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M. L. TURNER

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ARROW HAVING A FREELY SHIFTABLE ARROWHEAD

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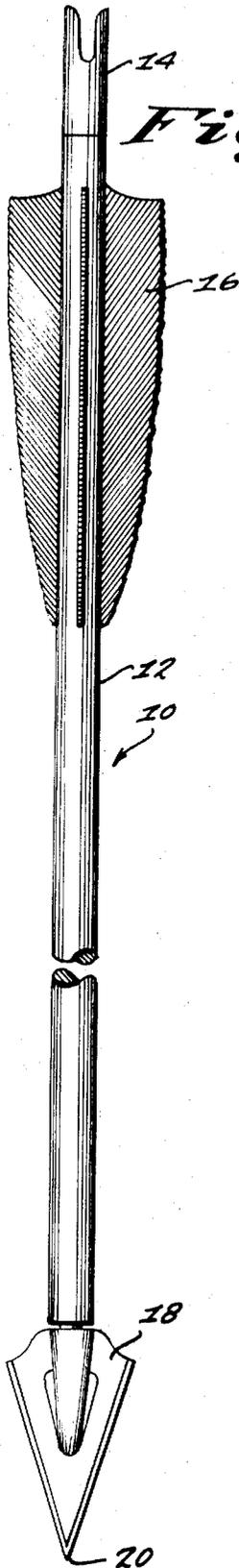


Fig. 1

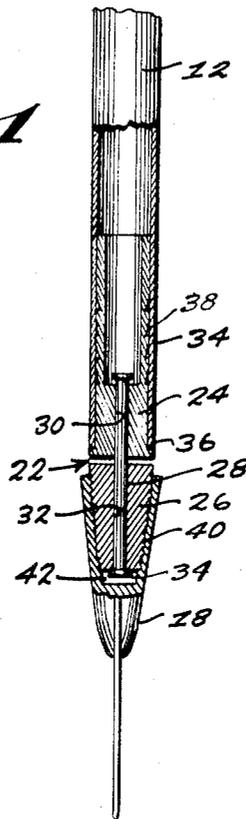


Fig. 2

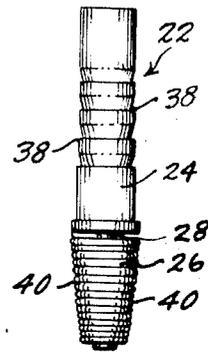


Fig. 3

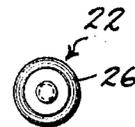


Fig. 4

INVENTOR.
MANNING LEE TURNER

BY

Channing L. Richards &
Dalbert C. Shefts
ATTORNEYS

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Manning Lee Turner, Charlotte, N.C., assignor of twenty percent each to Channing L. Richards and Howard C. Simpson, twelve and one-half percent to Beuna S. Shumate, and seven and one-half percent to Armand L. Zavitz, all of Charlotte, N.C.

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8 Claims

ABSTRACT OF THE DISCLOSURE

An arrow used primarily for game hunting comprising an elongated shaft member having a generally flat arrowhead mounted at one end thereof by an attachment fixture which allows the arrowhead to shift freely with respect to the shaft member about the longitudinal axis of the arrow when the arrow is in flight. Preferably, the fletching secured to the arrow extends parallel to the longitudinal axis thereof.

BACKGROUND OF THE INVENTION

Arrows used in hunting game animals are fitted with special arrowheads designed to inflict the greatest possible damage to the animal when it is hit, and while these arrowheads may vary to some extent in size and shape depending on the particular game being hunted and the individual taste of the hunter, they are almost always formed with a generally flat, wedge-shaped configuration designed to sever a maximum number of the animal's blood vessels and thereby promote heavy bleeding which ultimately results in the death of the animal.

Because of their flat construction, arrowheads of this type act somewhat in the nature of an airfoil when the arrow is in flight, and the reactive forces induced by this airfoil phenomenon are applied against the arrowhead and transmitted to the arrow shaft member integrally fixed thereto with a tendency to cause the arrow to depart from its intended trajectory unless something is done to counteract this effect.

So far as I am aware, the only method heretofore employed to counteract this effect has been the standard practice of arranging the arrow fletching so that it has a slightly spiralled extent along the shaft member of the arrow whereby the air passing over the fletching imposes a turning moment on the arrow causing it to rotate about its longitudinal axis so as to neutralize the aforementioned reactive force action at the arrowhead and thereby follow a substantially true path of flight.

