

[54] **ELASTIC BAND TYPE PROJECTING DEVICE**

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[51] Int. Cl.F41b 7/00

[58] Field of Search.....124/17, 21, 22, 16, 35, 41, 124/42, 37; 273/105.4

[56] **References Cited**

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[57] **ABSTRACT**

A target launcher having a pivoted lever arm that is manually pivoted to tension elastic members for projecting a target. The lever arm has a slidable block with a vertically movable fin which is manually actuated to release the elastic members when the lever arm is in a cocked position.

3 Claims, 2 Drawing Figures

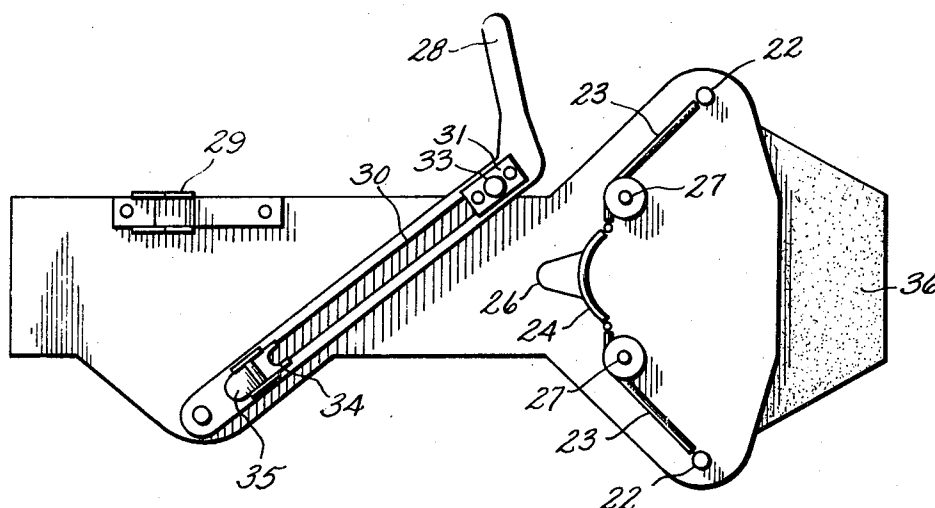


Fig. 1

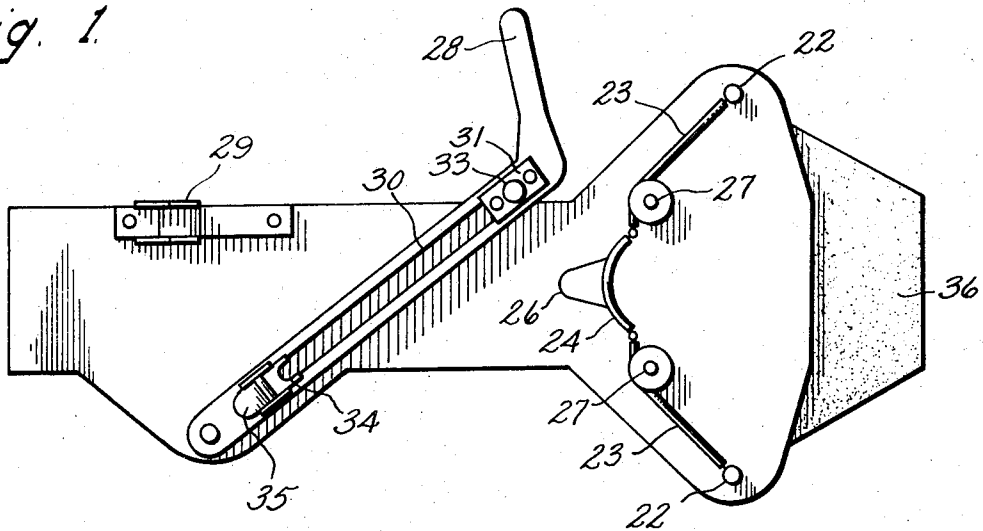
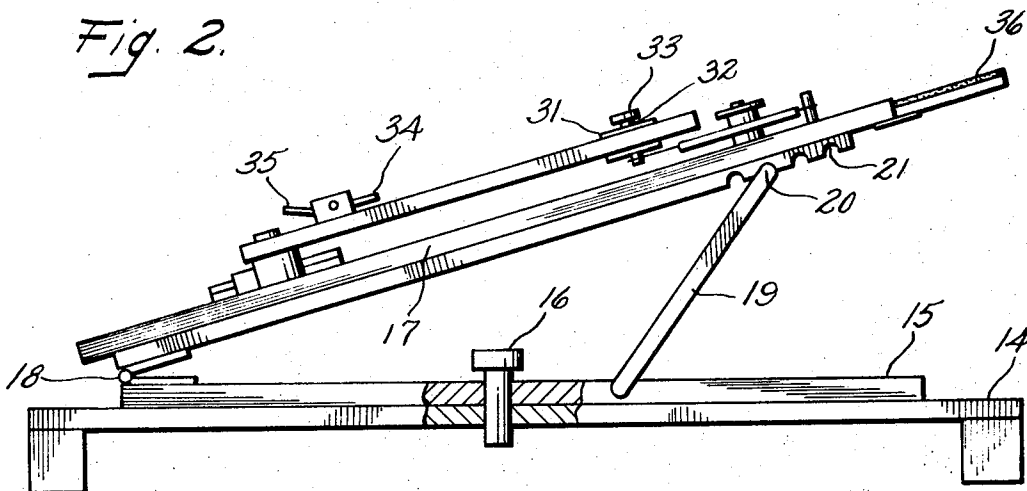


Fig. 2



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ELASTIC BAND TYPE PROJECTING DEVICE

RELATED APPLICATIONS

A copending application of Kenneth W. Misevich, Ser. No. 81,258, filed Oct. 16, 1970, relates to a preferred design of target to which this launching device is particularly adapted. Another copending application of Robert J. Tryon, Ser. No. 84,966, filed Oct. 29, 1970, relates to a preferred method of attaching tail-like appendages to such targets.

BACKGROUND OF THE INVENTION

Inanimate aerial targets have existed since the first shooter threw a bottle or soared a plate into the air. The brittle disk shaped target or clay pigeon was documented in the 1880's by United States patents and has enjoyed popularity ever since. Many patents have been issued to describe materials, design and novel ideas to make the launching and pronounced hitting of these targets cheap, reliable and entertaining. The standard trap and skeet target is thrown some 50 yards and is gyroscopically stabilized by the spin imparted to it at launching. It certainly is a simple flying target which has a predictable path to aid in shooter tracking.

Also from the earliest times, it has been recognized that the clay pigeon does not fly like many birds; therefore, there have been numerous solutions of bird-targets offered. However, none has endured in any popular shooting game.

Whereas a standard trap and skeet target cannot be thrown without spin to produce any bird-like flight, the related invention of Kenneth W. Misevich, above referred to, proposes that a minimum of aerodynamic stability be added to the target by affixing a tail on the rear of the target. This tail overcomes a natural tendency of the spinless standard trap and skeet target to tumble end over end and further provides a simple means of controlling the general flight trajectory of the target so as to produce swooping, soaring and skipping type flights which resemble bird flight. Further, the size, shape, and attachment angle of the tail coupled with control over launch direction, initial velocity and elevation permits variation in the "difficulty" of the target from the easy to the difficult shot. This appendage allows almost any type of flight to be selected and maintained with reasonable repeatability and therefore allows fundamental design of new shooting game.

The present invention relates to a portable, manually controlled launching device for such targets which stripped to bare essentials comprises a carrier adapted to engage such a target, a launching platform over which the carrier may linearly move the target and means for driving the carrier.

