May 30, 1972 H. R. SPRANDEL 3,666,368

ARCHERY SIGHT AND RANGE FINDER

Filed Feb. 18, 1971

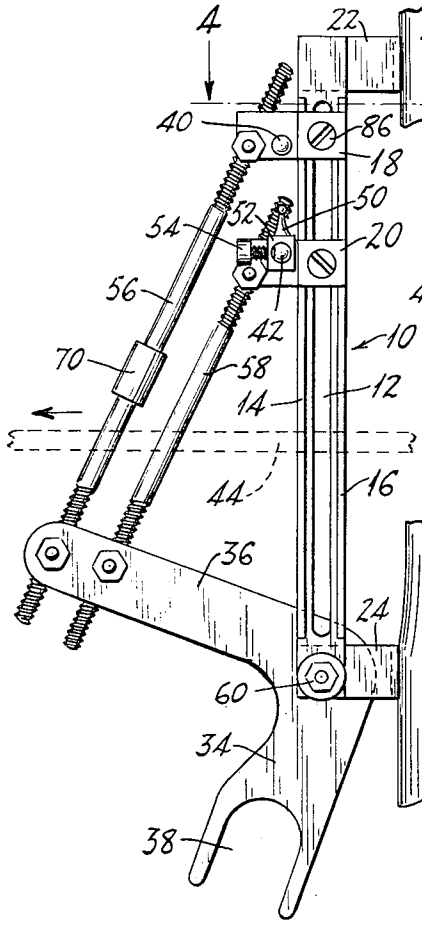


Fig. 1

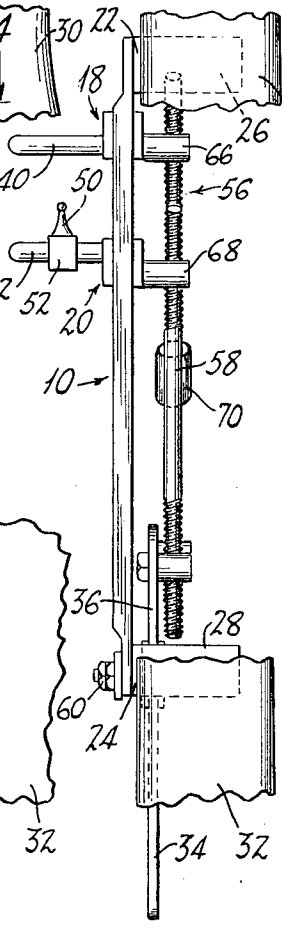


Fig. 2

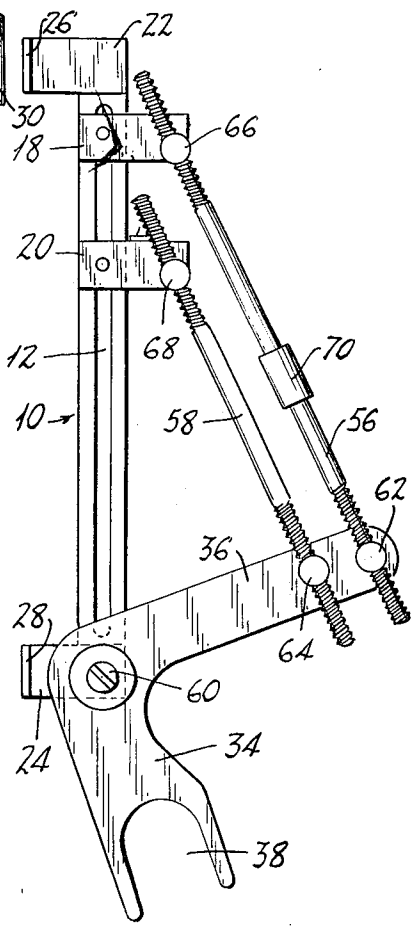


Fig. 3

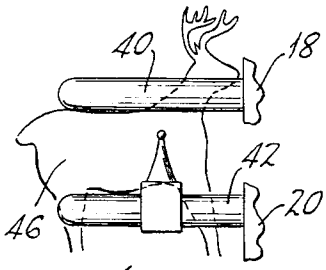


Fig. 5

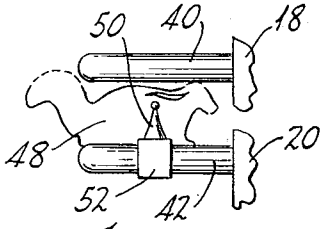


Fig. 6

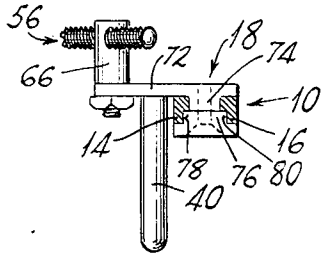


Fig. 4

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ARCHERY SIGHT AND RANGE FINDER

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ABSTRACT OF THE DISCLOSURE

A sight and range finder for archers, consisting of an attachment having a vertical slide on which two sliders are vertically movable. The sliders have parallel, horizontal sight bars, and when moved in spaced relation, enable the archer to sight the game between them. One sight bar also has a bull's-eye sight, to zero-in on the body of the game. A pivoted finger piece on the slide can be manually adjusted, and is connected to the sliders in such a manner as to not only vertically adjust the latter but also to automatically vary the spacing between them, this being accomplished by links between the finger piece and sliders. Game which is far away and appears small, requires close spacing of the sight bars which results in their being automatically positioned vertically to a lower level, together with the bull's-eye sight, so as to provide for a higher trajectory of the arrow, and vice versa.

BACKGROUND

This invention relates to archery sights and range finders and more particularly to devices of this type which are in the form of attachments, indended to improve the aim of the archer. In the past various types of archery sights have been proposed and produced. In general the objective has been to produce an arrow trajectory which was correctly related to the distance of the game from the archer. While prior devices have worked somewhat well, their usefulness has been limited in many instances. Some devices although simple and inexpensive, lacked the required accuracy, so that uniformly good results were not obtainable. With other devices where the accuracy was improved, the arrangements were complicated, costly, and in some cases not easily operated, or not quick enough in adjustment.

