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TIME INTERVAL DEVICE

3,054,992

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2 Sheets-Sheet 1

FIG. 1

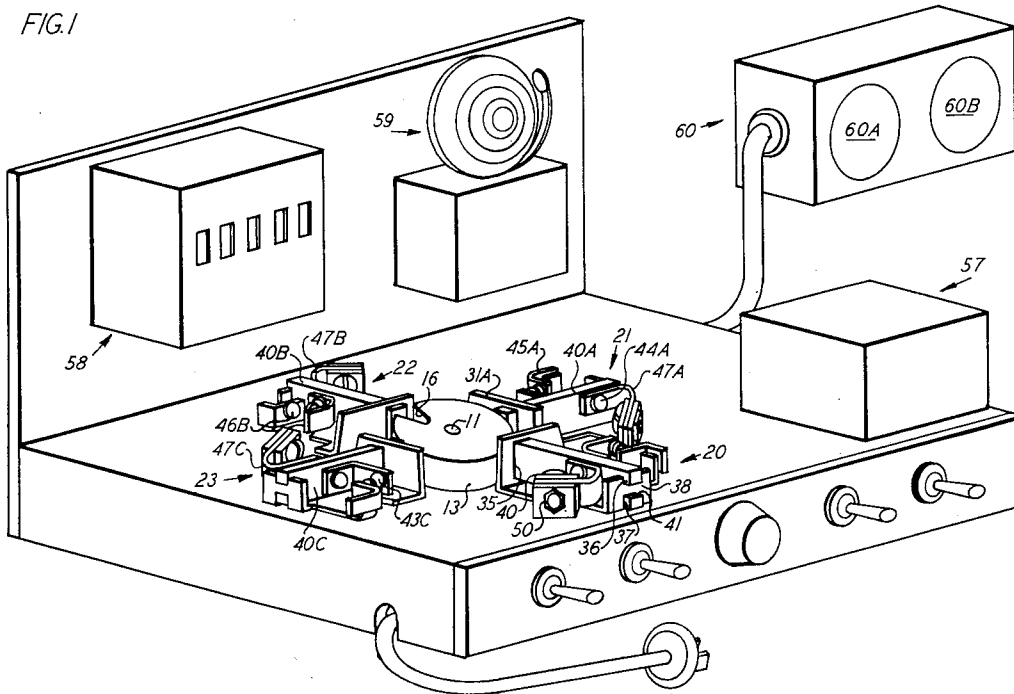
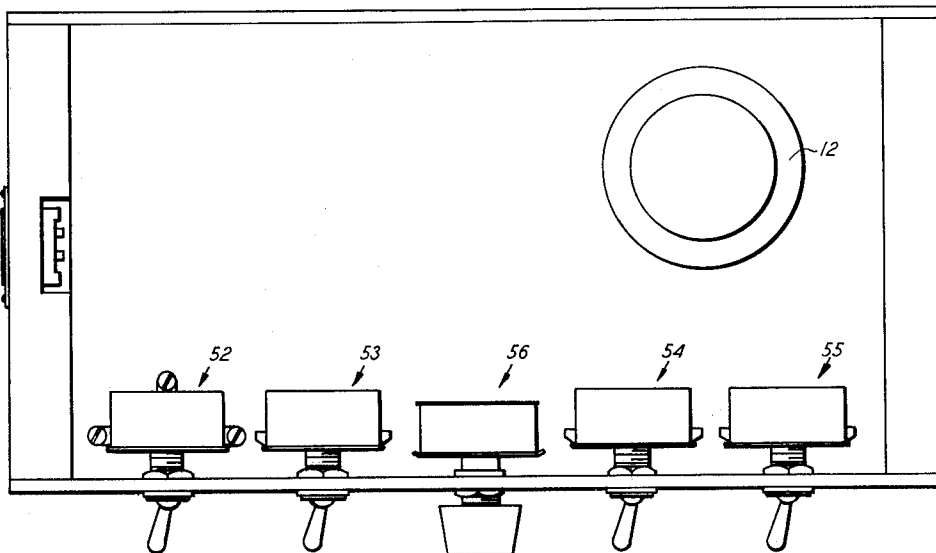


