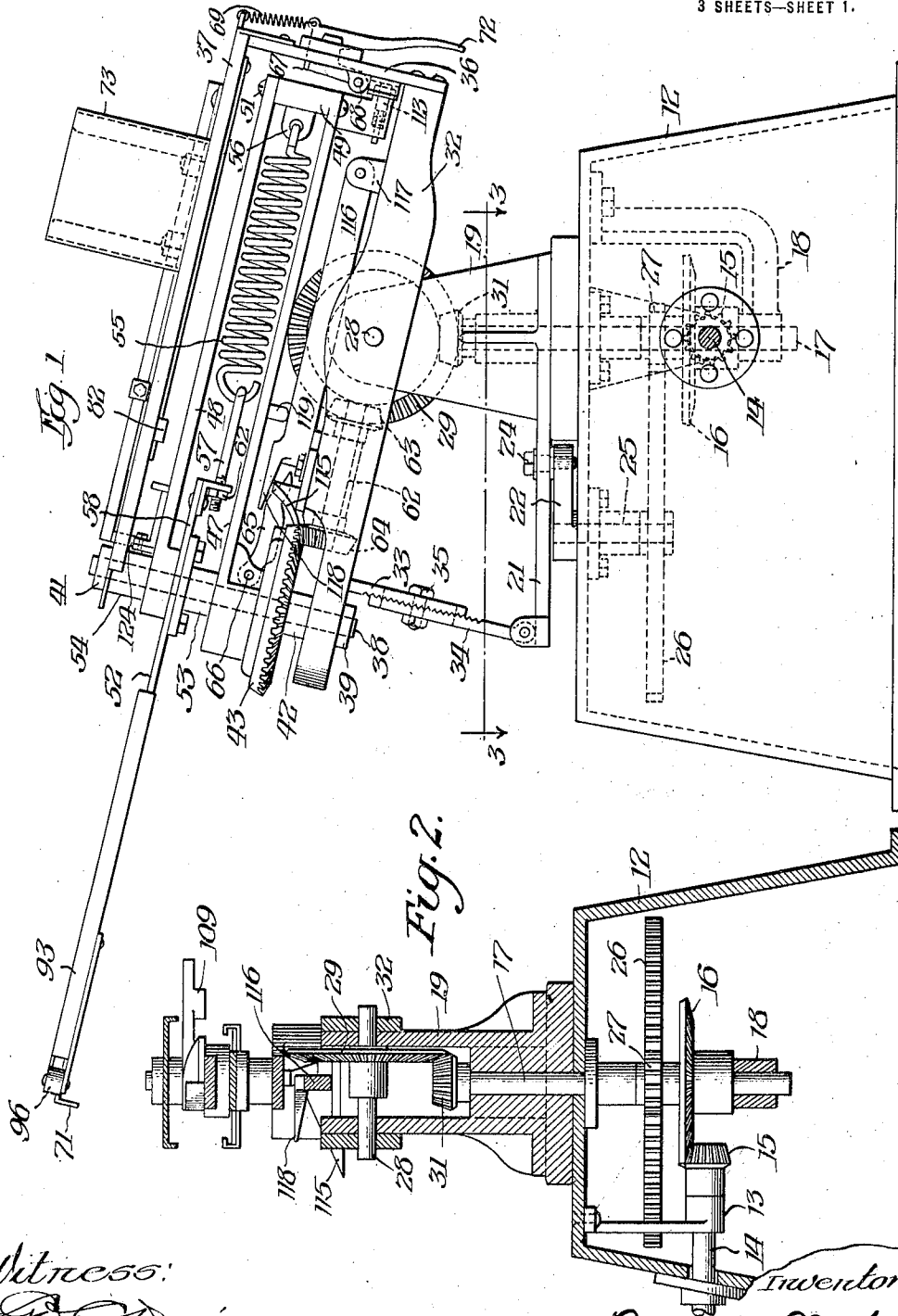


B. P. VICKERY.
 TARGET TRAP.
 APPLICATION FILED NOV. 25, 1918.

1,369,948.

Patented Mar. 1, 1921.

