Dec. 9, 1947. P. J. HEROLD 2,432,155

TARGET THROWING MACHINE

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FIG. 1

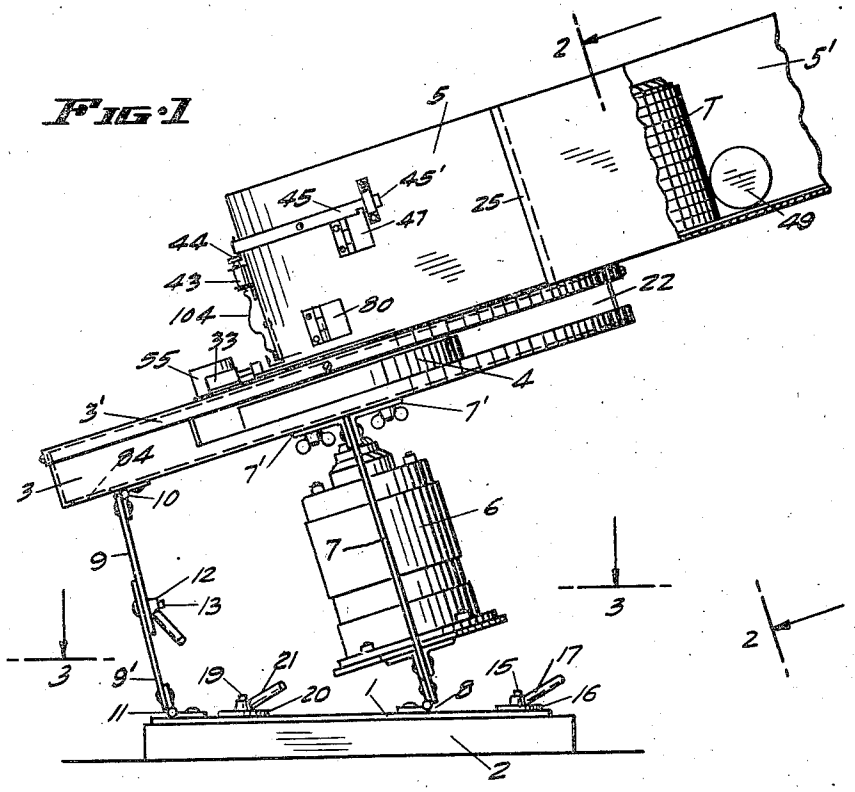
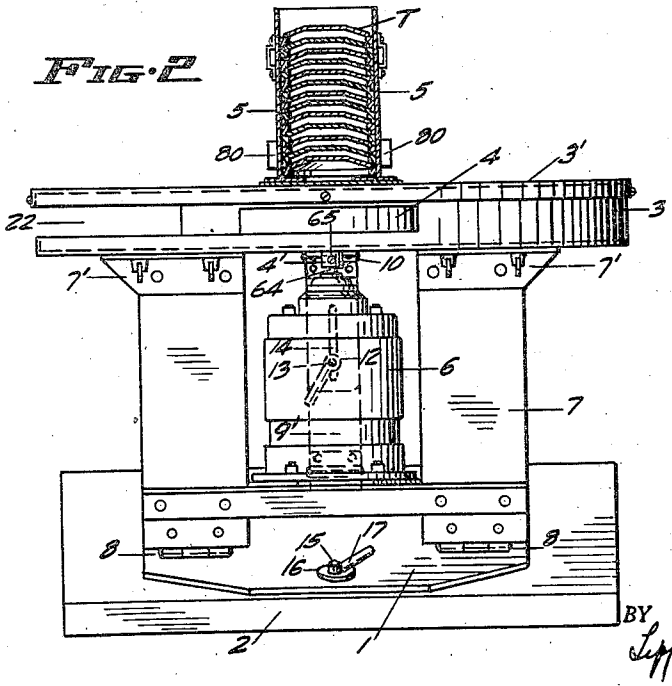


