 18 is raised in the direction of the contact member 22. To produce a contact between the lower contact member 21 with the upper contact member 22, I provide for the

mounting in the plate 12 of a plurality of pins 27, the lower end 28 of which extends into proximity to the upper contact member 22 and engages this member upon vertical movement of the part 19, so as to stop the upward movement of the contact member 22 and enable engagement thereof by the contact member 21. In accordance with the present construction, a vertical movement of the part 19 of the member 18 is effected by pivoting the member 18 to the arm 17 and arranging the part 19 at one end of the member 18. Vertical movement of the part is produced by means of an electro-magnetic device 29 carried by the arm and including an electric coil 31 on the arm and a magnetic-plunger 32 secured to the opposite end 33 of the member 18, whereby upon energizing of the coil 31, the end 33 of the member will be rocked about its pivotal connection to the arm to displace the opposite end 19 of the member upwardly towards the upper set of contact members 22.

In accordance with the above described arrangement, each pair of contact members 21 and 22 are spaced radially from the other pairs of contact members, so that upon rotation of the arm 17, the pairs of contact members will pass around circular concentric paths or courses of movement. In conformity with this arrangement, I provide in the wall 12 overlying the arm 17 a plurality of openings 34 for the receipt of the pins 27 aforesaid and which openings are arranged in concentric sets aligned with the concentric paths of the contact members and spaced circumferentially at predetermined distances in each set of openings. Where the apparatus is adapted for use with a radio receiver in effecting the selection of programs which frequently change at fifteen-minute intervals, the openings 34 in each set are spaced from each other circumferentially by a distance equivalent to the travel of the arm 17 during the period of fifteen minutes. Suitable indicia 36 (see Figures 2 and 7) are preferably mounted on the upper side of the wall 12 for indicating the several rings or sets of openings and the time interval spacing between openings in each ring. In this manner, one pin 27 may be placed in one of the sets of openings at each time interval to engage and operate the electric switch contact raised into engagement therewith. A cover plate 13 is preferably mounted over the top of the pins 27 to prevent the raising of the pins away from the contact members. An arm 37 may be mounted on the upper end of shaft 16 for indicating the time of day and also the position of the arm 17 underlying the wall 12.

Means for energizing the electro-magnetic device 29 for raising the switch contact members at predetermined time intervals as above described, is here effected by means of a rotary electric switch 38 connected to the motor 14 and having a rotary switch arm 39 and a plurality of circumferentially spaced contacts 41 which are engaged by the arm at predetermined time intervals, for example, fifteen minutes. The contacts 41 are here connected together by an annular conductor 42, and the latter is electrically connected to one side of the coil 31 by means of a conductor 43. The other side of coil 31 is connected to one side of a source of electric potential 44 by means of a conductor 46, while the other side of the source is connected by conductor 47 to the switch arm 39. In the apparatus the connections to the coil 31 are made through a pair of slip-rings 48 and 49 on the shaft 16 and stationary brushes 51 and 52 on the support.

Contacting members 21 and 22 may be connected to any external electric circuit for operation thereof in a time controlled manner provided by the foregoing mechanism. As here shown, a plurality of electro-magnetic actuators 53 are connected in an electric circuit (see Figure 6) with the contact members 21 and 22 and a source of electric potential 54, and the magnetic actuators 53 are mounted in operating relation to a set of push-buttons 56, such as used in a radio receiver for selecting various broadcast programs and for turning the receiver on and off. These actuators 53 are connected to the rotating switch contact members 21 and 22 by means of a plurality of slip-rings 57 and brushes 58 carried by the shaft and support respectively. In the present embodiment, the slip-rings 57 as well as slip-rings 48 and 49 aforementioned, are formed as flat annular rings carried by a disc 59 of electric insulation material, on the shaft 16 while the brushes 58 and 51 and 52 are supported on a stationary arm 61 carried by the support wall 11. The contact members 21 are connected in common by the member 19 which is electrically connected to the shaft 16 by members 18 and 17. This connection is shown as conductor 62 and the shaft and bearing as slip-ring and brush respectively in Figure 6. A conductor 63 is connected to a bearing 64 (see Figure 1 and shown as brush in Figure 6) for the shaft and to one side of the source of potential 54. The other side of the source of potential is connected by conductor 66 to a common side 65 of all of the actuators 53. The other sides of the actuators are connected by a plurality of conductors 68 (shown as arrows in Figure 1) to the several brushes 58. The slip-rings 57 are connected by conductors 67 to the contact members 22 to complete the electric circuit.

