Feb. 17, 1953 C. J. ZWICKEY 2,628,837

ARROWHEAD WITH RESILIENT ARMS

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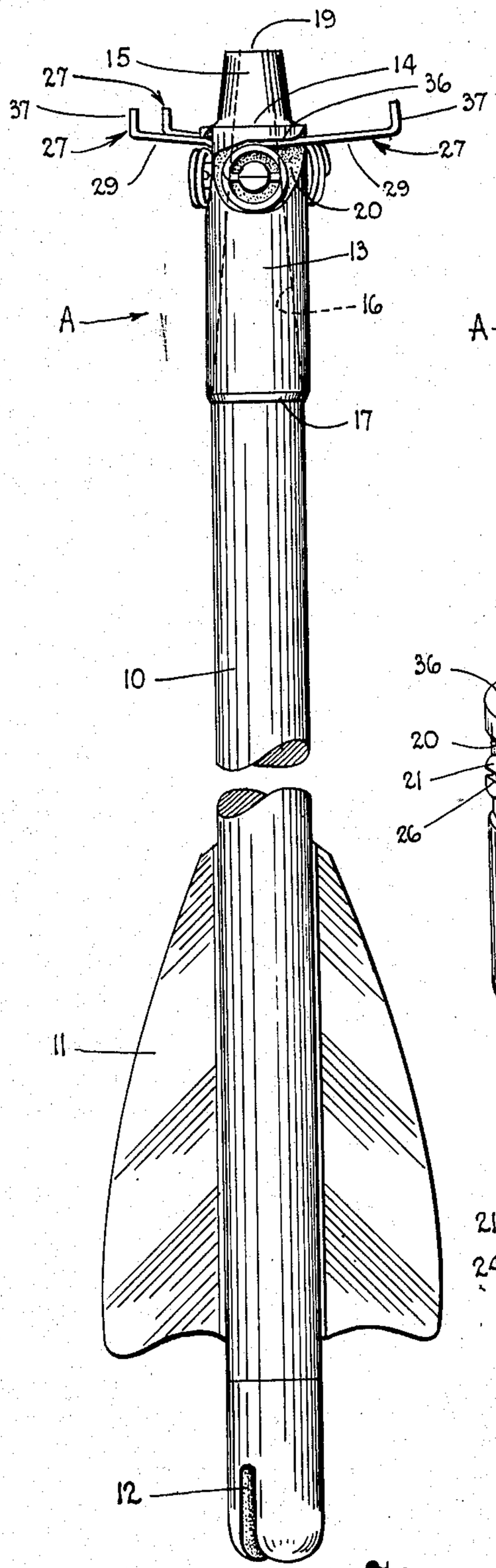
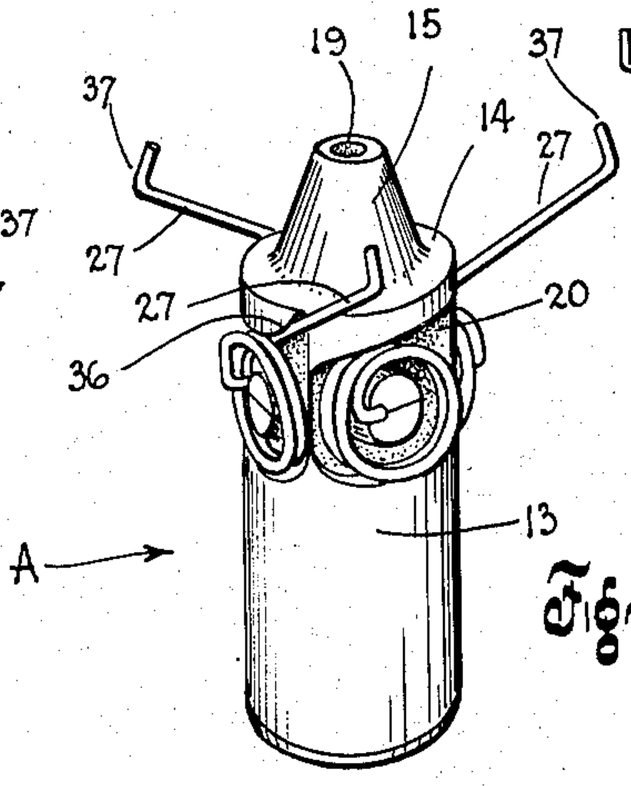
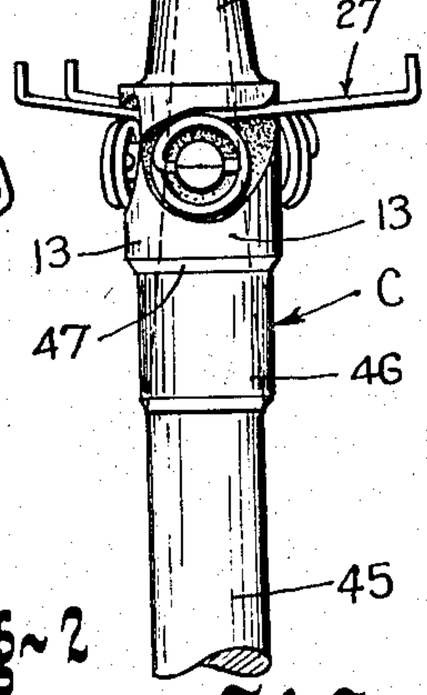


