

Aug. 6, 1940.

A. SCHILLACE ET AL

2,210,557

TARGET TOY

Filed March 30, 1938

2 Sheets-Sheet 1

FIG. 1

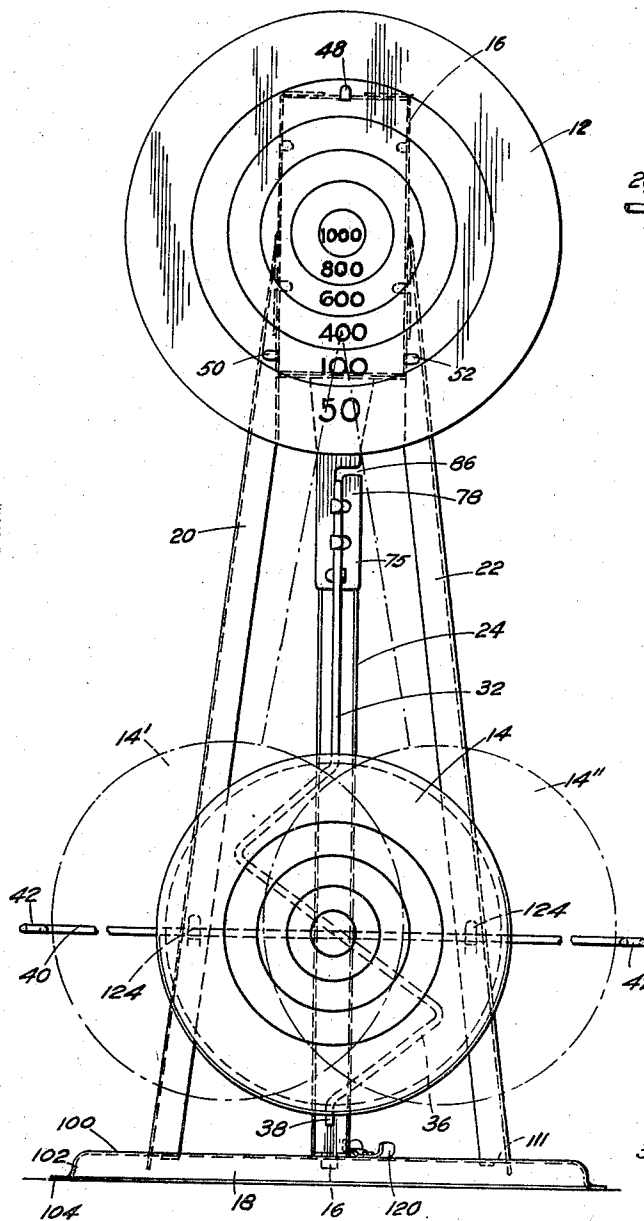


FIG. 2

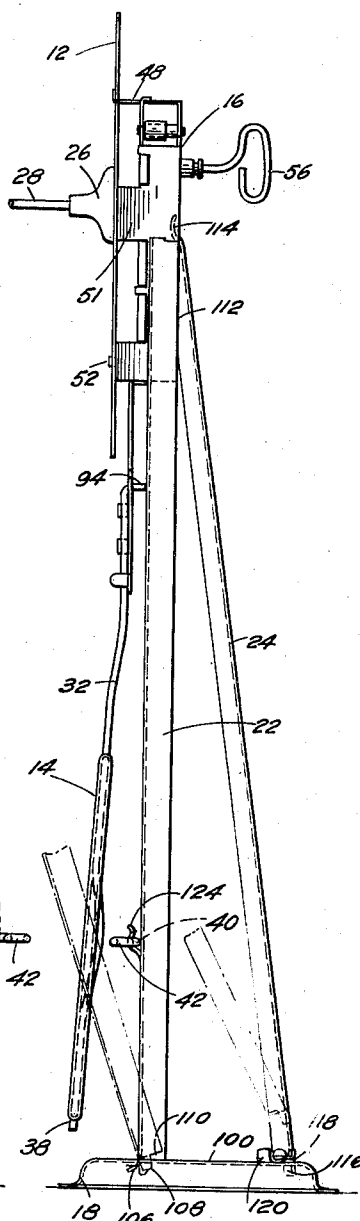
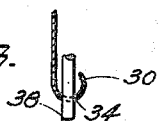


FIG. 3



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FIG. 3.

