

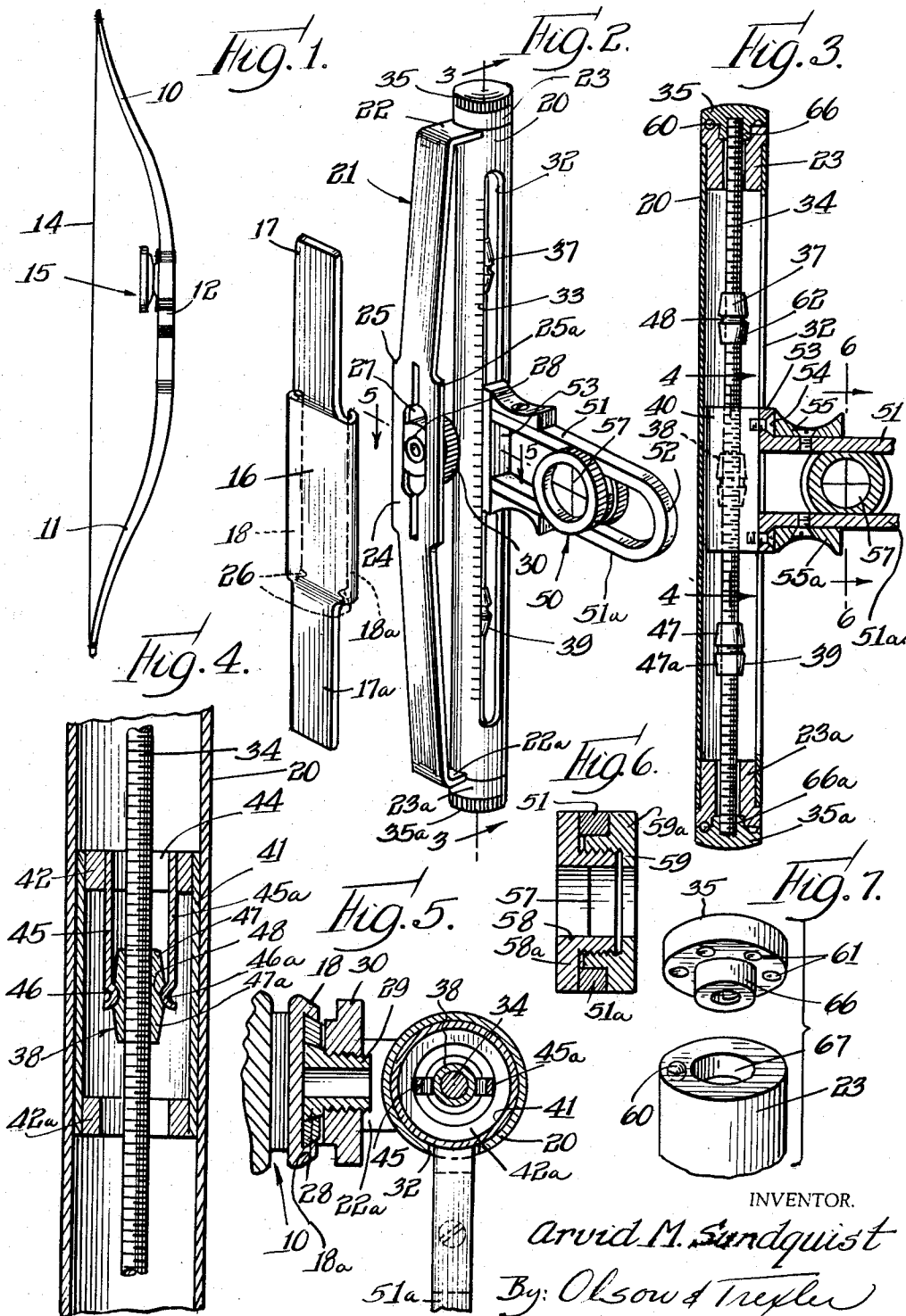
July 7, 1959

A. M. SUNDQUIST

2,893,124

ARCHERY BOWSIGHT

Filed March 20, 1957



1

2,893,124

ARCHERY BOWSIGHT

Arvid M. Sundquist, Dundee, Ill., assignor to Reliance Tool & Die Works, Elgin, Ill., a copartnership

Application March 20, 1957, Serial No. 647,307

18 Claims. (Cl. 33—46)

The present invention relates to new and useful improvements in sighting devices, and more particularly to such improvements in an archery sighting device adapted for attachment to a bow to improve its accuracy in shooting arrows either on an archery range or in actual hunting.