FIG. 2



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FIG. 3

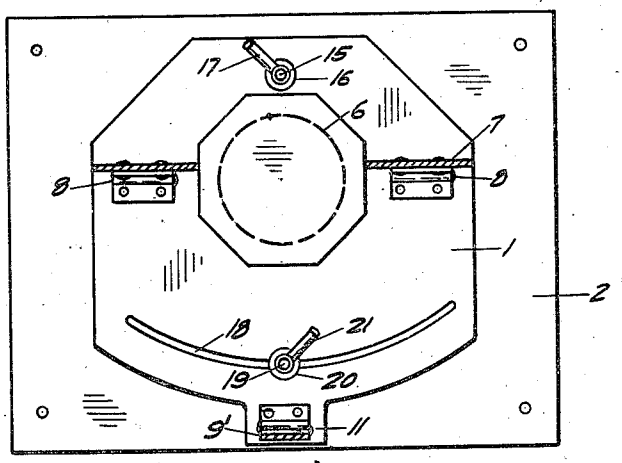


FIG. 4

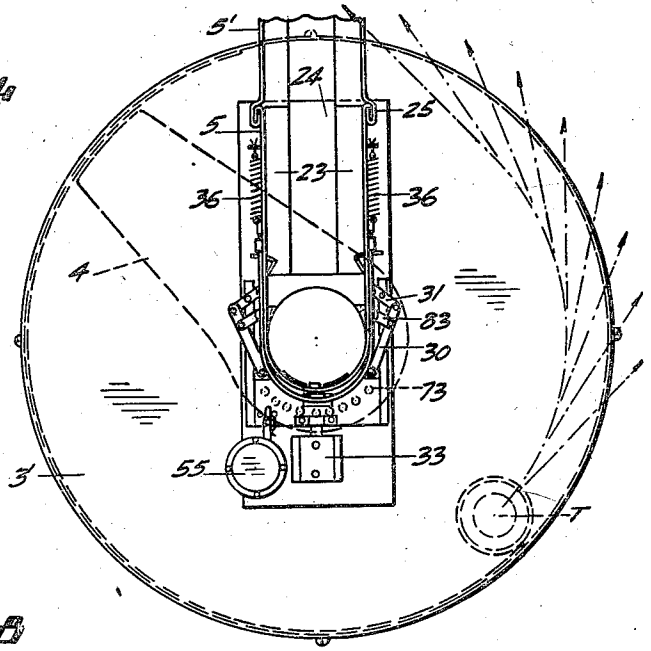
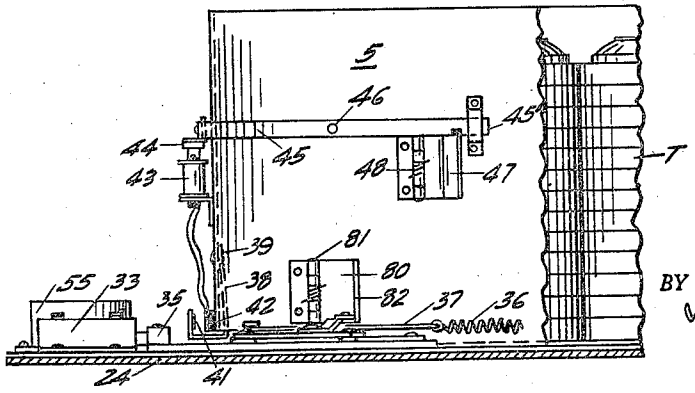


