Dec. 21, 1965 E. A. RONAN 3,224,427

CROSSBOW PISTOL

Filed Sept. 14, 1962 3 Sheets-Sheet 1

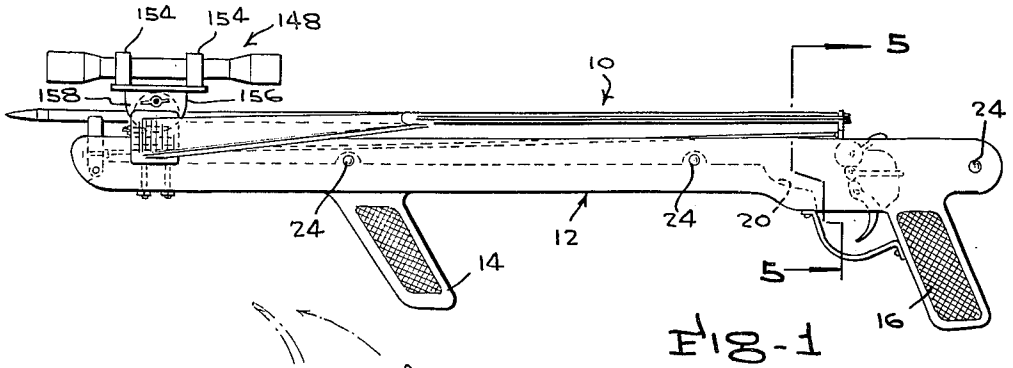

FIG-1

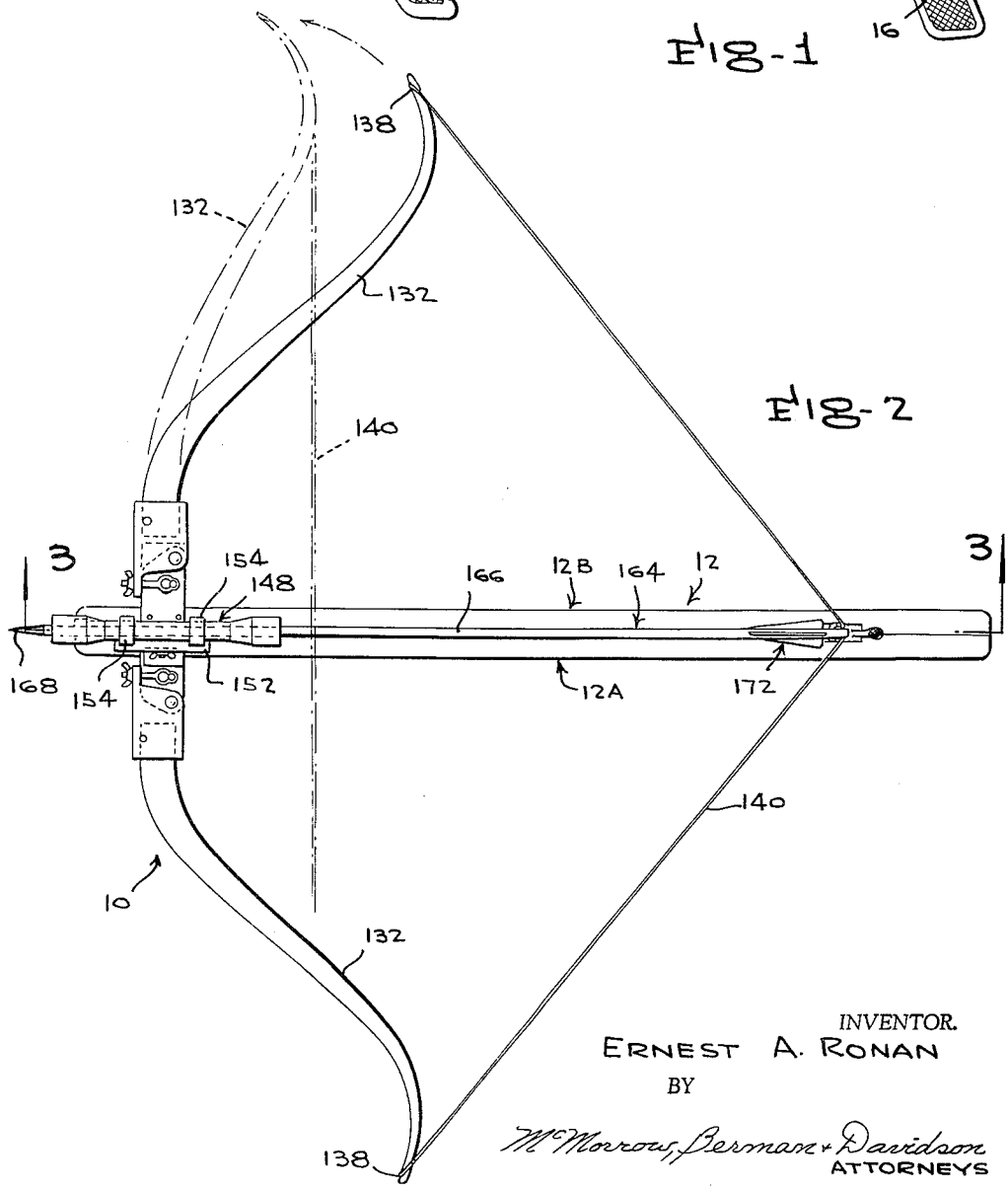

