May 1, 1951 E. CURRAN 2,550,915

BOWLING TIME DEVICE

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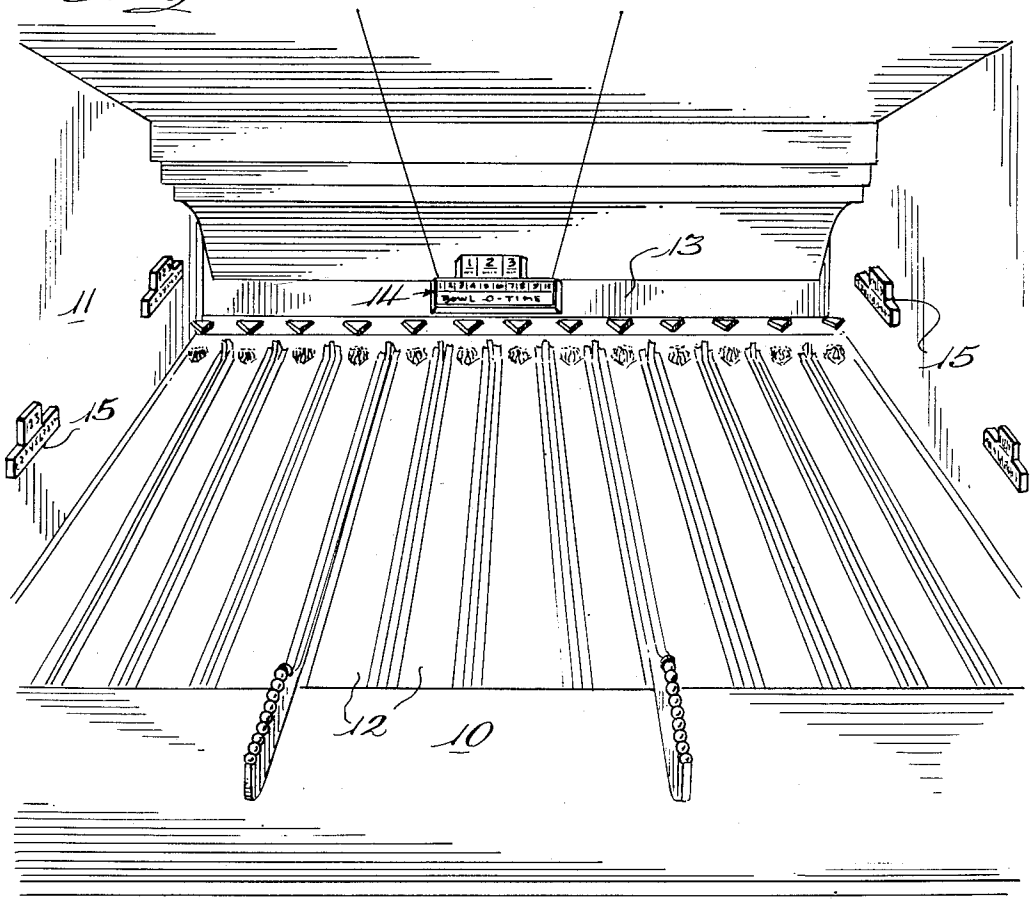
Fig. 1.



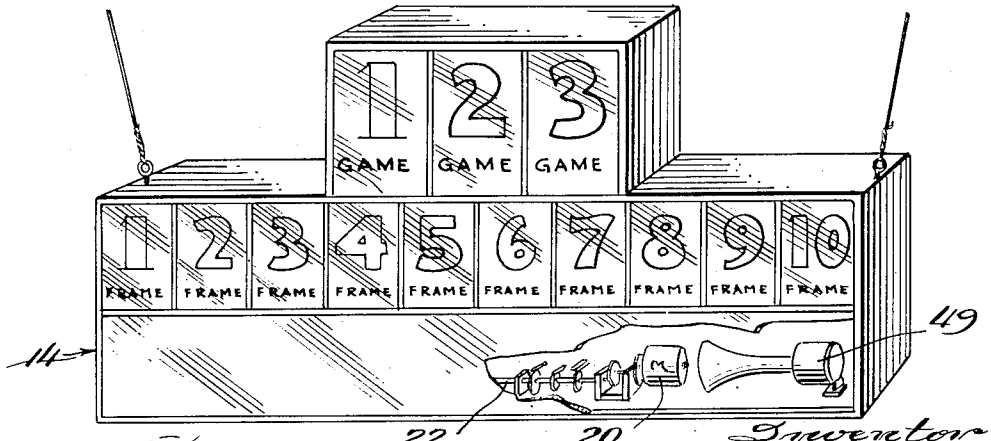




Fig. 2.

