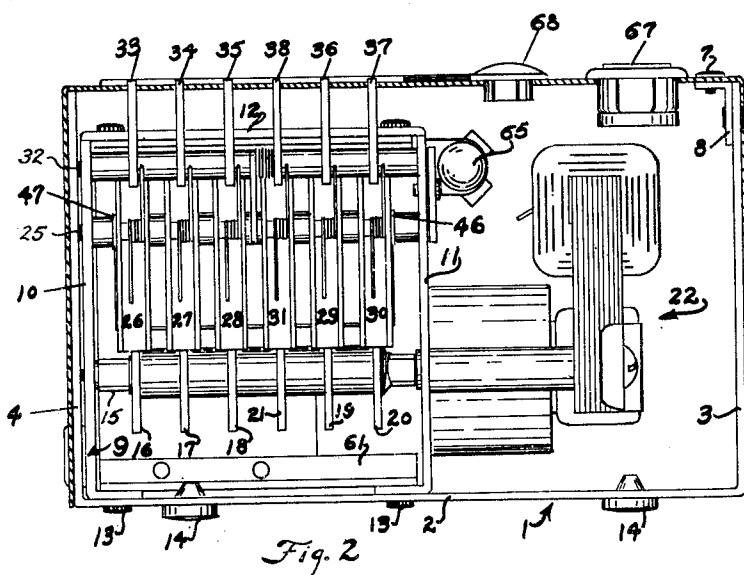
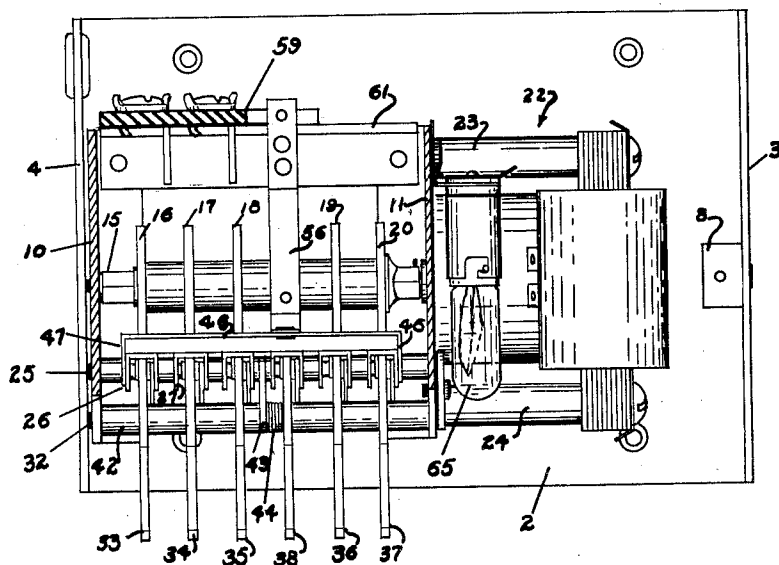


