Oct. 25, 1960 A. J. BARNA 2,957,470

BOW

Filed June 19, 1958 2 Sheets-Sheet 1

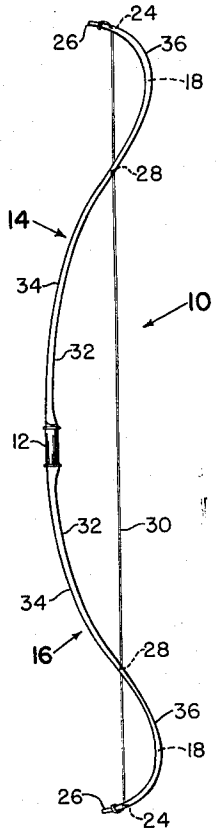


FIG. 1

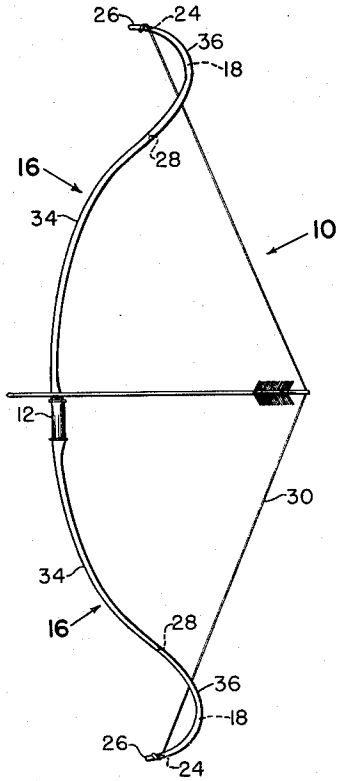


FIG. 2

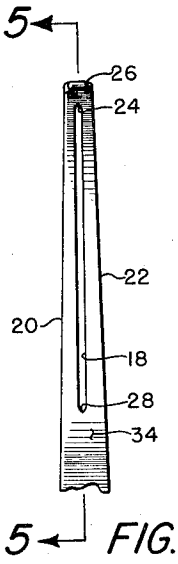


FIG. 3

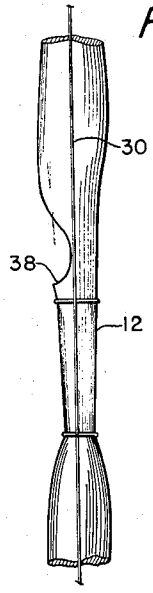


FIG. 4

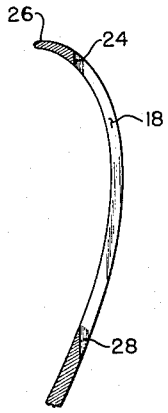


FIG. 5

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BOW

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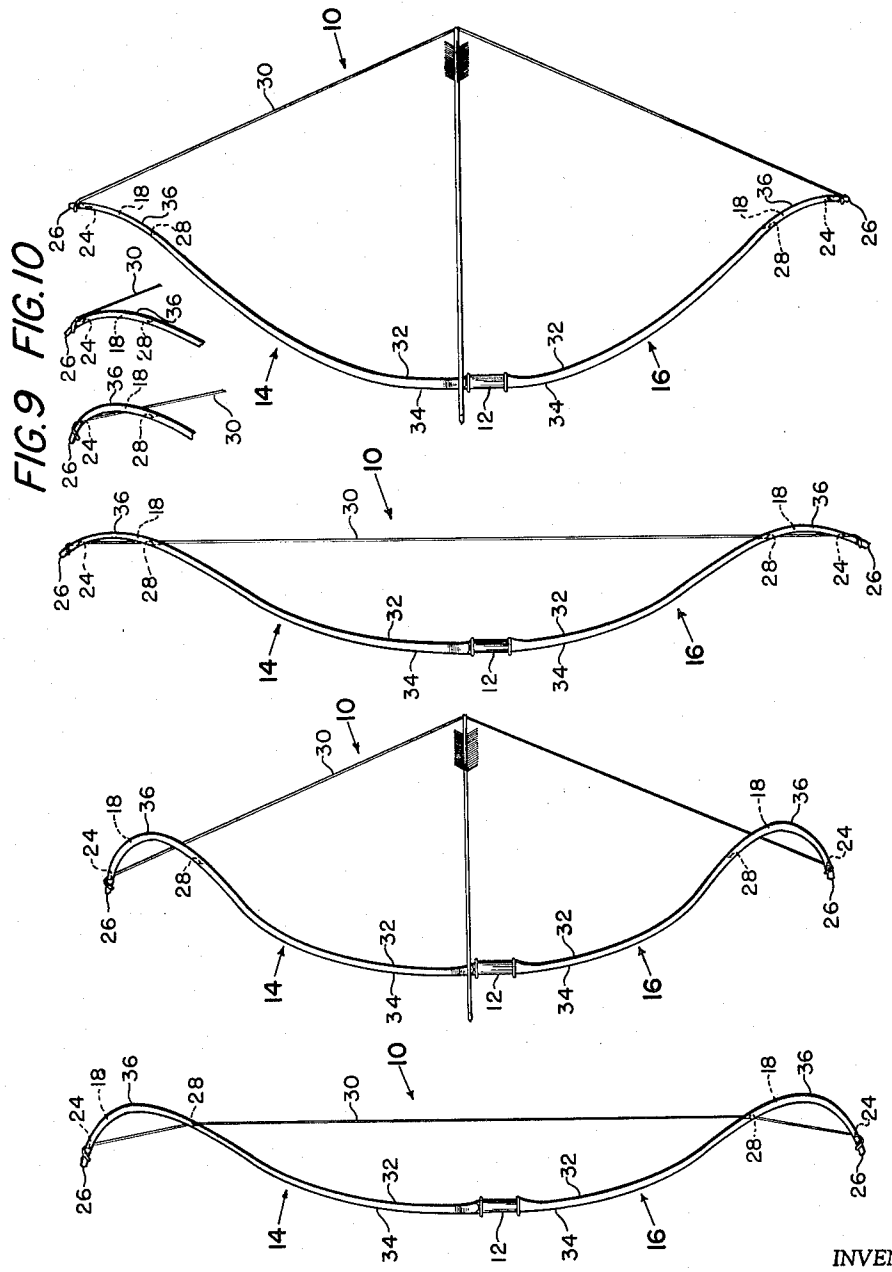


FIG. 9 FIG. 10 FIG. 11

FIG. 8

FIG. 7

FIG. 6

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2,957,470

BOW

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7 Claims. (Cl. 124—24)

This invention relates to a bow and more particularly to a bow having increased power to cast an arrow.

The conventional bows most commonly used in the United States are the conventional long bow which has a slight curvature inward in the undrawn position and which increases in curvature as the bow string is drawn. With this type of bow the force or pull required by the archer is at a minimum during the initial stages of the pull and increases to a maximum when the string is fully drawn. These pulling forces required are in effect opposite to the leverage present in the human body. At the initial stages of the pull, since the bow string is adjacent the handle, the archer's hands are adjacent each other and maximum leverage is available. When the bow string is fully drawn, however, the archer's hands are widely separated and minimum leverage is available.