FIG. 6



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TARGET THROWING MACHINE

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FIG. 5

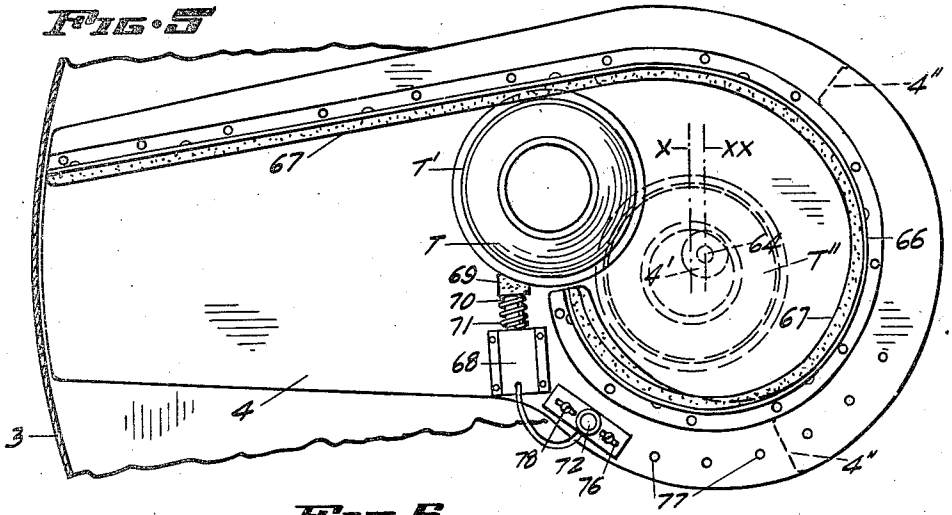


FIG. 6

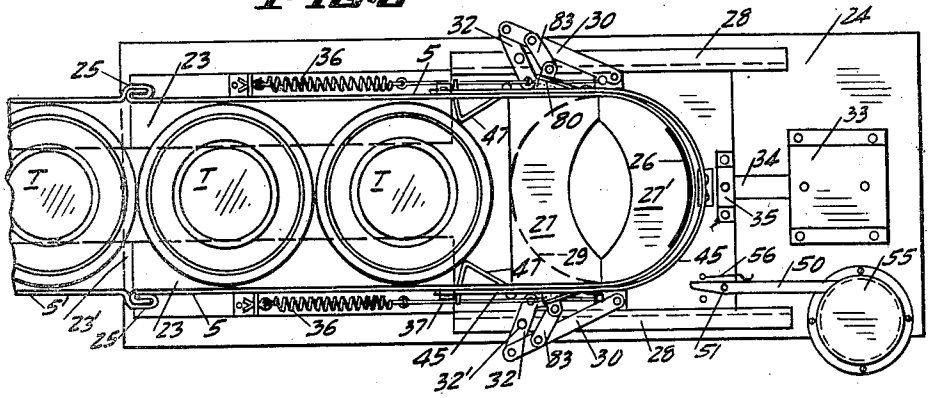


FIG. 6a

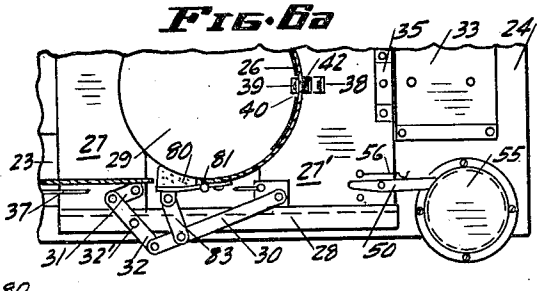
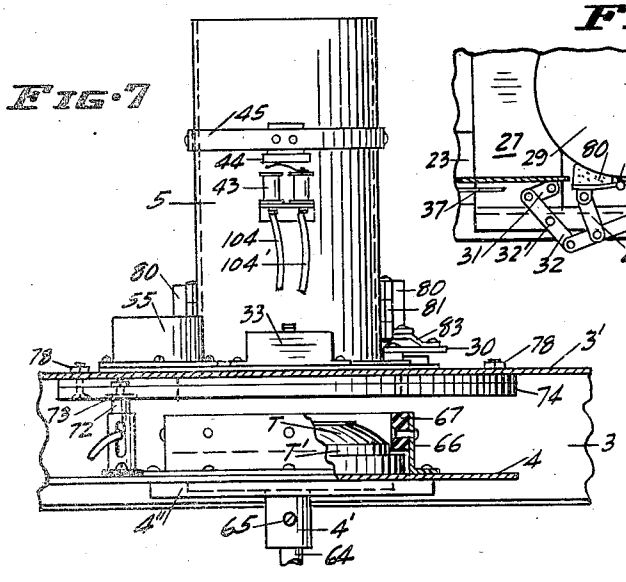


FIG. 7



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TARGET THROWING MACHINE

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FIG. 9.

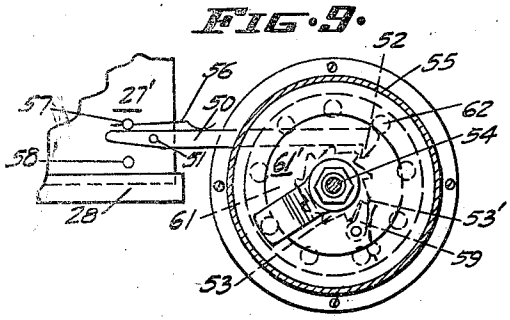


FIG. 10.

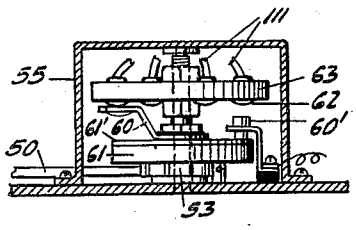
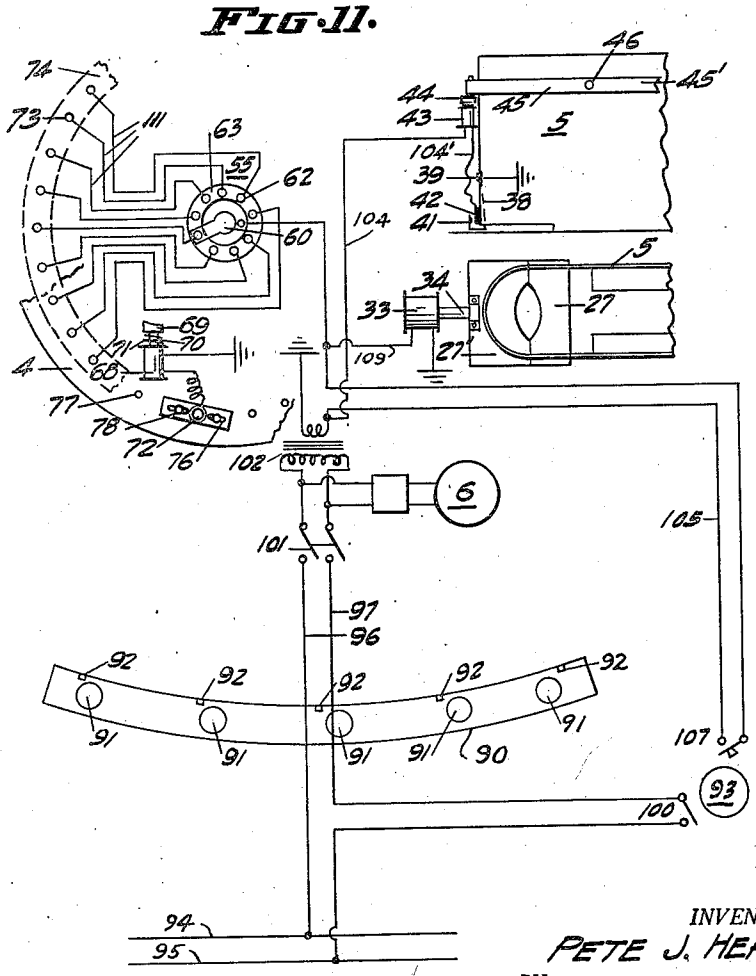


FIG. 11.