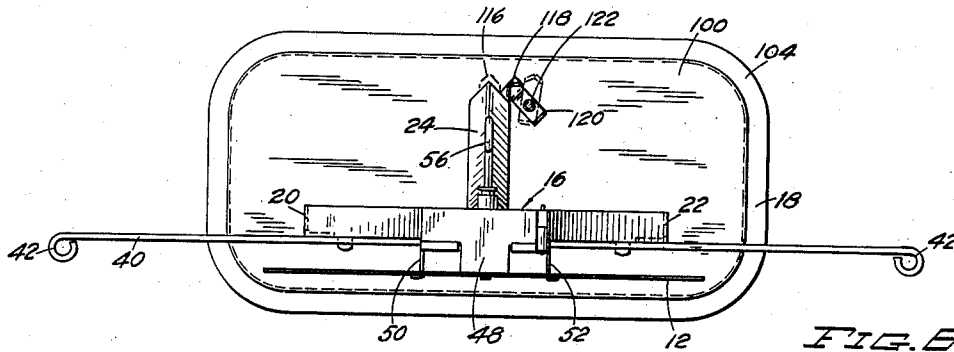


FIG. 6.

FIG. 4.

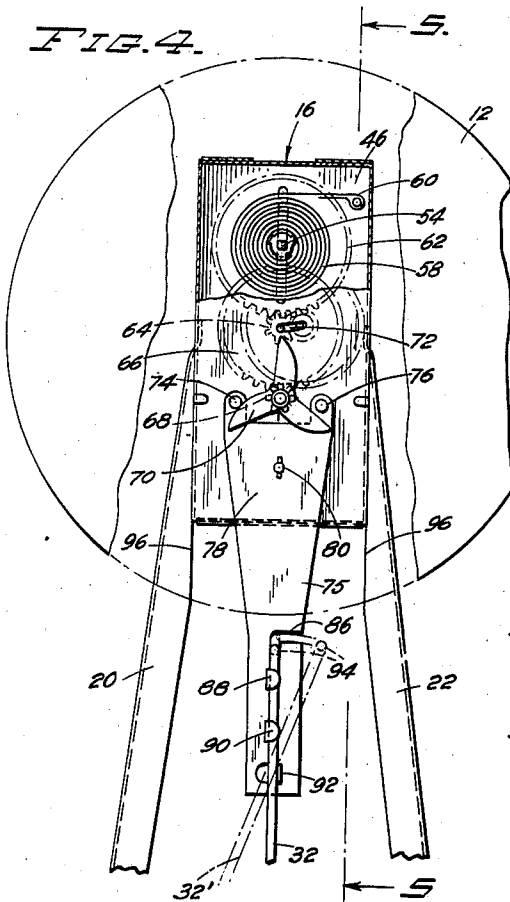


FIG. 5.

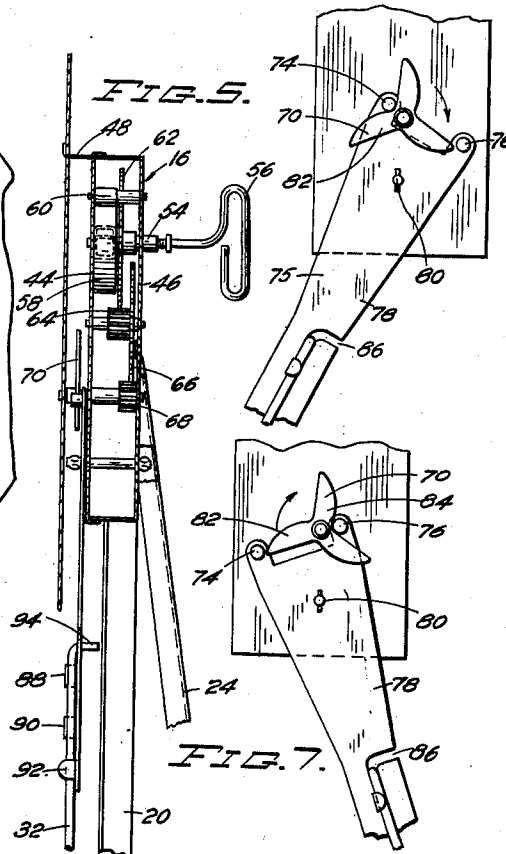


FIG. 7.

