Jan. 14, 1958 J. M. KAYFES ET AL 2,819,707

BOW STRING DRAWING AND RELEASING DEVICE

Filed March 25, 1955 2 Sheets-Sheet 1

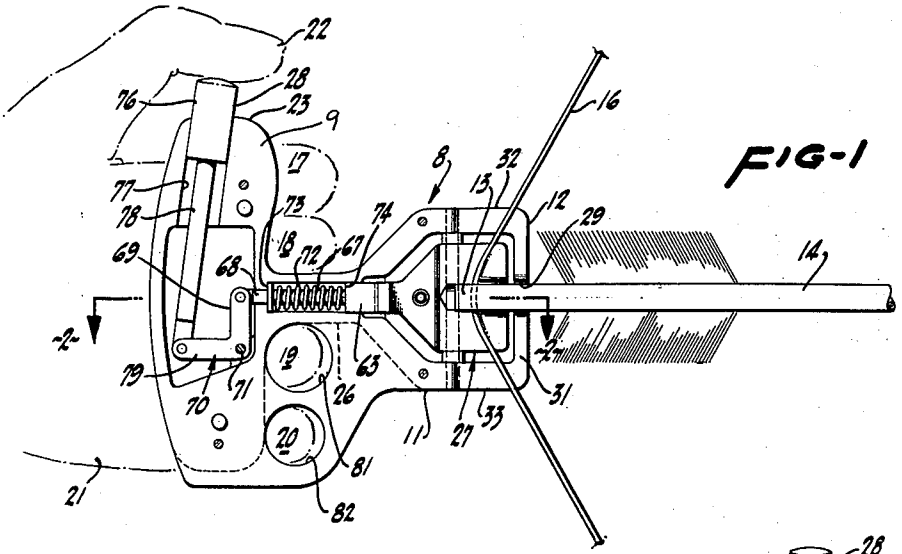

FIG-1

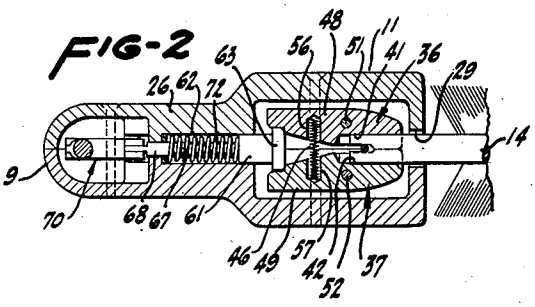

FIG-2

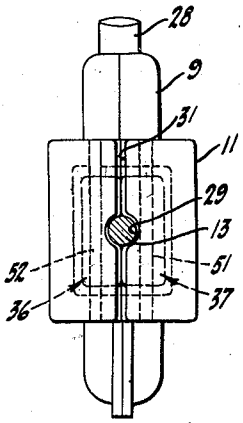

FIG-3

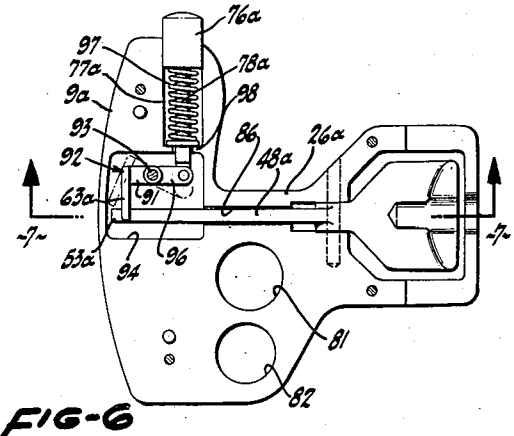

FIG-6

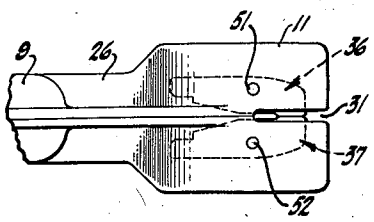

FIG-4

INVENTORS
JOE M. KAYFES
HENRY R. GARNERO

BY Manfred D. H. Warren
Their Attorney

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FIG-7

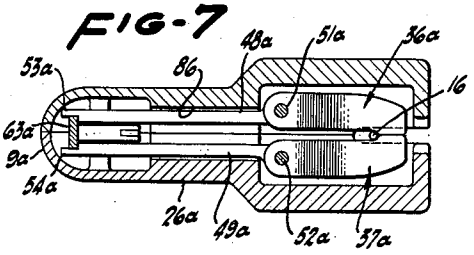

FIG-5

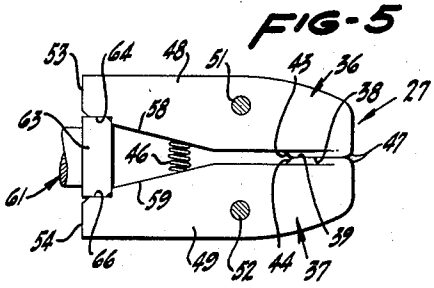

FIG-8

INVENTORS
JOE M. KAYFES
HENRY R. GARNERO

BY Manfred M. Warren
Their attorney.

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BOW STRING DRAWING AND RELEASING DEVICE

Joe M. Kayfes and Henry R. Garnero, Richmond, Calif.

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1 Claim. (Cl. 124—35)

The invention relates to manually held pull devices designed for engaging the string of the archer's bow to aid in the drawing back of the bow string and in the holding and releasing of the arrow.

An object of the present invention is to provide a device of the character described which will be strong, rigid and durable in its construction and which will afford maximum pulling force on the spring with all forces symmetrical and balanced so that the device and the bow and arrow may be accurately held on shooting center and which, notwithstanding the high forces transmitted to the bow string, will not cause an undue wearing or premature breaking of the spring.

Another object of the present invention is to provide a device of the character described which may be grasped in the palm of the hand of the user with the fingers encircling the handle portion of the device, and which provides an operating trigger positioned for convenient and easy engagement and displacement by the thumb to effect instantaneous trigger release of the arrow with minimum movement of the thumb and without in any wise disturbing the holding of the device or its position so as to thereby effect a steady, straightforward dead accurate rifle-like shooting action.

A further object of the present invention is to provide a device of the character above which may be carried on the fingers of the archer while leaving the index and adjacent fingers and thumb free for removal of an arrow from the quill and placing on the bow in shooting position, and which may thereafter be manipulated with ease and facility to engage the bow string and arrow preparatory to drawing back of the string to arrow releasing position.

The invention posseses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be undersood, however, that variations in the showing made by the said drawings and description may be adopted within the scope of the invention as set forth in the claim.

