Jan. 13, 1970 A. L. ALTIER 3,488,853

FRONT AND BACK SIGHT FOR A BOW

Filed March 10, 1967 4 Sheets-Sheet 1

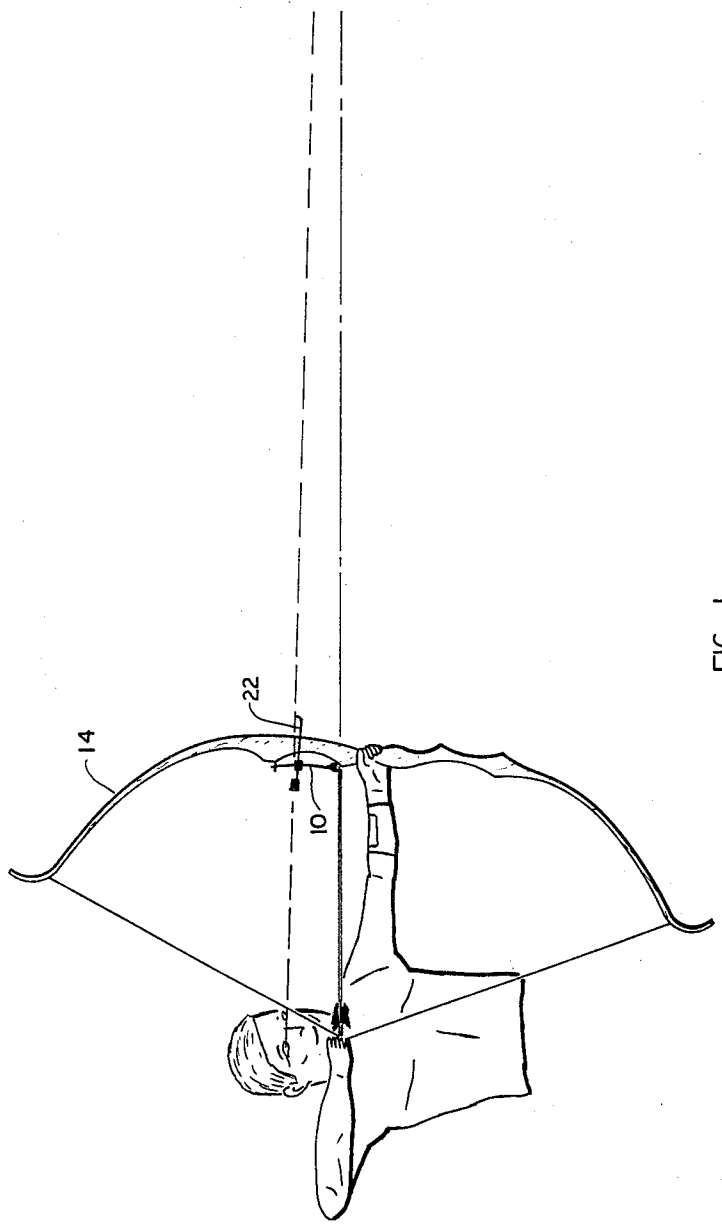


FIG. 1

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FRONT AND BACK SIGHT FOR A BOW

