

March 10, 1942.

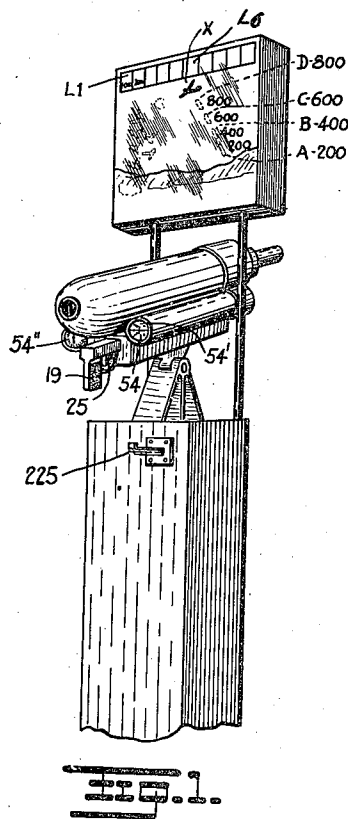
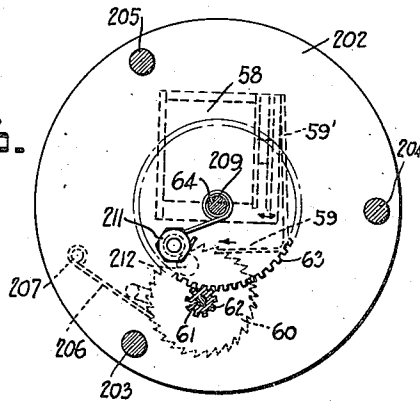
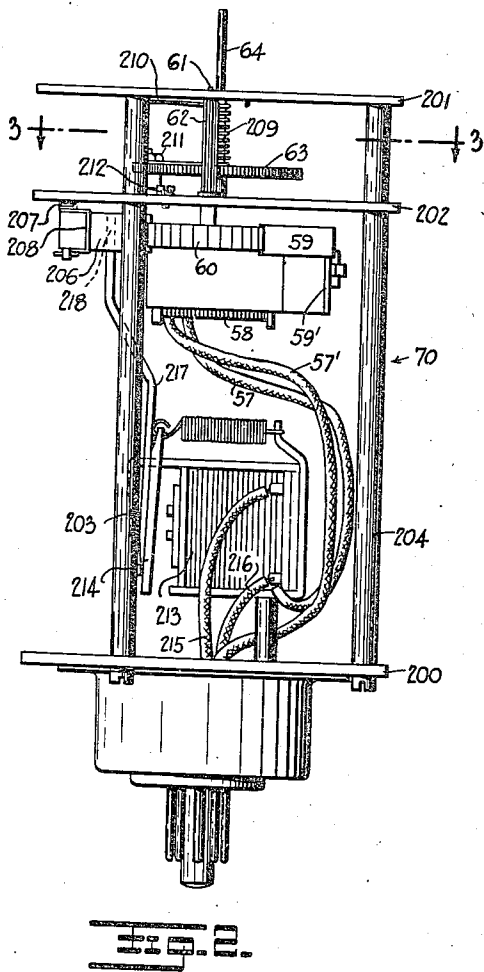
F. M. NEW