3 SHEETS—SHEET 1.



Witness:
J. D. Larrison

Inventor
Benjamin P. Vickery
 By *Fondel Wilson*

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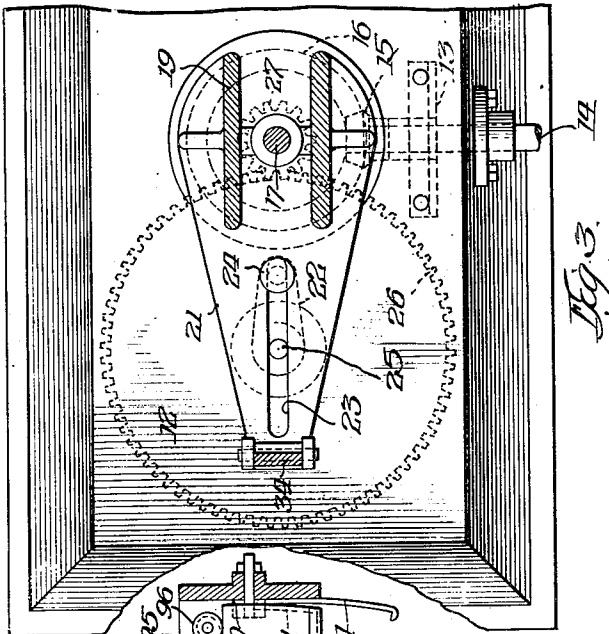


Fig. 3.

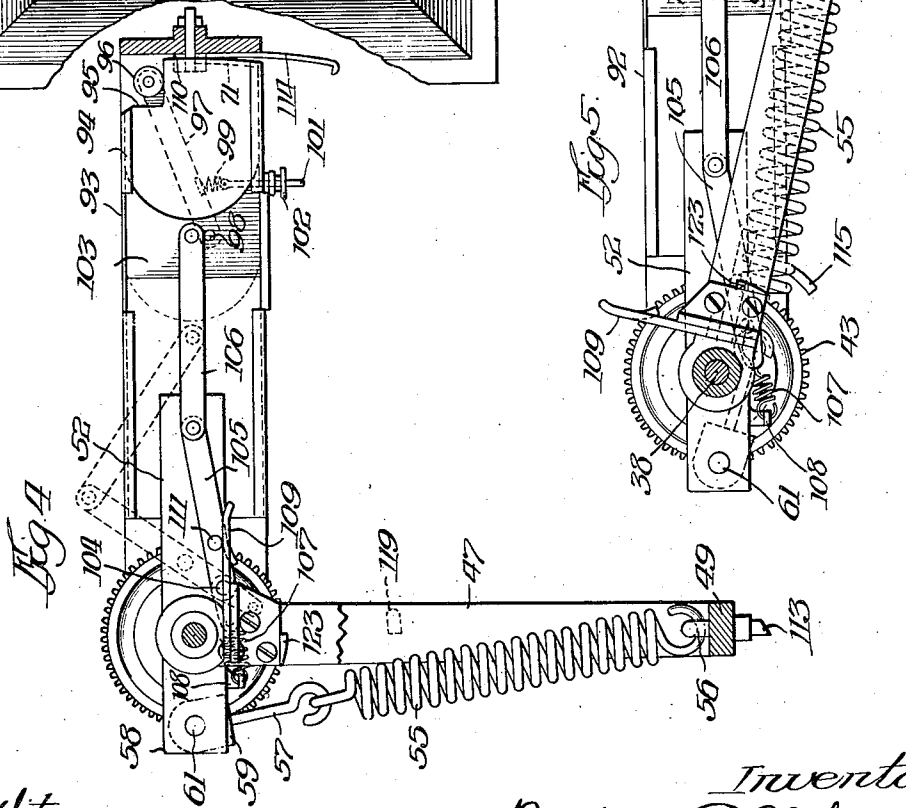


Fig. 4.

Fig. 5.