Various types of sighting devices have been proposed for use with a bow to improve its accuracy and the present invention generally contemplates the provision of a sighting device which may be conveniently attached to a bow, without structural alteration thereof, and which may be conveniently manipulated by the archer. On the archery range, as for instance, in a standard men's tournament round, it is common practice to take several shots at different ranges, such as forty yards, fifty yards, and sixty yards. Also, in actual hunting, the ability to quickly set a sighting device at least at an approximate range with respect to a spotted target is of importance.

One of the principal objects of the present invention is to provide an improved bow sight assembly wherein the sighting device may be rapidly shifted along the bow to predetermined positions substantially corresponding to predetermined ranges.

Another object of the present invention is to provide a bow sight assembly wherein the sighting device may be micro-adjusted at each predetermined range location thereof for improved accuracy.

A further object of the invention is to provide such a sighting device which may also be adjusted laterally of the bow for windage correction and also for adaptation to the particular stance or position of the archer.

A still further object of the invention is to provide a bow sight assembly wherein the sighting device may be rapidly shifted from one predetermined range position to another merely by finger pressure of the archer and without the necessity for effecting any mechanical connection or disconnection.

The invention still further aims to provide a bow sight assembly substantially of the above type which lends itself to relative inexpensive commercial production, which is readily assembled and attached to the bow, and which is extremely simple in its operation.

The above and other objects of the invention will in part be obvious and will be hereinafter more fully pointed out.

In the drawing:

Fig. 1 is a side elevation showing a more or less conventional bow with the sight assembly attached thereto;

Fig. 2 is an enlarged perspective view showing the bow sight assembly detached from its mounting plate;

Fig. 3 is a sectional view taken substantially along the line 3—3 of Fig. 2;

Fig. 4 is an enlarged sectional view, taken substantially along the line 4—4 of Fig. 3, to show further details of the carriage or slide carrying the sighting device;

Fig. 5 is an enlarged sectional view, taken substantially along the line 5—5 of Fig. 2, to show the mounting of the sight assembly on the mounting plate which is attached to the bow;

2

Fig. 6 is an enlarged sectional view, taken substantially along the line 6—6 of Fig. 3, to show the manner of adjustably mounting the sighting device on the windage frame; and

Fig. 7 is an enlarged fragmentary perspective detail showing an audible "clicking" device operable upon turning of the adjusting screw.

Referring more in detail to the accompanying drawing, and particularly to Fig. 1, there is shown a conventional bow having upper and lower limbs 10, 11, an intermediate hand grip 12, with the ends of the limbs connected by the usual bow string 14. The sighting device, generally indicated by the numeral 15, is illustrated as being attached to the back of the upper limb 10 directly above the hand grip 12. Thus, it will be seen that the sighting device can be conveniently attached to a conventional bow without structural alteration thereof.

With reference to Figs. 2 and 5, there is shown the mounting plate 16 having offset attaching ledges or legs 17, 17a which are adapted for attachment to the bow limb as by staking, riveting or cord lashing. The plate 16 includes side flanges 18, 18a forming retaining guide or trackways, such structure being more clearly shown in Fig. 5. The sight assembly includes a carriage guide means which is illustrated as being in the form of a cylinder 20 to which a mounting bracket 21 is attached by means of end tab portions 22, 22a secured to the cylinder within annular end rings or plugs 23, 23a, respectively. The central portion 24 of the bracket 20 may be slightly widened, if desired, to provide edge portions 25, 25a slidably fitting respectively within the guide or trackways 18, 18a. The bottom ends of the guide or trackways may be turned inwardly, as at 26, to engage the corresponding ends of the vertical edges 25, 25a and thus limit and properly position the bracket in its interfitting relationship with the mounting plate, 16.

The central portion 24 of the bracket 21 is provided with an elongated opening 27 in which is mounted a shoe or traveler 28 having an externally threaded boss 29 projecting toward the cylinder 20 adapted to receive a clamping nut 30 which overlies the central portion 24 of the bracket. The side elongated edges of the shoe 28 and of the opening 27 are complementally inclined (see Fig. 5). After assembly of the bracket 21 on the mounting plate 16, tightening of the nut 30 will operate through the aforesaid complementally inclined edges to draw the central portion 24 of the bracket into frictional engagement with the guideways 18, 18a, thus to hold the sight assembly in fixed position on the mounting plate.

