W. J. CLOW.

TARGET TRAP.

APPLICATION FILED MAY 12, 1908.

948,499.

Patented Feb. 8, 1910.

2 SHEETS—SHEET 1.

Fig. 3

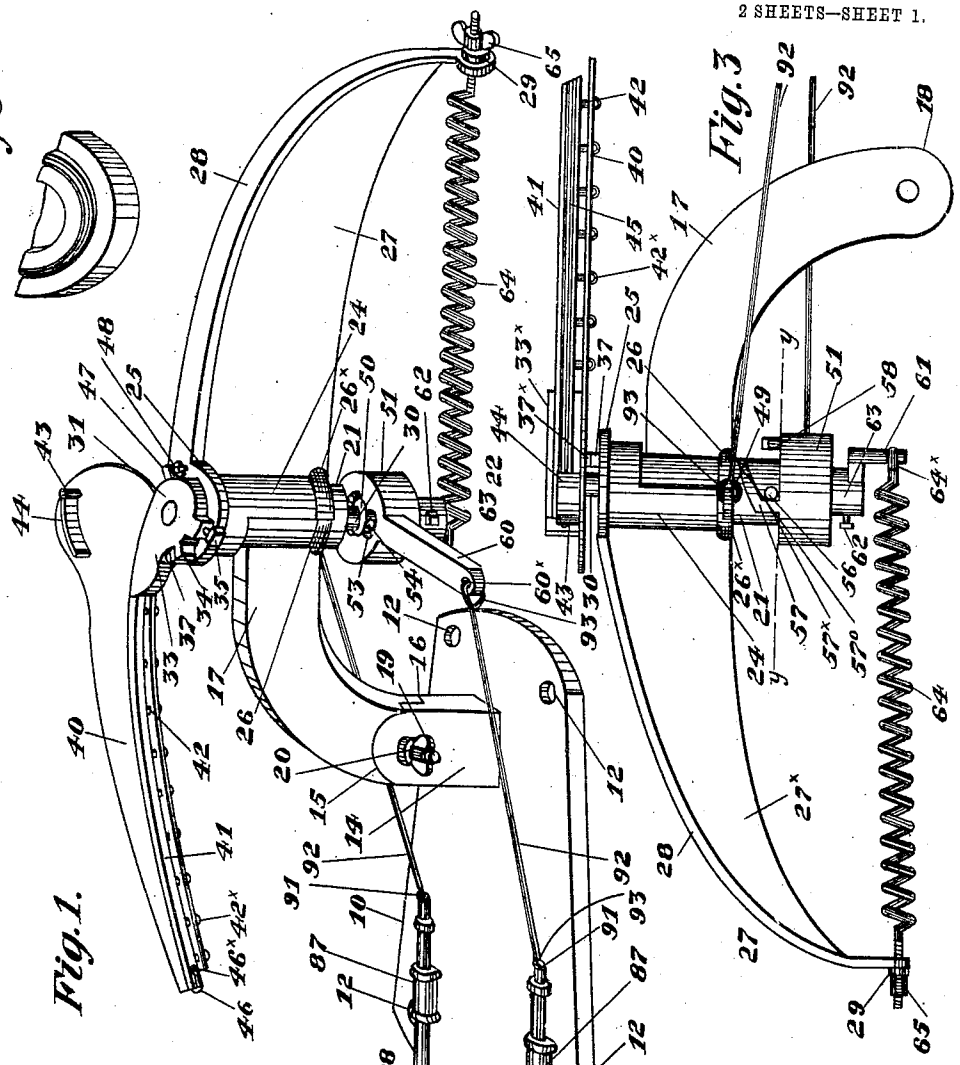

Fig. 1.

Fig. 8.

Witnesses.

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2 SHEETS—SHEET 2.

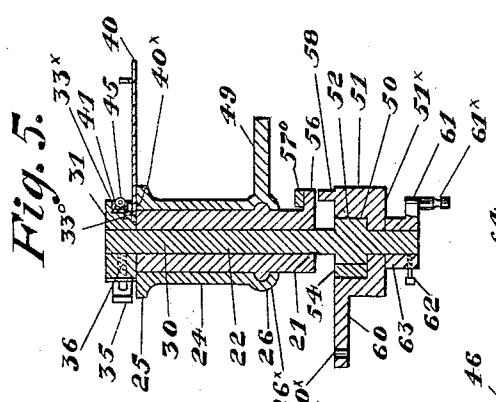

Fig. 5.