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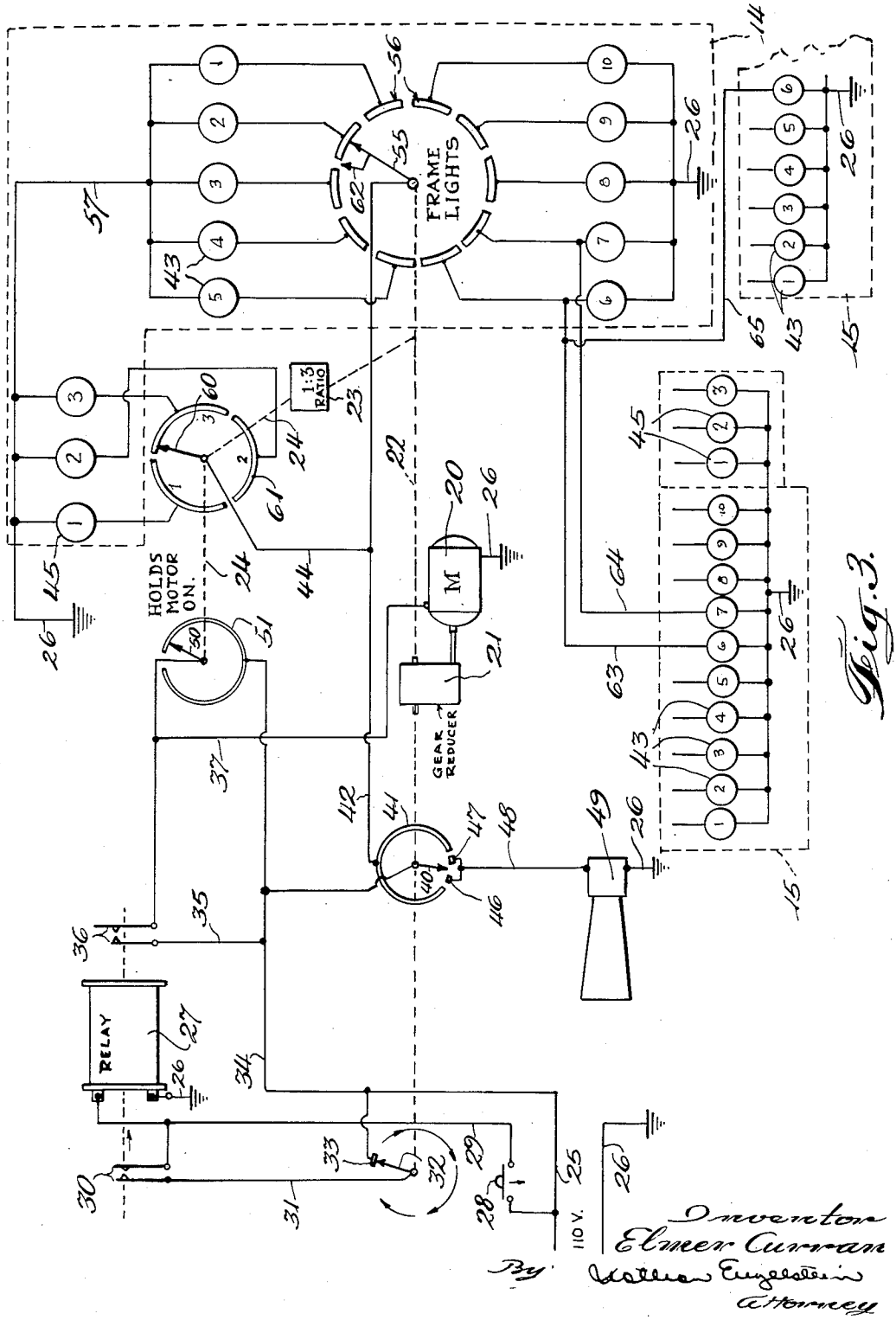


Fig. 3.

