

Feb. 6, 1951

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2,540,079

ARROW CONSTRUCTION

Filed Dec. 30, 1946

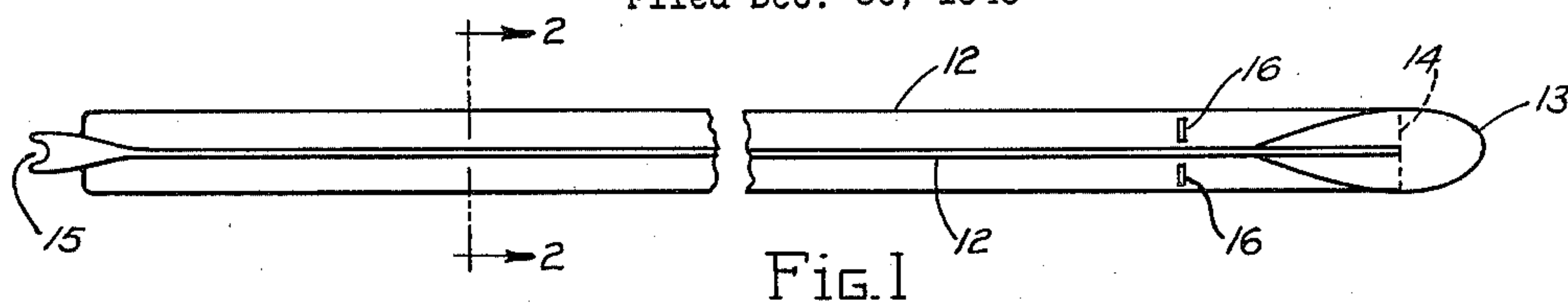


FIG. 1

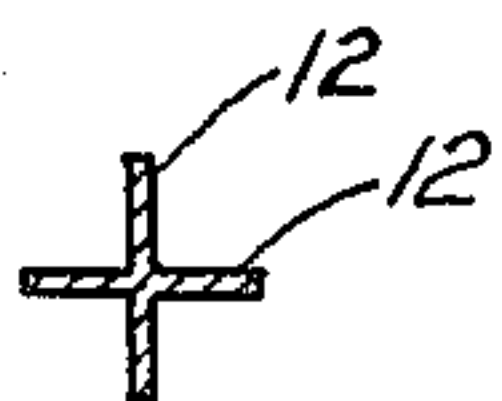


