Oct. 6, 1936. W. W. DODGE, JR 2,056,446

SLINGSHOT

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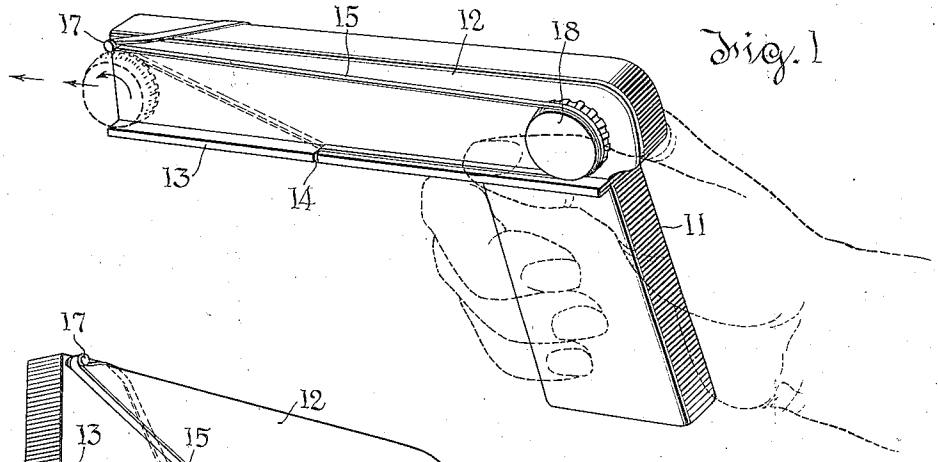


Fig. 1

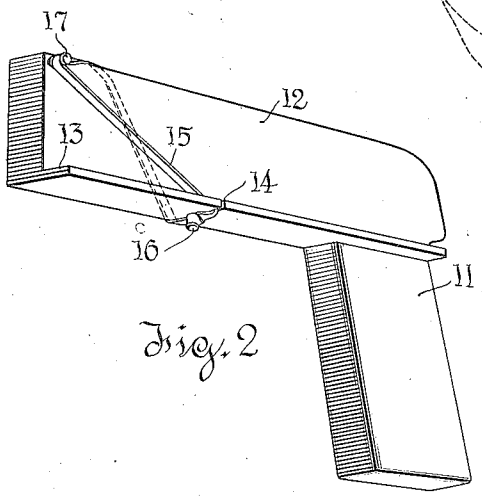


Fig. 2

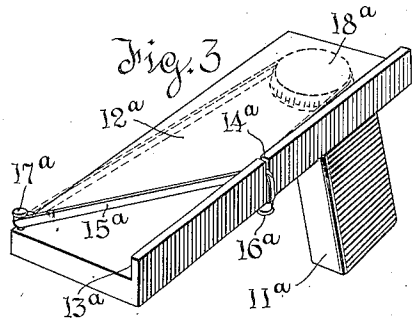


Fig. 3

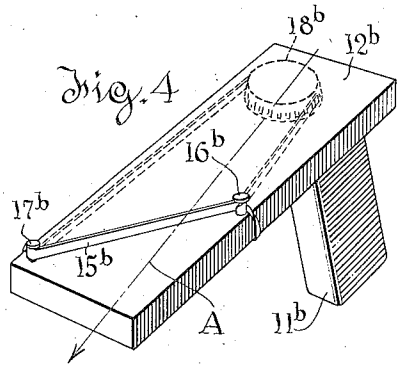


Fig. 4

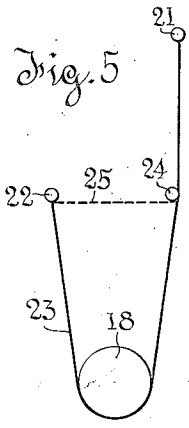


Fig. 5

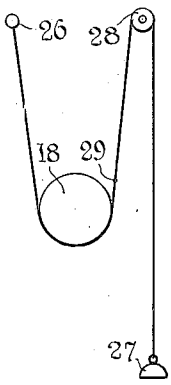


Fig. 6

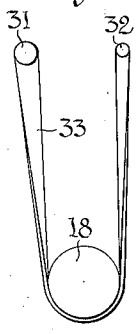


Fig. 7

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SLINGSHOT

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9 Claims. (Cl. 124—14)

This invention relates to throwing disc-like projectiles edgewise, with rotary motion about an axis normal to the plane of the disc. The effect of this rotation is gyroscopic, and tends to maintain it during flight in one plane, so that the disc flies true and for comparatively long distances.

