

# United States Patent [19]

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[54] MOTOR DRIVEN BOW SIGHTING DEVICE  
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296/26

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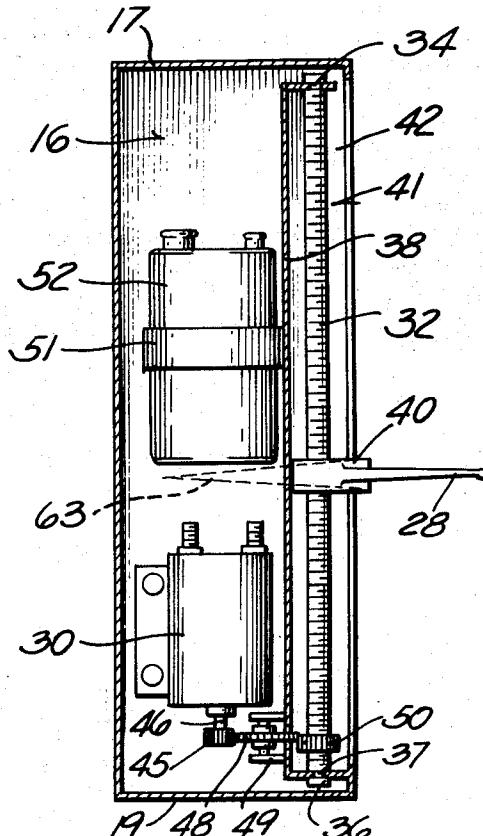
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[57] ABSTRACT

