United States Patent [19]

Moore

[11] **3,739,765**

[45] **June 19, 1973**

[54] **AUTOMATIC LOADING CROSS-BOW**

[76] Inventor: **Ralph J. Moore,** Route 2, Box 216-F, Houston, Tex. 77018

[22] Filed: **Apr. 21, 1971**

[21] Appl. No.: **136,111**

[52] **U.S. Cl.** **124/25,** 124/35, 124/41, 124/53

[51] **Int. Cl.** **F41b 5/00**

[58] **Field of Search** 124/25, 26, 27, 37, 124/40, 41, 53, 52, 35

[56] **References Cited**

UNITED STATES PATENTS

2,918,050	12/1959	Kopman	124/35 X
2,516,341	7/1950	Raffeis	124/35 X
2,520,713	8/1950	Diehr	124/25
2,842,114	7/1958	Duncan	124/35 X
3,490,429	1/1970	Benedict	124/25 X

FOREIGN PATENTS OR APPLICATIONS

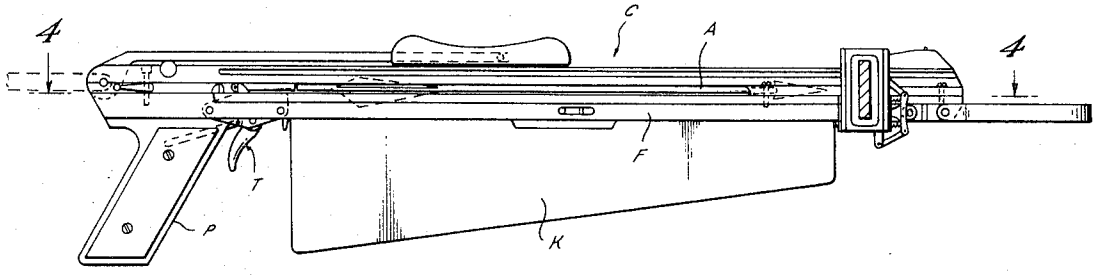
422,231	1/1935	Great Britain	124/52

Primary Examiner—Richard C. Pinkham
Assistant Examiner—William R. Browne
Attorney—Pravel, Wilson & Matthews

[57] **ABSTRACT**

An automatic loading cross-bow comprising a main frame having pivotally mounted bow pieces adjacent its front end with means for latching such bow pieces into extended position for firing and including an arrow clip containing a plurality of arrows adapted to be carried in the main frame. Spring device automatically feeding arrows one at a time into firing position in the main frame as the bow string is cocked including spaced jaws that are opened when the cross-bow is cocked to permit an arrow to be moved from the clip into firing position. A safety release trigger is adapted to be cocked by moving the bow string into firing position and to be fired only when the safety release and trigger are both actuated.

