July 15, 1969 D. J. PERKINS 3,455,027

ARCHERY BOW SIGHT

Filed Aug. 30, 1967 2 Sheets-Sheet 1

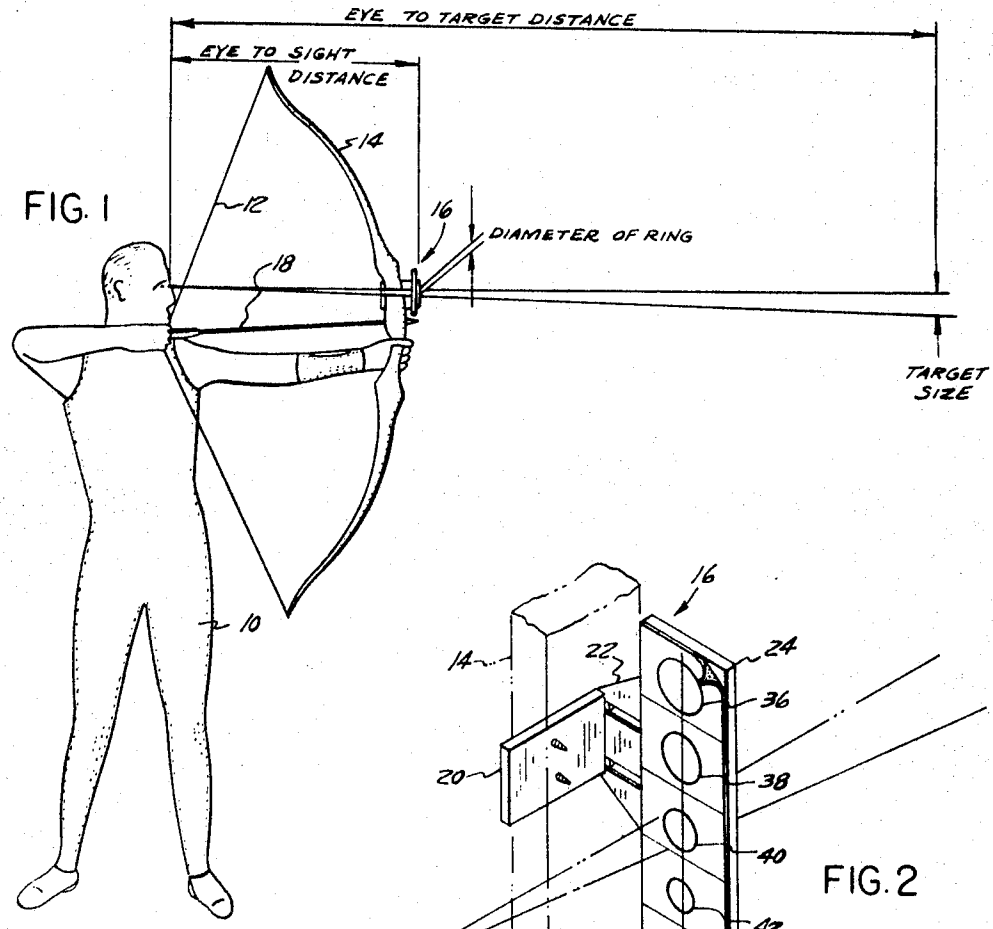


FIG. 1

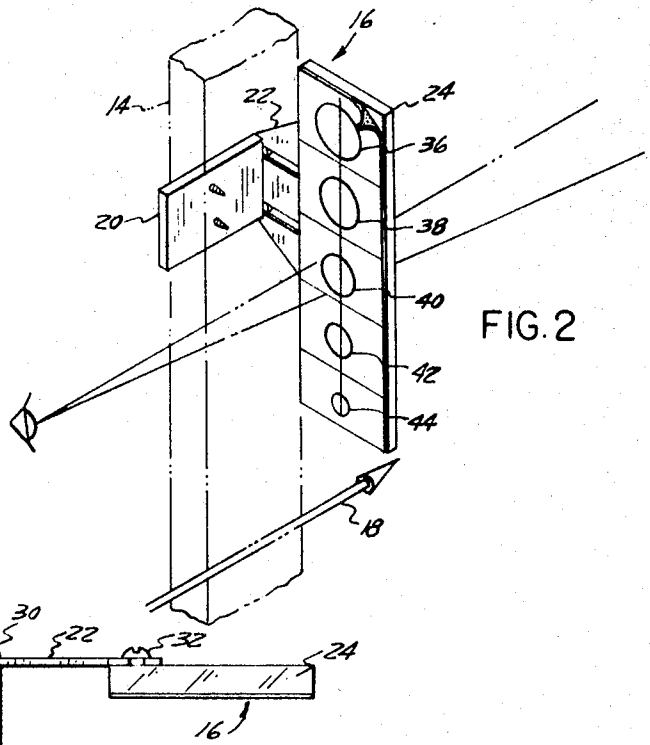
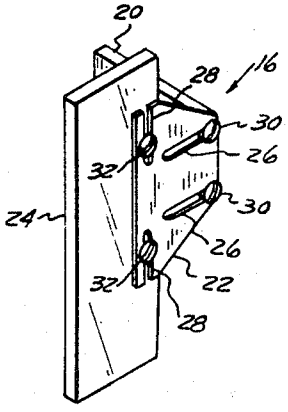


FIG. 2

FIG. 3



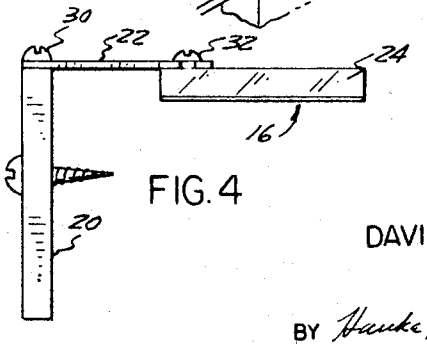


FIG. 4

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ARCHERY BOW SIGHT

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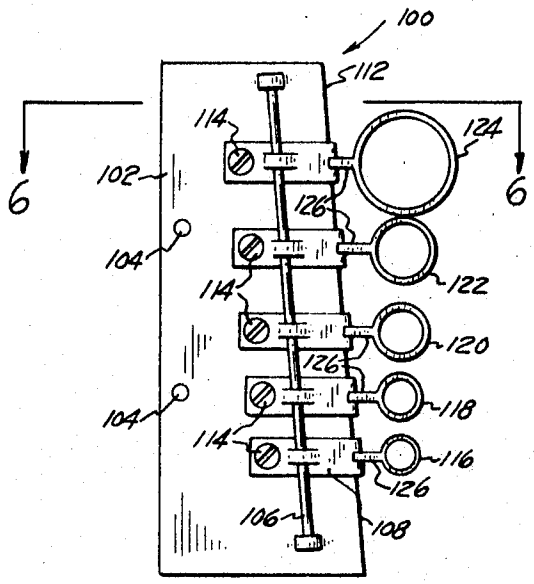


FIG. 5

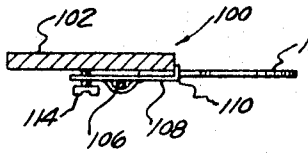


FIG. 6

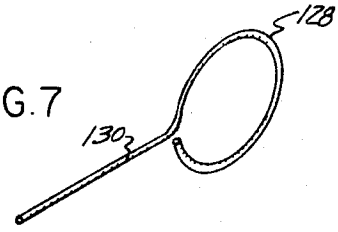


FIG. 7

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ARCHERY BOW SIGHT

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U.S. Cl. 33—46 3 Claims

ABSTRACT OF THE DISCLOSURE

A combination sight and range finder for an archery bow taking the form of a transparent support plate mounted on the bow with a series of vertically aligned sighting rings removably mounted on the support plate. The rings progressively increase in size from the lowermost ring to the uppermost ring and are mounted with a vertical spacing accommodating the particular physical characteristics of the archer.

A second embodiment of the invention employs a series of vertically aligned metal rings resiliently clamped on a mounting plate.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to sighting devices and range finders for archery bows and the like, and more particularly to a range finding device having a plurality of sighting apertures, each having an individual diameter corresponding to a selected target range and removably mounted on a support which is attached to the mid-section of the bow.

Description of the prior art

Numerous devices have been suggested in the prior art for sighting a weapon in order to fire a projectile in a given trajectory. The geometry on which such devices have been founded is well known and based on the concept that the image presented to the eye of a target decreases in size as the distance from the eye to the target increases.