Other prior art bird-like targets have been mounted on rods or arrows and projected by a crossbow like device (U.S. Pat. No. 224,254 to M. Warne, Feb. 3, 1880) or by a pair of extensible coil springs (U.S. Pat. No. 312,604 to J. L. Barker, Feb. 24, 1885). Although by the provision of suitable target carriers those devices could be adapted to project the targets referred to in the application of Kenneth W. Misevich, we prefer to use a device such as that which is described in more detail in the following detailed description referring to the attached drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view of an exemplary target launching device;

FIG. 2 is a side view of the launching device shown in FIG. 1.

FIGS. 1 and 2 show a preferred form of launcher which may be used to throw any of the targets disclosed in the Misevich application. This launcher which is disclosed but not claimed in the Misevich application comprises a fixed substantially level base 14 to which a sub-base 15 is secured with a pivotal mounting attachment 16 permitting at least limited rotation of the sub-base with respect to the base. A launching platform 17 is attached as by hinge means 18 to the sub-base with provision for elevation adjustment as by the braces 19 which mount a cross bar 20 engageable selectively in notches 21 in the lower surface of the launching platform to provide for elevation angles such as 10°, 20°, 30° or 40°. Thus, the launching platform is provided with adjustments which permit the selection of the desired angles of azimuth and elevation with respect to the base and thereby control the direction of target release.

Two fixed anchor points are provided on posts 22 in the upper surface of the launching platform and to these anchor points there are secured short lengths of highly elastic tubing 23, shock cord, bands or the like. The ends of the elastic means 23 remote from the anchor posts 22 are secured to a target carrier 24 which may be a light metal bar formed to define a curve matching the throwing target. A bail or wire hook 26 is attached to the target carrier to provide a means of extending the elastic and retaining it until release is desired. A pair of snubber posts 27 are provided in the surface of the launching platform to assist in controlling over travel of the carrier and the elastic means. Preferably the snubber posts are so positioned that, even in the uncocked position the elastic means is under some tension to insure that the carrier bail 26 has a consistent position for recocking.

A cocking arm 28 is pivotally mounted on the launching platform and provided with a latch 29 by which it may be releaseably retained in a cocked position. The cocking arm is longitudinally slotted as at 30 and slidably mounted in the slot is a carrier holding pin slide 31 in which a carrier holding pin 32 is mounted with limited capacity for vertical movement. With the carrier holding pin in its lowermost position, the pin extends below the cocking arm a sufficient distance to permit it to be engaged in the bail 26. The head 33 of the carrier holding pin extends above the slide 31 and provides a means of raising the pin 32 a distance sufficient to bring its end portion flush with the lower surface of the slide so that the bail 26 is released.

In use the pin 32 is engaged with the bail 26 and the cocking arm 28 is drawn backward into engagement with the latch 29. During this movement the elastic means 23 are tensioned and the slide 31 moves along the slot 30 to provide an increasing leverage as the tension in the elastic means increases. The length of the slot 30 and the position of the latch are so related that, when the cocking arm is engaged with the latch, the cocking pin 32 will be positioned equidistant from each of the anchor points 22 and the two lengths of the elastic means 23 will be equally tensioned.

A bifurcated carrier release lever 34 is pivotally mounted on the cocking arm in such a position that when the cocking arm is latched in fully cocked position the head 33 of the carrier holding pin is positioned over the arms of the carrier release lever which straddles the cocking pin. Pressure or the blow of a clenched fist upon the free end 35 of the carrier release lever raises the carrier holding pin out of engagement with the bail 26 and releases the carrier to project the target which has been in engagement therewith.

To provide for varying degrees of tension in the elastic means and hence varying the force of projection the latch 29 may provide for several different positions it being noted that in any of the practicable positions the carrier pin 32 is so nearly centered that there is no consequential lack of equality in the tension in the elastic means. A suitable range of target velocity extends from about 70 fps to about 85 fps.