2 Claims, 18 Drawing Figures



Patented June 19, 1973 3,739,765

6 Sheets-Sheet 1

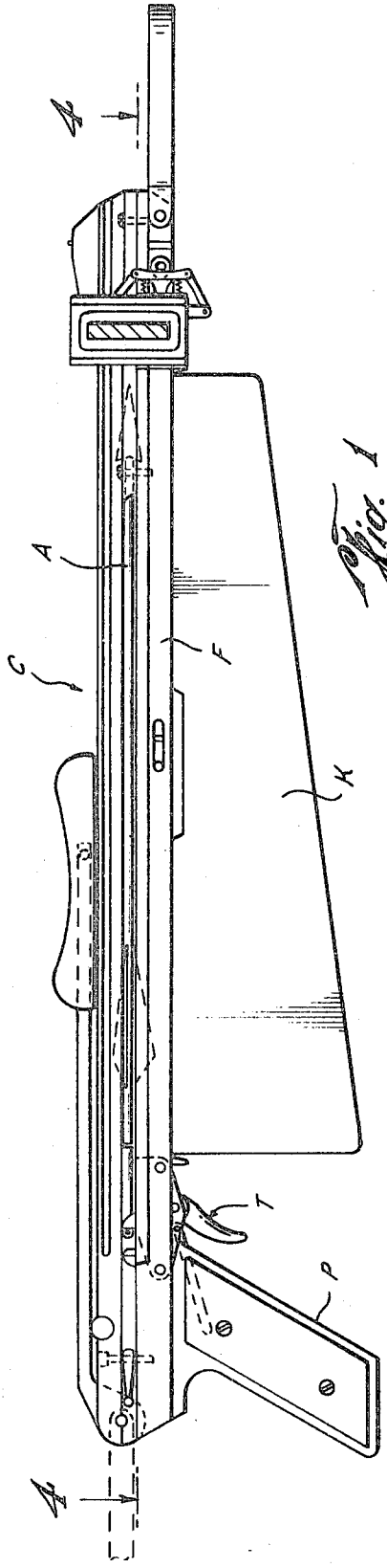


Fig. 1

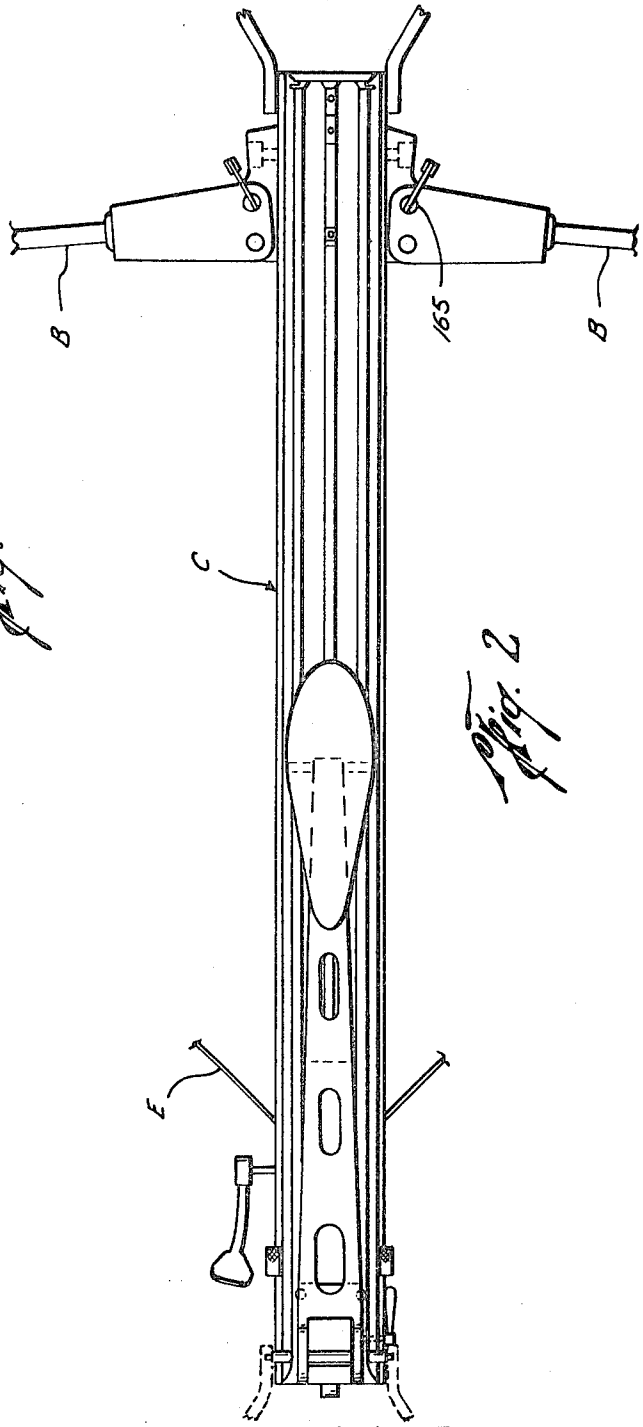


Fig. 2

Ralph J. Moore
INVENTOR.