Witness:
Ed. Harrison

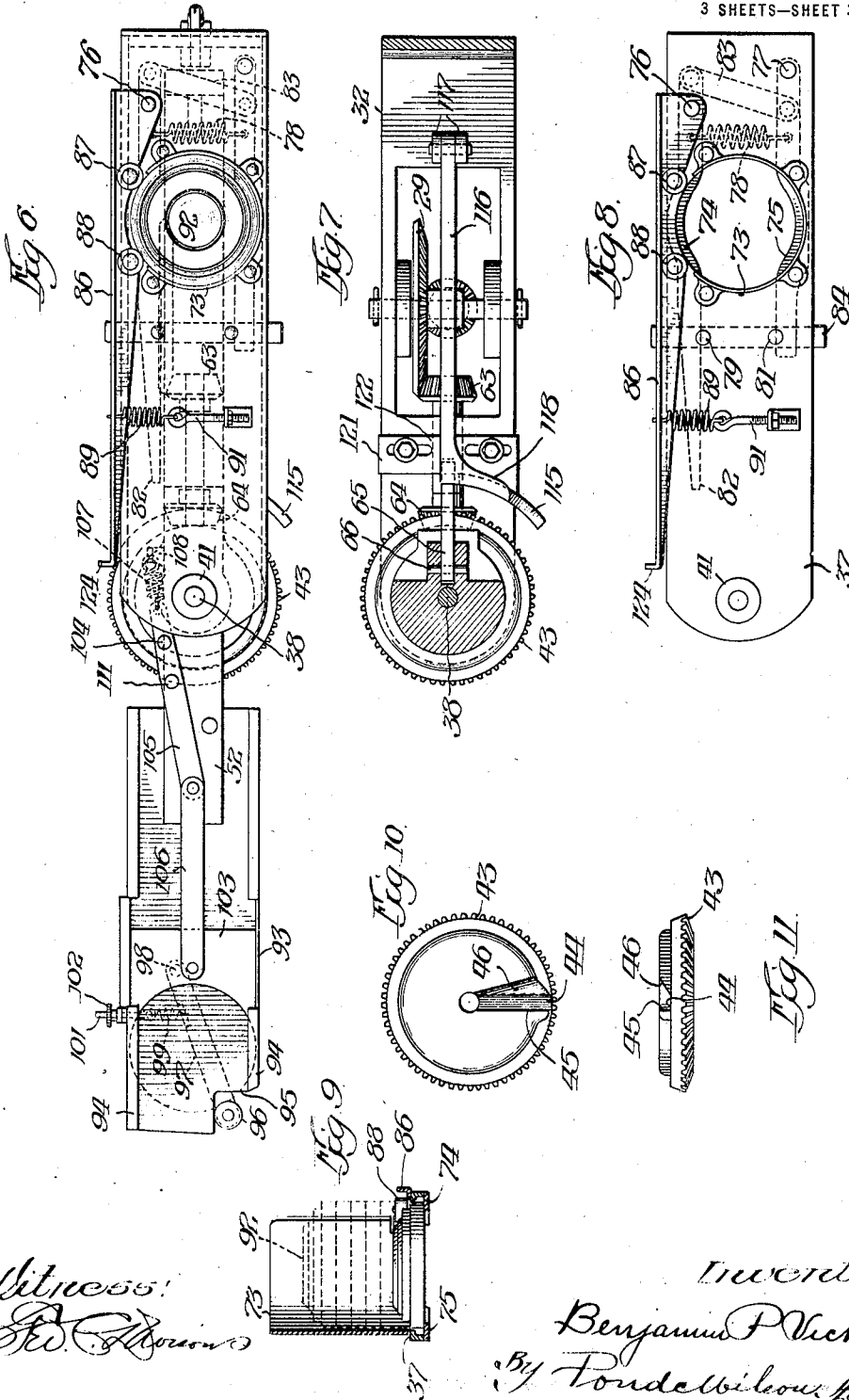
Inventor:
Benjamin P. Vickery
By *Pondel Wilson*
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3 SHEETS—SHEET 3.



Witness:
[Signature]

Inventor:
 Benjamin P. Vickery
 By *[Signature]* Attorney

UNITED STATES PATENT OFFICE.

BENJAMIN P. VICKERY, OF BRADLEY, ILLINOIS, ASSIGNOR OF ONE-HALF TO ELMER E. PERKINS, OF CHICAGO, ILLINOIS.

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This invention relates to target traps of the general class employed in throwing or projecting flying targets commonly known as clay pigeons for trap shooting.

One of the primary objects of my invention is to provide a target trap which will be entirely automatic in its operation so that the pigeons or targets will be automatically positioned on a throwing arm and automatically discharged or thrown by the arm which is then automatically restored to set position to receive another target, all of these operations being performed automatically and without manipulation by the operator who only need keep the magazine supplied with targets and trip the device to produce the flight of the target when the word or signal is given.

In target traps which have been employed prior to my invention, the direction or quarter which the target took in its flight was under the control of the operator who could turn or point the trap in any direction that he desired. As the result, favoritism could be shown to one or more of the shooting participants by the operator who could direct the flight of the targets for a particular participant in a predetermined direction. One of the objects and advantages of my invention resides in the fact that the operator has no control over the direction of flight of the targets since the position of the trap is automatically and continuously changed so that the targets are projected into different quarters which can not be controlled or previously determined.