FIG-2

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CROSSBOW PISTOL

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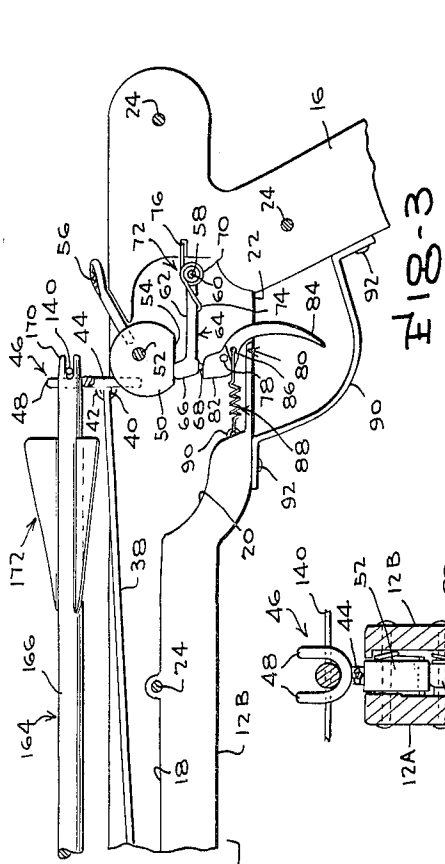