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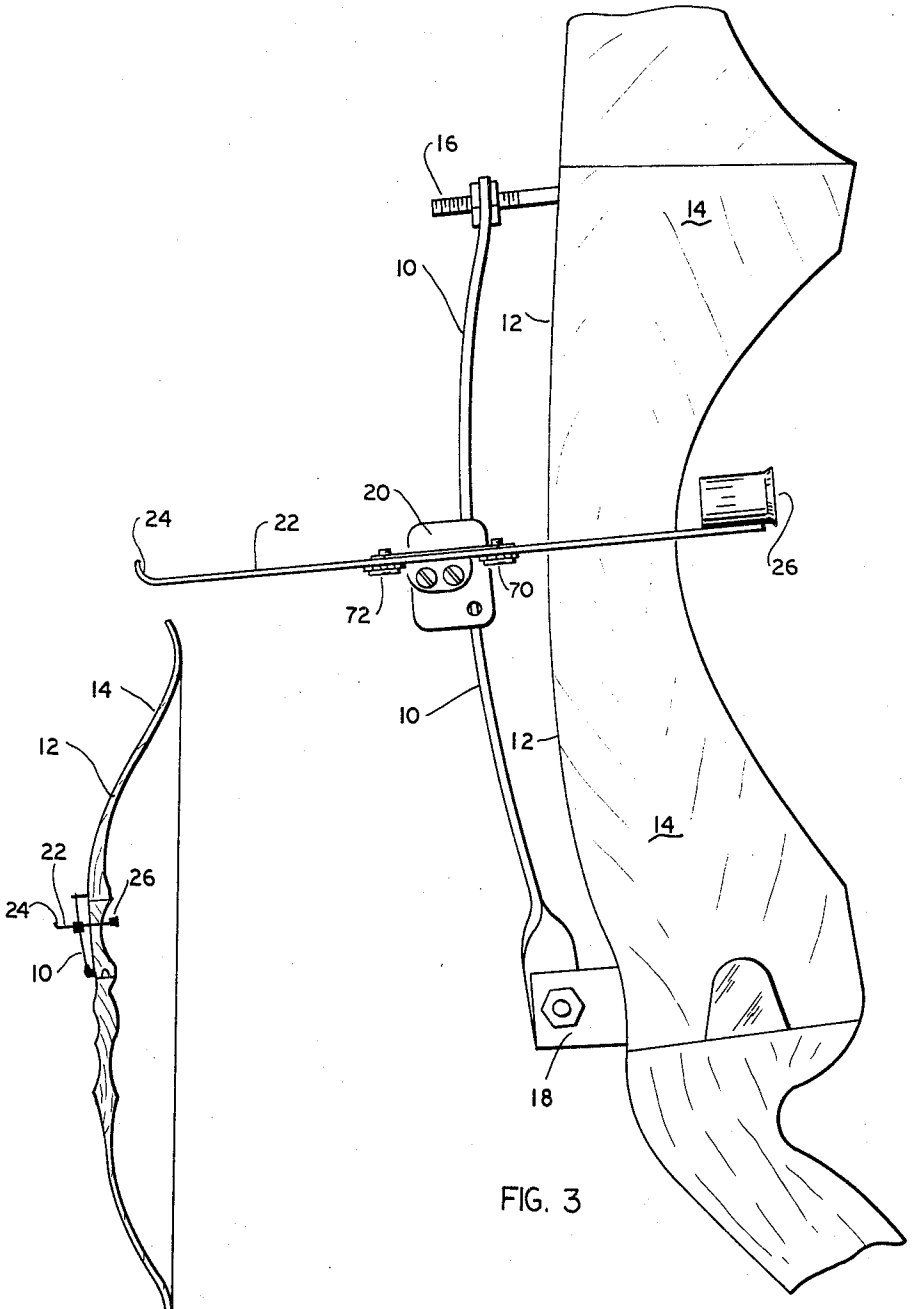


FIG. 3

FIG. 2

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FRONT AND BACK SIGHT FOR A BOW