Another object of my invention is to provide a target trap which can, if desired, be power operated thus relieving the operator of the manual labor customarily involved in resetting and pointing the trap and which, because of its automatic operation, can be operated to discharge or deliver the pigeons in as rapid succession as may be desirable.

A further object of my invention is to provide a target trap which will not be liable to get out of order, one which will not break the pigeons before they are thrown, one which will be easy to operate and will require a minimum of attention, and one which will be durable and efficient in operation.

Still another object is to provide improved mechanism for positioning and holding the target prior to its delivery and flight so that each target will be accurately positioned and held, thereby insuring an accurate flight for a predetermined distance of each target irrespective of its direction or quarter of flight.

Other objects and advantages of my invention will be readily appreciated by those skilled in the art as the invention becomes better understood by reference to the following description when considered in connection with the accompanying drawings. Referring to the drawings:

Figure 1 is a side elevation of a target trap embodying my invention.

Fig. 2 is a transverse vertical sectional view through the construction shown in Fig. 1.

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Fig. 7 is a horizontal view taken just beneath the magazine.

Fig. 8 is a plan view of the magazine itself, detached from the magazine.

Fig. 9 is a transverse sectional view through the magazine.

Fig. 10 is a plan view of the bevel gear which actuates the operating arm; and

Fig. 11 is an elevation of this gear showing the dog actuating shoulder.

By reference to the drawings, it will be

observed that the operating mechanisms of the machine are carried by a base or pedestal 12, in which is mounted in suitable bearings 13 a horizontally projecting power-shaft 14 which may be rotated from any suitable source of power by an electric motor or otherwise, or, if preferred, may be equipped so as to be manually operated. The inner end of this shaft is provided with a bevel pinion 15 which meshes with and drives a beveled gear 16 fixed upon a vertical shaft 17 which is mounted at its lower end in a bracket 18. This shaft, as will be manifest from Fig. 2, extends upwardly through the base portion of a bifurcated upright casting 19 which rests upon the base 12 and is adapted to rotate or oscillate about the shaft 17 as an axis.

This casting or member 19 is provided with a forwardly projecting portion or arm 21 spaced sufficiently above the base 12 to permit the rotation of a crank 22 beneath the arm and is provided with a longitudinally extending slot 23 adapted to accommodate a pin 24 projecting upwardly from the crank 22. The crank is fixed upon the upper end of a vertical shaft 25 which is provided at its lower end and within the base with a large gear wheel 26 which meshes with and is driven by a pinion 27 fixed on the shaft 17. It will be manifest that as the crank slowly rotates, the pin 24 traveling in the slot 23 will cause the upright member 19 to be oscillated back and forth about the shaft 17 as its axis, thereby automatically and continuously changing the position and therefore the direction of throw of the target throwing mechanism carried by the upright 19.

In the upright 19 there is rotatably mounted a shaft 28 carrying a bevel gear 29, which meshes with and is driven by a beveled pinion 31 fixed upon the upper end of the shaft 17. The ends of the shaft 28 project laterally beyond the side members of the upright 19 and upon these projecting ends is pivotally mounted a supporting frame 32, preferably cast and shaped to straddle the upright member 19, as shown in Fig. 2. This frame extends forwardly and rearwardly from the pivot shaft and the elevation of its forward end may be varied by means of an adjustable support consisting of a pair of overlapping members 33 and 34 depending from the frame 32 and pivotally attached to the forward end of the extension 21 respectively, both of the members being provided with a longitudinal slot through which a clamping bolt 35 is disposed to rigidly clamp the members together. To provide against accidental slippage, the engaging faces of these members are serrated, as shown in Fig. 1, and it will be observed that upon loosening the nut on the bolt 35, the forward end of the

frame 32 may be adjusted upwardly or downwardly into the required position for a purpose which will later be apparent.

To the rear end of the frame 32 there is rigidly secured, by bolts or otherwise, an upward extension 36 of the frame and from the upper end of this extension there extends forwardly, parallel with the frame 32, a plate 37, upon which the magazine is carried, as will be later described. In the forward end of the frame 32 there is rotatably mounted an upwardly extending shaft 38, its upper end projecting through and being journaled in the forward end of the plate 37, all as shown in Fig. 1, the shaft being retained in position against longitudinal displacement by collars 39 and 41 pinned to the lower and upper end respectively of the shaft. Immediately above the frame 32 there is disposed a spacing collar 42 upon which rests a bevel gear 43 rotatably mounted upon the shaft. The upper face of this gear, as will be evident from Figs. 10 and 11, is provided with a radial groove 44, having a vertical face or shoulder 45 and an inclined face 46, for a purpose which will later appear.