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CAM CONTROLLED DEVICE

2 Sheets-Sheet 1



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June 30, 1953

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2,644,119

CAM CONTROLLED DEVICE

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2 Sheets-Sheet 2

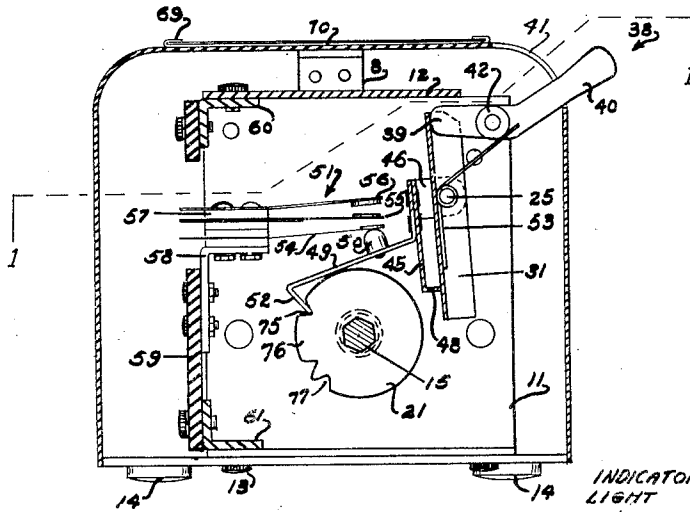


Fig. 3

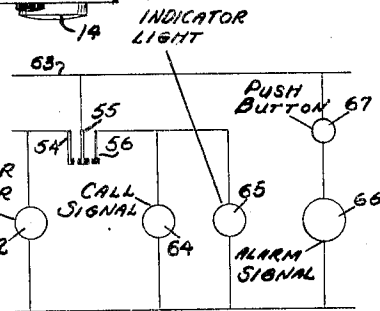


Fig. 5

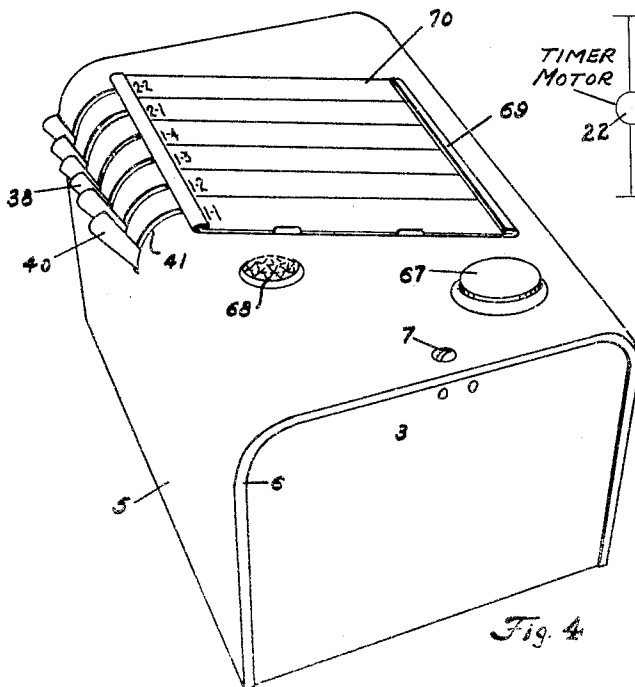


Fig. 4

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CAM CONTROLLED DEVICE

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This invention relates to timing devices and more particularly to sequence timers of the code signaling type.

The primary object of the invention is to provide a timer which is simple in construction, positive in operation and which permits easy selection of the desired sequence or timing characteristic.

A further object of the invention is to provide a timer in which selection of the characteristic desired serves to also start and stop the timing motor.

Another object of the invention is the provision of a simple and positive arrangement for maintaining the timer in operation until it reaches a predetermined angular position.

Other objects will appear from the following description and appended claims.

For a complete disclosure of the invention reference is made to the accompanying drawings in which

Fig. 1 is a top section view taken on line 1-1 of Fig. 3.

Fig. 2 is a side view with the cover in section.

Fig. 3 is an end sectional view.

Fig. 4 is a perspective view of the case exterior, and

Fig. 5 is a wiring diagram.

Referring to Fig. 2, reference character 1 indicates a base member of U shape configuration having a bottom portion 2 and end portions 3 and 4. This base member supports a cover member 5 which is also of U-shaped construction (see Fig. 4) having inturned end portion 6. The cover 5 is secured to the base by means of a screw 7 which is threaded into a bracket 8 which is secured to the end portion 3 of the base member.

Also carried by the base member is an inverted U-shaped bracket 9 having side portions 10 and 11 and a top portion 12. The end portions 10 and 11 are bent inwardly at the bottom ends and rest against the base portion 2. The mechanism bracket 9 is secured to the base by means of screws 13. The base is provided with rubber feet 14 of sufficient height to prevent the screw heads 13 from resting on the surface supporting the device. Extending between the end portions 10 and 11 of the mechanism bracket is a cam shaft 15 carrying a series of cams 16, 17, 18, 19, 20 and 21. The right hand end of the cam shaft 15 as seen in Figs. 1 and 2 is driven by the shaft of a synchronous motor generally indicated as 22. This timing motor is of well known construction and is supported on the end 11 of the mechanism bracket by means of studs 23 and 24.