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TARGET TOY

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Application March 30, 1938, Serial No. 198,886

10 Claims. (Cl. 273—105.2)

This invention relates to targets, and more particularly a target toy for use with harmless, rubber suction tipped darts.

The primary object of our invention is to generally improve target toys. A more particular object is to heighten the excitement and interest obtainable when using the toy, by providing a moving target. In accordance with further features and objects of our invention, the target is moved by a simple and inexpensive spring motor which may be wound up like ordinary spring motor toys of known construction. The target is moved back and forth with a pendulum-like movement, but it is given a positive motion by appropriate cam mechanism so arranged as to insure long-continued operation of the toy for each winding of the motor. To this end the cam mechanism functions also as an escapement, and the moving part of the target is oscillated like a pendulum, thus keeping the rate of unwinding of the spring motor to a practical minimum.

Still another object of our invention is to improve the appearance of the toy, and at the same time to increase its versatility and usefulness by providing a stationary as well as a moving target, the stationary target being mounted in elevated position and functioning not only as a target, but also to conceal the motor mechanism which supports and oscillates the moving target.

Still another object of the invention is to help support the moving target against the blow which it receives when struck by a dart, while at the same time affording free oscillation of the target during its normal movement. To this end we provide a support bar or guard behind but not contacting the moving target, and when the target is struck, it bears against the guard and is thereby held against rearward movement.

Still another object of our invention is to so construct the toy that it may readily be disassembled or knocked down for packing in compact, flat condition so that it may be shipped, sold, and after purchase, stored, in a comparatively thin, flat box of small dimension.

To the accomplishment of the foregoing, and such other objects as will hereinafter appear, our invention consists in the target elements and their relation one to the other, as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by drawings, in which:

Fig. 1 is a front elevation of a target toy embodying features of our invention;

Fig. 2 is a side elevation of the same;

Fig. 3 is a plan view of the same;

Fig. 4 is a front elevation of the upper part of the toy with the target and a part of the motor frame cut away to expose the mechanism;

Fig. 5 is a transverse section taken in the plane of the line 5—5 of Fig. 4;

Figs. 6 and 7 are explanatory of the operation of the cam and escapement mechanism; and

Fig. 8 is a section explanatory of a detail.

Referring to the drawings, the complete toy as here illustrated comprises a stationary target 12 and a movable target 14. The movable target 14 is moved by a motor generally designated 16, and preferably concealed behind the stationary target 12. The movable target 14 is preferably suspended and moved with an oscillatable motion like a pendulum, and for this purpose it is disposed an appreciable distance beneath the stationary target 12, and is so connected to the motor 16 as to cause the desired oscillating movement. The movement is schematically indicated by the broken line positions 14' and 14'' in Fig. 1, but the amplitude is much greater, say twice that shown in Fig. 1, and about like that shown in Figs. 6 and 7. Because of the pendulum-like arrangement, it is convenient and desirable to mount the stationary target 12 in elevated position, and for this purpose the toy is provided with a base 18 of substantial area, and legs 20, 22 and 24 which are secured at their lower ends to the base and which carry the stationary target 12 and motor 16 at their upper ends. The support is made sufficiently rigid to keep the upper target steady during oscillation of the lower target, and sufficiently stable to hold the target stationary even when struck by the projectile.