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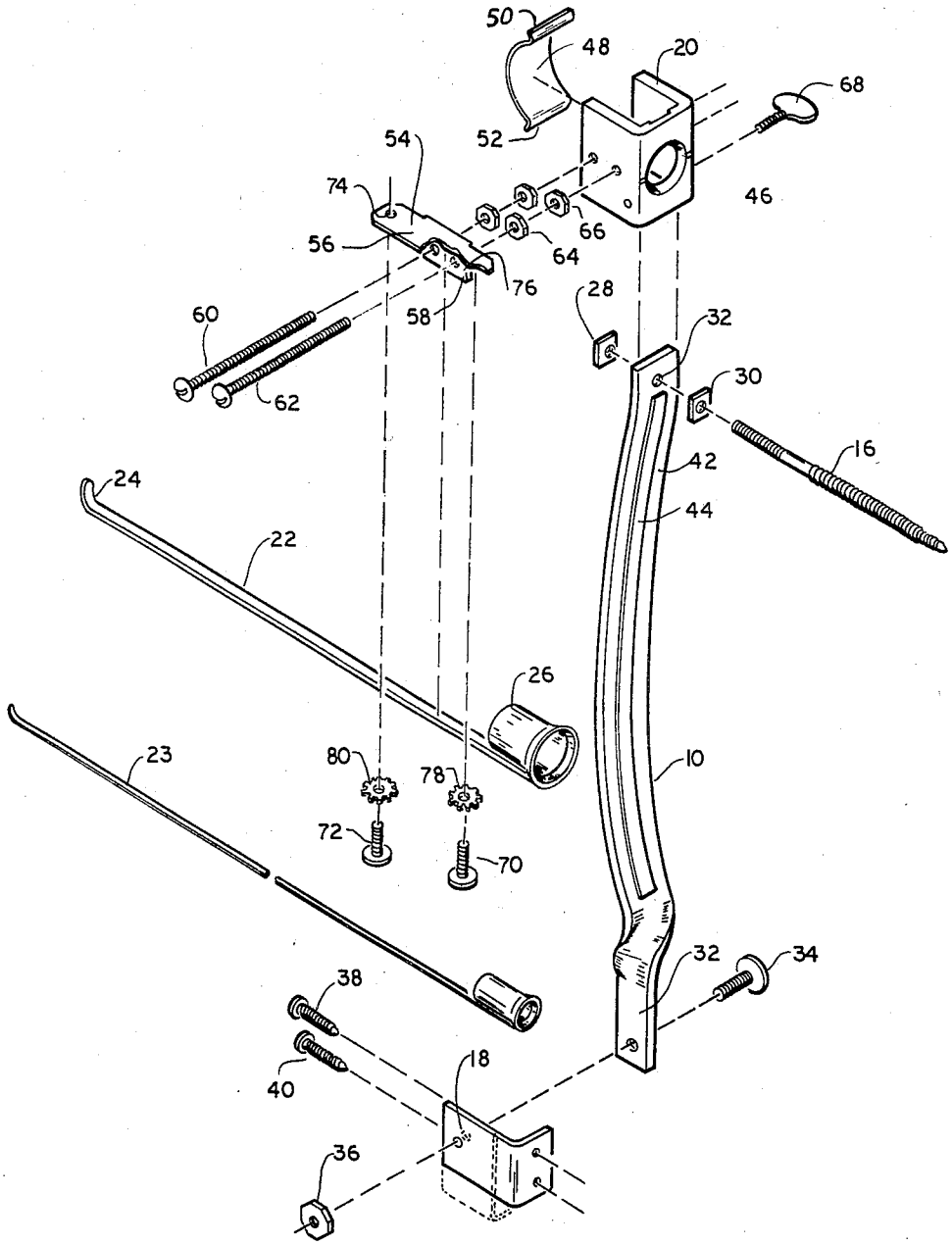


FIG. 4

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Jan. 13, 1970 A. L. ALTIER 3,488,853

FRONT AND BACK SIGHT FOR A BOW

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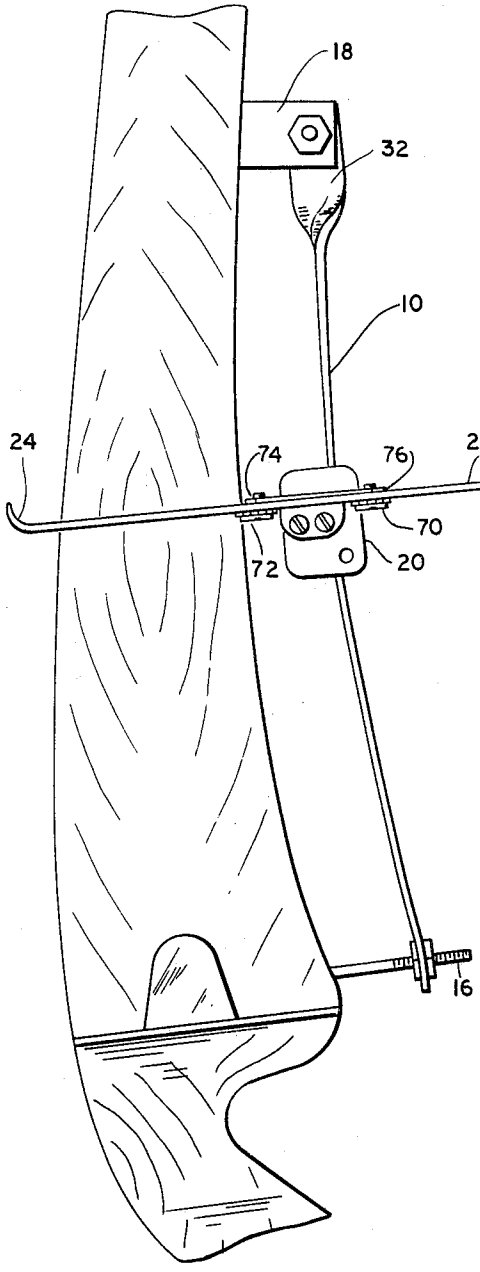