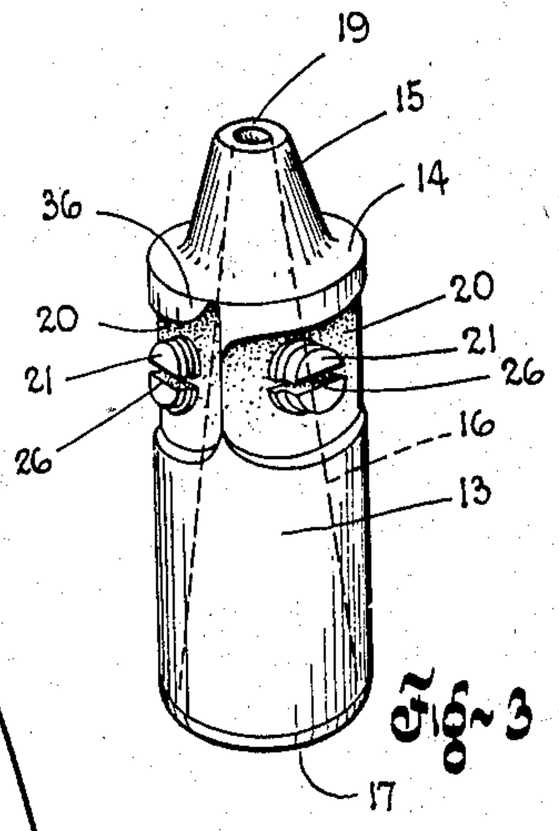
Fig~1



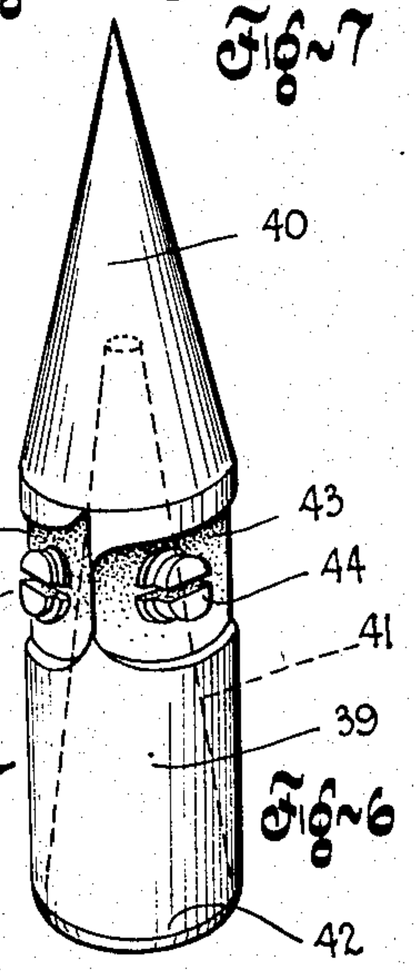
Fig~2



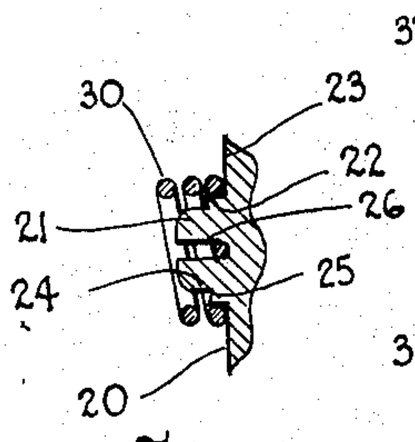
Fig~7



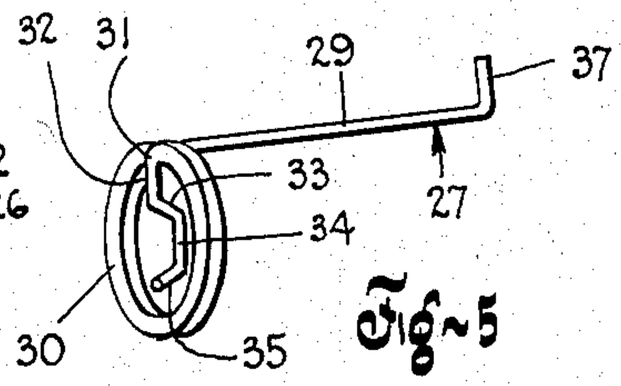
Fig~3



Fig~6



Fig~4



Fig~5

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ARROWHEAD WITH RESILIENT ARMS

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5 Claims. (Cl. 273—106.5)

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My invention relates to an improvement in arrow heads and deals more particularly with the type of projectile shot from a bow or similar instrument.

The object of the present invention lies in the provision of an arrow head which will lengthen the useful life of the arrow and which is not lost as readily as arrows of the usual type. Many arrows are lost when they become buried in grass or leaves or are shot into the earth. My arrow head is so constructed that the arrow can not readily become buried in this manner.

A feature of the present invention lies in the provision of an arrow head which may be easily detached from an arrow shaft and attached to another shaft. Difficulty is often encountered in salvaging arrow heads from broken and bent arrow shafts. My construction is such that the head may be readily removed from one arrow shaft and readily applied to another shaft.

A feature of the present invention resides in the provision of an arrow head having a series of angularly spaced resilient members extending outwardly from the head. These resilient members may flex under pressure to fold back toward the shaft of the arrow. These arms tend to lessen the speed of the arrow when the same is shot into grass, leaves, or the like. Similarly these resilient elements tend to reduce the speed of the arrow when the arrow glances from a more solid object.