2,275,797

GAME-SCORE INDICATING DEVICE

Filed July 28, 1939

2 Sheets-Sheet 1



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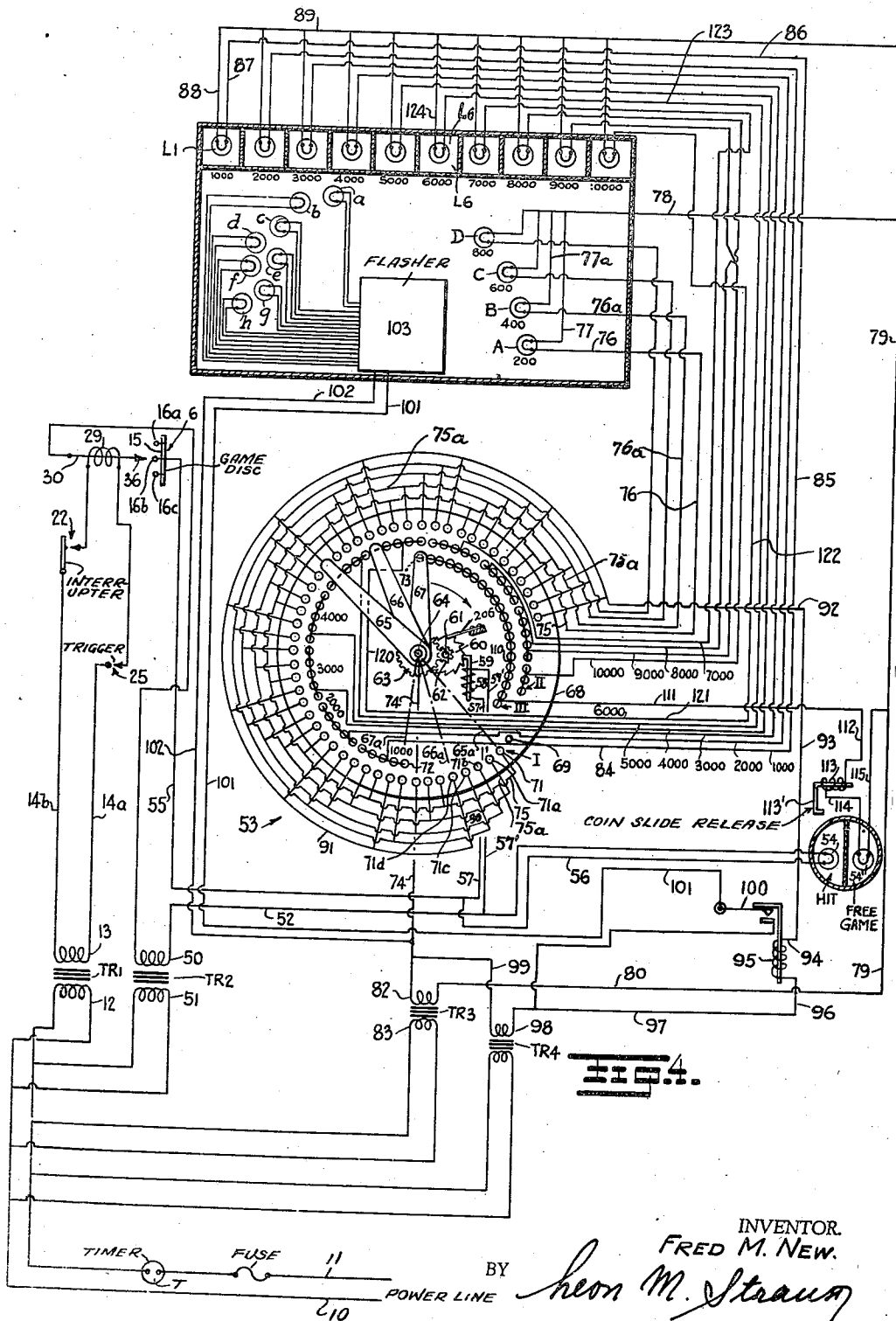
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2 Sheets-Sheet 2



## UNITED STATES PATENT OFFICE

2,275,797

## GAME-SCORE INDICATING DEVICE

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Application July 28, 1939, Serial No. 287,047

2 Claims. (Cl. 177—384)

This invention relates to signaling or indicating devices, particularly adapted for use in connection with ballistic or similar game apparatus, such as exemplified in United States Letters Patent No. 2,139,210.

It is an object of the present invention to provide an electrically coin operated game having novel controlling means for indicating scores resulting from the skillful operation by the person using the game.

It is another object of the present invention to provide means for successively indicating in stages the number of hit scores.

Still another object of the present invention is to produce from a single means or instrumentality impulses to indicate different numbers of hit scores.

Yet another object of the present invention is to provide means to automatically reset the signal controlling means.

A still further object of the invention is to provide in the device of the above character means to release the coin slot mechanism upon attaining a predetermined score whereby the person operating the game is enabled to start again the operation of the game without requiring the insertion of another coin.

This invention accordingly consists in the features of construction, combination of parts and in the unique relations of the members and in the relative proportioning and disposition thereof; all as more completely outlined herein.

To enable others skilled in the art so fully to comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, drawings depicting a certain form of the invention have been annexed as a part of this disclosure, and in such drawings, like characters of reference denote corresponding parts throughout all the views, of which:

Fig. 1 is a perspective view of the device made in accordance with the invention and mounted on and combined with a ballistic game apparatus of which the upper part is shown.

Fig. 2 is a side elevational view of mechanism embodied in the invention.

Fig. 3 is a sectional view taken through line 3—3 of Fig. 2.

Fig. 4 is an electrical wiring diagram showing the electrical connections for the indicating device incorporating the invention.