Above the bevel gear 43 there is rotatably mounted upon the shaft 38, the power arm of the trap, which, as will be evident from Fig. 1, comprises lower and upper arm elements 47 and 48 respectively, disposed in parallel spaced relation and journaled at one end upon the shaft 38 and rigidly connected together at their other ends by an element 49, preferably connected integrally with the element 47 and to which the arm element 48 is rigidly secured by bolts or screws 51. Between the pivoted ends of the power arm elements 47 and 48 there is rotatably mounted upon the shaft 38, the throwing arm, which is designated generally by reference character 52, this throwing arm being provided with a downwardly extending collar 53 which gives an elongated bearing surface on the shaft, and similarly the power arm element 48 is equipped with an upwardly extending collar or bearing portion 54, providing an elongated bearing on the shaft 38. It will be manifest from the foregoing, that upon the shaft 38 there is rotatably mounted the bevel gear 43, the throwing arm 52 and the power arm by which the throwing arm is actuated in a manner to be later explained.

Attention is directed at this point to the fact that both the power arm and the throwing arm are adapted to be rotated about the shaft 38 in a counter-clockwise direction viewing Fig. 6, through a complete revolution, and that one of these arms may travel while the other remains stationary, since the only connection between the arms is a yielding one consisting of a relatively strong power spring 55 disposed between the power

arm elements 47 and 48 and attached at one end to an eye 56 on the connecting element 49 and at its other end by an adjustable link 57 to an extension 58 of the arm 52, which extension projects on the opposite side of the shaft 38 from the main portion of this throwing arm. Normally, the spring 55 would retain the power and throwing arms in the relative position shown in Figs. 1 and 6, but, by means of mechanism which will presently be explained, the angular relation of these arms is changed to place the power spring 55 under a sufficient tension to impart to the throwing arm the impetus necessary to properly deliver the target in flight. To facilitate the changes in the angular relations of the power and throwing arms, the link 57 is connected to the extension 58 of the throwing arm 52 by an angle shaped eye member 59 pivoted at 61 to the extension 58. The tension of the spring 55 may be adjusted by the nut 62 threaded on to the link 57, as will be apparent from Fig. 1.

The power arm of the apparatus is intermittently rotated about the shaft 38 by the bevel gear 43 which is continuously driven from the continuously rotating shaft 62 mounted in the frame 32 and equipped at its ends with beveled pinions 63 and 64 meshing respectively with the gears 29 and 43. The direction of rotation of the bevel gears is in a counter-clockwise direction viewing Figs. 6 and 10. The driving connection between the gear 43 and the power arm is established by a pawl 65 pivoted at 66 in a socket formed radially in the hub of the power arm element 47, as is clearly shown in Figs. 1 and 7. This pawl is adapted to ride down the incline 46 into the groove 44 formed in the upper face of the gear 43, so as to thereby establish a driving connection between this gear and the power arm, whereby the power arm is rotated in a counter-clockwise direction with the gear. The throwing arm, being normally held by the power spring 55 at an angle of 180° with respect to the position of the power arm, will be, as the power arm is rotated from the position shown in Fig. 1 through an angle of 180° , rotated through 180° from the throwing position shown in Fig. 1, to the set position illustrated in Figs. 4 and 5.

When the throwing arm reaches this set position beneath the plate 37, its further rotative movement is arrested by an abutment or latch 67, projecting through the upright frame member 36 and pivoted at 68 between ears carried on the inner face of this member, the latch being normally retained in the position shown in Fig. 1 by a contraction spring 69 so that it is disposed in the path of travel of a downwardly projecting abutment finger 71, carried by the end of the throwing arm. The latch is provided

with a downwardly projecting tail 72, which when pressed inwardly toward the frame member 36, will withdraw the abutment or stop portion of the latch from in front of the abutment finger 71, thereby releasing or tripping the throwing arm for the purpose of discharging the target.

Assuming, for the moment, that the throwing arm has reached its set position and is restrained against further rotative movement by the latch 67, it will be observed that, as the gear 43 continues to rotate, the power arm by reason of its connection to the gear through the pawl 65, will continue its rotative movement through the position shown in Fig. 4 and finally into the position shown in Fig. 5. During the travel of the power arm from its extended position in parallel relation to the throwing arm to its set position shown in Fig. 5, the power spring 55 will be gradually placed under tension as the result of the gradually increasing distance between the eye 56 and the pivot point 61, so that when the throwing arm is released from the latch 67, this spring will actuate the throwing arm, or, in other words, will swing it with extreme rapidity from set to throwing position so as to deliver the target therefrom with considerable velocity.