A feature of the present invention lies in the provision of an arrow head having resilient arms projecting outwardly therefrom, which catch grass, leaves, and similar matter, and tend to bunch these materials up in front of the arrow shaft. As a result the path of the arrow can be easily detected and there is little likelihood that the arrow will become hidden under these materials.

Arrow shafts are often broken when the arrow strikes a relatively solid object with a deflecting or glancing blow. If the arrow is deflected by a tree trunk or the like, the sudden change in direction of the arrow creates a whipping action tending to break the shaft. In my construction the speed of motion of the arrow is greatly decreased by engagement of the solid object with the outwardly projecting resilient fingers so that the whipping action is similarly decreased. As a result my arrow head greatly decreases the chance of breaking the arrow shaft.

A further feature of my invention lies in the provision of an arrow head having a blunt forward end of reduced diameter attached to the

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main body of the arrow head along a circular shoulder. When the reduced diameter point of the arrow strikes an object, the force against the head is confined to the central portion of the head, thereby tending to center the blow against the shaft. The shoulder also tends to impede the progress of the arrow as it strikes a glancing blow, thereby decreasing the chance for the shaft to break.

An added feature of the present invention lies in the provision of an arrow head of generally cylindrical outer form having a reduced diameter blunt tip thereupon. A tapered opening extends through this tip to receive the tapered end of the arrow shaft. In the preferred form of the invention, the tapered opening extends entirely through the arrow head, thereby permitting the shaft of the arrow to be removed from the head when it is necessary to replace the shaft.