The elongated cylinder 20 is provided with an elongated slot 32 serving as a guide in a manner to be hereinafter pointed out, and may also be provided with graduations 33 as shown. Within the cylinder 20 there is positioned an elongated screw member 34 which extends entirely through the cylinder and through the plugs 23, 23a in which the screw is freely rotatable. The ends of the screw member 34 are threadedly secured to knurled upper and lower knobs 35, 35a, respectively, by which the screw member may be rotated within the cylinder.

Threadedly mounted on the screw member 34 and within the cylinder 20 are a plurality of stop members, preferably in the form of internally threaded nut members. Three of such nut members are illustrated, namely, an upper nut member 37, an intermediate nut member 38 and a lower nut member 39. These nut members are initially disposed along the screw member 34 in predetermined spaced relation, as for instance, corresponding to ranges of forty yards for the top stop member 37, fifty yards for the intermediate stop member 38 and sixty yards for the bottom stop member 39. The positioning of these stop members may be varied in accordance with the

3

ranges to be encountered and additional stop members may be provided if desired.

Within the cylinder 20, there is mounted a slide or carriage 40. As more particularly shown in Fig. 4, this slide includes an outer cylindrical portion 41 having upper and lower ring members 42, 42a suitably mounted at the upper and lower ends thereof, respectively. The cylindrical body 41 of the slide or carriage is freely slidable within the inner surface of the cylinder 20. If the cylinder 20 should be formed of out-of-round stock, the slide or carriage could be similarly formed.

One of the ring members 42 or 42a has suitably mounted within the inner surface thereof an annulus 44 carrying spaced spring fingers 45, 45a projecting axially of the body portion 41 and, as illustrated, disposed there-within. These spring fingers 45, 45a are pre-tensioned to tend to move toward the centrally disposed nut member 34 and the free ends of the spring fingers are provided with inwardly directed curved knob portions 46, 46a. Each nut or stop member is identical and by reference to Fig. 4, the nut member 38 is illustrated as including a centrally disposed peripheral groove 48 with which the rounded knob portions 46, 46a of the spring fingers cooperate. From the groove 48, the peripheral surface of the nut or stop member is inclined inwardly toward the screw 34 and thus provides upper and lower inclined camming surfaces 47, 47a to cooperate with the spring knob portions 46, 46a, facilitating attachment and detachment therefrom as the carriage or slide 40 is shifted within the cylinder 20 in the manner to be hereinafter pointed out.

The sighting device, generally indicated by the numeral 50, is mounted between the legs 51, 51a of a U-shaped frame 52. The inner ends of the legs are mounted on or molded integrally with a support 53 carrying mounting screws 54 which threadedly engage corresponding openings in the carriage or slide 40 to secure the sight frame 52 thereto. Curved finger pieces 55, 55a may be attached to the legs 51, 51a, respectively, to serve as convenient finger grip surfaces for the archer in shifting the sighting device and its mounting along the cylinder 20. Where the guide cylinder 20 and slide or carriage 40 are both cylindrical, it is necessary to provide some means for preventing relative rotation therebetween, thus to confine the carriage or slide 40 to rectilinear movement within the cylinder 20. Rather than provide a separate machining operation on the carriage or slide 40 to afford a rib or the like running in the slot 32, the supporting block 53 is disposed within the slot 32 to substantially fill the transverse extent thereof and thus prevent rotation of the slide 40 and confine the same to rectilinear movement along the cylinder 20 as guided by the edges of the slot 32 cooperating with the sides of the block 53. The sighting device 50 includes crossed hair lines on a lens 57 mounted within an externally threaded annular member 58 having a flange portion 58a overlying the legs 51, 51a of the frame 52. This annular member 58 cooperates with an internally threaded annular member 59 having an outwardly directed flange 59a overlying the opposite edges of the legs 51, 51a. Thus, relative tightening of the annular members 58, 59 will cause their respective flanges to engage the legs 51, 51a and hold the sighting device in predetermined position along its frame. Relative loosening of these members will permit shifting of the sighting device which is for the purpose of making corrections for windage and also in corrections for the particular or peculiar stance of the archer.