FIG. 5

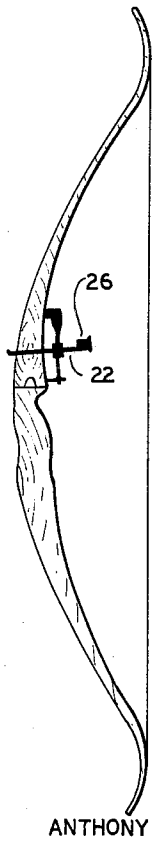


FIG. 6

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3,488,853

FRONT AND BACK SIGHT FOR A BOW

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Int. Cl. G01c *15/12, 15/00*
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ABSTRACT OF THE DISCLOSURE

A front and back sight is provided for a bow, which may be mounted either at the face or at the back of the bow. The sight includes a curved slide bar fastened to the bow by a combination mounting screw at one end which also provides anchor point adjustment, and a pivot hinge at the other end. An elongated horizontal bar is disposed to move vertically up and down along the slide bar. This horizontal bar acts as a sight span and has a front sight and back peep and means for lateral and longitudinal adjustment.

The present invention relates to a front and back sight arrangement for archery and more particularly to a front and back sight arrangement which can be readily mounted on commercially sold bows. This sight arrangement can be mounted either at the face side or the back side of the bow.

By having both a front and a back sight the archer acquires a distinct sight picture when shooting. This sight picture actually makes the archer maintain constant form. By maintaining constant form, i.e., head position, anchor point, hand position, etc. the archer continually shoots accurately. A change in the sight picture can only be noticed when a front and back sight is used. This enables the archer to correct his form before release of the arrow. This will give him the accuracy which this sight is designed to provide. If the archer grips the bow too tightly, or twists the hand slightly, accidentally anchors wrong, or moves his head slightly, the sight picture will change. With a front and back sight, the archer can see his mistake and correct it before shooting.

Although it has long been recognized that a front and back sight is highly desirable such an arrangement has not been provided heretofore.

According to the present invention, a slide bar is vertically disposed just above the arrow rest. The slide bar is curved to a specific slight degree of curvature. Mounting means are provided at the ends of the slide bar to anchor the slide bar to the bow. Slidably engaging the slide bar and moving up and down along the slide bar is a sight span bracket attached to a slide box which is designed to hold a sight span. The sight span is an elongated piece disposed at right angles to the slide bar and held by the sight span bracket. At the front end of the sight span is a front sight which is merely a short vertical upstanding bar or pin and at the rear end of the sight span is the rear peep or sight which is usually a hollow cylinder or a V-shaped object if desired. The slide bar is mounted to the bow by means of a combination screw at one end and a tightenable pivoted hinge at the other end. The sight span and its sight span bracket are mounted on the slide bar by means of set screws and a spring arrangement attached to a slide box.

The invention as well as other objects and advantages thereof will appear more clearly from the following detailed description when taken together with the accompanying drawing, in which:

FIG. 1 is a perspective view of an archer using the sight of the present invention when shooting at a target;

FIG. 2 shows the sight contemplated herein mounted on the back of the bow;

FIG. 3 is an enlarged view of FIG. 2;

FIG. 4 is an exploded view of the sight contemplated herein;

FIG. 5 is a view similar to FIG. 3 showing the sight mounted on the face of the bow; and,

FIG. 6 is a view of a bow with sight mounted as shown in FIG. 5.

Referring now to the drawings, in FIGS. 2, 3 and 4 there is shown a curved slide bar **10** mounted on the back **12** of a conventional recurve bow **14** using a combination mounting screw **16** and hinge **18**. The purpose of combination mounting screw **16** will be explained at greater length herein. A mounting slide box **20** is slidably attached to slide bar **10** and disposed for up and down vertical movement along the slide bar. When the archer looks at the mounting bar from behind the bow, he sees a curved flat surface. The radius of curvature of bar **10** is approximately two to three feet, as shown in the table provided later herein. That is to say, the archer's eye acts as the center of curvature of the slide bar, depending on his draw length. Horizontally disposed on the slide box **20** is a sight element span **22** having front and back sight **24**, **26**. Front sight **24** will appear as a dot in a bulls eye which is defined by back sight **26** consisting of a hollow cylinder or a V-shaped object if desired.