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UNITED STATES PATENT OFFICE

2,432,155

TARGET THROWING MACHINE

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Application August 17, 1943, Serial No. 498,992

17 Claims. (Cl. 124—9)

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This invention relates to the so-called "traps" for projecting disks or "targets" into the air in trap or "skeet" shooting sports, and shooting practice generally, and the invention has for its principal object to provide novel and improved means for automatically controlling the feeding of the "targets" from a magazine to and from the throwing arm.

A further object of my invention is to provide a novel and improved target throwing machine capable of adjustment to alter the plane of discharge of the targets.

A further object of my invention is to provide a novel and improved target throwing machine for "skeet" shooting or the like.

A further object of my invention is to provide a novel and improved target throwing machine capable of handling a large supply of targets at each loading and with substantially complete absence of cracking or fracturing of targets.

A further object of my invention is to provide a novel and improved target throwing machine of relatively light weight, capable of being readily assembled and disassembled for use at different locations.

A further object of my invention is to provide a novel and improved target throwing machine of relatively simple though rugged and trouble-free construction.

Other objects and features of the invention will appear in the following description and accompanying drawings:

Figure 1 is a side elevation of a "target trap" or target throwing machine embodying my improvements.

Figure 2 is a discharge end, elevational view of the machine as seen from the line 2—2 of Figure 1.

Figure 3 is a cross-section of the machine or plan of the base portion as seen from the line 3—3 of Figure 1.

Figure 4 is a plan view of the top of the machine and showing the centrifugal throwing arm and controlling contacts in dotted lines.

Figure 5 is a plan of the throwing arm showing a disk target or "clay pigeon" held by a controlled stop preparatory to its release.

Figure 6 is an enlarged plan view of part of the target magazine or chute with target release gates closed.

Figure 6a is a fragmentary view of the structure of Figure 6 showing the target release gates in open position.

Figure 7 is an elevation of the inner end of the target magazine.

Figure 8 is an elevation of one side of the inner portion of the target magazine.

Figure 9 is an enlarged plan view and Figure 10 is an enlarged vertical cross-section of the random contractor switch for determining the

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release of targets from the throwing arm at random angles.

Figure 11 is a diagram showing the electric wiring of the cooperating electric devices used to control the operation of the machine.

Before describing the drawings in detail, the machine may be generally described as comprising a base plate 1 mounted on a foundation 2 and tiltably supporting a round (preferably sheet metal) casing 3 within which is a rotatable target throwing arm 4 which is automatically fed with targets ("clay pigeon" disks) one at a time from a magazine 5 mounted on top of the casing 3, or rather upon its lid 3'. The throwing arm 4 is directly secured to the shaft of a substantially vertically disposed electric motor 6, preferably a variable speed motor to afford a control on the speed and height to which the targets are thrown.

The motor is mounted on a supporting bracket 7 preferably of skeleton steel frame construction as indicated, secured rigidly at its upper end to the bottom of the throwing arm casing 3 as by angle irons 7', and pivotally mounted at its lower end as by loose pin hinges 8 to the base plate 1 so that the frame 7 with its motor 6 and casing 3 with its magazine 5 can all tilt at various angles to the horizontal about the axis of the hinges 8, and be locked in desired position as by one or more extendable pivoted braces, the upper and lower sections 9 and 9', respectively, which are pivoted as by loose pin hinges 10, 11 to the casing 3 and base plate 1, and the two free ends of which braces overlap and are clamped together by means of a hand lever clamping nut 12 on a bolt 13 passing through slots 14 in the overlapping ends of the braces.

The base plate 1 is pivotally secured to the foundation 2 as by a foundation bolt 15 extending up through the base plate with a large washer 16 around it and with a substantial hand lever nut 17 screwed on the bolt. The opposite margin of the base plate is arcuately slotted as at 18 on a curve struck from the center of pivotal bolt 15 and may similarly be clamped to the foundation by means of one or more foundation bolts 19 projecting up through the slot and with a large washer 20 on the bolt in straddling relation to the slot 18 and clamped by a substantial hand levered nut 21, all so that the machine may be bodily revolved and adjusted as to the general direction at which it is desired to throw targets with respect to the shooters, the targets themselves being directed from the machine through arcuate slot 22 in the edge of the casing 3, at various random angles within the scope of said slot (unknown to the marksmen) through means which wil be described in detail later on.

As one of the main features of the invention is to provide a target trap which will hold enough

targets in its magazine for a match (at least 140) and automatically feed them one at a time to a constantly revolving throwing arm, and throw them at successive random angles, all upon the simple pressing of a button or foot switch by the shooter or attendant, the magazine will first be described in detail.