FIG. 3

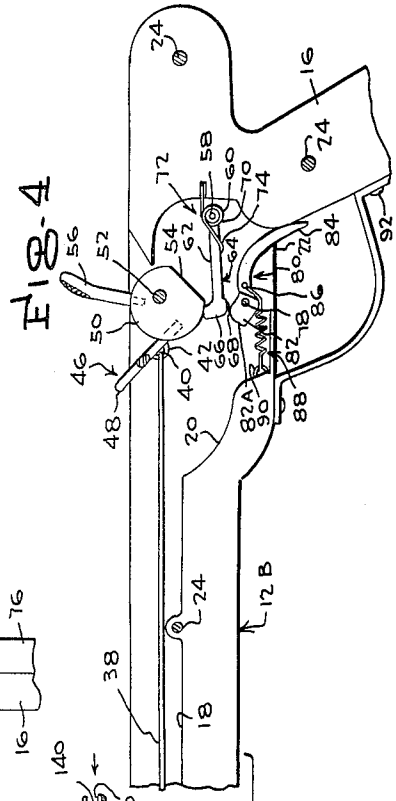


FIG. 4

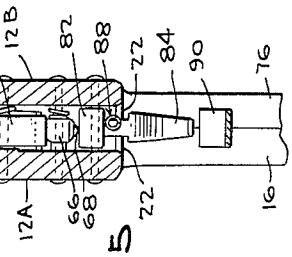


FIG. 5

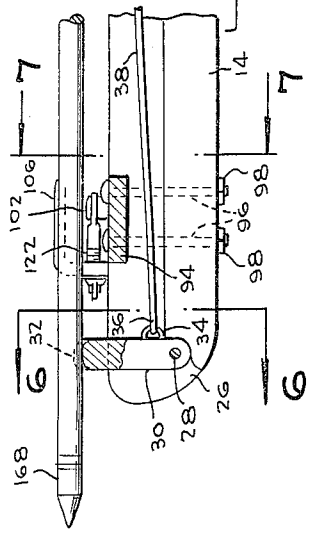


FIG. 6

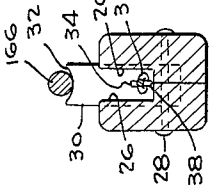
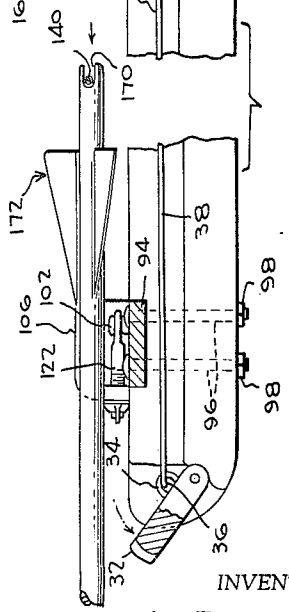


FIG. 7



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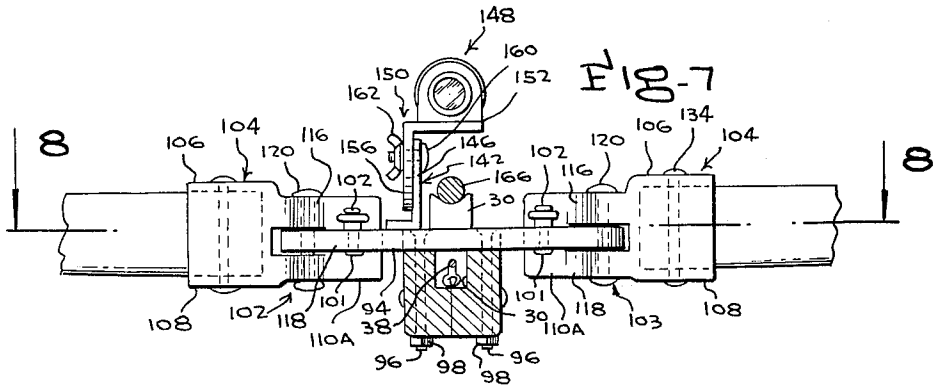