The target toy is preferably designed for use with harmless rubber suction tipped darts of conventional character. A portion of one of these darts is shown in Fig. 2, it comprising a rubber head 26 and a wooden stick or shaft 28, the forward part only of which is shown in Fig. 2. These darts may be fired from a simulated pistol, cross-bow gun, or the like, and in order to cooperate most effectively with such darts, the targets 12 and 14 are preferably with a smooth, flat, stiff front face. More specifically, the targets may be made of metal, and in the present case, the target 12 is a flat disc of heavy gauge sheet metal, the gauge being sufficiently heavy to dispense with the necessity for curling the

edges of the metal in order to stiffen the same. The target 14 is also made of sheet metal, but in this case we prefer to curl the edge inwardly, as is best shown at 30 in Fig. 8. The swinging pendulum 14 is carried by a suitable arm 32, and this is preferably made of stiff, heavy gauge round wire. This is received through holes 34 formed in the rim of the target at the top and bottom thereof, and the wire is preferably bent from side to side in zig-zag fashion, as is indicated at 36 in Fig. 1, thus preventing oscillation of the target about the wire arm 32 and also functioning to stiffen the target face somewhat, and additionally functioning to facilitate assembly of the target 14 onto the arm 33 by springing the wire somewhat as the lower tip 38 of the wire is sprung through the hole 34 at the bottom of the target. By assembling the parts with a spring action, the possibility of vertical movement of the target along the target arm is effectively prevented.

Inasmuch as the target may receive a substantial blow when hit by a dart, we prefer to provide a guard or support means to prevent rearward movement of the swinging target 14 when the target is hit. In the present case, the support means is simple in character, it comprising merely a relatively long piece of stiff, heavy gauge wire 40 the ends of which may be curled at 42 to finish the same, said wire being stationarily supported immediately behind the path of movement of the swinging target 14. It will be understood from inspection of the drawings that the guard 40 is adequate in length to obstruct the target against rearward movement at any point in the swing or oscillation of the target. At the same time, there is no extra lead placed on the motor because during the normal swinging movement of the target, it clears and is free of the bar 40.

Because of the size of the toy, we prefer to assemble the same in such a manner that it may be readily knocked down for packaging in a comparatively thin, flat box. This is convenient for shipment and sale, and is also convenient for the owner of the toy when the toy is not in actual use. For this purpose, the legs are detachably secured to the base, and the rear leg 24 may be removed so as to lie flat with the other legs. Moreover, the guard 40 is detachably secured to the legs, and the moving target may be detached from the motor. The winding key of the motor may also be removed, and in this way, all of the parts may be nested together in substantially the same plane, so as to make up a comparatively thin, flat package.

Considering the motor 16 in greater detail, this motor is here illustrated as a spring motor. It is of the type commonly employed in toys, and may be manufactured at low cost. The motor mechanism is housed in a frame or box made up of a front plate 44 and a rear plate 46. These plates are secured together by appropriate tongue and slot connections, and parts of the side or edge walls are extended forwardly to form spacer arms 48, 50 and 52 which terminate at their forward ends in tongues which are secured to the stationary target 12. The tongues are pressed flat on the target face, and do not appreciably interfere with the desired smooth, flat target surface. However, it will be understood that at somewhat greater expense, the target may be secured to the motor without any projecting tongues, as by soldering the same to the rear face of the target. Additional forwardly project-

ing support arms may be provided such as the support arms 51 (Fig. 2). These are not provided with tongues, but act merely to space the target properly from the motor and to stiffen the target against any force or blow tending to bend the same toward the motor.

The motor consists of a winding stem 54 to which a winding key 56 is detachably connected, as by the use of a screw-thread connection. A spiral ribbon spring 58 drives the motor, and the inner end of this spring is secured to the winding stem in known fashion, while the outer end 60 is secured to the motor frame. The winding stem also carries a large driving gear 62. This meshes with a pinion 64 the shaft of which carries a gear 66 which in turn meshes with a pinion 68, the shaft of which carries an escapement cam 70 located in front of the motor frame. The spring may be wound without corresponding rotation of cam 70 by using any desired unidirectional clutch or ratchet device. In the present case the shaft of pinion 64 is carried in slot-like bearings 72 (Fig. 4), and these are so dimensioned and located that the gear 66 may move out of engagement with pinion 68 during winding of the spring. However, when the spring unwinds, the direction of rotation is such that gear 66 is moved back into mesh with pinion 68, and the step-up gear train is completed.