A sighting device for an archer's bow includes a single

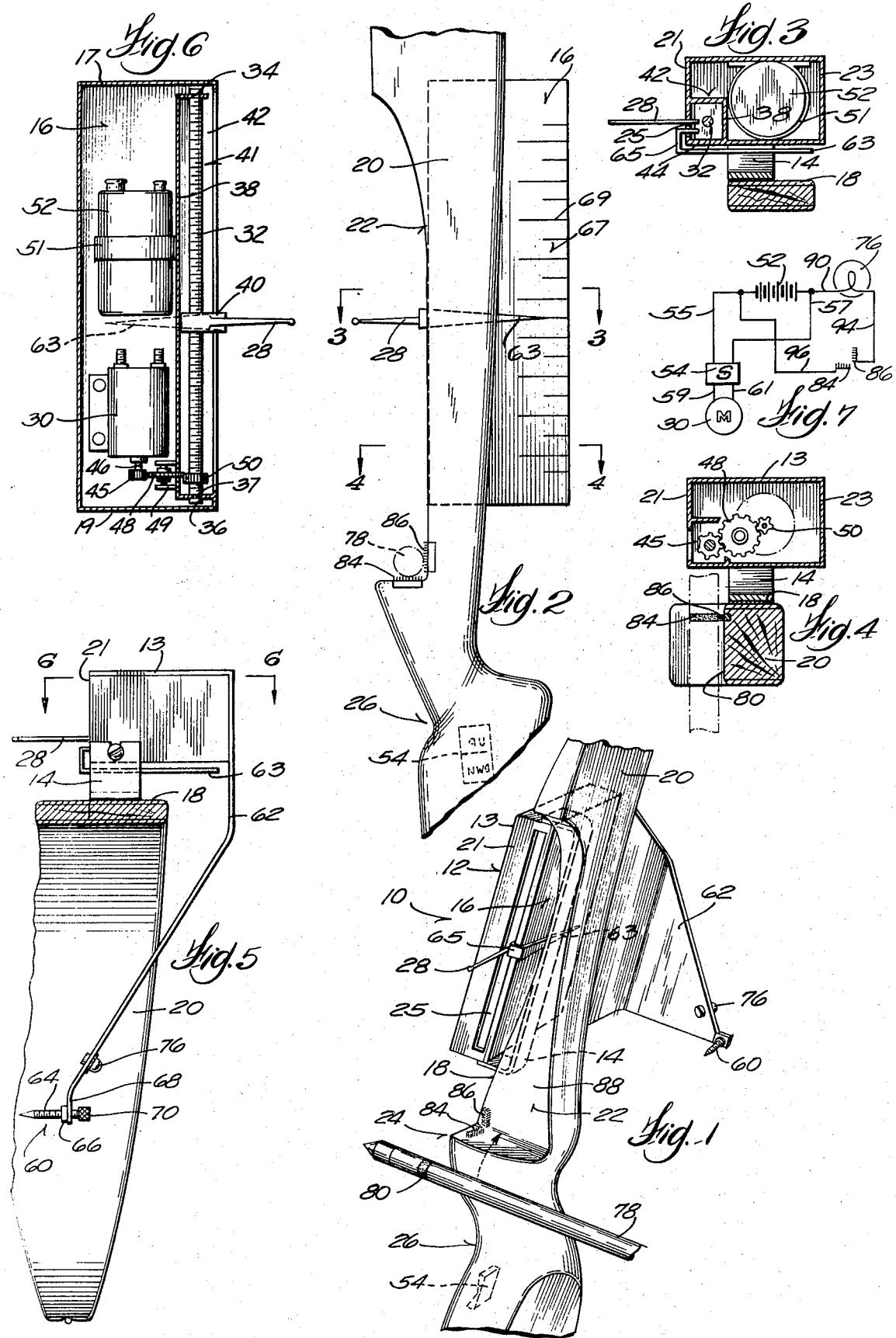
sight pointer which is adjustably movable vertically in registry with the sight window on the bow. The sight pointer is mounted on and extends laterally from a nut which is threadably received on a screw rotatably supported on a bracket which is attachable to the bow. The nut is confined by channel flanges which afford rectilinear movement of the nut but restrain rotation of the nut. A small electric reversible motor is connected to the screw by a gear drive train for raising and lowering the sight pointer. The motor and a battery for energizing the motor are supported on the bracket. The electrical switch for energizing the motor for raising or lowering the sight indicator is optionally located on the bracket or in a convenient access location on the bow hand grip. An indicator projects laterally and oppositely of the pointer for registration with distance indicia on a scale also carried by the bracket. The bow sight also includes a rear sight which is connected to the bracket and positioned rearwardly of the bow hand grip and alignable with the forward sight pointer and the target to facilitate aiming of the arrow. The sighting device also includes an electrical circuit with a signal light to indicate a pre-selected full arrow draw and in which the signal light is illuminated when a conductor on the arrow closes two electrical contacts on the arrow rest.

5 Claims, 7 Drawing Figures



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## MOTOR DRIVEN BOW SIGHTING DEVICE

## BACKGROUND OF INVENTION

Various types of bow sighting devices are available which have one or more sight pointers which are typically preset for various ranges prior to drawing the bow. These devices are convenient when target shooting at known ranges but impractical for hunting, because the sight pointer is not readily adjustable as the range changes and when the bow is drawn.

## SUMMARY OF INVENTION

The bow sight of the invention provides a single sight pointer which is easily adjusted for various ranges when the arrow is drawn. An electrical switch easily accessible by the archer on the hand grip energizes a reversible motor to rotate a screw to raise or lower the sight pointer which is supported on a nut threaded on the screw. The screw, the motor and a battery are all conveniently carried on a bracket easily attachable to the bow. The bracket includes opposed spaced flanges or wall portions for confining the nut against rotation. An indicator carried by the nut and extending laterally oppositely of the sight pointer moves over a scale on the bracket which provides indicia to facilitate calibration and adjustment of the sight pointer for various ranges.

The invention also provides a rear sight in the form of a laterally adjustable screw which is carried by a support which is connected to the bracket and extends rearwardly of the bow and behind the sight pointer for alignment with the sight pointer and the target. A signal light to indicate full draw of the bow includes a conductor adjustably positioned longitudinally of an arrow adjacent the arrow tip and two spaced electrical contacts on the arrow rest which are closed by the conductor on the arrow to complete the circuit to the signal light.

