July 14, 1953 J. FISHER 2,645,217

CROTCH TYPE ARROW PROJECTOR

Filed July 18, 1950

Fig. 1.

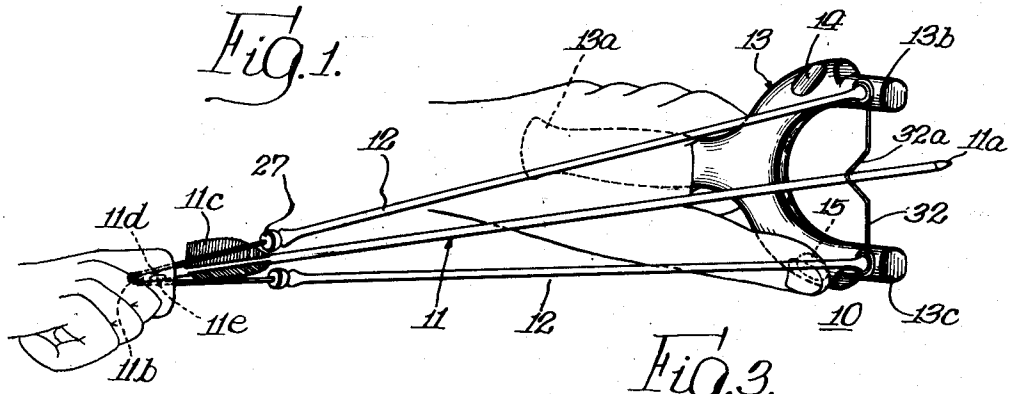


Fig. 2.

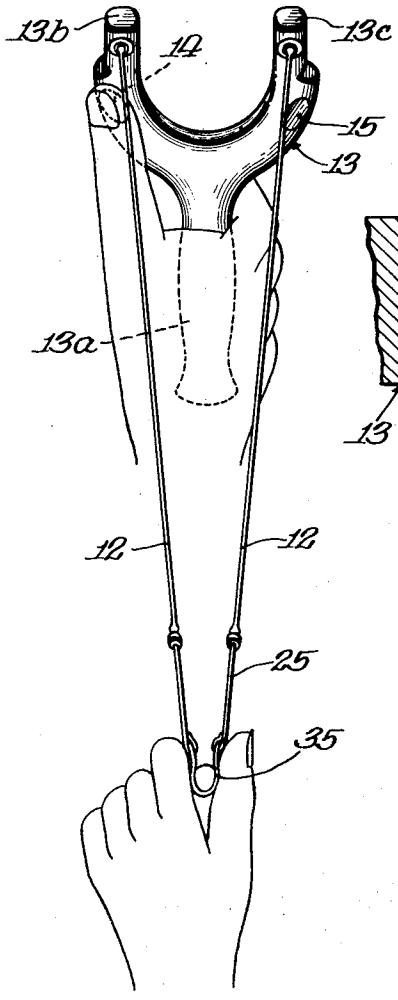


Fig. 3.

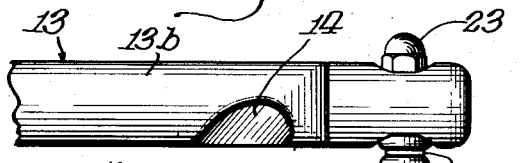


Fig. 4.