Referring to said drawings:

Figure 1 is a cross sectional view of a device for drawing and releasing a bow string and arrow constructed in accordance with the present invention and shown in operative position with a bow string and arrow.

Figure 2 is a cross sectional view of the device taken at right angles to the plane of the view in Figure 1 as indicated by line 2—2 of Figure 1.

Figure 3 is a front elevation of the device.

Figure 4 is a fragmentary plan view of the device.

Figure 5 is an enlarged fragmentary view of the jaws forming part of the device.

Figure 6 is a vertical cross sectional view similar to Figure 1 but showing a modified form of the invention.

Figure 7 is a cross sectional view of the device illustrated in Figure 6 and is taken substantially on the plane of line 7—7 of Figure 6.

Figure 8 is a plan view, partly in cross section, of a further modified form of the device.

The device of the present invention and as illustrated in the accompanying drawings consists briefly of a housing 8 having a first elongated finger encircling handle portion 9 and a second perpendicularly related portion 11 extending forwardly of the portion 9 medially of its length and being formed at its forward end 12 for receipt of an end 13 of an arrow 14 and bow string 16. As will be seen in Figure 1, the elongated or handle portion 9 has a length on opposite sides of the forwardly projecting portion 11 sufficient for engagement and encircling by pairs of fingers 17 and 18, and 19 and 20, of the archer's hand 21 with the thumb 22 of the hand arranged in juxtaposition to one end 23 of the elongated handle portion 9. As will also be seen in Figure 1, the forwardly projecting portion 11 of the housing is formed with a relatively narrow section 26 at the joinder of the portion 11 with the handle portion 9 so as to permit the straddling of the narrow section 26 by the middle fingers 18 and 19 of the hand. In this arrangement the handle portion 9 is adapted to be held in vertical position with the index finger 17 uppermost and the little finger 20 of the hand lowermost, and with the thumb 22 naturally oriented over the upper end 23 of the handle. The handle 9 will thus be positioned in a common vertical plane with the bow string 16. In accordance with the present invention string latching means 27 is carried by the housing, and more specifically in the forwardly projecting portion 11 thereof, for engagement with the bow spring, and a thumb operated trigger 28 is mounted at the upper end 23 of the handle portion 9 and is connected to the latching means 27 for releasing the bow string 16 therefrom.