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# UNITED STATES PATENT OFFICE

2,550,915

## BOWLING TIME DEVICE

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1 Claim. (Cl. 177—384)

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My invention relates to bowling games played under league or tournament auspices or regulations. Operations in such games are susceptible of being supervised under a schedule or on a time basis, so that the starting, duration and ending of games may be pre-arranged or planned with more or less accuracy. Under present conditions, a game may be set to begin at a certain time, but proceeds in most instances, without supervision in respect to the progress of the player groups or teams. Thus, one group may run behind the others, due to one or more lagging or careless players, such action making for irregularity in the progress of the the game and the prolonged duration thereof. It is, therefore, one object of the novel system to set a timed schedule for the incidents and duration of the game which is based on established playing practice and may be employed by all the groups participating in a given game for guiding and regulating their playing progress.

A further object is to devise an apparatus for the above purpose which is in full view of the players, much like a score board, and brightly illuminated for easy legibility.

A further object is to provide a master indicating unit at the remote end of the game room for direct view by the players and spectators, and a number of secondary indicating units along the sides of the room for handier reference.

Another object is to employ an electrical apparatus which is mainly encased in the master indicating unit and extended to serve the secondary units at the same time.

An important object is to employ an electrical circuit in which units and operations following well-established electrical principles are employed in a novel combination.

With the above objects in view, and any others which may suggest themselves from the description to follow, a better understanding of the invention may be had by reference to the accompanying drawings, in which—

Fig. 1 is a perspective view of a typical bowling game room, showing the novel system installed;

Fig. 2 is a perspective view of the master indicating unit, partly broken away; and

Fig. 3 is a diagrammatic illustration of the electrical circuit employed.

In accordance with the foregoing, specific reference to the drawings indicates the floor of the bowling game room at 10, the side walls at 11, the alleys at 12, and the wall at the foot-end of the latter at 13. Fig. 1 shows that the master indicating unit 14 is suspended midway between the front wall and starting line, while the secondary indicating units 15 are mounted on the side walls; one set up near the pin boys and the other back so the bowlers can view them when they happen to look sideways.

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As shown, the indicating units are marked on the upper part with the number of games; and they are marked on the lower part with the number of frames involved in each game. Thus, the plan of the novel system for a given tournament or game series is to first sound a horn calling the bowlers to their posts and to start the game. At the same time the upper and lower numbers "1" in the indicating units are illuminated to show that the first game is on and that the first frame thereof is being played. The system is timed to allow a reasonable period to elapse for the playing of the first frame, and automatically turns off the "1" signal in the frame series, the system turing on the "2" signal as an indication that the playing of such frame should be in progress.

The change continues in the same manner until frame 10 darkens, and then the horn sounds for the completion of the game. An interval elapses thereafter, and the horn sounds again for the start of the second game. The frame series now repeat for the second game; and the action for the third game follows in the same manner, so that the system times and announces the incidents of the game and the duration thereof on a pre-arranged schedule.

Since the duration of a game series is a matter of two or three hours, a reliable motive source continuously operative for such a period is provided in the form of an electric motor 20 combined with a reduction gearing 21 to operate a drive shaft 22 at a very slow speed The drive is further geared down by way of a suitable gear reducing element 23 to operate a companion shaft 24 at one-third of the said speed.

The motor 20 is interposed in an electric circuit tapped into a convenient service outlet, the line being represented at 25 and 26 in the circuit diagram. As noted, this line primarily includes a relay 27 and a push button 28 to energize the same. The push button is intended as a starter for the system; and one purpose of the relay is to keep the system in action after the push button has been released. As noted, the push button conductor is marked 29.

The operation of the relay 27 acts to close a pair of contacts 30 which form a circuit as follows: Contacts 30, conductor 31, rotary switch 32, contact bar 33, conductor 34, conductor 35, contacts 36 also closed by the relay, conductor 37; motor 20, ground, and return line 26. This

circuit sets the motor in motion while the push button 28 is pressed as well as after it has been released, since the circuit no longer employs the push button conductor 29.

The rotation of the motor shaft 22 sets into motion the rotary arm 40 of a master light switch 41 of band form. Thus, this switch controls a feed line 42 to the zone of the frame indicating lamps 43, and a branch 44 from the line to the zone of the game indicating lamps 45. The switch arm 40 is shown at a neutral point, where it is between the contact posts 46 and 47 of a branch line 48 to a horn 49. Thus, at the start the arm 40 makes temporary contact with the post 46 to operate the horn 49. The arm then leaves the post and assumes continuous contact with the switch band 41 to supply all the lamps 43 and 45.