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Also extending between the vertical portions 10 and 11 of the mechanism bracket is a cam follower shaft 25. This shaft carries a series of cam followers 26, 27, 28, 29, 30 and 31 which ride on cams 16, 17, 18, 19, 20 and 21 respectively. These cam followers are channel shaped and are pivoted on the shaft 25 intermediate their ends (see Fig. 3).

Also mounted on the bracket 9 and extending between the vertical portions 10 and 11 of this bracket is a selector shaft 32. This shaft carries a series of selector fingers 33, 34, 35, 36, 37 and 38 which cooperate with the cam followers 26, 27, 28, 29, 30 and 31 respectively. As shown in Fig. 3 these selector fingers each have a portion 39 which is adapted to engage the cam follower and a handle portion 40 which extends through a slot 41 in the cover 5. The selector fingers are separated by means of spacers 42 carried by the shaft 32. Preferably a strap 43 extends between the shafts 25 and 32 for providing support between these shafts at their midportions. A compression spring 44 also may be provided between the strap 43 and the finger 38. This spring serves to keep tension on the sides of the selector fingers to prevent them from moving too easily.

Also carried on the cam follower shaft 25 is a switch operating member 45. This member is provided with ears 46 and 47 at each end which are provided with holes through which the shaft 25 passes. The member 45 is also provided with an inturned portion 48 which extends inwardly towards the cam followers to be engaged thereby. The operating member 45 carries a bracket 49 which in turn carries an insulating button 50 which operates a switching mechanism generally indicated as 51. Bracket 49 also extends outwardly over the cam 21 and is provided with an inturned cam follower portion 52.

The cam followers are each provided with separate springs 53 for biasing the followers in a clockwise direction toward the cams as shown in Fig. 3. These springs are preferably of the torsion type, having one leg bearing against the cam follower and another leg bearing on the selector shaft spacers 42.

Referring to the switch mechanism 51, this device consists of switch blades 54, 55 and 56 which are provided with suitable separators 57 and are mounted on a bracket 58. The bracket 58 is carried by a terminal panel 59 which is mounted to the base member 9 by means of brackets 60 and 61.

As mentioned above the device described is of special utility for use as a code signaling device

for signaling personnel that they are wanted. Fig. 5 shows a wiring diagram of the device for this use. The switch blade 55 is connected to a line wire 63, the switch blade 54 is connected to the timer motor 22, and the switch blade 56 is connected to one or more signaling devices 64 which may be chimes, gongs, etc. The switch blade 56 also may be connected to an indicator light 65. If alarm signals are used such as signals 66, they may be wired to a push button 67 carried in the case top 5. The indicator light 65 may be mounted on the bracket portion 11 so that its light shines through a button 68 mounted on the cover. The cover as shown in Fig. 4 is provided with a name card holder 69 carrying a name card 70. This card indicates the code signal provided by each cam and provides spaces for the names of the personnel to be signaled.

It will be understood that each cam is provided with a series of notches for giving the code signal indicated by the corresponding numbers on the name card. For example, the cam 21 is controlled by the selector finger 38 as shown in Fig. 4. The code signal for selector finger 38 is 1-3. Thus the cam 21 is provided with a notch 75, a space 76 and a series of two notches 77. It will be apparent that this arrangement of notches will cause the cam follower 31 to be operated once and then operated two times. The remainder of the cams are provided with similar notches arranged to give the other signals indicated on the name card.

Operation

With the parts in the positions shown, the selector fingers are all in their lower positions. Thus each selector finger has forced its corresponding cam follower to the position shown in Fig. 3. In this position the bracket 49 is in its lower position which causes the switch blades 54, 55 and 56 to be separated as shown. Due to switch blades 54 and 55 being separated the timing motor is out of operation and due to switch blades 55 and 56 being separated, the call signals are de-energized.