The target magazine is preferably of sheet metal and takes the form of an inclined chute with parallel side walls 5 spaced apart to freely receive several stacks of nested disk targets T arranged in a row and supported upon a pair of polished or anti-friction strips or tracks 23 (Figures 4 and 6) secured to the bottom wall 24 of the magazine. The magazine is high enough to take stacks of about 14 or 15 targets, as this is the height they come in the boxes from the manufacturer, and thus the stacks of target may be bodily transferred from the original boxes to the magazine.

As it is desired to carry from 140 to 150 of the disk targets in the magazine, this would require about a dozen stacks in the row (to allow for some broken ones), and as this makes quite a long magazine chute I preferably make the body of the magazine with one or more detachable sections 5' which are hooked together as by slidable lock joints 25 formed in the extreme ends of the sheet metal side walls. The extension sections have their tracks overlapping the slightly extending bottom of the lower section of the magazine as indicated at 23' to act as stops, and thus permit of sliding a section vertically in place down to these stops, and of easily lifting a section off when not in use or in transporting the machine.

The lowermost section of the magazine is secured to the lid or cover plate 3' of the casing 3 of the machine by any suitable easily detachable means not shown, and its lower end is closed and rounded to conform to and receive the target disks, and its axis X (Figure 5) is positioned about a half inch out of line with the axis XX of rotation of the throwing arm 4 below it in the casing.

Within the lower rounded end wall of the magazine is a sheet of rubber or rubberized fabric 26 (Figure 6) or the like, against which the lowermost stack of targets comes to rest directly over a pair of trap doors or rather sliding doors 27, 27' which are slidable in guides 28 and normally partially close an opening 29 in the bottom 24 of the magazine and through which the targets can fall, one at a time to the throwing arm 4.

The sliding doors or gates are linked together by duplicate systems of levers 30, 31, 32 (Figures 6 and 6a) pivotally secured to the magazine floor 24, by pivots 32', so that they will open or close in opposite directions in response to movement of one of these doors. To operate these doors, I provide an electric solenoid 33 secured to the bottom plate 24 of the magazine and with its movable armature 34 connected as at 35 to one of the doors (27') so as to forcibly open it when the solenoid is energized. The other door, of course, opens simultaneously by reason of the connecting linkage, and upon de-energizing of the solenoid a pair of tension springs 36 anchored at one end to the bottom plate 24 and connected by flexible members 37 to one of the doors, at once closes them. It is manifest without an additional drawing figure that the closing spring may be otherwise arranged, or placed to act direct on the solenoid core if desired.

As part of the electric control of the machine a flexible electric contact strip, such as a light arched leaf spring 38 (Figures 6a, 8 and 11) is conductively secured as at 39 to the closed end of the magazine with the spring free to flex in a slot 40 in the rubber sheet 26, and the lower end of which spring carries an electrical contact piece 41 adapted to break circuit with a contact member 42 when the arched spring 38 is flattened as by pressure against it from the lowermost stack of targets. Upon dropping of the last target of such stack, the spring is released to expand inwardly to thereby close the contacts 41—42 and energize an electro-magnet 43 to pull down an armature 44 secured to the round end of a U-shaped or bent latching lever 45 pivoted at opposite sides of the magazine at 46, and thereby lift the two free ends 45' from notched engagement with a couple of stops 47 which normally through the force of light springs 48 project inward through openings in the side walls of the magazine into the path of the stacks of targets as shown in Figure 6, but due to their wedge form in plan, would easily be pushed aside by the weight of the descending stacks of targets, were the spring stops 47 not locked in inward position by the ends 45' respectively of lever 45 when in position shown in Figure 8.

Thus when the last target of that pile which is over the trap doors 27, 27', falls through, contacts 41—42 are permitted to close, thereby energizing magnet 43 which in turn operates the lever 45 to release stops 47. These are then pushed outwardly under pressure of the remaining stacks of targets, and another pile or stock of nested targets will slide to the lower end of the magazine chute, whereupon stops 47 will spring inwardly again to stop the next stack of targets, contacts 41—42 become again separated, magnet 43 is de-energized, and latching ends 45' of lever 45 being overweighted (or assisted by a light spring if desired) will fall to lock the stops 47 in inward position until the last target in the stack over the trap doors is used, whereupon the cycle will automatically be repeated.

If the tilted angular adjustment of the throwing arm casing (and consequently the magazine) is too flat to make the row of stacks of targets slide downward freely, any desired spring or gravity follow up may be put in back of the last stack, or even a heavy metal roller 49 (Figure 1) will serve such purpose.

When the trap doors open to drop the lowermost target disk from a stack, a pair of clamps 80 (Figures 6, 6a and 8) first move inwardly to embrace and hold the remainder of the stack from falling. These clamps are preferably shod with rubber or felt, are pivoted to the magazine at 81 to swing through openings 82 (Figure 8) in the walls of the magazine, and are linked for operation to trap door operating levers 30 as by links 83, so that before the trap doors are fully opened, the clamps 80 will have moved inwardly sufficient to have embraced the outer edges of the two targets above the lowermost one and forced the whole stack under pressure against the rubber sheet 26, and thus frictionally support the stack while the lower one falls when the trap doors are open. As the doors close again, the clamps 80 gradually release their pressure on the stack so that the whole stack slides down, without undue shock to again rest upon the closed trap doors ready for the lower target to fall when the trap doors open again.