Cam 70 cooperates with two symmetrically arranged, spaced cam followers 74 and 76. These are mounted on a plate 78 which is oscillatable about a pivot pin 80 passing through the motor frame. The location of pivot 80 and cam followers 74 and 76 is properly related to the cam arms and the shaping of the same, to produce a resulting operation which is almost self-explanatory from inspection of Figs. 4, 6 and 7. Referring to Fig. 6, it will be seen that when plate 78 is swung in a clockwise direction, the curved upper edge of cam arm 82 bears against cam follower 74, and urges the same in counterclockwise direction, as will be seen by inspection of successive Figs. 6, 4 and 7. In Fig. 4, the plate 78 has reached mid-position, and in Fig. 7 the plate has been oscillated in a counterclockwise direction to the limit of its motion. At this time the cam arm 82 can pass or escape from the cam follower 74, but at the same time the cam arm 84 is already engaging and beginning to act upon the cam follower 76. The downward movement of the curved lower edge of cam arm 84 causes plate 78 to move in a clockwise direction until finally, in the position shown in Fig. 6, the cam arm escapes or passes by the cam follower 76, and at this time another cam arm is beginning to cooperate with the cam follower 74.

In this way the mechanism acts as an escapement mechanism, and the pendulum action of the swinging target 14 prevents rapid unwinding of the spring motor. In fact, a single winding of the motor will cause the target to oscillate for a very long period of time. At the same time, the cam is effective in causing a substantial smooth swinging motion of the target, for it functions with a true camming pressure between curved surfaces, that is, the curved surface of the cam arm and the rounded surface of the cam follower.

As has already been mentioned, the swinging target 14 is preferably detachably connected to the plate 78. This is done by providing the plate with an L-shaped slot at 86 and forwardly bent lugs 88, 90 and 92. The upper end of the target arm 32 is bent rearwardly, as is clearly shown at

94 in Fig. 5. To assemble the parts, it is merely necessary to place the wire 32 between legs 90 and 92, as is indicated in broken lines in Fig. 4. The wire is then swung to the solid line position, the inwardly turned end 94 then being received in slot 86. The wire then moves downwardly somewhat in the vertical arm of the L-shaped slot 86, thus assuming the position best shown in Fig. 1. At this time the parts are held rather securely together and oscillation of target 14 about a vertical axis is prevented by the intumed end 94 of arm 32.

The legs 20, 22 and 24 are all preferably made of heavy gauge sheet metal stock bent to form two walls at right angles or in effect, angle irons. The forward legs 20 and 22 may be detachably secured to the motor frame, but we find that it is more convenient to attach these parts permanently together. This is done by appropriate tongue and slot connections. The inner edges of the front wall of the legs are cut away as indicated at 96 (Fig. 4) to give the legs the desired angularity so that all three legs will together form a tripod support. The lower ends of legs 20 and 22 are detachably received in the base 18. The latter consists of a single piece of heavy gauge sheet metal the center portion of which is dished upwardly, as is clearly shown in the drawings, thereby forming a top wall 100, a peripheral wall 102, and a marginal flange 104. The lower ends of legs 20 and 22 are stepped or cut away to form lugs 106 and 108. The top wall 100 of the base is perforated to receive lugs 106 and 108, these being inserted in an angular position, as is indicated in broken lines in Fig. 2. The legs are then turned upwardly to the solid line position, and at this time the bent lug 106 anchors the leg against upward movement. The legs are held against downward movement by the shoulders 110, 111 formed where the material is cut in to make the lugs 106, 108.