When the operator wishes to call a particular individual, the desired selector finger is moved upwardly to its top position. Assuming that the finger 38 has been moved, this movement causes the abutting portion 39 to be moved downwardly toward the center of the cam follower 31. This releases the cam follower for movement toward the cam 21 under the action of the torsion spring 53. This movement of the cam follower causes corresponding movement of the common operating member 45 which moves the switch button 50 upwardly to cause engagement of the switch blades 54 and 55. The end of the cam follower 31 engages the cam 21 before switch blades 55 and 56 engage. Due to the engagement of the blades 54 and 55, the timer motor 22 is energized and this causes rotation of the cam shaft in a clockwise direction. When the notch 75 in the cam passes under the end of the cam follower this follower drops into the notch, thus moving further in a clockwise direction and closing switch blades 55 and 56. This energizes the signal and also energizes the indicator light. As the cam continues to rotate it lifts the cam follower out of the notch 75 and thus disengages switch blades 55 and 56. On further rotation of the cam shaft the cam follower drops successively into notches 77 and for each drop gives one energization of the call signal. This operation continues indefinitely until the operator moves the selector finger back to the "off" position. This

movement instantly prevents any further signals from being given inasmuch as the cam follower is prevented from dropping into notches of the cam. If the cam follower portion 52 on the bracket 49 is riding the periphery of the cam, it holds the switch blades 54 and 55 engaged until this follower portion drops into a notch 75 in the cam. This arrangement maintains the timing motor in operation until the cam shaft reaches a position insuring that the device will not start in the middle of a code signal.

From the foregoing description it will be apparent that the present invention provides a sequence timer which is especially adaptable to code signaling devices and which provides for starting and stopping of the device simply by the flick of a lever. It will further be apparent that its use is not limited to this application. In fact, the invention may be used in any timing application where a plurality of different cycles must be selected.

While a single embodiment of the invention has been described in detail it will be apparent that many modifications in form may be made without departing from the spirit and scope of the invention. It is desired to be limited only by the appended claims.

What is claimed is:

1. In a device of the character described, the combination of, a cam shaft having a plurality of cams of different contour, drive means for the cam shaft, a cam follower shaft having a series of cam followers arranged to be actuated by said cams, a selector shaft adjacent said cam followers, and a plurality of independently operable selector members mounted on said selector shaft and arranged to lift certain of said cam followers off their respective cams.

2. In a device of the character described, the combination of, a cam shaft having a plurality of cams of different contour, a cam follower shaft having a series of cam followers arranged to be actuated by said cams, drive means for driving said cam shaft, selector means arranged to maintain certain of said cam followers off their respective cams, and means controlled by said selector means for starting said drive means.

3. In a device of the character described, the combination of, a cam shaft having a plurality of cams of different contour, a cam follower shaft having a series of cam followers arranged to be actuated by said cams, drive means for driving said cam shaft, selector means arranged selectively to maintain at least portions of said cam followers in predetermined positions independently of said cams, and means controlled conjointly by said selector means and said cam shaft for starting and stopping said drive means.

4. In a device of the character described, the combination of, a cam shaft having a plurality of cams, means including an electric motor for driving said cam shaft, a plurality of cam followers arranged for actuation by said cams, a common operating member arranged to be actuated by each of said plurality of cam followers, means including a motor switch for controlling said electric motor, a main switch for controlling a load, means actuated by said common operating member for actuating said switches in a manner to first close the motor switch and then close the main switch on motion of said common operating member in a single direction, and selector means for controlling said cam followers, said selector means being arranged to prevent movement of said cam followers for closing said

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switches, said cams having different controlling effects on said main switch and serving to operate the main switch while the motor switch remains closed.

5. In a device of the character described, the combination of, a cam shaft having a plurality of cams, means including an electric motor for driving said cam shaft, a plurality of cam followers arranged for actuation by said cams, a common operating member arranged to be actuated by each of said plurality of cam followers, means including a motor switch for controlling said electric motor, a main switch for controlling a load, means actuated by said common operating member for actuating said switches in a manner to first close the motor switch and then close the main switch on motion of said common operating member in a single direction, selector means for controlling said cam followers, said selector means being arranged to prevent movement of said cam followers for closing said switches, said cams having different controlling effects on said main switch and serving to operate the main switch while the motor switch remains closed and means for maintaining said motor switch closed independently of said cam followers until the cam shaft reaches a predetermined angular position.