Each time the throwing arm is brought to set position, a pigeon or target is automatically delivered from the magazine and properly positioned on the arm. The magazine, as will be apparent from Figs. 1 and 6 to 9 inclusive, comprises a vertically disposed receptacle 73 constructed in any preferred manner and mounted upon the plate 37, this magazine being adapted to contain a stack of superposed targets which are delivered from beneath, one at a time, to the throwing arm as required. From Fig. 8 it will be apparent that the plate 37 is provided with a circular opening beneath the magazine 73 through which the targets may pass from the magazine onto the throwing arm. The stack of targets is normally prevented from passing through this opening by a pair of retainers 74 and 75 respectively, which are pivoted to the under side of the plate at 76 and 77 and are urged together by a connecting spring 78 against the two fixed stops 79 and 81 projecting downwardly from the plate 37 so that these retainers partially underlie the opening through the plate beneath the magazine and prevent the targets from dropping out through this opening. To release the lowermost target from the magazine, the inner end of the retainer 74, which is provided with a downwardly projecting abutment portion 82, is moved by mechanism, which will be presently described, away from the axis of the plate 37 so that it is withdrawn from beneath the magazine. A link 83, connecting

the retainers 74 and 75 in the manner shown in Figs. 6 and 8, imparts a similar movement to the retainer 75 with the result that both retainers are simultaneously moved in opposite directions, or, in other words, are separated from one another so as to permit the lowermost target in the magazine to drop out onto the throwing arm. A bar or guide 84 of suitable shape is secured to the under face of the plate 37 so as to underlie the retainers 74 and 75 thereby supporting their inner ends and serving as a guide for them in their movements.

For the purpose of retaining the remainder of the targets in the magazine while the lowermost one is being delivered to the throwing arm, I have pivoted at 76 upon the top of the plate 37, a retainer 86, which extends alongside of the magazine and is equipped with a pair of rubber studs 87 and 88 adapted to engage through an opening in the side of the magazine with the next to the lowermost target, and, by pressing against the same to hold this and the superposed targets from dropping down with the lowermost one. A tractile spring 89 attached at one end to the retaining arm 86 and at its other to an adjustable eye 91 connected to a stud projecting upwardly from the plate 37, normally urges the studs 87 and 88 into engagement with a target in the magazine. After the lowermost target has been delivered to the throwing arm, the retaining arm 86 is moved outward against the force of the spring 89 by mechanism, which will be later described, thereby permitting the stack to drop downwardly so that the lowermost target is supported upon the retainers 74 and 75 whereupon the arm 86 is again restored by its spring 89 so as to engage and hold the second-lowest target in the magazine against movement. The targets are designated in Figs. 6 and 9 by reference character 92.

Referring now to Figs. 4, 5 and 6, it will be observed that the throwing arm comprises a main portion made of sheet metal, provided at its sides with upstanding flanges 93, terminating in inwardly disposed flanges 94. This structure provides a channel-shaped holder adapted to receive and retain a disk target. Intermediate the ends of the arm the inwardly projecting flanges 94 are removed for a distance to provide an opening which, when the arm is disposed in set position, is aligned with the magazine so that a target may drop from the magazine through this opening onto the arm.

At its outer end, a notch 95 is formed at one corner of the arm and a retaining abutment in the form of a roller 96, preferably made of rubber and projecting upwardly from a lever 97, pivoted at 98 to the lower side of the arm, is normally retained in the said notch by a tractile spring 99 attached

at one end to the lever 97 and at its other end to an adjustable eye 101. This abutment 96 normally lies in the path of a disk target disposed on the arm and serves to limit the outward movement of the target until the centrifugal force, resulting from the rapid swinging movement of the arm upon its release from set position, becomes sufficient to force the target outwardly thereby displacing the retaining roller 96 against the force of its spring 99. The spring is adjusted by means of the adjusting nut 102 upon the eye-link 101 so that the release of the target occurs at a predetermined point in the travel of the arm, thereby insuring a uniform velocity of each target at its moment of discharge from the arm. As the target leaves the arm, a rotary whirling motion is imparted to it as the result of the friction between the periphery of the target and the abutment 96. This rotary movement of the target insures accuracy and uniformity of flight.