BY

Pravel Wilson & Matthews
ATTORNEYS

6 Sheets-Sheet 2

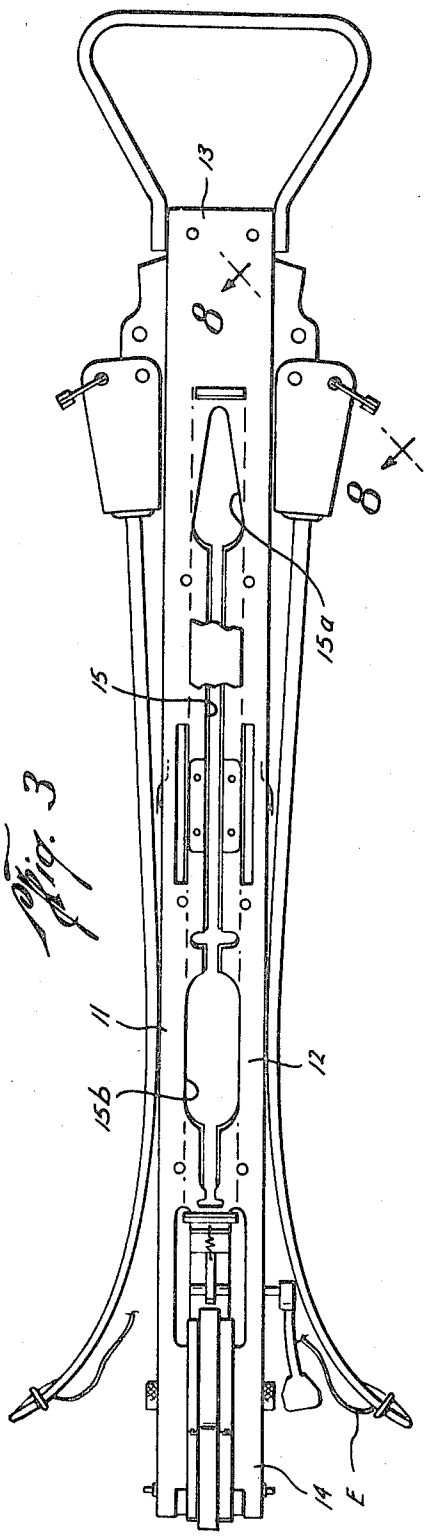


Fig. 3

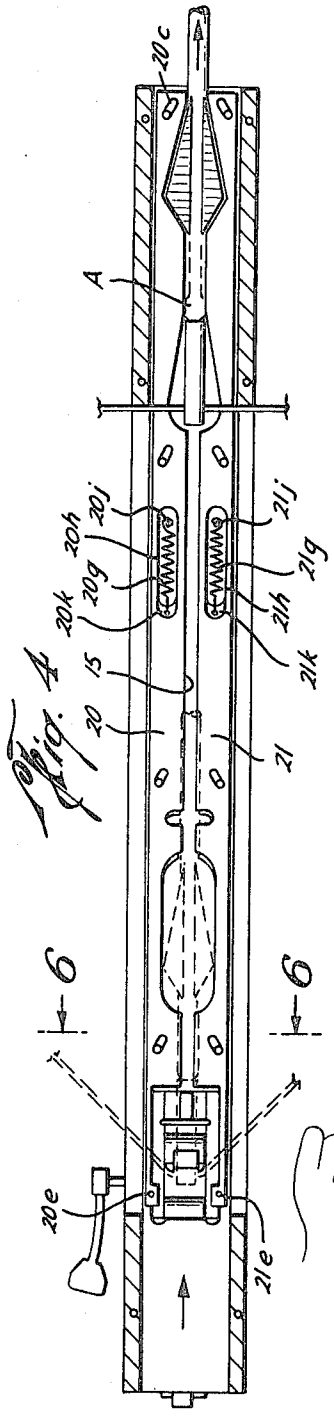


Fig. 4

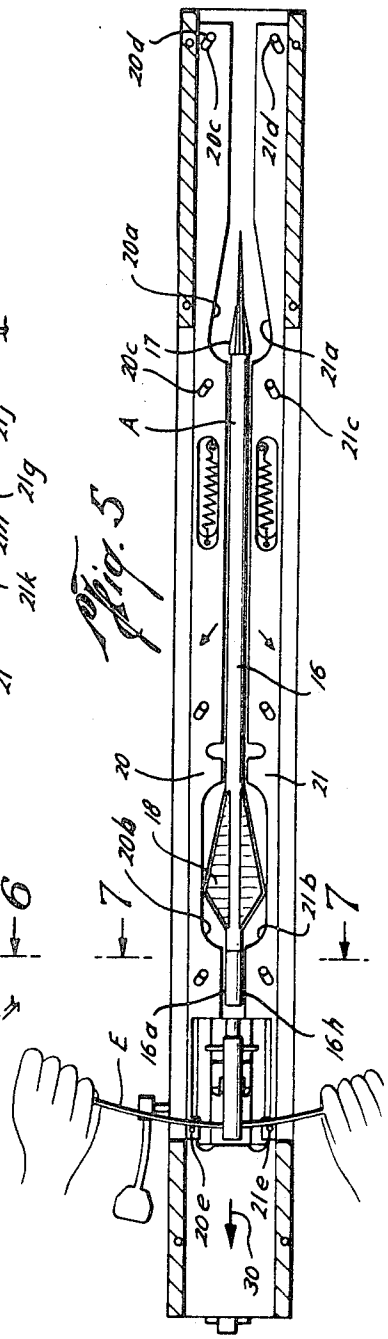


Fig. 5

Ralph J. Moore
INVENTOR

BY

Pravel Wilson & Matthews
ATTORNEYS

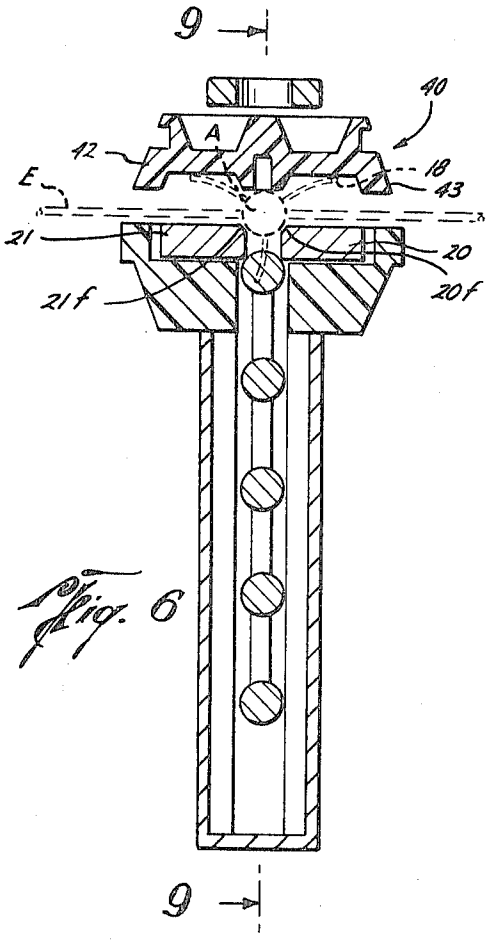


Fig. 6

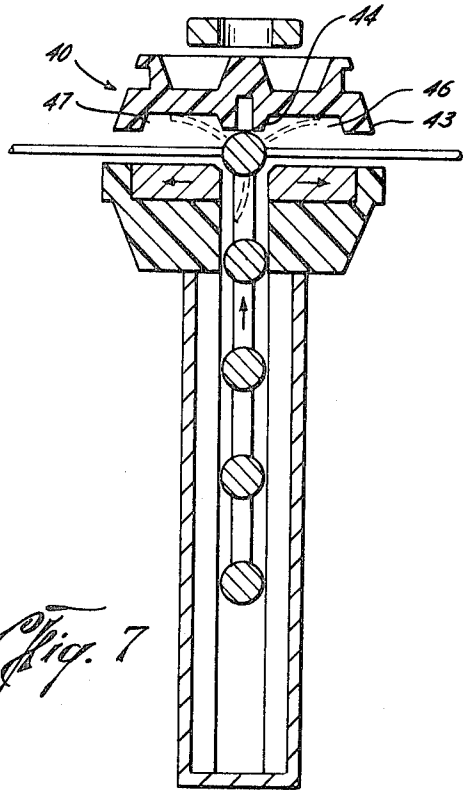


Fig. 7

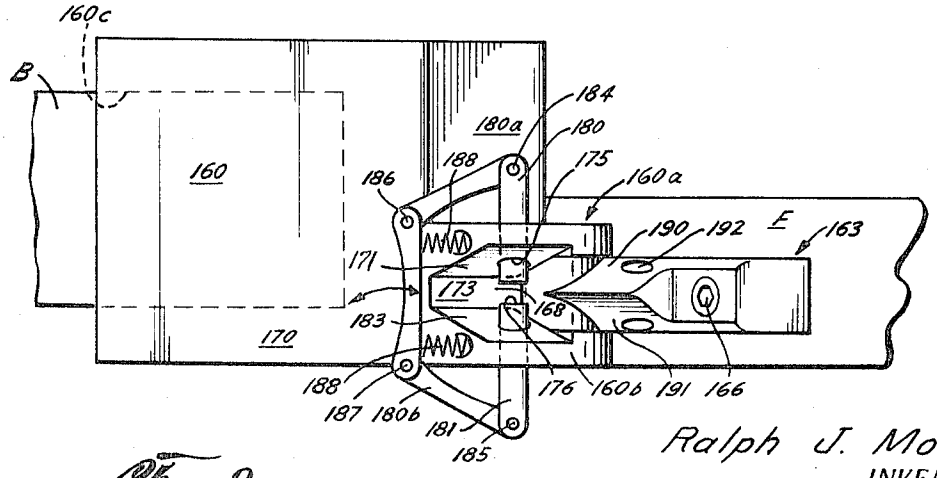


Fig. 8

Ralph J. Moore
INVENTOR

BY

Pravel Wilson & Matthews