A further feature of the present invention lies in the provision of an arrow head having cut away side portions within which are located spring elements. These springs are anchored to the arrow head and have ends which project outwardly therefrom for the purposes described. When one of these spring ends strikes an object, the spring is so positioned that the projecting spring end may be forced back into generally parallel relation with the axis of the arrow head.

A further feature of the present invention lies in the provision of an arrow head having resilient arms connected thereto to extend outwardly therefrom, and in so arranging this construction that it may be economically manufactured at a low cost.

These and other objects and novel features of my invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of my specification:

Figure 1 is a side elevational view of an arrow showing my arrow head thereupon.

Figure 2 is a perspective view of the arrow head removed from the shaft.

Figure 3 is a view of the arrow head before the resilient means are attached thereto.

Figure 4 is a sectional view through a portion of the arrow head during the attachment process.

Figure 5 is a perspective view of one of the resilient arms.

Figure 6 is a perspective view of a modified form of arrow head body construction.

Figure 7 is an elevation view of a modified form of arrow head construction.

The arrow head A is designed for application

upon an arrow shaft 10 of any suitable type. Such arrows are usually provided with a feathered end 11 and the projecting portion of the shaft is notched as indicated at 12, to receive the string of the bow.

The arrow head A, in preferred form, is provided with an elongated body 13 which is generally cylindrical in shape throughout most of its length. A shoulder 14 is provided on the cylindrical body 13 at a point spaced from its forward end, and a reduced diameter tapered end 15 projects forwardly from the shoulder 14. The end 15 is frusto-conical in shape, this end being coaxial with the cylindrical portion of the body.

As illustrated in Figures 1 and 3 of the drawings the tapered opening 16 extends through the body 13, this opening 16 being of relatively large diameter at the rear end 17 of the head A and of relatively small diameter at the forward extremity 19 of the arrow head. This tapered opening is of importance as it permits the shaft 10 of the arrow to be easily fitted thereto and provides a maximum of strength. Strain against the tip end of the arrow head is directed to the tapered forward end of the shaft 10, thus obviating any tendency for the shaft to break at the point where the shaft enters the head. In other words, when the arrow head strikes a solid object the arrow shaft is forced against the head by the forces of inertia, these forces acting accordingly throughout the circumference of the shaft. The tapered forward end of the shaft is also stronger than a shaft having a reduced diameter forward end connected to the shaft along a shoulder.

The arrow head A is provided with a series of angularly spaced notches 20 near the shoulder 14. These notches have relatively flat base surfaces which are on a plane at right angles to a radius from the axis of the shaft. At the center of each notch 20 I provide an outward projection 21, the shape of which is best illustrated in Figure 4 of the drawings. Each projection includes a spring locating portion 22 adjacent the base 23 of the notch and a smaller diameter end portion 24 coaxial with the portion 22 and projecting outwardly therefrom. A concave shoulder 25 connects the larger diameter portion 22 with the smaller diameter portion 24 in preferred form.

Each of the projections 21 is provided with a center slot 26 therein designed to receive an end of the spring supported thereby, as will be later described in detail.

A series of resilient arms 27 are provided on the arrow head A, as best illustrated in Figures 1, 2, and 4 of the drawings. Each resilient arm includes a relatively straight arm portion 29, a helically coiled portion 30 and an anchoring end 31. The anchoring end 31 includes a radially extending portion 32, an inwardly off-set portion 33, a transversely extending portion 34 and an outwardly directed extremity 35. The purpose of this construction is to position the transversely extending portion 34 as close as possible to the axis of the arrow head.

In forming the head A, each resilient arm 27 is connected to one of the projections 21, as illustrated in Figures 1, 2, and 4 of the drawings. To accomplish this result, the transversely extending portion 34 of each resilient member is inserted in a transverse slot 26 of a corresponding projection 21. The sides of the reduced diameter portion of each projection are then squeezed together as illustrated in Figures 1 and 2, clamping the resilient members 27 in place.

It will be noted that a shoulder 36 is provided

at the forward end of each notch 20 against which the straight portion 29 of the resilient member 27 may engage. As a result the straight shanks 29 of these resilient members are held at any desired angle relative to the head in assembled position. As indicated in the drawings the slots 26 extend transversely of the arrow head, whereas, the anchoring porton 31 normally tends to be at substantially right angles to the straight portion 29 of these resilient members. Accordingly in assembled form of the arrow head the coil 30 of the spring is under tension and the straight portions 29 of the resilient members are resiliently urged against the shoulders 36.