In order to obviate fracture of the fragile target and to insure accuracy of flight, it is desirable that each target be accurately positioned on the throwing arm in contact with the retaining abutment 96 before the arm is released. To accomplish this result, I have provided a positioning mechanism consisting of a pusher 103 reciprocable longitudinally upon the arm, together with mechanism for withdrawing the pusher inwardly beyond the point at which the targets are delivered to the arm and subsequently returning the pusher so as to move the target, which has been delivered to the arm from the magazine, outwardly into engagement with the retaining abutment 96, and to then hold the target in this position. This mechanism is perhaps best disclosed in Figs. 4 and 5, from which it will be observed that upon a fulcrum 104, upon the upper face of the arm 52, there is pivoted a lever 105 connected at its outer end by a link 106 with the pusher 103. A light tractile spring 107 attached at one end to the inner end of the lever 105 and at its other to a lug 108 projecting laterally from the outer portion 58 of the arm, normally tends to hold the pusher in its extended position shown in full lines in Figs. 4 and 5, where it holds a target in engagement with the retaining abutment 96.

For the purpose of retracting the pusher to permit the delivery of a target from the magazine to the holding arm in the manner hereinbefore explained, I have mounted upon the inner end of the power arm element 48, a laterally projecting actuator 109 and upon the lever 105 I have provided an upstanding pin or boss 111, which is disposed in the path of travel of the downwardly extending portion of the actuator 109. When the power arm, in the course of its revolution, has brought the throwing arm

UNITED STATES PATENT OFFICE.

BENJAMIN P. VICKERY, OF BRADLEY, ILLINOIS, ASSIGNOR OF ONE-HALF TO ELMER E. PERKINS, OF CHICAGO, ILLINOIS.

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Specification of Letters Patent.

Patented Mar. 1, 1921.

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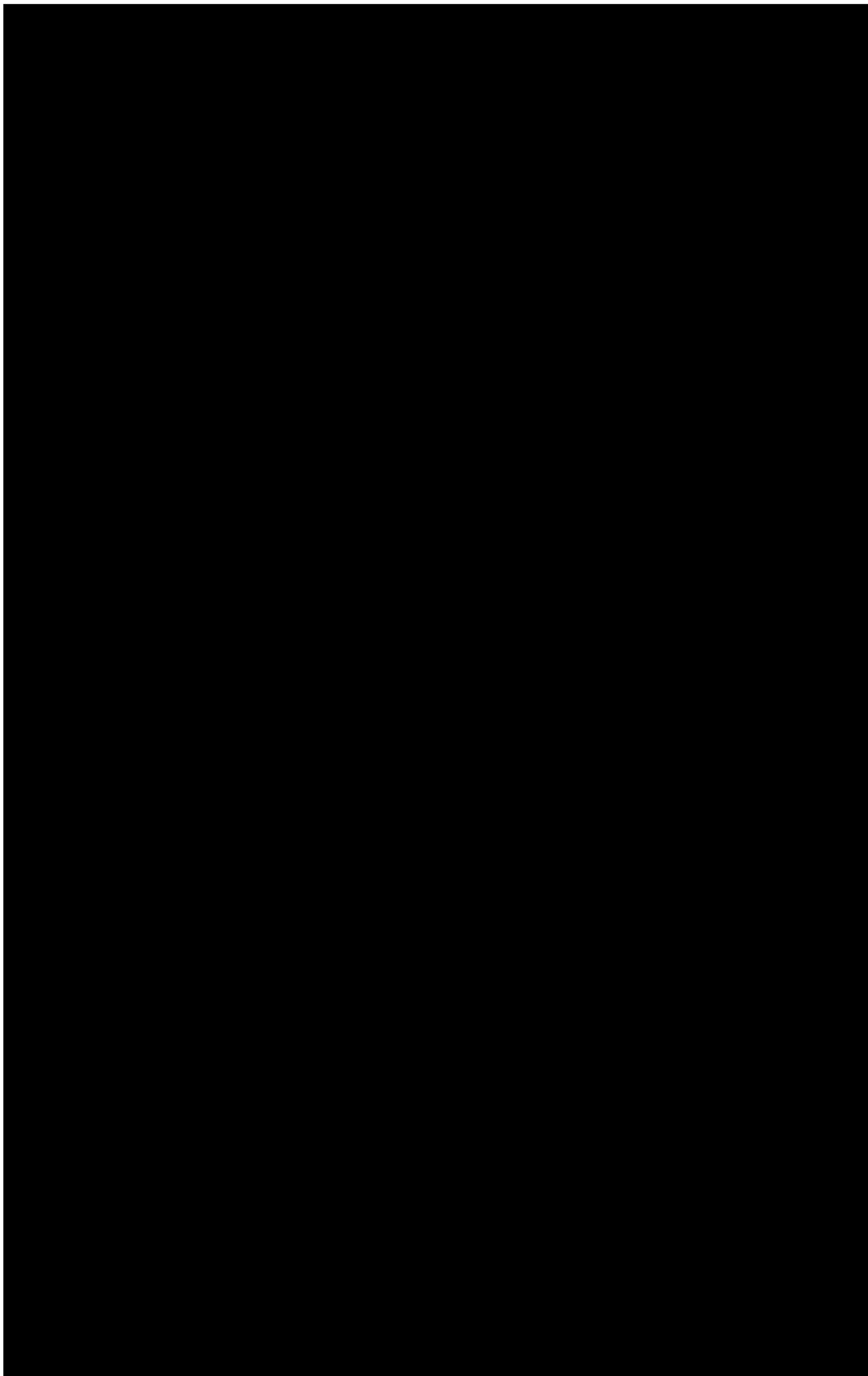
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Fig. 11 is an elevation of this gear showing the dog actuating shoulder.