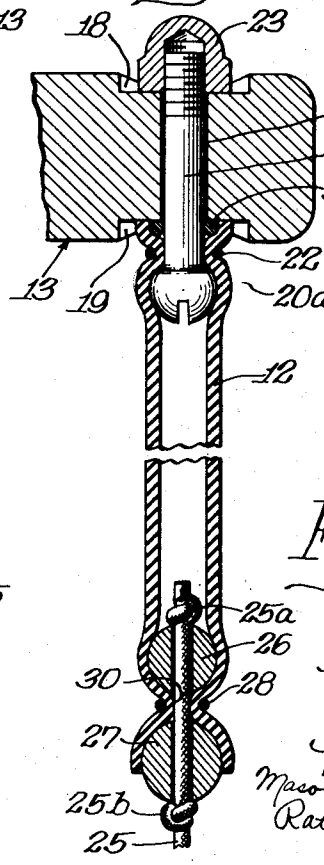
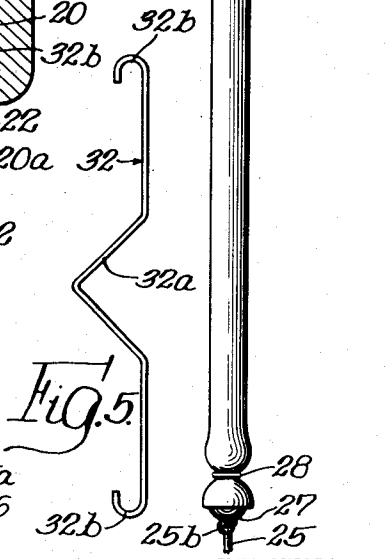


Fig. 5.



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CROTCH TYPE ARROW PROJECTOR

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6 Claims. (Cl. 124—20)

1

The present invention relates to devices for projecting articles, and, more particularly, to devices somewhat in the nature of a sling shot for projecting arrows and similar projectiles.

In certain portions of the United States where game animals abound there generally are limitations as to the time when hunters may hunt and kill such game animals. The so-called "open season" for game animals generally comprises only a week or ten days, and many times even less. In many of these same localities the "open season" when the weapons employed are not guns, but bow and arrow, are considerably longer, primarily because a hunter must be very proficient indeed to be able to kill an animal, such as a deer, for example, with a bow and arrow. In other words, the game animal has considerable more chance against a hunter armed with a bow and arrow as contrasted with a hunter armed with a gun.

It will be understood that a conventional bow and arrow is a rather unwieldly thing to carry through heavy woods and underbrush since it usually is six feet or so in length and is also rather unwieldly to use in certain situations. It would be desirable to provide a device for projecting articles which could function in the manner of a bow and arrow and yet which would take up very little space so that it might be carried in the pocket of the hunter's jacket. It would furthermore be desirable for such a device to be inexpensive and readily assembled and disassembled as well as being capable of being used to project other articles in addition to arrows.

Accordingly, it is an object of the present invention to provide a new and improved device for projecting articles, which can be manufactured at low cost, and yet which is capable of projecting articles such as arrows with extreme accuracy and speed.

It is another object of the present invention to provide a device for projecting arrows, having a new and improved arrow guide, which device may be small enough to be normally disposed in the pocket of the user.

It is a further object of the present invention to provide an improved device for projecting articles in the nature of a sling shot in which the energy storage portion comprises resilient tubing available in varied wall thicknesses whereby a variation of pull strengths may readily be had.

It is a further object of the present invention to provide in a device for projecting articles an improved arrangement for attaching the resilient

2

energy storage means to other parts of the device.

A still further object of the present invention resides in the provision of an improved device for propelling articles which can readily be used to propel arrows with extreme speed and accuracy and also may be used as an ordinary sling shot or the like.

Further objects and advantages of the present invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

For a better understanding of the present invention, reference may be had to the accompanying drawing in which Fig. 1 is a perspective view of the device of the present invention shown as being employed by a right-handed operator to project an arrow.

Fig. 2 is a view similar to Fig. 1 in which the device of the present invention is used as an ordinary sling shot by a left-handed operator;

Fig. 3 is an enlarged view of a portion of the device shown in Fig. 1;

Fig. 4 is an enlarged sectional view taken along the longitudinal axis of the tubular energy storage means to show the details of attaching the tubular means to the other parts of the device; and

Fig. 5 is an enlarged view of the arrow guide shown in Fig. 1 of the drawing.

The device for projecting articles with which the present invention is concerned comprises a somewhat Y-shaped supporting frame with one leg of the Y serving as the handle and the other two legs of the Y having fastened thereto energy storage means in the form of rubber tubing to produce the high propelling force for propelling an arrow or other article at high speed. The ends of the rubber tubing are interconnected by suitable cord which engages the nock of an arrow when used to project an arrow or is attached to a sling shot pouch when used as a sling shot. A readily removable arrow guide having a V-shaped notch for accurately accommodating many different sized arrows is employed. A novel means of attaching the tubing is also employed.

