

Jan. 16, 1940.

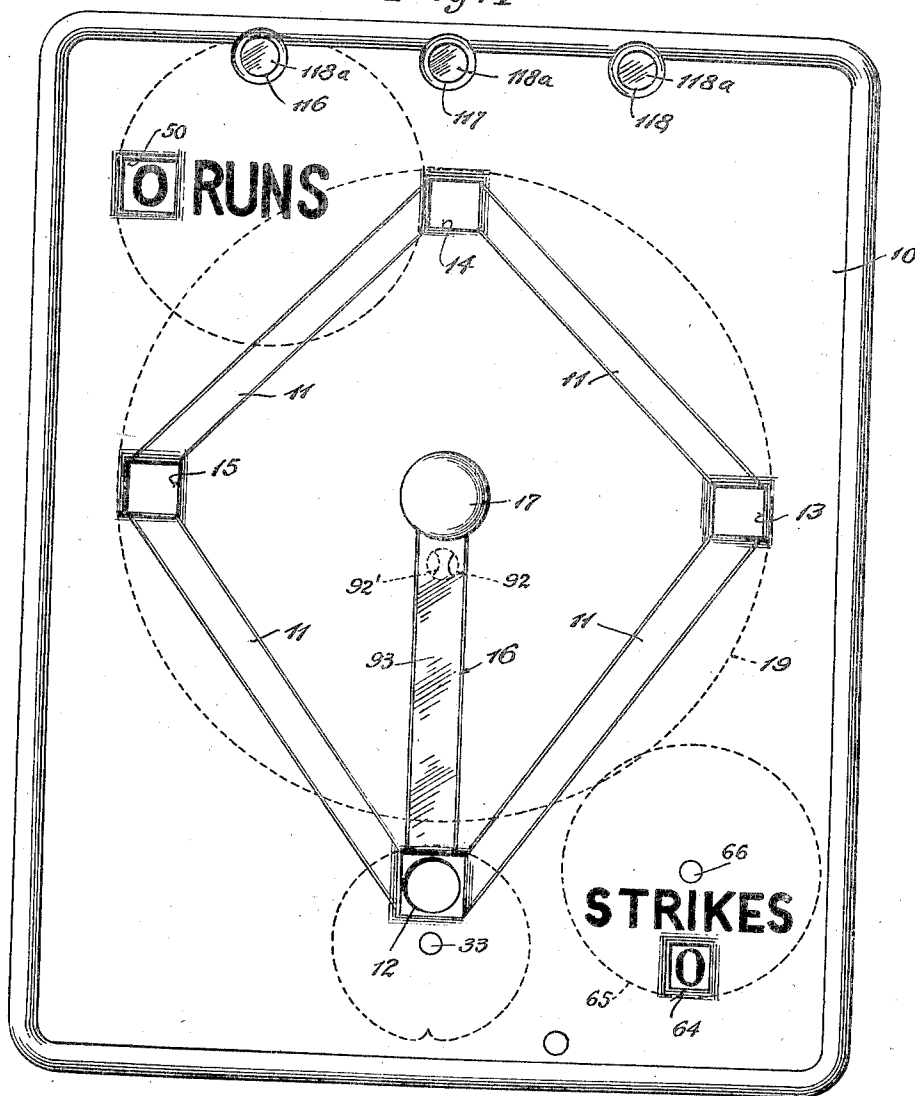
A. M. HENRY
AMUSEMENT APPARATUS

2,187,422

Filed Nov. 17, 1939

7 Sheets-Sheet 1

Fig. 1



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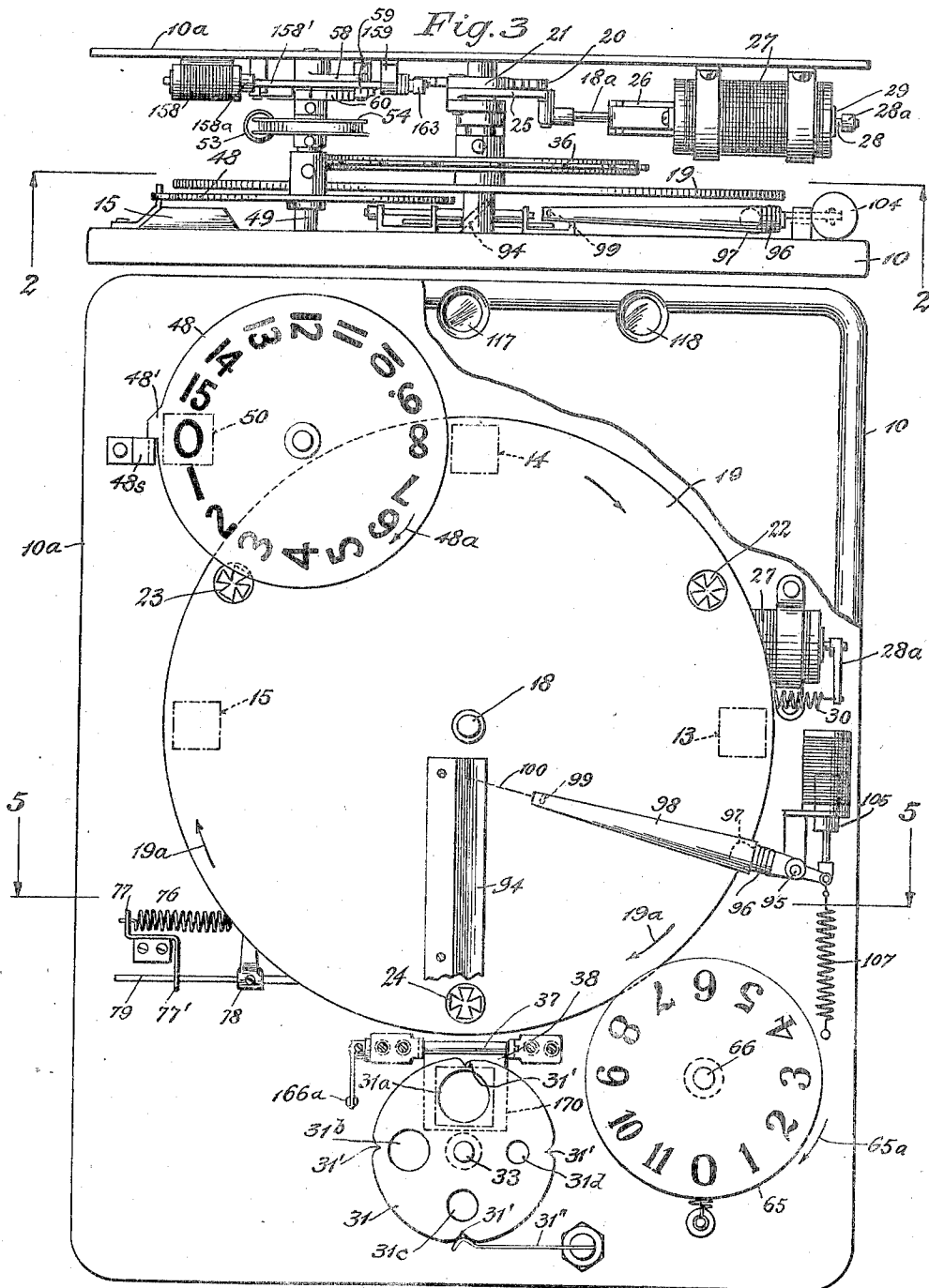
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A. M. HENRY

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Filed Nov. 17, 1939

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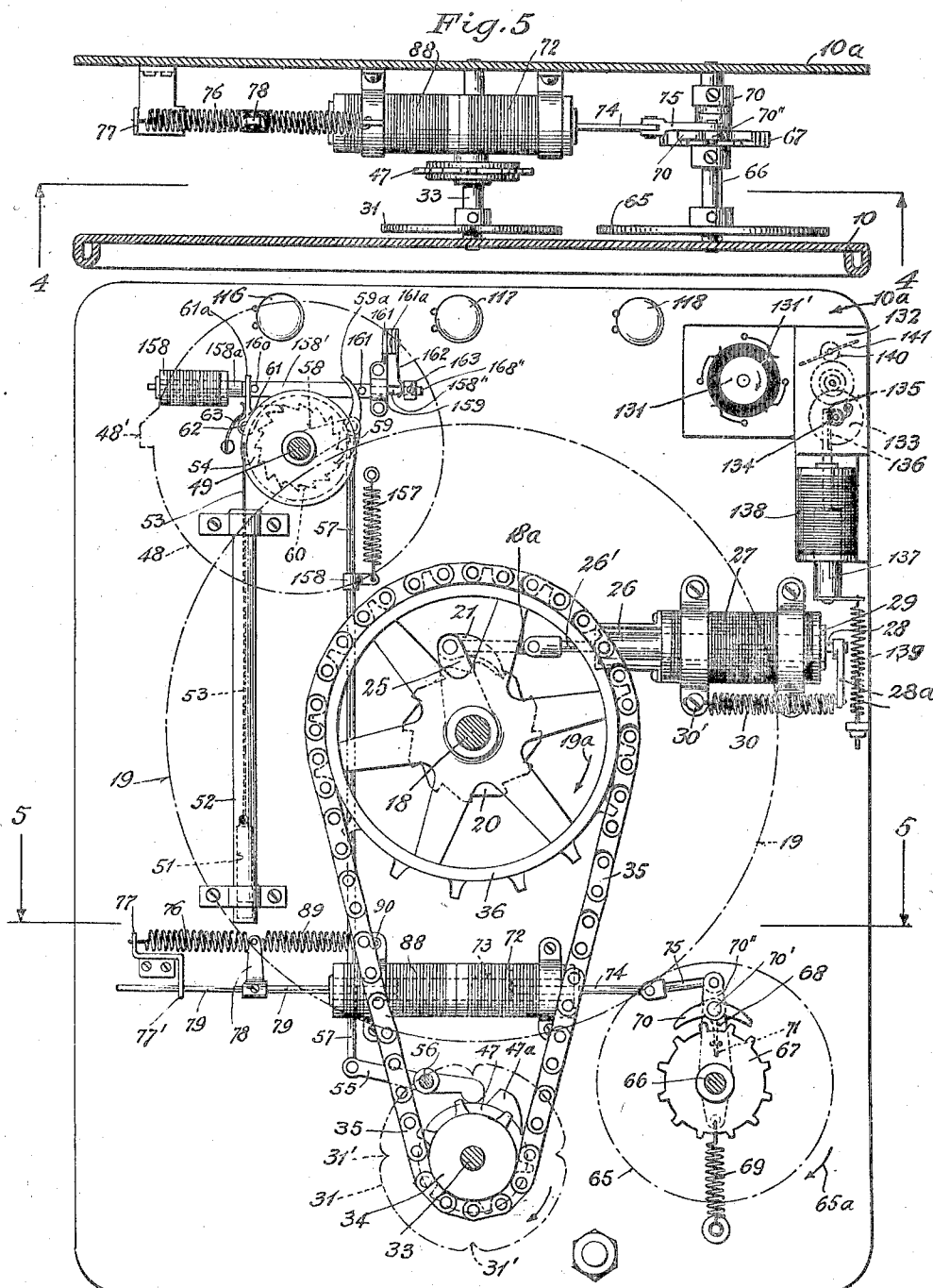


Fig. 4

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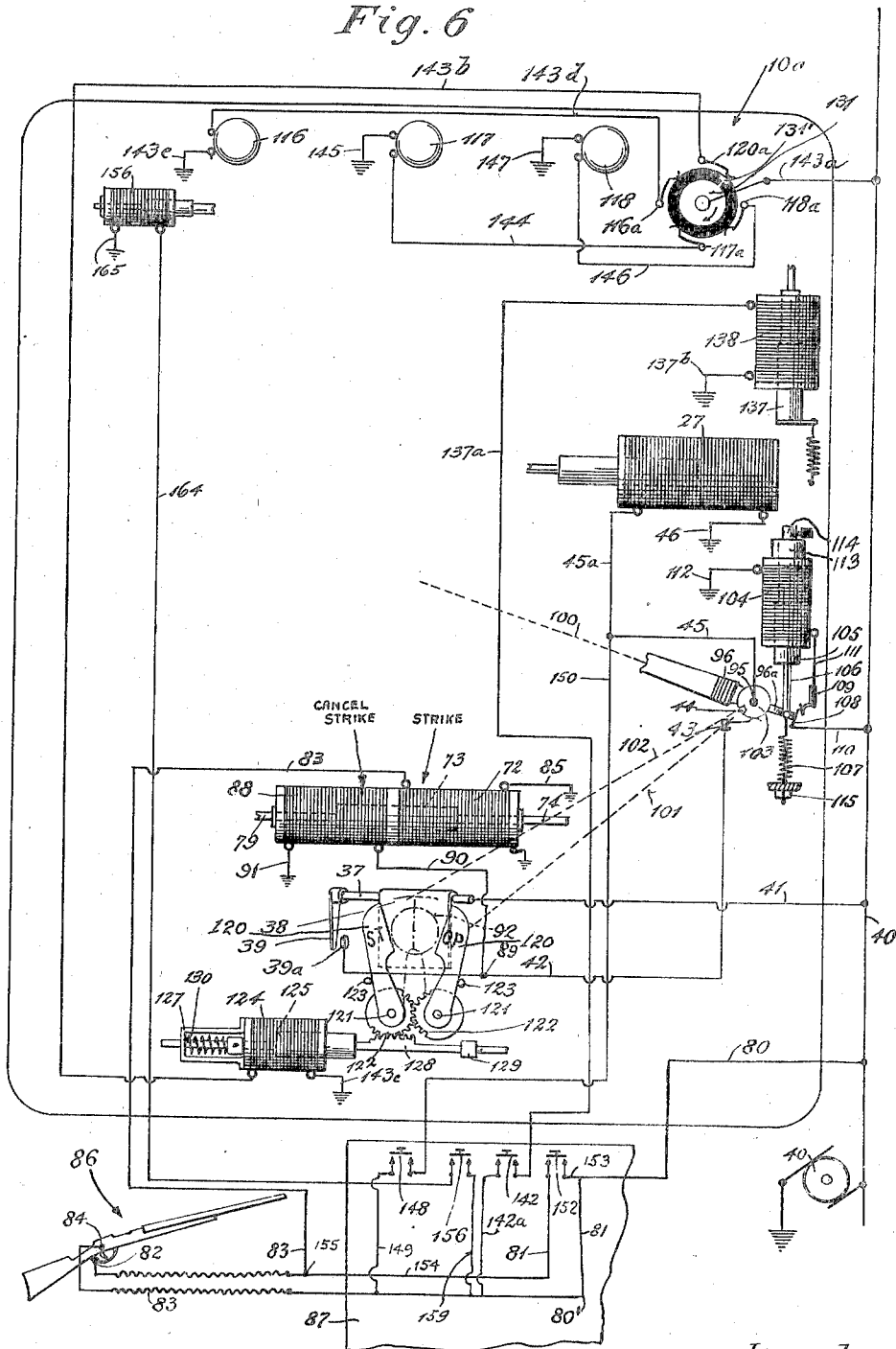
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Fig. 6