New mounting screw **16** which is used to attach the upper portion of the slide bar in this particular case to the bow has woodscrew threads on one end adapted to penetrate and engage the bow and adjustment machine threads at the rear thereof on which two adjustment nuts **28** and **30** are disposed one on each side of an aperture **32** formed in the slide bar. The importance of this arrangement will be more apparent shortly. At the other end the slide bar is twisted at right angles to form a neck **32** which is used to fasten the slide bar with a tightenable hinge **18** by means of a bolt **34** and a bolt **36** which prevents twisting of slide bar **10**. Hinge **18** in turn will be fastened, in this instance, to the back of the bow by means of screws **38**, **40**.

New slide box **20** has a U-shaped cross-section, the arms of the U being disposed to slide along the side of slide bar **10**. Across the face **42** of slide bar **10** nearest the archer a strip of paper or tape **44** for marking yardage relative to the bow used can be disposed as shown in FIG. 4. On the face of the slide box **20** is an aperture **46** and as the slide box **20** slides up and down the slide bar the tape **44** is visible through aperture **46**. In this way it is possible for the archer to mark the tape with pencil, pen, or crayon and he can adjust his sight for varied distance and visibly see the adjustment when moving the slide box as the mark will appear through the aperture **46**. Interposed between the slide box **20** and the slide bar **10** is a spring **48** curved so that the curve shall press against the slide bar, and in conjunction with screws **60**, **62** serve to hold slide box **20** adjustably against the curved slide bar **10** so as to follow the curvature of the slide bar and make possible the alignment of the line of vision through the front and back sights using the archer's eye as the pivoting point. As will be shown herein, the curvature of slide bar **10** is bent to a radius of curvature which is a function of the archer's draw normal or anchor point. Disposed along the side of slide box **20** is a sight span bracket **54** consisting of a horizontal element **56** and a depending wing **58**. Sight span bracket **54** and spring **48** are held in place in the slide box **20** by means of screws **60**, **62** which pass through the sight span bracket wing **58** into the slide box **20** with screw **60** passing over convex center of spring **48**. Screws **60**, **62** are inserted through wing **58** into tapped threads of slide box **20** and are positioned to the individual archer's adjustment and held

secure. They are held in place by means of jam nuts **64** and **66**, there being two nuts for each screw. Jam nut **64** acts as the forward nut and **66** as the rear nut. With this arrangement the slide box **20** can slide with constraight along the mounting bar. To set the slide box and prevent motion temporarily, when shooting at a fixed distance a set screw **68** is provided. The sight span **22** is mounted on its support by means of screws **70, 72** entering corresponding threaded apertures **74, 76** in the bracket **54**. To retain the sight span firmly, washers **78, 80** are provided on screws **70, 72**. By removing screws **70, 72** sight span **22** can be removed and different sight spans **23** substituted. These may be made available in 6, 9 and 12 inch lengths, with small medium and standard peeps, or any lengths or type V-back sights as desired.

The sight arrangement just described and mounted on the back **12** of bow **14** can also be used where the mounting has to be made on the face of the bow as shown in FIG. 5 and FIG. 6. In this arrangement, the neck **32** is placed towards the top and the combination mounting screw **16** towards the bottom. Tightenable swival action hinge **18** is pivoted 180° to the position in FIG. 5. In this arrangement the curved surface of the slide bar again faces the archer, the sight span and slide bar is nearer to the archer, and the sighting arrangement works in exactly the same way as when mounted on the back of the bow. In fact the only difference between mounting the sight arrangement on the face of the bow instead of the back of the bow is the up-side-down positioning of the slide bar, plus the necessity for a different radius bar as indicated later in the table provided herein relative to the archer's draw length. Consequently the combination mounting screw **16** providing anchor point adjustment also has to be reversed as can be seen by comparing FIG. 3 and FIG. 6.

The arrangement just described can also be used for left handed archers by removing sight span bracket **54** and screws **60** and **62** and inserting these in the opposite side of slide box **20**. This requires a complete removal of the sight span bracket and inserting from the opposite side, however, when ordering the sight arrangement, if the archer specifies that he is left handed the reversal of parts can best be done at the factory which can stock a certain amount of sight arrangements for left handed archers, thus saving valuable time dismantling the sight arrangement.

