Feb. 6, 1951 G. M. BUTLER 2,540,387

ARROW

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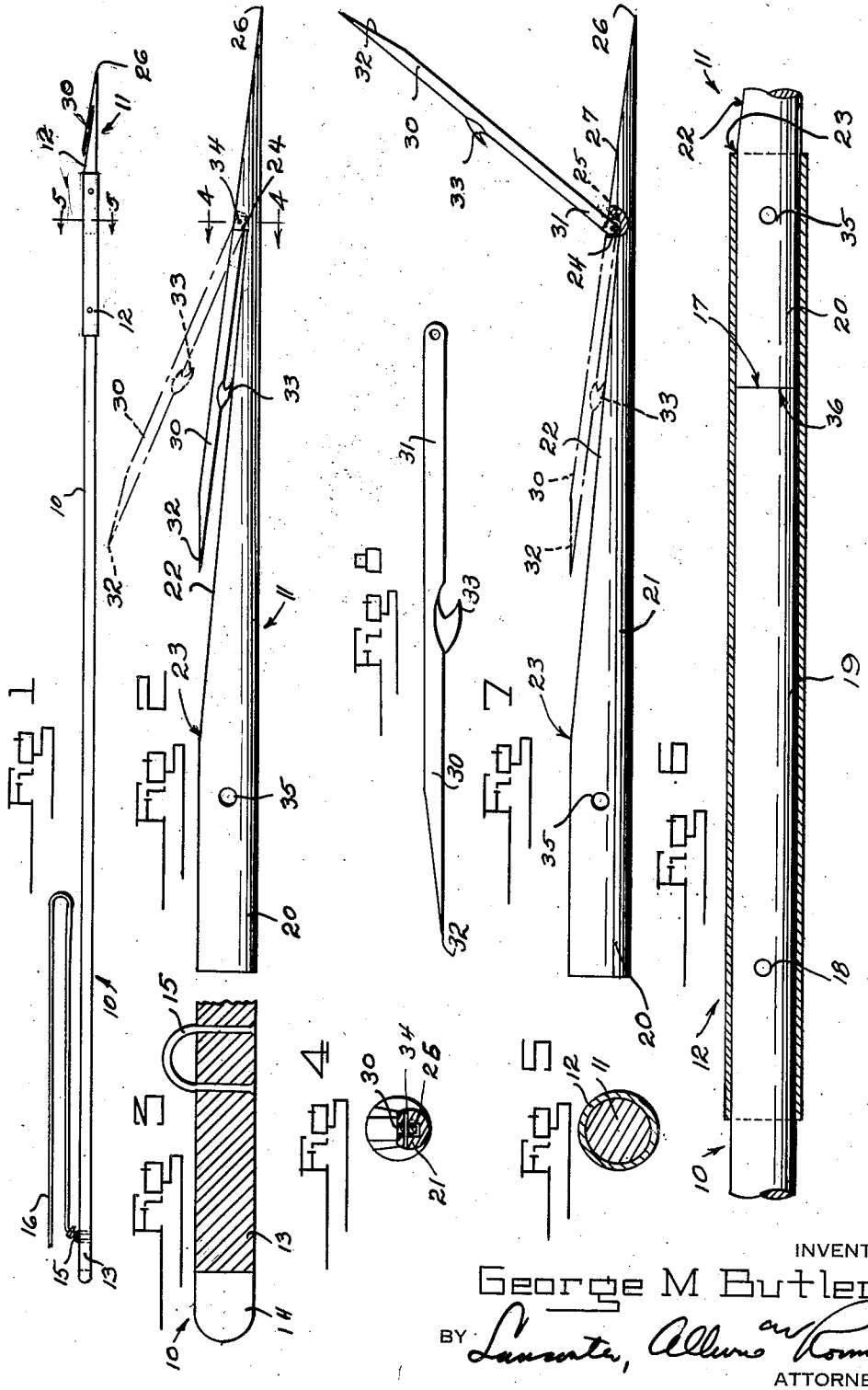

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ARROW

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1 Claim. (Cl. 43—6)

1

This invention relates to projectiles and more specifically to arrows. An example of the use of the arrow herein disclosed is in fishing.