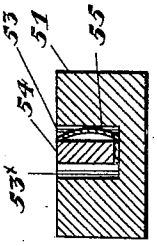

Fig. 7.

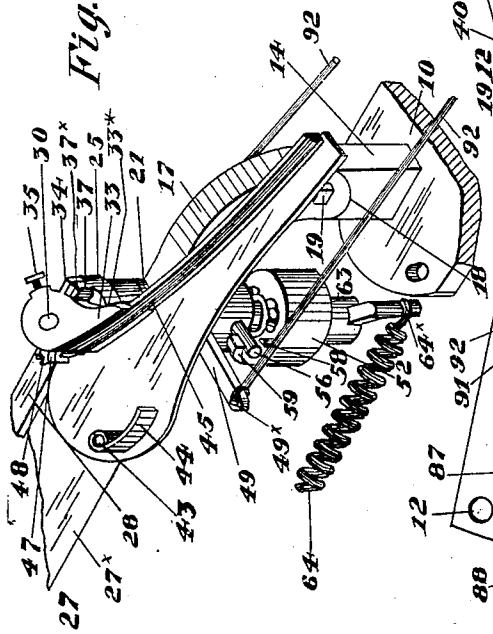

Fig. 2.

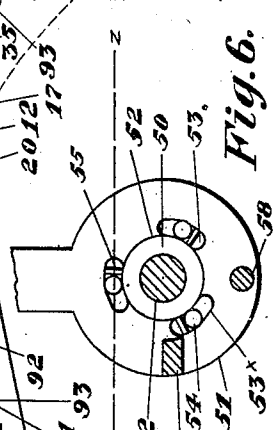

Fig. 6.

Fig. 4.

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UNITED STATES PATENT OFFICE.

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TARGET-TRAP.

948,499. Specification of Letters Patent. Patented Feb. 8, 1910.

Application filed May 12, 1908. Serial No. 432,333.

To all whom it may concern:

Be it known that I, WILLIAM J. CLOW, a citizen of the United States of America, residing at Independence, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Target-Traps; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The object of the invention, primarily, is to impart to the aerial target, an advancing and revolving motion simultaneously, with the least possible initial shock to the target. Secondly, to provide means for controlling the flight of the target, in both horizontal and vertical directions. Third, to conserve the power (in the form of momentum) of the throwing arm, by using it to partly extend the operating spring for subsequent action.

The invention consists in the novel construction and combination of parts such as will be first fully described and then specifically pointed out in the claims.

In the drawings: Figure 1, is an isometric view of the invention, the throwing arm being shown in readiness to discharge the target. Fig. 2, is a detail view, in perspective, taken from the left hand side of the base plate, showing broken portions thereof and the spring carrying arm, the throwing arm being in the like position as in Fig. 1. Fig. 3, is an enlarged, detail, side view of the adjustable shaft supporting bracket, and spring-supporting arm, as seen in Fig. 2, showing the vertical shaft in a raised position for the release of the throwing arm. Fig. 4, is a plan view of the invention, as seen in Fig. 1. Fig. 5, is a vertical, sectional view, taken upon the line x, x, of Fig. 4. Fig. 6, is a detail, plan view of the clutch box controlling the raising and lowering of the shaft, carrying the throwing arm, taken upon the line y, y, on Fig. 3. Fig. 7, is a vertical, sectional view of the clutch box, taken on line z, z, on Fig. 6. Fig. 8, is a broken view, in perspective, of an ordinary target.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

Referring to the drawings, 10 indicates the horizontal base plate, which is impaled to the ground by means of spikes extending through the openings 12, at the forward and rear ends of said plate. The base plate 10 is short in length, and gradually reduced in width in the direction of its forward end. Secured rigidly to the upper surface of the base plate 10, at a point a short distance in rear of its forward end is a post 14, which extends upwardly a short distance, said upper end being formed in the arc of a circle, as at 15. A short portion of the upper end of the post 14 is halved in the longitudinal direction of the base plate, and in the portion of the post from which the halved portion is removed is a downwardly curved socket 16.