ATTORNEYS

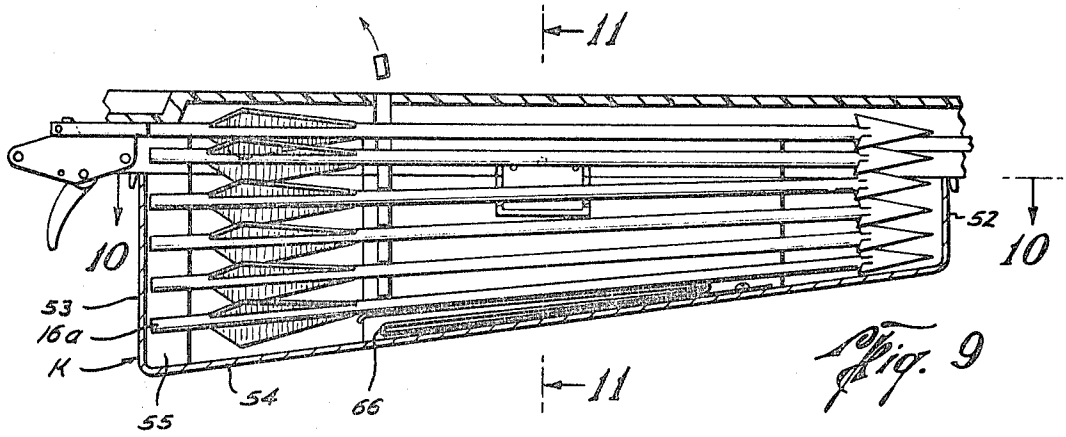


Fig. 9

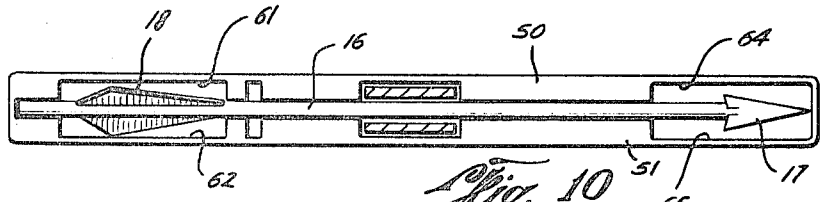


Fig. 10

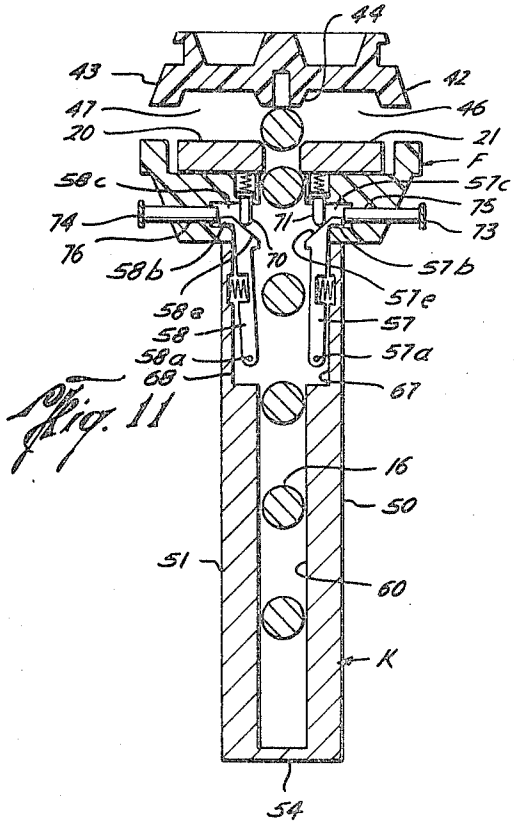


Fig. 11

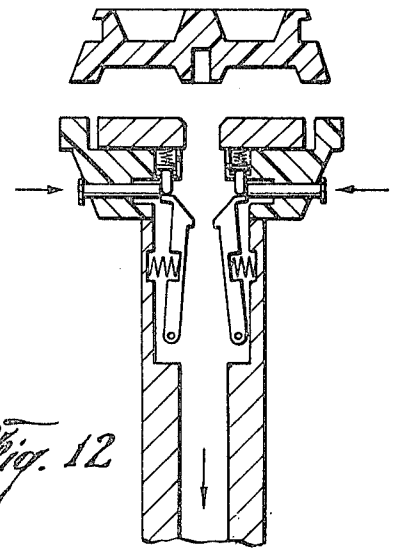


Fig. 12

Ralph J. Moore
INVENTOR

BY

Pravel Wilson & Matthews
ATTORNEYS

Fig. 13

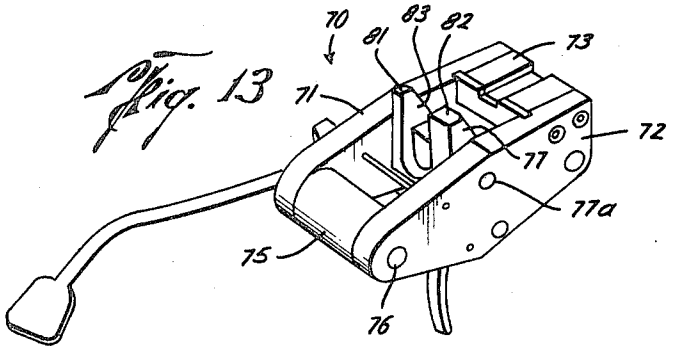


Fig. 14

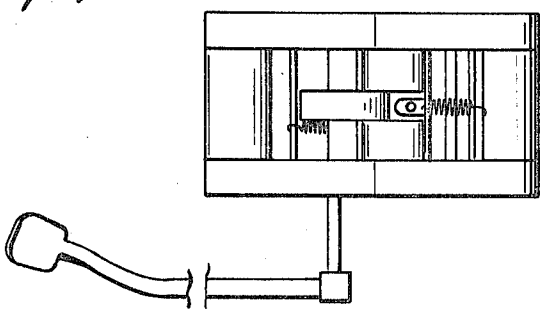


Fig. 15

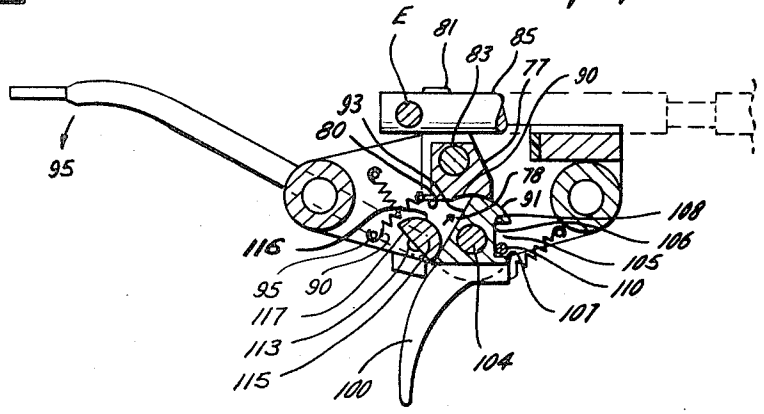
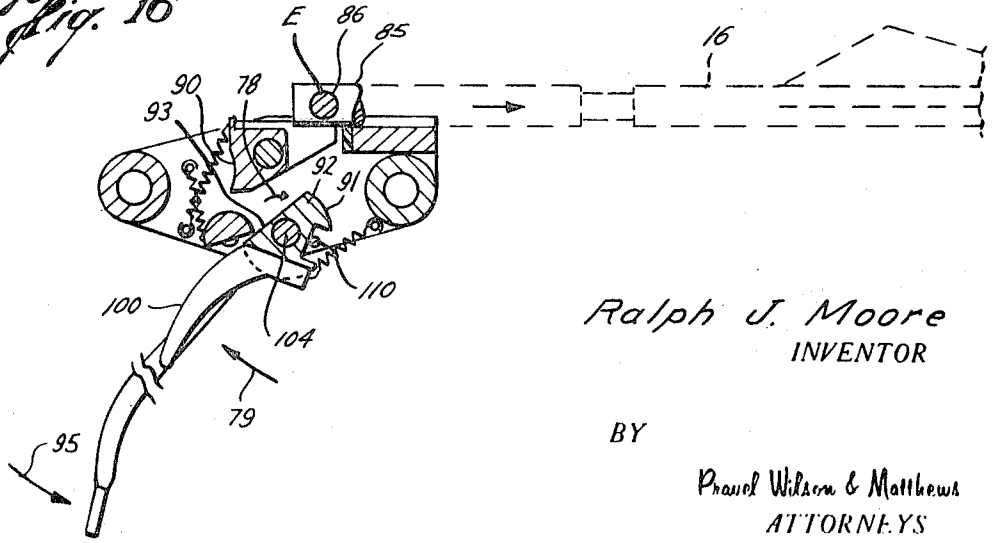