I claim:

1. A time controlled actuating mechanism for use with a plurality of electric circuits comprising, a plurality of electric switches adapted for connection in said circuit, means for moving said switches in synchronism with time through a predetermined course of movement, a plurality of members positionable along said course of movement and operative to engage and operate said switches, and means operative at predetermined time intervals to produce a relative displacement between said switches and members for causing the operation of said switches.

2. A time controlled actuating mechanism for a system including a plurality of electro-magnetic actuators comprising, a plurality of pairs of electric switch contact members electrically connected to said actuators for operating same upon closing of said pairs of contact members, means for moving said pairs of contact members in unison and at a constant speed through predetermined paths of movement, a plurality of members selectively positionable in said paths and at predetermined positions therealong, and means operative at predetermined time intervals to produce a relative displacement between said switches and members to cause the latter to engage one of said pairs of contact members to cause the electrical engagement thereof.

3. A time controlled actuating mechanism for a system including, a plurality of electro-magnetic actuators comprising, a plurality of pairs of electric switch contact members electrically connected to said actuators for operating same upon closing of said pairs of contact members, means for moving said pairs of contact

members in unison through a circular path at a constant rate of speed to define a plurality of concentric paths of movement of said pairs of switch contact members, a plurality of members selectively positionable in concentric rings at predetermined positions therealong, said rings being substantially aligned with said paths and in a plane substantially parallel to and longitudinally spaced from said paths, and means operative at predetermined time intervals to displace said pairs of contact members in the direction of said second named members to cause an engagement of said contact members by said second named members and a closing of the electric circuit through said contact members.

4. A time controlled actuating mechanism comprising, a support, an arm rotatably carried by said support, means for rotating said arm in synchronism with time, a plurality of electric switches carried by said arm in radially spaced position thereon and movable in unison in an axial direction parallel to the axis of rotation of said arm, magnetic means for axially displacing said switches in unison, means for energizing said magnetic means at predetermined time intervals, and a plurality of members carried by said support and positionable in circumferentially and radially spaced position relative to said switches for engagement with and operation of said switches upon axial displacement thereof as aforesaid.

5. A time controlled actuating mechanism comprising, a support, an arm rotatably carried thereby, means for rotating said arm in synchronism with time, a pivoted member carried by said arm, spaced electric contact members on said first member movable relative to each other in one direction, magnetic means for rocking said pivoted member on said arm in said direction, means carried by said support and engageable with one of said contact members upon movement of said pivoted member by said magnetic means to cause engagement of said contact members, means for energizing said magnetic means at predetermined time intervals, and an electrically controlled actuator connected to said contact members.

6. A time controlled actuating mechanism comprising, a support, a constant speed motor carried by said support, a shaft driven by said motor, an arm carried by said shaft, a member carried by said arm for movement relative thereto in a direction parallel to said shaft, a plurality of electric switches mounted on said member in radially spaced relation relative to said shaft to define a plurality of concentric paths of movement upon rotation of said shaft, a plurality of members carried by said support in axial spaced relation to said paths of movement, an electro-magnetic means for axially displacing said first member relative to said arm for engagement and operation of said switches by said second named members, and means for energizing said electro-magnetic means at predetermined time intervals.

7. A time controlled actuating mechanism comprising, a support, a constant speed motor carried by said support, a shaft driven by said motor, an arm carried by said shaft, a member pivoted to said arm for movement of a part of said member longitudinally of said shaft, a plurality of pairs of contact members mounted on said part with said pairs spaced radially from each other to define concentric paths of movement, the contact members of each pair being normally spaced longitudinally from each other, a stationary plate mounted across the axis of said shaft in substantially parallel relation to said arm, said plate being provided with a plurality of sets of circumferentially spaced openings concentric with said shaft and with each set radially spaced from the others to position said sets in longitudinal alignment with said paths, a plurality of pins positionable in said openings and extending longitudinally from said plate for engagement with one of a pair of said contact members upon movement of said part longitudinally to thereby cause engagement of said contact member with the other of the pair, and time controlled means for effecting said longitudinal movement of said part at predetermined time intervals.

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