April 3, 1962 H. C. CROOK 3,027,648

ARCHERY SIGHT

Filed May 11, 1959 2 Sheets-Sheet 1

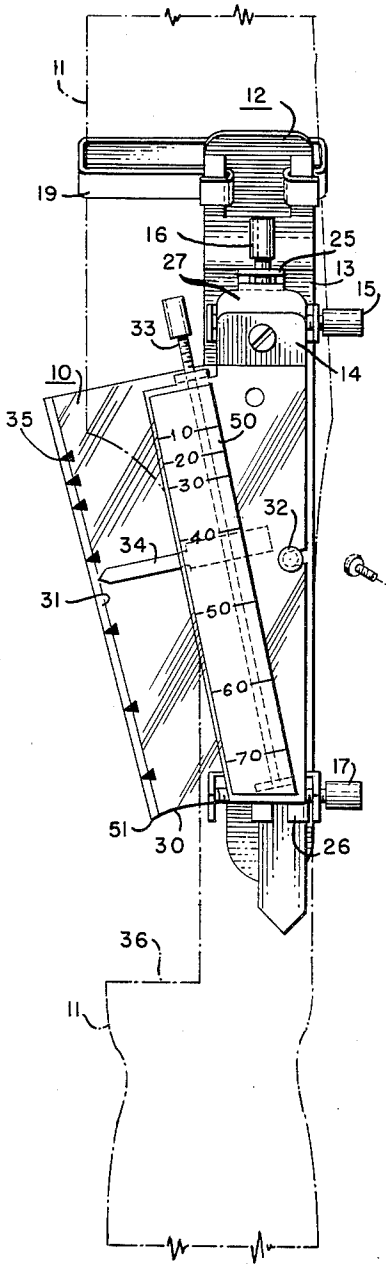


FIG. 1

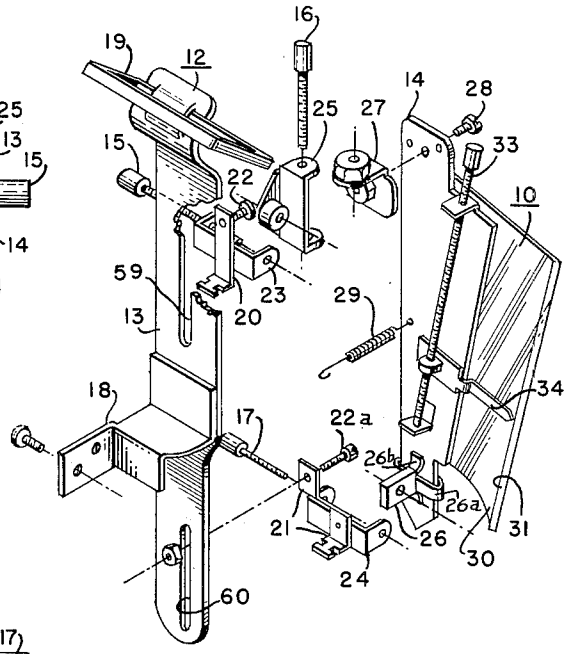


FIG. 2

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ARCHERY SIGHT

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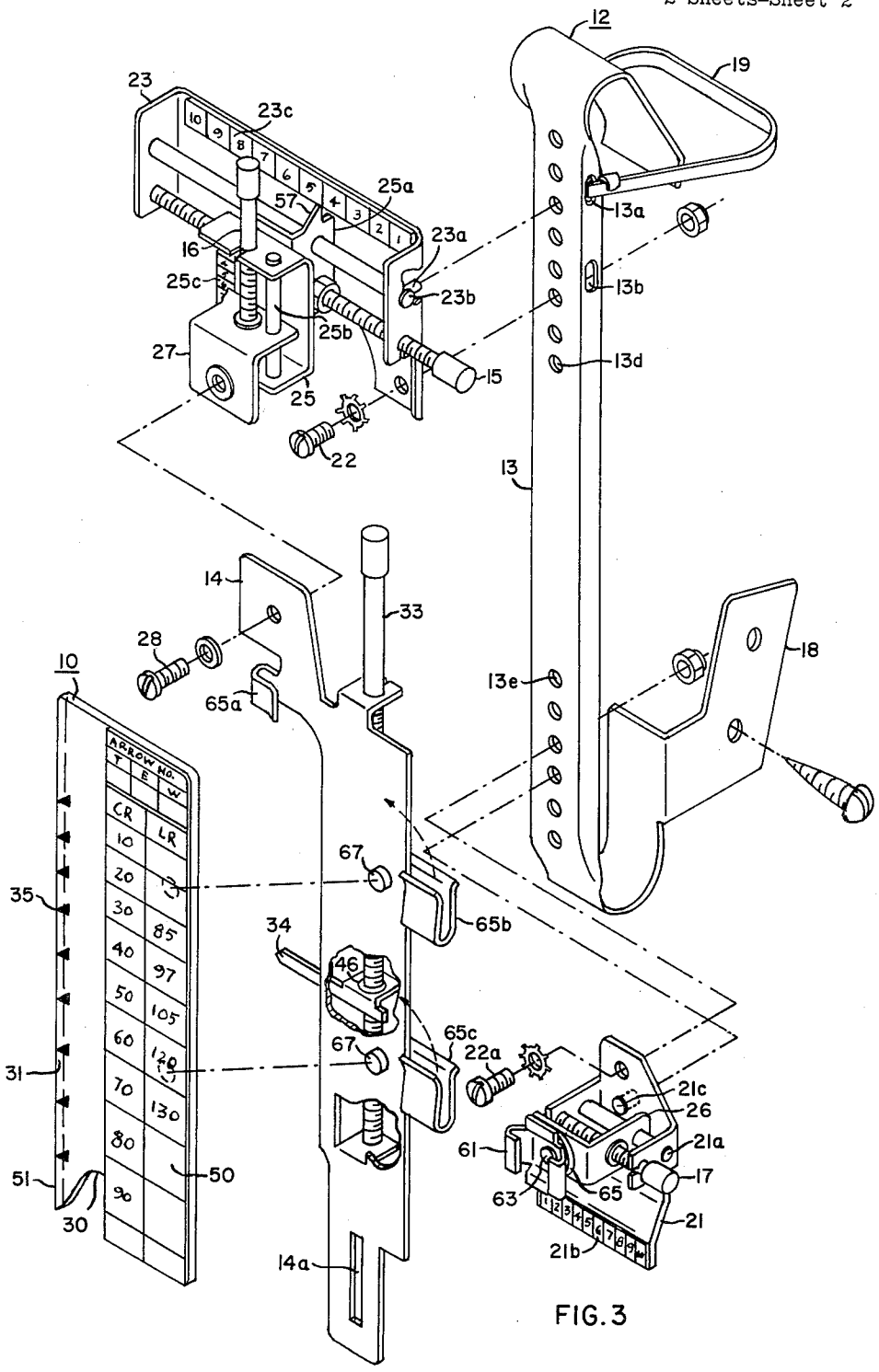


FIG. 3

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ARCHERY SIGHT

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7 Claims. (Cl. 33—46)

This invention pertains to archery equipment, and particularly, to an improved bowsight.

In contrast to gunsights, where the gun barrel serves as a rigidly fixed reference relative to the line of fire, a bowsight must at once establish such reference and indicate the correct firing angle relative thereto for any target range. Since individual archers hold the bow at different degrees of tilt or "cant" from a vertical plane, the sight must be adjustable to compensate for such variations. It must also be adjustable to compensate for changes in bow performance at different seasons of the year and for varying wind conditions. Besides these factors, since the archer may use arrows of different weights for different types of game, and may even wish to change the bowstring in the field, further compensating adjustments must be available if the sight is to be of universal applicability.

Various approaches to development of a universally adaptable bowsight have been made, as shown for example by Patent 2,742,702 to R. F. Williams, issued April 24, 1956. However, such prior art fails to achieve a bowsight capable of rapid and convenient adjustment for all of the many variables which are involved in different archery situations. The prior art also fails to provide the high degree of bowsight rigidity and permanency of calibration required to maintain consistent accuracy in spite of the severe vibration to which the bow is subjected each time it is fired. A very slight slip in the bowsight setting, such as one-tenth of an inch, for example, will miss a target at one hundred yards by two and one-half feet.

Accordingly, one object of the present invention is to provide a new and improved bowsight capable of being conveniently and rapidly adjusted to take account of all variables which may be involved in different archery situations, including differences between bows, bowstrings, arrows, archers, and climatic conditions.

A further object is to provide a bowsight which, while being readily adjustable in the field without use of tools, will reliably maintain its calibration over long periods of use without requiring readjustment.

A further object is to provide a reliable and conveniently adjustable bowsight which is light in weight, economical to construct, and readily mountable on many types of bows.

