April 4, 1939. I. J. HAWKINS 2,152,803

BULL'S EYE TARGET

Filed July 21, 1937 2 Sheets-Sheet 1

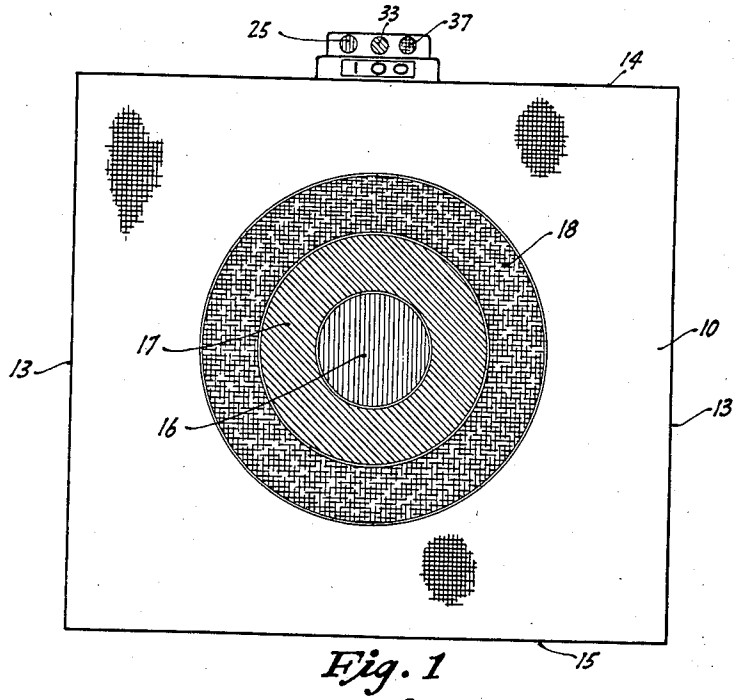


Fig. 1

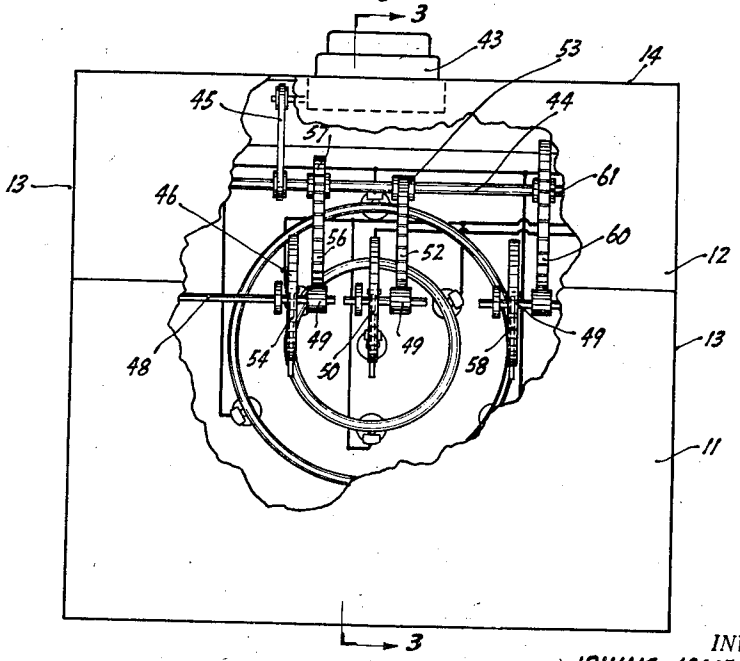


Fig. 2

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BULL'S EYE TARGET

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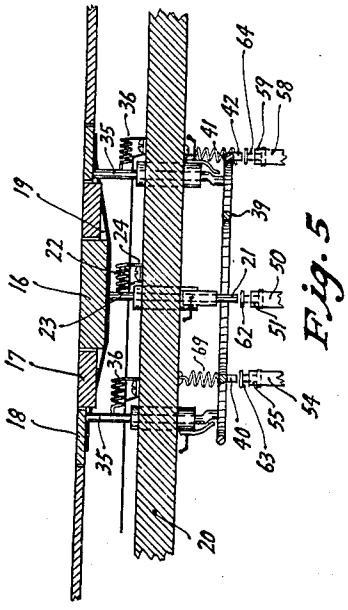