By reference to the drawings, it will be



7. In a target trap, the combination of rotatable concentrically mounted power and throwing arms, a connection between said arms whereby the throwing arm is actuated from said power arm, means for rotating the power arm, and means actuated by the power arm for automatically delivering a target to said throwing arm when said throwing arm is in set position.
8. In a target trap, the combination of a target magazine, a throwing arm mounted to rotate through a complete circle, a power arm mounted concentrically with said throwing arm, means for positively rotating said power arm, means for locking said throwing arm in position beneath said magazine, and means actuated by said power arm for automatically delivering a target from said magazine to said throwing arm.
9. In a target trap, the combination of a target magazine, a throwing arm mounted to move beneath said magazine, a power arm connected with said throwing arm and means actuated by said power arm for delivering a target from said magazine to said throwing arm.
10. In a target trap, the combination of a target magazine, a throwing arm adapted to be locked in set position beneath said magazine, a retainer for supporting the lowermost target in said magazine, a power arm adapted to actuate said throwing arm, means carried by said power arm for moving said retainer to release the lowermost target in said magazine, means for retaining the remainder of the targets in the magazine upon release of said lowermost target, and a device carried by said power arm for actuating said last mentioned means to permit the targets to feed downwardly in the magazine.
11. In a target trap, the combination of a target magazine, a throwing arm adapted to be positioned beneath said magazine, a power arm for actuating said throwing arm, and means controlled by said power arm for feeding one target only from said magazine to said throwing arm subsequent to each movement of said throwing arm to set position.
12. In a target trap, the combination of a throwing arm, means for delivering a target thereto remote from the end thereof, a pusher reciprocable longitudinally on said arm and means for actuating said pusher for positioning and holding a target in predetermined position near the end of said arm.
13. In a target trap, the combination of a throwing arm a pusher movable longitudinally thereof, means for moving said pusher inwardly of said arm when said arm is in set position, means for delivering a target to the arm, and means for causing said pusher to then move outwardly on the arm to position and hold said target near the end of the arm.
14. In a target trap, the combination of a magazine, a rotatable throwing arm adapted to be locked in set position beneath said magazine, a power arm connected with said throwing arm, a pusher mounted on said throwing arm, means carried by the power arm for moving said pusher inwardly of the throwing arm when in set position, means for delivering a target from said magazine to said arm and means for moving said pusher outwardly on the arm to position said target near the outer end of said throwing arm.
15. In a target trap, the combination of a throwing arm, a yieldingly mounted abutment carried by said arm at its outer end, means for delivering a target to said arm remote from said abutment, and means for moving said target longitudinally of the arm into engagement with said stud.
16. In a target trap, the combination of a rotatable throwing arm, a yieldingly mounted abutment carried at the outer end thereof, a pusher reciprocable longitudinally of said arm, means for delivering a target to said arm, and means for causing said target to be embraced and held by and between said abutment and said pusher.
17. In a target trap, the combination of a throwing arm, a yielding abutment carried at the outer end thereof, a pusher mounted to slide longitudinally on said arm and means for actuating said pusher so as to cause a target to be held between said pusher and said stud.

BENJAMIN P. VICKERY.