The rear leg 24 is detachably secured to the motor at its upper end and to the base at its lower end. The leg 24 is disposed with its open or trough side foremost and its apex or angle rearmost. This will be clear from inspection of Figs. 1 and 3. The side walls of the leg are tapered or cut away, as is indicated at 112 in Fig. 2, so as to permit a snug fit of the leg against the rear wall of the motor. The upper end of the leg is shaped to form a tongue 114 which is detachably received in a slot in the rear wall of the motor. The lower end of leg 24 is cut away to form a reduced corner portion 116 which is received in a mating hole in the base. A part of the material at the resulting shoulder is turned sidewardly to form a lug 118 which lies flat against the top of the base, and this lug may be held down against the base by an oscillatable locking lever 120 which is pivoted on the base at 122. It may be moved from the broken line position shown in Fig. 3, at which time the leg 24 may be removed from the base, to the solid line position shown in Fig. 3, at which time it rides above and bears downwardly against the lug 118, and thus serves to hold the leg tightly against the base. This in turn keeps the reduced end 116 of the leg anchored in the base, and that in turn prevents the entire assembly with the forward legs 20 and 22 from being swung forwardly. As long as these legs cannot swing forwardly, they are secured anchored to the base by reason of the bent lugs 106 previously referred to.

The support bar 40 is detachably mounted on the forward legs 20 and 22 in a very simple man-

ner by striking spring lugs 124 forwardly from the legs. These lugs receive the wire 40 by simply pressing the wire downwardly against the lugs until it slides in behind the same, as is shown in Figs. 1 and 2.

To assemble the toy, it is merely necessary to insert the upper end of rear leg 24 in the motor frame and to then insert the lower ends of all three legs in the base, the front legs being applied first at an angle, and the assembly being then tilted rearwardly until the rear leg enters its mating aperture in the base. Lever 120 is then turned to lock the rear leg in place. The guard or support bar 40 is then added to the front legs, and finally, the swinging target 14 is attached to the oscillating motor plate 75. Assuming the motor is wound up, the target is then ready for use. The enjoyment obtained from use of the game is heightened by the fact that for some parts of the game the stationary target may be aimed at, and for other parts, the movable target.

It is believed that the construction and operation, as well as the many advantages, of our improved target toy, will be apparent from the foregoing detailed description. It will also be apparent that while we have shown and described our invention in a preferred form, many changes and modifications may be made in the structure disclosed, without departing from the spirit of the invention defined in the following claims.

We claim:

1. A target toy comprising a stationarily located target, a motor behind said target, a base, legs supporting said motor a substantial distance above the base, a pendulum-like swinging target suspended below said stationarily located target, mechanism so connecting said motor and swinging target that the motor causes oscillation of the swinging target, and elongated stationary support means mounted on the aforesaid legs and extending immediately behind the path of movement of the swinging target, said support means being adapted to take the reaction of said swinging target when struck by a dart.

2. A target toy comprising a stationarily located target, a motor behind said target, a base, legs supporting said motor a substantial distance above the base, a pendulum-like swinging target suspended below said stationarily located target, mechanism so connecting said motor and swinging target that the motor causes oscillation of the swinging target, said targets having a smooth, flat front face for receiving rubber suction tipped darts, and a support bar stationarily mounted on the aforesaid legs and extending in a horizontal direction behind the swinging target, said support bar being adapted to receive the reaction of said swinging target when struck by a dart.

3. A target toy comprising a spring motor including a winding stem, a spring, and a train of step-up gearing terminating in a cam, an oscillatable plate mounted on said motor adjacent said cam, a movable target attached to and depending from the plate, to a point below the motor, said plate having a pair of spaced rounded cam followers and said cam having only a few long teeth with curved cam surfaces so shaped relative to said cam followers as to operate alternately on one and then the other cam follower and to thereby cause a continuous back-and-forth or pendulum-like oscillation of the target over a long arcuate range of travel.

4. A target toy comprising a spring motor including a winding stem, a spring, and a train of

step-up gearing terminating in a cam, an intermediate gear of said gear train being mounted in slotted bearings so disposed as to permit disengagement of the gears during winding of the motor, an oscillatable plate mounted on said motor adjacent said cam, a movable target connected to and depending from said plate to a point below the motor, said plate having a pair of spaced cam followers and said cam having only a few long teeth with curved cam surfaces so shaped relative to said cam followers as to operate alternately on one and then the other cam follower and to thereby cause a continuous pendulum-like or escapement oscillation of the target over a long arcuate range of travel.