While I contemplate use of the invention in any field in which it may prove useful, such as the throwing of clay pigeons, for example, I shall illustrate it as embodied in a toy pistol for shooting bottle caps of a type now extensively used, and characterized by a slightly cupped form with serrated edges produced by crimping. Other specifically different disc-like missiles may be shot from the pistol. As a rule the distance traveled is greatest when the diameter of the projectile at right angles to the line of flight is horizontal.

Generally stated, the invention contemplates the use of an elastic bight or sling to throw the projectile disc, the bight partially encircling the periphery of the projectile and being asymetrically stressed prior to release, so that upon release, it not only throws, but spins the disc.

Various embodiments of the invention will now be described with reference to the accompanying drawing:—

Fig. 1 is a perspective view of the preferred form, showing how the stock is grasped to hold the disc in firing position, and indicating in dotted lines, the travel of the projectile disc.

Fig. 2 is a perspective view of the same pistol with the elastic bight released.

Fig. 3 is a perspective view of a modified form.

Fig. 4 is a further modification, in which the guiding flange is omitted.

Figs. 5, 6 and 7 are diagrams illustrating different ways of ensuring unequal stretching of the two sides of the bight.

Referring first to Fig. 1, the stock of the pistol is indicated at 11 and carries, fixed to it, a guide member 12 simulating the slide of an automatic pistol, of the Browning type. The member 12 carries at the lower edge a guide flange 13. For right handed shooters this flange is preferably on the left side of the pistol as shown. For left handed shooting it may, if desired, be placed on the right side, to permit thumb control of the projectile.

At a point a substantial distance to the rear of the muzzle end of member 12, a narrow slot or kerf 14 is cut through guide flange 13. An endless elastic band 15, of rubber or the like, is engaged in slot 14, and looped around member 12 in the manner clearly shown in Figs. 1 and 2.

Slipping of the band is prevented by looping it around a tack 16, while a second tack 17, near the top edge of the muzzle end of member 12, serves to position the band 15, so that when free it stretches from tack 17 to kerf 14 to form an elastic projecting bight between these points. Other band retaining means will readily suggest themselves and may be substituted, but those shown are inexpensive and convenient.

To load the pistol a bottle cap or other disc 18 is pressed edgewise against the band between tack 17 and kerf 14 and slid back, preferably with a rotary motion equalizing the stress on the two parts of the bight, to position to be grasped by the thumb (see Fig. 1). The effect is to stretch the two sides or end portions of the loop or bight of band 15 between kerf 14 and tack 17, unequally so that when the cap is released, it is not only shot forward edgewise along the guide 13, but also is caused to spin, first by the unequal contraction of the two sides of the loop, and second by its engagement with the guide flange 13.

The spinning motion not only flattens the trajectory, but also maintains edgewise flight and thus reduces air resistance.

The pistol shown in Fig. 3 is similar, except for the relationship between the stock 11*a* and the guide 12*a*. Parts similar to those in Fig. 1 are similarly numbered with the letter *a*.

The pistol shown in Fig. 4 is identical with that shown in Fig. 3, except for the omission of the guide flange and the relocation of the tack 16*b* on the upper surface to take the place of the kerf. Similar parts are numbered similarly, with the letter *b*. The line of flight, indicated by the arrow A, is slightly oblique, but the range is as great as that secured with other forms, though the accuracy may be slightly less.

Other ways of securing unequal stretch by the two sides of the bight or loop are shown in Figs. 5, 6 and 7. In all figures, 18 represents the projectile disc.

In Fig. 5, 21 and 22 represent fixed points of attachment for the ends of an elastic loop 23. A guide appears at 24. The dotted line 25 shows the position assumed after release.

In Fig. 6, 26 and 27 are fixed points of attachment, 28 is a guide pulley, and the loop is made up of an elastic portion connected to 27 and a relatively inelastic portion connected to 26, the two portions being joined together at 29.

In Fig. 7, 31 and 32 are fixed points of attachment and the elastic loop 33 is given a changing cross section, so that one end is wider or thicker than the other, and hence develops a greater pull for a given stretch.

A guide, such as 13, may be used with any of the arrangements just described.

The arrangement shown in Figs. 1 to 4 inclusive is preferred. In this, a band elastic throughout its length is equally, or approximately equally, stressed through rotation of the projectile during its positioning prior to release. Since both sides of the bight contract when released, high velocity is obtained, and since such contractions are unequal, rotary motion is induced.