17 indicates a plate or bracket, the lower end of which bracket is curved in the arc of a circle, as at 18, and a portion of said end halved and fitted within the halved upper end of post 14, so as to form a movable joint. Through the halved portions of the bracket and post extends an adjusting screw bolt 19, upon the threaded end of which bolt is an adjusting nut 20. The upper end of the bracket is bent or curved in the arc of a circle, and extended forwardly a short distance, past a line extending vertically through the forward end of the base plate, and upon said end is secured rigidly, in a vertical position, a cylindrical shaft holder or bearing 21, the upper and lower portions of which bearing extend nearly equal distances above and below the said connecting end of the bracket. In the casting 21 is a circular shaft opening 22. Upon the upper portion of the shaft bearing 21 is revolubly mounted a sleeve 24, and upon the upper end of said sleeve is an annular flange 25, the upper end of said sleeve being upon a line horizontally with the upper end of the shaft bearing 21. The lower end of the sleeve 24 extends downwardly to a position in line horizontally with the lower portion and upper end of bracket 17, a portion of said sleeve in the direction of the bracket being removed to the extent of about one-half its circumference and upwardly from its lower end to a point a short distance above the horizontal line of the upper portion of said connecting end of the bracket and shaft bearing. Upon said shaft bearing 21, immediately above the said lower end of the sleeve 24, is a bead or bearing 26, integral with the casting, extending from one side of bracket 17 to the other, and in the lower end of the sleeve 24 is an outward depression 26^{x},

adapted to receive the bead 26, and support said sleeve and permit of its oscillation.

With the forward portion of the sleeve 24 is connected the spring-carrying and pointer arm 27. This arm consists of a vertically arranged, thin plate 27ˣ, its rear end extending from the flange 25, at the upper end of the sleeve 24, to the line of the lower end of said sleeve, and its forward end extended forwardly and bent in a curved line and extended downwardly a considerable distance, the forward end of said plate terminating at a point. Upon the upper, curved surface of the plate 27ˣ is a narrow plate 28, integral with the plate 27ˣ, and extending from the flange 25, on sleeve 24, and its forward end extended forwardly and downwardly, to a point nearly in line horizontally with the lower, pivoted end of the bracket 17, on the post 14, and in said end of the plate 28 is an eye 29, for the purpose hereinafter described.

Within the opening 22, of the shaft bearing 21 is a rotary shaft 30. The upper end of this shaft extends upwardly a short distance above the upper surface of said shaft bearing, and upon said end of the shaft is a hub or casting 31, approximately of the same circumference as the shaft bearing 21. Upon said hub 31 and formed integral therewith is an extension 33, the forward surface of said extension extending outwardly in a curved line from a line tangential to the said hub. The rear surface of the projection 33 is depressed inwardly in a curved line, as at 33*. Upon said hub 31, adjacent to said extension 33, is an outward projection or lug 34, formed integral with the hub. The hub 31 is secured to the shaft 30 by means of the set screw 35, which extends within the screw threaded perforation 36, in said hub, and binds firmly upon said shaft. Upon the upper surface of the flange 25, on the sleeve 24, is a fixed lug 37, against which the lug 34, on the hub, comes into contact in a rotary movement of the said hub, said lugs 34 and 37 forming a catch for the throwing arm, as further described. The upper end of the lug 37, from the side opposite to that in direct contact with the lug 34 is inclined downwardly in a slight degree, as at 37ˣ.

Within the lower surface of the extension 33 is a recess 40ˣ, extending inwardly a short distance from the line of its forward, curved surface, within which recess is secured by means of the rivets 33ᵒ, the inner side and rear end portion of the target supporting track plate 40, which forms part of the throwing arm, its rear end being made of the proper width to support the ordinary composition target disk. As shown, the rear portion of the target supporting track plate extends outwardly from the point of connection with the extension 33, of the hub 31, in a rearwardly, curved line.

The forward portion of the supporting track plate 40, of the throwing arm, is also curved rearwardly, in the manner as the rear portion, the distance between the said forward and rear portions being gradually reduced in width in the direction of the outer end, at which latter point the track plate is quite narrow. In the forward, curved surface of the extension 33, of hub 31, is a recess 33ˣ, within which recess is secured firmly one end of the grooved channel bar or guard rail 41, which bar extends outwardly in line with and a short distance above the rear portion of the target supporting track plate. Between the lower surface of the channel bar 41 and the upper surface of the target supporting track plate 40, are washers 42, spaced apart at short distances from each other, through which supporting track plate and the washers extend the screws 42ˣ, which screws extend a short distance into the channel bar 41, and secure said channel bar to the supporting track plate.