The invention herein is, in part, a continuation-in-part of applicant's copending application Serial No. 695,709, filed November 12, 1957, now abandoned.

In achievement of the stated objects, a bowsight constructed in accordance with the invention comprises supporting means for attachment to a bow. It further comprises a plurality of adjusting screws extending transversely across said supporting means and supported thereby. The bowsight additionally comprises a mounting plate tension-mounted relative to said supporting means and threadably supported by said screws so as to be rotationally and translationally adjustable thereby in a plane substantially transverse to the line of fire of the bow. Finally, the bowsight comprises a range-calibrated sighting window fastened to and extending longitudinally along the mounting plate.

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A more complete description of the invention, together with further objects and features thereof, is presented in the following specification and accompanying drawings, noting, however, that the actual scope of the invention is pointed out in the appended claims.

In the drawings:

FIG. 1 is a front view of a bowsight constructed in accordance with the invention attached to a bow shown in fragmentary form in phantom;

FIG. 2 is an exploded perspective rear view of the FIG. 1 bowsight, and

FIG. 3 is an exploded perspective front view of another embodiment of a bowsight constructed in accordance with the invention.

Referring now more particularly to FIG. 1 of the drawings, there is represented a front view of a bowsight constructed in accordance with the invention mounted on a bow shown in fragmentary view in phantom. It should be understood that, while in use, the bow is canted so that the leading edge **31** of the sighting window **10** is vertical and aligned with the target.

The bowsight comprises supporting means **12** (see also FIG. 2) for attachment to the bow. The supporting means may include a mount **13** for fixed attachment to the bow, a plurality of adjusting screws **15**, **16**, **17** being supported by the mount. Adjusting screws **15** and **17** extend transversely across supporting means **12**, while screw **16** extends longitudinally. A mounting plate **14** is tension-mounted relative to supporting means **12** and threadably supported by screws **15**, **17**, **16** so as to be rotationally and translationally adjustable thereby in a plane substantially transverse to the line of fire of the bow. Mount **13** is a slotted metal member, preferably of spring steel, having a lug **18** (see FIG. 2) which may be screwed to the side of the bow. A soft metal loop **19** is carried at the upper end of mount **13** and is wrapped over the bow so as to maintain the mount under slight tension. Thus, the mount **13** is a universal mount suitable for use on many bows. If desired, suitable mounting brackets especially fitted to a single bow may be employed in lieu of the mount **13**.

There are disposed in slots **59**, **60** of mount **13** the transversely slotted tabs of a pair of mounting lugs **20**, **21**, respectively, the tabs slidably engaging slots **59** and **60** so as to permit coarse longitudinal initial positioning of the lugs. The lugs **20**, **21** are held in position by suitable bolts **22**, **22***a* which fasten them to mount **13**, the upper end of lug **21** projecting forwardly toward mount **13** so as to provide tension when bolt **22***a* is tightened. A high degree of mounting rigidity is thus achieved.

Adjusting screws **15**, **17** are respectively journalled in the ears of a pair of mounting brackets **23**, **24**, which are respectively attached to lugs **20**, **21**, one end of each screw being shouldered to captivate it. Mounting bracket **24** is rotatably attached to lug **21**. Screws **15** and **17** threadably engage a pair of adjusting brackets **25** and **26**, respectively, so as to provide lateral or angular adjustment of the mounting plate **14** supported thereby when the screws are turned. Adjusting bracket **25** also supports the longitudinally extending screw **16** journalled and captivated therein, screw **16** threadably engaging another adjusting bracket **27** to which the upper end of mounting plate **14** is rotatably fastened by means of a bolt **28**. The other end of mounting plate **14** is slidably disposed within ears **26***a* of adjusting bracket **26**, so that when screw **16** is turned, it translates the plate in the longi-

tudinal direction. Adjusting bracket **26** also carries spring ears **26***b* tensioned against the plate to provide rigidity.

Tension mounting of mounting plate **14** relative to supporting means **12** may be effected by a spring **29** stretched between the plate and the bow. This, together with the tensioned support of lug **21** and adjusting bracket **26**, serves to minimize any inaccuracies in positioning due to tolerances of the threaded members and thus to allow inexpensive construction with highly accurate results.

Referring again to FIG. 1, the bowsight also includes a range-calibrated sighting window **10** supported on mounting plate **14**. In particular, the sighting window **10** may comprise a transparent plastic plate **30** removably attached to the mounting plate **14** by means of screw **32**. Plate **30** preferably has a beveled edge **31** for alignment with a target. The beveling of edge **31** renders it useful as a vertical sight line for the archer.