There are also bows, used many centuries ago by the Turks, which have their limbs first curving slightly backward toward the archer and then the tips or end portions curving forwardly away from the archer. This type of bow is noted for its high casting power in comparison with the long bow. For convenience this latter type bow will be called the Turkish bow. The string on the Turkish bow is secured to the end portions of the limbs and usually rests on the forwardly curved portion. As the bow is drawn the limb end portions flex away from each other and toward the archer. In its undrawn position, because of the forwardly curved end portions, the bow string is spaced at a greater distance from the handle than the conventional long bow. This bracing height or spacing of the bow string from the handle again requires the archer to exert maximum pull at a point where minimum body leverage is available.

With my invention I provide a bow that combines the advantages of the long bow and the Turkish bow. A bow having the general shape of a Turkish bow, that is, having limbs which curve slightly toward the archer and then away from the archer, is provided with a pair of longitudinal slots adjacent the limb end portions. The bow string, which is attached to the limb end portions, extends through both of the slots. The bow string in an undrawn position, because of the slots, rests adjacent the handle. As the bow is drawn, the bow string pivots and the portions positioned in the slots move outwardly therefrom. My bow thereby provides additional casting power for the same distance between the bowstring in a drawn position and the handle when compared with conventional long bows or with Turkish bows.

Accordingly, the principal object of this invention is to provide a bow having increased casting power in a full drawn position.