Fig. 5

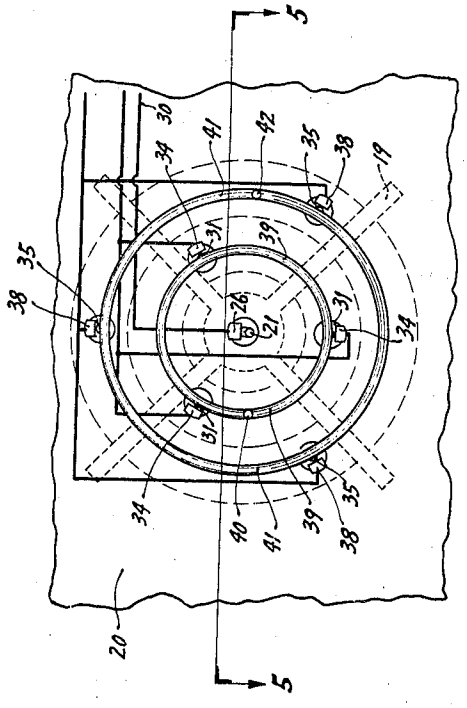


Fig. 6

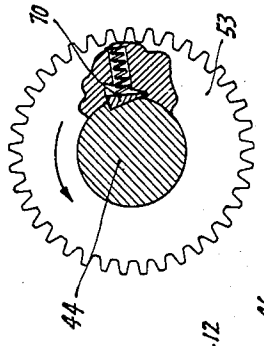


Fig. 4

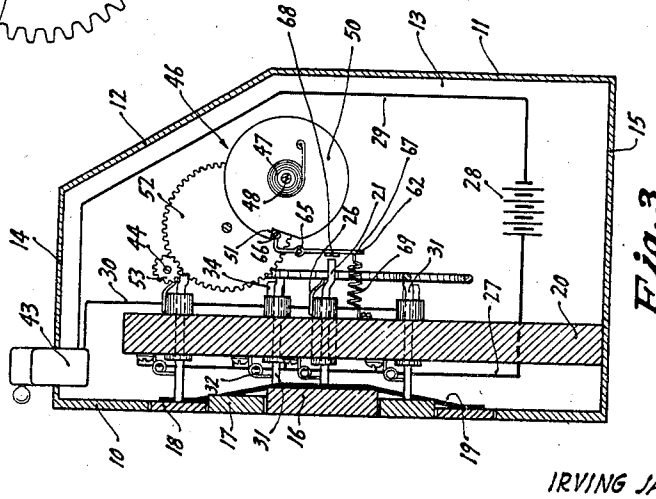


Fig. 3

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Patented Apr. 4, 1939 2,152,803

UNITED STATES PATENT OFFICE

2,152,803

BULL'S-EYE TARGET

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Application July 21, 1937, Serial No. 154,851

1 Claim. (Cl. 273—102.2)

This invention relates to a bull's-eye target device, and the general object of the invention is to provide a novel and improved game of skill.

A more explicit object of the invention is to provide a bull's-eye target device which will include mechanism for automatically denoting the shooting score of a marksman, and in which device will be incorporated various improved features and characteristics of construction novel both as individual entities of the device and in combination with each other.

With the above objects in view, as well as others which will appear as the specification proceeds, the invention comprises the construction, arrangement and combination of parts as now to be fully described and as hereinafter to be specifically claimed, it being understood that the disclosure herein is merely illustrative and intended in no way in a limiting sense, changes in details of construction and arrangement of parts being permissible so long as within the spirit of the invention and the scope of the claim which follows.

In the accompanying drawings forming a part of this specification,

Fig. 1 is a front elevational view of a bull's-eye target device in which the features of the invention are incorporated;

Fig. 2 is a rear elevational view of the device of Fig. 1, partially broken away;

Fig. 3 is a vertical sectional view, taken as on line 3—3 of Fig. 2;

Fig. 4 is a view detailing any one of several slip connections for a common drive shaft of the device;

Fig. 5 is a detail sectional view, taken substantially as on line 5—5 in Fig. 6; and

Fig. 6 is a view detailing elements of the device.

With respect to the drawings and the numerals of reference thereon, a casing of the device consists of a front wall 10, a rear wall including a vertical portion 11 and an oblique portion 12, side or end walls 13, a top wall 14, and a bottom wall 15.

The front wall 10 is cut away to receive target members including a bull's-eye target member 16, an annular target member 17 immediately surrounding the bull's-eye target member 16, and a second annular target member 18 immediately surrounding the annular target member 17. Each of the target members 16, 17 and 18 is an independent entity adapted to be moved with respect to the other target members and with respect to the front wall 10 when struck on the forward surface thereof, as by a bullet, missile, arrow, or the like.