An important object of the invention is to provide an arrow so constructed and arranged that it will be effective in fishing, in that, after being shot through the air, it will enter and pass through water, having sufficient momentum for the head portion thereof to penetrate the fish. After penetration, the head portion will remain in the fish until manually removed.

Another important object is to provide an arrow as described which will not tend to rust nor corrode, is light in weight and may be shot from conventional bows.

Still another object is to provide an arrow head of novel shape, provided with a movable barb, whereby the barb will normally remain close to the arrowhead and rearwardly of the point thereof but, after the arrowhead penetrates, the barb will assume a position whereby its longitudinal axis forms an acute angle with the longitudinal axis of the head. The barb will assume this angular position during the initial struggles of the fish, so that the latter cannot free itself from the head.

The problems of providing arrowheads adapted for flight through air only are radically different from those arising in the provision of arrowheads adapted to first pass through air, then through water and finally enter a fish. An arrowhead may be satisfactory for air flight and even for movement through water, but because of the scaly surface of fish, many arrowheads are wholly unsuited for penetration between the scales. The arrowhead of this invention is adapted to penetrate between the scales of the fish and enter the fish body sufficiently for the barb to come into play as will be more fully detailed.

Other objects and advantages of this invention will be apparent during the course of the following detailed description of the invention taken in connection with the drawing forming a part of this disclosure and in which drawing:

Figure 1 is a plan view of the complete arrow, including head, shaft, and connecting portions.

Figure 2 is a plan view of the head portion, with a movable barb in a raised portion (in dots and dashes) and a lowered position in dots and dashes.

Figure 3 is a rear or bow end view of the shaft portion.

Figure 4 is a vertical transverse section on the ine 4—4 of Figure 2.

Figure 5 is a vertical transverse section of the

2

connecting portion and head of Figures 1 and 6.

Figure 6 is a longitudinal section of the connecting portion with ends of the head and shaft portions carried thereby.

Figure 7 illustrates the movable connection of the barb and head portion of Figure 2.

Figure 8 is a plan view, on an enlarged scale, of the movable barb of Figure 2.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of the invention and wherein similar reference characters designate corresponding parts throughout the several views, the shaft portion is designated as 10, the head portion as 11 and the head and shaft connecting portion as 12.

The shaft portion 10 may be of a suitable lightweight material, such as aluminum, formed into a cylindrical rod of a length of twenty-four to thirty inches, for example. However, the length may vary within reasonable limits. The rear section 13 of the shaft portion 10 may be provided with a suitable notch or slot 14 for the bowstring and, spaced from the notch 14, is a suitable means 15 to secure a flexible member 16 to the shaft portion 10. This means 15 may be a U-shaped member with the legs thereof secured to the shaft portion 10 in any approved way as, for example, extending into the body of the shaft portion and held thereby. The bight portion of the U-shaped member extends outwardly of the shaft portion so that one end of the flexible member 16, which is preferably a cord, may be secured thereto, as by tying. The head end face 17 of the shaft portion is preferably flat. Extending through the head end section of the shaft portion may be a perforation 18 to accommodate means to secure the shaft portion to the connecting portion 12.

The head portion 11 which is also known as the arrowhead portion, may be of stainless steel, bronze or brass, for example. It includes a substantially clylindrical rear end section 20 and a generally conical, but partly flattened longitudinally, forward end section 21, so that there is provided a first flattened face 22 extending from a point 23 (well rearwardly of the forward end of the head portion 11) to the base of a shoulder 24, which is intermediate the ends of the head portion 11. This face 22 and the shoulder wall provides a recess for the barb to be subsequently described. This shoulder 24 is provided with a slot 25 preferably extending longitudinally of the head portion 10 and each section of the shoulder thus divided is provided with a pivot pin-accommodating perforation with their

axes normal to the longitudinal axis of the head portion 10. It will be noted in Figure 7 that the juncture of the first flattened face 22 and the base of the shoulder 24 is arcuate for a purpose later detailed. From the top of this shoulder to the point 26 of the head portion 10 is a second flattened face 27. This face is, of course, broadest at the shoulder end thereof and its edges converge to the point 26. This construction has been found particularly advantageous in the use of the arrow under water. The rear end face 36 of the head portion 11 is preferably flat, for abutment with the flat head end face 17 of the shaft portion 10.

