

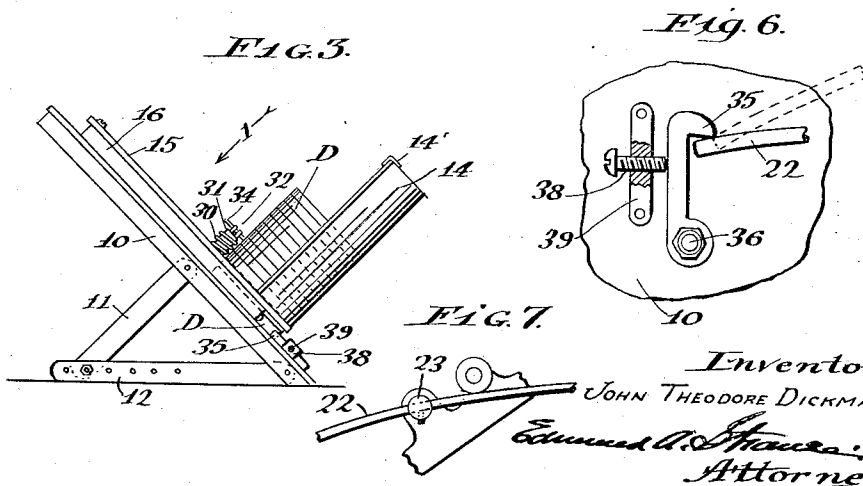
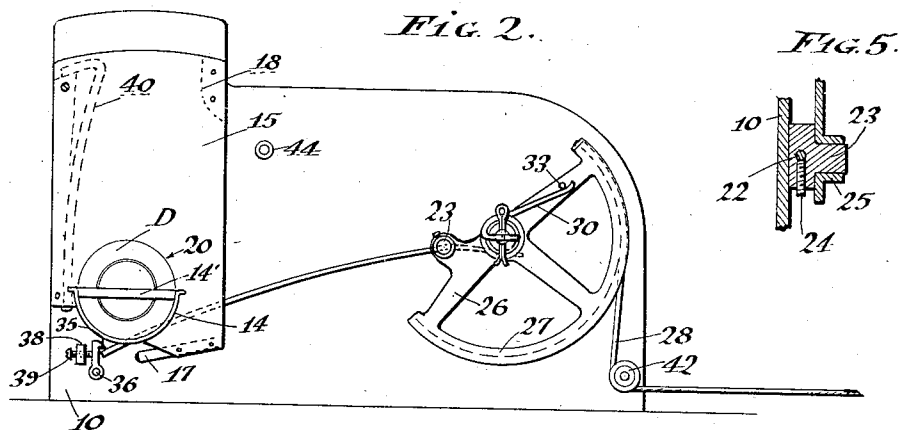
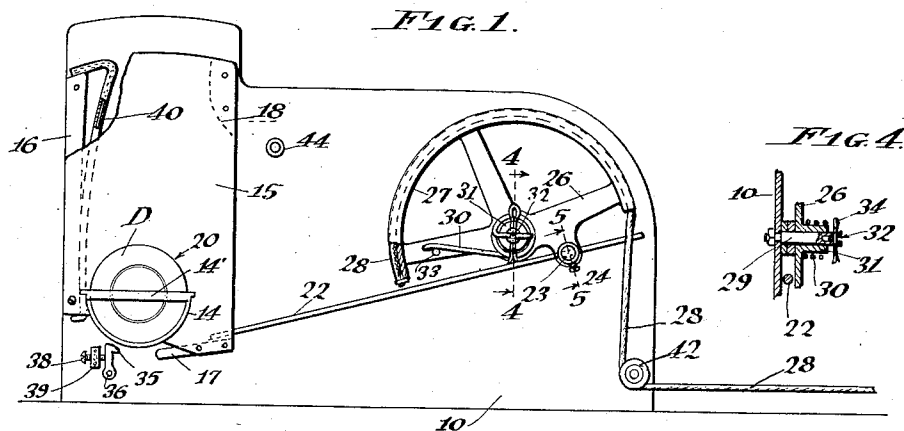
May 13, 1930.