FIG. 2



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FIG. 3

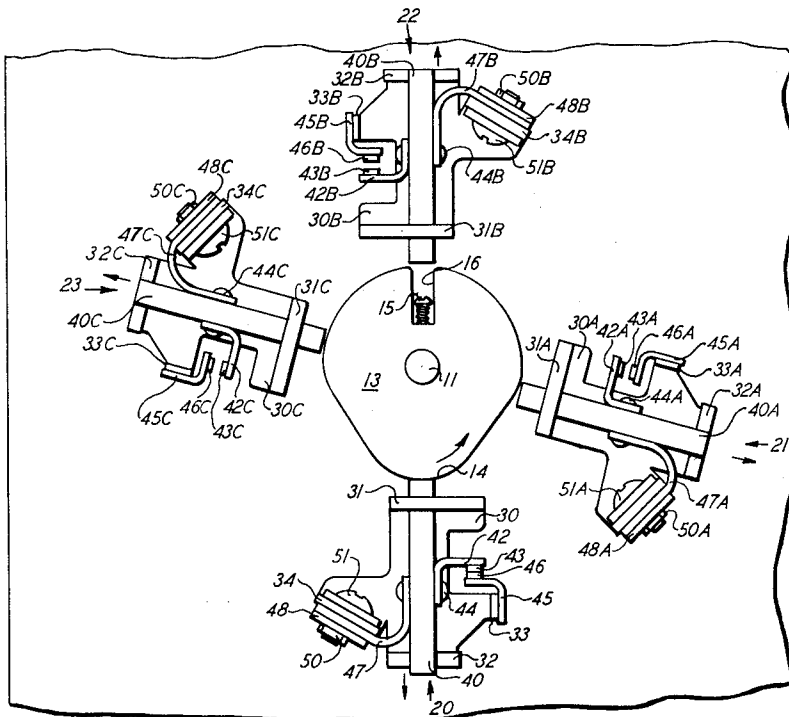
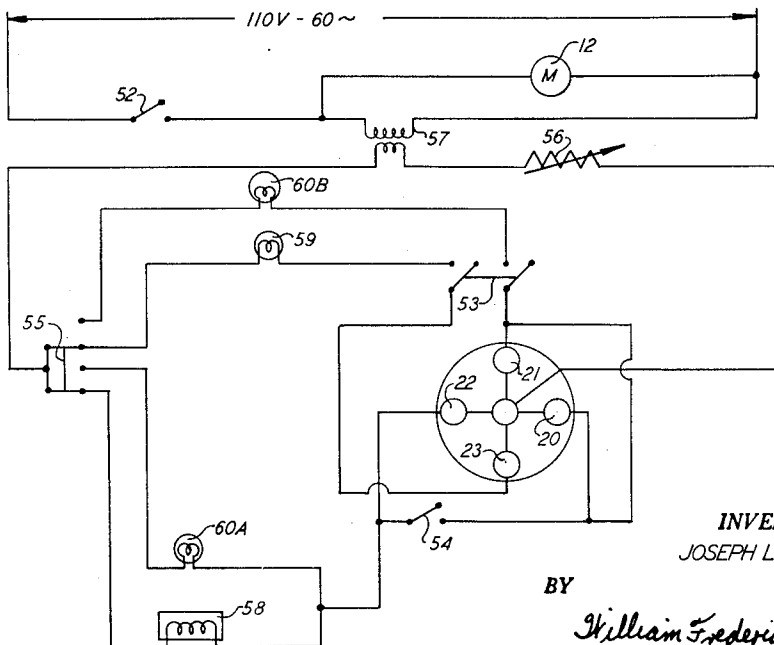


FIG. 4



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TIME INTERVAL DEVICE

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3 Claims. (Cl. 340-309.4)

This invention relates to a time interval device and more particularly to an improved means for indicating the lapse of an allotted amount of time, and one or more fractional portions thereof.

One of the objects of the present invention is to provide electro-mechanical means for indicating the expiration of a pre-selected time interval by means of a light, bell, buzzer or other indicator and to indicate one or more fractional portions thereof by a similar means.

Another object of the present invention is to provide electro-mechanical means for automatically indicating a pre-selected time interval prior to the expiration of a pre-selected allotted amount of time.

Still another object of the present invention is to provide an apparatus of simple, rugged, inexpensive construction which may easily be set to indicate the lapse of one or more fractional portions of a pre-selected time interval.

And still another object of the present invention is to provide an electro-mechanical means to indicate a fixed time period before the end of an allotted amount of time.

Other objects of the present invention will be pointed out in part and become apparent in part in the following specification and claims.

The present time interval device has particular application to a game of chess wherein a time interval in which a move must be made is uniform and accurate. A warning signal is provided before the expiration of an allotted time interval. A second warning signal is provided in a pre-selected time interval following the first mentioned warning signal.

Referring to the drawings in which similar characters of reference indicate corresponding parts in all the figures:

FIGURE 1 is a perspective view of the new and improved time interval device.

FIGURE 2 is a bottom plan view thereof.

FIGURE 3 is a plan view of the timing unit.

FIGURE 4 is a circuit diagram of the indicating means.

Referring to the drawings, wherein is illustrated a rotating timing shaft 11 which forms part of an electrical motor 12. Shaft 11 rotates counter clockwise in a pre-selected number of revolutions per minute. A cam 13 provided with a high spot or contact area 14 is secured to shaft 11 by means of a screw 15. A slot 16 is provided in cam 13 to accommodate screw 15.