Movably associated with the head portion 11 is the barb 30. This barb may be of steel, as stainless steel, and includes a shoulder-attached end section 31, pointed end section 32 and hook 33 intermediate and projecting outwardly from the sections 31 and 32. The size and general shape of the barb 30 is such that its shoulder-attached end section 31 (which is a tongue, less in width than the width of the section 32) will be accommodated within the recess defined by the first flattened face 21 and shoulder 24, with the point portion of the hook 33 normally resting upon the face 21. It should be noted that the hook 33 presents from its tip or point to its juncture with the main sections 31 and 32 a fairly long, curved surface, preferably achieved by cutting into or slitting obliquely the material at the juncture of the sections 31 and 32 and upsetting the material to form the hook. Thus there is provided a recess adjacent the hook, plus the relatively long curved surface mentioned, whereby, when the barb is positioned, as in its full line position as in Figure 7, the barb will hold the fish securely after the arrow or head portion penetrates it. A suitable pivot pin 34 may be employed to movably (pivotally) connect barb 30 with the shoulder 24, by extending through a perforation at the shoulder-attaching end 31 of the barb and through the perforations in the shoulder 24, this end of the barb extending, of course, into the slot 25. The curved juncture or connection of the first flattened face 22 and the base of the shoulder 24 coupled with an angular edge at the extreme part of the shoulder-attaching end 31 of the barb 30, forming a point permits ready oscillating of the barb yet does not permit the free end of the barb to swing too far toward the point 26 (when, for example the stop means subsequently described may become worn) since this edge will contact the adjacent surface of the head portion 11 and thus limit movement of the barb in one direction as may be seen in Figure 7. A perforation 35 extending transversely through the portion 11 provides for a pin for connection of the portion 11 to the portion 12 to be next described.

The shaft and shaft connecting portion 12 may be a tubular length of suitable material, as copper, with a bore to snugly accommodate the extreme forward or head end of the shaft portion and the extreme rear end of the head portion 11, with the faces 17 and 36 in abutment and suitable pins extending through the perforations 18 and 35 and corresponding perforations in the portion 12. This portion 12 is found to obviate a difficulty encountered in coupling the shaft and head portions, since with other coupling means, the head portion was inclined to break from the shaft portion.

The operator may shoot the novel arrow in the conventional way, by means of a suitable bow (no specially built bow is necessary). When shot, the barb 30 is within its recess mentioned. Striking the water at, say, a 30° angle with respect to the water surface, the arrow will travel, a foot below the surface, for a distance of six to eight feet. Being shot at a 75° angle with respect to the water surface, the arrow is effective at a depth of about 3½ feet. After penetration, the initial struggles of the fish cause the barb 30 to take a position such as shown in dot-and-dashes in Figure 3, or in full lines in Figure 7, causing the barb as a whole plus its hook 33 to hold the fish against coming off the head section 11.

It should be noted that the point 26 of the head portion 11 is not movable, hence there is no possibility of its being deflected with respect to the shaft portion 10, but the barb 30 is movable (being limited by the wider section 31 abutting the top of the shoulder 24, as the barb 30 reaches a position somewhat less than right angular with respect to the longitudinal axis of the head portion 11 and limited also by the point heretofore mentioned). The movement of the pointed end 32 of the barb is, as is apparent, in an arc up to substantially 120°, but the hook 33 is effective at any angle.

Various changes may be made to the form of the invention herein shown and described without departing from the spirit of the invention or scope of the claim.

What I claim is:

An arrowhead comprising a substantially cylindrical rear end section, a forward end section rigid therewith and provided with a point, two flattened faces intermediate the length of said arrowhead, a shoulder intermediate said faces, one flattened face extending from the base of the shoulder to said substantially cylindrical rear end section and defining, with said shoulder, a recess, and the other face extending from adjacent the top of the shoulder to said point, a barb having an outer pointed end section, a shoulder-attached end section, and a hook extending intermediate said end sections, said barb being normally disposed within said recess, with said hook resting upon the flat face of said recess, and means pivotally connecting said barb to said shoulder.

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