For the purpose of more clearly deriving at the invention, the same numerals will be employed in Fig. 4 to indicate similar elements (which form no part of the present invention) as those given in United States Letters Patent 2,139,210. In the present instance however these elements are shown in Fig. 4 merely diagram-

As will be readily seen from Fig. 4 primary winding 12 of transformer TR<sub>1</sub> is connected through timer T to the leads 10 and 11 of the power line and furnishes electrical power to its secondary winding 13. One leg 14a of said secondary winding 13 is connected to trigger 25 while the other leg 14b of said winding is connected to interrupter 22 for periodically closing the circuit for secondary winding 13 and one terminal of its coil 29, the other terminal of coil 29 being connected to the trigger 25. Interrupter 22 is operated by a motor (not shown).

Operable within coil 29 is armature 30 carrying contact point 36. One end of said armature 30 is connected to a terminal of a secondary winding 50, and the other terminal of said winding 50 is connected through conductor 52 to a controller generally indicated by 53 and to a "hit" indicator generally indicated by 54. The return conductor lead 55 connects with the return wires 56, 57 of "hit" indicator 54 and controller 53, respectively, the return lead 55 being connected with contacts 16a, 16b and 16c of motor (not shown) driven target or game disc 6, the said contacts being insulated from each other by a suitable layer 15 except when the device is correctly aimed, as described in the said United States Letters Patent hereinabove mentioned.

Secondary winding 50 of transformer TR<sub>2</sub> receives its electrical power by primary winding 51 whose terminals are connected to power lines 10 and 11.

When the "hit" circuit is caused to be closed as hereinafter described by engagement of contact point 36 with one of the said contacts 16a, 16b or 16c, simultaneously relay coil 58 of controller 53 is energized, actuating dog-plunger 59 to rotate ratchet wheel 60. Mounted on the shaft 61 of said ratchet wheel 60 is a pinion 62 which meshes with a gear 63 fixed to shaft 64. Secured to shaft 64 are contact fingers 65, 66 and 67 disposed in angular relation with each other as clearly indicated in Fig. 4 and for a purpose of actuating the controller 53 and hereinafter more fully described.

Controller 53 substantially comprises a plurality of rows I, II and III of contact points preferably circumferentially arranged on an insulating disc 68 mounted on a unit 70 (Fig. 2) later described. Fingers 65, 66 and 67 cooperate with respective rows I, II and III, to complete or open circuits.

In Fig. 4 dot-dash lines 65a, 66a and 67a show a particular initial location of said fingers 65, 66 and 67, finger 65 having been moved by gearing system 64, 63, 62, 61 and 60 and relay 58, 59 from zero-point 69 of row I to first contact point 71 of the said row. It is understood that all the other fingers move therewith since they are fixedly secured to shaft 64. The fingers 65, 66 and 67

are also fixed in angular relation with each other.

The purpose of the controller 53 is to establish connections between the "hit" contacts and the signal means which will be later described. To this end, it is desirable to indicate the "hit shots" in multiples, that is to say, when the "hit" contacts are made between contact point 36 and either of the three contacts 16a, 16b and 16c, and since the ratio of the diameters of pinion 62 and gear 63 is, for instance, 1 to 5, finger 65 will move from zero-point 69 to position 65a (contact point 71) only after five "hit shots" have been made. In this position 65a a circuit is closed which comprises secondary winding 82, lead 74, finger 65 (at position 65a) leads 75, 76, lamp A200, leads 77, 78, 79, back to secondary winding 82 through lead 80. Primary winding 83 of transformer TR3 is connected in the usual manner to the power lines 10 and 11.

If now five more "hits" are made in the aforementioned manner, finger 65 will then be shifted to the next contact point 71a whereas the aforesaid electrical connections through contact 71 are interrupted. Finger 65 then closes through contact 71a the circuit including lamp B400 through leads 75a, 76a, B400, 77a, 78, 79, 80, secondary winding 82, lead 74, finger 65, which connections are clearly shown in Fig. 4.

The finger 65 is shifted as described above, from contact point to contact point as the number of "hits" progresses, through 71b, 71c to 71d making and opening circuits successively at said contact points. At this latter contact point 71d, finger 66 will then be in contact with the first contact point 72 of row II. If finger 65 engages contact point 71d, finger 66 will engage contact point 72, and then the following circuits are established namely:

This circuit made by contact of finger 66 with contact point 72 (of the 1000 score row II) comprises leads 84, 85, 86, 87, lamp L1 (indicating 1000 scores) return leads 88, 89, 79, 80, 82, 74 and finger 66. Simultaneously the following circuit is also closed by finger 65 when engaging contact point 71d: comprising leads 90, 91, 92, 93, 94, coil 95, leads 96, 97, secondary winding 98 of transformer TR4, leads 99, 74 and finger 65. This latter circuit energizes relay coil 95 which causes operation of contact 100. This contact 100 is connected through leads 101 and 102 to transformer TR4 which energizes through said contact 100 a conventional flickering control device or flasher 103 for causing the lamps a to h inclusive to be lighted in sequence indicating stages in the falling course of an airplane x after being "hit" at the stage of each consecutive 1000 scores.