The details of initially setting up and adjusting the sight will now be described with reference to FIGS. 2 and **3**. As will be readily apparent to those skilled in the art, this explanation also applies to FIGS. 5 and 6 and to left handed archers with obvious modifications. Turning screws **60** and **62** inwardly together results in arrow grouping moving to the left. Turning there screws outwards puts arrow groups to the right, until dead center accuracy is obtained by these adjustments. This is reversed for left handed persons. Turning one screw in farther than the other gives canter or in and out action to either front sight or back peep to line up to the archer's style of shooting. Jam nuts **66** and **64** are provided for permanent setting once adjusted to the individual's likes.

A key feature of the sight arrangement is combination mounting screw **16** which accomplishes not only the mounting of slide bar **10** but also provides in and out adjustment of the slide bar. Wood screw threads of bolt **16** are coarse adjustments. Machine threads are found at the back of mounting screw **16**. These are fine adjustments. This adjustment makes possible constant anchor point positioning (the point where every archer draws his string before releasing the arrow, such positioning being individual choice, whether anchoring high or low in the area of his cheek or chin depending on choice), such positioning required for consistancy in accuracy being necessary whether using a sight or shooting instinctively. The front and back sight eliminates the guess work of such positioning. The longer the sight span and the smaller diameter of the peep or back sight, the more precise the positioning of this anchor point will be.

The up and down adjustment of slide box **20** accomplishes range adjustment necessary for varied distance when shooting. When the slide bov **20** position is high on slide bar **10** (such height being determined by archer's style of shooting and lowness of his desired anchor point), the arrow is aimed for close distance shooting. By lowering slide box **20** an amount determined by trial and error, e.g., weight of bow and arrows used by the individual; this automatically brings the bow hand up, necessary to produce the arc of the arrow flight to be able to hit a desired target further away. This too, is a trial and error adjustment commonly known to sight shooters.

Tape **44** is provided for proper marking relative to distance shooting and amount of elevation of bow, necessary for arc of arrow flight to hit a desired target.

With regard to the exact radius bars for the archer's draw length when mounted on the face of the bow and when mounting on the back of bow, five different bar radiuses are required. These are shown in the following table, all dimensions being in inches.

TABLE

Slide Bar Radius	29½	28	26	24	21½
Archer's Face Mount Draw Lengths	32½-34½	31-33	29-31	27-29	24½-27
Archer's Back Mount Draw Lengths	27½-31½	27-29	25-27	23-25	20½-23

Furthermore, the arrangement of hinge **18** prevents twisting of slide bar **10** as would not be possible with two wood-screws one at each end of slide bar **10**. This is why this mount is provided. Thus, two wood screws at each end of the slide bar instead of a tightenable swivel action could be used to mount a sight, but the possibility of twisting slide bar **10** would be present, through play found in the threaded action of nuts and screws.

Also, the sight span **22** is moveable forward or backward in sight span bracket **54** but may be secured in position by adjustment of screws **70** and **72**.

The following explanation is given as to how to mount the sight arrangement described herein on a bow.

Example of mounting

Step 1.—Attachment of swivel action bracket **18**. This bracket is secured by two wood screws **32, 40**. Drill two holes ⅝ inch deep at bottom area of bow sight window, using a 3/32 inch diameter drill drilling at the spot previously marked with a pencil through the two wood screw holes found in this bracket. Drill the same holes again, using a 7/64 inch drill, making certain to go only through the fiberglass and no deeper. This is to allow room for the gripping portion of the threads in the wood screws to pass through fiberglass without cracking the glass. Make certain this is mounted in the area above the sight window or in a spot having at least ¾ inch thickness in wood and lamination, to prevent damage to working action of the bow limbs and possibly of screws protruding out the opposite side of bow.

Step 2.—With concave slide bar attached to top swival action bracket, line up the slide bar to make certain that this slide bar is running parallel with bow string. If slide bar is too long, it may be cut off with a hack saw at desired length and drilled with a 3/16 inch drill. If cut off is performed, be careful to clamp only the portion discarded in vise so as not to change precision setting of the concave slide bar. Do not attempt to put a slight bend at the end of the slide bar to prevent the possibility of changing setting, but insert combination screw **16** at slight downward angle to compensate for this. Drill 5/32 inch hole 1½ inches deep in area of bow along side sight

window, drilling through hole **32** found in slide bar, but make certain the slide bar is held at one inch away from bow at time of drilling. (5/16 inch hole found in slide bar will position archer properly for this step. Now drill 5/16 inch hole through fiberglass only, no deeper, to prevent cracking of glass as mentioned above.)