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Fig. 7

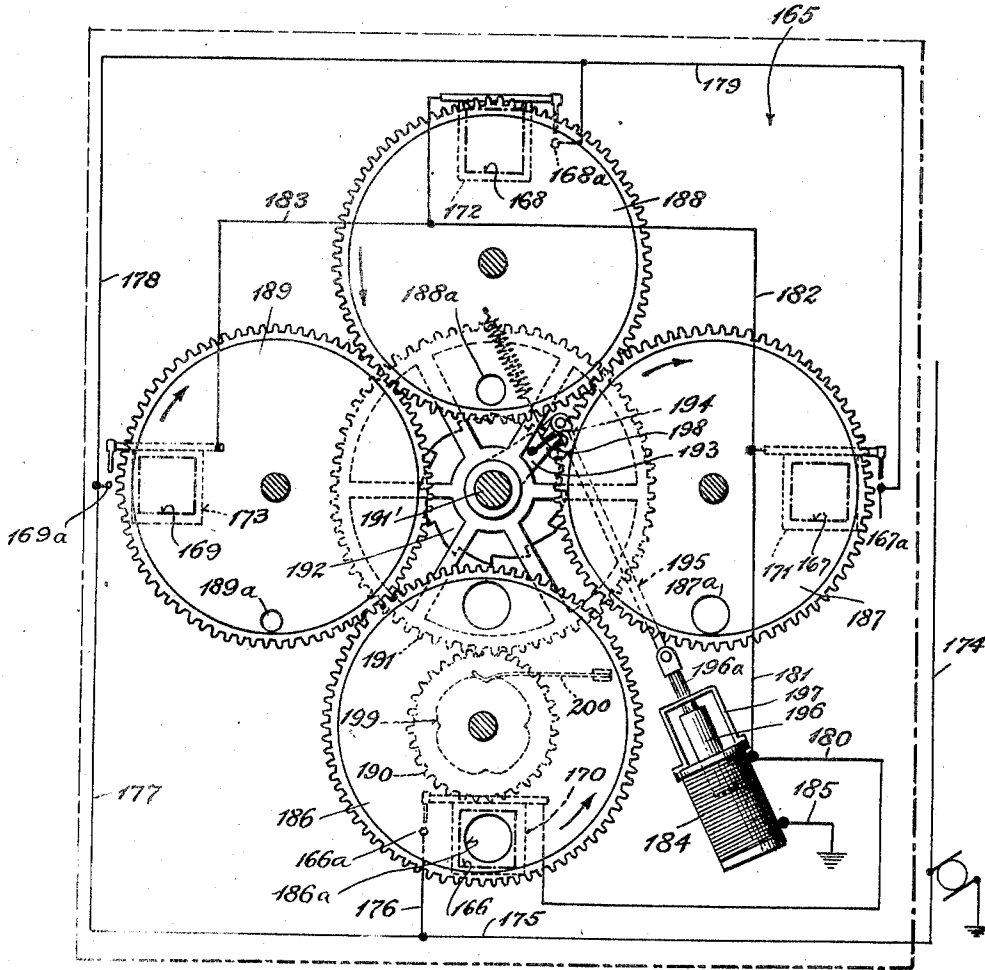


Fig. 9

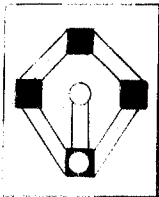


Fig. 10

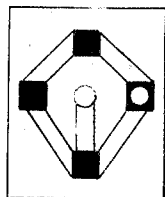


Fig. 11

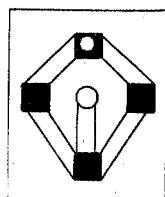
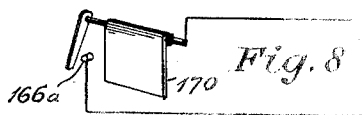
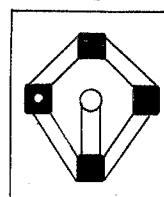


Fig. 12



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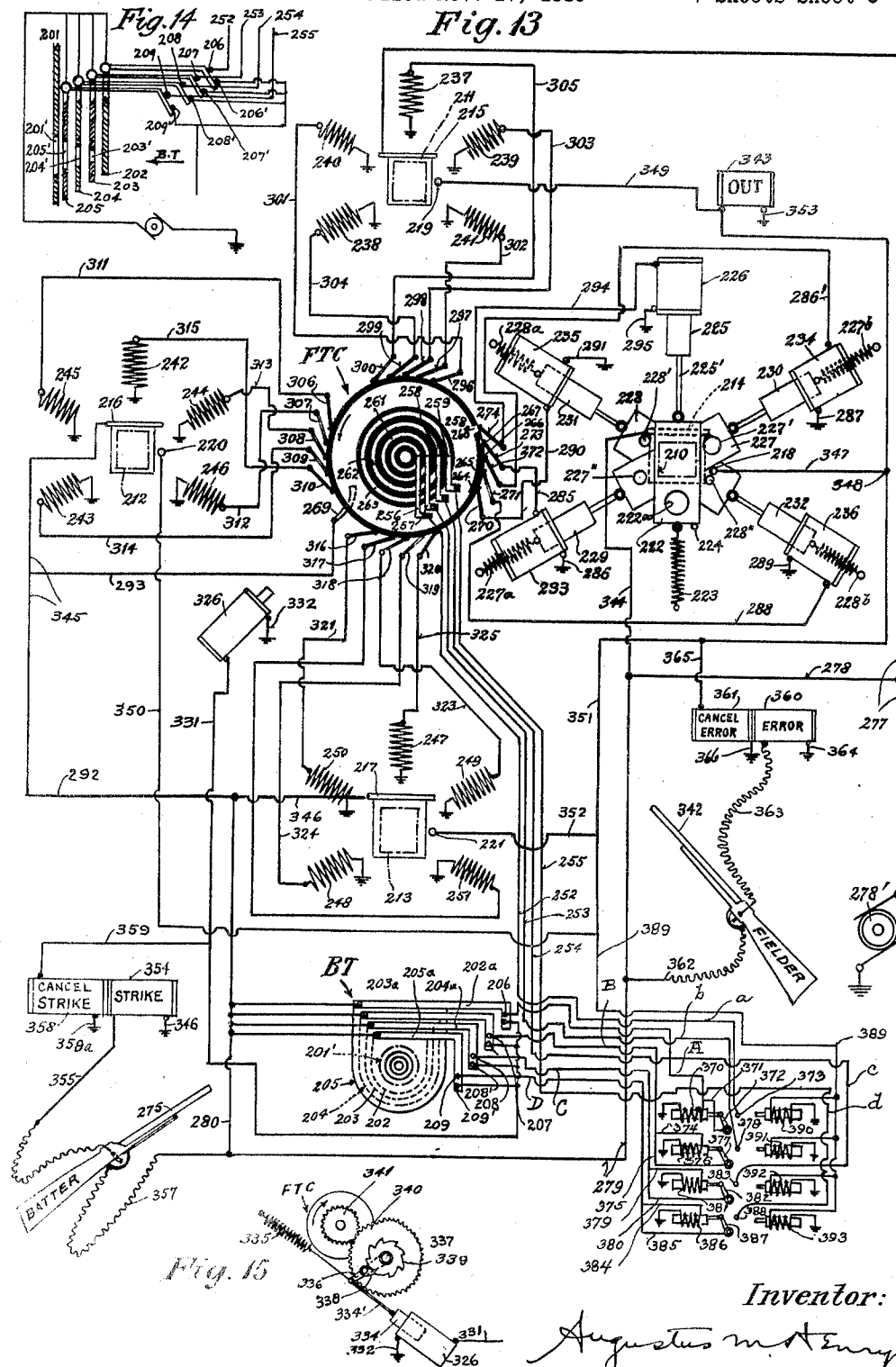
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AMUSEMENT APPARATUS

Filed Nov. 17, 1939

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Jan. 16, 1940.

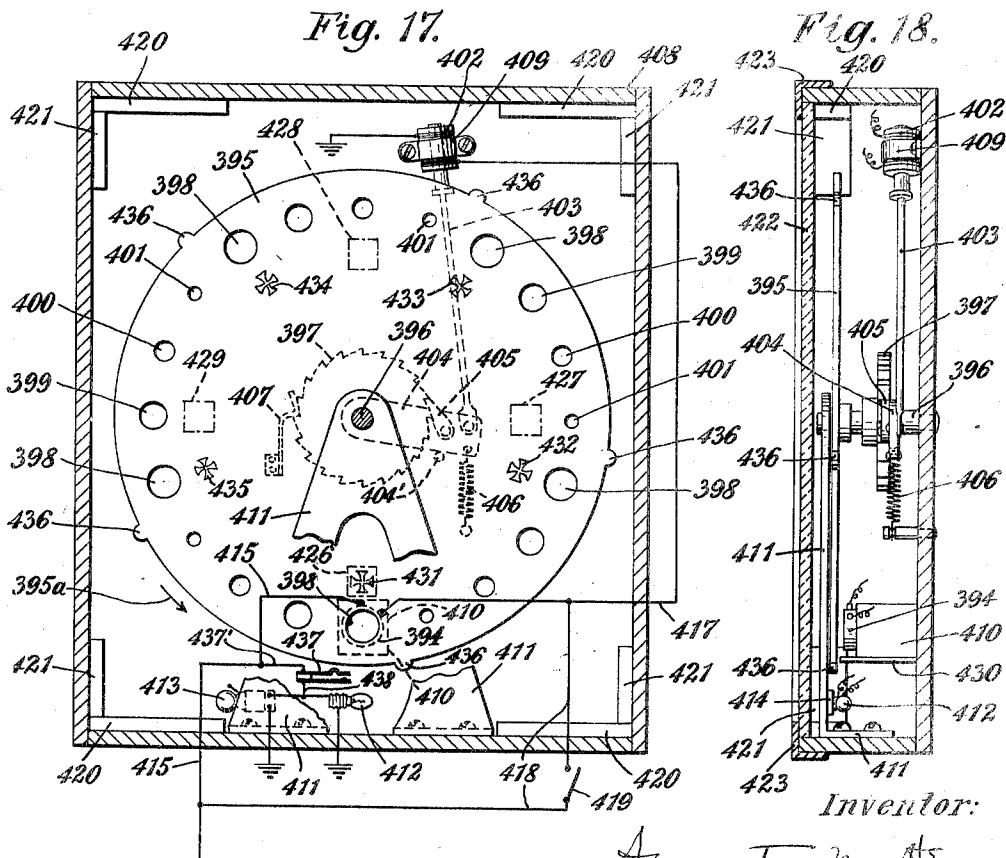
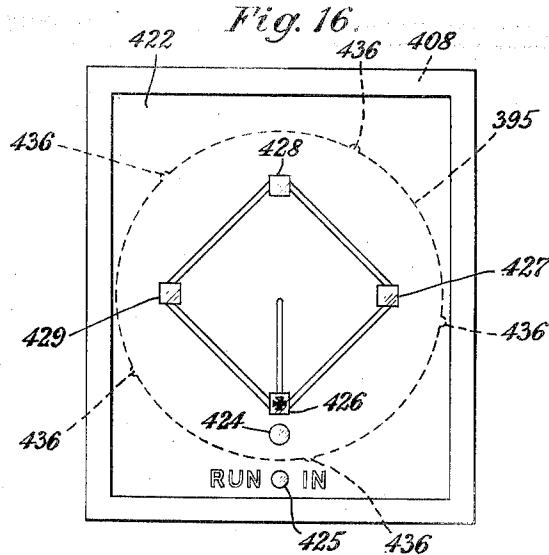
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UNITED STATES PATENT OFFICE

2,187,422

AMUSEMENT APPARATUS

Augustus M. Henry, Brooklyn, N. Y.

Application November 17, 1939, Serial No. 305,035

22 Claims. (Cl. 273—102.2)

This invention relates to games, or amusement apparatus, and has for a main object to provide a game or device of the kind just indicated, practicable for employment in so-called shooting galleries (especially when used as a target means in connection with the sending of a missile from a firearm, air rifle or the like), or in other public places where those who come and pay may operate or attempt to operate the game or device, as well also as by Boy Scout troops, school groups, sporting clubs and other associations, or in taverns and the like (especially when used as a target means in connection with the sending of a missile which is a ray of light or bundle of light rays "shot" from a so-called ray-gun), or in a home (in which case, preferably, the missile could be an arrow, say discharged from a bow, a rubber-tipped rod, or ball, or other object discharged say from a spring-gun), or wherever else appropriate; and in which game or device the element of skill of the player or contestant is an important factor.