FIG. 2

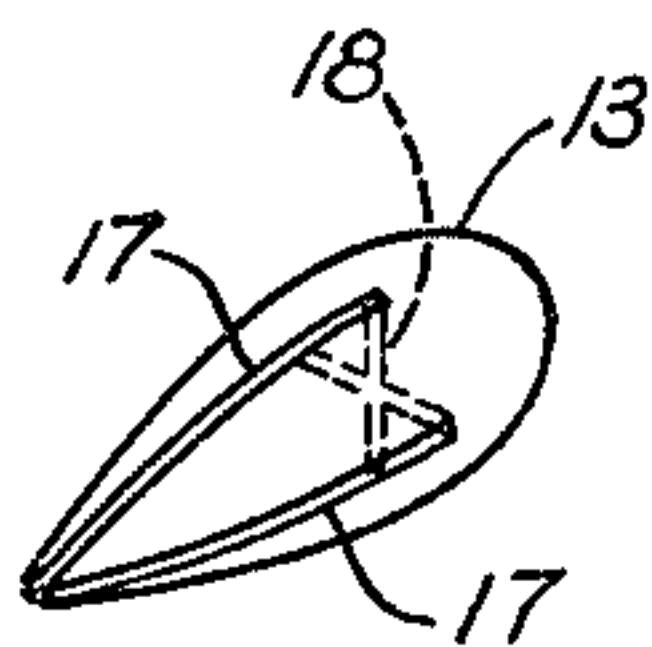


FIG. 3

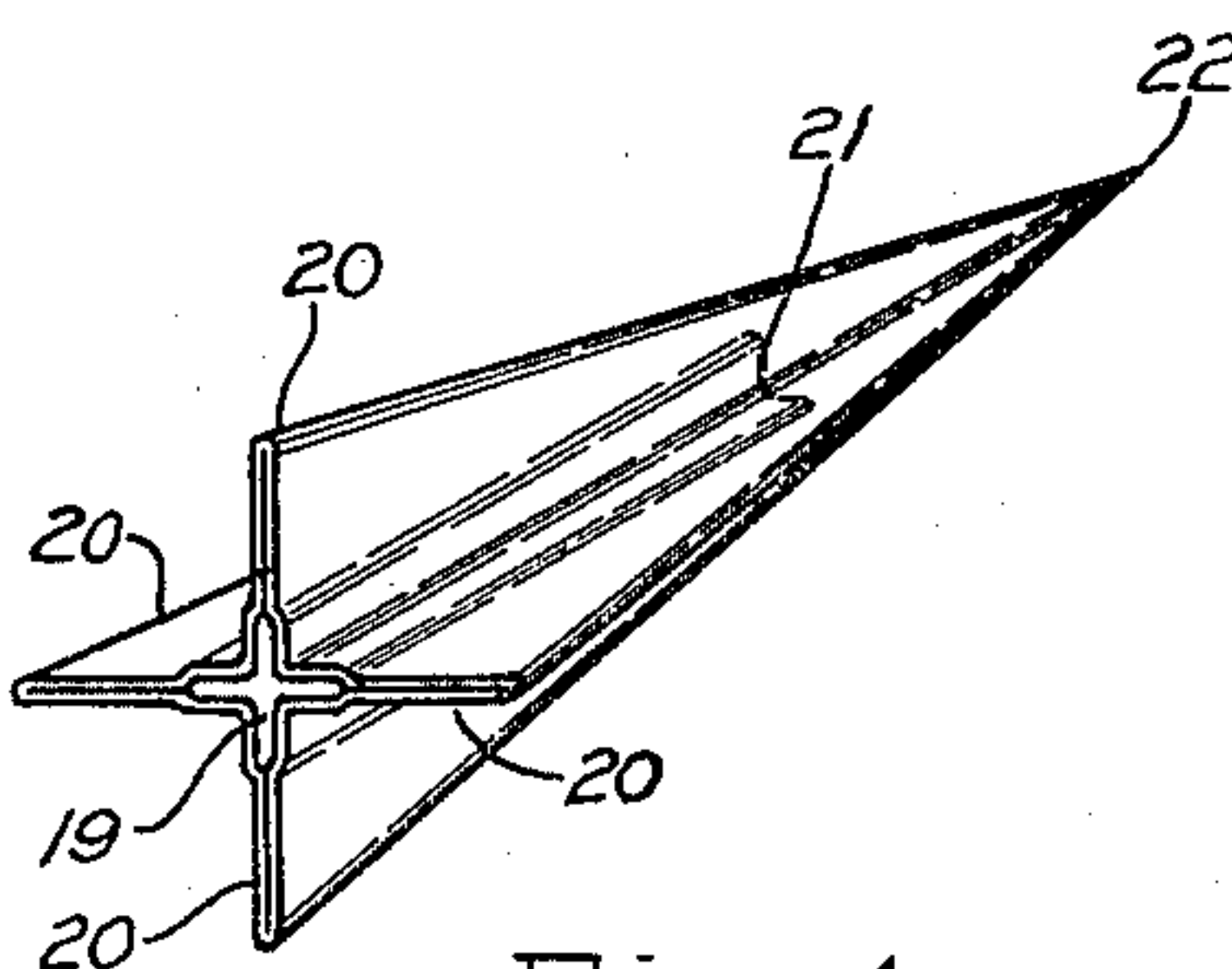


FIG. 4

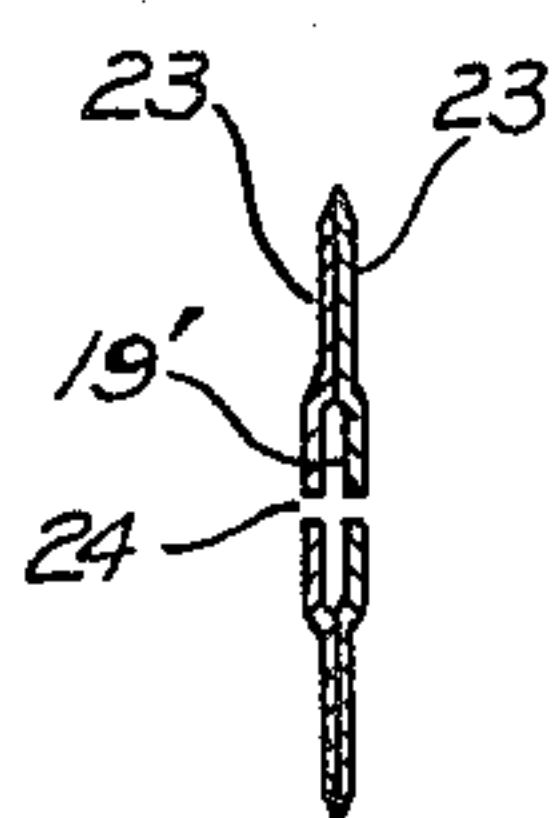


FIG. 6

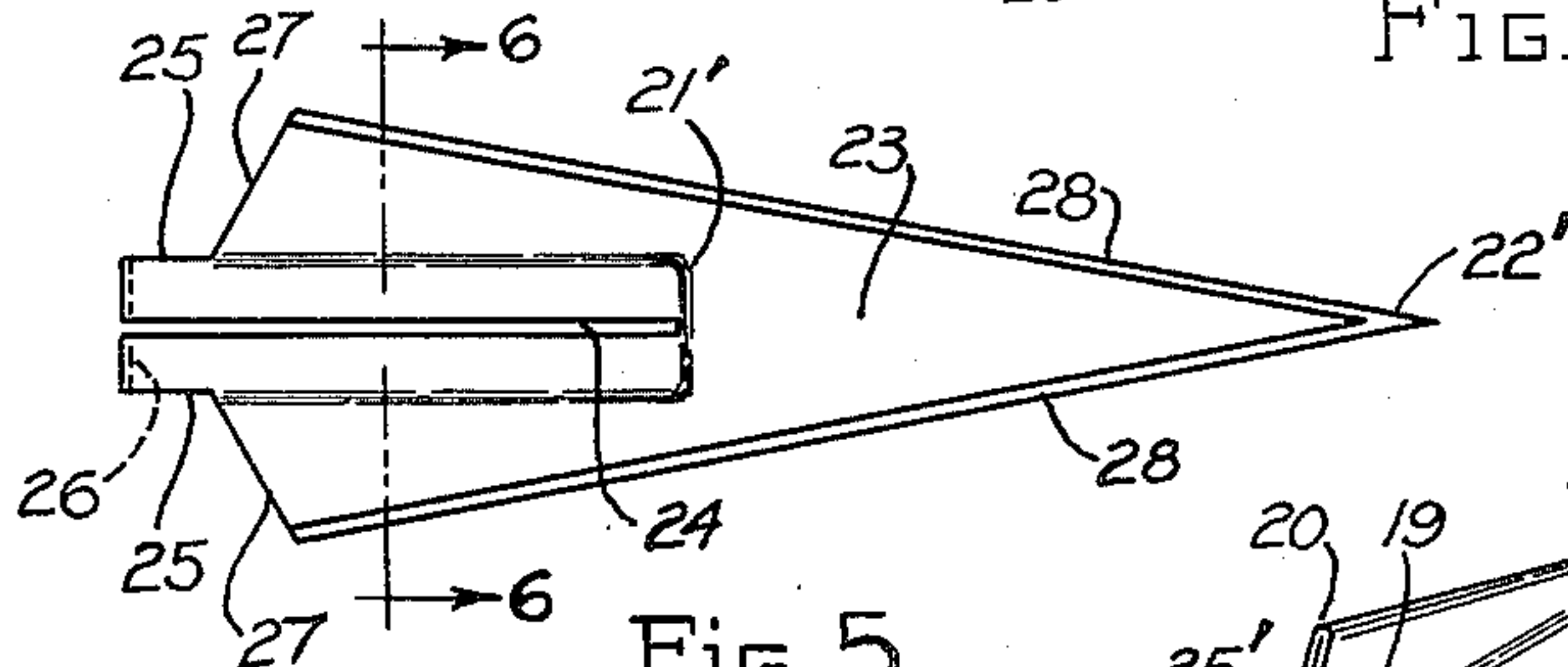