SUMMARY

The above disadvantages of prior archery sighting devices are obviated by the present invention, which has for one object the provision of an improved manually actuated archer's sight and range finder that can be quickly operated by the archer when game is sighted, so as to automatically indicate the correct orientation of the bow to give the arrow an accurate trajectory for striking the game. Another object of the invention is to provide an improved archer's sight and range finder as above characterized, which can be readily preadjusted to adapt it to animals or game of different sizes and configurations, thereby to make for universal application of the device. These objects are accomplished by the provision of an elongate slide and mounting means for securing the same in a vertical position on the central portion of the bow, said slide having spaced-apart vertically-movable sliders provided with sight bars adapted to be disposed adjacent the line of sight as the bow is held and the game is being sighted. The sight bars are shifted to closely frame the animal or game between them. One of the sight bars also carries a bull's-eye type sight which is arranged to be disposed in the space between the bars so that it can be aligned with the game. Pivotally mounted on the vertical slide is a finger piece which can be manually adjusted,

such finger piece being connected to the sliders in a novel manner so as to not only vertically adjust the latter but also to automatically vary the spacing between them. Pivotal links which are connected between the finger piece and the sliders effect this unique movement of the latter, one slider moving at a faster rate than the other in order to vary the spacing. When the sight bars are brought closer together by actuation of the finger piece, the orientation of the bow becomes such that the arrow has a higher trajectory, thereby to automatically adjust to the greater distance between the game and the archer. A closer positioning is required of the sight bars in framing the game as the latter appears smaller, with increases in the distance and vice versa. Thus, when framing the game between the two sight bars, there is had an automatic compensation for the distance or range between the archer and the game.

