

Sept. 27, 1960

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2,953,938

TIMER DIAL

Filed Aug. 12, 1957

2 Sheets-Sheet 1

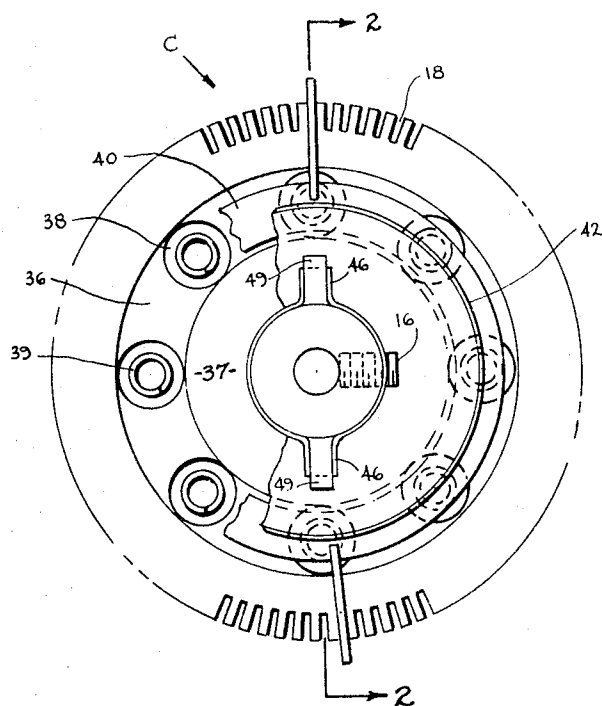


Fig. 1

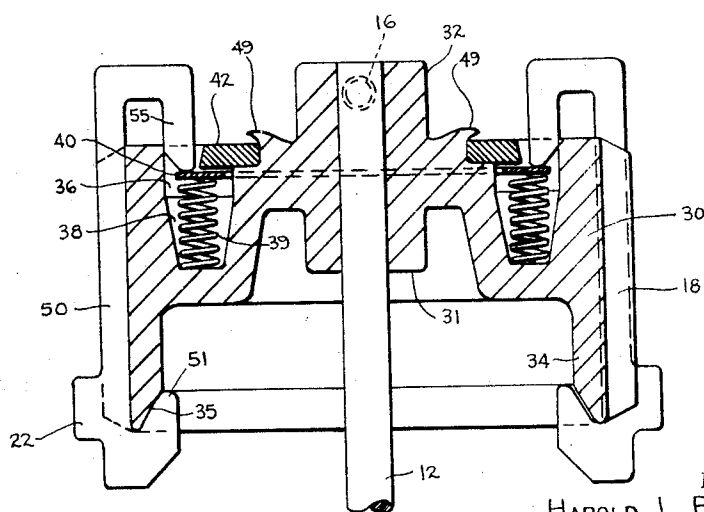


Fig. 2

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2 Sheets-Sheet 2

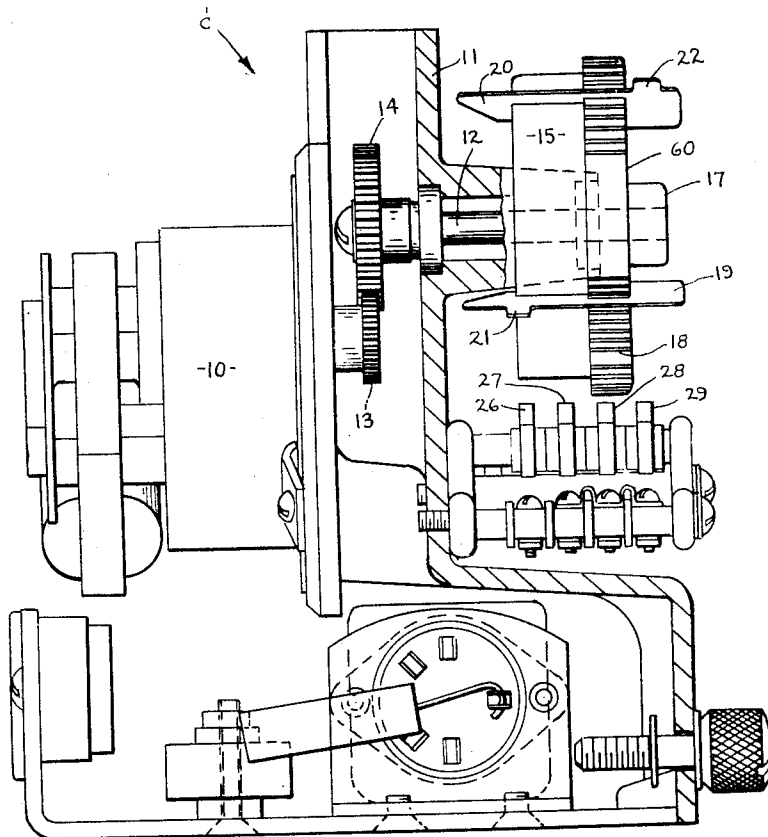


Fig. 3

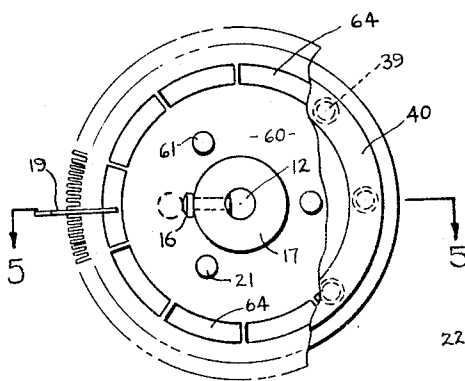


Fig. 4

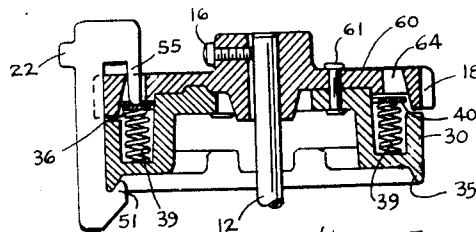


Fig. 5

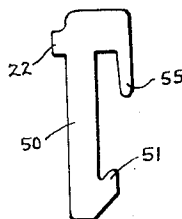


Fig. 6

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2,953,938

TIMER DIAL

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Filed Aug. 12, 1957, Ser. No. 677,527

7 Claims. (Cl. 74—568)

This invention relates to and has as an object a new and improved timer dial for use in connection with cycle timers of the type used for traffic signal controls as disclosed in Patent No. 2,301,999, issued November 17, 1942, to C. H. Bissell.

Essentially, the timer dial consists of a cylindrical body having a plurality of circumferentially spaced axially extending slots formed on the periphery of the body. The body is formed with an annular or cylindrical portion at one end, and an annular groove, or recess, concentric with the center of the body at the opposite end. A pressure ring is supported in the annular groove and is urged outwardly thereof by a plurality of compression springs. A plurality of switch actuating keys having a hook at one end and a tongue at the other end are mounted in the axial peripheral slots on the body by latching the hook of the key over the cylindrical end of the body, the tongue of the key being received in the annular groove so that the tongue is supported and spring biased outwardly by the pressure ring and the compression springs to yieldably latch the hook of the key on the cylindrical end of the body. Each of said keys is formed with one or more switch actuating ears, so that when the dial is mounted on a shaft for rotation adjacent a plurality of switches, each of said ears will actuate one of said switches once in each revolution of the dial. Consequently, the keys may be readily removed and adjustably positioned on the dial in order to give a different timing function to the cycle timers.