FIG-7

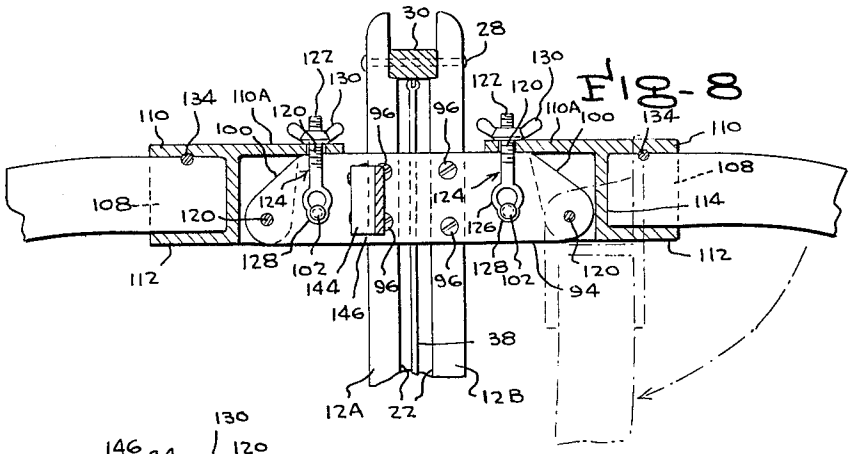

FIG-8

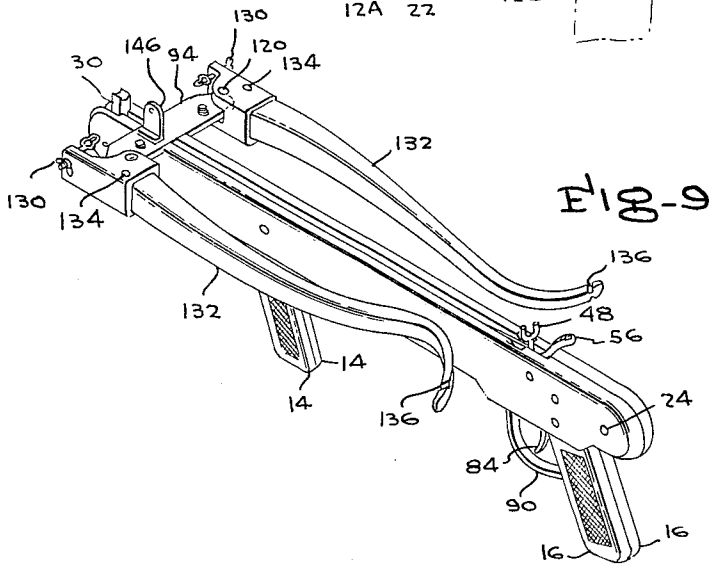

FIG-9

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3,224,427

CROSSBOW PISTOL

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Filed Sept. 14, 1962, Ser. No. 223,647
12 Claims. (Cl. 124—25)

This invention relates to the general field of weapons and, more particularly, the instant invention pertains to string or thong-operated instruments of the aforesaid general classification.

One of the primary objects of this invention is to provide an arm in the nature of a crossbow which readily lends itself to archery practice against fixed or moving targets and which finds a high degree of utility when employed in the field hunting of game.

Another object of this invention is to provide a device of the crossbow type in which have been incorporated features of a conventional sidearm and of sub-machine guns in order that the crossbow may, optionally, be operated through the use of one or both hands.

The instant device is so constructed as to be used with arrows which are conventionally feathered in the same manner as arrows which are constructed for use with usual longbows.

A still further object of this invention is to provide a crossbow pistol with a telescopic sight whereby the crossbow pistol may be fired at stationary or moving targets with a high degree of accuracy.

It is still another object of this invention to provide a crossbow pistol of a collapsible type in order to facilitate its portability and the storage thereof when not in use.

This invention contemplates, as another and further object thereof, the provision of a crossbow pistol that is non-complex in construction and assembly, inexpensive to manufacture and maintain, and one which is durable in use.

Other and further objects and advantages of the instant invention will become more manifest from a consideration of the following specification when read in conjunction with the annexed drawings, in which:

FIGURE 1 is a side elevational view of a crossbow pistol constructed in accordance with this invention, and illustrating the same as being armed, cocked and ready for firing;

FIGURE 2 is a top plan view of the crossbow pistol illustrated in FIGURE 1, FIGURE 2 illustrating in dotted lines the position of the bow arms after the arrow has been fired,

FIGURE 3 is a longitudinal medial, side elevational view of the inner side of the right-hand portion of the crossbow pistol stock, FIGURE 3 being taken substantially on the horizontal plane of line 3—3 of FIGURE 2, and illustrating the component elements of the invention when the crossbow pistol is armed and cocked ready for firing;

FIGURE 4 is a view similar to FIGURE 3, FIGURE 4 illustrating the relative positions of the component elements of the crossbow after the trigger has been tripped and with the arrow following its discharge path;

FIGURE 5 is an enlarged detail, cross-sectional view, FIGURE 5 being taken substantially on the line 5—5 of FIGURE 1, looking in the direction of the arrows;

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FIGURE 6 is an enlarged detail, fragmentary cross-sectional view, FIGURE 6 being taken substantially on the vertical plane of line 6—6 of FIGURE 3, looking in the direction of the arrows;

FIGURE 7 is a transverse detail, cross-sectional view, partly in side elevation, FIGURE 7 being taken substantially on the vertical plane of line 7—7 of FIGURE 3, looking in the direction of the arrows;

FIGURE 8 is a detail cross-sectional view, FIGURE 8 being taken substantially on the horizontal plane of line 8—8 of FIGURE 7, looking in the direction of the arrows; and

FIGURE 9 is a perspective view of the crossbow pistol, FIGURE 9 being drawn on a reduced scale and illustrating the bow with the arms thereof in their collapsed or inoperative positions.