Further objects, advantages and features of the present invention will become apparent from the following disclosure.

## DESCRIPTION OF DRAWINGS

FIG. 1 is a side rear perspective view of the bow sighting device and draw indicator of the invention and a fragmentary view of a bow and arrow.

FIG. 2 is an enlarged rear view of the sighting device of the invention.

FIG. 3 is a sectional view along lines 3—3 of FIG. 2.

FIG. 4 is a sectional view along lines 4—4 of FIG. 2.

FIG. 5 is a plan view of the bow sight shown in FIG.

1.

FIG. 6 is a front view of the bowsight shown in FIGS. 1 and 3 along lines 6—6 of FIG. 5.

FIG. 7 is a schematic diagram of the electrical circuit for the bow sight.

Although the disclosure hereof is detailed and exact to enable those skilled in the art to practice the invention, the physical embodiments herein disclosed merely exemplify the invention which may be embodied in other specific structure. The scope of the invention is defined in the claims appended hereto.

In the drawings, FIG. 1 discloses a sighting device in accordance with the invention which is generally designated 10 and which includes a frame or bracket 12 having a bracket mounting portion 14 which is spaced from the bracket wall 16 and connectable to the forward face 18 of the bow 20 by screws or bands (not

shown). The bracket 12 can also include a front wall 13 connected to the wall 16 by top and bottom walls 17 and 19 and spaced side walls 21, 23. The bracket walls thus enclose the motor and battery hereinafter described. The side wall 21 can be provided with a longitudinal slot 25.

The bow 20 conventionally includes a window 22 which extends downwardly to merge with an arrow rest 24. The bow also conventionally includes a hand grip 26.

The bow sight 10 includes a sight pointer or forward sight pointer 28 which projects through the slot 25 and is movable reciprocably in registry with the bow sight window 22 and forwardly of the sight window. In accordance with the invention, means are provided for connecting the sight pointer 28 to an electric motor 30 (FIGS. 6, 7) for moving said sight pointer reciprocably to afford a range of sight pointer positions within said window 22. In the disclosed construction, the means includes a screw 32 which is supported by bearings or tabs 34, 36 which have apertures 37 which rotatably receive the ends of the screw 32 which can be interconnected by a strut or wall portion 38 which is connected to the bracket wall 16.

The sight pointer 28 is carried by a threaded member or nut 40 with one or more flat surfaces which is confined in the channel 41 between a vertically extending flange or wall 42, the inner surface of the bracket wall 16 and wall portion 38. The nut 40 is thus confined against rotation and affords rectilinear movement of the nut 40 on the screw 32. The means for connecting the motor to the pointer 28 also includes a gear 45 on the motor output shaft 46 which meshes with an idler gear 48 carried by the bearings 49 on the bracket. The idler gear 48 meshes with a gear 50 on the screw 32. The use of the gear train as heretofore described enables placement of the motor 30 laterally offset from the screw 32 to minimize the size of the sighting device 10.

The motor 30 is a reversible DC motor powered by a battery 52 which is also mounted on the bracket wall 16 by a clip 51. The motor is energized by an electrical switch 54 (FIGS. 1 and 2) which can be located on the sighting device 10 or be conveniently located on the handle grip 26 of the bow so that it is easily operated by the hand gripping the bow. The switch 54 desirably has a rockable or slideable switch actuator which is movable between an off position and a forward and reverse position. A double pole double throw switch wired to reverse polarity to the motor can be employed. The switch 54 is connected to the battery by leads 55, 57 and to the motor by leads 59, 61.

The sighting device 10 also includes a range indicator 63 which is connected to the nut 40 and extends through the slot 25. A bend 65 provides clearance of the range indicator 63 with the bracket wall 16 and positions the indicator 63 between the front face 18 of the bow and the wall 16. A scale 67 with indicia is located on the wall 16 for cooperation with the indicator. The scale can contain suitable range indicia 69 which is used when calibrating the bow. When calibrated, the indicia will typically include range in yards or other units.