With the motor started, it is no longer necessary to keep the relay 27 energized; and the switch arm 32 soon leaves the contact bar 33 to accomplish this. However, the initial operation of the motor shaft 24 suffices to engage a rotary arm 50 with a band-type switch 51, which completes the following direct circuit from the service line to the motor: Line 25, conductor 34, switch 51, arm 50, conductor 37, motor 20, ground, and return line 26. The motor thus continues in operation with the lamp feed lines 42 and 44 in the circuit.

The feed line 42 leads to a rotary arm 55 carried by the shaft 22 and movable relative to a switch 56 whose spaced contacts—10 in number—lead from one of the terminals of the frame indicating lamps 43 in the master unit 14. The other terminals are joined in a conductor 57 leading to a ground. It is now seen that the rotation of the shaft 22 causes the lamps 43 to be lighted in sequence, indicating which frame is on playing schedule.

The shaft 24 also carries a rotary arm 60 which is movable relative to a switch 61 whose spaced contacts—three in number—lead from one of the terminals of the game indicating lamps 45 in the master unit 14. The other terminals are joined to the conductor 57. The rotation of the shaft 24 thus causes the lamps 45 to be lighted in sequence, indicating which game is on playing schedule. In order that there may be no dark intervals in the lamp series 43 and 45 when the related switch arm is between contacts, the illustration of switch 56 shows that its arm 55 has a trailing branch 62 which keeps the previous contact when the arm 55 reaches a gap.

The bottom center of the diagram shows a representation of the ten lamps 43 and three lamps 45 pertaining to a secondary indicating unit 15, wiring extensions 63 and 64 from the main unit to two lamps being shown as a matter of example. A partial showing of the lamps in another secondary indicating unit occurs in the right-hand bottom portion of the diagram, with a branch line 65 to one lamp, and it goes without saying that all the secondary indicating units are connected to duplicate the action of the master unit.

It is now apparent that a system of the above character places league or tournament bowling events on a schedule basis, so that the time for the incidents and duration of games are prescribed and rendered uniform. The operation of the system can thus serve as a program designed for the notice and attention of the players, the pin boys, the spectators and the game room management. The prominent and illuminated posting of the game incidents in their timed sequence will prompt slow players to catch up with the schedule, so that they may not delay or unduly prolong the game. As a result, league and tournament bowling can become regulated in action and duration, and therefore, rise to higher standards of efficiency.

I claim:

A timing system for bowling events comprising, in combination, an indicator having a series of visual signals representing games and adapted to be operated in sequence at relatively long intervals, a second indicator having a series of visual signals representing frames and adapted to be operated in sequence at relatively short intervals, a third indicator having an audible signal indicating the start of a game, a motor-operated shaft, an electric circuit connected to a source of electrical energy adapted to start the motor including a momentary manual switch, a relay actuated thereby, an auxiliary switch closed by the relay thereby closing the circuit and setting the motor in motion, a rotary switch operated by the motor-operated shaft effective to cut out the auxiliary switch and close a circuit for maintaining the motor in operation, a circular switch-track formed with spaced sections, a rotary arm driven by the motor-operated shaft contacting the related track sections in sequence, connecting lines between the visual signals of the game indicator and said track sections, a companion line leading to the rotary arm to thereby partially complete circuits to the visual signals in sequence in accordance with the rotation of the rotary arm, a second circular switch track formed with spaced sections, a second rotary arm also driven by the motor-operated shaft and at increased speed proportional to the number of sections in the first switch track contacting the related track sections in sequence, a branch of said arm spaced behind it adapted to contact the preceding section when the first mentioned arm reaches a gap between sections, connecting lines between the visual signals of the frame indicator and the second mentioned track sections, a companion line leading to the second rotary arm to thereby partially complete circuits to the visual signals of the frame indicator, a third switch in the form of a circular track interrupted by spaced contacts connected to said audible signal indicator, connecting lines between said circular track and the first and second rotary arms of the circular switches, a rotary sweep arm driven by the motor-operated shaft at the same speed as the second rotary arm contacting the circular track and connected to a source of energy for completing the circuit to the rotary switches for the visual signals of the indicators and to actuate the audible signal at spaced intervals in coordination with the visual signals.

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