Upon the upper surface and inner end of the supporting track plate 40, and near the outer portion of the track plate is a fixed pin 43, with which is connected one end of a short target guiding spring strip 44, the other end of the spring strip extending a short distance in the direction of the outer end of said track plate 40. In the channel bar 41 is a flexible tube 45, preferably made of rubber, the outer surface of which tube extends outwardly beyond the lines of the outer surface of the contiguous sides of the channel bar. Through the tube 45 extends a securing wire 46, screw threaded at one end, one end of which wire, at the outward end of the throwing arm, extends over the end of said arm and is provided with a loop, which loop extends over a pin 46ˣ, secured to the rear side of the channel bar. Upon the hub 31 is a lug 47, through which lug is extended the screw threaded end of the wire 46, and upon which end is an adjusting nut 48. With the lower, rear portion of the sleeve 24, adjacent to the left hand side of the bracket 17, is rigidly connected a short, outwardly extended operating bar 49, having a perforate outer end 49ˣ, for controlling the direction of movement of the spring carrying and pointer arm and throwing arm in their horizontal adjustments, as further described.

The lower end of the shaft 22 extends a considerable distance below the line of the lower end of the shaft bearing 21, and upon said shaft, at a point a short distance below said end of the shaft bearing is an enlargement 50, concentric to and formed integral with the shaft 22, the distance between its upper surface and the lower end of the casting being slightly in excess of the distance from the line of the upper surface of the flange 25 and the upper end of the lug 37,

considering the shaft in its lower or engaged position.

51 indicates a revoluble clutch box, consisting of a cylindrical casting, larger in circumference than the casting 21, and provided with a centrally located, circular recess 52, extending downwardly about two-thirds the distance in the direction of the lower end of the shaft bearing 21, and within which recess is an opening 51^x, on the lower portion of the clutch box, for the passage of the lower end of shaft 22, and in which recess 52 the enlargement 50 is extended. In the clutch box 51, concentric with the recess 52, are a number of recesses 53, of the same depth as the recess 52, each recess extending a short distance in the direction of the line of the side of the larger recess and communicating with said recess, the width of the recesses 53 in the direction of one end being slightly narrower, as at 53^x. Within the said recesses 53 are vertical clutch rollers 54, and transverse to said recesses are curved spring plates 55, the lower ends of which plates are bent in a horizontal direction and extended beneath the lower end of the clutch rollers 54, the curved ends of the spring plates acting to force the clutch rollers in the direction of the narrowed ends of the recesses, and in close contact with the surface of the enlargement 50, on the rotary shaft 22.

Upon the lower portion of the shaft bearing 21, and upon the left hand side of said casting is an outwardly extended pin 56, and upon the upper surface of the clutch box 51 is secured rigidly a shaft raising cam plate 57, which plate extends upwardly above the said box a short distance, to form a recess 57^x, and its upper end bent at an angle, and a portion 57^0 inclined upwardly in the opposite direction to the circle of rotation of the shaft 22, and in a concentric line to a position above the pin 56, on the shaft bearing 21. In the said upper circle of the box or casting 51, beyond a line extending vertically through the portion 57^0, of the cam plate 57, is a fixed cam 58, the forward portion of the upper end of said cam being inclined relatively to pin 56. With the portion of the clutch box transverse to that carrying cam 58 is connected one end of a clutch operating arm or bar 60, the outer end being perforated at 60^x. Upon the extreme lower end of shaft 22 is crank arm 61, which is secured to shaft 22, adjacent to the clutch, supporting said clutch, and in such position that the spring hereinafter described, is just beyond the position of greatest tension, when lugs 34 and 37 contact, and the arm is in proper position for throwing movement. The wrist pin of the crank is provided with an annular, concentric groove 61^x, and the hub is fitted with a set screw 62, to secure the same to the shaft.