FIG. 5

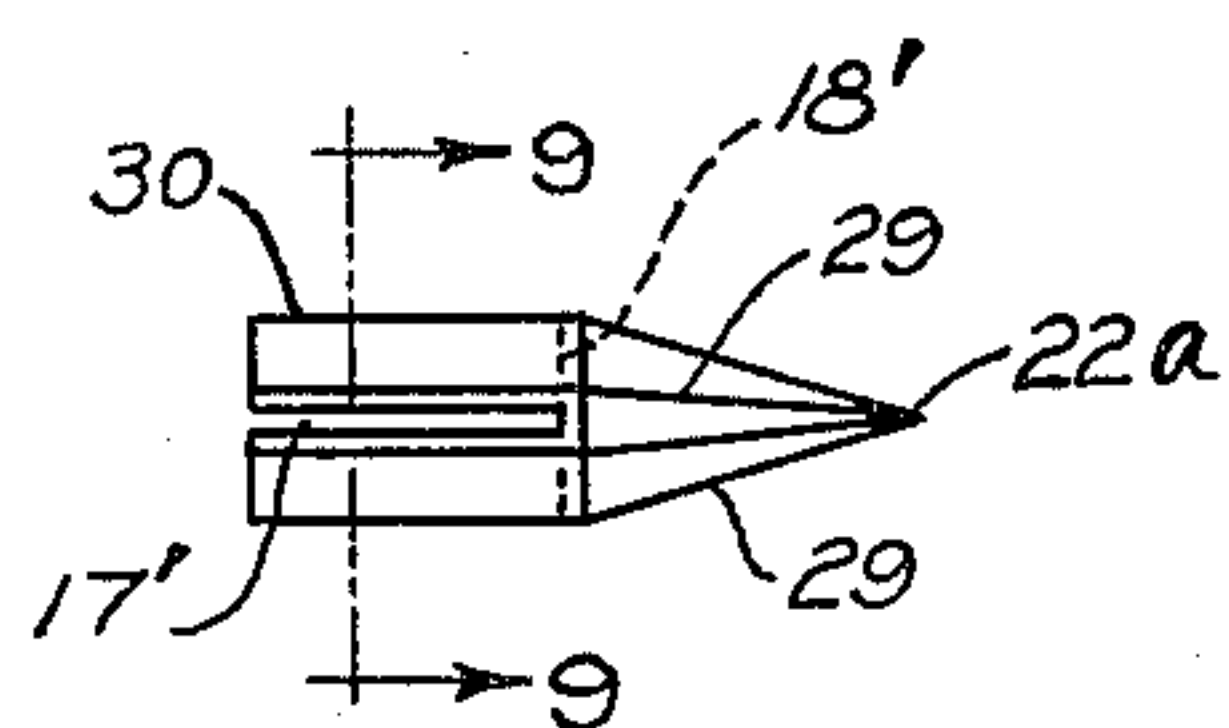


FIG. 8

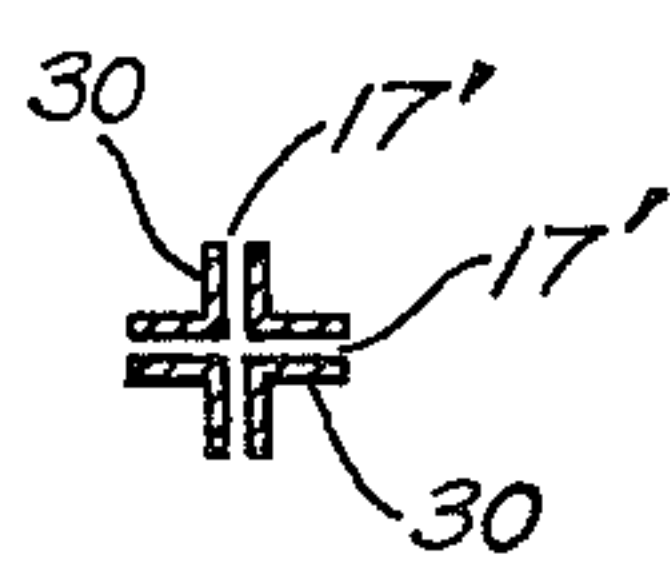


FIG. 9

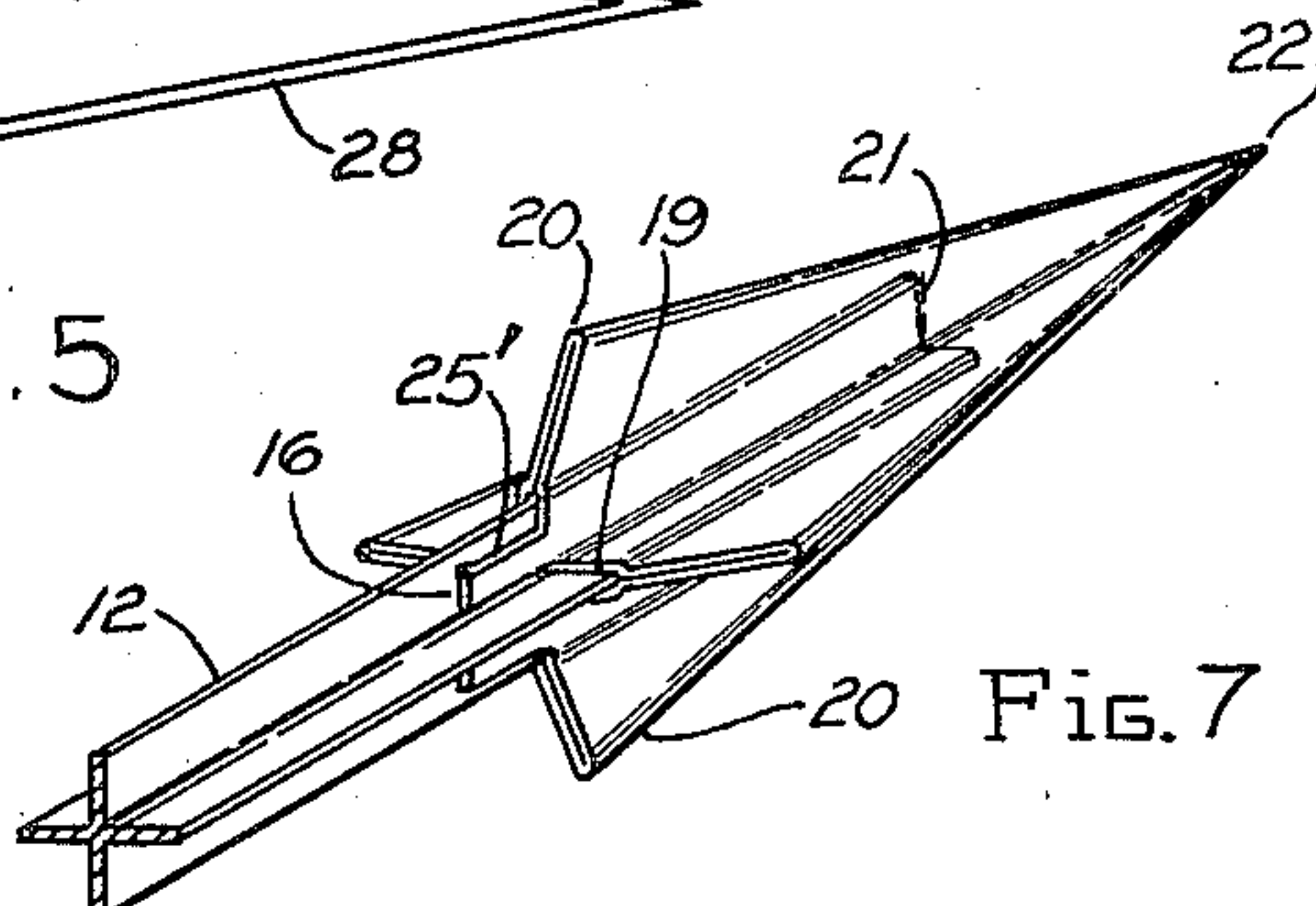


FIG. 7

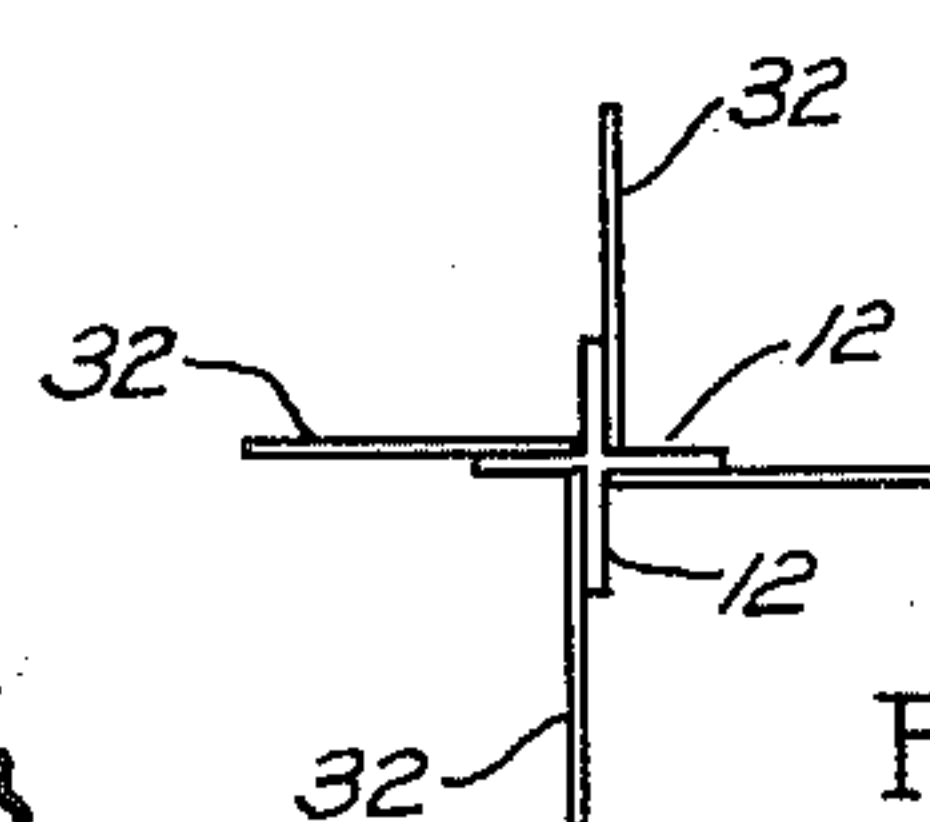