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1,758,032

SPRING TRAP FOR THROWING DISK TARGETS

Filed Oct. 24, 1927



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SPRING TRAP FOR THROWING DISK TARGETS

Application filed October 24, 1927. Serial No. 228,250.

This invention relates to trap mechanisms for projecting into the air the well known frangible disks commonly employed as targets for gun practice.

5 The primary object of the invention is to provide a spring trap of simple construction and high efficiency particularly adapted for shooting galleries. Another object is to provide such a device which will impart a whirling movement to each disk as it is projected, and a further object is to render the structure capable of adjustment for varying the length of the path of travel of the projected disks.

10 Briefly stated, the invention comprises a swingingly mounted tensioning member (preferably arcuate in form), an elongated spring (which in the preferred form is a spring rod) eccentrically pivoted on said member, a catch adapted to engage and temporarily hold the free end portion of the spring, and a part for engagement with the spring at a third point during swinging movement of the tensioning member, whereby the spring is flexed and tensioned. This part according to one form is the relatively stationary pivot of the tensioning member and is engaged by the other end of the spring as the spring pivot advances, the effective length of the spring being shortened by the continued flexure of the spring as the tensioning member continues to swing, until the one end of the spring disengages its catch. The free end of the spring thus freed forcibly ejects the disk which is rolled along a friction guide, this guide determining the direction of travel of the disk and also causing it to adopt a spinning movement. The catch is adjustable to cause it to release the spring earlier or later and thus respectively reduce or increase the projective energy developed in the spring. The invention resides further in such other features of novelty as may be herein presented.

45 In the accompanying drawings wherein certain embodiments of the invention are disclosed by way of illustration,

Fig. 1 is an elevation of the spring trap looking in the direction of the arrow of Fig. 3, the parts being at rest;

Fig. 2 is a similar view showing the parts in the act of flexing the spring;

Fig. 3 is an end elevation thereof;

Fig. 4 is a sectional detail through the pivot of the tensioning member as indicated by 55 the line 4—4 of Fig. 1;

Fig. 5 is a sectional detail through the spring pivot and is taken on the line 5—5 of Fig. 1;

Fig. 6 is an elevational detail showing the catch and its adjustment and indicating its function; and

Fig. 7 is a further detail indicating the method of spring flexure.

The operating parts of the trap are carried 65 on a base 10 adjustably positioned at the desired angle by means of an inclined pair of pivoted arms 11 adjustably connected with a horizontal pair of arms 12 also pivoted to the base 10. A hopper or reservoir 14, for the usual clay or similar frangible disks D, has a strengthening bar 14' at its top and is carried by a cover or guard plate 15 whose left edge is screwed to a spacer or guide rail 16, whose lower edge at the right is screwed to a combined guide and spacer 17 and whose upper edge at the right is screwed to a spacer 18. A round hole 20 in the cover 15 permits passage of the disks D from the hopper into operative position upon the base 10, escape 80 of the disk in position being prevented by the guide 17 or by means of the elongated spring rod 22 when moved into position along the guide 17 so as to engage the under side of said disk D.

85 This spring rod 22 is actuated (both reciprocated and flexed) through the medium of its connection with a pivoting stud 23 through which it passes and in which it is secured by means of a set screw 24. The forward end of said stud pivot 23 works in a boss 25 provided in one of the spokes of semi-circular tensioning member 26 having a grooved periphery 27 which receives and has secured thereto at its left end a cable line 28. The tensioning member 26 is mounted on the base 10 by means of a non-rotating pivot pin 29, and is adapted to be returned to initial position by a spring 30 which is coiled around the hub 31 of the tensioning member and has one 100

end fixed in a slot 32 in the end of fixed pivot pin 29 and has its other end held in tension by engagement with a pin 33 on one of the spokes. A cotter key 34 or the like serves to retain these parts, including the tensioning member 26, in operative position upon said base 10.