Another object of the invention is to provide a game or device of the kind above indicated, and wherein, with such device preferably embodied, the popular appeal of a shooting contest can be combined with the popular appeal of the game of baseball, and at the same time a game or device will be provided which is quick in action as well as positive in indicating the result of a shot, which can also conveniently be embodied when desired so as to incorporate automatic means for the indication of successive base hits and the completion of runs, the recording of the latter and the registering of "strikes" according to any prearranged rule, and which also can be manufactured at comparatively low cost and operated at negligible expense.

In connection with the several advantages last-mentioned, these, particularly, were not present in the shooting gallery disclosed and claimed in United States patent to Horton and me No. 1,193,462, granted August 1, 1916. When an apparatus constructed according to the drawings of said patent was placed in a shooting gallery at Coney Island, New York, in July, 1914, such apparatus was found, to put it briefly, to have as its chief disadvantage that it was "too good." In other words, so much happened when any one of the target sections located at the home plate was hit that an unmanageable assemblage of spectators and would-be participants gathered; in numbers so great that a squad of police had to be called to disperse the crowd. Moreover, from the standpoint of the conces-

sionaire, who had only the clear days of a comparatively short season on which to depend for the recoupment of his heavy rent, not to mention his hope for some profit from his concession, the apparatus of the patent aforesaid was a distinct disappointment, as will now be explained.

In the first place, said prior apparatus weighed a ton or more, was very costly, and required a tremendous wall space, indeed about 40% of the wall space of the average size shooting gallery. As against this, an advantage of the present invention is the provision of a device, not only of exceedingly low cost and light weight enough not to need special and bulky foundations, but also small enough that perhaps a dozen thereof can be placed in the average size shooting gallery, while leaving plenty of remaining space for a large number of clay-pipes, traveling ducks, frangible balls supported atop water jets, and other time-honored target equipment. Consequently, the proprietor of a shooting gallery can retain all or almost all of his present target equipment, and yet at the same time he can install a sufficient number of the devices of the present invention to arrange matters so that all the members of several groups of participants in several different rifle-baseball contests can simultaneously shoot, with each contestant shooting at a device individually assigned to him.

In the second place, said prior apparatus had so many interest-intriguing visible working parts which operated when a target section was hit that after the firing of each shot, the one shooting waited to watch all the things happening, and even to listen to and answer the remarks of bystanders, before making another shot. Also, if the patron missed the target completely, so that none of said working parts visibly operated, he would wait sometimes a full minute in the hope that the machine was slow-acting, and in the disinclination to believe that he had missed the target; before making another shot. The result was that shots were fired anywhere from one to three to five minutes apart. As is well known, the privilege of shooting at these galleries is paid for at the rate of so much for so many shots, usually 25¢ for eight shots; and unless shots are made in rapid succession, as in endeavoring within a certain number of minutes to shatter a line of clay-pipes, the proprietor of the gallery does not make a fair profit.

An object of the present invention is to provide a simple and inexpensive game or apparatus having the popular appeal of a shooting contest

and also that of the game of baseball, wherein each base hit and/or run completion and/or each missing of a target and/or each hitting of a target, will be instantly and unmistakably recorded; so that there will be no excuse for pauses between shots.

Another object is to provide a game or device as last described, wherein simple and practical means are incorporated for timing a contestant to require him to make a certain number of shots within a given time interval, as by placing him under a certain penalty for his failure to do so.

Another object is to provide a game or device as above described, and for giving one or more of the registrations and recordings above referred to, which can be instantly reset to "zero" or starting condition, as to all of the recording instrumentalities employed, when one patron ceases shooting and it is desired to reset the device for the starting of a second contest.

Another object is to provide a simple and inexpensive game or apparatus having the popular appeal of a shooting contest and also that of the game of baseball, and wherein simple and practical means are provided for "timing" the effectiveness of a shot relative to the travel of the projectile object of play in an actual game of baseball, to wit, the baseball itself, in simulation of that rule of an actual game of baseball according to which the ball must be struck while it is passing "over the plate". Means to this end were a feature of the patented apparatus aforesaid; but in the case of the present invention the complexities, and the disadvantage of having the replica of the baseball and its carrying means subjected to injury from shots striking the same, are avoided.

A very important object of the present invention is to provide a target arrangement in a game or device having the popular appeal of a shooting contest as well as that of the game of baseball, such that the target as soon as struck will become transformed so as to be more difficult to hit, as by diminishing the area thereof, and/or changing the location thereof, and so that when the thus transformed target is struck it will similarly be made even more difficult to hit than before, and so on; to the end that a contestant who is able to hit the easiest target will be lured on to attempt to hit the next most difficult target. According to the present invention, as preferably embodied, each hitting of a target will advance the contestant one base; that is, the easiest target will be the one which he has to hit in order to be advanced to first base, and when he is "on first base" a more difficult target will be presented, so that he will have to show greater skill in getting from first base to second base, and still greater skill in getting from second base to third base, with the most difficult target of all being that one which he must hit in order to go from third base back to the home plate and thereby set to his credit one run.

Various other objects and advantages will be hereinafter referred to or become apparent from the following description, when taken in connection with the accompanying drawings, showing embodiments of the invention as now preferred.

In these drawings:

Figure 1 is a front elevation of one such embodiment, the peripheries of certain hidden scoring disks being indicated in broken lines.

Fig. 2 is a vertical sectional view, showing disks in front elevation and also showing certain

other parts; this view being taken on the line 2—2 of Fig. 3.

Fig. 3 is a top plan view.

Fig. 4 is a view similar to Fig. 2, showing various operating parts hidden in Fig. 2 behind said disks; this view being taken on the line 4—4 of Fig. 5.

Fig. 5 is a horizontal sectional view, taken on the line 5—5 of Figs. 2 and 4.

Fig. 6 is a somewhat diagrammatic view, showing electrical elements and wiring connections.

Fig. 7 is generally a vertical elevational view, illustrating another embodiment, in so far as are concerned features thereof whereby change of target size is accompanied by change of target location.

Fig. 8 is a fragmentary perspective view, showing a detail of construction.

Figs 9, 10, 11 and 12 illustrate the front of the apparatus as displayed to the person shooting, according, respectively, as such apparatus appears when said person starts shooting, when he has struck a target to advance a man to "first base", when he has struck a target to advance a man to "second base", and when he has struck a target to advance a man to "third base".

Fig. 13 is a view illustrating still another embodiment,—the same being somewhat diagrammatic in certain particulars, being largely electrical, and arranged in such manner that mechanical elements are shown in front elevation.

Fig. 14 is a vertical sectional view, taken on the line 14—14 of Fig. 13.

Fig. 15 is a fragmentary detail view.

Fig. 16 is a front elevation of an embodiment wherein the missile is a ray of light from a ray-gun and the target area exposed is a photo electric cell.

Fig. 17 shows said embodiment also in front elevation, but with the cover plate removed.

Fig. 18 is mainly a vertical section taken on the line 18—18 of Fig. 17.

Referring to the drawings in detail, and particularly to the exemplifying form of the invention shown in Figs. 1 to 6, at 10 is indicated a front wall behind which are located various mechanisms, and at 10a a rear wall in back of the latter.

On the obverse side of wall 10 is displayed a conventional representation of a baseball field, since this embodiment shows the invention employed in such a way that a similitude of the game of baseball can be "played" by shots fired at a target means pursuant to the invention. In the present case, such representation as shown includes a "diamond" having four "base line" paths joining the four "bases", these last being shown as squares so that they suggest the actual base positioning sacks or markers.

The "home plate" is designated by an opening 12, "first base" by an opening 13, "second base" by an opening 14, and "third base" by an opening 15. As is also conventional in apparatus for graphically reproducing an actual baseball game then being actually played at some remote point, such, for instance, as the apparatus disclosed in United States patent to me No. 1,043,765, of November 5, 1912, said representation is shown as also including a path 16 joining the pitcher's position 17 and the home plate.

Mounted on a shaft 18 is a disk 19 hereinafter called the base-running disk.

Base-running disk 19 has secured thereto a ratchet 20 having twelve teeth, whereby when a mechanism including a pawl 21 is operated, said

disk will be advanced $\frac{1}{12}$ th of a revolution in the direction indicated by the arrow 19a in Fig. 2. When a person starts shooting, as to commence participation in a shooting contest, the base-running disk is positioned as shown, that is, a "man-on-base" symbol, in the present case a maltese cross 22, is short of having a position corresponding to the opening 12 in wall 10 at first base, by $\frac{1}{12}$ th of a revolution of disk 19. A second similar symbol 23 is short of having reached the opening 14 in a wall 10 at second base by $\frac{2}{12}$ ths of a revolution of said disk, and a third similar symbol 24 is short of having reached the opening 15 in wall 10 at third base by $\frac{3}{12}$ ths of a revolution of said disk. As will be seen, starting with the disk in the position shown in Fig. 2, the first $\frac{1}{12}$ th revolution thereof will expose a man-on-base symbol at first base, the next $\frac{1}{12}$ th revolution of said disk will expose a man-on-base symbol on second base and remove the previously displayed symbol from first base, a third $\frac{1}{12}$ th revolution of said disk will display a man-on-base symbol at third base and remove the previously displayed symbol from second base, and a fourth $\frac{1}{12}$ th turn of said disk will remove the symbol previously displayed at third base and will bring the three symbols to such positions that the fifth, sixth, seventh and eighth ensuing $\frac{1}{12}$ th revolutions of said disk will display symbols, respectively, as said symbols were set following said first, second, third and fourth $\frac{1}{12}$ th revolutions of said disk; and so on indefinitely.

The pawl 21 is pivoted on an arm 25 rockable on shaft 18, and from the pivotal connection between the pawl and arm a link 18a is connected to a non-magnetic extension 26' of an armature 26 for a solenoid 27. Said armature has a non-magnetic extension pin 28 guided loosely by a suitable opening in a fixed plate 29. Pin 28 carries a dependent arm 28a connected to one end of a retractile coil spring 30 the other end of which is secured at 30'.

Each time the solenoid 27 is energized, the arm 25 is rocked in a clockwise direction as viewed in Fig. 4, thereby rotating the base-running disk 19 through $\frac{1}{12}$ th of a revolution; said arm, the pawl 21 and the movable parts of and associated with the solenoid returning to their normal positions, under action of spring 30, on subsequent de-energization of the solenoid.

In order squarely to halt the base-running disk 19 at the conclusion of each $\frac{1}{12}$ th revolution thereof, the periphery of another disk 31 therebelow, and sprocket-and-chain driven therewith all as will be described in a moment, has four equidistant and properly placed notches 31' each of which coacts with a leaf spring 31'' to provide an impositive yet dependable detent.

The target location is, in the structure now being described, behind the home-plate opening 12 in front wall 10, which opening 12 is shown as circular and as large as the largest of a plurality of circular openings of differing diameters in the disk 31. This disk 31, hereinafter called the target-modifier disk, is revoluble on a shaft 33. Disk 31 is so mounted as to rotate with a sprocket 34, driven by a sprocket chain 35 passing over a sprocket 36 mounted to rotate with base-running disk 19; the sprockets being such that on each complete revolution of target-modifier disk 31 base-running disk 19 is rotated through $\frac{1}{3}$ rd of a revolution.

When a person first commences to shoot, that is, when as aforesaid the disk 19 is set as shown

in Fig. 2, the disk 31 is set as there shown, that is, the largest opening 31a therein is matched to the home-plate opening 12 in front wall 10. There are three other circular openings in the disk 31, marked respectively 31b, 31c and 31d. The centers of these four openings in said disk lie in a circle concentric with the axis of the disk, and the centers of said openings are spaced 90° around such axis. Thus, on each quarter revolution of the target-modifier disk 31, corresponding to each $\frac{1}{12}$ th revolution of base-running disk 19, there is substituted, for the opening in the disk 31 previously at the "target" position (behind home-plate opening 12), the next succeeding opening of the disk 31 clockwise of the disk 32.

As will be noted, the opening 31b is of smaller diameter than the opening 31a, the opening 31c is of smaller diameter than the opening 31b, and the opening 31d is of smaller diameter than the opening 31c.

Consequently, with the parts initially set as shown in Figs. 1, 2 or 4, the target opening at home plate which the one shooting will test his skill against, is the largest opening in target-modifier disk 31, that is, the opening 31a.

Assume now that he fires a shot which passes through said opening, and that the solenoid 27 is energized. Thereupon, the disk 19 will be rotated $\frac{1}{12}$ th of a revolution to place a "man" (the symbol 22) on first base, but simultaneously therewith the target opening next to be presented to the skill of the person shooting is reduced in size to that of the opening 31b in target-modifier disk 31. Consequently, it will require more skill to advance from first base to second base, than to reach first base. Similarly, since a person shooting who has placed his man on second base will next have to try his skill against a target opening corresponding to the opening 31c of disk 31, it will be still harder for him to advance from second base to third base. And, since when he has progressed to third base, he must try his skill against a target opening as small as the opening 31d of target-modifier 31, the greatest extreme of skill will be required to "bring in a run."

There will now be described the means for operating the solenoid 27 each time a person shooting "hits the target", that is, sends his bullet through the opening in the target-modifier disk then at the target or home-plate position. Fixedly suspended from a loosely mounted shaft 37, so as normally to depend vertically by gravity, is a target proper 38, hereinafter called the target plate. As shown best in Fig. 6, this plate is free to swing backward, when impacted by a bullet passing through the target opening, so as cause a contact 39 moving therewith to touch a fixed contact 39a thus closing a normally open circuit including the coil of solenoid 27.