Fig. 16



Ralph J. Moore
INVENTOR

BY

Pravel Wilson & Matthews
ATTORNEYS

Fig. 17

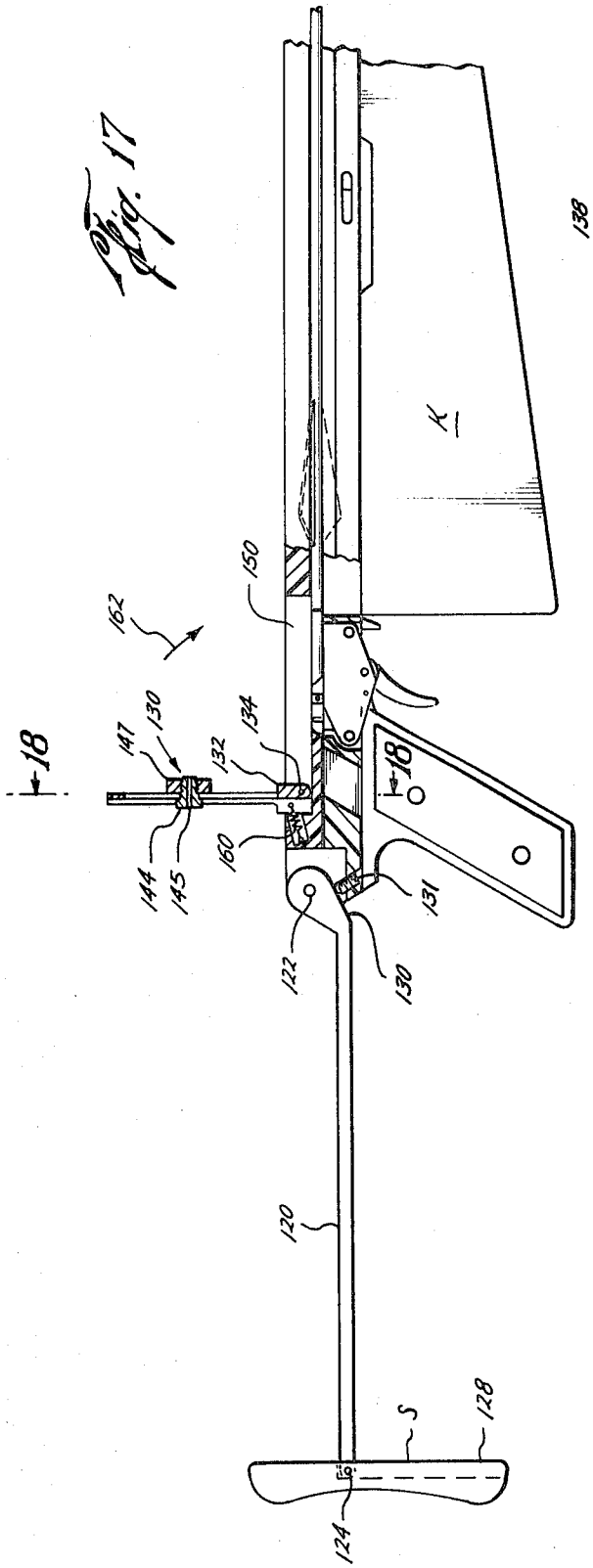
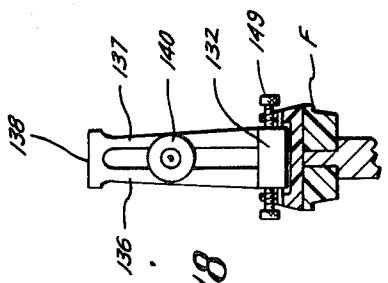


Fig. 18



Ralph J. Moore
INVENTOR

BY

Pravel Wilson & Matthews
ATTORNEYS

AUTOMATIC LOADING CROSS-BOW

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a new and improved cross-bow construction and particularly to an automatic loading cross-bow having a clip for storing a plurality of arrows or projectiles for firing in such cross-bow and means for automatically feeding each of such arrows individually into the body of the cross-bow for firing therefrom. The cross-bow of the present invention also includes a safety trigger release mechanism which will prevent arrows from being unintentionally or accidentally discharged from the cross-bow.

2. Description of the Prior Art

The cross-bows of the prior art are generally large, cumbersome and difficult to store or carry about from place to place and are also difficult to string. Similarly, such prior art bows require manual loading of each individual arrow for firing, and further, the bow string release apparatus or trigger in many of the prior art bows, does not include a positive safety release apparatus which will prevent accidental or unintentional firing of the cross-bow when it is loaded.

SUMMARY OF THE INVENTION

The present invention comprises a new and improved collapsible cross-bow having pivotally mounted bow pieces which may be pivoted into an extended position adjacent the front of a main frame to facilitate storage and transportation of the cross-bow with such pivot means having locking mechanism for locking the bow pieces in the extended position. The bow string is secured to the outer ends of the bow pieces so that the bow may be "strung" or "unstrung" by pivoting the bow pieces into the extended position or into the retracted position as the case may be. Such cross-bow includes an automatic arrow loading means to automatically load an arrow into the chamber or firing mechanism of the cross-bow each time the bow string is drawn and latched in the trigger mechanism. The present cross-bow includes arrow guiding tracks in the firing chamber for guiding the arrow as it is fired from the cross-bow.

It is an object of the present invention to provide a new and improved cross-bow apparatus including a clip containing a plurality of arrows and means to automatically inject individual arrows from the clip into the cross-bow aligned and positioned for firing with such automatic loader being actuated by the bow string when it is drawn back for firing.

A further object of the present invention is to provide a new and improved cross-bow having a trigger which is adapted to be cocked by drawing the bow string into firing position and also having a manual safety latch for locking the trigger against release until the manual safety is actuated.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation partly in section and partly in phantom showing the automatic cross-bow apparatus of the present invention with the arrow clip in position thereon;

FIG. 2 is a top view of the cross-bow as seen in FIG. 1, with the bow pieces shown in the extended position;

FIG. 3 is a bottom view of the cross-bow as seen in FIG. 2, except that the bow pieces are shown folded back in a retracted position on the sides of the main frame of the cross-bow;

FIG. 4 is a sectional view taken on line 4—4 of FIG. 1 showing the bow string in a cocked position in phantom and the string in the forward position and an arrow being fired from the cross-bow;

FIG. 5 is a sectional view similar to FIG. 4 except that it shows an arrow in firing position in the cross-bow and the bow string being drawn across the trigger mechanism;

FIG. 6 is a sectional view taken on line 6—6 of FIG. 4 showing the jaws of the arrow feeding mechanism closed;

FIG. 7 is a sectional view taken on line 7—7 of FIG. 5 showing the jaws of the arrow feeding mechanism open;

FIG. 8 is a view taken on line 8—8 of FIG. 3 showing the means for pivotally mounting the bow pieces on the main frame of the cross-bow;