With the cocking arm retracted to a maximum degree and the elastic means at their maximum tension, the target carrier may, upon release, over travel beyond the snubber posts to a degree sufficient to extend past the end of the launching platform. To avoid the chance that the carrier may whip around the edge of the platform with consequential damage to the carrier or platform or both, the platform may be elongated beyond the maximum possible over travel of the carrier or a resiliently faced platform extension 36 may be utilized which preferably lies slightly below the plane of the launching platform to minimize interference with the flight of the target. To minimize friction during target projection the launching platform is preferably faced with a hard surfaced smooth material such as the plastic material identified by the trademark "Formica."

With the carrier secured in the cocked position the target may be placed in the carrier with the curved surface of the carrier engaging the throwing rim of the target. The variables of launcher adjustment which control target flight are the settings in azimuth and elevation and the force of the elastic means. Release of the carrier propels the target along a line midway between the anchor points at the angle of elevation determined by the setting of the platform. The flight of the target thereafter follows a general trajectory determined by the azimuth, elevation, and force of launching but that trajectory is subject to wide variations in soaring above and dipping below that trajectory as determined by the aerodynamics of the disklike target body and the particular tail structure employed.

Targets can be comfortably launched at the rate of seven or eight per minute by following the procedure described above. The highest or 40° elevation setting produces a target which is easiest to hit. Generally a 40° target will climb to a near stall and then circle or sail down in a direction whose randomness is influenced by the wind. As the elevation is dropped, the targets fly perceptibly faster and, of course, lower with the possibility of some rather quick turns, climbs or dives. The lowest elevation is a very fast and difficult shot with a possibility of a target diving into the ground before a shooter can get on it.

The elevation angle can also be used to compensate

to some degree for differences in elevation between the shooter and the launching device and to provide some compensation for head wind or tail wind conditions.

Generally, tension settings to produce velocities of the target around 70 fps are most satisfactory in terms of providing for the more desirable climbing and wide turning flight. A higher velocity may be desirable to compensate for a head wind but generally even a relatively small increase in velocity up to about 85 fps will produce a substantially harder target to hit.

Although a preferred embodiment has been discussed above in some detail, it will be appreciated that substantial variations in the design are possible and practicable. Accordingly, it should be understood that we do not consider that our invention is limited to the precise embodiment disclosed. For a definition of the scope of our invention reference should be made to the appended claims.

What is claimed is:

1. A launching device for an aerial target wherein there is provided a planar launching platform, a target carrier movable over the surface of the launching platform, means first comprising a pair of extendable elastic members each secured at one end to the platform and at the other end to the target carrier and acting to propel the carrier, and a target carried thereby in a linear path across the surface of the platform, second means for releaseably retaining the carrier in a cocked position with the first means extended to a degree sufficient to launch the target when the carrier is released, a third means pivotally mounted on the platform, for moving said carrier removably in a generally straight line during a cocking action with each of said extendable elastic members placed under substantially equal tension a fourth means for holding said third means in a cocked position said second means including a block slidably mounted in only said third means, said blocks including a vertically displaceable fin for releaseably engaging the carrier, and said third means further including means for manually disengaging said pin to permit the elastic members to propel the target.

2. A launching device as defined in claim 1 wherein said second means is selectively engageable at different positions on said platform so that the degree of tension applied to said extendable elastic members may be selected.

3. A launching device as defined in claim 1 wherein said third means includes a cocking lever, a fifth means is provided defining a track extending along the length of the cocking lever, said block being slidable along the length of the track between a first position which is remote from the pivotal mounting of the lever and adjacent the uncocked position of the carrier and a second position which is nearer to the point of pivotal mounting, the cocking forces applied to the carrier reacts on the blocks in such a manner that as the cocking lever is swung about the pivotal mounting to a cocking position the block will be constrained to move toward the point of pivotal mounting and to increase the mechanical advantage of the lever system thus substantially equalizing the force required for cocking during the cocking movement.

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