Four cam actuated slide bar electrical switch units, indicated generally at 20, 21, 22 and 23, are provided. However, it is understood that the number of electrical switches could be increased or decreased as desired.

Slide bar electrical switch unit 20 consists of a base 30 having an upturned front portion 31, an upturned rear portion 32, an upturned right side portion 33, and an upturned left side portion 34. A rectangular slot 35 is provided in upturned front portion 31. Upturned rear portion 32 is provided with an upper 36 and lower 37 U-shaped grooves with a cross bar 38 between them. A rectangularly shaped slide bar 40, fabricated from nonelectrical conductive material, and provided with a horizontal slot 41 in its rear area, is slidably mounted with its front end in rectangular slot 35. Horizontal slot 41 slidably engages cross bar 38 with upper 36 and lower 37 U-shaped grooves guiding bar 40 in horizontal alignment.

A bracket 42 fabricated from electrically conductive

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material is provided with a contact point 43. Bracket 42 is secured to slide bar 40 by means of an electrically conductive rivet 44. A resilient arm 45 provided with a contact point 46 and fabricated from electrically conductive material, is secured to upturned right side portion 33 by brazing, soldering, welding, etc. A resilient member 47 fabricated from electrically conductive material is secured on one end to slide bar 40 by means of rivet 44. Resilient member 47 is secured on its opposite end to a washer 48 fabricated from electrically insulated material and to upturned left side portion 34 by means of a nut 50 and screw 51.

Each of the four cam actuated slide bar electrical switch units 20, 21, 22 and 23 are similarly constructed.

The time interval device is provided with four electrical switches, generally designated by reference characters, 52, 53, 54 and 55. A rheostat or volume control is generally designated at 56.

Electrical switch 52 is the "On-Off" switch. It controls the source of electricity from an outside source to the electrical circuit of the time interval device. Electrical switch 53 is an "On-Off" switch controlling the "Forfeiture" circuit. Electrical switch 54 is a two way switch which controls both the five second and the ten second circuit when shaft 11 rotates six revolutions per minute. Electrical switch 55 is a two way switch which controls the visual and the audio circuit.

Reference characters generally indicated at 57, 58, 59 and 60 refer to a transformer, buzzer, bell and dual light, respectively.

In operation let it be assumed that switch 55 is manually positioned to close the electrical circuit to the buzzer 58. Let it be further assumed that switch 54 is manually positioned in the ten second position. This switch renders cam actuated slide bar electrical switch unit 22 electrically active. All other cam actuated slide bar electrical switch units 20, 21 and 23 will remain electrically inactive.

The manual operation of electrical switch 52 from "Off" to "On" position closes the electrical circuit from a source of electric current to motor 12. Motor 12 will rotate shaft 11 and cam 13 in a counterclockwise direction as illustrated by the arrow in FIGURE 3. As the high point 14 of cam 13 engages slide bars 40, 40A, 40B and 40C, it will cause said slide bars to slide rearward in the direction of the respective arrows in FIGURE 3, against the tension of resilient members 47, 47A, 47B and 47C, respectively, whereby contact points 43, 46, 43A, 46A, 43B, 46B, 43C, 46C, will engage. Since the electrical circuit to cam actuated slide bar electrical switch units 20, 21 and 23 are "open"; the engaging of contact points 43, 46, 43A, 46A, 43C, 46C will be electrically ineffectual. However, the engaging of contact points 43B, 46B will "close" the electrical circuit to buzzer 58 and thereby cause buzzer 58 to be actuated, audibly. As the high point 14 rotates to disengage slide bar 40B; resilient member 47B will cause slide bar 40B to slide in a direction opposite to the direction of the arrow in FIGURE 3 and thereby cause contact points 43B, 46B to disengage to render buzzer 58 inoperative or silent.

Thus, with each revolution of shaft 11 and cam 13, at the rate of six revolutions per minute; buzzer 58 will be sounded every ten seconds.

It will be noted that cam actuated slide bar electrical switch unit 20 is located diametrically opposite or 180 degrees from cam actuated slide bar electrical switch unit 22. Thus, high point 14 of cam 13 will engage two slide bars 40, 40B located 180 degrees or one half cycle apart. If a five second interval instead of a ten second interval buzzer sound is desired, the handle of switch 54 is manually positioned to the five second position. There-

by closing the electrical circuit to contact points 43, 46, whereby buzzer 58 is actuated by both slide bar 40 and slide bar 40B.

The nub of the present invention is to provide a time interval device which may be used to give signals in timed sequence, so that each player in a game of chess is notified that his thinking time has elapsed and the time to move a chessman has arrived. In order to enforce the obligation to move at the sound of buzzer 58; a bell is provided which is actuated by cam actuated slide bar electrical switch units 21, 23.