Accordingly, it is an object of this invention to provide a timer dial of such construction that the switch actuating keys may be readily and conveniently removed from the dial for adjustable positioning on the dial and wherein the keys are held firmly on the dial, when the dial is being rotated, to actuate the switches.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

In the drawings:

Figure 1 is a front elevational view, with parts broken away, of one of the preferred forms of the timer dial.

Figure 2 is a section taken on line 2—2, of Figure 1.

Figure 3 is a side elevational view of another form of timer dial shown mounted on a cycle timer and wherein the cycle timer is shown partly in section.

Figure 4 is a front elevational view, shown partly broken away, of the timer dial of Figure 3.

Figure 5 is a section taken on line 5—5, Figure 4.

Figure 6 is a plan view of the timer key used in connection with the timer dial shown in Figures 3, 4 and 5.

A timer arrangement with which the dial structure of this invention may be used is shown in Figure 3. A motor 10 is mounted on the rear side of a supporting frame plate 11 and is operatively connected to a shaft 12

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by gears 13, 14. The dial body, indicated at 15, is fixedly secured to the shaft 12, as by a set screw 16. The dial body is formed with a multiplicity of axially extending switch actuating key slots 18 in which are mounted keys, such as 19, 20, Figure 3, formed with projections 21, 22, respectively, which extend radially outwardly from the dial body 15.

A series of switches having actuators 26, 27, 28, 29, are mounted on the face plate 11 below the dial structure, the arrangement being such that the ears of the keys engage and operate the switch actuators 26—29. In the arrangement shown in Figure 3, the ear 21 of key 19 will engage and actuate the actuator 26. The ear 22 of key 20 will operate the actuator 29. The slots 18 are spaced circumferentially about the dial whereby the keys may be positioned in various selected ones of the slots and have ears, such as 21, 22, located at different positions throughout the length of the keys to effect operation of selected ones of the switches in a desired sequence.

