

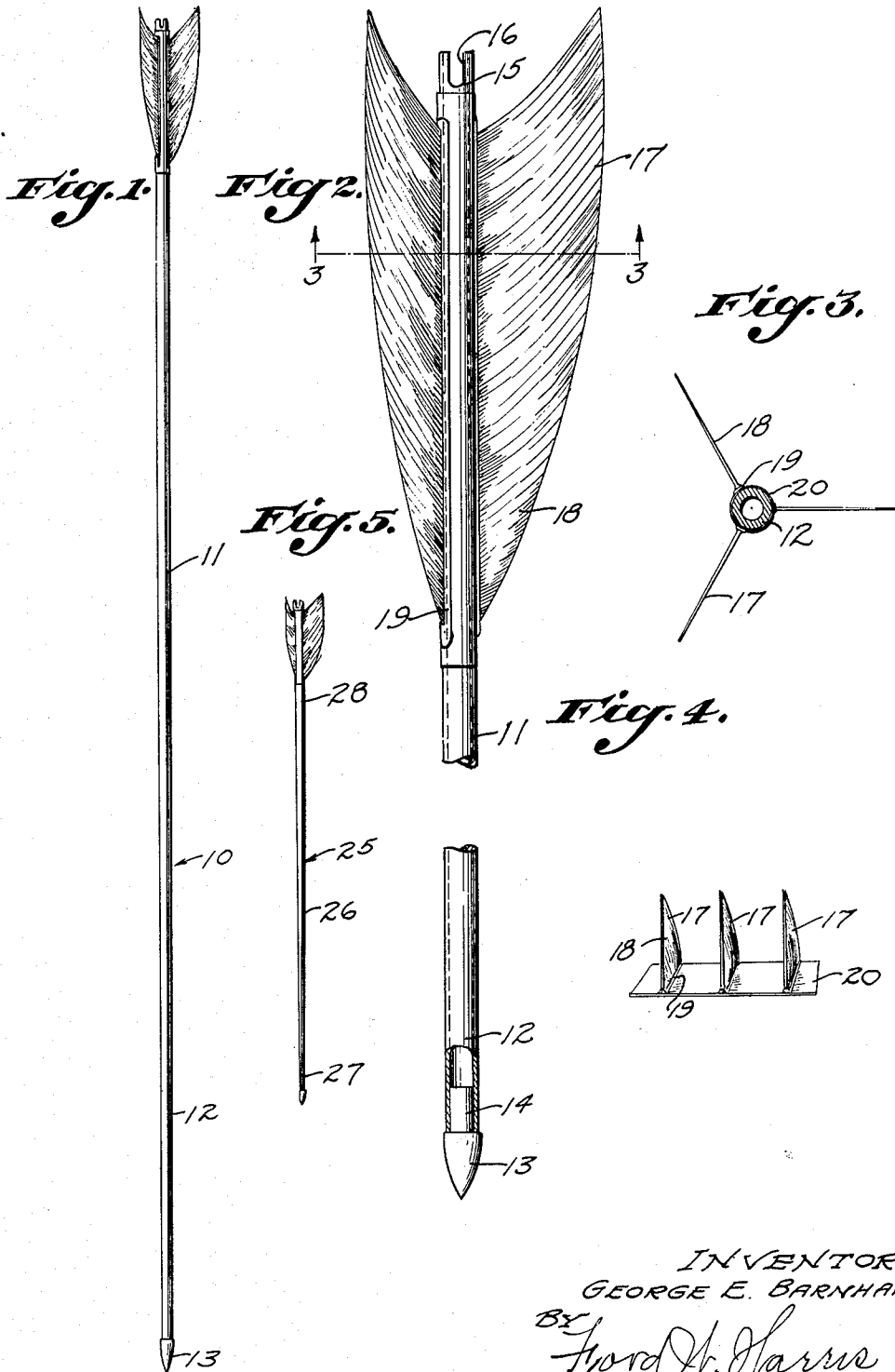
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ARCHER'S ARROW

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UNITED STATES PATENT OFFICE

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ARCHER'S ARROW

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My invention relates to archery and more particularly to arrows used in this sport.

Practically all of the arrows used throughout the history of archery have had a shaft of wood. I have noted that the wood shafts of these arrows have made uniform accuracy in archery impossible owing to the slight warping of the wood in response to changes in weather. Thus, though the arrows were shot by an archer in exactly the same manner, each arrow would curve from the path it would theoretically take, if straight, in a direction and to a degree depending upon the character of the warping of the wood shaft of that arrow.

It is correspondingly an object of my invention to provide an arrow which will not warp due to changing weather conditions.

It is also an object of my invention to provide an arrow which will be stronger than a wooden arrow of the same weight and which will not deteriorate with age in the manner characteristic of wooden arrows.

The diameter of the body of an arrow is an important factor in the resistance of the air to the flight of the arrow. There is a minimum diameter of a wooden arrow, to go beneath which will make the arrow too weak to satisfactorily stand the strain incidental to the shooting of the arrow and its impact against the target.

It is a further object of my invention to provide an arrow which will have a smaller diameter than that of a wooden arrow of the same strength.