64 indicates a coiled spring, of the requisite length, one end of which is formed with an eye 64^x, which eye engages with the groove 61^x, of crank 61. A portion of the other end of the spring 64 is screw-threaded and extended through the eye 29, on the outer end of the spring carrying pointing arm 27, and upon said screw threaded end of the spring is a securing nut 65.

For the purpose of operating and controlling the movements of the target trap at any convenient distance therefrom, and particularly in rear of the trap, by the transmission of manual power, a flat plate 66 is secured firmly to the ground at the required distance in rear of the trap, upon the upper surface of which are journal boxes 67, arranged upon said plate at considerable distances apart, in which is mounted the ends of a fixed shaft 68, said shaft extending transversely to a line extending longitudinally through the central portion of the bed plate 10. Upon the shaft 68 is mounted a hollow rocking sleeve 69, extending from the inner side of the journal bearing 67, upon the right hand portion of the plate 66, about three-fourths the distance in the direction of the other supporting journal box 67, upon the left hand side of the plate 66. With this sleeve 69 is rigidly connected the lower end of an upwardly extended operating bar or lever 70. At the end of the rocking sleeve 69, is a journal box 71, secured to the plate 66, through which the shaft 68 is passed. Upon the shaft 68, between the journal box 71 and the journal box 67, in the direction of the left hand side of the plate 66, is mounted a hollow rocking sleeve 72, with which sleeve, adjacent to said journal box 67, is rigidly connected the lower end of an upwardly extended operating lever 73.

74 is a segment plate upon the side of the lever 73, in the direction of the journal box 71, and with which plate are downwardly extended supports 75, connected with the upper surface of the plate 66. In the segment plate are notches 76. Upon the lower end of the lever 73, and secured thereto directly above the notched segment plate 74, is a flat plate 77, upon which are outwardly extended, perforate lugs 78, through which lugs extends the lower end of a rod or detent 79, the lower end of which rod engages with the notches 76, in the segment plate 74. Extending around the rod 79, between the lugs 78, is a coiled spring 80, the upper end of which spring bears against the upper lug 78. A pin 81 extends through the rod 79, at a point immediately above the lower lug 78, which pin bears upon the lower end of the coiled spring, the tendency of which spring is to retain the rod 79 in the notches 76, of the segment plate 74. At a point a short distance below the upper end of the lever 73, and with said lever are pivoted at

82[x] separate, forwardly extended plates 82. With said plates is rigidly secured the lower end of a short hand lever 83. With the outer end portion of plates 82 is pivotally connected at 86 the upper end of the rod 79.

Upon the upper surface and rear end portion of the base plate 10, supporting the target trap, are secured the separate guide bearings 87, in which are inserted the forward ends of the horizontal sliding tubes 88, the rear ends of which tubes are extended rearwardly to the respective levers 70 and 73, and upon said ends of the tubes are forked castings or connections 89, which castings are pivotally connected at 90, with the levers 70 and 73 the requisite distance above the rocking sleeves 69 and 72. The forward ends of these connecting tubes 88 are perforated at 91. 92 indicate connecting rods, which are smaller in circumference than the tubes 88, and are provided with loops 93, at their respective forward and rear ends. The loops upon the rear ends of the rods 92 are connected with the perforate ends 91, in the forward ends of the sliding rods 88, and the loops on the forward ends of rods 92 are connected with the perforate end 60[x], of the arm 60, of the clutch box 51, and with the perforate end 49[x], on the arm 49, on the sleeve 24, carrying the arm 27, respectively. Upon the tube 88, pivotally connected with the operating lever 70, and at a point on said tube in rear of the bearing 87, is an adjustable collar 95, secured to the rod by means of a set screw 94, which collar limits the movement forwardly of the sliding tube 88.