Referring to Figures 1 and 2, the dial consists of a circular body or back member 30 having a hub portion 31 extending inwardly and a hub portion 32 extending outwardly, this elongated hub being apertured to receive the motor driven shaft 12 to which it is affixed by the set screw 16. The inner end portion 34 of the body has an open end wall of cylindrical formation to provide an annular end edge or circular rib 35. The opposite end of the main body casting is formed with an annular groove or recess 36, in the bottom wall of which there are a plurality of sockets 38 in which are mounted compression springs 39 acting to urge a washer or circular ring member 40 outwardly. The outward limit of the washer 40 is determined by a circular outer or front body member 42 formed with a central aperture to receive the outer hub portion 32, and is also formed with a pair of radially extending slots to receive projections 46 extending radially from the hub 32. These projections are swedged downwardly and outwardly to provide ears 49 overlying the washer 42 and fixedly securing it to the shoulder 37 formed by the recess 38 and the hub 32 on the body 30.

The keys are formed from sheet metal and consist of an elongated intermediate portion 50 formed at one end with a hook portion 51 for hooking over the end 35 of the cylindrical body portion 34. The keys at their opposite ends are formed with tongue portions 55 extending inwardly toward the hook portions 51 and in spaced relation to the intermediate portions 50. These tongues 55 are inserted in the annular recess 36 against the washer 40, and the key is then moved axially inwardly of the body, compressing the springs 39 until the hook portion 51 can be hooked over the inner end 35 of the dial body. The key is then moved into the selected slot in parallel relation to the shaft 12 and permitted to be moved axially outwardly by the springs 39. In this manner, it will be seen that the keys are detachably retained in the slots 18 and are readily removable therefrom by reversing the operation—that is, first moving the key inwardly against the action of the springs 39 so that the hook portion 51 can be detached, or unhooked, from the inner end of the body whereupon the key is removed by moving it axially outwardly from the dial body.

In the arrangement shown in Figures 3, 4 and 5, the body is also of two-piece construction wherein the back member or rear portion 30 is attached to an outer or front member 60, as by rivets 61, the outer member 60 being provided with the hub portion mounted upon the shaft 12 and being formed with the annular recess 36 and the key receiving slots 18. In this arrangement, ac-

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cess to the washer 40 by the tongue portions 55 of the keys is had through slots 64.

It will be apparent that while the keys can be conveniently inserted and removed from the slots 18, they are nevertheless securely held in the slots because of the hook end portions 51 and the tongue portions 55 engaging the dial body, whereby the keys are not displaced during operation of the timer.

What I claim is:

1. A timer dial comprising front and back cylindrical members, a plurality of removable switch actuating keys carried in axial peripheral slots formed on one of said members, said members being fixed together for rotation, means mounted between said front and back members for yieldably urging a plurality of keys forward in said axial peripheral slots, said back member being formed with an open end wall, said open end wall being co-operable with said means for releasably locking said keys on said dial, and said keys being formed with switch actuating ears.

2. The invention of claim 1, wherein said means includes an annular groove formed in said back member, a plurality of circumferentially spaced axially extending recesses in said back member communicating with said groove, a plurality of springs mounted in said recesses, a pressure ring mounted in said groove and acted on by said springs, said front member acting to retain said pressure ring in said groove, each of said keys being formed at its outer end with a tongue impinging upon said pressure ring and a hook at its inner end, said hook being latched over the open end wall of said back member.

3. The invention of claim 2, wherein said axial peripheral slots are formed on said front member.

4. The invention of claim 2, wherein said axial peripheral slots are formed on said back member.

5. A timer dial comprising a cylindrical body formed on its periphery with a plurality of axially extending circumferentially spaced apart slots, one end of said body being formed with a circular rib adjacent the periphery thereof; a circular member mounted at the opposite end of the body, means yieldingly urging said circular member axially outwardly from the body, switch actuating keys mounted in selected ones of said slots, each of said

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keys being formed at one end with a hook portion interlocking with said rib, and at its opposite end with a portion engaged by said circular member.

6. A timer dial comprising front and back members, said back member being formed with a central hub and a cylindrical open end wall terminating in an annular rib, an annular groove positioned in spaced concentric relation to said hub forming a shoulder intermediate said groove and hub, a pair of upstanding ears formed on said shoulder, a ring member positioned in said groove and means yieldingly urging said ring outwardly in said groove, said front member having an aperture and a pair of slots in registry with the hub and ears on said back member, said front member being affixed to said back member by said ears, a plurality of axial slots formed on the periphery of said back member and a plurality of switch actuating keys received in said slots, said keys having a hook portion engaging said rib and a tongue portion engaging said ring member.

7. A timer dial for operating electrical switches comprising a circular body having a cylindrical rib at one end, a ring member positioned at the opposite end of the body, means yieldingly urging said ring member axially outward from the body, the peripheral surface of said body being formed with a multiplicity of axially extending key receiving slots, switch actuating keys positioned in selected ones of said slots, each of said keys being formed with a body portion adapted to be positioned in said slots, a hook portion at one end of said body for hooking over said cylindrical rib on the dial body, and each of said keys being formed at its opposite end with a tongue portion engaged by said ring member, whereby the hook portion of each of said keys is maintained in detachable hooked engagement with said dial body.

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