Step 3.—Insert combination wood and machine screw **16** ¾ inch in bow at first. Try to shoot using your normal anchor point. If anchor point is too low, turn combination screw in farther and so on until proper position is found. (High anchor point requires far in position-low anchor point far out position.) Machine threads are fine adjustments, wood threads are coarse adjustments.

Step 4.—Archer is now ready to start sighting in, once proper anchor point is found. Loosen all ¼ inch nuts **64, 66** found on two screws holding sight span bracket. (Bracket holding front sight and back peep.) Screwing this bracket in brings groups of arrows to your left. Screwing out puts arrow groups to right, for a right handed person, (use reverse for left handed person). Turn each screw **60, 62** only one turn at a time, to prevent bending of bracket. Screwing one in or out farther than the other gives canter to front sight or back peep, to line up to archer's style of shooting. Once adjusted, tighten all nuts and start shooting. Properly matched arrows and a little time. Greater accuracy can be obtained with finer peeps practice will give tremendous accuracy in a very short and longer sight spans such as **23**.

It is to be observed therefore that the present invention provides for a sight arrangement which could be mounted on any style bow. The front sight and back peep, line up perfectly with the archer's eye, once adjusted to his style shooting. The archer can maintain the sight picture for close shooting or lower slide box **20** and the sight span which moves therewith to obtain elevation for distant shooting. This precise alignment is made possible by the precision concave slide bar of the sight. Thus, the slide box and the sight span will follow the archer's line of vision relative to the target. The archer's eye acts as a pivot point for front and back sight. A set screw **68** is provided for precise desired range setting and a convenient window with centering lines is provided for extremely accurate setting and yardage markings. The arrangement described has vertical adjustment, horizontal adjustment, with interchangeable sight spans which can be anywhere from 6 to 12 inches in length from sight and back peep, or longer if so desired. It has a degree canter adjustment to either the front sight or back peep necessary for proper sighting, and a precise anchor point adjustment provides constant positioning by means of combination mounting screw **16**. Anchor point positioning is determined through the use of sight picture. It is adaptable to left or right hand shooting.

I claim:

1. A sight arrangement for mounting on a bow, comprising in combination,

a curved elongated slide bar having a flat surface, the radius of curvature being of the order of two feet and having a neck at one end thereof formed at right angles to the flat surface, said neck having a flat face portion;

a hinge bracket having a flat face mounted on said neck and in face-to-face contact with said flat face portion of said neck, means passing through said hinge bracket flat face and the flat face portion of said neck for tightening and clamping said hinge flat face and the flat face portion of said neck thereby preventing relative movement therebetween, means for rigidly fastening the hinge bracket to the bow and tightenable mounting screw means at the other end of said slide bar and passing through the flat surface thereof and anchored into the bow including adjustment means for adjustably fixing the position of said other end of the slide bar relative to the bow, whereby said slide bar is rigidly mounted on said bow and is prevented from movement in any direction with respect to said bow;

a slide box for sliding engagement on said slide bar, said slide box including spring means for resiliently holding said slide box on the slide bar and a set screw for fastening said slide box at any selected position along said slide bar;

a bracket attached to one side of said slide box and an elongated sight span having an upstanding point at one end and a framing aperture at the other end, means mounting said span on said bracket at right angles to said slide bar for forward and rearward adjustment, and lateral adjustment means on said bracket for moving said span laterally inward or outward with respect to said slide box.

2. A sight arrangement as claimed in claim **1** said mounting screw means comprising a bolt with wood screw threads at one end and machine screw threads at the other, and nut means for adjustment disposed on the machine screw threads.

3. A sight arrangement as defined in claim **1** including an indicia receiving face on the inner side of the curved slide bar for marking range distances thereon.

4. A sight arrangement as defined in claim **3**, and further including a registration window on one face of said slide box through which the indicia receiving face of said slide bar is visible.

5. A sight arrangement as defined in claim **1**, wherein said lateral adjustment means comprises a pair of spaced horizontally disposed adjustment bolts fixed to said bracket and threadedly received by said slide box, each adjustment bolt being separately adjustable to selectively cant said sight span with respect to said slide box.

6. A sight arrangement as defined in claim **1**, wherein said upstanding point is formed as an upward bend of one end of the sight span, and said aperture is a cylindrical peep sight.

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