In operation the position of the target throwing track plate 40, and also the operating levers 70 and 73, being in the position as shown in Fig. 1, the spring 64, on the crank arm, is extended, and the lug 34, on the hub 31, is in contact with the lug 37, on the sleeve 24. A target similar to that shown in Fig. 8, is then placed upon the target support or the track plate 40 and 40[x], near the axial end of the plate, and within the spring strip 44, which spring strip has a guiding control of the target, prior to the discharge. Lever 70 is then operated, and its upper end moved forwardly and the movement communicated through the tube 88 and rod 92, to the arm 60, on the clutch box 51, and a partial rotation communicated to the clutch box, in which movement the cam plate 57 comes into contact with the fixed pin 56, on the shaft bearing 21, thus raising the clutch box 51, which in turn acts upon the lower surface of the enlargement 50, on shaft 22, and the shaft, which is both revolubly and slidingly mounted in the shaft bearing, moves upwardly, raising the throwing arm into the position seen in Fig. 3 and slightly above, the upper end of the lug 37, thereby releasing the lug 34 from engagement with the lug 37, and the power of the spring 64, upon the crank, is imparted to the shaft 22 and a rapid, rotary motion imparted to the throwing arm and target, through shaft 22, the lever 70, in the meantime, being in its forward position. Centrifugal force now acts upon the target, causing it to move rapidly from the axis of rotation upon the supporting surface of the throwing arm, to and beyond the peripheral extremity of the arm, the circumferential surface of the target, meanwhile, having frictional contact with the tube 45, along the track of the support 40, produces a revolving motion of the target, and upon reaching the extremity of the throwing arm the movement acquired by the target carries it forward through the air, with a compound motion, that is, forward in its trajectory, and also rotating rapidly on its own axis, the gyroscopic effect thus secured, maintaining a steady flight.

The arm has made about one-half of a revolution when the target leaves the arm, and the spring 64 is relaxed as the crank is on the forward center. The momentum of the arm, together with shaft and crank, causes the revolution to continue until the momentum is overcome by the increasing tension of the spring 64, this position being shown in dotted lines in Fig. 4, the arm having described about three-fourths of a complete circle.

When the shaft reaches the limit of motion the roller clutch 54 automatically grips the enlargement on shaft 50, so that any reaction of the shaft 22 is prevented. A rearward movement being now given to the lever 70, the clutch, together with shaft, crank and throwing arm, rotates sufficiently to complete the revolution of the throwing arm into its former position, as seen in Fig. 1, in which movement the cam 57 is released from the pin 56, on the shaft bearing 22, and the shaft and the clutch 51 move by gravitation downwardly into their normal position, the lug 34, of the throwing arm, comes into contact with the lug 37, on the sleeve 24, the spring 64 is tensioned, and the parts in readiness for a repeated operation. The crank being now slightly passed the center of greatest tension of the spring, the spring will now tend to hold the lugs 34 and 37 in contact, while clutch 50 is free to return to the tripping position. The function of the cam 58, on the clutch box 51, is to bring the clutch box with the shaft 22 to its lowest, or normal position. In case the action of gravity does not suffice for the purpose, and the said cam meets the pin 56, on the shaft bearing and a pressure on cam 58, at an angle to said pin 56, effects the movement downwardly.

In order to control the vertical direction of flight of the target, the adjusting nut 20, on the bolt 19, on the post 14, is loosened, and

the forward portion of the trap given the required angle, by the vertical movement of the bracket 17, and the nut again tightened.

The horizontal adjustment of the trap is effected by the lever 73, which may, in the various movements of the parts of the trap discharging the target, remain at rest. In the operation of this lever, the hand lever 83 is grasped simultaneously releasing the detent 79 from the notched segment plate 74, and the lever 73 is moved forwardly or rearwardly, as the direction of the trap in the discharge of the target is required. In the movements of said lever the tube 88 slides within the guide bearing 87 on the base plate 10, actuating rod 92 and the arm 49, on the sleeve 24, on the shaft bearing, and the sleeve is given rotation necessary to place the spring carrying pointer arm 27 in an adjusted position, after which the detent 79 is permitted to engage with the sector plate, as before. The detent and sector plate permits the operator to employ both hands upon the main operating lever 70, if he so chooses, in the rapid operation of the trap.

It is obvious that the operation of the clutch and the direction of movement of the throwing arm may be controlled by the hands of the operator by disconnecting the operating rod from the arm on the clutch box, and also the rod connected with the arm on the sleeve supporting the spring carrying arm. The operating lever, is capable of rapid movement and also enables the operator to stand at a distance during the flight of the targets.

In the obvious use of my invention, the clutch 51 may be dispensed with, and the throwing arm oscillated, or moved back and forth, through a partial revolution. In a full revolution of the arm the catch or lug and co-acting cams may be dispensed with, and the arm permitted to immediately discharge the target, when the crank passes the center of greatest spring tension.