It will be noted that the spring locating portions 22 of the projections 21 fit snugly within the first convolution of each resilient member. However, the reduced diameter end portions 24 of these projections are spaced inwardly from the spring so that the projecting portion of the spring is free from contact with the projection. As a result the spring may flex freely in its operation.

The straight portions 29 of the resilient members may if desired have ends 37 thereon which extend forwardly, or rearwardly. When extending forwardly in the manner illustrated the resilient arms have more of a tendency to bunch up loose material such as leaves, grass, or the like, in front of the arrow head.

The operation of my arrow head can be understood from the foregoing description. When the arrow strikes leaves, grass. loose ground, or other similar material, the resilient arms catch in this material and quickly halt the forward progress of the arrow. Furthermore, these resilient arms tend to bunch up material forwardly of the arrow so that the course of the arrow can be readily detected, and the arrow does not have a tendency to become buried in such loose material.

If the arrow is shot a deflecting blow against a more solid object, such as the trunk of the tree, the resilient arms 27 tend to strike this object and impede the forward progress of the arrow. As a result the whipping action of the arrow in changing direction is decreased and the danger of breakage of the arrow shaft is substantially lessened.

The purpose of the tapered opening through the arrow head has been described. It will be noted that the opening extends entirely through the arrow head, thus simplifying the procedure of removing the shaft in the event a shaft should be broken. The blunt ended point and the shoulder 14 also tend to impede the progress of the arrow as it strikes against an object, thus decreasing the chance of losing the arrow. In the event a pointed arrow is desired, a similar construction may be employed. I indicate at B in Figure 6 of the drawings an arrow head which differs from that previously described only in the construction of the forward end of the arrow head.

The arrow head B is provided with a generally cylindrical body portion 39 having a conically pointed forward end 40. A tapered opening 41 is provided in the body 39 with the large diameter end of this opening at the point end 42 of the arrow head. Obviously the opening 41 in this construction cannot extend entirely through the arrow head.

The arrow head B is provided with angularly spaced notches 43, identical to the notches 20, and each notch 43 is provided with a projection 44, identical with the previously described projections 21. In view of the similarity of these por-

tions of the construction the shape of the notches and projection will not be described in detail.

The arrow head C, illustrated in Figure 7, is identical in form with the arrow head A, except for the shape of the tubular body 13. If it is desired to provide an arrow head on a shaft 45 of smaller diameter than the shaft 10, I cut down the diameter of the rear end of the head A to provide a reduced diameter portion 46 which is connected to the larger diameter body 13 at the shoulder 47. In this structure the length of the body is decreased so that the inside taper may be maintained. In other words, the arrow head C is formed by cutting the size of the rear end of the head to smaller diameter which results in shortening the head to some extent.

In accordance with the patent statutes, I have described the principles of construction and operation of my arrow head, and while I have endeavored to set forth the best embodiments thereof, I desire to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. An arrow head including a body member, a series of radially extending projections thereon, and a series of tangentially extending arms resiliently connected to said projections.

2. An arrow head including a body, a series of angularly spaced notches in said body, a series of resilient arms having coiled end portions, and means connecting said coiled ends in said notches.

3. An arrow head including an elongated body, a series of angularly spaced notches in said head, an outwardly extending projection in each of said notches, and an arm having a resiliently coiled end anchored to each said projection.

4. An arrow head including an elongated body, a series of angularly spaced projections extending outwardly from said body, a series of arms having resiliently coiled ends, and means connecting each resiliently coiled end to a corresponding projection so that the coiled portion of the arm encircles the projection and the arm extends outwardly from said body.

5. An arrow head comprising an elongated body, a series of angularly spaced notches in said body, a projection on each of said notches, a series of arms having resiliently coiled ends, means connecting the resiliently coiled end of each arm to a corresponding projection with the coil encircling the projection and the arm projecting outwardly from said body, and a shoulder adjacent each notch limiting pivotal movement of said arms in a forward direction.

CLIFFORD J. ZWICKEY.

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