The invention also includes a rear sight pointer 60 which is supported by a bracket portion 62 which extends rearwardly and inwardly from bracket 12 to position the pointer 60 behind the sight pointer 28 for alignment with the pointer 28 and the target. The

pointer 60 desirably has a threaded shank portion 64 which is threaded into a nut 66 which is anchored on the tab 68. A kurled head 70 facilitates lateral adjustment of the pointer to compensate for the effect of cross winds, etc.

The invention also includes a full draw indicator in which a signal light or other alerting device such as a buzzer 76 is supported on the bracket portion 62 or bracket 12 and connected to the battery 52. An arrow 78 is provided with an electrical conductor 80 which is adjustable longitudinally of the arrow and typically located adjacent the tip 82 of the arrow. The conductor 80 can be a metallic band, paint or a film. When the conductor 80 is in the desired position and the arrow is drawn, the conductor 80 will complete the electrical circuit to the signal light 76 when the conductor engages spaced electrical contacts 84 and 86. The electrical contact 84 is located on the rest 24 and the electrical contact 86 is affixed to the sight window face 88. The circuit to the signal light includes a lead 90 connecting one terminal of the light 76 to the battery 52, a lead 94 connecting the other terminal of the light 76 to the contact 86. A lead 96 connects the contact 84 to the other battery terminal.

In use the conductor 80 is positioned on the arrow at a position which is comfortable for the archer when the arrow is at the desired full draw. Thus the archer can consistently make the same draw which is necessary for uniform power and uniform shooting.

What is claimed is:

1. A sighting device for a bow comprising a mounting bracket including wall portions defining a housing, a sight pointer movable relative to said bracket, an electric motor having an output shaft, said motor being supported on said mounting bracket within said housing walls, means for connecting said output shaft to said pointer for moving said sight pointer reciprocably to afford a range of sight pointer positions on said bracket, said means comprising a screw, means for supporting said screw on said bracket, a threaded member in the form of a nut having opposed flat surfaces threadably received on said screw and connected to said sight pointer, channel means having opposed flat surfaces engaging said nut surfaces and including at least one channel wall comprising a flange means pro- 45

jecting inwardly from a housing wall for restraining rotation of said threaded member and affording rectilinear movement of said threaded member on said screw, and means for energizing said motor, said housing wall portions including front, rear and side walls enclosing said motor and said screw, a longitudinal slot in one of said side walls, said rear wall being adapted to face a bow when mounted on a bow including a scale on said rear housing wall having indicia and a range indicator connected to said threaded member, said range indicator including a portion generally parallel with said rear wall and registerable with said indicia, a portion generally parallel with said side wall having said slot, and an indicator portion extending through said slot and said sight pointer extending in a direction counter to the direction of said range indicator.

2. A sighting device in accordance with claim 1 wherein said output shaft is offset from said screw and wherein said means for connecting said output shaft to said screw includes a gear on said output shaft, a gear on said screw and an idler gear supported on said bracket and meshing with said gear on said output shaft and said gear on said screw.

3. A sighting device for a bow in accordance with claim 1 wherein said threaded member has opposed flat surfaces and wherein said means for restraining rotation of said threaded member and affording rectilinear movement of said threaded member further comprises opposed spaced surfaces on said bracket defining a channel to receive said flat surfaces of said threaded member.

4. A sighting device for a bow in accordance with claim 1 including a rear sight pointer, means for supporting said rear sight pointer on said bracket in spaced relation from said sight pointer and means for adjusting said rear sight pointer laterally to compensate for wind variations.

5. A sighting device in accordance with claim 1 wherein said sighting device is adapted to be attached to a bow and said sighting device including a battery, and an electrical switch selectively operable by manual manipulation of the user, said switch being electrically connected to said battery and said motor for energizing said motor.

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