FIG. 11

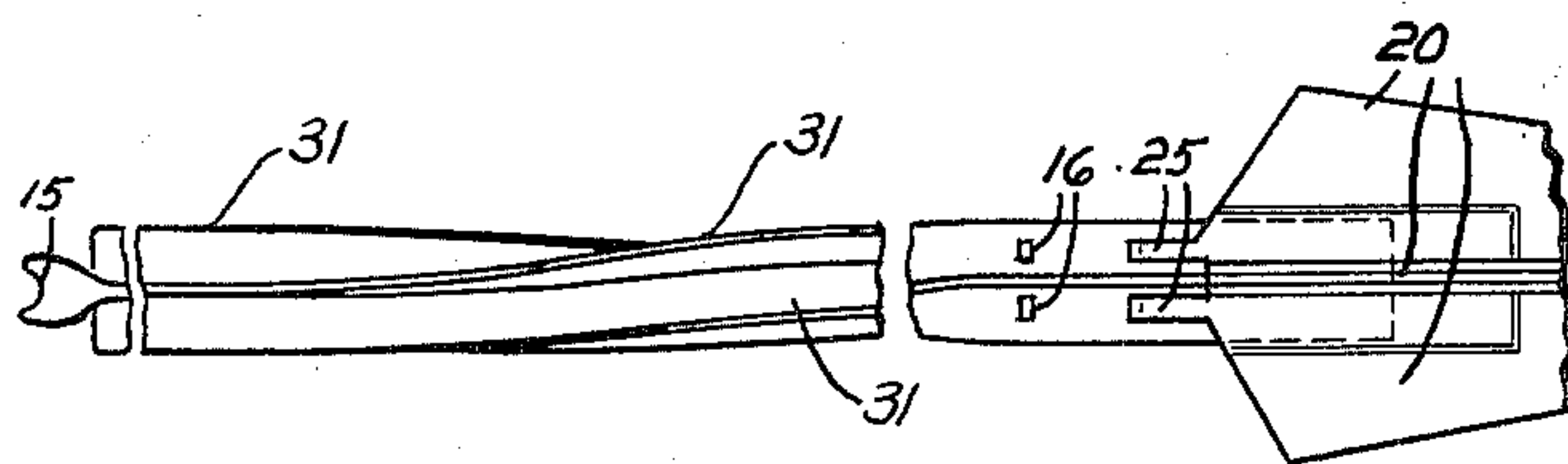


FIG. 10

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2,540,079

ARROW CONSTRUCTION

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Application December 30, 1946, Serial No. 719,218

4 Claims. (Cl. 273—106.5)

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My invention relates to arrow construction wherein the shaft provides definitely improved flight characteristics and includes the use of detachable heads of various forms, that may be changed at will by the archer, which are suitable for use in hunting large and small game and for target practice.