As early as 1852 a British patent disclosed a range finding device for a musket based on this geometry which employed a sighting plate having a series of vertically aligned, progressively reduced sighting apertures. Variations of this concept have been disclosed in subsequent patents. Generally these variations are similar in that the sighting apertures form a permanent part of their sighting plate. Such devices have proven generally satisfactory for rifles and the like where the distance from the users eye to the sight is fixed by the rifle structure and does not substantially vary between individuals. Variations of these rifle range finders have been employed as a means for sighting archery bows. In general such prior art sighting devices have not proven satisfactory for archers. Thus some archers who are expert on a target range where the target distance is known are often unsuccessful in hunting game on unfamiliar terrain where it is extremely difficult to estimate the target distance.

The reason that the range finders of the prior art have not been successfully employed by archers is because they do not permit the archer to adjust the sights to accommodate his own physical characteristics and the bow and arrow characteristics. Where the archer must match the target image with a sighting aperture or similar means on a range finder, the distance from the archer's eye to the sight is a critical factor. Because of the variable physical dimensions between different archers, and various bow strengths, conventional range finders having a fixed setting between the sighting apertures are ineffective.

Thus there are two requirements that must be satisfied by an effective sighting device for an archery bow. First the vertical distance between the sighting apertures must be preset by the archer in order to reflect his own physical characteristics as well as the bow and arrow characteristics. Secondly, the supporting device on which the apertures are mounted must be vertically adjustable relative to the bow in order to reflect a condition requiring the adjustment of all the apertures such as a change in draw length, anchor point or the arrows e.g. wood vs. aluminum arrows. That is to say that a sight which is preset for a particular archer will generally have adjusted from a position which is suitable for an aluminum arrow to a different position to accommodate wooden arrows.

It is the broad purpose of the present invention to provide an automatic sight and range finder for archery bows which permits the archer to adjust the range finder in order to accommodate his own physical characteristics as well as the characteristics of the bow and the arrows.

SUMMARY

The preferred embodiment of the present invention, which will be subsequently described in greater detail, is employed with a hunting bow for shooting game such as deer or the like. A transparent, plastic, support plate is mounted on the mid-section of the bow by a bracket which permits both vertical and horizontal adjustment with respect to the bow. A set of sight rings are mounted on the support plate in a vertical arrangement. The sight rings progressively increase in size from the lowermost ring to the uppermost ring. Each set of sight rings are chosen to accommodate a target of a given size. Thus for hunting deer, a target size of fourteen inches which reflects the breast to back dimensions of a typical white tail deer is chosen.

The sight rings are formed on individual strips of transparent tape having an adhesive backing. This permits the archer to mount the sight rings on the transparent support plate so that the relative distance between the sight rings is associated with his own physical sighting characteristics. The sight rings are preferably each formed on the tape as a circle having a predetermined inner diameter. However, the sight rings could as well take other geometrical shapes such as a triangle, a square, an ellipse or the like which permit the archer to match the image of the target with the ring.

The sight rings are normally pre-set by the archer by trial and error. This is achieved by taking a target of given size and moving away from the target until the target's image fills a given sight ring. The archer then shoots an arrow at the target with the bow held at different elevations until a trajectory is found which intersects the target. By holding the bow at this elevation, the sight ring is secured on the transparent support plate on an axis passing from the eye of the archer to the target. This is done with each of the sight rings. The archer then can hunt and select a target at an unknown distance by raising or lowering the bow until the target fills a particular sight ring. He then knows that he is on target. It is to be understood, of course, that the archer pulls the bow string rearwardly to similarly flex the bow for all ranges. That is to say that the propelling force produced on the arrow by the bow string does not vary for different target ranges. Thus the archer accommodates different ranges primarily by inclining the bow.

The preferred embodiment of the invention, is simply constructed and comprises relatively few components and provides means for achieving a high degree of accuracy which has not heretofore been achieved by archers employing other forms of range finders.

The rings could be die cut from an adhesive backed, colored plastic tape.

Another embodiment of the invention takes the form of a series of steel rings, each independently and resiliently clamped on a mounting plate. The rings are movable relative to one another and individually separable from the mounting plate.