FIG. 9 is a sectional view taken on line 9—9 of FIG. 6 showing details of construction of the arrow clip;

FIG. 10 is a transverse sectional view taken on line 10—10 of FIG. 9 showing additional details of the arrow clip;

FIG. 11 is a transverse sectional view taken on line 11—11 of FIG. 9 showing further details of the arrow clip and particularly the means for securing such clip to the main frame of the cross-bow;

FIG. 12 is a view similar to FIG. 11 showing the means for connecting the arrow clip to the main frame of the cross-bow in a released position;

FIG. 13 is an isometric perspective view of the bow string release mechanism of the present invention including the trigger and the safety;

FIG. 14 is a bottom view of the bow string release apparatus;

FIG. 15 is a side elevation partly in section showing details of construction of the bow string release apparatus with the trigger in the cocked position;

FIG. 16 is a side elevation partly in section and partly in phantom showing the bow string apparatus with the trigger in the firing position;

FIG. 17 is a side elevation partly in section showing details of construction of the collapsible shoulder stock of the present invention in an extended position with the aiming sight elevated for use; and

FIG. 18 is a view taken on line 18—18 of FIG. 17 showing additional details of construction of the elevated sight of the cross-bow of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The cross-bow of the present invention is designated generally C in FIGS. 1 and 2 of the drawings. Briefly, such cross-bow comprises a main frame F having a pair of bow pieces B pivotally mounted on opposite sides of the main frame adjacent its front end and a shoulder piece or stock S pivotally mounted adjacent the rear end of such main frame F. A pistol grip P is also affixed to the rear of the main frame on its lower side adjacent a firing mechanism T, which is provided for holding the bow string E taut when the bow is cocked and for releasing such bow string to discharge an arrow A when the cross-bow is fired. An arrow clip K containing a plurality of arrows is secured below the main frame F and includes means for automatically feeding an arrow into the main frame for firing each time the bow string

E is drawn back and latched in the firing mechanism T as will be described in detail hereinafter.

Considering now the apparatus of the present invention in more detail, the main frame member F preferably comprises a pair of laterally spaced, longitudinally extending side rails **11** and **12** which are disposed generally parallel to each other and are connected together at the front end by forward transverse member **13** and at the rear by rear transverse member **14.** A centrally disposed, longitudinally extending opening **15** is provided in the main frame F between the side rails **11** and **12** to permit arrows A to be moved upwardly from the arrow clip K into firing position in the firing chamber in such main frame member F as will be described in detail hereinafter.

As best seen in FIGS. 3–5 of the drawings, the central opening **15** includes a longitudinally extending slot for receiving the shaft or body **16** of the arrows A with an enlarged or relieved portion **15***a* for accommodating the arrowhead **17** affixed at the forward end of the shaft **16,** and a rear opening **15***b* to accommodate the feathers or rear stabilizers **18** affixed adjacent the rear end of the arrow shaft **16.** With the relieved portions **15***a* and **15***b* in the centrally disposed opening or passage **15,** it will be appreciated that the arrows A may be moved vertically upwardly from a storage position in the clip K into position in the main frame F for firing with the longitudinal axis of the arrows A being maintained substantially parallel to the longitudinal axis of the main frame F.

A pair of longitudinally extending jaws or gate members **20** and **21** are slidably mounted on top of the side rails **11** and **12,** respectively. Such slidable gate members **20** and **21** include forward relieved portions **20***a* and **21***a*, respectively, for receiving the arrowhead **17** and rear relieved portions **20***b* and **21***b*, respectively, for permitting the feathers **18** to pass therethrough without damage when the arrows A are moved from storage in the clip below the main frame into firing position above the jaws **20** and **21** as will be described.

Such sliding jaws **20** and **21** are provided with longitudinally spaced diagonal guides **20***c* and **21***c*, respectively, which extend inwardly and forwardly relative to the central opening **15.** Guide pins or lugs **20***d* and **21***d* extend through the guide slots **20***c* and **21***c*, respectively, and are affixed to the upper surface of the main frame F. Actuating pins **20***e* and **21***e*, respectively, project upwardly at the rear end of the sliding jaws **20** and **21,** respectively, and, as shown in FIG. **5** of the drawings, are engaged by the bow string E when it is drawn back and latched in the firing mechanism T. As shown, when the bow string E is moved rearwardly as indicated by the arrow **30** in FIG. **5,** it engages the upstanding pins **20***e* and **21***e* and moves the sliding jaws **20** and **21** rearwardly and also outwardly due to the diagonally disposed **20***c* and **21***c* acting against the guide pins **20***d* and **21***d*, respectively, to thereby spread the jaws **20** and **21** laterally apart to allow the uppermost arrow A in the main frame F to be moved upwardly between such gates **20** and **21** into firing position atop the gates as will be described in detail hereinafter.

As shown in FIGS. **6** and **7** of the drawings, the gates **20** and **21,** respectively, are provided with upwardly and outwardly inclined inner edges **20***f* and **21***f*, respectively, which extend axially of the arrow shaft **16** for supporting and aligning such shaft **16** in position for firing. Each of the gates **20** and **21** is provided with a spring **20***g* and **21***g*, respectively, which is preferably carried in recesses **20***h* and **21***h*, respectively. The forward end of the springs **20***g* and **21***g* are connected to pins **20**j and **21**j, respectively, mounted on the upper side of the main frame F and the rear end of such springs are connected in suitable openings **20**k and **21***k* in the gates **20** and **21** adjacent the rear of the recesses **20***h* and **21***h*, respectively. Such springs **20***g* and **21***g* move the gates **20** and **21,** respectively, from the open position shown in FIGS. **5** and **7** to the closed position shown in FIGS. **4** and **6** when the bow string E is allowed to move forward against the string latching member in the firing mechanism T as shown in FIG. **4.**

An upper guide member **40** which also extends axially of the shaft **16,** is provided for guiding the arrow shaft **16** along the inclined surfaces **20***f* and **21***f* on which it moves when fired. Such upper guide comprises an inverted U-shaped member having a base **41** and a pair of depending sides **42** and **43** extending along the opposite edges of such base. A central depending projection **44** extends longitudinally along the base **40** and is positioned above and between the inclined guide surfaces **20***f* and **21***f* for engaging the shaft **16** of the arrow A and retaining it on such surfaces when it is being fired or moved therealong by the bow string E.

As best seen in FIGS. **6** and **7** there are parallel longitudinally extending recesses **46** and **47** formed between the central projection **44** and the depending sides **42** and **43** which provide an unobstructed passageway for the upper feathers **18** on the arrow A as it is moved along the surfaces **20***f* and **21***f*. Similarly, the lower feather passes through the slot or central opening **15** between the gates **20** and **21** and in the main frame F.