I have shown the throwing arm curved, but I do not wish to be confined to the construction shown, as this may be varied, and it may be preferred to make the arm straight and radial to the axial center, and the target supporting portion of the arm may be less in extent to that of the propelling portion.

I am aware of target traps in which the target is supported by carriers, either oscillatory or fixed, at the outer end of an arm radial to the circumference of the actuating shaft, which impart the necessary rotary motion to the target by retarding one edge of the target as it leaves the trap, thus subjecting the target to considerable stress or shock.

I am also aware of target traps in which the target is supported in a chute or track, which is fixed radially to the actuating shaft, and in which the target receives its rotary movement by means of frictional contact with one edge or side of the chute or track, as it moves from or near the inner end to the outer end of said track or chute, thus imparting a rotary movement to the target with little shock, but requiring considerable rotative speed of the throwing chute or track to produce the necessary rotary velocity of the target. I am not aware, however that target traps have heretofore employed a target-supporting rotary track from which the target is discharged, fixed spirally or tangentially to the circumference of the actuating shaft.

What is accomplished in my invention is sufficient rotary motion imparted to the target with moderate degrees of speed of rotation of the throwing arm, without shock, and hence without injury to the target. This result is effected in a spiral or tangential track, embodied in my invention, wherein the length of the frictional inducing surface, progressively applied to the rim of the target, is proportionally greater than it would be if the chute or track were radial to the operating shaft.

Having fully described my invention, what I now claim as new and desire to secure by Letters Patent is.

1. In target traps the combination with an actuating shaft and a target throwing track movable in a circular path and positioned at right angles to the axis of motion of said shaft, of means for attaching said track in position tangentially to the circumference of said shaft, said track extending outwardly and also rearwardly from its point of attachment.

2. In target traps the combination with an actuating shaft and a target throwing track plate movable in a circular path, and positioned at right angles to the axis of motion of said shaft and a friction inducing member co-extensive with said plate connected with its rear edge and adapted for longitudinal progressive frictional contact with the target during an initial portion of the target flight, of means connecting the rear edge of said plate tangentially to the circumference of said shaft said track plate extending outwardly and also rearwardly from its point of attachment.

3. In target traps the combination with a revoluble shaft of a hub on said shaft and an outwardly curved extension of said hub extending in a curved line tangential to the said hub and a target propelling arm connected with said extension.

4. A target trap comprising a shaft holder or bearing and a revoluble sliding shaft in said bearing, a target throwing arm upon said shaft, means for imparting a throwing movement to said arm, means for effecting simultaneously the sliding movement of said shaft and a catch controlling the

movements of said arm adapted to be released in said sliding movement of the shaft.

5. A target trap comprising a shaft holder or bearing, a vertically movable revoluble shaft in said bearing, a target throwing arm connected with said shaft, means for imparting a throwing movement to said arm, a catch controlling the movement of said arm, and a lever acting to slide said shaft in position, and release said catch.

6. A target trap comprising a shaft holder or bearing, and a revoluble sliding shaft, a target throwing arm upon said shaft, means acting to impart a throwing movement to said arm, engaging devices controlled by the sliding movement of the shaft acting to hold the arm in position, prior to the throwing movement to discharge the target, and means for effecting the sliding movement of the shaft and disengage the said engaging devices.

7. A target trap comprising a shaft holder or bearing, and a sliding revoluble shaft, a target throwing arm, means acting to impart a throwing movement to said arm, engaging devices acting to hold the arm in position prior to the discharge of the target, and disengaging means comprising a box revolubly mounted upon said shaft, and a cam plate upon said box, and a projection upon said shaft bearing, with which said cam plate is adapted to engage, and means for communicating rotary motion to said box in an opposite direction to the direction of movement of the throwing arm.

8. In a target trap the combination with a sliding revoluble shaft, and the shaft bearing and the target throwing arm, of a projection on said bearing and a revoluble cam support on said shaft, and a cam plate upon said support adapted to engage with the said projection, and means for actuating said cam support to effect a sliding movement of the shaft.

9. The combination with the sliding revoluble shaft and shaft bearing, and a projection upon said bearing, of a rotatable box mounted upon said shaft, a cam upon said box adapted to engage with said projection on said shaft bearing to effect a sliding movement of the shaft, and a cam acting to produce motion in an opposite direction.