Such circuit is shown in Fig. 6 as starting from a suitable current supply source 40, and thence including a wire 41, said contacts 39 and 39a, a wire 42, a switch including relatively movable contacts 43 and 44 (if such switch be present; for instance, as shown and as below described), a wire 45, the coil of solenoid 27 and a wire 46 to ground.

Mounted to rotate with target-modifier disk 31 and sprocket wheel 34, is a cam 47 having a lobe 47a. On the completion of each revolution of disk 31, which always follows four strikings of the target plate 38 (each of such striking accomplished through a smaller opening in the disk

31 than the immediately preceding striking),—that is, following a $\frac{1}{2}$ th revolution of disk 19 (during which $\frac{1}{2}$ th revolution a "man" is successively advanced to first base, then to second base, then to third base, and then cleared away from the third base, with each such successive advance accomplished by one of four separate strikings of the target plate 28)—the cam lobe 47 moves through a field of operation such that a run-scoring disk 48 will be rotated in the direction of the arrow 48a of Fig. 2, through a proper fraction of a revolution, in order to register a "run".

Said disk 48 is fixed on a shaft 49, has run-scoring numerals arranged on the front face thereof as shown in Fig. 2, and is, when a person first commences shooting, held so that the zero of said numerals is displayed through a run-registering opening 50 in front wall 10; the disk being then thus held by abutment of a projection 48' thereof against a suitably fixed stop 48s, this abutment insured by gravity acting on a weight 51 guided in a tubular shaftway 52. Weight 51 is secured to the lower end of a flexible metal band 53, the upper end of which is anchored to a drum 54 fixed on the same shaft 49 which carries the run-scoring disk 48.

Each time the target-modifier disk 31 has finished one complete revolution, marking the bringing in of a run, the run-scoring disk 49 raises by an increment of 1 the numerical reading previously displayed through opening 53. The required fractional rotation of disk 48 is accomplished through a lever 55 fulcrummed at 56 and at one end presenting a follower for the cam lobe 47a and at its other end being pivoted to the bottom of a vertical link 57 the top of which is pivotally connected to a lever 58 loose on shaft 49 and carrying a pawl 59 so engaging the teeth of a ratchet 60 fixed on said shaft 49 that, each time the lever 55 is rocked by said cam lobe traversing its aforesaid field of operation, the run-total showing at the front wall opening 50 is increased by 1.

In order to overcome the constant tendency of weight 51 to rotate the ratchet in a counter-clockwise direction, thereby to return the disk 49 to zero reading, a second or detent pawl 61 is fixedly pivoted at 62 and held against the ratchet by a leaf spring 63.

The parts just described are most clearly shown in Fig. 4; and in this view will be noted a solenoid and certain other parts above the two pawls 59 and 61. These elements of the apparatus, which have to do with restoring the run-recording to a zero reading, as when one person finishes shooting and another is about to begin, will be later described.

As hereinabove already indicated, a feature of the invention is the prompt recording of the result of every shot. Thus, a miss should be recorded as well as a hit. As will be seen from Fig. 1, front wall 10 is provided with an opening 64, for the display therethrough of a signal that a shot has been a miss, such signal in the present case being a "strike" registration. Normally, that is, when a person first commences shooting, the zero of a suitable set of numerals carried by the front of a disk 65, hereinafter called the strike-recording disk, will be displayed through the opening 64.

This disk is fixed on a shaft 66. Also fixed on this shaft is what may be termed an escapement wheel 67. Loosely pivoted on the shaft 66 is a rocker-lever 68 normally resiliently held vertical

by a retractile coil spring 69 as shown. A collar 70 (Fig. 5) is so set on shaft 66 that sufficient friction is set up between the hub portion of the rocker-lever 68 and escapement wheel 67 to restrain the latter from ever following any mere swinging movement of the rocker-lever.

Otherwise stated, the escapement wheel, and consequently the strike-recording disk 65, will not rotate fractionally in either direction, until one of the teeth of the escapement wheel is engaged and positively pushed to an extent required fractionally to rotate the escapement wheel to change a numerical reading at the window 64.

The instrumentality for giving such push is a crescental or double pawl 70 pivoted on the upper end of a rocker-lever 68 at 70' and resiliently biased to the position shown by a leaf spring 71 anchored at its upper end to the hub of said double pawl and at its lower end to the rocker-lever 68.

As will be seen from Fig. 2, to give a strike indication or to increase the strike-total reading, the strike-recording disk 65 should be rotated in a clockwise direction, as per the arrow 65a in Figs. 2 and 4.

Referring now to the latter view, each time the rocker-lever 68 is swung to move the pivot 70' for a proper throw toward the right, the pawl 70 effects the required fractional rotation of the disk 65.

Such movement of said pivot occurs on energization of a solenoid 72; as then an armature 73 on which this solenoid magnetically acts, is moved toward the right and in such manner as, through a rod 74 fixedly carried by the armature, and through a link 75 operatively connected to said rod and a finger 70'' upstanding on pawl 70 above the upper end of rocker-lever 68, to give the element last-mentioned the prevised swing toward the right.

During this swing, leaf spring 71, which is weaker than coil spring 69, is first bowed, thereby lowering the rightward horn of the pawl 70 on the rocker-lever so that such horn will surely engage the tooth of escapement wheel 67 lying therebelow, before a swinging of the rocker-lever toward the right commences. Following engagement of said horn with said tooth, the action of the solenoid 72 on its armature 73 is effective to rotate the escapement wheel, and with it the strike-recording disk 65, through the fractional revolution required to increase the reading through the window 64 by an increment of 1.

On subsequent deenergization of the solenoid 72, the parts return automatically to the dispositions shown in Fig. 4, except that, as already explained, the escapement wheel and the disk 65 stand fast in the positions to which they were just previously advanced. Such restoration of the parts is accomplished by means of a retractile coil spring 76, one end of which is secured to a fixed bracket 77 and the other end of which is secured to an upstanding arm 78 fixed on a rod 79 carried by armature 73 and loosely passing through a guiding opening (not shown) in a leaf 77' depending from bracket 77.

Solenoid 72 is in a normally open circuit, and means are provided to close such circuit each time a shot is fired and a target is missed.

Such circuit is shown in Fig. 6 as starting from the current supply source 80, and thence including a wire 81 leading to a contact 82, a wire 83 leading from a contact 84, the coil of solenoid 72, and a wire 85 to ground. The contacts 82 and 84 are here shown as carried by the shooting

implement, the latter, indicated at 86, being conveniently a small-arms rifle of about .22 calibre as commonly used in shooting galleries. The contact 84, as shown, may be the trigger, while the contact 82 may be a metallic piece set in a suitable mount of insulation and in such position that before the trigger is pulled the circuit is open, but on pulling the trigger the contacts touch. As indicated, the wires 81 and 83 will be quite light and flexible and long enough to allow the person shooting considerable latitude in position and posture relative to his post in front of counter 87, which in a shooting gallery acts as the separating barrier between the proprietor of the gallery and the patron shooting.

As the embodiment now being described has so far been described, every time a shot is fired, a strike will be registered. However, it is preferable to register such strike only when a base hit is not registered. In order to attain this result, another solenoid 88 is provided. The armature 73 acted on by the solenoid 72 as above described, is also the armature which is acted on by the solenoid 88. It should be noted that armature 73 is normally held as shown by coaction of the spring 76 (and also the spring 69) with another spring 89, also a retractile coil spring, but one arranged to pull in a direction opposite to that of the pull of spring 76. This spring 89 is at one end connected to arm 78 and is at its other end anchored at a fixed point 90; these springs 76 and 89 being balanced in their pulls when the parts are disposed as shown in Fig. 4.

A solenoid ordinarily acts fairly rapidly, and therefore each time a shot is fired one or an additional strike will be registered by action of the solenoid 72 as above described. This action takes place immediately on pulling the trigger of the rifle 86. If, however, a second later the bullet strikes the target plate 33, so that the strike just previously registered should be cancelled, the solenoid 88 is energized thereby moving the armature 73 not only from its extreme rightward location to which it was just sent by energization of the solenoid 72, back to its normal position shown in broken lines in Fig. 4, but beyond this last-mentioned position and to a leftward extreme position as much removed from said normal position as was its said rightward limit of travel. Thereby, and by action first of the leaf spring 71 and subsequent movement of the rocker-lever 68 as already described, the escapement wheel 67 and the disk 65 are rotated in an anti-clockwise direction, that is, in a direction opposite to that of the arrow 65d in Figs. 2 and 4, and to an extent sufficient to cancel out the strike registration just previously made.

The circuit for the solenoid 88 is shown in Fig. 6 as starting from the current source 40 and including the wire 41, the contacts 39 and 39a, the wire 42 between said contact 39a to the point 89, a wire 90, the coil of the solenoid, and a wire 91 to ground.

In order to necessitate shots to be fired at certain times suggestive of the judgment required of a batter in an actual game of baseball, a now preferred feature of the invention is embodied in a now favored form in the apparatus illustrated in Figs. 1 to 6. According to this arrangement, said timing is in terms of the "pitch." A representation of a baseball, which can be of any shape, but is preferably a circular figure, with or without markings indicative of the cover-stitchings of a real baseball, is caused to travel, preferably at a uniform rate of speed, up and down the path 16

(Fig. 1) between the pitcher's and catcher's positions.

Such representation is shown at 92, and such stitchings at 92', in Fig. 1. Said path is here constituted by a panel 93 of laminated or shatter-proof, and frosted, glass, suitably set in place in said front wall.

As shown best in Figs. 2 and 3, behind this panel is a mirror 94 also of panel form and of like length with the panel 93, but obliquely inclined relative to the plane of said front wall, as illustrated; such mirror being desirably of thin sheet metal chromium plated. Oscillable on a suitable pivot 95 is a socket 96 for an electric-light bulb 97, this socket being continued as a beam-emitting tube 98 equipped with a suitable condenser lens 99 and so forming an oscillable searchlight with a beam focused on the mirror surface. Said lens can be painted with an opaque material to cause the arcuate lines shown at 92' in Fig. 1 to be always seen as part of the representation of the baseball visible from the front of the apparatus.

If the socket 96 is oscillated to run the beam up and down the mirror 94, a person at the front of the apparatus will see the ball being first thrown from the pitcher to the catcher and then returned to the pitcher and then thrown again to the catcher and so on.

In Fig. 2 the searchlight is shown at the upper limit of its oscillation, with its axis extended along the line 100. Such line is also shown, similarly numbered, in Fig. 6, where the position of the searchlight at the lower limit of its oscillation is indicated by a line 101. When the beam-ball 92 reaches the pitcher, that is, arrives at the end of its upward travel, it immediately starts its downward travel; but after it reaches that end of its downward travel apparent to an observer in front of the apparatus, there is an appreciable pause before the beam-ball recommences an upward travel,—in fact it disappears for the space of time measured by that pause. That is, the line 102 of Fig. 6, not the line 101, indicates the axial line of the searchlight when the beam-ball 92 is at the bottom of the mirror 94.

It would be during this pause, that is, while "the ball is over the plate" that a shot could be required to be fired if a hitting of the target by that shot is to be effective to actuate base-running disk 19. Such a result could be secured by employment of the hereinabove referred to switch elements 43 and 44; the element 43 being a spring contact suitably insulated as shown and fixed to have an end ride over an insulation ring 103 secured to the socket 96, and the element 44 being a contact segment set in said ring and so elongated peripherally of the ring and so angularly located thereon, that only while said socket is moving downwardly and then upwardly, through the angle measured by the lines 101 and 102, the energizing circuit for the solenoid 72 is closed through said switch.

Oscillation of the searchlight-including socket 96 is here shown as effected by the following means. A solenoid 104 has an armature 105 carrying a rod 106 secured to an extension 96a on socket 96 beyond pivot 95, there being the requisite pin and slot connection between said arm and the lower end of said rod. The socket is urged toward a position such that its axis will coincide with the line 100, by a retractile coil spring 107, and then the armature 105 is drawn out of center with the winding of the solenoid 104.

When the parts are thus disposed, a suitably

insulated contact 108 on arm 96' touches a suitably insulated fixed contact 109. From supply wire 40 a wire 110 leads to contact 108, and from contact 109 a wire 111 leads to the winding of solenoid 104, such winding continuing as a wire 112 to ground.

Thus, each time the socket 96 arrives at a position where its axis coincides with the line 100, the energizing circuit for solenoid 104 is closed, and thereupon the armature 105 is moved upwardly to become centralized relative to the winding of the solenoid. But by this movement, the energizing circuit for the solenoid is broken, and the spring 107 returns the armature to its full line position. Then again the energized circuit for the solenoid is closed and the armature is again centralized relative to the solenoid winding; and so on. In order to time the rate of travel of the up and down movements of the beam-ball 92, each rising movement of the armature 105 is subject to the control of a dash pot 113 adjustable by a needle valve 114 and the tension of the spring can be made adjustable in any well known way, as, for instance, as illustrated at 115.

Referring now to the exemplifying means herein illustrated for timing the firing of a series of shots, as the eight shots customarily allowed a patron of a shooting gallery for a payment of \$.25, this means as shown functions first as a repetitive warning of the amount of the allotted time which before each such warning has elapsed, and then as a final notification that no more shots can be made, and, further, so operates that this final notification actually insures that a shot made too late will be fruitless for scoring; said means, moreover, being so constructed that the period allotted for the firing of such eight shots (or some other predetermined number of shots) can be varied when desired.

As shown, electric light bulbs 116, 117 and 118 (see particularly Figs. 1 and 6) are the instrumentalities for respectively giving the successive warnings,—according to such an arrangement, for instance, that the bulb 116 warns that one-quarter of said period has elapsed, the bulb 117 that one-half of said period has elapsed, and the bulb 118 warns that three-quarters of said period have elapsed. Also, as shown, each of these bulbs is placed behind a circular window 118a of shatter-proof glass suitably set in front wall 10; these windows being preferably spaced across the top of the wall 10 distances representing fractions of the width of the wall corresponding to the time interval fractions of said period the completions of which are flashed by the respective bulbs.