One of the primary advantages of this invention lies in the simplicity and efficiency of the completed article wherein the shaft is of such shape as to provide stability in flight without the use of fletching at the tail end of the arrow.

It is a feature of the present invention that my arrow is formed of two general parts and this construction keeps down cost of manufacture. Another advantage lies in the manner of fastening the two parts together whereby all forms of heads suitable to large and small game hunting and for target shooting can be quickly and securely attached and detached from the arrow shaft at will of the archer for the particular use at hand.

Another object of this invention is to provide an arrow comprising a shaft having a plurality of thin, flat, spaced apart vanes extending longitudinally thereof, and a readily attachable and detachable arrow head for said shaft, said arrow head having vane receiving recesses extending from the rearmost end thereof forwardly said recesses being shaped and positioned so as to fit over and receive and frictionally engage the vanes on said shaft to thereby detachably secure said arrow head to said shaft.

Another object is to provide an arrow shaft having a plurality of thin, flat, spaced apart longitudinally extending vanes that distribute the material in said shaft in a manner well adapted to secure a shaft of great strength in proportion to the amount of material used therein.

Other advantages will appear, express or implied, from the following description of the illustrative embodiments of the present invention.

In the drawing:

Fig. 1 is a plan view of an arrow with one form of detachable head shown fastened upon the forward end of the arrow shaft.

Fig. 2 is a view in cross section of the arrow shaft taken on line 2—2 of Fig. 1.

Fig. 3 is a perspective view of a streamline shaped detachable arrow head.

Fig. 4 is a perspective view of another form of detachable arrow head which is formed from a single cone shaped piece of sheet material.

Fig. 5 is a side view of an arrow head formed from two similarly shaped pieces of flat material.

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Fig. 6 is a view in cross section taken on line 6—6 in Fig. 5.

Fig. 7 is a perspective view of an arrow head and fragment of a shaft said arrow head being formed from a single piece of material and having locking lugs formed thereon.

Fig. 8 is a side view of an arrow head formed from extruded or drawn material and having means for attaching the same to an arrow shaft similar to the shaft shown in Fig. 1.

Fig. 9 is a view in cross section of the arrow head shown in Fig. 8 said view being taken along line 9—9 in Fig. 8.

Figure 10 is a fragmentary view of an arrow shaft showing the use of spiral flutes or vanes thereon and showing a fragment of an arrow head in a partly withdrawn position relative to the shaft.

Figure 11 is an end view showing the manner in which fletching may be attached to the fluting or vanes of this arrow shaft.

Similar numerals refer to similar parts throughout the several views.

Referring to Fig. 1 numeral 12 indicates one of the several vanes or wings or planes, being either straight or spiral, which make up the arrow shaft. These vanes or wings or flutings being made purposely to serve as aerodynamic stabilizers and supports to hold the arrow more accurately on its course and to sustain longer flight. This arrow shaft may be economically produced by extrusion or drawing the material through a die as in the case of light weight metals or plastic materials and simply cut to length having the forward end of the shaft cut at right angle to the longitudinal center line as indicated at 14, Fig. 1, and having a bow string notch or slot 15 at the rear end of said shaft. It will be seen that the vanes or fluting of the shaft, due to their stabilizing and aerodynamic qualities, eliminates the necessity for feathers or fletching at the tail but that if, for any reason, the fletching 32, Fig. 11, may be desired the vanes provide a very convenient surface upon which the fletching may be attached. Spiral flutes or vanes 31 are shown in Fig. 10.

It will be readily understood, by those skilled in the art, that the various forms of heads as shown by Figures 3, 4, 5, 7 and 8 in the drawing represent only a few of the possible shapes of arrow head but that each has for its basic principle a slot, series of slots or socket so formed that each may be readily, securely and interchangeably mounted on the arrow shaft without departing from the basic principles of my invention. The part 13 is an arrow tip or head

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of streamline form having slots 17, see Figs. 1 and 3, formed in the rearward portion thereof to the depth of the maximum diameter, or thereabout, as indicated by dash lines 18. Said slots 17 are made slightly narrower than the thickness of the vanes 12 so that the tail of the arrow head will be sprung with sufficient force to grip the arrow shaft securely when inserting the shaft into slots 17.