10. In target traps the combination with a sliding, revoluble shaft and shaft bearing, and the throwing arm, of a projection on the shaft bearing, a revoluble cam supported by said shaft, and a cam plate upon said support adapted to engage with the said projection on said bearing and impart motion to said shaft in its longitudinal direction, and an auxiliary cam acting to impart a reverse movement to said shaft.

11. In target traps the combination with a shaft bearing or holder, a sliding, revoluble shaft, a target throwing arm upon said shaft, a rotatable hollow box supported by said shaft, an enlargement upon said shaft, a projection upon said shaft bearing, a cam plate upon said hollow box adapted to engage with said projection, and an auxiliary reversing cam upon said box having its inclined portion adapted to engage with the projection on said bearing.

12. In a target trap the combination with the target throwing arm, a crank shaft, a shaft bearing, and a sleeve on said shaft bearing an oscillating spring carrying arm on said sleeve, a spring connected with the said crank shaft, and with the said spring carrying arm, and engaging means upon the sleeve and throwing arm adapted to engage with each other and control the movement of said arm.

13. A target trap comprising a crank shaft and shaft holder or bearing, a target throwing arm, and a spring carrying arm, a support for the latter mounted upon and having an oscillating movement on the shaft bearing, a spring connected with the crank on the crank shaft, and also with the outer end of the spring carrying arm.

14. A target trap comprisng a crank shaft and shaft holder or bearing, a target throwing arm and a spring carrying arm, and a support for the latter mounted upon and adapted to oscillate on said shaft bearing, a spring connected with the crank on said crank shaft and with the spring carrying arm, and means for adjusting the spring carrying arm in position and changing the direction of said arm.

15. In a target trap the combination with the shaft bearing or holder, of a sleeve, means for supporting said sleeve on said bearing, a spring carrying arm connected with said sleeve and having a forwardly and downwardly extended forward end, a crank shaft in said bearing, a target throwing arm mounted thereon, and a spring connected with the crank on said shaft and with said spring carrying arm.

16. In a target trap the combination with a spring actuated target throwing arm, of a sliding revoluble shaft, a shaft holder or bearing means acting to effect a sliding movement to said shaft, a revoluble clutch mounted upon said shaft adapted to engage automatically with said shaft and means for imparting motion to the clutch in an opposite direction of movement to that imparted to the spring actuated target throwing arm.

17. In a target trap the combination with a spring actuated throwing arm, of a sliding, revoluble shaft and shaft holder or bearing, a revoluble clutch mounted upon said shaft adapted to engage with said shaft in one direction of its rotation, and means upon said

clutch and shaft bearing co-acting to move said clutch and shaft in a direction longitudinal to the shaft.

18. In a target trap, the combination with a spring actuated target throwing arm, of a sliding revoluble shaft and shaft holder or bearing, a revoluble clutch supported by said shaft and adapted to engage with said shaft in one direction of rotation, and a projection on said shaft bearing, and a cam plate upon said clutch adapted to engage with the projection on said shaft bearing, and means for imparting an oscillatory movement to said clutch.

19. In a target trap the combination with a spring actuated target throwing arm, of a sliding revoluble shaft and a shaft holder or bearing means acting to effect a sliding movement of the shaft, a revoluble hollow clutch box supported by said shaft, clutch rollers in the said hollow box adapted to engage with said shaft, and an operating arm upon said box.

20. In a target trap the combination with a spring actuated target throwing arm, of a sliding revoluble shaft and shaft holder or bearing, a revoluble hollow clutch box supported by said shaft, said shaft having an enlargement extending within the hollow clutch box, recesses in said box communicating with the hollow portion thereof, and clutch rollers or balls in said recesses adapted to engage with the enlargement of said shaft, and an operating arm upon said box.

21. In a target trap the combination with the target throwing arm, and with a sliding revoluble shaft supporting said arm, a shaft holder or bearing, means for communicating an operating movement to said arm, engaging devices upon said shaft bearing and throwing arm, and arm releasing devices upon said shaft, an operating lever, and power transmitting devices connected with said lever and actuating the arm releasing devices.

WILLIAM J. CLOW.

Witnesses:
HARRY L. GREEN,
FRANCIS A. LEACH.