The means for giving the final notification that said period is concluded, and for positively preventing further unauthorized shots to be of any effect in scoring, here includes a pair of leaves 120, one carrying the letters "ST" and the other the letters "OP", and each separately pivoted at 121. The pivots for these leaves have fixed thereon spur-pinions 122 directly intermeshing, whereby when one leaf is thrown to the full line position in Fig. 1 the other leaf is thrown to its full line position, and when one leaf is thrown to the broken line position of Fig. 1 the other leaf is thrown to its broken line position. While the shooting time period is running, the two leaves are in this full line positions, resting on stop pins 123. When the period ends, a solenoid 124 is energized, thereby drawing in-

wardly and centrally of the winding thereof an armature 125, guided rearwardly thereof by a pin extension 126 loosely passing through a suitable aperture in a U-strap 127 and guided forwardly thereof by the resting of a reduced extension 128 of the armature on a roller 129. This armature extension 128 is toothed to provide a rack meshing with one of the pinions 121. The throw of the armature is such that when the solenoid is energized the rack is moved to the left the amount required to rock the leaves 120 to their broken line positions, thereby to cover the home-plate opening 12 and present a shield to prevent any shots subsequently fired from reaching the target 28 and to display the word "Stop" in said opening. On deenergization of the solenoid 125, an expansile coil spring 130 sleeving the pin extension 126 within the spool of the solenoid and desirably of phosphor-bronze or some other suitable non-magnetic material restores the parts to their full line positions.

The bulbs 116, 117 and 118 are successively lighted, and finally the leaves 120 are thrown to their broken line positions, by automatically operating electric-switch means including four fixed contacts 116a, 117a, 118a and 120a. The period or time interval allowed for shooting the agreed number of shots is measured by a wheel 131 rotating in the direction of the arrow shown thereon in Figs. 4 and 6. This wheel has a rim of insulation in which is set a contact segment 131', which, during one revolution of the wheel in an anti-clockwise direction from the starting position thereof shown, coacts successively with the fixed contacts 116a, 117a, 118a and 120a, first to close a circuit for the bulb 116, next to close a circuit for the bulb 117, next to close a circuit for the bulb 118, and finally, as the wheel again comes to rest in said starting position, to close a circuit for the solenoid 124.

As shown in Fig. 4, wheel 131 is part of a train of clockwork contained in, and on (as shown), a case 132, suitably mounted in place on rear wall 10a. Within the case and forming the driver for said train, is a suitable main spring 133 such that when wound as intended and then released, said train operates to rotate the wheel 131 through one revolution as above. The spring-winding shaft 134 of the clockwork carries a spur gear 135 so connected to said shaft, as by an overrunning clutch not shown but of any suitable type, that said gear as viewed in Fig. 4 can rotate in an anti-clockwise direction without causing rotation of said shaft, yet when rotated in a clockwise direction it will cause the spring 133 to be wound. Meshing with the gear 135 is a vertical rack 136 which on an upstroke thereof will rotate said gear in the direction to wind said spring. This rack is carried by the armature 137 of a solenoid 138, these last two parts being so arranged that when the solenoid is energized the rack performs its said upstroke of a length to wind up the spring 133 as intended. On deenergization of the solenoid, the armature is turned by a spring 139 to the position shown, and idly, as aforesaid, relative to the train of clockwork.

In order to vary the length of said period or timing interval, the train of clockwork as shown includes a wheel 140 carrying an adjustable air-brake 141 of the well-known shiftable vane type.

When a person desires to commence shooting, the solenoid 138 is energized, and incidental to this the solenoid 124 is deenergized by opening the previously closed circuit therefor. As shown,

there is a push button 142 on the counter 87. On pushing in such button, a circuit is closed for the solenoid 138, and the rack 136 on armature 137 performs an upstroke, thereby winding up spring 133. Said circuit (Fig. 6) includes the wires 80 and 80', a wire 142a, the push button 142, a wire 137a to the solenoid and thence a wire 138 to ground. On releasing the push button, the spring 133 restores said armature to the position shown; and thereupon the time-interval wheel 131 starts its appointed rotation. Immediately this occurs, the contact segment 131' passes beyond the fixed contact 122, and opens a circuit starting from source 40 and including a wire 143a, the wheel 131 and said contact segment, said fixed contact 122a, a wire 143b, the winding of solenoid 124 and a wire 143c to ground.

Thereby, predeterminedly relative to the movement of wheel 131, and at the beginning of the shooting period, the target 38 is exposed through the opening 12 in front wall 10 and the opening in target-modifier disk 21 matching said opening 12, due to the return of the leaves 120 to their full line positions.

At the conclusion of one-quarter of said shooting period, the bulb 116 flashes; due to a circuit being closed which includes said wire 143a and the wheel 131, its contact segment 131', the fixed contact 115a, a wire 143d to the filament of said bulb, and a wire 143e to ground.

At the conclusion of one-half of said shooting period, the bulb 117 flashes; due to a circuit being closed which includes said wire 143a and the wheel 131, its contact segment 131', the fixed contact 117a, a wire 144 to the filament of said bulb, and a wire 145 to ground.

At the conclusion of three-quarters of said shooting period, the bulb 118 flashes; due to a circuit being closed which includes said wire 143a, and the wheel 131, its contact segment 131', the fixed contact 118a, a wire 146 to the filament of said bulb, and a wire 147 to ground.

At the conclusion of said period, the solenoid 124 is again energized; due to the aforesaid circuit being closed which includes the wire 143a and the wheel 131, its contact segment 131', the fixed contact 122a, and the wires 143b and 143c; thus, also as aforesaid, throwing the leaves 120 to their broken line positions.

Thereafter, and until again push button 142 is actuated, said leaves remain as last described.

Since, whenever a person desires to commence shooting for a score-making effort resulting from firing as many shots as predetermined relative to a prevised shooting period, a previous such effort may have left target-modifier disk 31 in other than starting position (that is, in a position such that the largest opening 31a thereof is not opposite the home-plate opening 12 in front wall 10), means are provided for allowing an attendant readily to restore said disk to its proper starting position. This means as shown includes a push button 148 on the counter 87 and interposed in a circuit starting from current source 40, and including the wire 80, a wire 149 connecting the latter to said push button and thence a wire 150 joining the wire 45 at the point 151. The push button 148 is operated the number of times required, each time to energize and actuate the solenoid 27 once, to effect the desired rotation of the target-modifier disk 31.

Similarly, it may be necessary at the starting of a shooting period to restore the strike-reading shown at window 64 in front wall 10, to zero. Such restoration means here includes a push but-

ton 152 on the counter 87 and interposed in a circuit starting from current source 40 and including the wire 80, a wire 153, connecting the latter to said push button, and thence a wire 154 joining the wire 83 at the point 155. The push button, operated the number of times required, each time to energize the solenoid 72, on each such actuation fractionally rotates the strike-recording disk 65 in an anti-clockwise direction, until a zero indication is restored at the window 64.

Finally, it may be necessary at the starting of a shooting period to restore the run-reading shown at window 50 in front wall 10, to zero. This restoration means includes a push button 156 on the counter 87. The circuit in which this button 156 is interposed will be described in the second paragraph below.

Reverting now to Fig. 4, the cam follower portion of lever 55 is always yieldingly held against cam 47 by a retractile coil spring 157 connected at its upper end to a fixed point and at its lower end to a collar 158 on the vertical link 57 which operatively connects said lever and pawl 59, and which pawl, as already described, rotates the run-recording disk 43 in a clockwise direction each time the base-running disk 19 completes 1/4ths of a revolution. It will be recalled, also, that normally the detent pawl 54 holds the run-recording disk against retrograde rotation. In order when desired to rearrange these parts so that then the run-reading shown at window 50 in front wall 10 can be restored to zero, as, for instance, when such restoration is required at the start of a shooting period, means are provided including a solenoid 158, an armature 158a, therefor, and a rod extension 158' from said armature and having a reduced prolongation 158'' loosely guided in a suitable aperture in a hanger 159. Rod extension 158' is provided with a pair of pins 160 and 161, arranged as shown relative, respectively, to upstanding fingers 61a and 59a, carried, respectively, by pawls 61 and 59. Normally, that is with the parts arranged as illustrated in Fig. 4, these pawls can operate as hereinabove described for scoring runs during a shooting period; the armature being held out of center within the winding of the solenoid by a leaf spring 162 at its upper end anchored on an upstanding portion 161a of bracket 161 and pressing at its lower end against a collar 163 fixed on armature prolongation 158''.

A circuit, which includes the push button 156, is provided for energization of the solenoid 158 when such push button is manually operated; such circuit starting at the current source 40, and thence including wires 80 and 80', a wire 159, said push button, a wire 164, the winding of the solenoid, and a wire 165 to ground.

In operating the embodiment above described, any suitable set of rules for a solo shooting period by a single person or for a contest between a plurality of persons each shooting at one of the apparatus, can be adopted. For instance, where two persons are in a contest, and first one and then another is to shoot an agreed number of shots at the same apparatus, and then compare scores to determine the winner, each contestant could be allowed say sixteen shots and the winner would be the one who, subject to the condition next mentioned, obtains the most runs, or if both obtain the same number of runs the one obtaining the greater degree of base-running advance beyond the last run scored, or if both are tied as to this factor the one making the least number

of strikes. Said condition might be that when either contestant has had say nine strikes scored against him, he will be "retired" from the contest, as by the analogy that he is representing a baseball team of which three members thereof can "go to bat", with each such member to be retired from batting after having made three strikes.

Just as the rate of "throwing" of the "ball" 92 can be varied as desired, as hereinabove described, and as the shooting period measuring means can be varied as above described, the openings carried by the target-modifier disk 31 can be varied as desired. To this last end, such disk is preferably quickly detachably secured to its carrying sprocket wheel as by screws, bolts, cotter pins, or the like. That is, one such disk may be readily substituted for another, not only to vary the nature of the contest by changing the sizes and/or the relative sizes of the openings in said disk, but also to replace an old disk by a new one when the former after long use has been damaged, as, for instance, by having one or more of the openings therein deformed by bullet impact.

Referring now to the embodiment of the invention illustrated in Figs 7 to 12, wherein the location of an outline of a front wall 165 of suitable size and preferably rectangular shape is indicated by dot-and-dash lines, and wherein merely a base-hit scoring mechanism is illustrated, said board is provided with four target-display openings instead of merely one at 12 in Fig. 1. These openings are here marked 166, 167, 168 and 169; and each is located at one of the four base points—it being desirable that the obverse face of the wall 165 carry base-lines joining these bases or some other representation suggestive of the playing field of the game of baseball. Each of these openings is here shown as square. There are not only four such openings, but four targets each similar to the targets 38 of Fig. 2. One of these targets, 170, is behind the home-plate opening 165. Another of these targets, 171, is behind the first base opening 167. Still another of these targets, 172, is behind the second base opening 168. And the fourth of these targets, 173, is behind the third base opening 169.

As shown in Figs 7 and 8, each of these four targets has operatively associated therewith a contact 166a, 167a, 168a and 169a, as the case may be, each such contact suitably insulated. When any target is struck, a normally open circuit is closed which includes a source of current 174 and a wire 175, and thence, as the case may be, a wire 176; or wires 177, 178 and 179; or all the three wires last mentioned except the last; or the wire 177, and thence, as the case may be, the contact 166a, 167a, 168a or 169a and its associated target, and thence, as the case may be, a wire 180; or said wire 170 and a wire 181; or the two wires last mentioned and a wire 182; or the three wires last mentioned and a wire 183, and thence to the winding of a solenoid 184 and a wire 185 to ground.

Revoluble on the shafts shown are four spur gears of the same diameter each carrying a target-varying disk 186, 187, 188 or 189. These gears mesh as shown in a continuous train beginning with the gear carrying disk 186 and ending with the gear carrying disk 187. Fixed to rotate with the gear 186 is a spur pinion 190, meshing with a spur gear 191, on a shaft 191', this gear last mentioned having secured thereto

a ratchet 192. Loose on the shaft 191' is an arm 193 which at its free end pivotally carries a pawl 194 and is pivotally connected to a link 195 similarly connected at 195' to a reduced extension 196a of an armature 196 for the solenoid 184; said extension 196a being guided loosely in a suitable aperture in a hanger 197, and the pawl 194 being resiliently urged to the normal position shown by a spring 198.

On each energization of the solenoid 184, by a closing of any of the four circuits above described, this occurring on the striking by a bullet of the appropriate target 166, 167, 168 or 169, the pawl 194 is operated to rotate the gear 191 one-eighth revolution, and the pinion 190 one-quarter revolution, and, consequently, each of the four target-varying disks one-quarter revolution.

Referring now to Figs. 9, 10, 11 and 12, in the first of these the appearance of the apparatus at the start of the shooting period so far as the eye of the person firing is concerned, is shown. In Fig. 10, is illustrated a first diminution in target size, and the shifting of the target from home plate to first base (as, also, to indicate that now a man is on second base). And in Fig. 12 is illustrated the last diminution in target size, and the shifting of the target from second base to third base (as, also, to indicate that now a man is on third base). When the last referred to target is hit, the apparatus again becomes arranged as shown in Fig. 9, and, as by the means described in connection with Figs. 1 to 6, a run is recorded.

In order that at each operation of the solenoid 184 the target-sizing opening in that one of the target-varying disks which is brought in front of and to expose any one of the targets proper 166, 167, 168 and 169, will come into place squarely precisely as intended, all the gears carrying these disks are limited to precisely one-quarter revolution on each operation of said solenoid; the means here shown for attaining this being a notched disk 199 and a suitably mounted leaf spring 200 for coacting with such notches.