Other features and advantages of the invention reside in the provision of an improved, manually actuated, semi-automatic sight and range finder as above characterized wherein simple and straight-forward linkages and mechanical movements are incorporated, thereby to prevent maladjustment or malfunctioning; and a sight and range finder which is sturdy and durable, quiet in its operation, easily and quickly actuated by the archer, and capable of being preset by use of targets of different sizes, so as to enable an accurate aiming of the bow to be had for the various different sizes of game.

Still other features and advantages will hereinafter appear.

In the drawings, illustrating one embodiment of the invention:

FIG. 1 is a side elevational view of the sight and range finder attachment of the invention, positioned on central portions of a bow, only fragmentary portions of the latter being shown in side elevation.

FIG. 2 is a rear elevational view of the archery sight and range finder attachment, shown with central portions of the bow.

FIG. 3 is a reverse side elevational view of the sight and range finder attachment, this view being a mirror image of the illustration of FIG. 1.

FIG. 4 is a fragmentary horizontal section taken on the line 4—4 of FIG. 1.

FIG. 5 is a fragmentary rear elevational view of the sight bars of the attachment, shown adjusted to frame a large game animal such as a deer.

FIG. 6 is a fragmentary rear elevational view of the sight bars disposed in more closely spaced relation and arranged to frame a smaller game animal such as a skunk.

Referring first to FIGS. 1–3, in accordang with the invention the sight and range finder attachment comprises an elongate vertical slide **10** which is preferably constituted as a flat strip of channel-shaped cross section. The slide or strip **10** has an elongate longitudinal slot **12**, and has a pair of oppositely-disposed, longituidnally extending side flanges **14, 16** which provide stiffness and rigidity, and also constitute a track means for a pair of vertically movable sliders **18, 20**. The vertical slide **10** at its ends is provided with mounting means in the form of angle brackets **22, 24** which have arm portions **26, 28** respectively adapted to engage and to be secured to central portions **30, 32** respectively of an archer's bow. The brackets **22, 24** may, for example, be attached to the bow portions **30, 32** by taping them thereto, or by other suitable means.

Pivotally carried at the lower end of the vertical slide **10** is a finger piece **34** having an actuator arm **36**, the finger piece **34** being provided with a recess **38** to accommodate a finger of the one hand which holds the bow. The finger piece **34** and arm **36** are preferably located at right angles to each other and constitute a bell crank formation.

The vertically movable sliders **18, 20** are provided respectively with horizontally extending sight bars **40, 42** arranged to be parallel to each other and to be located adjacent the path of vision of an archer who is sighting game with the bow in shooting position. In FIG. 1 the approximate position of an arrow is indicated by the broken outline labelled **44**, and it will be understood that the archer's line of sight is at a level somewhat above that defined by the arrow.

When the sight bars **40, 42** are vertically moved in spaced relation to each other (together with the sliders **18, 20** which carry them) this will enable an archer to sight an animal or game between them. For example, in FIG. 5 the sight bars **40, 42** are shown as outlining or framing the body of a large game such as a deer **46**. In FIG. 6, the sight bars **40, 42** are shown as more closely spaced, and as framing a small game such as a skunk **48**. Should the deer **46** be located at a great distance from the archer, the outlining of the deer's body as indicated in FIG. **5** would require the sight bars **40, 42** to be more closely spaced with respect to each other, and the same thing is true of the small animal **48** in FIG. 6. Also the reverse is true, meaning that if the distance between the game and the archer is less, the game will appear larger in size, and the sight bars **40, 42** will then be spaced further apart in order to frame the body of the animal.