Referring now more specifically to the drawings, reference numeral 10 designates, in general, a crossbow pistol constructed in accordance with the teachings of this invention. The crossbow pistol 10 is provided with a stock 12 which is seen to be allochiral, and hence, the description of one section or portion is a description of the other.

The stock 12 includes the forearm portions 12A, 12B from which depend forearm handle sections 14, 14 intermediate the ends thereof, and rear handle grips 16, 16 respectively. Each of the stock portions 12A, 12B has a longitudinally extending L-shaped groove 18, 18 formed therein. The grooves 18, 18 adjacent their respective ends terminate in a laterally offset and enlarged groove 20, 20 which open downwardly at 22, 22 at a point immediately adjacent the rear handle grips 16, 16. The stock 12 portions 12A, 12B are secured together by screws or rivets 24.

The connected stock portions 12A, 12B adjacent their respective forward ends are notched, vertically, as at 26, 26 (see FIGURES 3 and 6), the notches being in open communication with the grooves 18, 18. Extending transversely across the aforementioned forward ends of the stock portions 12A, 12B is another securing rivet 28 which also serves as a pivot pin on which is pivotally mounted one end of an elongated substantially rectangular forward arrow rest 30, the other end of the latter having an arcuate arrow-receiving and supporting recess 32 extending inwardly therefrom with its axis being substantially parallel to the longitudinal axis of the stock 12. To the rear side of the arrow rest 30 adjacent the pivot pin 28 is a hasp 34 which extends inwardly of the groove 18, 18. The hasp 34 has pivotally connected thereto an eye 36 formed at one end of an elongated substantially rigid cylindrical trigger rod 38 that extends longitudinally within the grooves 18, 18. The other end of the rod 38 terminates in an eye 40 pivotally connected to a hasp 42 which, in turn, is connected to the stem 44 of a bifurcated rear arrow rest 46.

The stem 44 includes upstanding divergent arms 48, 48 and the lower end of the stem is threaded into the peripheral edge of a cocking disc 50 eccentrically mounted on a pivot pin 52, the opposed ends of the latter being supported on and connected to the stock portions 12A, 12B. As is seen in the drawings, the cocking disc 50 is supported above the groove 20, 20 and the latter opens downwardly at 22, 22. It is to be observed that the

threaded end of the stem 44 is received forwardly of the pivot pin 52 and that the cocking disc, when in cocked position, as shown in FIGURE 3, has a downwardly facing peripheral chord side 54. Fixedly secured to the cocking disc 50 rearwardly of the pivot pin 52 is a cocking handle 56 which, in all positions of the cocking disc 50, projects upwardly and outwardly of the groove 18, 18.

Extending transversely across the groove 20, 20 and supported on the stock portions 12A, 12B is a pivot pin 58 on which is pivotally supported the hub 60 having rigidly secured thereto one end of an elongated shank 62 of a sear 64. The other or forward-facing end of the shank 62 terminates in an upwardly-facing, laterally-offset lip 66 which, when the cocking disc 50 is in its cocked position, as shown in FIGURE 3, engages the chord side 54 forwardly of the pivot pin 52. Facing downwardly and away from the lip 66 is a protuberance, preferably a ball bearing 68. Coiled about the hub 60 are convolutions 70 of a helicoidal spring 72 having an end 74 engaged under the inner end of the stem 62 and its other end anchored in the groove 76, 76. The arrangement is such as to constantly bias the sear 64 for clockwise movement about the pin 58, reference being made to FIGURES 3 and 4, whereby the lip 66 is maintained in constant contact with the locking disc 50.

A pivot pin 78 extends transversely across the groove 20, 20 above its opening 22, 22 and the ends thereof are supported on the stock portions 12A, 12B. The pin 78 has pivotally mounted thereon a bellcrank trigger 80 having an upper arm 82 normally engaging the bearing 68 when the cocking disc 50 is in its cocked position (see FIGURE 3), and a lower arcuately shaped trigger arm 84 of conventional design. To the upper end of the trigger arm 82 and below the pivot pin 78 is anchored one end 86 of a helicoidal spring 88, the latter having one of its ends connected to a hasp 90 secured to the stock portion 12B and the groove 20, 20. As is seen in the drawings, the spring 88 constantly biases the trigger 80 for clockwise movement about the pin 78 whereby the arm 82 constantly engages the bearing 68. The trigger arm 84 projects outwardly through the opening 22, 22 and is surrounded by a conventional trigger guard 90 connected to the underside of the stock 12 and to the hand grips 16, 16 as by rivets 92.