Airplane x is shown diagrammatically in Fig. 1. In the same Fig. 1 the score stages 200, 400, 600, 800 which correspond to signals A200, B400, C600, D800 of Fig. 4, represent the path taken by a "bullet," aimed at airplane x through electrical contacts made at 36 with either contact 16a, 16b, or 16c when pulling trigger 25.

When each 1000 score stage is reached airplane x is "hit" and the airplane is indicated as "falling" as heretofore described.

When fingers 65, 66, 67 are moved in the direction of arrow to positions shown in Fig. 4, finger 67 engages the first contact point 73 of row III and closes circuit through contact connection 110 of row III, leads 111, 112, coil 113, lead 114, lamp 54, leads 115, 79, 80, secondary winding 82, lead 74 back to finger 67.

It can be readily seen from the circuit diagram of Fig. 4 that when scores of 6000 or over

are made, the coil 113 is energized, which coil attracts a releasing armature 113' which through a known mechanical connection (not shown) influences and releases the coin slide mechanism 225 (Fig. 1) of the apparatus to permit operation of the slide without requiring the insertion of a coin therein. This "free game" chance is indicated by signal lamp 54'. At the same time finger 66 which is, as heretofore mentioned, fixed to the same shaft 64 as fingers 65, 67, will also close a circuit which will signal the lamp L6 (indicating said score of 6000) and which comprises secondary winding 120, lead 74, finger 66, leads 120, 121, 122, 123, lamp L6, leads 124, 89, 79 and 80 back to secondary winding 82 of transformer TR3.

It is to be noted that the primary windings of transformers TR1, TR2, TR3 and TR4 are connected across the power lines 10, 11.

From the above description it is obvious that when the trigger 25 is pulled (after a coin has been inserted in the coin slide of the apparatus) and the barrel 19 has been aimed in the direction of the rotating game disc 6 carrying the spaced apart targets 16a, 16b, 16c to be "fired upon" for a "hit," contacts will be made successfully when correct aims are made, establishing, as aforesaid, the electrical connection between contact point 36 and any one of contacts 16a, 16b or 16c, as the case may be, this being accomplished in accordance with the operation of interrupter 22 during its closed position.

Upon the closing of either one of said latter contacts then the electrically operated dog 59 will rotate ratchet wheel 60 about one tooth which translates through 61, 62, 63 rotation to shaft 64 carrying thereon contact fingers 65, 66, 67. In this particular instance, after 5 "hits" have been made, and the gear 63 thus moved to the extent of five teeth, finger 65 is moved from its zero-position 69 to the first contact 71 thus closing a circuit, as stated hereinabove, for signaling lamp A200 (200 scores). After five further "hits" are made, a similar movement of finger 65 is accomplished, closing the next circuit (as described before) for signaling lamp B400 (400 scores) etc., until the circuit of lamp D800 (800 scores) is closed. If thereafter further five "hits" are made two circuits are closed, one signaling lamp L1 (1000 scores) and another operating flickering device 103 (as hereinbefore explained).

In the event that further five "hits" are made then the finger 65 will move to a contact position which will close again a circuit of row I including lamp A200, while finger 66 still maintains contact with row II (1000 section thereof) thereby providing signaling of lamps L1 and A200 (1200 scores) in respective circuits. This may be then continued during operation of trigger 25 until the "6000 scores" are reached for a "free game."

It can be seen from the electrical connections that the flickering device 103 will only become operative when finger 65 is moved to positions representing 1000, 2000, 3000, etc. scores.

It is understood that time switch T may be employed to limit the period of time within which the scores are to be made. A release lever (not shown) actuable by the coin-slide of the machine, which is conventional in its construction, may be operated by said coin-slide for resetting the time switch, if the said "free game" score is attained. In this instance, operator may push inwardly the coin-slide without insertion of a coin to operate the release lever in a well known manner.