It will be noted that as shown each of the target-varying disks has a single target-sizing opening therein, each such opening differently angularly placed on each disk, and each opening on a different disk of a different size from any other. The home-plate disk 186 has the largest opening, 186a; the first-base disk 187 has the next largest opening, 187a; the second-base disk 188 has the next largest opening, 188a; and the third-base disk has the smallest opening, that shown at 189a.

As the parts are illustrated, that is, as they would be at the start of a shooting period, or after the scoring of one run during a shooting period, each of these four openings in the four disks is at the six o'clock position on the disk, so that the first-base target opening 186a is establishing that target, that is, is exposing the target proper 170; but—with all the disks rotatable by the pawl 194 in the direction indicated by the arrows on the disks—the disk carrying the first base target opening 187a needs 90° of angular movement to establish the target at such base, the disk carrying the second base target opening 188a needs 180° of angular movement to establish the target at third base, the disk carrying the third base target opening 189a needs 270° of angular movement to establish a target at third base, and, to refer again to the first-mentioned target opening 166a, the disk carrying that opening needs

360° or a full revolution to reestablish a target at home plate.

Therefore, when, with the parts arranged as illustrated, the target 170 is struck by a bullet, said target disappears, and another target 171, appears at first base, but smaller, the same indicating a man is on first base. When said target 171 is struck, it disappears and another and still smaller target appears at second base, indicating a man is on that base. When the last-mentioned target is struck, it disappears at third base, indicating a man is on that base. When this last-mentioned smallest target is struck, it disappears and the apparatus is restored to the condition shown, that is, the target at third base disappears, and the largest target is again displayed at first base—the scoring of one run being noted, automatically or otherwise.

Any suitable provision, such as that shown at 31' and 31'', in Fig. 2, can be provided to limit the four disks 186, 187, 188 and 189 to a one-quarter revolution each, on each energization of the solenoid.

Referring now to the embodiment of the invention illustrated in Figs. 13 and 14, which is shown principally diagrammatically (as it happens, like the others, to be shown largely electrical in operation, as is now preferred), the feature of the present invention of having a target progress "around the bases" is present, as is also the feature of having a target variable in size as a differing test for the shooting skill of the person attempting to hit that target. In addition, the present embodiment provides such a target, and one which varies in size according to the degree of skill shown by an opponent in a shooting contest so far as is concerned the last shot fired by that opponent and which struck the target appointed for him to shoot at.

By the embodiment now about to be described, two contestants fire at the same apparatus, without, preferably, one waiting for the other to conclude a shot; in order words, the embodiment now to be described is such that there is not only a contest between the two persons shooting as to relative shooting skills, but a race as to which can shoot faster, while skillfully shooting.

To attain these ends, one target is assigned to one person, who will hereinafter be called the "batter", this target also being always at the home plate; and another target is provided, which last-mentioned target—on a certain contingency, that is, immediately after a "hit" is made by the batter (such hit being a striking of the batter's target at home plate by a bullet from his rifle)—is established first at first base. After its establishment at first base, this target can be advanced by the batter to second base, and thence to third base, and hence to a position near the home plate (as when the batter brings in a run); the batter having to hit his target one time by a bullet from his rifle for each of such advances. This advancing, or "fleeting", target, as it will be called, is assigned to the other contestant, hereinafter called the "fielder."

As the invention is preferably carried out, the fleeting target, at whichever of its four locations it be displayed, is varied in size in accordance with the relative degree of skill exhibited by the batter in his shot which by striking the home plate batter's target established the fleeting target at any one of its four locations, that is, the greater the degree of skill exhibited by the batter in making said shot, the smaller the fleeting tar-

get is when displayed at whatever base location it is due to take.

The batter's target at home plate is located behind an opening 201' in the front wall 201 of the apparatus. This target is here in the form of four target members, each hung to depend vertically by gravity from one of four suitable separate shafts on which they are respectively loose. The rearmost target member 202, constituting a bull's-eye, is the most difficult to hit, since its area is that of a central circular opening 203' in the next forward target member 203. In the same way,—due to the similar and correspondingly larger openings in the various target members between the target member 203 and the front wall 201, and due to the largest opening of all, the opening 201', in the front wall 201 (note the opening 204' in the target plate 204 immediately forward of the target plate 203, and the opening 205' in the next forward target plate 205)—a shot not quite well placed enough to strike the bull's-eye target member 202 will strike the target member 203, a shot not quite well placed enough to strike the target member 203 will strike the target member 204, and a shot not quite well placed enough to strike the target member 204 will strike the target member 205.

When any of these four target members is struck, it is rocked backwardly, then touching a pair of suitably insulated fixed contacts 206, 207, 208 or 209, and 206', 207', 208' or 209'.

Preferably, the front faces of the target members 202, 203, 204, 205 are painted or otherwise colored, each one differently from another, so that the front face of the target member 202 is of a color contrasting with that of the front faces of the other target members and also with that of the front wall 201 around the opening 201'.

At each of the four base points, in the front wall 201, there is provided an opening 210, 211, 212 or 213, each here shown as square and indicated in dot-and-dash lines. Behind each of these openings is hung a target member 214, 215, 216 or 217, each dependent vertically by gravity from a suitable shaft on which it is loose. When any one of these four target members is struck, it is rocked backwardly, then touching a suitable insulated fixed contact 218, 219, 220 or 221.

Between the rear of the front wall 200, and each of said openings 210, 211, 212 and 213, are provided three slide plates; as shown in detail in connection with the first base opening 210.

As there illustrated, a slide plate 222 is normally held in the position shown, that is, with an opening 222a therethrough out of alignment with and beyond any overlap of said opening 210; as the result of the pull of a spring 223 and the action of a fixed stop pin 224. The opposite end of the plate 222 is secured to a reduced extension 225' of an armature 225 of a solenoid 226. When this solenoid is energized, the plate 222 is pulled against its spring to center the opening 222a with the opening 210.

Also, behind each of the four openings 210, 211, 212 and 213 as illustrated in the case of the openings 210, there are two other slide plates. At the opening 210, these slide plates are shown at 227 and 228. Each of these is normally held as illustrated, that is, with both of the two openings 227' and 227'' of the first-mentioned plate, and with both of the two openings 228' and 228'' of the second-mentioned plate, out of

alignment with and out of any overlap of the opening 210. Each of the two slide plates 227 and 228 has also a third hole (not shown); these holes being located in the two plates 227 and 228 so that with said plates arranged normally as in Fig. 13, said holes, which are at least as large as the largest opening of the other four openings carried by these two plates, that is, here at least as large as the opening 227' of the plate 227, are in registry with each other and in registry with the position which will be assumed by the opening 222a in the plate 222 when that plate is pulled up by its solenoid 226. Each of said plates 227 and 228 is normally held in its position just described by two balancing springs at the opposite ends of each, those for the plate 227 being marked 227a and 227b and those for the plate 228 being marked 228a and 228b. Each of these springs is connected to an armature 229, 230, 231 or 232, by way of a reduced extension from said armature as illustrated; these armatures respectively being parts of solenoids 233, 234, 235 and 236. The opposite ends of said armatures have similar reduced extensions also as illustrated, and of these last-mentioned extensions, those from the armatures 229 and 230 are secured to the opposite ends of the slide plate 227, and those from the armature 231 and 232 are secured to the opposite ends of the slide plate 228.

Thus, whenever a solenoid 233, 234, 235 or 236 is energized,—and according to which one of said solenoids is energized, provided that at the same time (which provision is herein made) the solenoid 226 is energized,—a target-modifying hole in one or the other of the slide plates 227 and 228 and of a different size—result relative to the target member 214 will be brought central with the target opening 210 in front wall 201 to register with the aforesaid third hole in the other of said two slide plates 227 and 228, and simultaneously the opening 222a of the target-effectuating plate 222 will be brought concentric with said hole.

Preferably, the front faces of the three slide plates 222, 227 and 228 are painted or otherwise similarly colored, but with a color contrasting to that of the coloration of the front face of the target member 214.

A similar collection of slides, solenoids and mechanical assistants, is behind each of the three other square openings 211, 212 and 213 in front wall 201. For simplifying the drawings, at these openings there are shown, in addition to the aforesaid target members 215, 216 and 217, merely the solenoid windings corresponding to those of the solenoids described just above as behind the opening 210, and their coacting electrical elements, that is, the contacts 219, 220 and 221, corresponding to the contact 218, and the wires leading to or from these windings and contacts.

At the second base square opening 211, the windings 237, 238, 239, 240 and 241 respectively have functions corresponding to those of the windings of the solenoids 226, 233, 234, 235 and 236; that is, the armature of the solenoid including the winding 237 is connected to a slide plate (not shown) corresponding to the plate 222, and on energization of said solenoid such plate is moved for target effectuation, the armatures of the solenoids including windings 238 and 239 carrying between them a slide plate (not shown) corresponding to plate 227 and control their plate as the plate 227 is controlled by the solenoids 233 and 234, and the armatures of

the solenoids including windings 240 and 241 carry between them a slide plate (not shown) corresponding to the plate 228 and control their plate as the plate 228 is controlled by the solenoids 235 and 236.

Similarly, at the third base square opening 212, the windings 242, 243, 244, 245 and 246 respectively have functions corresponding to those of the windings of the solenoids 226, 233, 234, 235 and 236 associated with the first base square opening 210.

And, similarly, at the home-plate square opening 213, the windings 247, 248, 249, 250 and 251 respectively have functions corresponding to those of the windings of the said solenoids 226, 233, 234, 235 and 236 associated with the said first base square opening 210.

Referring to the batter's target, such target marked BT in Figs. 13 and 14, each of the target members 202, 203, 204 and 205 thereof is provided with an offset arm 202a, 203a, 204a or 205a for closing the circuits including the contacts 206 and 206', 207 and 207', 208 and 208', or 209 and 209', when that target member is rocked by the impact of a bullet.

From said contacts 206, 207, 208 and 209, respectively, extend wires 252, 253, 254 and 255; these wires going, respectively, to brushes 256, 257, 258 and 259. Said brushes ride respectively on conductor rings 260, 261, 262 and 263. These rings, carried by a metal distributor disk, which disk is marked FTC, since it may be aptly called the fielder's target-changer, are insulated from each other and from all other parts of the disk, except that the ring 260 is electrically connected to a contact 264, and the rings 261, 262 and 263 are, respectively, similarly connected to contacts 265, 266 and 267, all at the periphery of the disk and insulated from each other as by the ring of insulation shown. An additional or fifth contact 268 is integral with, or at any rate electrically connected with, the metal disk FTC.

Each of the peripheral contacts 264, 265, 266 and 267 on said disk is separately served by one of the four individual fixed brushes 255, 256, 257 and 258; and hence on a rocking of an appropriate target member of the batter's target BT, and only on the rocking of that particular target member, some one, but only one, of said four brushes will be placed in circuit. However, the fifth of such contacts, 268, is served by a brush 269, which is arranged to be placed in a closed circuit whenever any one of the four target members of the target BT is rocked.

Consider, for example, the slide plates and the other parts associated with the first-base square opening 210. Assume that the disk FTC, which is rotatable about a central shaft, is disposed as in Fig. 13; as it would be disposed at the commencement of a shooting contest. Then the five fixed brushes 270, 271, 272, 273 and 274 are respectively engaging the aforesaid five contacts at the periphery of the disk FTC,—which contacts will hereinafter be called the target-fitting contacts, and which fixed brushes will hereinafter be called the first-base monitor contacts. Assume next that any one of the four target members of the target BT is rocked by a bullet from the fielder's rifle 275 striking such target member; thereby to place the current supply source 278' in current-feeding relation to the four first-base monitor brushes 270, 271, 272, 273 and 274—by way of wires 278, 279 and 280, and the wire 281, 282, 283 or 284, these last going, respectively, through different ones of the target members of

the target BT to different ones of the contacts 206, 207, 208 and 209 and thence through different ones of the wires 252, 253, 254 and 255, to different ones of the brushes 256, 257, 258 and 259. Then, according to which of said target members is so struck, the solenoid 233, 234, 235 or 236 will be energized, to move the proper slide 227 or 228 to center in the first-base square opening 210 the appropriate target-sizing opening carried by that plate.

The fixed brush 273, when the easiest to hit of the target members of the target BT, that is the target member 205, is struck, receives current to complete a circuit through the solenoid 233; this circuit including a wire 285, the winding of said solenoid and a wire 286 to ground. And, similarly, the fixed brush 272, if it is the next most difficult target member 204 which is struck, receives current to complete a circuit through the solenoid 234—this circuit including a wire 286', the winding of said solenoid and a wire 287 to ground; the fixed brush 271, if it is the next most difficult target member 203 which is struck, receives current to complete a circuit through the solenoid 235—this circuit including a wire 288, the winding of the solenoid, and a wire 289 to ground; and the fixed brush 270, if it is the most difficult target member 202 which is struck, receives current to complete a circuit through the solenoid 236, this circuit including a wire 290, the winding of the solenoid, and a wire 291 to ground.

Now, regardless of which of the target-sizing opening 227 and 228'', 228' and 228'', is moved into operative position relative to the fielder's target at first base as described in the last paragraph, such target is effectuated only when the opening 222a of the slide plate 222 is moved up to uncover such target-sizing opening. Therefore, every time the BT target is struck by a bullet from the batter's rifle 275, the solenoid 226 is energized, thus to move the slide plate 222. This is accomplished through the brush 269, the disk 263 and the fifth first-base monitor brush 274; current flowing from source 276, and by way of the wires 277, 278, 279 and 280, through wires 292 and 293, and thence by way of the brush 269 to the disk FTC, and thence from the brush 274, through a wire 294 to the winding of the solenoid 226, and thence through a wire 295 to ground.