In accordance with the invention, one sight bar, preferably the lower bar **42**, is provided with a bull's-eye type sight **50** which can be carried by a hub **52** adjustably secured to the bar **42** by means of a set screw **54** (FIG. 1). To effect the proper shifting or positioning of the sight bars in response to actuation of the finger piece **34**, the invention provides a pair of connector links **56, 58**, said links being pivotally joined to the actuator arm **36** of the finger piece and being respectively pivotally connected to the upper and lower sliders **18, 20**. With the arrangement shown, manual adjustment or operation of the finger piece **34** will shift the sliders **18, 20** in such a manner that they are not only vertically adjusted along the slide **10**, but also automatically brought either closer together or further apart. This takes care of the requirement that game which is far away and which appears small, requiring a close spacing of the sight bars **40, 42**, automatically results in their being positioned vertically at a lower level, together with the bull's-eye sight **50**, so as to provide for a higher trajectory of the arrow as needed to reach the more remote game. Also, the opposite is true for game which is located closer to the archer. Such game, appearing larger, will require a greater spacing of the sight bars **40, 42** from each other, and this will result in their being automatically positioned vertically to a higher level, together with the bull's-eye sight **50**, so as to provide for a lower trajectory of the arrow since the distance or range is less.

Referring to FIGS. 1 and 3 it will be seen that the outermost link **56** is connected to the arm **36** at a point more remote from the pivot **60** of the finger piece. Also, the inner link **58** is connected to the arm **36** at a point closer to the pivot **60** for the finger piece. Thus, for any given movement of the finger piece **34**, the link **56** will shift the upper slider **18** a greater distance than the link **58** will shift the lower slider **20**. Therefore, the distance between the two sliders, and consequently the distance between the two sight bars **40, 42** will vary as the finger piece **34** is shifted either clockwise or counterclockwise as viewed in FIGS. 1 and 3.

Also, in accordance with the present invention, a simple and effective adjustment means is provided by which a given spacing of the sliders **18, 20** and therefore spacing of the sight bars **40, 42** may be had initially. As shown in FIG. 3, the bell crank arm **36** is provided with a pair of hubs **62, 64** which are turnably carried by the arm, and which have threaded transverse bores to receive the threaded end portions of the links **56, 58** respectively. In a like manner, the sliders **18, 20** have hubs **66, 68** which are pivotally carried by the sliders and which have transverse threaded bores to receive upper threaded portions of the links **56, 58**.

The lower end portions of the links **56, 58** have right hand threads and the upper end portions are provided with left hand threads. Also, the outer or foremost link **56** is provided with a finger knob portion **70** to facilitate its being turnably adjusted. By such arrangement, turning of either of the links **56, 58** will effect a raising or lowering of the associated slider **18, 20**, as can now be readily understood.

Referring to FIG. 4, the slider **18** is shown as comprising a flat strip portion **72** on which the hub **66** is pivotally mounted. The slider **18** has a thicker or body portion **74** which is received in the vertical slot **12** of the slide **10**. The slider **18** further comprises a companion piece **76** of angular configuration, such piece being also received in between the side flanges **14, 16** of the slide **10** and having shoulders **82, 84** engageable with said slide flanges. A screw **86** secures together the parts **74, 76** in a manner that a loose sliding fit is had with the vertical slide **10**. The slider **20** is constructed in a similar manner.

The sight and range finder as above set forth may be advantageously initially adjusted as follows: If the game which is being hunted is of large size, such as for example the deer illustrated in FIG. 5, the archer will initially adjust the sight by use of a target of, say, 18" in diameter. At a distance of 20 yards from an 18" target, the archer will now shift the finger piece **34** while aiming an arrow at the center of the target and sighting the latter, so as to bring the bull's-eye sight **50** exactly in line with the target bull's-eye or center. In doing this, the archer may also have to shift the bull's-eye sight **50** horizontally on the sight bar **42** by first loosening and then tightening the screw **54**. This lateral or horizontal adjustment is often referred to as a windage setting. An arrow can now, if desired, be shot at the target, and depending on whether it strikes too far left or right, the bull's-eye sight **50** is readjusted horizontally until the best accuracy is obtained, for the horizontal or windage adjustment.