The sighting assembly is mounted on the bow limb in substantially vertical position with the sight frame 52 projecting substantially horizontally from the guide cylinder 20. Assume use of the bow on an archery range at a fifty yard distance, the slide or carriage will be positioned on the intermediate nut or stop member 38, as illustrated in Figs. 2 and 3. In this position, the

4

curved ends 46, 46a of the spring fingers 45, 45a will engage the groove 48 in the stop member with sufficient spring pressure to prevent rotation of this stop member if and when the adjusting screw 34 is rotated. With the device thus set for the fifty yard range, taken as an example, the archer may wish to make some fine micro-adjustment of the sighting device and to this end, one of the knobs 35, 35a may be rotated and since the spring fingers hold the nut member 38 against rotation, there will be micro-adjustment of the slide 40 and the connected nut member 38 along the slot 32 in one direction or the other, as the case may be. As a further indication to the archer of this micro-adjustment, a spring loaded ball 60 may be positioned in each of the end plug members 23, 23a and this ball will cooperate with one or more recessed seats 61 in the corresponding knobs 35, 35a to give an audible "clicking" to the archer. Thus, a single seat might be provided in which case the "click" would indicate one complete turn of the corresponding knob, or intermediate seats may be provided for even finer adjustment.

It will be understood that during any micro-adjustment of the slide or carriage 40 and its connected nut or stop member, as for instance, the connected stop member 38, the other stop members 37, 39 will rotate with the screw 34 so that their relative axial position thereon will not be altered. Then, when the archer wishes to change to a forty yard range, for instance, he will grasp the finger piece 55a and apply pressure thereto toward the top of the sighting device and this will cause the ends 46, 46a of the spring fingers to ride out of the groove 48 and free themselves from the stop member 38 so that the entire sighting device and slide 40 can be rapidly shifted upwardly toward the stop member 37. At the end of such movement, the ends 46, 46a of the spring fingers will ride up the camming surface 62 on the stop member 37 to facilitate snap engagement of the ends 46, 46a of the spring fingers and the groove 48 in the stop member 37. This will position the sighting device and its carriage in position for a forty yard range, for example, and further micro-adjustment at this range can now be accomplished by rotating the screw 34 in the manner pointed out above. In similar manner, the slide 40 can be shifted into engagement with the stop member 39 for the sixty yard range, and in doing so, the spring fingers are forced over the intermediate stop member 38. While in actual hunting, time may not, in some instances, permit micro adjustment, nevertheless the permissive rapid shifting of the sighting device to various range approximations will greatly add to the accuracy of the bow in following moving targets. It is understood, of course, that the carriage and ring members clear the screw 34 although the spring fingers may be such as to frictionally engage the screw so as to maintain the sighting device at intermediate approximate ranges in which case the cylinder 20 may be calibrated along the slot 32 for this purpose. The screw is centered by means of the threaded bosses 66, 66a on the knobs 35, 35a, respectively, seating in corresponding recesses in the plugs 23, 23a, such as the recess 67 in Fig. 7.

From the foregoing description, it will be seen that the present invention provides a highly efficient and easily operable bow sight wherein the sighting device, with windage adjustment, may be readily shifted along the guide cylinder for selective positioning at various ranges and at each range position micro adjustment may be further accomplished. The spring and groove or detent connection not only provides the readily releasable connection between the stop members and slide but also serves as the means for holding a connected stop member against rotation when micro adjustment at a selected range is desired. When such micro adjustment is made, the particular stop member is easily accessible through the housing slot so that it can be turned for adjustment to a predetermined position with respect to the other stop mem-

5

bers. The various parts of the bow sight assembly may be made of any suitable material, plastic or metal, and secured together in any suitable manner in accordance with the material employed.

While one form of the invention has been shown and described, it is to be clearly understood that various changes in the details of construction and arrangement of parts may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. A bow sight comprising elongated guide means for mounting on a bow limb, rotatable screw means carried by said guide means and extending longitudinally thereof, slide means carried by said guide means for rectilinear movement relative thereto independently of said screw means, a sighting device carried by said slide means, a plurality of stop members having threaded engagement with said screw means and normally disposed in predetermined spaced apart relationship and with each stop member adapted for micro adjustment therealong when held against rotation during rotation of said screw means, and means providing a releasable and selectively engageable connection between said slide means and each said stop member and operating to hold a connected stop member against rotation when the slide means is connected thereto for effecting micro adjustment of the slide means upon rotation of said screw means, while permitting quick release and selective shifting of the slide means from the connected stop member to another stop member.