As hereinabove already explained, similar slide plates, solenoids and circuits are at the square second-base, third-base and home-plate openings 211, 212 and 213 (these last constituting on the proper contingencies the fielder's targets); in which connection it is now further explained that:

(a) In regard to the second-base fielder's target at the opening 211, fixed brushes 296, 297, 298, 299 and 300, connected respectively by wires 301, 302, 303, 304 and 305 to the second-base slide-controlling solenoids 238, 239, 240, 241 and 242, correspond respectively to the first-base monitor brushes 270, 271, 272, 273 and 274.

(b) In regard to the third-base fielder's target at opening 212, fixed brushes 306, 307, 308, 309 and 310, connected respectively by wires 311, 312, 313, 314, and 315 to the third-base slide-controlling solenoids 243, 244, 245, 246 and 247, correspond respectively to said first-base monitor brushes 270, 271, 272, 273 and 274.

(c) In regard to the home-plate fielder's target at the opening 213, fixed brushes 316, 317, 318, 319 and 320, connected respectively by wires

321, 322, 323, 324 and 325 to the home-plate slide-controlling solenoids 248, 249, 250, 251 and 247, correspond respectively to said first-base monitor brushes 270, 271, 272, 273 and 274.

In order to rotate the FTC disk one-quarter revolution at each striking of any target member of the batter's target BT,—thereby, according as the contacts on said disk are opposite the first-base, the second-base, the third-base, or the home-plate monitor brushes, to transfer such contacts from said brushes to the brushes at the next base around the base lines in the direction in which a base runner customarily advances in an actual game of baseball,—a solenoid 326 is provided. This solenoid is energized when any target member of the batter's target BT is struck by a bullet from the rifle 275; by way of the appropriate contact 206', 207', 208' or 209'—current flowing from source 278', through wires 277, 278, 279 and 280, a wire 281, 282, 283 or 284, thence to the proper one of said contacts, thence through a wire 327, 328, 329 and 330, and thence through a wire 331, the winding of the solenoid, and a wire 332 to ground.

On each energization of said solenoid 326 (see Fig. 15), the armature 334 thereof is moved against a retractile spring 335 connected to an armature extension 334'. Said extension is pivoted to the outer end of an arm 336 loose on a shaft 337; there being also pivoted to this arm a pawl 338 coacting with a ratchet 339 to which is fixed a spur gear 340 meshing with a pinion 341 fixed to the disk FTC for rotation therewith.

The first task of the person shooting with the batter's rifle 275 is to place the smallest fielder's target he can at first base. How that is done has been explained.

As soon as this fielder's target is established, it becomes the task of the person shooting with the fielder's rifle 342 to shoot accurately enough to hit that target, and to shoot quickly enough to hit that target before another shot from the batter's rifle 275 strikes a target member of the batter's target BT and thereby causes the fielder's target to fit or advance from first base to second base. On the other hand, it is the batter's task now to cause such fitting of the fielder's target before a bullet from the fielder's rifle 342 strikes said target at its then location, and so preclude the fielder from obtaining an "out."

(From now on, and until hereinbelow another paragraph in parentheses is reached, and for a reason which will be understood from that paragraph, the circuits of Fig. 13 will be described as though each of the contacts 206, 207, 208 and 209, respectively, connect directly, as indicated in Fig. 14, with the wires 252, 253, 254 and 255; that is, as though the wires A, B, C and D, the wires a, b, c and d, and the elements interposed between these wires, were not present.)

Referring to said task of the person shooting with the fielder's rifle 342, the following parts are provided: At 343 is shown, by way of example, a solenoid which will register in some suitable way such an "out." each time the fitting target, whatever be its base location, is struck by a bullet. This result, in part, is attained by the engagement of any one of the base-point target members 214, 215, 216 and 217 when rocked on its suspending shaft by impact of a bullet, with the adjacent fixed contact 218, 219, 220 or 221. Current from the source 278' is fed to the target member 214 through the wires 277 and 278 and a wire 344; to the target member 215 at second-base, through the wire 277; to the target

member 216 at third base, through the wires 277, 278, 279, 280 and 292 and through a wire 345; and to the home-plate target member 217, through the wires 277, 278, 279 and 280 and a wire 346. From the first-base contact 218 wires 347 and 348 lead to the solenoid 343; from the second-base contact 219 a wire 349 leads to said solenoid; from the first-base contact 220 the connection to said solenoid is through a wire 350, a wire 351 and said wire 348; and the home-plate contact 221 is connected to said solenoid through a wire 352 and said wires 351 and 348. The solenoid is grounded through a wire 353.

In this form of the invention, as in the others previously above described, each shot from either the rifle 275 or that from the rifle 342, which is abortive, can be recorded against the person firing the shot. Thus each shot from the rifle 275 which misses making a "hit," could be registered as a strike. And, equally as appropriately, each shot from the rifle 342 which misses a flitting target, could be registered as an "error."

As to these strike registrations, every time the rifle 275 is fired, a solenoid 354 is shown as being energized, through a wire 355, leading from the rifle 275, through a wire 356 grounding said solenoid, through a wire 357 branched off from the supply wire 279, and through a switch in the rifle as described above in connection with the rifle 85 of Fig. 6. This solenoid 354 can operate any suitable strike-registering mechanism, as for instance that described in connection with Figs. 1 to 6. However, as in Figs. 1 to 6, such strike registration should be cancelled if the firing of the rifle 275 results in hitting one of the target members of the batter's target BT. In order to attain this result, as for instance by the means described above in connection with Figs. 1 to 6, there is provided a strike-cancelling solenoid 358, which is supplied with current when any one of the contacts 206', 207', 208' and 209' is touched by the rocking of a target member of the batter's target BT; in which connection it will be noted that a wire 359 branches off from the wire 331 and leads to the solenoid 358, such solenoid being grounded through a wire 359.

As to error registration, the rifle 342 is provided with a trigger-operated switch as is the rifle 275; and there are provided a solenoid 360 corresponding in registration efficacy with the solenoid 354 and a solenoid 361 corresponding to registration-cancelling efficacy with the solenoid 358. To the rifle 342 extends a wire 362, branched off from the supply wire 279, and from said rifle extends a wire 363 to the solenoid 360, such solenoid being grounded through a wire 364. The solenoid 361 is supplied with current through a wire 365 branched off from the wire 348, and such solenoid is grounded through a wire 366. As will be recalled, each time a bullet from the rifle 342 strikes any one of the base-point target members 214, 215, 216 or 217, one of the four contacts 218, 219, 220 and 221 is touched by said target member to close a circuit including said wire 348 and the source 278'.

As will be understood, the mechanism corresponding or equivalent in function to that described in connection with Figs. 1 to 6 for recording "runs" accumulated by the person shooting with the rifle 275, can be incorporated.

(Referring further to Fig. 13, the circuits of this view have been described, as hereinabove stated, in a paragraph in parentheses, as though the wires A, B, C and D, the wires a, b, c and d, and the elements interposed between these wires,

were not present. However, if from the embodiment of Figs. 13, 14 and 15, these last mentioned parts or some suitable substitutes were omitted, every time any one of the four target members of the batter's target BT were struck, there would, it is true, be displayed at one of the square base-target openings 210, 211, 212 and 213 a flitting fielder's target of the proper size, but such target would only fleetingly appear, that is, it would appear and then immediately disappear. The energization of the proper solenoids at, for instance, the square base opening 210 (i. e., the solenoid 226 and one of the four solenoids 233, 234, 235 and 236), would be only momentary, and until the struck target member of target BT returned by gravity to its normal position spaced away from its contact 206, 207, 208 or 209. To avoid this difficulty the shown arrangement is such that said contact 206 is connected to the wire A, said wire branching off into the winding of a solenoid 370 and thence to ground, and into a lead 371 to the pivoted end of a contact arm 372; while from a fixed contact 373, to be touched by the free upper end of this arm when the latter is swung to the right, there is extended the wire a to the wire 252. In the same way, the wire B from contact 207 branches through leads 374 and 375 to another similar solenoid 376 and to another similar contact arm 377, and the wire b from a similar fixed contact 378 is extended to the wire 253. In the same way, the wire C from the contact 208 branches through leads 378 and 380 to another similar solenoid 381 and to another similar contact arm 382, and the wire c from a similar fixed contact 383 is extended to the wire 254. And in the same way, the wire D from the contact 209 branches through leads 384 and 385 to another similar solenoid 386 and to another similar contact arm 387, and the wire d from a similar fixed contact 388 is extended to the wire 255. Now each of these four solenoids has an armature which is of iron or other suitable magnetic material only at the block shown at its extreme lefthand end, but which otherwise and up to and including the reduced extension thereof to the right of the solenoid winding, is of phosphor bronze or some other non-magnetic material, so that on energization of the solenoid said block will center itself in said winding and said reduced extension will move to the right sufficiently to swing the associated contact arm 372, 377, 382 or 387 far enough to the right, to connect the wire A with the wire a, the wire B with the wire b, the wire C with the wire c, or the wire D with the wire d, by way of one of the fixed contacts 373, 378, 383 and 388. The armature of each of these solenoids is normally urged to the position illustrated, by a suitable spring (now shown). Each of said contact arms 372, 377, 382 and 387, is, as indicated, provided with friction means at its pivot, so that when said arms is moved as above described (or is moved in the opposite direction back to its normal position illustrated), it will stay in the position to which it has been moved. Thus, each time a flitting fielder's target is made to appear at any base and of any size, by the striking by a bullet from the fielder's rifle 275 of a target member of the batter's target BT, that fielder's target will remain on display after the target member last mentioned has returned by gravity to vertical position. In order, however, to cause said flitting target to disappear, when the same is struck by a bullet from the fielder's rifle 342, a wire 389 is tapped from the meeting point of wires 350

and 351, through which two wires last-mentioned current flows as above described whenever any one of the four flitting targets is struck. This wire 388 has four branches each leading as shown to a winding of a different one of four solenoids 390, 391, 392 and 393. These solenoids last-mentioned, all constructed alike and all attended by springs in the same way as the solenoids next-mentioned, are opposite to and in line with, respectively, each of the solenoids 370, 376, 381, 386. Thus, on the striking of any flitting fielder's target, at any of the four base openings 210, 211, 212 and 213, all the solenoids 390, 391, 392 and 393 are energized, and the armature of the one thereof opposite the solenoid 370, 376, 381 or 386 which previously moved the associated pivoted contact arm to engage its associated fixed contact 373, 378, 383 or 388, is moved to the left sufficiently to throw that pivoted contact arm back to the position illustrated; the springs associated with the solenoids 390, 391, 392 and 393 then immediately restoring the armatures of said solenoids to the positions illustrated.)

Referring now to the embodiment shown in Figs. 16, 17 and 18, this is a type of device in which the missile is a light-beam or ray of light from a so-called ray-gun, and is shown as so arranged that when the gun is properly aimed and the light therefrom strikes a photoelectric cell 394, the target at which the next shot is to be fired has its area diminished.

Diminution of the target area is accomplished by rotating a disk 395 fixed to a shaft 396 to which a ratchet 397 is also fixed. The ratchet here has twenty teeth, so that on each fractional rotation of the ratchet to the extent of one tooth the disk will rotate through 1/20th of a revolution.

The disk 395 in the present case is provided with twenty round openings, in five identical groups; that is, with each group, proceeding around the disk as seen in Fig. 17 in a clockwise direction, consisting first of an opening 398 of greatest size, next an opening 399 of smaller size, next an opening 400 of still smaller size, and last an opening 401 of smallest size.

With the disk 395 arranged as in Fig. 17, as it would be whenever a player begins shooting, one of the largest openings 398 is opposite the cell 394.

Whenever the gun is so well aimed that the light-ray therefrom goes through the last-mentioned opening 398, a solenoid 402 is energized. To the armature of this solenoid is attached a rod 403 connected to an arm 404 rockable on shaft 396, and carrying a pawl 405 for the ratchet. On energization of the solenoid the disk 395 is rotated 1/20th of a revolution in the direction of the arrow 395a; the armature 404 being returned to normal position against a stop 404' by a spring 406, and the disk being held against casual shift from its position just taken by a suitable impositive detent, as the illustrated leaf-spring 407.

Now, instead of one of the largest openings 398 being opposite the cell 394, one of the next smaller openings 399 is so disposed.

Thus each time the solenoid 402 is momentarily energized in the manner just above described, the parts are readjusted so that the marksmanship of the person shooting receives a harder test than the one before, until he has energized the solenoid 402 by striking the cell 394 with a light-ray so well aimed that it passes through one of the smallest openings 401, thereby to "bring in a run", as will be described in a moment.

The device is contained in a box-like housing 408, against the back wall of which the solenoid 402 is mounted by a bracket 409, which back wall also serves to support the rear end of the shaft 396, and carries a block 410 on which the cell 394 is mounted. The free end of the shaft is supported at the upper end of a bracket 411 of inverted V-shape secured inside the housing to the bottom wall thereof.

A socket for an electric light bulb 412, and an electric bell 413, are carried by a slab 414 of insulating material, this slab attached to the bracket 411.

Current is supplied from a wire 415. A wire 416 from the wire 415 is connected to one terminal of the cell 394, and a wire 417 leads from the other terminal of said cell to one end of the coil of the solenoid 402 the other end of which coil is grounded as shown.

Each time the light-ray from a ray-gun strikes the cell 394, the solenoid 402 is energized, thereby to diminish the target area, until a run is brought in; at which time the target area is increased again to the maximum size predetermined.

In order to return the disk to normal position, that is, with one of its largest openings 398 opposite the cell 394, whenever a person shooting is to retire in favor of another contestant (if then the disk 395 is not in normal position), a parallel connection 418 from the wire 415 to the wire 417 and having therein a manually closable switch 419 is provided. One, two or three successive closings of the switch 419 causes actuation of the solenoid a corresponding number of times thereby to return the disk to normal position.