Another object of my invention is to provide a bow having a pair of longitudinal slots in its limb portions.

A further object of this invention is to provide a bow whose limbs flex forwardly during the initial portion of the draw and rearwardly during the final portion of the draw.

Still another object is to provide a bow having longitudinal slots into which the string returns as the bow string is released and thereby providing truer flight for the arrow after it leaves the bow string.

These and other objects of this invention will be more clearly understood from the following description and the accompanying drawings in which:

Figure 1 is a view in side elevation of one embodiment of my bow in an undrawn position.

Figure 2 is a view in side elevation of the bow illustrated in Figure 1 in a drawn position with the limb end portions flexing away from the archer.

Figure 3 is a view in front elevation of one of the limb end portions showing the slot in detail.

Figure 4 is an enlarged view in front elevation of the bow handle portion.

Figure 5 is a view in section taken along the line 5—5 in Figure 3 illustrating the slot in side elevation.

Figure 6 is a view similar to Figure 1 illustrating another embodiment of my invention wherein the bow string rests against the lower wall formed by the slots in the limb portions.

Figure 7 is a view in side elevation of the bow illustrated in Figure 6 in a drawn or braced position.

Figure 8 is a view similar to Figure 1 illustrating another embodiment of my invention in an undrawn position.

Figure 9 is a fragmentary view of the limb end portion of the bow of Figure 8 illustrating the forward curvature of the limb end portions during the initial stages of the draw on the bow string.

Figure 10 is similar to Figure 9 and illustrates the rearward curvature of the limb end portions during intermediate stages of the draw on the bow string.

Figure 11 is a view of the bow illustrated in Figure 8 in a fully drawn position.

Referring to the drawings and particularly Figures 1 through 5, there is illustrated an embodiment of my bow generally designated by the numeral **10**. The bow **10** includes a handle portion **12** and a pair of limb portions **14** and **16**. Although the limb portions **14** and **16** are described separately it should be understood that the bow **10** may be constructed of a single piece or, where desired, in separate limb portions suitably secured to the handle portion.

Limbs **14** and **16** each have an elongated slot **18** extending longitudinally therethrough between the limb side walls **20** and **22**. As illustrated in Figure 3 the slot **18** extends substantially along the longitudinal axis of the bow **10** so that equivalent cross sectional areas of the limbs are on opposite sides of the slot. The slot **18** terminates in an upper wall **24**, which for convenience will be called the slot outer wall **24** since it is located in adjacent relation with the bow string securing end portions **26** of limbs **14** and **16**. The slot **18** terminates at its other end in an inner wall **28** in closer proximity with the handle **12** than the outer wall **24**.

A bow string **30** is suitably secured to the limb bow string receiving end portions **26** and in a strung position extends through both of the slots **18**.

In order to more clearly point out the invention the limbs **14** and **16** will be further described as each having a rearwardly curved portion **32** adjacent the handle portion **12**. By rearwardly it is meant toward the archer and away from the front face **34** of the bow. The limbs **14** and **16** also have forwardly curved intermediate portions **36** which curve away from the archer and toward the front face of the bow **10**. The intermediate portions **36** terminate in the bow string receiving end portions **26** already described. The handle **12** has a grooved portion **38** which functions as an aiming guide and is illustrated in Figure 4.

In the embodiment of my invention illustrated in Fig-

ures 1 and 2 the limb intermediate portions **36** are preferably constructed or formed of material capable of withstanding high bending stresses. In the undrawn position the intermediate portions are only under the bending stress required to keep the bow string **30** taut. As the archer draws the bow string **30**, the limb intermediate portions are flexed forwardly away from the archer as illustrated in Figure 2. Portions of the bow string **30** remain in the slots **18** even when the bow string **30** is fully drawn and a majority of the bending stress in the bow is taken by the limb intermediate portions **36**. Thus it will be seen in this embodiment that the bow string **30** remains adjacent the handle **12** in an undrawn position, and in a fully drawn position portions of the bow string **30** remain within the slots **18** so that the slots **18** serve as guides for the bow string **30** upon its release by the archer.

In the embodiment of my invention illustrated in Figures 6 and 7 the bow string **30**, in an undrawn position, rests on the inner wall **28** of slots **18**. With this arrangement after the bow string **30** is released from its fully drawn position, it will strike both of the slot inner walls **28** with a rebounding action to thereby positively release the arrow along a true path. In this embodiment the limb intermediate portions **36** flex forwardly as the bow is braced similar to the embodiment illustrated in Figures 1 and 2.