2. A bow sight as claimed in claim 1, wherein the releasable connection between the slide means and each stop member comprises interengaging and readily releasable spring and detent means.

3. A bow sight as claimed in claim 2, wherein the detent means comprises an annular recess on each stop member and the spring means comprises a plurality of spring fingers carried by the slide means for selective engagement with one of the recesses.

4. A bow sight as claimed in claim 1, wherein the releasable connection includes a plurality of spring fingers carried by the slide means.

5. A bow sight as claimed in claim 4, wherein each stop member is in the form of a nut threaded to said screw means and comprising a central annular groove to receive said spring fingers for connecting the slide means thereto and camming surfaces inclined from the groove toward the screw means and cooperating with said spring fingers to facilitate connection and release from the nut member.

6. A bow sight as claimed in claim 1, wherein the guide means comprises a slotted cylinder enclosing the stop members and wherein the sighting device is connected to the slide means through the slot with which the sighting device cooperates to constrain the slide means to its rectilinear movement along the cylinder.

7. A bow sight as claimed in claim 1, wherein the guide means comprises an elongated housing enclosing the stop members and having an elongated longitudinal slot through which the sighting device is connected to the slide means.

8. A bow sight as claimed in claim 7, wherein the screw means comprises an elongated screw member extending longitudinally of said housing and wherein the housing has journaled in the ends thereof rotatable knobs to which the screw member is attached.

9. A bow sight as claimed in claim 8, wherein at least one end of the housing and the adjacent knob are provided with mutually cooperating means providing an

6

audible clicking sound upon rotation of the knob to indicate a predetermined degree to which the knob and screw member have been turned.

10. A bow sight as claimed in claim 1, wherein there are provided a mounting bracket offset from said guide means and a mounting plate adapted for attachment to a bow limb, the bracket and mounting plate having mutually and slidably interfitting track and guideway means with screw means carried thereby for securing the same against separation.

11. A bow sight as claimed in claim 1, wherein there is provided a horizontal bracket extending outwardly from said slide means, and wherein the sighting device is mounted for horizontal adjustment along said bracket to correct for windage and stance.

12. A bow sight as claimed in claim 1, wherein the guide means comprises an elongated housing and the slide means is complementally shaped for mounting therein.

13. A bow sight as claimed in claim 12, wherein the housing and slide means are both substantially cylindrical to encircle the screw means and stop members, and wherein the slide means carries spring fingers normally urged inwardly toward the screw means to engage the stop members.

14. A bow sight as claimed in claim 1, wherein the slide means is in the form of hollow housing surrounding the screw means and carrying therewithin spring fingers for selectively engaging the stop members.

15. A bow sight adapted for mounting on a bow limb and comprising elongated guide means, slide means carried by said guide means for rectilinear movement relative thereto, a sighting device carried by said slide means and movable therewith, a plurality of stop members and means mounting said stop members in predetermined spaced relation on said guide means and for permissive adjustment along and relative to the guide means whereby the stop members may be positioned according to predetermined ranges, and means providing mutually cooperating spring and detent means on said stop members and slide means for releasably connecting said slide means to one stop member while permitting ready shifting thereof to another.

16. A bow sight as claimed in claim 15, wherein the spring means is carried by said slide means and the detent means is formed on the stop members each of which being provided with cam means cooperating with the spring means to facilitate connection and release therebetween.

17. A bow sight as claimed in claim 15, wherein the mounting means for the stop members comprises a screw member with which the stop members are in threaded engagement for effecting longitudinal adjustment of the stop members upon rotation of said screw member.

18. A bow sight as claimed in claim 17, wherein the guide means is in the form of a housing structure enclosing the stop members and screw member and slide means, and having a slot through which the sighting device is mounted on said slide means.

References Cited in the file of this patent

UNITED STATES PATENTS

2,283,692	Paldani	May 19, 1942
2,542,501	Fredrickson	Feb. 20, 1951
2,642,661	Frederickson	June 23, 1953
2,654,152	La Vire	Oct. 6, 1953
2,742,702	Williams	Apr. 24, 1956
2,767,472	Kocur	Oct. 23, 1956