Referring now to FIGS. 1 and 2, the bowsight may also include a sighting pointer **34** threadably supported on a range-adjusting screw **33** which extends longitudinally along plate **14**, screw **33** being supported by lugs on the plate in which it is journalled and captivated. Turning screw **33** thereby adjusts the position of the pointer **34** with respect to the sighting window **10** for accurately calibrating the sight window for various ranges. The sighting pointer **34** extends approximately to the edge **31** of the sight window to facilitate calibration in a manner presently to be described.

A set of removable tabs **35** (see FIG. 1) are provided for attachment to the sight window in accordance with the calibration to serve as sight markers for various ranges.

Considering now the adjustment and calibration of the sighting window **10** with reference to FIG. 1, the archer's hand is placed on the bow below edge **36** and the arrow rests on edge **36**. The sight has previously been coarsely adjusted on the bow by means of the positioning of lug **18**, loop **19**, and lugs **20**, **21** (see FIG. 2). The archer then holds the bow in its normal position and with his fingers adjusts screws **15** and **17** to rotate and translate the sighting window **10** with the edge **31** as a vertical sight line. The sighting window **10** is made of transparent material to enable the archer to look through it to the target. The archer then stands at a measured distance from a target, say 40 yards, and adjusts the sighting pointer **34** by means of screw **33** to a proper estimated sighting position. The archer then fires several arrows, readjusting the sighting pointer if necessary, and by trial and error locates the proper sighting position. He then attaches one of the tabs **35** to the window **10** at that point and marks the numeral **40** at approximately the correct point on an adhesive water-proofed strip **50** attached parallel to and displaced away from the leading edge **31** of the window **10**. Alternatively, the tabs **35** may be in different colors to identify the distances to which they correspond.

The foregoing procedure is repeated at different distances to calibrate the sighting window for various ranges. During the calibration for the first selected range, vernier lateral readjustment of the sight may be accomplished by screws **15** and **17** and vernier vertical or longitudinal adjustment of the sight may be accomplished by screw **16**. Ordinarily, the lower corner **51** of edge **31** is positioned above the diametral center of the arrow, corner **51** being pointed to facilitate this positioning.

When the sighting window **10** has been calibrated for one group of matched arrows, it may be removed from mounting plate **14** by simply loosening screw **32** and a similar sighting window may be substituted for calibration with a different group of arrows. From time to time, minor vernier adjustments of the position of the sighting window may be necessary due, for example, to a change in weather conditions, and such adjustments may be readily accomplished by screws **15**, **16**, and **17**. After calibration, the proper sighting window for a given group of arrows may be selected and quickly attached to mounting plate **14**. In firing at a target, the archer then simply estimates his range and quickly sights at the proper tab **35**.

From the foregoing description, it will be apparent that the bowsight of FIG. 1 has several advantages. The sight provides universal longitudinal and lateral vernier finger adjustments which are readily made without use of tools, and an accurately adjustable sighting pointer facilitates accurate calibration. Moreover, sighting windows may be interchanged for use with different groups of matched arrows without ordinarily requiring appreciable readjustment of the mounting plate supporting the sighting window. Also, the use of removable sight tabs allows a given window to be used again with a different bow or group of matched arrows and recalibrated if desired. The sight has the further advantage of being constructed of inexpensive elements while nevertheless providing highly accurate results.

Referring now to FIG. 3, there is shown a bowsight similar to that of FIGS. 1 and 2, but which has still further improved rigidity and reliability and which is provided with calibration guides for each of the adjusting screws **15**, **16**, and **17**. The construction of this preferred form of the invention will, therefore, be described principally with reference to how it differs from the embodiment thereof illustrated in FIGS. 1 and 2, corresponding parts having the same reference numerals in all figures.

Considering first the mount **13**, this is formed of spring metal and has its lower end doubled over at an angle substantially parallel to the mount surface. The upper end is also double over, but at an angle projecting rearward. Thus, when a bow is clamped or screwed to lug **18** and loop **19** is wrapped around the bow, the mount will be placed under considerable tension assuring permanency of position. Loop **19** may be affixed to the mount either at an upper or lower set of slots **13***a*, **13***b*, the lower set providing adequate tension for bows of lesser cast. Mount **13** also has groups of equally spaced mounting holes **13***d*, **13***e* in its surface at the upper and lower portions thereof.