Set into the stock 12 adjacent the forward end thereof is an elongated substantially trapezoidal connector plate 94 which is disposed perpendicular to the longitudinal axis of the stock 12 and projects laterally beyond the remotely disposed sides of the stock portions 12A, 12B. The plate 94 is fixedly secured in position by bolts 96 and nuts 98, the bolts extending through the stock portion 12A, 12B as is clearly seen in FIGURES 3, 4, 7 and 8. The opposed ends 100, 100 of the trapezoidal plate are convergent in a forward direction. The plate 94, adjacent to but spaced inwardly from its remotely disposed ends 100, 100, has fixedly secured thereto a rivet 101 having a circumferentially grooved upstanding head 102 to serve a function to be described.

Reference numeral 103, 103 (see FIGURE 7) denotes, in general, a pair of identical bow arm mounting brackets. Each bracket 103, 103 includes a substantially rectangular socket 104, 104 having opposed top and bottom walls 106, 106, 108, 108, respectively, and an elongater front side wall 110, 110 and an opposed rear side wall 112, 112 of shorter length. An end wall 114, 114 extends between the rear side wall 112, 112 and the front side wall 110, 110, and is connected to the latter intermediate its opposed ends leaving a front end wall portion 110A, 110A. As is seen in the several drawings, the front end wall portions 110A, 110A project, normally, when the bow is in operative position, toward each other.

Integral with the extension 110A, 110A and with the end wall 114, 114 is a pair of spaced bracket mounting ears 116, 116 and 118, 118, respectively, between which is secured the opposed ends of the plate 94, the ears being pivotally connected to the latter by means of pivot pins 120, 120.

The front end wall portion 110A, 110A adjacent the outer end thereof is bored at 120, 120 to loosely receive therethrough the threaded shank 122, 122 of an eye bolt 124, 124. The eye 126, 126 of the bolt 124, 124 is substantially annular in configuration and opens at its outer extermity into a loop 128, 128 of lesser diameter. As is seen in FIGURES 7 and 8, the loop 128, 128 is adapted to engage the grooved head 102, 102 and is retained thereon by a winged nut 130 which abuts against the front end wall portion 110A, 110A when the bow is in its operative position, as shown in the figures.

The bow arms 132, 132 have substantially the classical configuration and are rectangular in transverse cross-section. The inner end of each bow arm 132, 132 is received within the sockets 104, 104, respectively, and is locked therein by transversely-extending lock rivets 134, 134. The outer ends of the arms 132, 132 are notched at 136, 136 to receive the looped ends 138, 138 of a conventional ring, cord or thong 140.

While not necessarily an adjunct to this invention, but in the interest of the accuracy of the firing of the crossbow pistol 10, an L-shaped support 142 is provided, the support having a foot portion 144 thereof fixedly connected to the plate 94, and having an upstanding leg portion 146. The mounting bracket for the telescopic sight 148 is denoted at 150 and includes an elongated substantially rectangular plate 152 to which is secured the telescopic mounts 154, and from a longitudinally extending marginal edge of the plate 152 depends a semi-circular flange 156 which is provided with scaler indicia 158 adjacent its arcuate edge. The flange 156 is secured in a selected adjusted position on the leg 154 by means of a bolt 160 and wing nut 162.

Reference numeral 164 indicates a conventional archer's arrow having an elongated substantially cylindrical shank 166 provided with a tipped head 168 at one end thereof, the other end having a conventional bolstering notch 170 formed therein. Adjacent the last-named end the shaft is feathered as at 172.

Having described and illustrated the instant invention in detail, the operation thereof is deemed to be obvious to those skilled in the art. However, and in the interest of clarity, the operation of this crossbow pistol is summarized below.