As shown in FIG. **5** of the drawings, the rear end of the arrow shaft **16** is provided with a pair of parallel faces **16***a* and **16***b* which are received in a suitable guide slot which will be described in detail hereinafter to orient the arrow A with two of the feathers aligned in the openings **46** and **47** and with the third feather disposed in the opening **15** as is best seen in FIGS. **6** and **7** of the drawings.

It will be appreciated with the arrow shaft **16** positioned in the main frame F, such shaft will be in contact with three circumferentially spaced lines extending axially of such shaft, namely the inclined surfaces **20***f* and **21***f* as well as the longitudinally extending projection **44** and that such surfaces cooperate to align and guide the arrow A as it is discharged from the cross-bow C.

As shown in FIGS. **9** and **10,** the clip K which contains a plurality of arrows A comprises a case having laterally spaced apart sides **50** and **51** joined together at the forward end by a transverse member **52** and at the rear end by transverse member **53** with an upwardly and forwardly inclined bottom **54.** A vertically disposed groove **55** is provided in the rear end portion **52** for receiving the parallel faces **16***a* and **16***b* on arrow shaft **16** and to serve as a guide for orienting such arrows with the upper feathers **18** aligned with the spaces **46** and **47** and the lower feather **18** aligned with the central opening **15.**

As shown, the spaced apart walls **50** and **51** provide a central recess **60** for receiving the arrow shafts **16.** Recesses **61** and **62** are provided near the rear of the walls **50** and **51,** respectively, to accommodate the feathers **18** on the arrow shaft **16** so as to enable such arrows to be stored in the clip K without the feathers being bent or crushed and to also facilitate movement

of the arrows vertically upwardly as they are discharged from the clip K as will be described hereinafter. Also, recesses **64** and **65** are provided near the forward end of the walls **50** and **51**, respectively, to provide space for the arrow heads **17**. As best seen in FIG. **9** of the drawings, a suitable spring **66** is secured to the bottom **54** for urging the arrows A vertically upwardly so as to move them from the clip K into the main frame F as will be described hereinafter.

As shown in FIGS. **11** and **12**, latches **57** and **58** are provided in centrally disposed recesses **67** and **68** in the sides **50** and **51** for releasably securing the clip K to the main frame F. The latches **57** and **58** are pivotally mounted on pins **57***a* and **58***a*, respectively, and each has a laterally projecting shoulder or tooth **57***b* and **58***b*, respectively, formed at the upper end thereof. Such upper ends are urged laterally into recesses **57***c* and **58***c*, respectively. Also, in the preferred form of the present invention, spring loaded detents **70** and **71** are provided in suitable openings in the main frame for locking the upper end of the latches **57** and **58** in the recesses **57***c* and **58***c*. Such spring loaded detents **70** and **71** are biased downwardly so as to engage the upwardly and outwardly inclined surfaces **57***e* and **58***e*, respectively.

Laterally extending release plungers **73** and **74** are provided in suitable openings **75** and **76**, respectively, in the main frame F adjacent the recesses **57***c* and **58***c*, respectively. Such plungers **72** and **73** are positioned so as to engage the flanges **57***b* and **58***b* and urge them laterally inwardly to release the latches from the main frame F and thereby release the clip K from such main frame.

As shown in FIG. **12** of the drawings, when the plungers **72** and **73** are moved inwardly as indicated by the arrows **78**, the teeth **57***b* and **58***b* are moved out of the recesses **57***c* and **58***c* so the clip K may be disconnected from the main frame F.

In the preferred form of the present invention, the firing mechanism comprises a trigger support which is designated generally **70** in FIG. **13** of the drawings. Such support includes a pair of laterally spaced apart plates **71** and **72** which may be joined together adjacent their front ends by means of a spacer block **73** and spaced apart at their rear ends by a sleeve **75** mounted on a pin **76**. A bow string latch **77** is positioned between the plates **71** and **72** and is pivotally mounted on a pin **77***a* extending through suitable openings in the plates **71** and **72**.

The bow string latch **77**, which is best seen in FIGS. **15** and **16** of the drawings, comprises a body having a pair of laterally spaced upstanding projections **81** and **82** with a groove **83** therebetween for receiving a bolt or cylindrical firing block **85** which is mounted on the bow string E.

Such bolt or firing block **85** comprises a cylindrical member having an opening **86** adjacent its rear end for receiving the bow string E which extends therethrough. When the bow is in a cocked position with the bow string extending behind the upright projections **81** and **82**, the bolt **85** is disposed in the groove **83**. The forward end of the firing block **85** engages the rear end of the arrow shaft **16** and drives such shaft forward to fire it when the string E is released by pivoting the firing block **77** forwardly as will be described in detail hereinafter.

The bottom **80** of the bow string latch **77** is provided with a concave cam surface **90** which is of substantially the same radius as the cylindrically shaped cam surface **91** on the cylindrical trigger support **92**. A return spring **94** connects the bottom of the bow string latch body **77** with a pin or rod **95** that is carried in the side plates **71** and **72** and extends transversely therebetween.

The trigger **100** is best seen in FIGS. **15** and **16** of the drawings. Such trigger **100** is connected to the cylindrical trigger support **92** by suitable means or may be formed integrally therewith, as desired. Such cylindrical trigger support **92** is rotatably mounted on a transversely extending pin or rod **104** that is also mounted in suitable openings in the side plates **71** and **72**. The front portion of the cylindrical trigger support is provided with a transversely extending groove designated generally **105** that has a base **106** and a pair of parallel sides **107** and **108**. A transversely extending limit pin **110** is mounted in the plates **71** and **72** and is positioned in the groove **105** between the sides **107** and **108** so as to limit the arc of rotation of the cylindrical trigger support **92**.

The cylindrical trigger support **92** is relieved on the opposite side of the mounting pin **100** from the groove **105**. Such cylinder is cutaway or relieved so as to permit the bow string latch **77** to pivot forward and release the bow string E when the trigger support cylinder **92** is rotated in the direction of arrow **78** from the position shown in FIG. **15** to the position shown in FIG. **16** of the drawings.

In the preferred form of the present invention the firing mechanism **70** includes a trigger safety latch **112** which is connected to a shaft **113** carried in the side plates **71** and **72**. Such safety latch includes a half cylinder **115** which is rotatably mounted between the side plates **71** and **72** on the shaft **113**. Such half cylinder **115** has a convex curved surface **116** which terminates in a plane surface **117**. Such safety locks the trigger support cylinder **92** against rotation in the direction of arrow **78** as long as the convex curved surface **116** engages the plane surface **93** on the back of the trigger support cylinder **92**. As the shaft **113** is rotated in the direction of the arrow **95** the half cylinder **115** turns from the position shown in FIG. **15** to the position shown in FIG. **16**, and the curved surface **116** on the half cylinder safety block **115** is moved out of contact with the plane surface **93** on the back of the trigger support cylinder **92**, thereby permitting such trigger to be rotated rearwardly as indicated by the arrow **79**. Such movement of the trigger rotates the trigger support cylinder in the direction of arrow **78** and the convex cam **91** is moved out of engagement with the concave cam **90** on the base of the bow string release block **77**, freeing such block to rotate or pivot forwardly as shown in FIG. **16** to thereby release the bow string E so as to fire the arrow A from the cross-bow C.