The forward end 12 of the housing is provided with an opening 29 arranged to receive the end 13 of the arrow and is also formed with a vertical slot 31 intersecting the opening 29 to receive the bow string. In the present construction slot 31 bisects opening 29 and is formed in a common axial plane with the opening which is also the axial plane of the bow string 16 and the handle 9 above mentioned. As will be observed from Figures 1, 3 and 4, the slot 31 extends across the full vertical dimension of the forward end 12 and back along the top wall 32 and the bottom wall 33 so as to admit the bow string 16 into the interior of the forwardly projecting portion 11 of the housing for engagement by the string latching means 27.

The string latching means here consists of a pair of sections or jaw members 36 and 37 which are mounted in the forwardly projecting portion 11 of the housing for transverse reciprocation between a closed position at the slot 31 for retaining the string therein and an open position releasing the string. As will be seen in Figure 2, the jaw members 36 and 37 are formed with confronting faces 38 and 39 which are formed with opposed recesses 41 and 42 which cooperate in the closed position of the jaw members to provide a bore aligned with the opening 29 to receive and accurately center the arrow therein. At their internal ends, the faces 38 and 39 are offset to provide shoulders 43 and 44 which move into edge to edge contact at the aforementioned center of the device in the closed position of the jaw members 36 and 37 so as to carry the bow string 16 jointly thereon, and as will be further observed from Figure 2, these shoulders are beveled so that the bow string will spring forwardly and between the confronting faces 38 and 39 at the instant the jaw members are opened from their closed position. As an important feature of the present construction the shoulders 43 and 44 are curved in the aforementioned

center plane convexly away from the opening and symmetrical to the axis thereof so as to give a curved or rounded support to the string **16**, thereby distributing the stress over a substantial length of the string and minimizing wear thereon.

As a further aid in the ease of use and operation of the device, spring means **46** is used for urging the jaw members **36** and **37** to closed position, and the leading edges of the confronting faces **38** and **39** adjacent to opening **29** are beveled forwardly and away from each other as indicated at **47** so as to receive and center the bow string between the faces and to effect a forced separation of the faces by the string against the resistance of the spring to permit passage of the string between the faces and to its supported position on shoulders **43** and **44** as above described.

In accordance with the present construction, the jaw members **36** and **37** are formed at the forward ends of a pair of levers **48** and **49** which are pivotally mounted internally of the housing, as by pins **51** and **52**, on axes spaced on opposite sides of and parallel to the center plane of the device so that the confronting faces **38** and **39** of the jaw members will swing about the pivot pins **51** and **52** into and from their engaged position at the center plane. The opposite or rearwardly disposed ends **53** and **54** of the levers are formed so as to move into a spaced apart position, illustrated in Figure 2, in the closed position of the jaw members. The spring means **46** above mentioned may be conveniently provided as here shown in the form of a helical spring mounted in compression in sockets **56** and **57** provided in the opposed sides **58** and **59** of the rearwardly disposed ends of the levers.

The latching means accordingly here consists of a latch part **61** mounted in the housing for reciprocation into and from engaged position between the lever ends **53** and **54** for respectively holding and releasing the jaw members in closed position and for opening from such closed position against the resistance of the spring **46**. In the form of the invention illustrated in Figures 1 to 4, the latch part **61** consists of a plunger mounted for reciprocation in a bore **62** formed in the narrow section **26** of the housing. The part is formed with a head end **63** arranged for movement into and from an engaged position between confronting faces **64** and **66** on the lever ends **53** and **54**, and with a stem **67** which extends through the bore **62** and is connected at its end **68** to one arm **69** of a bell crank lever **70** pivoted, as by pin **71**, at the interior of handle portion **9** of the housing. A spring **72** here mounted in surrounding relation to stem **67** and in compression between an end wall **73** of bore **62** and a shoulder **74** adjacent the head end **63**, normally urges the latch part into engagement between the spaced ends **53** and **54** of the levers, thus positively holding the jaw members **36** and **37** in closed position and the bow string **16** retained on the shoulders **43** and **44**.