Every time the solenoid 33 opens the trap doors to drop a target disk to the throwing arm,

a ratchet hook 50 (Figures 6 and 9) pivoted at 51 to trap door 27' is pulled forward to carry the hook end 52 beyond engaging position with teeth 53' of a ratchet wheel 53 idling upon the shaft 54 of a random contact switch device generally designated 55. When the trap doors snap closed, this hook end 52 engages one of the ratchet teeth and gives the ratchet wheel a sudden though short spin to thus set the switch for another random contact. These contacts, as will be discussed in more detail later, control the random angle of throwing of the targets from the arm 4 within the limits permitted by the slot 22. Ratchet hook 50 is resiliently urged toward the ratchet wheel 53 by a light spring 56, and may swing on its pivot to the limit between stop pins 57—58.

A small spring pressed pawl 59 prevents reverse movement of the ratchet wheel and also insures that the ratchet wheel will stop at definite points of advancement each time. Secured to ratchet wheel 53 is an insulating disk 61 (Figure 10) shod with a conducting disk 61' from which projects a spring brush arm 60 arranged to revolve against the lower rounded ends of nine spaced contact pins 62 supported in a circular row on a fixed plate 63 of insulating material, each contact pin being separately wired as at 111 to a magnetic target release 68 on the throwing arm, for throwing the targets in random directions (see electric circuit diagram Figure 11). Ratchet wheel 53 and its brush mountings 60, 61, 61' are all small and light so that they spin but a moment or two from each pull of hook 50, and the brush is preferably cupped out to fit over and come to rest directly on one of the contact pins 62, an action which is aided by spring pawl 59 engaging successive ratchet teeth. The electric circuit to spring brush 60 includes a wiping contact or brush 60' sliding on plate 61'.

The throwing arm 4 is provided with a hub 4' (Figure 5) detachably secured to the motor shaft 64 (Figure 2), as by a set screw 65 so that it may easily be lifted therefrom when the lid 3' of casing 3 is removed. The throwing arm is preferably of sheet metal suitably counterbalanced as at 4'', and of a length so that its outer end just clears the circular wall of the casing 3 as it revolves at high speed when the motor 6 is running.

Secured to the upper face of the arm is a spiral shaped upstanding flange or wall 66 lined interiorly along its upper portion with a tough resilient strip of material 67 such as rubber, or fabric rubber mixture, leather, or cork, for the purpose of engaging the next to the outer edge of a disk target and spinning it on its own axis as it hurls it outward by centrifugal force. The disk targets T are of inverted saucer shape and formed with a secondary circular step or wall T' (Figure 7) spaced within the diameter of the extreme outer edge, and which is round and free from defects found on the outer edge, and hence best for contacting the spinning strip 67.

When a target is dropped from the magazine to the spinning arm 4, it is deposited thereon slightly off center as indicated by the dotted position T'' and through the effect of centrifugal force at once shifts to contact the spinning strip 67 and moves with gradually increasing velocity outward, but is stopped at the full line position of Figure 5 by a magnetic brake or stop comprising a solenoid 68 carrying a brake block 69 at the end of its movable core 70.

The body of the solenoid 68 is secured to the

throwing arm, and the movable core 70 is normally urged outward as by a spring 71 to cause the brake block 69 (preferably of soft material such as rubber or felt) to block the passage of the target and hold it against the centrifugal urge of the constantly spinning arm until the solenoid is energized to withdraw the core 70 and release the target for almost instant hurling from the arm out of the peripheral slot 22 in the edge of the circular casing 3.

In case any of the targets are broken into several pieces, or are cracked and break upon falling to the throwing arm, they will not be stopped by solenoid stop 69 but will scatter out of the casing slot, or if any fall into the casing below the arm, they will fall out of an opening 84 (Figure 1) in the bottom of the casing, and in any event they will do no harm.

The precise moment of release of stop 69 with respect to the angular relation of the rotating arm to the length of slot 22 is controlled by the random connection existing at the moment in the random switch 55, and this in turn fixes the angle at which the target leaves the machine for a particular throw. The electrical circuit for accomplishing this includes the provision of an electric contact brush 72 adjustably and insulatingly mounted on the circular flange of the throwing arm and which brush makes a wiping contact with a circular row of nine spaced contacts 73 (Figures 7 and 11) carried by an insulating ring 74 secured to the underside of the lid 3' of the throwing arm casing, and which spaced contacts are respectively wire connected from within the ring to the nine spaced contacts 62 of the random switch 55 as per wiring diagram of Figure 11.

The winding of solenoid 68 is grounded at one end, and at the other end is connected to the brush 72. The brush, by reason of slots 76 in its base, may be adjusted along a circular path after initial securing of the same, to any of a row of tapped holes 77 located on an arc in the flange of the arm. Similarly, contacts 73 may be arcuately adjusted by screws 78 passing through arcuate slots in the casing lid 3'.