The arrangement shown in Fig. 7 is very satisfactory for the same reason, but additional expense is involved in producing the elastic loop of varying cross section.

The arrangement shown in Fig. 6, in which one end of the loop is inelastic, is considered the least desirable form of the device, and in fact, is the limiting case in which the disc is rolled in an inelastic loop at or near the termination of its propulsion.

A comparison of the figures will make clear that the spinning motion is produced by unequal contraction of the two end portions of the sling.

This unequal contraction can be caused by making the end portions of unequal length (Figs. 1–5). They are then preferably stressed approximately equally as this is believed to improve the accuracy of flight, but equality of stress is not essential.

Another way of ensuring unequal contraction is to form the sling so that its two end portions have diverse contractions because of differences in the elastic characteristics of such end portions (Figs. 6 and 7). In Fig. 7, the end portions are of equal lengths but stretch different amounts when equally stressed. Various specifically different schemes readily suggest themselves.

While the elastic element used in conjunction with the structure of Figs. 1 to 4, inclusive, has been described as endless, this feature is merely a matter of convenience, because it permits a simplification of the attaching means. Obviously all that is essential is some means for attaching the two ends of the loop or bight. Furthermore, the elastic member need not be in the form of a single strip or strand, multiple stranded elastic being well known and obviously capable of use.

What is claimed is:—

1. A toy simulating a firearm and comprising a stock and a guide member having a flange, said flange being parallel with the intended line of flight of the projectile; and an elastic loop having its terminal portions connected respectively to said flange and to a portion of said guide, said points of connection being displaced from each other both transversely to said flange and in the direction of the length of said flange.

2. Means for throwing disc-like projectiles edgewise with a spinning motion comprising a support; and an elastic sling member carried by said support, the sling having a middle portion adapted to encircle and engage a portion of the periphery of the projectile, and end portions of unequal elasticity whereby they elongate differentially when approximately equally stressed, said support having an extension aiding, when the sling is stressed, in maintaining the projectile in said position in the sling and against said extension.

3. Means for projecting disc-like projectiles and causing them to spin while in flight, comprising an elastic sling, the end portions of which are of similar material and different cross sectional areas; and a support to which the sling is attached, said support aiding in maintaining the disc-like projectile, when the sling is stressed, in position in the sling with the sling partially encircling and engaging the periphery of the disc-like projectile.

4. Means for projecting disc-like projectiles and causing them to spin while in flight, comprising an elastic sling, the end portions of which are of materials having different degrees of elasticity; and a support to which the sling is attached, said support aiding in maintaining the disc-like projectile, when the sling is stressed, in position in the sling with the sling partially encircling and engaging the periphery of the disc-like projectile.

5. Means for projecting disc-like projectiles and causing them to spin while in flight, comprising an elastic sling, the end portions of which are of unequal lengths; and a support to which the sling is attached, said support aiding in maintaining the disc-like projectile, when the sling is stressed, in position in the sling with the sling partially encircling and engaging the periphery of the disc-like projectile.

6. An elastic sling shot for projecting disc-like projectiles and causing them to spin while in flight comprising a support; and an elastic sling connected at its ends to support, said support having a guide portion aiding in maintaining a disc-like projectile in said sling, when the sling is stressed, with the periphery of the projectile partially encircled and engaged by the sling, and the end portions of the sling differentially elongated, said guide portion extending a substantial distance rearwardly of the effective points of engagement of the sling with the support to guide the projectile as the sling is stressed.

7. The combination defined in claim 6, in which there is an additional guide for engaging the edge of the projectile.

8. A device for projecting disc-like projectiles and causing them to spin while in flight, comprising a support; and an elastic sling forming projecting means, said sling being connected to the support at its ends and forming a bight into which the projectile may be drawn with its periphery partially encircled and engaged by the bight so as to stress the bight preparatory to discharge of the projectile, said support having a guide portion aiding in maintaining the projectile in the stressed bight, the guide portion being arranged relatively to the sling connections so as to maintain the projectile in the stressed bight only in a position in which said bight assumes an asymmetrical form.

9. An elastic sling shot for projecting disc-like projectiles and causing them to spin while in flight, comprising an elongated support including a guide portion; and an elastic sling having its ends connected to said support at points spaced both longitudinally and laterally of the support, said guide portion extending a substantial distance rearwardly of said points of connection of the sling with the support and aiding in maintaining a disc-like projectile in said sling, when the sling is stressed, with the periphery of the projectile partially encircled and engaged by the sling.

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