It is therefore an object of the present invention to provide an improved combination sight and range finder for archery bows.

It is another object of the present invention to provide a range finder for archery bows that can be preset to accommodate the individual characteristics of the archer.

A still further object of the present invention is to provide a range finder for archery bows and the like employing a series of vertically aligned sighting apertures mounted on a supporting member so that the relative vertical distance between the apertures can be adjusted.

Another object of the present invention is to provide a range finding device for archery bows comprising a support member mounted on the bow with a series of sighting apertures removably mounted on the support member so that the archer can re-adjust the relative distance between the sighting apertures.

Still another object of the present invention is to provide an automatic range finder for archery bows comprising a transparent support secured to the bow and a series of individually mounted sighting rings each formed on a tape having an adhesive backing to permit the sighting rings to be mounted on the support.

Still further objects and advantages of the present invention will readily occur to one skilled in the art to which the invention pertains upon reference to the following detailed description.

DESCRIPTION OF THE DRAWINGS

The description refers to the accompanying drawings in which like reference characters refer to like parts throughout the several views and in which:

FIGURE 1 is an elevational view of an archer with a conventional archery bow employing a range finder embodying the present invention;

FIGURE 2 is a perspective view of the range finder of FIGURE 1 mounted on the bow;

FIGURE 3 is a view of the preferred range finder as viewed from the side opposite to FIGURE 2 and separated from the bow;

FIGURE 4 is an enlarged plan view of the preferred view of the preferred range finder;

FIGURE 5 illustrates another embodiment of the invention;

FIGURE 6 is a sectional view taken along lines **6—6** of FIGURE 5; and

FIGURE 7 is a perspective view of another form of a preferred sighting ring.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, FIGURE 1 shows an archer **10** drawing a bow string **12** which is secured to the extreme ends of a conventional bow **14**. A range finding device, generally indicated at **16**, is mounted adjacent the arrow rest of the bow **14** and enables the archer **10** by raising or lowering the bow to launch an arrow **18** in a trajectory which intersects a target.

The range finder **16** comprises a mounting plate **20**, a bracket **22** and a transparent support plate **24**. The mounting plate **20** is mounted by threaded fasteners (not shown) to a lateral side of the bow **14**. The bracket **22** has a pair of horizontal adjusting slots **26** and a pair of vertical adjusting slots **28**. A pair of threaded fasteners **30** received by the slots **26** mount the bracket **22** on the mounting plate **20** so that the bracket extends across the front of the bow **14**.

The support plate **24** is secured to the bracket **22** by a pair of threaded fasteners **32** received by the slots **28** and which permit the support plate **24** to be vertically adjusted with respect to the mid-portion of the bow **14**.

The support plate **24** is preferably rectangular in shape and formed of a clear, transparent, plastic material. A vertical sighting line **34** is scribed on the plate and provides means for the archer to mount a series of vertically aligned sighting rings **36**, **38**, **40**, **42** and **44**. The sighting rings progressively increase in size from the lowermost ring **44** to the uppermost ring **36** and are preferably each formed on an individual strip of transparent tape having an adhesive backing which permits the archer to mount each ring in a selected position on the support **24** and to remove each ring from the support **24**.

Each of the rings has a predetermined diameter and each set of rings are normally associated with a target of a given size. Thus in the preferred embodiment, the ring **36** has a .65 inch inner diameter; the ring **38** has a .42 inch diameter, the ring **40** has a .32 inch diameter, the ring **42** has a .28 inch diameter and the ring **44** has a .24 inch diameter. The diameter of the rings each correspond to the image of a 14 inch target at distances of 18, 28, 36, 42 and 49 yards when viewed by an archer having an eye to sight distance of 30 inches.

The archer normally pre-sets the rings **36**, **38**, **40**, **42** and **44** on the support plate **24** at a relative vertical spacing accommodating his own eye to sight distance. Each ring is pre-set by employing a target having a given diameter and moving away from the target until its image fills the particular ring which is being adjusted, and then raising or lowering the bow by a trial and error process until an arrow launched from the bow travels in a trajectory which intersects the target. When this trajectory has been determined, the ring is secured in place. The archer then moves away from the target until the targets image has diminished so that it fills the next smaller size ring and the trial and error process repeated.