Assuming that the crossbow pistol 10 is in its operative position as is illustrated in FIGURES 1, 2, 3, 7 and 8, the crossbow pistol being cocked and armed with an arrow 164. In the operative position, the operator has drawn the bowstring 140 for engagement behind the arms 48, 48 of the arrow rest 46. This causes the bow arms 132 to assume the full-line positions shown in FIGURE 2. The arrow 164 is placed in the recess 32 with the tipped end 168 lying immediately adjacent thereto, and the other end of the arrow 164 is rested between the arms 48 with the bowstring 140 engaged within the notch 170.

The archer now takes aim with the crossbow pistol 10 by grasping the handles 14, 14 and 16, 16, with or without use of the telescopic sight 148, and a finger is engaged across the trigger arm 84. When the desired sighting has been made, the trigger arm 84 is pulled toward the handle grip members 16, 16 in a counterclockwise direction with respect to FIGURE 3, causing the arm 82 to pivot in the same direction about the pivot pin 78 and to escape below the bearing or protuberance 68 of the sear 64. With the sear 64 thus released, the tension of the bowstring 140 against the arms 48 of the rest 46 tends to cause the cocking disc 50 to rotate in a counterclockwise direction about the pin 52, and in so doing, disengages the peripheral chord side 54 from the lip 66. With this pivotal movement, the rod 38 is urged toward a forward position, causing, substantially simul-

taneously with the movement of the cocking disc **50**, a pivotal movement in a counterclockwise direction of the arrow rest **30** in a counterclockwise direction. It will be understood, of course, that at the time the arrow rests **30**, **46** initiate and continue their above-described movement, the bowstring **140**, now being released from restraint by the arms **48**, forces the arrow **164** forwardly and remains within the notch **170** until the bow arms **132** reach their maximum forward position illustrated in dotted lines in FIGURE 2. At this point, the advance of the bowstring **140** is halted and the inertia of the arrow **164** continues to propel the same toward the selected target.

With the arrow **164** discharged, the component elements of the crossbow pistol **10** assume their relative positions, as illustrated in FIGURE 4 of the drawings. To re-arm the crossbow pistol **10** it is only necessary that the archer press against the cocking handle **56**, using his thumb or a finger, to effect a rotation of the cocking disc **50** in a clockwise direction about the pivot pin **50** whereby the lip **66** of the sear **64** is re-engaged below the chord side **54** of the cocking disc and is retained thereagainst under the influence of the helicoidal spring **72**. As the lip **66** moves upwardly against the chord side **54**, the arm **82** of the bellcrank trigger **80** will follow, moving in a clockwise direction under the bearing **68** until it comes to rest in the position shown in FIGURE 3. It will be noted that the outer end of the arm **82** is cam-shaped, as at **82A**, having a rising contour as the arm is pivoted in a clockwise direction, whereby the arm is locked against escape below the bearing **68**. The pivotal movement of the bellcrank trigger is, of course, furnished by virtue of the helicoidal spring **88**. The bowstring **140** is now drawn rearwardly for engagement behind the arms **48** of the arrow rest **46**, and the crossbow pistol is bow ready to receive the arrow **164** in the manner described above.

In order to facilitate the portage and storage of the crossbow pistol **10**, the bow arms **132** are collapsible to the positions illustrated in FIGURE 9.

Assuming that the crossbow pistol **10** has been discharged and that the arms **132**, **132** have moved to the dotted-line position shown in FIGURE 2, and that the other component elements of the crossbow pistol **10** are resting in the positions shown in FIGURE 4, the wing nuts **130**, **130** are now unloosened from the eye bolts **124**, **124**. This permits the eye bolt **124** to be shifted axially so as to disengage the loop **128** from the grooved head **102** and to circumscribe the head **102**, **102**. It will be recalled that the bore or openings **120**, **120** loosely received the threaded shank **122**, **122** of the eye bolt **124**, **124**, and with the annular eye **126**, **126** in the described position, the same may be lifted over the upper terminal end of the rivet **101** and the eye bolt is then shifted axially toward the extension **110A** to effect complete disconnection between the eye bolt **124**, **124** and the upper ends **102**, **102** of the rivets **101**, **101**. The arms **132**, together with their respective sockets **104**, **104** are then pivoted about the pivot pin **120**, **120** to assume the positions shown in FIGURE 9, the arms **132**, **132** extending axially of the shank portions **12A**, **12B**. The telescope **148** may be dismounted by removing the bolt or screw **160** through the disconnection of the wing nut **162**.