Referring now to the drawing, there is illustrated the device for projecting articles generally designated by the reference numeral 10 which is indicated in Fig. 1 of the drawing as adapted to shoot arrows such as 11 which may be quite similar to conventional arrows. As illustrated,

the arrow 11 comprises a metal tip 11*a* at the forward end and a nock 11*b* at the rearward end with the conventional feathered portion 11*c* located adjacent the rearward end. For proper use with the device 10 the arrow 11 is provided with a pair of opposed notches 11*d* and 11*e* to receive the ball of the thumb and the second joint of the opposing forefinger as indicated in Fig. 1, whereby the operator may firmly grasp the arrow to stress the energy storage elements designated as 12 in the drawing.

To support the energy storage elements 12, the device 10 of the present invention comprises a supporting frame generally designated at 13 which includes a handle portion 13*a* and a pair of projecting arms 13*b* and 13*c* which, with the handle portion 13*a*, form sort of a Y. As illustrated, the arms 13*b* and 13*c* are disposed in a continuously diverging relation from the junction thereof with the handle 13*a*. It will be understood that the supporting frame 13 may be formed of a molded plastic, from suitable wood, or from other material, and preferably also is finished with a pleasing appearance. It has been found in actual practice that constructing the supporting frame 13 from a molded plastic is the most practical since it may thereby be constructed with great uniformity and at high speed, whereas when formed of material such as wood, difficulty is encountered in getting the necessary uniformity when the device is manufactured on a high production basis. Preferably, the supporting frame 13 is provided with thumb receiving notches 14 and 15, one disposed in each arm 13*b* and 13*c*. Depending upon whether the operator using the device is right- or left-handed, one of these notches 14 or 15 will receive the thumb as indicated in Figs. 1 and 2 of the drawing when the handle 13*a* is grasped in the hand of the operator. This arrangement provides for very firm grasping of the supporting frame 13 in order to stress the energy storage elements 12.

In accordance with the present invention, the energy storage elements 12 comprise rubber tubing and preferably surgical rubber tubing by virtue of the great elasticity thereof and the ability of such material to store a large amount of energy and release the same with great speed. Furthermore, such rubber tubing may be purchased in a wide variety of wall thicknesses so that any desired pull strength for the device may be obtained. Actually, the device is well adapted for use as a toy whereby the energy storage devices 12 in the form of rubber tubing will have a very thin wall thickness, and in such case the arrows 11 instead of being tipped with metal as indicated at 11*a* may be provided with a suction cup at the forward end in a conventional manner.

For the purpose of attaching adjacent ends of the energy storage means 12 to the arms 13*b* and 13*c* of the supporting frame 13 in a manner to permit ready removal and replacement with tubing of different pull strengths, an improved fastening means, best shown in Fig. 4 of the drawing, is employed. Each arm 13*b* and 13*c* of the supporting frame 13 is provided with an opening therethrough generally designated by the reference numeral 17. These openings 17 extend in a direction perpendicular to the plane defined between the arms 13*b* and 13*c*. In addition, counterbores 18 and 19 of relatively shallow depth are provided in the arms of 13*b* and 13*c* at opposite ends of the openings 17. To attach one end of the length of tubing 12 to the arm 13*b* or 13*c* there is employed a bolt 20 having a relatively small head 20*a* which head is inserted within one end of the associated tubular member 12. By means of wire generally designated at 22, preferably of nickel silver, or the like, the end of the tubing 12 is attached to the bolt 20 as by wrapping the wire 22 tightly around the bolt 20 beyond the head 20*a* thereby securely fastening the head 20*a* within the tubing 12. The bolt 20 preferably has a rounded head or some other similar shape so as not to injure the rubber tubing where it contacts therewith. The end portion of the tubing 12 is then disposed within the counterbore 19 and a suitable cap nut 23 is applied to the bolt 20 after insertion into opening 17. It will be apparent that the tubing 12 may be replaced with tubing of a different wall thickness merely by removing cap nut 23 and replacing it on the bolt 20 fastened to such tubing of different wall thickness and hence different pull strengths.