Fig. 4 shows an arrow head which has been formed from a single cone shaped piece of material wherein the vanes or wings 20 are formed by collapsing said cone inwardly at a number of places corresponding to the number of flutes 12 used on the arrow shaft. In completing the wings 20 the arrow shaft socket 19 is formed. The forward end of the shaft socket 19 terminates at a location 21 well toward the arrow point 22 but far enough from the point 22 so that the socket 19 is entirely within the width of the vanes 20 of the arrow head. When the arrow head of Fig. 4 is placed on the shaft the vanes 12 and 20 are in common planes.

Fig. 5 shows an arrow head formed of two flat sheets of material 23 whose edges come to a point 22' and are suitably fastened together forming a socket 19' when the two halves 23 are assembled. Resilient fingers 25 in the form of extensions at the sides of socket 19' have outer ends that are bent to form hooks 26 which engage in holes or depressions 16 made in the arrow shaft at a suitable distance from the forward end thereof so as to lock the arrow head to the shaft thus preventing separation of these elements. Rear edges 27 of the pieces 23 may be at right angles to the longitudinal axis of the arrow or may be sloped downwardly or rearwardly therefrom without affecting the utility of socket 19' or spring fingers 25. The outer edges of the arrow head pieces 23 may be sharpened as at 28. Slots 24 are provided to permit such flutes 12 of the arrow shaft, as are not used in socket 19, to enter the head in assembling the head on the shaft. Socket 19' terminates at 21'.

Fig. 7 shows an arrow head formed as in Fig. 4 but in addition to the features of that head the head shown in Fig. 7 has spring fingers 25' provided with hook members to engage in the slots or depressions 16 of the arrow shaft in the same manner and for the same purpose as described in connection with Fig. 5.

Still another form of head embodying principles of fastening to the arrow shaft similar to those of Fig. 3 is shown in Fig. 8. The arrow head shown in Fig. 8 is formed of suitable extruded or drawn material or is die cast. It has a number of flutes or vanes 30 corresponding to the number of vanes 12 on the arrow shaft. For example, pieces of such extruded material are cut to length suitable for an arrow head and brought to a point 22a. Here again, as in Fig. 3, the rearward portion of the arrow head has slots 17' terminating at line 18'. Slots 17' being made narrower than the thickness of the arrow shaft flutes 12 thus giving the arrow head a natural gripping force when it is pressed onto the shaft.

Thus it will be understood, from the foregoing descriptions, by those skilled in the art, that my invention effects a considerable saving in

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the cost of the manufacture of arrows, provides an arrow of greater stability and accuracy while at the same time providing a wide variety of head shapes and sizes that can be readily changed at will by the archer for use on large or small game and for target shooting.

Having thus revealed this invention, I claim as new and desire to secure the following combinations and elements, or equivalents thereof by Letters Patent of the United States.

I claim:

1. An arrow comprising a shaft having a plurality of thin, flat vanes extending longitudinally and spirally thereof, whereby when the shaft is in flight the reaction of the air on said vanes will impart rotation to said shaft and tend to keep said shaft on a straight course; and an arrow head carried by said shaft.

2. An arrow comprising a shaft having thin, flat, radial vanes extending longitudinally and spirally thereof, whereby when the shaft is in flight the reaction of the air on said vanes will impart rotation to said shaft and tend to keep said shaft on a straight course; an arrow head having in its rear end portion an axial receptacle corresponding in shape to the cross sectional shape of said shaft and adapted to fit over said shaft and the vanes thereon; and vanes on said arrow head in planes coinciding with the vanes over which they fit, the vanes on said arrow head extending outwardly beyond the vanes on said shaft at the rear end of said arrow head and being convergently tapered to the point of said arrow head.

3. An arrow comprising a shaft having thin, flat, radial vanes extending from the front end thereof rearwardly; a notch in the flat side of at least one of said vanes; an arrow head formed of thin sheet material and having in its rear end portion an axial receptacle adapted to fit over said shaft and the vanes thereon; and at least one resilient catch member carried by said arrow head extending rearwardly therefrom and adapted to lie flat on the surface of a notched vane and engage within said notch in the vane of said shaft to thereby secure the arrow head to the shaft.

4. An arrow comprising a shaft having a plurality of thin flat vanes extending longitudinally and spirally thereof, whereby when the shaft is in flight the reaction of the air on said vanes will impart rotation to said shaft and tend to keep said shaft on a straight course; a string receiving notch at the rear end of said shaft; and an arrow head engaging notch in at least one of said vanes near the forward end of said shaft.

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