The bull's-eye target member 16 includes a forward surface normally alining with the forward surface of the front wall 10, and said bull's-eye target member 16 includes a rearward surface spaced somewhat rearwardly of said front wall. The bull's-eye target member 16 is held in its normal position by a plurality of elastic straps 19, or equivalent, secured to the rearward surface of said bull's-eye target member 16 and to the rearward surface of the front wall 10.

The annular target member 17 includes a forward surface normally alining with the forward surface of the front wall 10, and said target member 17 includes a rearward surface spaced rearwardly of said front wall a distance less than the rearward surface of the bull's-eye target member 16 is spaced from the front wall. The annular target member 17 is held in its normal position by the elastic straps, or equivalent, 19.

The annular target member 18 includes a forward surface normally alining with the forward surface of the front wall 10 and a rearward surface substantially alining with the rearward surface of said front wall. Said annular target member 18 is held in its normal position by the elastic straps, or equivalent, 19.

In practice, the game is played, or the device is operated, by shooting at and striking the target member 16, or coming as close to this target member as possible. The device includes an arrangement for lighting a lamp when the bull's-eye target 16 is struck, as well as for lighting additional lamps, one corresponding to each target member, when either of the target members 17 or 18 is struck. And said device also includes mechanism for automatically posting the score, and the accumulated score, of a marksman, whether he hits the bull's-eye target member 16 itself or either of the target members 17 or 18.

An insulating block 20 is suitably mounted in the casing in slightly spaced apart and parallel relation to the front wall 10 of said casing. Said insulating block 20 slidably supports a movable contact member or rod 21 disposed in axial alinement with the central target member 16. A coil spring 22, secured to the contact member or rod 21 as at 23 and to the insulating block 20 as at 24, normally retains the forward or outer end of said contact member or rod 21 in engagement with the rearward surface of the bull's-eye target member 16, as will be more clear from Figs. 3 and 5. A lamp 25, corresponding to the bull's-eye target member 16, is as disclosed arranged upon the casing of the device, but could be situated elsewhere. A fixed contact member 26 suitably supported upon the insulating block 20 is adapted to be engaged by the movable contact member or rod 21 when the center target member 16 is struck at the front thereof and moved rearwardly against the resilient action of the elastic straps 19. The coil spring 22 is adapted to the

purpose of returning the contact member or rod 21 to its normal position after said contact member or rod 21 is actuated. And too, the length of time the movable contact member or rod 21 and the fixed contact member 26 are in engagement is regulated by said coil spring 22. By adjustment of the coil spring 22 to exact perpendicular relation to the movable contact member or rod 21, the contact members 21 and 26 may be caused to be in engagement a minimum of time, and with adjustment of said coil spring 22 away from perpendicular relation to said movable contact member or rod 21 said contact members 21 and 26 are caused to be in engagement after actuation of the contact member or rod 21 an increased length of time, due both to a more disadvantageous relation of the coil spring 22 to the contact member or rod 21 and increased resistance due to friction caused by said spring to sliding movement of said contact member or rod 21 in the insulating block 20. A lead wire 27 connects the movable contact member or rod 21 with a battery 28, a lead wire 29 connects the battery with the lamp 25, and a lead wire 30 extends from said lamp to the fixed contact member 26. It will be evident that striking the bull's-eye target member 16 will cause the lamp 25 to be lighted and that said lamp will remain lighted during an interval of time as predetermined by the setting of the coil spring 22.

The insulating block 20 slidably supports a plurality, three as shown, of movable contact members or rods 31 desirably disposed at sixty degrees apart and each in alinement with the annular target member 17. Coil springs 32, each similar to the coil spring 22 and similarly functioning, include a coil spring 32 corresponding to each movable contact member or rod 31. Each coil spring 32 normally retains the forward or outer end of its corresponding movable contact member or rod 31 in engagement with the rearward surface of the target member 17. A lamp 33, corresponding to the target member 17, is arranged adjacent the lamp 25. Fixed contact members 34, one for each movable contact member or rod 31, are suitably supported upon the insulating block 20, and the arrangement is such that one or the other of the movable contact members or rods 31 engages a fixed contact member 34 when any part of the annular target member 17 is struck at the front thereof and moved rearwardly against the resilient action of the elastic straps 19. A lead wire connects each movable contact member or rod 31 with the battery 28, a lead wire connects said battery with the lamp 33, and a lead wire extends from said lamp 33 to each fixed contact member 34, so that striking of the target member 17 at any location will cause the lamp 33 to be lighted. As stated in connection with the lamp 25, said lamp 33 will remain lighted during an interval of time as predetermined by the setting of the coil springs 32.