It will be understood that in order to engage the nock of an arrow, a relatively small cord receivable within such nock 11*b* must be employed to interconnect the ends of the energy storage means 12 remote from the supporting frame 13. Preferably a braided nylon cord 25 is employed for this purpose and is connected with the tubing 12 in accordance with the present invention in a novel manner. As illustrated, each end of the braided nylon cord 25 is provided with means which could be a dumbbell-shaped member, but which has been specifically illustrated as a pair of beads 26 and 27 threaded on the nylon cord. This dumbbell-shaped member or the beads 26 and 27 could be formed of metal, plastic or the like. Suitable knots 25*a* and 25*b* are tied in the cord to limit the location of the beads 26 and 27 relative to the cord 25. To attach the energy storage means 12 with the cord 25 all of the bead 26 and a portion of the bead 27 is inserted into the end of the tubing 12 remote from the supporting frame 13. By means of suitable wire 28, which is preferably a nickel silver wire, the portion of the tubing between the beads 26 and 27 is clamped against the cord 25. The nickel silver wire is twisted tightly to produce a narrow neck generally designated at 30 in the tubing 12 of sufficiently small diameter to prevent the bead 26 from passing therethrough. Hence the cord 25 is secured in a simple and foolproof manner to the energy storage means or tubing 12. Actually, only the bead 26 or a similar member is essential for each end of the cord 25 and the extra bead 27 is primarily added for the sake of appearance. Since a part of it is visible, it preferably has the same color as the frame 13. It should be understood that a dumbbell-shaped member could comprise a molded, cast or machined element which would function just like the beads 26 and 27.

When the device 10 is used for projecting arrows, it will be apparent that some guide for the arrow is essential if accurate shooting is desired. In accordance with the present invention, extremely accurate shooting is obtained by employing the improved arrow guide 32, best shown in Fig. 5 of the drawing. This arrow guide 32 is preferably formed of a length of wire having at its center a deformation defining an enlarged V-shaped notch 32*a*. The ends of the arrow guide 32 are provided with hook-shaped portions 32*b* spaced and shaped to engage the bolts 20 in the manner clearly shown in Figs. 1 and 4 of the drawing. This arrow guide 32

may readily be attached to the bolts **20** prior to insertion into the openings **17** and is then firmly clamped in position between the tubes **12** and the frame **13**, as clearly shown in Fig. 4. It has been found that the V-shaped notch **32***a* which is disposed midway between the arms **13***b* and **13***c* provides very satisfactory guiding of the arrow so that the arrow may be propelled with extreme accuracy. Furthermore, by employing such a V-shaped guide, arrows of varied sizes may be employed with the same guiding accuracy performed by the guide **32**. It is believed that the reason such extreme accuracy is attained is because of the fact that the arrow guide **32** supports the arrow in such a way that the operator sights directly along the longitudinal axis of the arrow and the pull of the energy storage means is also along this axis.

The device for projecting articles of the present invention may readily be used as an ordinary sling shot as indicated in Fig. 2 of the drawing merely by attaching a pouch **35** at the center of the cord **25**. This pouch may be formed of leather or other readily deformable material to enclose the article to be propelled and to permit grasping the same by the fingers of the operator. This pouch **35** may be provided with openings for receiving the cord which may be knotted thereto or fastened thereto in any suitable manner.

In view of the detailed description included above, the operation of the device of the present invention will be readily understood by those skilled in the art. Extensive use of the device of the present invention indicates that it should be held with the handle **13***a* in a horizontal position, as shown in Fig. 1 of the drawing, whereby the opening between the arms **13***b* and **13***c* of the supporting frame **13** extends laterally either to the right in the case of a right-handed operator, shown in Fig. 1, or to the left in the case of a left-handed operator, shown in Fig. 2. Much greater accuracy may be obtained, and energy storage means having greater pull strengths may be employed under these conditions, particularly when used to project arrows. Of course, when used to project other articles, as when used as a sling shot, the device may be held with the handle portion **13***a* projecting downwardly. It should be understood that the frame **13** may be held in several different ways, one of them being shown in the drawing. Experts who have used the device of the present invention are of the opinion that most accurate and satisfactory operation can be obtained by holding the frame **13** in a manner slightly different from that shown in the drawings with the thumb in notch **15** (for a right-handed operator), and the forefinger of the same hand extending into notch **14** whereby the frame **13** is bridged across the "arch" formed by the thumb and forefinger and a very firm support for stressing the energy storage means is provided.