Upon the alignment of the sight **50** being accomplished in the foregoing manner, the finger piece **34** is not again moved during the initial adjustment of the device, and it is important to observe this precaution. The archer now turns the link **56** by grasping the finger knob **70**, so as to exactly frame the upper and lower edges of the target between the sight bars **40** and **42** respectively, while sighting the target with an arrow drawn back in the bow. This completes the adjustment procedure.

As the device is now set, the archer will find that great accuracy will be had in shooting, from a distance of 60 yards to all lesser distances. All that is necessary is to frame the animal accurately between the sight bars **40, 42** by adjustment of the finger piece **34** and thereafter zero-in by aligning the bull's-eye sight **50** with the game as shown in FIG. 5.

The same procedure is followed to initially adjust the device for small game, except that a smaller target is used, for example a 6" target, and adjustment made at a distance of 10 yards from the target.

It will now be seen from the foregoing that I have provided a novel and improved combination archery sight and range finder which is of universal application, being adaptable for use with both large and small game by proper preadjustment. The device is in the form of an attachment by which it can be incorporated on various types of bows, and when properly installed and adjusted, can be easily and quickly actuated to enable the archer to properly orient the bow for accurate aiming at the game. Relatively few parts are involved in the construction, and the parts needed may be economically fabricated and quickly assembled into a rugged and foolproof organization which will provide for accurate shooting and will not readily get out of order or malfunction. The at-

tachment of the device can be quickly effected by the use of friction tape, vinyl electrical tape or the like, as will be readily understood.

Variations and modifications are possible without departing from the spirit of the invention.

I claim:

1. An archery sight and range finder comprising, in combination:

(a) an elongate slide,

(b) means for mounting the slide vertically on a central portion of an archer's bow,

(c) a pair of sliders carried by and vertically movable on the slide,

(d) an actuating arm pivotally connected to the slide,

(e) a pair of links pivotally connected to said actuating arm at spaced-apart points thereon,

(f) said links being respectively pivotally connected to the sliders to constitute with the latter and with the actuating arm a movable assemblage whereby pivotal movement of the arm shifts the sliders at different rates along the slide to vary the spacing between them and simultaneously reposition them vertically,

(g) a pair of projecting sight bars disposed alongside each other respectively on said sliders and arranged to be located at the path of vision of an archer who is sighting game with the bow in shootng position,

(b) said sight bars thereby having a variable spacing and vertical positioning by virtue of their being carried by the respective sliders, whereby game can be visually located between the sight bars,

(i) a bull's-eye type sight carried by one of said sliders and disposed between the sight bars, for alignment with the game being sighted, and

(j) means connected to said slide and including a manually-operable finger piece, for effecting movement of said movable assemblage of sliders, links and actuating arm.

2. An archery sight and range finder as in claim 1, and further including:

(a) adjustment means for changing the length of one of said links.

3. A device as in claim 2, wherein:

(a) said one link comprises a rod having left hand and right hand threads at its respective ends.

4. A device as in claim 1, wherein:

(a) said slide comprises a flat strip having a longitudinal slot in it,

(b) said sliders comprising multi-part assemblages extending through said slot.

5. A device as in claim 1, wherein:

(a) the finger piece and arm comprise a bell crank.

6. A device as in claim 5, wherein:

(a) the finger piece has a recess to accommodate a finger of one hand which holds the bow.

7. A device as in claim 1, wherein:

(a) means are provided for adjustably mounting the bull's-eye sight on one sight bar.

8. A device as in claim 1, wherein:

(a) the sliders have hubs projecting from them in directions opposite to the projecting directions of the sight bars,

(b) said links being connected to said hubs.

9. A device as in claim 5, wherein:

(a) the bell crank is pivotally mounted at one end of the slide.

10. A device as in claim 4, wherein:

(a) said slide is of channel-shaped cross section with side flanges,

(b) said sliders having shoulder surfaces engaged with the side flanges of the slide.

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