The circular adjustment of the brush contacts within a wide range as shown, provide for rough initial setting and final adjustment (depending on speed of the driving motor, response of solenoid stop release, current strength, etc.) so as to insure the targets leaving the throwing arm at any of the nine different angles indicated by the nine arrows in Figure 4, and after once correctly setting these contacts, the angles of projection of the targets will be maintained, providing all the factors are kept fairly constant.

The operation of the machine control circuits will be easily followed from a consideration of the electric circuit diagram of Figure 11 and wherein the general positioning of the shooters and score keeper relative to the electric control is indicated. In this diagram, the driving motor, switches, various magnets, solenoids, and associated operated parts of the machine above described have been numbered to correspond with the same components of the previous figures.

The shooters stand is indicated as an arcuate platform 90 with several shooting contestants indicated by the small circles 91, each standing adjacent his cartridge supply stand 92. To one side of the shooters stand, as at 93, are the operator and score keeper.

Electric current from a service line 94, 95 is carried by a branch line 96—97 to the apparatus.

The driving motor 6 of the machine is connected to this branch line and brought under control of operator at 93 through a remote switch 100 connected in one side of this branch line.

As it is preferable to operate the electric throwing and feeding control elements by a lower voltage, a step-down transformer 102 is provided across the branch line 96—97, the secondary of which transformer is grounded at one side, while the high side is connected through wire 104 to magnet 43 and from the magnet through return wire 104' to contact 42. As previously indicated, contact 42 is adapted to be engaged by contact 41 upon release of spring 38 when the last one of a stack of targets is dropped to the throwing arm. By grounding the casing 5 to which the spring 38 is conductively affixed, it will be seen that the solenoid 43 will become energized when it becomes necessary to release a new stack of targets for disposal at the dispensing end of the magazine, above the trap doors 27, 27'.

A second connection 105 from the high side of the transformer secondary includes a switch 107 at the operator's stand 93 to give him complete control of the trap door operation and the throwing operation of the machine, such connection extending to the rotary spring brush 60 of the random switch 55, and by a parallel connection 109, to one side of the trap door operating solenoid 33 whose other side is grounded. Individual leads 111 connect the contact pins 62 of the random switch to corresponding contacts 73 and these, during operation of the machine, are sequentially grounded through the target brake release solenoid 68 by movement of brush 72 thereover. The solenoid becomes energized, however, only through that contact whose circuit at the time includes the spring brush 60.

Operator's switch 107 is preferably a momentary contact device or spring released push button so that, upon simple momentary pressure and release, the short application of electric energy will have operated solenoid 68 and released the target held by brake 69, so that it is free to be hurled from the revolving arm 4. At the same time solenoid 33 will have been energized to open the trap doors and drop another target to the arm. Upon release of the push button, the spring closing of the trap doors of the feeder will have given a quick jerk to hook 50 and twirled the random switch 55 to a new position for the subsequent release of a fresh target, which by this time will be in position on the throwing arm and blocked by the spring returned solenoid brake 69. Thus successive momentary closing of switch 107 will successively discharge one at a time all of the large quantity of targets in the feeder magazine.

For skeet shooting, which does not ordinarily call for discharge of the targets at varying angles as in trap shooting, the switch 55 can be fixed to control discharge of the targets at a predetermined angle by removing the hook 50 or otherwise holding it out of engagement with the ratchet wheel 53 and adjusting the contact 60 to the desired one of the contacts 62 where it will stay put until manually shifted or the switch is restored to automatic operation for trap shooting.

Thus, it will be apparent that I have provided means for carrying out the objects of my invention, and while I have described a preferred embodiment of the same in considerable detail, the same is subject to modification or alteration without departing from the principles of the invention. I, accordingly, do not desire to be limited in my protection to the specific details

disclosed, except as may be necessitated by the appended claims.

I claim:

1. In a target throwing machine having a throwing member, means supporting a row of stacks of disk targets, and means for successively releasing and feeding a target from the bottom of the stack at one end of the row to said throwing member until the targets in said stack are used up, and means operative through release of the last target in said stack for advancing another stack to feeding position in repetition till the targets of the last stack in the row have been so fed to the throwing member.

2. In a target throwing machine having a throwing member, means supporting a row of stacks of disk targets, and means for successively releasing and feeding a target from the bottom of the stack at one end of the row to said throwing member until the targets in said stack are used up, and means operative through release of the last target in said stack for advancing another stack to feeding position in repetition till the targets of the last stack in the row have been so fed to the throwing member, a movable stop on said throwing member stopping the targets from being thrown therefrom, and means withdrawing said movable stop in substantial coordination with the operation of said means releasing the targets from the bottom of the stack.

3. In a target throwing machine having a rotary centrifugal throwing member, means supporting a row of stacks of disk targets, and electrically controlled means for successively releasing and feeding a target from the bottom of the stack at one end of the row to said throwing member until the targets in said stack are used up, and means operative through release of the last target in said stack for advancing another stack to feeding position in repetition till the targets of the last stack in the row have been so fed to the throwing member, a movable stop on said throwing member stopping the targets from being thrown therefrom, and electrically controlled means withdrawing said movable stop in substantial coordination with the operation of said means releasing the targets from the bottom of the stack.