The trigger **28** here consists of a cylindrical plunger **76** which is mounted for reciprocation in a bore **77** formed in the housing portion **9** and opening to the upper end **23** thereof so that the plunger will project from the end **23** for engagement with and for depressing by the thumb **22** of the archer's hand holding the housing as above described. The cylindrical form of the plunger **76** is of importance in providing a perfectly smooth and rounded contour which cannot injure the face or jaws of the user due to the recoil action of the device upon trigger release of the arrow. The plunger **76** is provided with a stem **78** which is pivotally connected to the other arm **79** of the bell crank **70** so that depressing of plunger **76**, as viewed in Figure 1, will cause a counterclockwise rotation of the bell crank **70** and a withdrawal of the head end **63** of the latch part from its engaged position between the lever ends **53** and **54**, thus releasing the jaw members for opening by the bow string **16** and releasing the string against the nominal resistance of spring **46**. Upon releasing of the pressure of the thumb against the plunger **76**, spring **72** will cause a forward movement of the latch part to its engaged position between the lever ends **53** and **54** and a clockwise rotation of the bell crank **70** and an upward extension of the plunger **76**.

As another important feature of the present construction, the handle portion **9** is formed on one side of the housing section **26**, on the lower side as viewed in Figure 1, with a pair of finger loops **81** and **82** for retaining the housing on the little finger **20** and adjacent finger **19** of the archer's hand **21** during movement of the hand generally so as to leave the other fingers **17** and **18** and thumb **22** free for other duties such as the selection and removal of an arrow out of the quill and placing of the arrow on the bow in shooting position.

A modified form of the invention is illustrated in Figures 6 and 7 of the drawings wherein the levers **48*a*** and **49*a*** are extended rearwardly from their relative length and position held in the first embodiment and through an opening **86** in the narrow section **26*a*** of the housing so as to locate the rearwardly disposed ends **53*a*** and **54*a*** in the interior of the vertical elongated handle portion **9*a*** of the housing. The advantage of this form of the invention is the increased mechanical advantage afforded by the extension of the levers **48*a*** and **49*a*** for a considerable distance rearwardly of their pivotal connections **51*a*** and **52*a*** where such increase in mechanical advantage may be desired. Latching of the forwardly arranged jaw members **36*a*** and **37*a*** is accomplished in the same manner as in the first described embodiment by the introducing of a latch part **63*a*** between the spaced lever ends **53*a*** and **54*a*** so as to thereby lock the jaw members in closed position, and by removing the latch part **63*a*** from its inserted position so as to release the jaw members for opening under the action of the bow string **16** as above described. In this form of the invention the latch part **63*a*** is formed as the terminal end of one arm **91** of a bell crank **92** pivoted as by pin **93** within an interior chamber **94** provided by the housing portion **9*a*** and having a second perpendicularly related arm **96** pivotally connected to one end of a stem portion **78*a*** of a trigger plunger member **76*a***. As will be seen from Figure 6, depressing of plunger **76*a*** will cause a clockwise rotation of the bell crank **92** and a removal of the latch part **63*a*** from between the lever ends **53*a*** and **54*a***. Contrariwise, release of pressure on plunger **76*a*** will cause its outward extension under the urge of spring **97** surrounding stem **78*a*** and compressed between plunger **76*a*** and a bottom shoulder **98** at the base of the plunger bore **77*a***, so as to cause a counterclockwise rotation of the bell crank **92** and the insertion of latch part **63*a*** into engaged position between the lever ends **53*a*** and **54*a***.