The embodiment of my invention illustrated in Figures 8 through 10 also has intermediate limb portions **36** that are curved forwardly. The do not, however, have as sharp a curve as the previous embodiments and are preferably not constructed or formed of material capable of withstanding as high bending stresses. As in the other embodiments, portions of the bow string **30** extend through the slots **18** and the bow string, in an undrawn position, rests adjacent the handle **12**. During the initial stages of the bow string draw the limb intermediate portions **36** flex forwardly and away from the archer (Fig. 9). As the bow string progresses rearwardly during the intermediate stages of the draw the angle of the bow string relative to the limb intermediate portions **36** is such that the intermediate portions **36** flex backwardly toward the archer (Fig. 10) and progress backwardly until fully drawn (Fig. 11). With this arrangement the initial stages of the draw require the greatest pulling force by the archer because the limb intermediate portions flex away from the archer and the subsequent stages of the draw require less pulling force. This sequence of pulling forces required of the archer compares more favorably with the leverage available in the human body and yet the kinetic energy required for high casting is present when the bow string is fully drawn.

While I have shown and described in some detail in the foregoing specification several embodiments of my invention, it will be understood that these details are illustrative only and for the purpose of making the invention more clear, and that I do not intend to indicate that my invention is limited to such details or any of them, save insofar as they are included within the terms of the following claims in which it is my intention to claim all novelty inherent in the invention as broadly as possible in view of the prior art.

I claim:

1. A bow having a handle portion and recurved limb portions, said limb portions each having an elongated slot extending lengthwise thereof, each of said slots terminating at one end adjacent the respective ends of said limbs, and a string extending through both of said slots and connected to said limb end portions, said limb end portions constructed and arranged to flex forwardly during the initial drawing of said string.

2. A bow having a handle portion and limb portions, said limb portions having forwardly curved end portions, said forwardly curved end portions each having an elongated slot extending lengthwise thereof, said slots extending substantially the entire length of said forwardly curved end portion, and a string extending through both of said slots and connecting said limb end portions, said limb forwardly curved end portions constructed and arranged to flex forwardly during the initial drawing of said string.

3. A bow having a handle portion, a pair of limb portions extending from said handle portion, said limb portions each having a rearwardly curved portion adjacent said handle portion, a forwardly curved intermediate portion terminating in a string retaining end portion, said limb portions having an elongated slot extending longitudinally thereof, and a string connected to said string retaining end portions and extending through both of said slots, said slots forming longitudinal passageways for said string so that in an undrawn position said string extends between said handle portion and said limb forwardly curved intermediate portions, said limb forwardly curved intermediate portions constructed and arranged to flex forwardly during the initial drawing of said string.

4. A bow having a handle portion, a pair of limb portions extending from said handle portion, said limb portions having a pair of side walls, said limb portions each having a rearwardly curved portion adjacent to said handle portion and a forwardly curved intermediate portion terminating in a string retaining end portion, said limb portions each having an elongated slot extending therethrough between said side walls, and a string connected to said string retaining end portions and extending through both of said slots, said slots forming longitudinal passageways for said string so that when said bow is in an undrawn position said string extends between said handle and said limb forwardly curved intermediate portions, said limb forwardly curved intermediate portions constructed and arranged to flex forwardly during the initial drawing of the string.

5. A bow having a handle portion, a pair of limb portions extending from said handle portion, said limb portions having a pair of side wal'ls, said limb portions each having a rearwardly curved portion adjacent said handle portion and a forwardly curved intermediate portion terminating in a string retaining end portion, said limb portions each having an elongated slot extending therethrough between said side walls, and a string connected to said string retaining end portions and extending through both of said slots, said slots forming longitudinal passageways for said string, said limb forwardly curved intermediate portions constructed and arranged to flex forwardly during the initial drawing of said string.

6. A bow as set forth in claim 5 in which said slots each have a wall portion adjacent said handle portion and said string in an undrawn position abuts both of said walls.

7. A bow as set forth in claim 5 in which said bow is constructed and arranged so that said limb intermediate portions flex forwardly during the initial drawing of the string and flex rearwardly during the final drawing of the string.

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