It will be noted that the support plate **24** can be vertically and horizontally adjusted on the bow **14**. This permits the archer to re-adjust the position of the support plate when he uses arrows having different flight characteristics such as when he switches from wooden arrows to aluminum arrows.

When the archer goes into the field to hunt game, the pre-set sight rings enable him to sight the bow when he encounters game without being concerned as to the particular range of the game. He merely raises and lowers the bow until the game fills a particular ring. If necessary he can move toward and away from the game when the range is between a pair of rings or use the upper ring of a pair and shoot high or use the lower ring of a pair and shoot low.

It is to be understood that although the sight rings employed in the preferred embodiment have a circular configuration, that the term sight rings as employed in this specification refer to other geometric shapes such as triangles, rectangles, ellipsis which can be used to frame a target's image.

The sight rings could as well be die cut from a colored or opaque tape having an adhesive backing and individually mounted on the support plate.

Although the archer need not be concerned with the targets range as measured in yards when he is hunting, the preferred range finder can be employed as a means for determining the targets range by employing the following formula:

$$\text{Sight circle diameter} = \frac{\text{target diameter} \times \text{eye to sight distance}}{\text{eye to target distance}}$$

This formula can be transformed into a form so that the archer who knows the sight ring diameter, the target diameter, and his eye to sight distance can compute the eye to target distance.

FIGURES 5 and 6 illustrate a combination sight and

range finder **100** comprising a mounting plate **102** having mounting holes **104** for securing the plate to a bow.

An elongated, rigid, wire **106** is removably mounted on the plate **102** in a generally upright position.

A series of spring steel clamping elements **108** are slidably and pivotally mounted on the wire **106**. The outer end of each of the clamping elements **108** is bent as at **110** to engage the inclined edge **112** of the plate **102**. The wire **106** is parallel to the inclined edge **112** and acts as a fulcrum for each of the elements **108**.

Preferably a screw **114** is carried at the inner end of each of the clamping elements and functions as a means for biasing the outer end of the clamping elements toward the plate **102** in the matter of a lever.

A series of metal sighting rings **116**, **118**, **120**, **122** and **124** each having a shank **126** are clamped to the mounting plate **102** in a vertical alignment by the clamping elements **108**.

The sighting rings are preferably formed of spring steel and each has a predetermined diameter associated with the image of a target of a given size at various ranges. Each of the rings can be individually vertically adjusted in the manner described with reference to the preferred embodiment **16** illustrated in FIGURES 1–4.

FIGURE 7 illustrates another form of sighting ring **128** having a shank **130** which can also be employed in the embodiment of FIGURES 5 and 6. The sighting ring **128** is preferably formed of spring wire.

It is to be understood that I have described in detail a novel form of range finder for archery bows which permits the archer to individually pre-set a series of vertically arranged sighting rings. The preferred embodiments are each formed of a relatively few components which can be easily and inexpensively manufactured while providing a reliable means for sighting a bow for hunting or target shooting.

Although I have described several embodiments of my invention, it is to be understood that various changes and revisions can be made therein without departing from the spirit of the invention as expressed in the scope of the appended claims.

Having described my invention, I claim:

1. A sight for an archery bow, comprising:

(a) a transparent support plate having a flat surface;

(b) a bracket for mounting said support plate to an intermediate section of an archery bow, with said flat surface in a vertical plane substantially normal to and within the line of sight of an archer using said bow, said bracket having means permitting said transparent support plate to be horizontally and vertically adjusted relative to the intermediate section of said archery bow; and

(c) a plurality of sight rings, each having a discrete diameter individually adjustably disposed on the flat surface of said transparent support plate whereby said sight rings are disposed within the line of sight for an archer using said bow, each of said rings being disposed on said surface in vertical alignment with the other of said sight rings each of said rings having a diameter corresponding to the apparent size presented by a target having a predetermined size at a predetermined range associated with the ring, said sight rings being supported on the support plate in order of increasing diameter from the lowermost sight ring to the uppermost sight ring.

2. The combination as defined in claim **1**, in which said sight rings are removably mounted on the face of said support plate.

3. The combination as defined in claim **1**, in which each of the sight rings comprises an opaque ring having an adhesive surface attached to the face of the support plate.

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U.S. Cl. X.R.

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