A further modified form of the invention is illustrated in Figure 8 of the drawings wherein the device is designed for two-handed operation for flight shooters interested only in maximum distance rather than target accuracy. In such case the archer may shoot from a sitting position holding the bow with his feet and drawing back on the string with both hands to get maximum power. The device illustrated in Figure 8 follows generally the construction illustrated in Figures 1 through 4, but the elongated handle portion **9*b*** is made approximately twice as long as the corresponding portion **9** of the first described device, so that the archer may apply both hands **21*a*** and **21*b*** to the housing portion **9*b*** with the hands straddling the forwardly projecting section **26*b*** of the housing. In this arrangement the handle portion **9*b*** is gripped in the palms of both hands as illustrated in Figure 8 with the palms up and thus disposing the thumbs **22*a*** and **22*b*** of the hands in juxtaposition to the opposite ends **23*b*** and **99** of the handle portion **9*b***. As an important feature of this form of the device, a pair of thumb operated triggers **28*b*** and **101** are mounted at the ends **23*b*** and **99** and are operatively connected to the string latching means **27*b*** for controlling its string releasing operation in the same manner as described above. As here shown, the triggers

28*b* and **101** are formed with stem portions **78***b* and **102** which are mounted in longitudinally extending bores **103** and **104** of the portion **9***b* and extend into a centrally arranged chamber **106** where they are connected to the opposite ends of a lever **107** pivoted on pin **108** between the stems. Lever **107** is here formed with a further and perpendicularly related arm **109** which is pivoted to the rearward end **68***b* of the stem **67***b* of the sliding latch part **73***b* operating as hereinabove described. It will thus be understood with reference to Figure 8 that depressing of either or both of triggers **28***b* and **101** will cause a clockwise rotation of the lever **107** and its arm **109** and a withdrawal of latch part **73***b* from its engaged position between the rearwardly extending ends of latch levers as above described, and that such movement will be resisted by spring **72***b*. Conversely, upon release of thumb pressure on triggers **28***b* and **101** spring **72***b* will restore the triggers to their outwardly disposed position and the latch portion **73***b* to its inserted interlocking position.

The operations of the several devices are essentially similar. In each case the forwardly extending housing portion is oriented to thread the bow string **16** into its receiving slot **31** and with the trigger **28** depressed to permit movement of the latch jaws, the device is pushed forwardly against the bow string whereby the latter will cause an automatic opening of the jaws against the resistance of spring **46** and movement of the string between the opposed jaw faces **38** and **39** to behind the string retaining shoulders, when the jaw members will click closed. Thumb pressure on the trigger is released to permit spring **72** to move the latch part **73** into engagement between the ends of the jaw levers to thereby lock the string behind the shoulders with a strong and positive action. The arrow is inserted through opening **29** and the opposed recesses in the jaw faces, as illustrated in Figure 1, and with the string so locked and with the convenient and comfortable hand engagement provided by the device, the archer is able to apply a powerful yet easy hand-held drawing action to the bow string. It will also be noted that while maximum pulling force is thus afforded the archer, all forces are symmetrically balanced so that the device and the bow may be accurately held on shooting center. In such position the arrow may be released with a smooth, precise trigger action afforded by minimum movement of the thumb without in any wise disturbing the holding of the device, and the arrow is instantaneously released for steady, guided, straightforward, dead accurate, rifle-like shooting action.

We claim:

A device for drawing and releasing a bow string and arrow comprising, a housing including a first elongated portion formed for encircling by the fingers of the hand of the operator and adapted to be held thereby in vertical position and a second perpendicularly related portion extending forwardly of said first portion medially of its length and being formed with an opening at its forward end to receive an end of an arrow and a vertical slot to receive the bow string bisecting said opening and extending rearwardly therefrom in a common plane with said first portion, a pair of levers pivotally mounted internally of said housing on axes spaced on opposite sides of and parallel to said plane and having forwardly disposed jaw members arranged with confronting faces movable into contact at said plane in the closed position of said jaw members, said levers having rearwardly disposed ends spaced apart in said closed position, spring means urging said jaw members to closed position, the forward edges of said faces being beveled to receive and center the bow string between said faces and to effect a forced separation of said faces by said string against the resistance of said spring means to permit passage of said string between said faces to a supported position on the rearward edges of said faces, a latch part mounted in said housing for reciprocation into and from an engaged position between said lever ends for respectively holding and releasing said jaw members in closed position and for opening therefrom against the resistance of said spring means, said faces being formed with opposed recesses aligned with said opening for receipt of the arrow, a cylindrical plunger mounted for reciprocation in said first housing portion and projecting from the upper end thereof for engagement with and depressing by the thumb of the hand holding the housing, said plunger and latch part being connected for movement of the latter from its engaged position upon depressing said plunger and for movement of said latch part into its engaged position from outward extension of said plunger, and spring means urging said latch part and plunger to their last named positions.

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