The upper mounting bracket **23** is here supported by means of a projecting pin **23***a* affixed thereto which extends into any of holes **13***d* and the bolt **22** extending into an adjacent hole. Bracket **23** carries, in addition to adjusting screw **15**, a torsion rod **23***b* parallel thereto and on which a longitudinal rear-projecting lug **25***a* of adjusting bracket **25** is slidably supported. Lug **25***a* is shaped as a pointer relative to the divisions of a transverse linear scale **23***c* affixed to mounting bracket **23**, so that when screw **15** is turned the changed position of adusting bracket **25** will be measured by that scale. Bracket **25** carries, in addition to the longitudinal adjusting screw **16**, a parallel torsion rod **25***b* slidably engaging the spring metal lug **27** which threadably engages screw **16**. One corner of lug **27** is shaped as a pointer relative to the divisions of a longitudinal linear scale **25***c* affixed to bracket **25**, so that when screw **16** is turned, the changed position of bracket **27** will be measured by scale **25***c*.

Lug **27** is affixed to the upper end of mounting plate **14** by means of bolt **28**. In contrast to the bowsight of FIGS. 1 and 2, however, the mating surface of lug **27** is bent forward relative to the surface of plate **14**. When tightened together by bolt **28**, therefore, plate **14** is supported under considerable spring tension and so very reliably maintains the position to which it is adusted. The lower end of plate **14** is slidably engaged within the ears of an adjusting bracket **61** which is rotatably fastened by rivet **63** to adjusting bracket **26**. A resilient washer **65** is compressed by the rivet between brackets **26** and **61** to provide a tension grip of bracket **61** on plate **14**. Adusting bracket **26** is threaded on transverse screw **17**

supported by mounting bracket **21**, and also slidably engages torsion rod **21***a* carried by the latter bracket parallel to screw **17**. A parallel linear scale **21***b* is also affixed to a downturned lower end of bracket **21**, the divisions thereon being framed by a slit **14***a* in the lower end of mounting plate **14**. Consequently, the displacement of plate **14** caused by turning screw **17** is measured by scale **21***b*. Supporting bracket **21** is fastened to mount **13** by means of a projecting pin **21***c* affixed thereto which extends into any of holes **13***e* and the bolt **22***a* extending into the adjacent hole.

Sighting window **10** is affixed to mounting plate **14** by means of arm clips **65***a*, **65***b*, and **65***c*, the latter two clips being rotatable so as to permit rapid interchange of differently calibrated windows. Plate **14** may have projecting pins **67, 67, which mate with depressions in the** corresponding side of sighting window **10** to prevent relative movement thereof. Sighting window **10** may carry a range calibration strip **50** as in the bowsight of FIGS. 1 and 2. Here, however, strip **50** also carries the proper **settings of each of adjusting screws 15, 16, and 17 in** terms of the numbered divisions of scales **23***c*, **25***c*, and **21***b*. Thus each strip may not only record the range settings for a particular group of matched arrows, but may also be used for recording the precalibrated scale settings applicable to each of such groups. It may also be desirable, as shown, to provide on each strip range data for two alternate firing techniques. That is, for close range (C.R.) targets, the archer may normally draw the bow **so the nock end of the arrow is in line with his** mouth, while for long range (L.R.) targets, he may use a lower reference point such as his chin in order to establish a trajectory to the target.

In calibrating the bowsight of FIG. 3, the archer proceds in the same way as described above for the bowsight of FIGS. 1 and 2 except that he notes the settings of scale **23***c* ("T" or tilt), scale **21***b* ("W" or windage), and scale **25***c* ("E" or elevation). These settings are marked on calibration strips for each group of notched arrows used with a particular bow, bowstring, wind velocity, etc. New sets of strips may be calibrated for any possible variations in the archery situation, such as when the archer uses the sight on two different bows, or changes bowstrings, or when the season of the year has changed, **etc. Then, when in the field, he need only select the** strip that fits the situation which actually exists, and adjust screws **15**, **16**, and **17** to establish the requisite "T," "E," and "W" scale settings. That accomplished, the marked ranges on that strip directly indicate the correct target ranges corresponding to the various tabs **35**.

It should be noted that the bowsight of FIG. 3 provides an extremely high degree of stability and reliability of calibration because any tolerances and clearances inevitably present in the adjusting screws and brackets are absorbed by the tensioned and torsioned condition of the entire assembly. Thus, spring lug **27** is compressed by mounting plate **14** and so places adjusting bracket **25** under tension. The latter is, however, resisted by the torsion set up in torsion rods **23***b* and **25***b*. Bracket **25** and plate **14** are thus very firmly supported. It should also be noted that this high stability is achieved without adding appreciable weight to the bow. In addition, torsion rod **21***a* carried by lower mounting bracket **21** prevents adjusting bracket **26** from rotating and causing bracket **61** to bind the lower end of plate **14** when the plate is adjusted.