Fig. 2 shows a unit or mechanism 70 particularly adapted for operating the controller 53. This unit 70 has a frame comprising the end discs 200 and 201. Spaced from disc 201 and intermediate the latter and disc 200 is positioned another disc 202. These discs are held in spaced relation by means of standards 203, 204, 205. Projecting through disc 201 and rotatably mounted on discs 201 and 202 is shaft 64 for receiving thereon fingers 65, 66, 67 (not shown). Mounted on standards 203, 204, 205 and above disc 201 is controller disc 68 (Fig. 4) in such manner that fingers 65, 66, 67 may move by means of shaft 64 on controller disc 68 (as particularly shown in Fig. 4).

Gear 63 is mounted on shaft 64 between discs 201 and 202 and meshes with pinion 62 rotatably mounted on disc 202. Pinion 62 projects through 202 and has fixed thereto ratchet wheel 60. Dog 59 forming an extension of armature 59' is adapted for intermittent engagement with ratchet wheel 60. A locking lever 206 is swingably mounted on disc 202 at 207 and is held against the teeth of ratchet wheel 60 by spring 208 for preventing counter-rotation of the latter. This counter-rotation is brought about by a coil spring 209 having one end fixed to the frame at 210 and its other end secured to an abutment 211 carried by gear 63. As gear 63 is rotated said spring 209 winds up until abutment 211 which projects beyond the other face of the gear 63 abuts against a projection 212 on disc 202 indicating the terminal positions of fingers 65, 66, 67 on controller disc 68 when the 10,000 scores are reached (Fig. 3).

Armature 59' will be attracted, as hereinbefore stated, by coil 58 which is connected by lead 57' to secondary winding 50 of transformer TR2, whereas lead 57 connects with contacts carrying discs 6.

Within the aforesaid frame, there is further housed a coil 213 which is energized through wires 215, 216, which are connected with conventional switch means (not shown). These switch means are operated by the coin slot of the apparatus in such manner that upon insertion of a coin (or also in case of "free game") the coin slot is pushed to such an extent that it closes through said switch means a circuit which energizes coil 213 which latter attracts armature 214. Fixed to said armature is a lever 217 whose offset free end 218 upon movement of said armature toward said coil 213 acts upon locking lever 206 and against the action of its spring 208, thus releasing ratchet wheel 60 for rotation under action of spring 209 to bring the ratchet wheel 60 to its initial position. Since shaft 64 is fixedly connected with ratchet wheel 60, said shaft is rotated and fingers 65, 66, 67 are reset to their respective starting positions making the indicating apparatus ready for a new game. If finger 65 is brought to its zero-position 69 the operating circuit is opened and the lamps, etc., are disconnected from their respective circuits.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantages before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without depart-

ing from the principle involved or sacrificing any of its advantages.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a preferred embodiment, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and its operation may be made by those skilled in the art without departing from the spirit of the invention.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. In combination with a game device having a sighting device for following a moving target associated with the game device and means for periodically closing a circuit when the sighting device is aimed at the target; a step-by-step circuit controlling device, means in said circuit for stepping said device step by step, a score indicating device comprising a first series of lamps arranged to indicate by their successive illumination hits scored on the moving target, a second series of lamps arranged to indicate by their successive illumination stages in the simulated falling of the target when hit, a third series of lamps for indicating by their successive illumination the number of times said first series of lamps has been operated, circuit controlling means for successively operating said second series of lamps through a cycle when set into operation, and means operated by the step-by-step circuit controlling device for successively operating said first series of lamps, setting into operation the circuit controlling means for the second series of lamps for one cycle of operations, thereafter repeating these operations and with each repetition successively illuminating the lamps of the third series.

2. In combination with a ballistic game apparatus provided with means for aiming at a moving target and with means for periodically closing an electric circuit whereby through said aiming means when in aligned position with said target and when said circuit is closed a "hit" is established, a step-by-step circuit controlling device, electro-magnetic means in said circuit for stepping said device step by step, a score indicating device comprising a first series of lamps arranged in slanting formation to simulate stages of a trajectory of a projectile directed toward a target arranged on said indicating device and to indicate by their successive illumination "hits" at said moving target, a second series of lamps arranged to simulate by their successive illumination stages of a falling target when "hit," and a third series of lamps for indicating by their successive illumination respective operations of all the lamps of said first series; means controlling for a single cycle of actuation said second series of lamps, and contact means relatively movable to each other and actuated by said step-by-step circuit controlling device for successively operating respectively said first series of lamps, and then placing in operation for a single cycle said controlling means for actuating the second series of lamps and simultaneously illuminating a respective lamp of said third series for signaling operation of all lamps of said first series.

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