4. In the construction as set out in claim 3, the operation of the means for withdrawing the movable stop including a random multiple contact switch operated by the means releasing the targets from the stack and controlling the circuit withdrawing the movable stop to operate the same at random intervals and thereby discharge the targets from the throwing arm at random points during its revolution.

5. In a target throwing machine having a rotary centrifugal throwing member, means for supporting a row of stacks of disk targets at an incline so that the stacks will tend to slide toward the lower end of the row, means for successively releasing targets from the bottom of the lowermost stack for feeding to the throwing member, means for holding back the succeeding stacks from contact with the lowermost stack until the last target of said stack has been released, and means operative upon release of said last target releasing the succeeding stacks for moving downward toward feeding position, and so on until the targets of the last stack have been so fed to the throwing member.

6. In a target throwing machine having a rotary centrifugal throwing arm, a target feeder positioned above said arm adapted to hold a plu-

rality of targets for delivery to said arm, an electrically controlled gate arranged for dropping one target at a time to said throwing arm, an electrically controlled stop on said arm temporarily holding the targets from being hurled therefrom, an electric switch having a plurality of contacts, means operated simultaneously with the movement of said gate for operating said switch to close any one of said contacts at random, and an operative circuit from said random switch to said electrically controlled stop for operating the same to release the same from target holding position at random points in the revolution of said arm as prescribed by the random contacts of said switch.

7. In a combination as set out in claim 6, circuit contact means associated with said rotatable arm insuring the random releasings of said stop to all take place within a predetermined limited arc of the revolution of said arm.

8. In a construction as set out in claim 6, circuit contact means associated with said rotatable arm insuring the random releasings of said stop to all take place within a predetermined limited arc of the revolution of said arm, and means for shifting the operative arc of said random releasings to the desired position in the revolution of said arm.

9. In a construction as set out in claim 6, circuit contact means associated with said rotatable arm insuring the random releasings of said stop to all take place within a predetermined limited arc of the revolution of said arm, a circular casing enclosing said rotary centrifugal arm formed with a peripheral slot only through which the targets can emerge when hurled from said arm.

10. In a target throwing machine of the character described having a rotary centrifugal throwing arm, a target magazine with a feeder at one end for feeding targets successively to said throwing arm, and a movable stop on said arm for holding a target thereon against the tendency of centrifugal force to throw the target from said arm, and means for rotating the arm, electric operable means for successively feeding targets from the magazine to said arm, electric operable means for releasing said stop from target holding position, and electric circuit means including a remote control switch for energizing both said electric operable means.

11. In a target throwing machine of the character described having a rotary centrifugal throwing arm, a target magazine with a feeder at one end for feeding targets successively to said throwing arm, and a movable stop on said arm for holding a target thereon against the tendency of centrifugal force to throw the target from said arm, and means for rotating the arm, electric operable means for successively feeding targets from the magazine to said arm, electric operable means for releasing said stop from target holding position, and electric circuit means including a remote control momentary contact switch for energizing both said electric operable means substantially simultaneously.

12. In a construction as set out in claim 10, a plurality of contacts spaced respectively with respect to different points of revolution of said throwing arm, arranged to be selectively in circuit with the electric operable means for releasing the stop.

13. In a construction as set out in claim 10, a plurality of contacts spaced respectively with respect to different points of revolution of said throwing arm, arranged to be selectively in circuit with the electric operable means for releasing the stop, and a random contact switch device predetermining which one of said plurality of contacts shall control the release of said stop.

14. In a target throwing machine of the character described, a rotary centrifugal target throwing member, a circular casing enclosing said member and provided with a peripheral slot of limited length and only through which the targets can leave said member, a lid closing the upper side of said casing over said throwing member, a target magazine supported on top of said lid, and means for feeding targets one by one from said magazine through an opening in said lid to said throwing member.

15. In a target throwing machine of the character described having a rotary centrifugal target throwing member with a target magazine supported above the throwing member for feeding targets thereto, said magazine having the form of an elongated chute with side walls spaced to guide a series of stacks of targets toward one end of the magazine, and the magazine formed of sections adapted to be connected together to vary the length of the magazine.

16. In a target throwing machine of the character described having a rotary centrifugal target throwing member, with a target magazine supported above the throwing member for feeding targets thereto, said magazine having the form of an elongated chute with side walls spaced to guide a series of stacks of targets toward one end of the magazine, a trap door arranged for dropping targets from a stack at said one end of the magazine, movable stop means holding oncoming stacks clear of the stack over the trap door, and means actuated upon dropping of the last target from the stack over the trap door for releasing said stop means to permit another stack to move to the trap door.

17. In a target throwing machine having a target throwing member and a target magazine supported above the throwing member for feeding targets thereto, a pair of oppositely slidable trap doors in the bottom of the magazine arranged to open for dropping a target to said throwing member, a movable clamp above the target to be dropped arranged to hold any targets above from falling, a solenoid connected to one of the trap doors for operating the same electrically, and lever means pivotally connecting the solenoid operated trap door with the oppositely movable door and with said movable clamp for simultaneous operation.

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