6. In a device of the character described, the combination of, a cam shaft having a plurality of cams, a cam follower shaft having a series of cam followers arranged to be actuated by said cams, a selector shaft adjacent said cam followers, a plurality of independently operable selector members mounted on said selector shaft and adapted to control said cam followers, means including an electric motor for driving said cam shaft, a common operating member arranged to be actuated by each of said plurality of cam followers, means including a motor switch for controlling said electric motor, a main switch for controlling a load, means actuated by said common operating member for actuating said switches in a manner to first close the motor switch and then close the main switch on motion of said common operating member in a single direction, said selector members being arranged to prevent movement of said cam followers for closing said switches, said cams having different controlling effects on said main switch and serving to operate the main switch while the motor switch remains closed.

7. In a device of the character described, the combination of, a cam shaft having a plurality of cams, a cam follower shaft having a series of cam followers arranged to be actuated by said cams, a selector shaft adjacent said cam followers, a plurality of independently operable selector members mounted on said selector shaft and adapted to control said cam followers, means including an electric motor for driving said cam shaft, a common operating member arranged to be actuated by each of said plurality of cam followers, means including a motor switch for controlling said electric motor, a main switch for controlling a load, means actuated by said common operating member for actuating said switches in a manner to first close the motor switch and then close the main switch on motion of said common operating member in a single direction, said cams having different controlling effects on said main switch and serving to operate the main switch while the motor switch remains closed and means for maintaining said motor switch closed independently of

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said cam followers until the cam shaft reaches a predetermined angular position.

8. In a control mechanism, the combination of, an electric motor, a cam driven by the electric motor, a switch for controlling said electric motor, means independent of said cam for closing said switch to start the motor, means operated by initial movement of said cam for maintaining said switch closed irrespective of said independent means, said cam being arranged to maintain said switch closed until it reaches a predetermined angular position.

9. In a device of the character described, the combination of, cam means comprising a series of cams, drive means for said cams, said drive means including a motor and means connecting the cams together and to the motor for simultaneous operation of said series of cams by said motor, a control device, actuating mechanism between the cams and control device arranged to cause the cams to actuate the control device in a manner to effect a controlling function, said operating mechanism including selector means arranged to limit the number of cams actuating said control device while permitting simultaneous operation of said cams by the drive means, and means controlled by said selector means for controlling said drive means in a manner to start operation of said cam means when the selector means is actuated in one direction.

10. In a device of the character described, the combination of cam means comprising a series of cams, drive means for said cams, said drive means including a motor and means connecting the cams together and to the motor for simultaneous operation of said series of cams by said motor, a control device, actuating mechanism between the cams and control device arranged to cause the cams to actuate the control device in a manner to effect a controlling function, said operating mechanism including selector means arranged to limit the number of cams actuating said control device while permitting simultaneous operation of said cams by the drive means, and means controlled by said selector means for controlling said drive means in a manner to start operation of said cam means when the selector means is actuated in one direction and means controlled by the cam means for controlling said drive means in a manner to maintain operation of the cams irrespective of the selector means until a predetermined position is reached.

11. In a device of the character described, the combination of, a series of cams, drive means for said cams, said drive means including a motor and means connecting the cams together and to the motor for simultaneous operation of the series of cams by said motor, a series of cam followers, one for each cam, and each biased toward its respective cam, a control device having an operating element biased in one direction, a common operating member arranged to be operated by the bias of the cam followers in a direction against the bias of the operating element for causing actuation of the control device by said cams, a series of selector members arranged for holding selected cam followers away from their respective cams, and means controlled by said selector members for controlling said drive means in a manner to start operation of the cam means when any selector member is moved in a direction releasing its respective cam follower.

12. In a device of the character described, the combination of, a series of cams, drive means for

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said cams, said drive means including a motor and means connecting the cams together and to the motor for simultaneous operation of the series of cams by said motor, a series of cam followers, one for each cam, and each biased toward its respective cam, a control device having an operating element biased in one direction, a common operating member arranged to be operated by the bias of the cam followers in a direction against the bias of the operating element for causing actuation of the control device by said cams, a series of selector members arranged for holding selected cam followers away from their respective cams, means controlled by said selector members for controlling said drive means in a manner to start operation of the cam means

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when any selector member is moved in a direction releasing its respective cam follower, and means for maintaining operation of the cam means irrespective of said selector member until the cam means reaches a predetermined position.

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