Also, the insulating block 20 slidably supports a plurality, three as shown, of movable contact members or rods 35 desirably disposed at sixty degrees apart and each in alinement with the annular target member 18. Coil springs 36, each similar to the coil springs 22 and 32 and similarly functioning, include a coil spring 36 corresponding to each movable contact member or rod 35. Each coil spring 36 normally retains the forward or outer end of its corresponding movable contact member or rod 35 in engagement with the rearward surface of the target member 18. A lamp 37, corresponding to the target member 18, is arranged adjacent the lamps 25 and 33. Fixed contact members 38, one for each movable contact member or rod 35, are suitably supported upon the insulating block 20. The arrangement is such that one or the other of the movable contact members or rods 35 engages a fixed contact member 38 when any part of the annular target member 18 is struck at the front thereof and moved rearwardly against the resilient action of the elastic straps 19. A lead wire connects each movable contact member or rod 35 with the battery 28, a lead wire connects said battery with the lamp 37, and a lead wire extends from said lamp 37 to each fixed contact member 38, so that striking of the target member 18 at any location will cause the lamp 37 to be lighted, and said lamp 37 will remain lighted during an interval of time as predetermined by the setting of the coil springs 36.

An annular frame 39 in spaced relation to the insulating block 20, and in alignment with each of the movable contact members or rods 31 and just to the rear of said movable contact members or rods 31, is suitably mounted within the casing of the device to be moved rearwardly upon rearward actuation of any one of the movable contact members or rods 31 by reason of rearward actuation of the target member 17. Said annular frame 39 includes a rearwardly extending button or working surface 40.

An annular frame 41 in spaced relation to said insulating block 20 and in surrounding, spaced relation to the annular frame 39, as well as in alinement with each of the movable contact members or rods 35 and just to the rear of said movable contact members or rods 35, is suitably mounted within the casing of the device to be moved rearwardly upon rearward actuation of any one of the movable contact members or rods 35 by reason of rearward actuation of the target member 18. Said annular frame 41 includes a rearwardly extending button or working surface 42.

A counting and posting member 43 of ordinary or preferred construction is mounted upon the top wall 14 of the casing of the device as disclosed, and is adapted to be actuated by a horizontal driven shaft 44 suitably mounted in said casing, there being a belt and pulley connection 45 between the driven shaft 44 and the counting and posting member 43.

The driven shaft 44 is adapted to be independently and cumulatively driven by each of clock mechanisms 46, there being three clock mechanisms in the present instance. Each clock mechanism includes in common an actuating spring 47, a supporting shaft 48 conveniently mounted in the casing, and a pinion 49 upon the supporting shaft.

There is a clock mechanism 46 corresponding to the movable contact member or rod 21 and including, in addition to the elements common to all of the clock mechanisms, a cam 50 with detent 51 and a gear 52, suitably mounted in the casing, with which a pinion 49 of the corresponding clock mechanism meshes. The gear 52 meshes with a pinion 53 upon the driven shaft 44.

There is a clock mechanism 46 cosresponding to the button or working surface 40 and including, in addition to the elements common to all of the clock mechanisms, a cam 54 with detent 55 and a gear 56, suitably mounted in the casing, with which a pinion 49 of the corresponding clock

mechanism meshes. The gear 56 meshes with a pinion 57 upon the driven shaft 44.

There is a clock mechanism 46 corresponding to the button or working surface 42 and including, in addition to the elements common to all of the clock mechanisms, a cam 58 with detent 59 and a gear 60, suitably mounted in the casing, with which a pinion 49 of the corresponding clock mechanism meshes. The gear 60 meshes with a pinion 61 upon the driven shaft 44.

Each of the cams 50, 54 and 58 is normally held in stationary position by a pivoted arm, denoted 62, 63 and 64, respectively. These pivoted arms are, generally, similar and a description of the pivoted arm 62 as clearly disclosed in Fig. 3 and its method of functioning will suffice to explain the manner of operating of each of the pivoted arms 62, 63 and 64. Said pivoted arm 62 is mounted at 65 upon the casing and includes a length 66 thereof at one side of the axis 65 engaged with the detent 51. The length 67 at the opposite side of said axis includes a boss 68 adapted to be engaged by the movable member or rod 21, A coil spring 69 attached to the length 67 of the pivoted arm 62 and to the casing is adapted to normally retain the length 66 engaged with the detent 51 and so that the boss 68 is adjacent the inner end of the movable member or rod 21.