Initially the functioning end of spring rod 22 rests upon the guide 17, and when the member 26 is rotated, said end is moved therealong and is guided thereby under the lowermost disk D and into position under the upper hooked portion of a catch 35 pivoted to the base at 36. The position of this catch is such that the end of the rod engages thereunder at approximately the point of maximum throw of the pivot 23, and the extent of the rod end to be engaged thereunder may be regulated by means of an adjusting screw 38 carried in a bracket 39 so that said catch may be moved either to the right or to the left, whereby the spring rod will disengage said catch under more or less flexure as desired. Along the inner side of the guide rail 16 a rubber covered spring wire 40 or similar friction member is positioned so as to lie alongside the path of a moving disk and engage the edge thereof to cause the same to rotate, this device being suitably held in position as by fastening the ends to said rail.

In operating the present spring trap, the cable line 28, which is passed under a sheave or roller 42, is pulled to cause the member 26 to swing about its pivot 29. This movement causes the spring rod 22 to advance along the guide 17 and also to swing with its pivot 23 in the member 26 as said pivot describes an arc of a circle during swinging movement of the tensioning member. The left or functioning end of the spring rod 22 thus passes under the lowermost disk D and is guided into position under the catch 35 when the pivot 23 reaches its limit of throw about as indicated in Fig. 2. Immediately thereafter, the right end of the rod 22 which projects beyond the pivot 23 is moved into engagement with the under side of the fixed pivot 29 of the member 26, (see Fig. 7), whereupon further movement of the member 26 and of the pivot 23 causes the rod 22 to be flexed and tensioned as indicated in Fig. 2. As flexure increases, the effective length of the spring rod is reduced until it is withdrawn from engagement with the tip of catch 35 as indicated in dotted lines in Fig. 6. Upon release of the spring rod 22, the energy developed by the flexure causes the spring to snap up and project the disk D from the trap into the air, the rolling of the disk along the friction element 40 imparting a whirling movement to the disk. A stop 44 near the top of the base 10 limits the ejecting movement of the spring rod, while the spring 30 returns the member 26 to initial position thereby allowing the spring 22 to drop back upon the

guide 17. Since gravity immediately feeds another disk D into position, it in turn may be projected immediately upon return of member 26, thus making possible the rapid projection of successive disks. To reduce the extent of projection, the set screw 38 may be retracted so that the spring 22 will disengage the catch with less flexure and therefore with less developed power, while the range may be increased by advancing the screw so as to require greater flexure for release.

I claim:

1. A spring trap for throwing targets comprising a base, a target holder, a spring rod to engage a target and project the same, a swinging member to tension the rod, said rod being pivoted on the swinging member, a catch to engage one end of the rod, and means to engage the rod at a third point to flex the same during swinging of the member.

2. A spring trap for target projection comprising a spring rod to project a target, a swinging member upon which the rod is pivoted, means to hold one end of the rod, and means for engagement of the rod at another point to flex the rod as the member continues to swing and whereby the rod will be withdrawn from said holding means upon a given amount of flexure.

3. A spring trap for target projection comprising a spring rod to project a target, a swinging member upon which the rod is pivoted, means to hold one end of the rod, means for engagement of the rod at another point to flex the rod as the member continues to swing and whereby the rod will be withdrawn from said holding means upon a given amount of flexure, and means to adjust the position of said holding means for release of the rod under varying amounts of flexure.

4. A spring trap for projecting targets comprising a base having a target holder, a spring rod adapted to project a target, a swinging tensioning member mounted on said base, said rod being pivoted on said member but held against longitudinal movement with respect to its pivot, one end of the rod projecting beyond its pivot, a catch to engage the other end of the rod, and a stop to engage the projecting end as the tensioning member swings to cause the rod to be flexed.

5. A spring trap for projecting targets comprising a flat inclined base member having a guard plate affixed thereto at one side thereof and in spaced relation and having an opening therein for the passage therethrough of disk targets, a target hopper secured to the guard plate and communicating with the target opening therein for automatically feeding targets into position, a spring rod, a catch to engage and hold one end of said rod in engagement with the edge of a target, and

means to flex and tension the rod and to withdraw the rod from said catch by reason of the flexure to eject a target.

5 6. A trap for projecting targets comprising a flat inclined base member, a target hopper mounted on the upper face of said member for feeding targets by gravity to said base member, a spring rod mounted on said base member, a catch for the free end of said rod, and means to flex the rod and to release the
10 same from the catch on a given amount of flexure to project a target from the trap.

In testimony whereof I affix my signature.

JOHN THEODORE DICKMAN.