However, the necessity of imparting rotational movement to the arrow also results in several disadvantages, including increased wind resistance caused by the relatively large flat surfaces of the arrowhead and fletching being turned in the surrounding air, and additional noise which may forewarn the intended prey of the arrow's approach. Also, since the arrowhead is rotating when it strikes the animal, undesirable tearing of the animal's flesh results and the penetration of the arrow is reduced.

All of these disadvantages are effectively eliminated by the present invention which provides a unique arrow that follows an extremely accurate flight path without the need of having any rotational movement imposed on the arrow.

SUMMARY OF THE INVENTION

According to the present invention, the elongated shaft member of an arrow is provided at one of its ends with an attachment fixture by which the arrowhead is mounted

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on the shaft member so as to be freely shiftable with respect thereto about the longitudinal axis of the arrow. By virtue of this free mounting of the arrowhead on the shaft member, the aforementioned reactive forces acting on the arrowhead simply cause it to shift about its own axis in much the same manner as a weather vane. As a result, the necessity of imposing a rotational movement on the arrow to neutralize these forces is eliminated and, since the shifting movement of the arrowhead is caused by the passing air, such movement does not generate any substantial wind resistance which would adversely affect the speed of the arrow or its path of flight. Additionally, this mounting of the arrowhead permits replacement of the spirally extending arrow fletching with straight, longitudinally extending fletching of the type heretofore associated primarily with target arrows which have small conical heads that do not present the ballistic problems caused by the flat hunting-type arrowheads.

Thus, the arrow of the present invention follows a true path of flight while traveling at greater speeds and with less noise than hunting arrows heretofore known. Moreover, the absence of a rapidly rotating arrowhead permits a deeper penetration of the arrow when it strikes the target animal and also results in a neater wound.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevation view illustrating an arrow having a hunting-type arrowhead mounted thereon in accordance with the present invention;

FIG. 2 is an enlarged fragmentary view of the arrow shown in FIG. 1, partly broken away to illustrate the mounting arrangement for the arrowhead;

FIG. 3 is an elevation view of the attachment fixture for mounting the arrowhead on the shaft member of the arrow; and

FIG. 4 is an end view of the attachment fixture illustrated in FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now in detail to the drawings, FIG. 1 illustrates an arrow 10 composed of a conventional elongated shaft member 12 made of a suitable material such as fiber glass or aluminum and fitted at one of its ends with a nock 14 and fletching 16, the other end of shaft member 12 being fitted with a typical arrowhead 18 used for hunting game animals. The arrowhead 18 is generally flat (see FIG. 2), and has a wedge-shaped or flared configuration extending from a sharp point 20 to a maximum width that substantially exceeds the thickness of the shaft member 12, the side edges of the arrowhead 18 being sharpened so as to sever a large number of blood vessels when the arrow 10 strikes its target.

In contrast to the conventional prior art practice of uniting the shaft member and arrowhead together as an integral unit, the arrowhead 18 of the present invention is mounted at one end of the shaft member 12 by an attachment fixture 22 which permits the arrowhead 18 to shift freely with respect to the shaft member 12 about the longitudinal axis of the arrow 10. As best seen in FIGS. 2 and 3, the attachment fixture 22 comprises a first component 24 secured to the shaft member 12 at one end thereof, a second component 26 secured to the arrowhead 18, and a pin element 28 extending through centrally located bores 30 and 32 formed, respectively, in first component 24 and second component 26. The bores 30 and 32 extend along the longitudinal axis of the arrow 10 and have a diameter which is slightly greater than the diameter of pin element 28 so as to permit free relative shifting of the components 24 and 26 with respect to each other about the pin element 28 and the longitudinal

axis of the arrow, and the pin element 28 is provided with enlarged end parts 34 having a diameter larger than the diameter of bores 30 and 32 to maintain components 24 and 26 in longitudinal adjacency. It will be noted that pin element 28 has sufficient length to allow a slight spacing between first component 24 and second component 26 to allow relative shifting of the latter free of any frictional contact with first component 24.

The first component 24 of attachment fixture 22 is cylindrically shaped so that it can be inserted in the hollow end of shaft member 12 until the end face of the shaft member 12 abuts the shoulder 36 of the first component 24 as seen in FIG. 2. Normally, the first component 24 is permanently secured in place with a suitable adhesive, and it is provided with circumferentially extending edges 38 to facilitate holding the first component 24 securely in place. The second component 26, which is left free to shift about the extending portion of pin element 28 when first component 24 is secured in place, is formed as a frustum with circumferentially extending ribs 40 that engage the hollow portion 42 of arrowhead 18 with a press-fit to hold it in place. While arrowhead 18 may be permanently secured to second component 26 with an adhesive, the press-fit mounting is generally preferable because it allows the arrowhead 18 to be removed and replaced with comparatively little trouble.