When the bull's-eye target member 16 is struck upon its forward surface, the movable member or rod 21 is pushed against the boss 68 and the pivoted arm 62 is actuated to remove the element 66 thereof from the detent 51 against the resilient action of the coil spring 69. The cam 50 of the clock mechanism makes one revolution under the influence of the clock spring while the element 66 rides upon the perimeter of the cam. The elastic straps 19 draw the target member 16 forwardly to its normal position, away from the movable member or rod 21, and the coil spring 22 draws said movable member or rod 21 away from the boss 68 during the interval the element 66 is riding the cam 50. Upon the completion of a single revolution of said cam 50, the element 66 engages the detent 51.

Similarly, when the target member 17 is struck, one of the movable members or rods 31 actuates the annular frame 39 so that the button or working surface 40 upon said frame 39 actuates the pivoted arm 63 to release the detent 55, and the cam 54 makes one revolution and stops, the elastic straps 19 returning said target member 17 to normal position immediately after a blow is struck. A coil spring 32 returns the member or rod 31 which was actuated to its normal position so that a coil spring such as 69 can actuate the pivoted arm 63 to engaging relation with the detent 52 and the annular frame 39 to its normal position.

Also, when the target member 18 is struck, one of the movable members or rods 35 actuates the annular frame 41 so that the button or working surface 42 upon said frame 41 actuates the pivoted arm 64 to release the detent 59, and the cam 58 makes one revolution and stops, the elastic straps 19 returning said target member 18 to normal position immediately after a blow is struck. A coil spring 36 returns the member or rod 35 which was actuated to its normal position so that a coil spring such as 69 can actuate the pivoted arm 64 to engaging relation with the detent 59 and the annular frame 41 to its normal position.

The relation of the gear 52 to its pinion 49 is such that a single rotation of the cam 50 will propel the driven shaft 44 the requisite distance to obtain the desired advancement of the counting and posting member 43. The relation of the gear 56 and its pinion 49 is such that a single rotation of the cam 54 will propel said driven shaft 44 a smaller amount to obtain a smaller advancement at the counting and posting member. The relation of the gear 60 to its pinion 49 is such that a single rotation of the cam 58 will propel the driven shaft 44 a still smaller amount to obtain a still smaller advancement at the counting and posting member. That is to say, hitting the bull's-eye target member 16 could be made to count 100 at the member 43, hitting the target member 17 could count 50, and hitting the target member 18 could count 25, simply by way of example. The driven shaft 44 and the belt and pulley connection 45 will desirably cause a cumulative score to be posted at the member 43 by repeated actuations advancing the driven shaft 44. The member 43 will desirably include an ordinary resetting means (not shown), and each of the clock mechanisms 46 will be separately windable in any customary manner.

In order that each clock mechanism can independently advance the driven shaft 44, a slip arrangement, denoted generally at 70 in Fig. 4, between each pinion 53, 57 and 61 and said driven shaft, can be employed. In said Fig. 4, rotation of the pinion 53 in the direction of the arrow disclosed will advance the driven shaft 44, and, at the same time, said driven shaft can be rotated in the direction of said arrow by one or the other pinions 57 and 61 while the pinion 53 remains stationary and the shaft rotates in the pinion. The pinions 57 and 61 are secured to the driven shaft 44 in the same manner as is the pinion 53.

What is claimed is:

A device of the character described, comprising a target member adapted to be actuated by being struck, a lamp, a fixed contact member, a supporting member, a slidable contact member adapted to be engaged with said fixed contact member in response to actuation of said target member, a circuit including said lamp, said fixed contact member and said slidable contact member, said circuit being adapted to be closed in response to movement of said slidable contact member into engagement with said fixed contact member by actuation of said target member, resilient means for normally maintaining the target member in a predetermined position and for returning said target member to its normal position immediately after actuation of the target member by being struck, and adjustable means upon said supporting member for controllably removing said slidable contact member from said fixed contact member to adjustably regulate the interval of time said circuit remains closed after movement of said slidable contact member into engagement with said fixed contact member after actuation of said target member, said adjustable means being constituted as a coil spring disposed in substantially right-angle relation to said slidable contact member, adjustably mounted upon said supporting member in spaced relation to said slidable contact member and secured to the slidable contact member.

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