When a slight over-strain is placed upon a wooden arrow, it splinters or breaks and cannot be repaired so as to be again serviceable.

A yet further object of my invention is to provide an arrow which may be easily restored to its original condition after an over-strain damaging the arrow.

It is a still further object to provide a novel method of and means for securing a plurality of feathers to the shaft of an arrow.

Further objects and advantages will be made manifest in the following description and in the accompanying drawings in which

a preferred embodiment of my invention is illustrated. In the drawings,—

Fig. 1 is a full length view of a preferred embodiment of the arrow of my invention.

Fig. 2 is an enlarged view similar to Fig. 1, showing parts of the arrow broken away so as to illustrate the structure thereof.

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a perspective view illustrating the mounting of the guide feathers on the arrow of my invention.

Fig. 5 is a full length plan view of a modified form of the arrow of my invention.

Referring specifically to the drawings, 10 indicates a preferred form of the arrow of my invention, which includes a shaft 11 which comprises a metallic tube which is uniform in diameter throughout its length.

This tube may be made of aluminum alloy and may be heat treated to give the proper strength. Other metals may also be used,

such as chrome nickel steel, nickel steel, molybdenum steel, vanadium steel, and plain carbon steel, as well as many other varieties of alloyed steel. It is, however, preferable to heat treat the steel so that the greatest strength will be obtained for the least weight.

These tubes are preferably made of seamless tubing, but tubes made by other processes, such as seamed, swaged, or welded tubes, may be used.

Mounted in an end 12 of the shaft 11 is an arrow-head 13, the neck 14 of which extends into the end 12 of the shaft 11.

Formed in the opposite end 15 of the shaft 11 is a notch 16 which is adapted to receive the string of a bow, not shown.

It is necessary that the arrow 10 be guided in flight and this is accomplished by guiding feathers 17 mounted upon the end 15 of the shaft 11, as shown in Figs. 1 to 3 inclusive.

Each of the guide feathers 17 is formed by splitting a feather of a bird so that it includes a feather portion 18 and a quill portion 19.

In order to mount the feathers 17 upon the shaft 11, the quill portions 19 of each feather 17 are cemented, as by collodion, to a sheet 20 of base material which may be cloth or a paper such as parchment. The feathers 17 are thus secured to the sheet 20

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In order to mount the feathers 17 upon the shaft 11, the quill portions 19 of each feather 17 are cemented, as by collodion, to a sheet 20 of base material which may be cloth or a paper such as parchment. The feathers 17 are thus secured to the sheet 20

in proper spaced relation so that when the sheet 20 is bent around the end 15 of the shaft 11, as shown in Fig. 3, the feathers 17 project radially in equi-angular spaced relation relative to the shaft 11. In the illustrations, the feathers 17 are shown three in number, but these may be two or four or even a larger number if desired. When the base sheet 20 is thus wrapped about the shaft 11, it is secured in place preferably by cementing it to the shaft 11 as by the use of water-glass.

One of the advantages of the arrow 10 over the wooden arrow in common use is the freedom of the shaft 11 from warping or other physical changes due to weather conditions which might tend to destroy the accuracy of the arrow 10 while in flight. Moreover, it is desired to point out that by the use of the metallic tube in forming the shaft 11, this shaft may be made of smaller diameter than a wooden shaft of the same strength, or else the shaft 11 may be made lighter than a wooden shaft of the same strength and diameter.

Referring now to Fig. 5, 25 indicates a modified form of the arrow of my invention which is substantially the same in construction as the arrow 10 except that the shaft 26 of the arrow 25 tapers toward the head-end 27 thereof. The shaft 26 is tubular in form and the walls thereof may be made slightly thicker toward the end 27 thereof than at the feather-end 28 of the shaft 26. The proportion of the thickness of the walls of the tubular shaft 26 is carried out with a view to giving the arrow 25 a proper fore-and-aft balance so that it will follow the proper trajectory in its flight through the air.

The purpose of tapering the shaft 26 of the arrow 25 is to decrease the head resistance of the arrow without decreasing the strength of the head-end 27 of the shaft 26. The tubular construction of the shaft 26 makes this possible where it could not possibly be accomplished were the shaft 26 to be made of wood. It is also important that the head-end 27 of the shaft 26 be of small diameter so as to facilitate the penetration of a target or the body of an animal.

While I have shown but two forms of my invention, it is to be understood that various changes might be made by those skilled in the art without departing from the spirit of the invention or scope of the appended claims.

I claim as my invention:

1. A method of applying guide feathers to an arrow shaft which consists in mounting said feathers on a flexible base member, bending said base member about said shaft and securing said base member to said shaft in said position.

2. In an arrow, the combination of: a tubular metallic shaft; a head closing one end

of said tubular shaft, there being a notch formed in the other end of said tubular shaft to receive a bow string; a sheet of flexible base material of a length equal to the peripheral distance around said shaft; and feathers cemented to said sheet of base material, said sheet being in turn cemented around the rear end of shaft.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 7th day of October, 1927.

GEORGE E. BARNHART.