With the arrowhead 18 mounted on shaft member 12 in this manner, it is apparent that any reactive forces acting at the flat surface areas of arrowhead 18 when the arrow 10 is in flight will simply cause the arrowhead 18 and second component 26 to shift about the pin element 28 and, therefore, these forces will not adversely affect the trajectory of the arrow. Similarly, small twigs or the like which lie in the path of the arrow's flight will, in many cases, result only in the arrowhead 18 being shifted about pin element 28 rather than causing the arrow to alter its course.

Finally, since the present invention eliminates the necessity of imposing rotation on the arrow 10, the fletching 16, which has heretofore been arranged for spiral extent along the shaft member 12 in arrows having hunting-type arrowheads, may now extend longitudinally along the shaft member 12 as seen in FIG. 1 thereby increasing the speed of the arrow because the wind resistance formerly generated by the rotation of the shaft member and the fletching is no longer present. It will be noted, however, that the arrowhead mounting of the present invention may also be used with spiral fletching, if desired, and the aforementioned advantages derived from a freely shiftable arrowhead will still be realized.

The present invention has been described in detail above for purposes of illustration only and is not intended to be limited by this description or otherwise except as defined in the appended claims. For example, in cases where the shaft member 12 is made without a hollow end portion, the first component 24 of the attachment fixture 22 could be formed to fit around the end of shaft member 12 rather than for insertion therein. Likewise, the pin element 28 could be fixed to either the first component 24 or second component 26 without departing from the scope of the present invention.

What is claimed is:

1. In an arrow including an elongated shaft member having a generally flat arrowhead located at one end thereof, the improvement comprising means mounting said arrowhead at said one end of the shaft member to permit free shifting of the arrowhead with respect to said shaft member about the longitudinal axis of said arrow upon movement of said arrow in flight.

2. In an arrow of the character described, the improvement defined in claim 1 and further characterized in that said mounting means comprises an attachment fixture in-

cluding a first component secured to said shaft member at said one end thereof, a second component secured to said arrowhead, and means interconnecting said first and second components to permit free relative shifting thereof about the longitudinal axis of said arrow.

3. In an arrow of the character described, the improvement defined in claim 2 and further characterized in that said shaft member is hollow at said one end thereof and said attachment fixture first component is received and permanently secured therein, and in that said arrowhead includes a hollow portion receiving said attachment fixture second component with a press-fit.

4. In an arrow of the character described, the improvement defined in claim 2 and further characterized in that said first and second attachment fixture components each include a centrally located bore extending along said longitudinal axis of said arrow, and in that said attachment fixture interconnecting means comprises a pin element extending freely through said bores in said first and second components and having enlarged end parts to maintain said first and second components in longitudinal adjacency.

5. In an arrow of the character described, the improvement defined in claim 1 and further characterized in that the other end of said shaft member includes fletching extending therealong in a direction parallel to said longitudinal axis of the arrow, and in that said arrowhead has a flared configuration with a maximum width that substantially exceeds the thickness of said shaft member.

6. An attachment fixture for rotatably mounting a generally flat arrowhead on the shaft member of an arrow, said attachment fixture comprising a first component adapted to be secured to said shaft member at said one end thereof, a second component adapted to be secured to said arrowhead, and means interconnecting said first and second components to permit free relative shifting thereof about the longitudinal axis of said arrow when said attachment fixture is secured in place and the arrow is moving in flight.

7. An attachment fixture as defined in claim 6 and further characterized in that said first component has a cylindrical shape and is formed with circumferentially extending edges to facilitate permanently securing said first component within a hollow end of said shaft member, and in that said second component is formed as a frustum with circumferentially extending ribs to facilitate securing said second component within a hollow portion of said arrowhead with a press-fit.

8. An attachment fixture as defined in claim 7 and further characterized in that said first and second components each include a longitudinally extending bore, and in that said interconnecting means comprises a pin element extending freely through the bores in said first and second components and having enlarged end parts to maintain said first and second components in longitudinal adjacency.

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ANTON O. OECHSLE, Primary Examiner

P. E. SHAPIRO, Assistant Examiner

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