Cam actuated slide bar electrical switch unit 23 is placed to the left of cam actuated slide bar electrical switch unit 22 as viewed in FIGURE 3. As viewed in FIGURE 3, cam actuated slide bar electrical switch unit 23 is placed in the cycle of rotation of cam 13, at a distance of two seconds following the actuation of slide bar 40B. Obviously, if slide bar 40C was located 90 degrees from slide bar 40B, it would be located at a distance of two and one half seconds from slide bar 40B. Similarly, cam actuated slide bar electrical switch unit 21 is located the exact same time distance from slide bar 40 that slide bar 40C is located from slide bar 40B.

When desired, forfeit switch 53 handle is manually moved from "Off" to "On" position. In this position contact points 46C, 43C when engaged through the action of slide bar 40C will close the circuit to bell 59. If the chessman has not been moved before the bell 59 rings, the game is forfeited on the grounds of a violation of the time rule. Similarly, contact points 46A, 43A engage to ring bell 59 following the ringing of buzzer 58 actuated by slide bar 40.

Should the handle to electrical switch 54 be located in the ten second position; then cam actuated slide bar electrical switch unit 21 will be inoperative because electrical switch 54 is a two way switch which must have its handle in the five second position to close the circuit to cam actuated slide bar electrical switch 54.

There are times when a buzzer or a bell may be a nuisance to chess players. In that event two colored lights 60A, 60B are provided in place of buzzer 58 and bell 59. Switch 55 controls the electrical circuit to buzzer 58, bell 59 or to lights 60A, 60B through the position of its handle 55A which is manually operated.

Having shown and described a preferred embodiment of the present invention, by way of example, it should be realized that structural changes could be made and other examples given without departing from either the spirit or scope of this invention.

What I claim is:

1. A time interval device comprising a motor provided with a shaft, a cam having a high spot secured to said shaft, a cam actuated slide bar electrical switch unit, said cam actuated slide bar electrical switch unit consisting of a base having an upturned front portion, provided with a slot, an upturned rear portion provided with a cross bar, an upturned right side portion and an upturned left side portion, a resilient arm secured to said upturned right side portion having a first contact point, a slide bar provided with a second slot in the rear end thereof, slidably mounted with the front end in said slot and with the second slot engaging said cross bar, a bracket provided with a second contact point

secured to said slide bar for engagement and disengagement with said first contact point, a second resilient member secured on one end to said upturned left side portion and on the other end to said slide bar, the front of said slide bar engageable with said high spot to cause said first and second contact points to engage against the resilience of said second resilient member, an electrical circuit consisting of an "on-off" switch controlling the rotation of said motor, an alarm unit, a two way switch and said first and second contact points whereby rotation of said motor through said high spot on the cam actuates said slide bar to engage said first and second contact points to actuate said alarm unit.

2. A time interval device comprising a motor provided with a shaft, a cam provided with a high spot secured to said shaft, two oppositely located in circular array cam actuated slide bar electrical switch units having circuit closing contacts, the slide bar of said cam actuated slide bar electrical switch units engageable by said high spot to close said circuit closing contacts, an electrical circuit consisting of said motor, said circuit closing contacts, an alarm unit, a motor starting switch and a two way switch, whereby in one position of said two way switch one of said circuit closing contacts actuates said alarm unit, and in the other one of said two positions both said circuit closing contacts actuate said alarm unit in timed sequence with the rotation of said motor, shaft and high spot, with said high spot actuating said slide bars.

3. A time interval device comprising a motor provided with a shaft, a cam provided with a high spot secured to said shaft, four cam actuated slide bar electrical switch units located in circular array, each cam actuated slide bar electrical switch unit having a slide bar provided with a circuit closing contact, each slide bar engageable in sequence by said high spot through the rotation of said motor, shaft and cam, to close said circuit closing contact, an electrical circuit consisting of said motor, the circuit closing contacts of each of said four cam actuated slide bar electrical switch units, a first alarm, a second alarm, a forfeit switch having an "On" position and an "Off" position and a two way switch whereby in one position of said two way switch, with said motor rotating said cam and said forfeit switch in "Off" position, one of said slide bars actuated by the high spot closes a circuit closing contact to actuate said first alarm, and in the other one of two positions of said two way switch, said motor rotating said cam with said forfeit switch in "Off" position, a second of said slide bars actuated by the high spot closes a circuit closing contact to actuate said first alarm; the positioning of said forfeit switch to "On" position causes the other two of said four cam actuated slide bar electrical switch units to actuate said second alarm through the closing of the circuit closing contacts on the other two slide bars actuated by the high spot; the positioning of said two way switch into the first mentioned position breaking the circuit to the second of the last mentioned circuit closing contacts.

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