5. A target toy comprising a spring motor including a winding stem, a spring, and a train of step-up gearing terminating in a cam, an oscillatable plate mounted on said motor adjacent said cam, a movable target having a target supporting arm extending upwardly therefrom, the upper end of said arm and the lower end of said plate having a pin and slot connection so constructed as to afford ready attachment to or detachment of the target from the plate, and a rigid connection therebetween when the target is attached, said plate having a pair of spaced cam followers and said cam having a plurality of teeth so shaped relative to said cam followers as to operate alternately on one and then on the other cam follower and to thereby cause a continuous back-and-forth or pendulum-like oscillation of the target.

6. A target toy comprising a stationarily located target, a motor behind said target, a base, legs supporting said motor a substantial distance above the base, a pendulum-like swinging target suspended below said stationarily located target, mechanism so connecting said motor and swinging target that the motor causes oscillation of said swinging target, each of said targets having a stiff, flat front face for receiving rubber suction tipped darts, a support bar stationarily mounted on the aforesaid legs immediately behind the path of movement of the swinging target, said support bar being adapted to receive the reaction of said swinging target when struck by a dart, the major parts of said toy being arranged to be readily "knocked down" for shipment or storage in a relatively small box.

7. A target toy comprising a stationarily located target, a motor behind said target, a base, legs supporting said motor a substantial distance above the base, a pendulum-like swinging target suspended below said stationarily located target, mechanism so connecting said motor and swinging target that the motor causes oscillation of said swinging target, each of said targets being made of sheet metal and having a smooth front face for receiving rubber suction tipped darts, a generally horizontal support bar mounted on the aforesaid legs and extending immediately behind the path of movement of the swinging target,

said support bar being adapted to receive the reaction of said swinging target when struck by a dart, said toy being arranged to be "knocked down" for shipment or storage, the legs being detachably related to the base, and said horizontal support bar being detachably mounted on said legs, whereby all of said parts may be nested in compact, flat condition in a suitable package.

8. A target toy comprising a stationarily located target, a spring motor behind said target, a base, means supporting said motor a substantial distance above the base, said spring motor including a winding stem, a spring, a train of step-up gearing terminating in an escapement-like mechanism operating upon an oscillatably mounted plate, and a swinging target having a target supporting arm extending upwardly therefrom, the upper end of said arm and the lower end of said plate having a pin and slot connection so constructed as to afford ready attachment to or detachment of the swinging target from the plate, each of said targets having a stiff flat front face for receiving rubber suction tipped darts.

9. A target toy comprising a stationarily located target, a spring motor behind said target, a base, legs supporting said motor a substantial distance above the base, said spring motor including a winding stem, a spring, a train of step-up gearing terminating in an escapement-like mechanism operating upon an oscillatably mounted plate, and a swinging target having a target supporting arm extending upwardly therefrom, the upper end of said arm and the lower end of said plate having a pin and slot connection so constructed as to afford ready attachment to or detachment of the swinging target from the plate, each of said targets having a stiff flat front face for receiving rubber suction tipped darts, the legs being detachably related to the base and so arranged that the toy may be readily "knocked down" for shipment or storage in a relatively thin box.

10. A target toy comprising an upright stationarily located circular target of the bull's eye type, a motor behind said target, a horizontal base, legs supporting said stationary target a substantial distance above the base, a pendulum-like swinging target suspended below said stationarily located target and above said base, said swinging target being a circular target of the bull's eye type having a diameter of the same order of magnitude as the stationarily located target, mechanism so connecting said motor and swinging target that the motor causes oscillation of said swinging target, each of said targets having a stiff flat front face for receiving rubber suction tipped darts, the base and legs being fitted together with separable joints and so arranged that the toy may be readily "knocked down" for shipment or storage in a relatively thin box.

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