While there has been illustrated and described what are at present considered to be preferred embodiments of the present invention, it will be understood that various changes and modifications will readily suggest themselves to those skilled in the art, and it is intended in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the present invention.

What is claimed as new and is desired to be secured by Letters Patent of the United States is:

1. In a device for projecting arrows, the combination of a supporting frame comprising a handle, a pair of arms integral with said handle projecting from one end of said handle and disposed in a diverging relation from the junction of said arms and handle, a pair of tubular rubber members, means for attaching adjacent ends of said members to the ends of said arms remote from said handle, a cord interconnecting the other ends of said tubular rubber members, a detachable arrow guide including a V-notch at the center thereof, and means including said means for attaching said members to said arms for holding said arrow guide in position with said V-notch disposed midway between said arms.

2. In a device for projecting articles, the combination of a supporting frame comprising a handle, a pair of arms integral with said handle projecting from one end of said handle, energy storage means attached to the ends of said arms remote from said handle, a cord interconnecting the other ends of said energy storage means, means including a pair of spaced spherical enlargements attached to each end of said cord, and a constricting member between each of said pair of spaced spherical enlargements tightly clamping said energy storage means to said cord thereby to unite said cord with said energy storage means.

3. Apparatus for projecting articles comprising a supporting frame including a handle, a pair of arms integral with said handle projecting from one end of said handle and disposed in a diverging relation from the junction of said arms and handle, energy storage means including a pair of tubular rubber members each having adjacent ends thereof attached to the ends of said arms remote from said handle, a cord interconnecting the other ends of said tubular rubber members, means including a pair of spaced identical enlargements attached to each end of said cord, one of each of said pair of identical enlargements being inserted into the adjacent end of one of said tubular rubber members, and a pair of constricting members one disposed between each of said spaced identical enlargements tightly clamping said tubular rubber members to unite said cord with said rubber members.

4. In apparatus for projecting arrows, the combination of a supporting frame comprising a handle, a pair of arms integral with said handle projecting from one end of said handle and disposed in a diverging relation from the junction of said arms and handle, a pair of energy storage means, means for attaching adjacent ends of said means to the ends of said arms remote from said handle, a cord interconnecting the other ends of said energy storage means, a detachable arrow guide including a V-notch at the center thereof, and means including said means for attaching said energy storage means to said arms for holding said arrow guide in position with said V-notch disposed midway between said arms.

5. In a device for projecting arrows, the combination of a supporting frame comprising a handle, a pair of arms integral with said handle projecting from one end of said handle and disposed in a diverging relation from the junction of said arms and handle, a pair of tubular rubber members, means for attaching adjacent ends of said members to the ends of said arms remote from said handle, a cord interconnecting the other ends of said tubular rubber members, a detachable arrow guide and means including said means for attaching said members to said

arms for holding said arrow guide in position such that the force produced upon stressing said tubular members is in a direction along the longitudinal axis of an arrow associated with said device whereby the operator may sight directly along said arrow and extremely accurate projecting of said arrow results.

6. In apparatus for projecting arrows, the combination of a supporting frame comprising a handle, a pair of arms integral with said handle projecting from one end of said handle and disposed in a diverging relation from the junction of said arms and handle, a pair of energy storage means, means for attaching adjacent ends of said means to the ends of said arms remote from said handle, a cord interconnecting the other ends of said energy storage means, a detachable arrow guide including a V-notch at the center thereof, and means including said means for attaching said energy storage means to said arms for holding said arrow guide in position with said V-notch disposed midway between said arms whereby an arrow disposed in said apparatus for projecting the same has its longitudinal axis coincident with the resultant direction of the force acting on said arrow.

JESSE FISHER.

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