At the four corners of the front of the housing 408 are blocks 420 and 421. These form a pocket for the reception within the front end of the housing of a pane 422 of clear glass. This pane is held in place by an open frame 423, of L-shaped cross-section as seen best in Fig. 18.

This glass pane is painted or otherwise treated so as to be opaque all over except, as shown in Fig. 16, for a circular area 424, below called the target window, and except for a circular area 425 spaced downward from the target window and below called the run window, and except for four square areas 426, 427, 428 and 429, hereinafter called "first-base", "second-base", "third-base" and "home plate." The opaque portion of the glass pane can be decorated in any suitable way, and have any printed matter thereon, either in substitution for or in addition to that shown. In the present case, the pane carries the usual base-line markings and a line-marking extended from the home plate to about the center of the baseball diamond represented by said base-line markings and the square areas 426 through 429; and adjacent the run window 425 is the phrase "Run In."

Comparing Figs. 16 and 17, it will be noted that the electric light bulb 412 is positioned so as to light up the run window 425 but is served by a shield 430, Fig. 18, so as not to affect the cell 394; and that first-base, second-base, third-base and the home plate, 426, 427, 428 and 429, are positioned as indicated in dot and dash lines in Fig. 17; and that after any fractional rotation of the disk 395 by energization of the solenoid 402, one of five Maltese-crosses on the disk will be behind one of the transparent areas 426, 427, 428 and 429. These crosses are marked 431, 432, 433, 434 and 435.

It will further be noted from Fig. 17, that with the parts arranged as there shown, that is, with the disk 395 in normal position, a Maltese-cross, in the present case the cross 431, will show at home plate 426, but no other cross will show at first-base, second-base, third-base or home plate. It will also be noted that a 1/20th revolution of the disk 395, to substitute a smaller opening 399 for the largest opening 398 now opposite the cell 394, will remove the cross now at home plate 426 from the latter, and display another cross, the cross 432, at first-base 427; that the next 1/20th revolution of the disk, to substitute a still smaller opening 400 for the opening 399, will remove the cross then at first-base from the latter, and show another cross, the cross 433, at second-base; and so on. That is, each time the one shooting advances the "runner" (one of the crosses) by one base, the target area is diminished, until, after the target has finally been hit with its area merely that of one of the smallest openings 401, the disk returns to normal position, ready for an attempt to bring in another run.

It will be noted, in regard to how the runner is advanced from base to base, always to bring the runner to home plate 426 when the disk 395 comes to normal position, regardless of which of the five largest openings 398 is then brought opposite the cell 394, that such advance is always properly here taken care of by the five crosses 431 through 435. With any one of the crosses, here shown as the cross 431, at the home plate 426, the next cross (in the direction of the arrow 395a), the cross 432, is 1/20th of a revolution, or one "step", ahead of first-base 427; the next cross 433 is two steps ahead of second-base 428; the next cross 434 is three steps ahead of third-base 429; and the next cross 435 is four steps ahead of home plate 426. When the fifth cross, 435, arrives at home plate, the cross 431 will have so far left the home plate as to have taken the position now held by the cross 432, and so one cross, as before, will be at the home plate, and the other four crosses will be, respectively, one, two, three and four steps ahead of first-base, second-base, third-base and the home plate.

In order to give a special visual signal, and also an audible one, when a run is brought in, the following parts are here provided. Disk 395 has five peripheral projections 436, each located between an opening 398 and an opening 401. A switch 437 of the type normally resiliently biased to open condition, is interposed between a wire 437', leading from the wire 415, and a wire 438 leading to a wire connected at one end to one terminal of the socket for the electric light bulb 412 and at its other end to one terminal of the electric bell 413, the other two terminals of these parts 412 and 413 being grounded as shown.

Thus each time a run is brought in, by rotation of the disk to substitute an opening 398 for an opening 401 opposite the cell 394, one of the projections 436 engages the switch 437, momentarily to close the latter, and thereby to flash on the bulb 412 and to cause the bell 413 to ring.

The present application is in substitution for, and in part continuation of, application Ser. No. 101,216, filed September 17, 1936.

Other variations and modifications may be made within the scope of this invention, and

portions of the improvements may be used without others.

I claim:

1. In a target-carrying game apparatus, a target-area defining means including means to be struck by a missile; means for actuating said target-area defining means to diminish the target area defined thereby; and means for operating the last-named means when a missile strikes the second named means; wherein there are also provided a means including a light-beam for graphically showing the travel of an indicium toward a defined target-area, and means for rendering said fourth-named means inoperative during an interval of time predeterminedly related to such travel.

2. In a target-carrying game apparatus, a target-area defining means including means to be struck by a missile; means for actuating said target-area defining means to diminish the target area defined thereby; and means for operating the last-named means when a missile strikes the second-named means; wherein a timing means is provided, such means for rendering said fourth-named means inoperative at the end of a predetermined interval of time.

3. In a target-carrying game apparatus, a target-area defining means including means to be struck by a missile; means for actuating said target-area defining means to diminish the target area defined thereby; and means for operating the last-named means when a missile strikes the second-named means; wherein a timing means is provided, such means for rendering said fourth-named means inoperative at the end of a predetermined interval of time, and there is also a means for supplying driving energy to said timing means at intervals, said supply means automatically operating on the striking of said second-named means by a missile.

4. In a target-carrying game apparatus, a target-area defining means including means to be struck by a missile; means for actuating said target-area defining means to diminish the target area defined thereby; and means for operating the last-named means when a missile strikes the second-named means; wherein a timing means is provided, such means for rendering said fourth-named means inoperative at the end of a predetermined interval of time, said timing means including a plurality of signals and also a means for operating said signals one after another and each after a predetermined fraction of said time interval has elapsed.

5. In a target-carrying game apparatus, a target-area defining means including means to be struck by a missile; means for actuating said target-area defining means to diminish the target area defined thereby; and means for operating the last-named means when a missile strikes the second-named means; in which the means to be struck by a missile includes a plurality of targets at spaced points over the apparatus, and said target-area defining means includes means for covering one of said targets when another is exposed, said target-area defining means being operated by said operating means when any exposed target is struck by a missile to cause said covering means to cover a previously exposed target and expose a previously covered target to an areal extent less than the areal extent of exposure of the previously exposed target.

6. In a target-carrying game apparatus, a target-area defining means including means to be

struck by a missile, the means last-named including a plurality of targets spaced over the apparatus; means for controlling said target-area defining means so as to diminish the target area defined thereby and to relocate the defined target area from one of said targets to another; and means for operating said controlling means when a missile strikes a target in the target area thereof then defined by the target-area defining means.

7. In game apparatus, a target means including means to be intercepted by a missile; means for normally covering a part of the second-named means; means for causing relative movement between the second-named means and the third-named means to cover a part of the second-named means previously uncovered and to uncover a different part of the second-named means and to diminish the uncovered area of the second-named means to make the target means more difficult to be intercepted by a missile than before; and means for operating the fourth-named means when a missile strikes the second-named means.

8. In a target-carrying game apparatus, a target-area defining means including means to be intercepted by a missile; means for actuating said target-area defining means to diminish the target-area defined thereby; and means for operating the last-named means when a missile intercepts the second-named means; in which the second-named means includes a target member having a single target area of continuous expanse.

9. In a target-carrying game apparatus, a target-area defining means including means to be intercepted by a missile; means for actuating said target-area defining means to diminish the target-area defined thereby; and means for operating the last-named means when a missile intercepts the second-named means; in which the second-named means includes a target member having a single target area of continuous expanse and in which the third-named means includes a target-area defining means movable relative to said target member, said target-area defining means including a shield having a target-area defining opening.

10. A game apparatus as in claim 7, in which the second-named means includes a plurality of target members one of which carries said previously uncovered part of the second-named means and the other of which carries the part of the second-named means diminished in area as aforesaid and in which the third-named means includes a target-area defining means having a plurality of target-area defining openings of different sizes.

11. In a target-carrying game apparatus, a target-area defining means including means to be struck by a missile; means for actuating said target-area defining means to diminish the target-area defined thereby; and means for operating the last-named means when a missile strikes the second-named means; in which the target-area defining means includes rotatable means having openings of different sizes.

12. In a target-carrying game apparatus, a target-area defining means including means to be struck by a missile; means for actuating said target-area defining means to diminish the target-area defined thereby; and means for operating the last-named means when a missile strikes the second-named means; in which the target-area defining means includes a rotary

means including wheels carrying openings of different sizes.

13. In a target-carrying game apparatus, a target-area defining means including means to be struck by a missile; means for actuating said target-area defining means to diminish the target-area defined thereby; and means for operating the last-named means when a missile strikes the second-named means; in which the target-area defining means includes a rotary means having openings of different sizes, said rotary means including a plurality of wheels each carrying one of said openings.

14. In a target-carrying game apparatus, a wall-like structure carrying the representation of a well-known playing field such as a baseball diamond, a target-area defining means including means normally at a familiar location on said field and to be intercepted by a missile; means for actuating said target-area defining means to change the location of the target-area defined thereby to another location on said field; and means for operating the last-named means when a missile intercepts the second-named means.

15. In a target-carrying game apparatus, a wall-like structure carrying the representation of a well-known playing field such as a baseball diamond; a target-area defining means including means normally at a familiar location on said field and to be intercepted by a missile; means for actuating said target-area defining means to diminish the target area defined thereby and change the location of said target area to another location on said field; and means for operating the last-named means when a missile intercepts the second-named means.

16. In a target-carrying game apparatus, a wall-like structure arranged in a plane at substantially right angles to the line of vision of the player and substantially in a single such plane at a given distance from the player; a target-area defining means in said plane and including means to be intercepted by a missile; means for actuating said target-area defining means, on a first operation thereof to diminish the target area defined thereby while maintaining said area in said plane, and on each of a plurality of subsequent operations thereof further to diminish the target area defined thereby while maintaining said area in said plane until said area is diminished to a predetermined extent; and means for operating the last-named means each time a missile intercepts the second-named means up to and including the time when said area is diminished to said predetermined extent.

17. A game apparatus as in claim 16, in which there is a means for registering the interception of the second-named means by a missile after said area has been diminished to said predetermined extent.

18. In a target-carrying game apparatus, a target-area defining means including means to be struck by a missile; means for actuating said target-area defining means to diminish the target area defined thereby; and means for operating the last-named means when a missile strikes the second-named means; and including an aimable element for discharging a missile toward said second-named means, and means for registering the total number of times in a game said element has been discharged without the discharged missile striking said second-named means.

19. In a target-carrying game apparatus, a

target-area defining means including means to be struck by a missile; means for actuating said target-area defining means to diminish the target area defined thereby; and means for operating the last-named means when a missile strikes the second-named means; and including an aimable implement for discharging a missile toward said second-named means; signalling means for registering the total number of times in a game said implement has been discharged without the discharged missile striking said second-named means and for maintaining such registration until a different total is to be registered; and controlling means for said signalling means including an actuator therefor on said implement operated each time a missile is discharged from said implement, said controlling means also including means operated by the second-named means when a missile strikes the same for rendering said actuator ineffective to register and maintain registration of the discharge of the last-mentioned missile.

20. In a target-carrying game apparatus, a wall carrying the representation of a known field of play such as a baseball diamond; a target-area defining means at a prevised location on said field; means to be intercepted by a missile when the latter is so directed as to traverse said area; means for indicating each such interception and for giving a first such indication at one prevised location on said field and for giving a second such indication at another prevised location on said field; and means for actuating said target-area defining means to diminish said area different extents according as said indications are given at different ones of the locations last-mentioned.

21. In game apparatus, a target means including a wall-like structure having a missile-passing opening; auxiliary means including a wall-like structure having a missile-passing opening registrable with the opening first-mentioned; means for causing relative movement between the first-named means and said auxiliary means to cover a part of the auxiliary means previously uncovered and to uncover a different part of the auxiliary means and to diminish the uncovered part last-mentioned and thereby diminish the effective area of the opening first-mentioned; and means for causing said relative movement when a missile passes through the opening first-mentioned.

22. A target-carrying game apparatus, comprising a wall-like structure displaying the rep-

resentation of a field of play including a line; a plurality of normally inoperative targets at different locations along said line, each representing a point of advance along said line ahead of another, each of said targets including target-area diminishing means, and means to be struck by a missile; a target additional to the ones just-mentioned and including a plurality of target members, said target members being so arranged that one partially uncovers another and so that the different members are uncovered to different extents whereby when said additional target is struck by a missile the missile strikes a different target member in accordance with the relative degree of aiming skill exhibited by a player using an implement discharging said missile; a plurality of aimable implements one for discharging a missile toward said additional target and the other for discharging a missile towards one of the first-mentioned targets and each to be used by one of a plurality of contesting players; means, responsive to the striking of said additional target by a missile, for rendering operative a particular one of said first-mentioned targets and for indicating that said particular target is to be aimed at by the player using the second-mentioned implement; means, operating with the means last-named, for actuating the target-area diminishing means of said particular target thereby to vary the target-area thereof according as one or another of the target members of said additional target was struck by the missile striking said additional target; means, responsive to a subsequent striking of said additional target by a subsequent missile, for rendering inoperative said particular target and for rendering operative a second particular one of said first-mentioned targets and one further along said line and for indicating that the said second particular target is to be aimed at the player using said second-mentioned implement; means, operating with the means last-named, for actuating the target-area diminishing means of said second particular target thereby to vary the target area thereof according as one or another of the target members of said additional target was struck by said subsequent missile; and means, responsive to a striking of the one of said first-mentioned targets which then is operative as aforesaid, for indicating that the last-named target was struck.

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