Having described and illustrated one embodiment of this invention, it will be understood that the same is offered merely by way of example, and that the invention is to be limited only by the scope of the appended claims.

What is claimed is:

1. A crossbow comprising an elongated stock having a pair of opposed ends, a bow arm projecting laterally from opposed sides of said stock and disposed adjacent one end thereof, means adjacent the remotely-disposed ends of said bow arms for stringing a bowstring therebetween, a first arrow support pivotally mounted on said stock adjacent the other end thereof and projecting laterally therefrom, said arrow support being fixed by its said pivotal mount against movement longitudinally of said stock, trigger means pivotally mounted on said stock adjacent said other end of said stock and engaging said first arrow support to prevent pivotal movement thereof in one direction, said first arrow support being engaged by said bowstring when drawn and placed under tension thereby constantly urging said arrow support for movement in said one direction, a second arrow support mounted on said stock adjacent said one end thereof, said trigger being operable to release said first arrow support for pivotal movement in said one direction under said tension of said drawn bowstring, and means pivotally connecting said arrow support on said stock, and means connecting said first and second arrow supports for substantially simultaneous movement with one another upon operation of said trigger to release said first arrow support.

2. A crossbow as defined in claim **1**, wherein means are provided for pivotally connecting said bow arms to said stock and releasable locking means for holding said arms in their respective laterally projecting positions.

3. A crossbow as defined in claim **2**, wherein said stock is provided with handle means intermediate said ends and handle means adjacent said one end thereof.

4. A crossbow as defined in claim **3**, and target sighting means mounted on said stock adjacent said other end thereof.

5. A crossbow as defined in claim **4**, wherein said target sighting means comprises a telescopic sight.

6. A crossbow comprising an elongated substantially rectangular stock having a pair of opposed ends, a pair of bow arms projecting laterally from opposed sides of said stop and disposed adjacent one end thereof, means adjacent the remotely-disposed ends of said bow arms for stringing a bowstring therebetween, said stock having a longitudinally-extending groove formed therein, said groove extending inwardly from the upper side of said stock, a cocking disc disposed within said groove, means supporting said disc for eccentric movement within said groove, said supporting means being fixedly secured to said stock at opposite sides of said groove to prevent longitudinal movement of said disc relative to said stock, a first arrow rest comprising a stem having an end thereof fixedly secured to the peripheral edge of said disc, the opposed end of said stem being bifurcated, said stem and said disc being pivotal in the direction of of the longitudinal axis of said groove, a second arrow rest pivotally mounted on said stock for movement in said groove in the same direction as said first arrow support, both of said arrow rests projecting beyond said groove, and a bellcrank trigger member pivotally mounted intermediate its ends on said stock for movement within said groove, said trigger member being connected with said disc to prevent rotation thereof in said one direction, and said trigger member having a finger-engaging portion exterior of said stock to effect release of said trigger member from said disc.

7. A crossbow as defined in claim **6**, wherein means are provided for pivotally connecting the inner ends of said bow arms to said stock, and means releasably securing said arms in their respective laterally projecting positions.

8. A crossbow as defined in claim **7**, and target sighting means disposed on said stock adjacent said other end thereof.

9. A crossbow as defined in claim **8**, and rigid means connecting said first and second arrow rests for simultaneous pivotal movement, said means being disposed within said groove.

10. A crossbow as defined in claim **9**, wherein said cocking disc is provided with a chord side, a sear pivotally mounted in said groove, means constantly biasing said sear into engagement with said chord side of said disc,

and said other end of said trigger member engaging said sear to hold said cocking disc against rotation under the tension of said bowstring.

11. A crossbow as defined in claim **10**, and resilient means connected with said stock and said trigger member, said resilient means constantly biasing said other end of said trigger member into engagement with said sear.

12. A crossbow as defined in claim **11**, wherein said cocking disc is provided with a cocking handle, said cocking handle being disposed within said groove and projecting therebeyond.

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