While there have been described what are, at present, considered to be typical and preferred embodiments of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and it is, therefore, aimed to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. A bowsight comprising: a longitudinally extending mount for tension-mounting on a bow; a pair of transversely extending and longitudinally spaced mounting brackets affixed to said mount; a pair of transversely extending adjusting screws respectively journalled and captivated in said mounting brackets; a transversely extending adjusting bracket threadably supported by the lower one of said transversely extending screws; a longitudinally extending adjusting bracket threadably supported by the upper one of said transversely extending screws; a longitudinally extending adjusting screw journalled and captivated in said longitudinal adjusting bracket; an intermediate adjusting bracket threadably supported by said longitudinal screw; a longitudinally extending mounting plate rotatably affixed to said intermediate bracket and slidably supported in said transverse adjusting bracket so as to be rotationally, transversely and longitudinally adjustable by said screws in a plane substantially transverse to the line of fire of the bow; and a range-calibrated sighting window fastened to and extending longitudinally along said mounting plate.

2. The invention defined by claim 1, wherein said mounting plate also supports a longitudinally adjustable transversely extending pointer adapted to indicate the proper range calibrations for said sighting window.

3. A bowsight comprising: a longitudinally extending mount for tension-mounting on a bow; a pair of transversely extending and longitudinally spaced mounting brackets affixed to said mount; a pair of transversely extending adjusting screws respectively journalled and captivated in said mounting brackets; a transversely extending adjusting bracket threadably supported by the lower one of said transversely extending screws; a longitudinally extending adjusting bracket threadably supported by the upper one of said transversely extending screws; a longitudinally extending adjusting screw journalled and captivated in said longitudinal adjusting bracket; an intermediate adjusting bracket threadably supported by said longitudinal screw; a longitudinally extending mounting plate rotatably affixed to said intermediate bracket and slidably supported in said transverse adjusting bracket so as to be rotationally, transversely and longitudinally adjustable by said screws in a plane substantially transverse to the line of fire of the bow; a range-calibrated sighting window fastened to and extending longitudinally along said mounting plate; and respective linear scales affixed to the upper one of said transverse adjusting brackets, said longitudinal adjusting bracket, and said further adjusting bracket for indicating the adjustments of each of said screws applicable to any given archery situation.

4. The invention defined by claim 3, wherein the range-calibration of said sighting window is carried by each of a plurality of strips selectably attached thereto, each strip being marked with said scale indications for different archery situations.

5. A bowsight comprising: a longitudinally extending mount for tension-mounting on a bow; a pair of transversely extending and longitudinally spaced mounting brackets affixed to said mount, each of said brackets supporting a transverse torsion rod therein; a pair of transversely extending adjusting screws respectively journalled and captivated in said mounting brackets; a longitudinal adjusting bracket threadably supported by the upper one of said transverse screws and slidably supported by the torsion rod in the upper mounting bracket, said longitudinal bracket itself supporting a longitudinal torsion rod and a longitudinal adjusting screw therein; a spring lug threadably supported on said longitudinal screw and slidably supported by said longitudinal torsion rod; a transverse adjusting bracket threadably supported by the lower one of said transverse screws and slidably supported by the torsion rod in the lower mounting bracket; an auxiliary bracket rotatably affixed to said transverse adjusting bracket; a longitudinally extending mounting plate affixed

to said spring lug under tension and slidably supported under tension in said auxiliary bracket; and a range-calibrated sighting window removably affixed to said mounting plate for use as a vertical firing guide.

6. The invention defined by claim 5, further comprising a longitudinally adjustable transverse sighting pointer supported by said mounting plate and adapted to indicate the proper calibration of said sighting window for all target ranges.

7. The invention defined by claim 6, further comprising a plurality of linear scales respectively affixed to said transverse mounting brackets and to said longitudinal

adjusting bracket for indicating the proper adjustments of said screws for any archery situation.

References Cited in the file of this patent

UNITED STATES PATENTS

12,180	Silver et al.	Apr. 16, 1903
2,742,702	Williams	Apr. 24, 1956

OTHER REFERENCES

"Archery Sight Permits Snap Shooting at Different Ranges," Popular Science, March 1945.