FIG. **17** shows the shoulder rest or stock portion S of the cross-bow C in extended position for firing. The shoulder support comprises a pair of laterally spaced arms **120** and **121** which are pivotally mounted at the rear of the main frame F by means of a pin **122** extending transversely thereof. The outer ends of such arms are connected together by means of a pin **124** on which a pad or shoulder rest **126** is pivotally hinged. Such pad **126** may be provided with a recess **128** in the front side thereof for receiving the ends of the arms **120** and **121**

when folded into the collapsed position as shown in FIG. 1 of the drawings.

A stop surface **130** is normally provided on the ends of the arms **120** and **121** adjacent the main frame F. Such stop surface **130** engages an adjusting screw **131** provided in the main frame F for adjusting the angle of the arms **120** and **121** relative to such main frame when the arms are in an extended position.

An adjustable peep sight **140** is also normally provided on the cross-bow C. Such peep sight **140** preferably includes a base portion **132** which is mounted on a pivot pin **134,** and includes a pair of upstanding arms **136** and **137** which are spaced laterally apart and connected together at their lower ends by the block **132** and their upper ends by transverse member **138.** A longitudinally extending slot **139** is thus formed between the upstanding arms **136** and **137** for receiving a movable sight member **140** which includes a hollow bolt **144** having an aperture or passage **145** extending therethrough. Such hollow bolt is threadedly connected to a suitable threaded disc **147.** The peep sight **140** may thus be moved upwardly or downwardly on the arms **137** and **137** by loosening the threaded disc **147** for movement and tightening such disc on the threaded hollow bolt **145** when the peep sight is positioned at the desired elevation thereon.

Lock screws **149** may be mounted in the main frame F on opposite sides of a recess **150** so as to engage the base block **132** and lock it in a desired position. A spring **160** is connected to the pivotally mounted base block **132** for swinging the arms **136** and **137** into a vertically upright position as shown in FIG. **17.** Such lock screws **149** may then be tightened to hold the peep sight in its erect position for firing. When it is desired to retract the peep sight into the recess **150,** the lock screws **149** may be loosened and the peep sight manually rotated forward in the direction indicated by the arrow **162** so as to place the peep sight in the recess **150** and thereafter the lock screws **149** may again be tightened to lock the peep sight in its retracted position in the recess **150.**

The bow pieces B normally pivotally mounted near the forward end of the main frame F to permit such bow pieces to be pivoted from the retracted position as shown in FIG. **3** of the drawing outwardly into the extended position shown in FIG. **2** of the drawings for firing.

Such bow pieces B are attached to mounting blocks **160** which are pivotally connected by pivot pins **162** to pivot blocks **163** that are secured near the forward end of the main frame F by screws (not shown) or other suitable connecting means. Spring loaded latching pins **165** are carried on the bow blocks **160** and are adapted to be inserted into the openings **167** in the mounting blocks **163** when aligned therewith.

As shown in detail in FIG. **8** of the drawings the bow block **160** is provided with a pair of laterally projecting plates **160***a* and **160***b* which are spaced apart and which have a V-shaped opening **168** formed therebetween. Such V-shaped opening comprises facing tapered or inclined surfaces **170** and **171** provided on opposite sides of a base **173** disposed at the bottom of the V-shaped opening. Openings **175** and **176** are provided through the plates **160***a* and **160***b* respectively, for receiving the latching pins **180** and **181.** Each of such pins is connected by means of arms **180**a and **180***b* that link the outer ends of the pins to a cross member **183,** by pivot pins **182** and **183.** Pivot pins **184** and **185** connect the pins **180** and **181** to the linking arms **180***a* and **180***b*, and similarly pivot pins **186** and **187** connect such linking arms **180**a and **180***b* to the central arm **183.** Springs **188** urge the central connecting member **183** laterally outwardly which in turn urges the pins **180** and **181** inwardly into the V-shaped opening in the bow block **160.**

The main block **163** is provided with converging tapered or inclined surfaces **190** and **191** which form a wedge-like portion that is adapted to be received in the V-shaped opening in the bow block **160.** An opening **192** is provided in the wedge-shaped portion of the connecting block **163** and extends through to the surfaces **190** and **191** and is provided for receiving the ends of the latching members or pins **180** and **181** that are slidably mounted in the laterally spaced openings **175** and **176** on opposite sides of the V-shaped opening.

By urging the lateral cross member or link **183** laterally inwardly and compressing springs **188,** the ends **180** and **181** will be withdrawn from the V-shaped opening to permit the bow block **160** to be pivoted from the position shown in FIG. **3** to the position shown in FIG. **2** and thereafter, upon releasing the cross member **183,** the springs **188** will force the pins **180** and **181** into the opening **192.**

If desired the bow blocks **160** may be swung in position and the wedge shaped surfaces **190** and **191** will engage the pins **180** and **181,** respectively, to force them laterally apart and permit the bow block **160** to be pivoted over the connecting block or mounting block **163** and when such pins **180** and **181** are aligned with the openings **195** the pins will move laterally into such opening and lock or latch the ends of the bow in the extended position such as is shown in FIG. **2.**

In order to release the latching members **180** and **181** and permit the bow block to be swung back to the retracted position such as shown in FIG. **3** of the drawings, the cross member **183** is manually depressed causing the linking arms **180**a and **180**b to withdraw such pins **180** and **181** from the openings **195** in the mounting block **163.**

It will be appreciated that the quick connect type of latching mechanism provided with the pins **180** and **181** acting against the inclined surfaces **190** and **191** will facilitate stringing the bows or bow pieces B as it will be necessary to only momentarily position the pins **180** and **181** opposite the holes **195** to enable the spring loaded pins **180** and **181** to be moved laterally into such openings **195** to thereby lock the bows in their open or extended position suitable for firing.

A stirrup **200** is provided at the forward end of the main frame F to facilitate carrying the cross bow C and also to facilitate loading or cocking the bow as well as stringing the bow string E.

For handling, stirrup **200** is mounted on a pivot pin **201** which extends transversely of the front end of the main frame F and with the bow pieces B folded back or collapsed in the position shown in FIG. **3.** The bow may be carried by simply manually gripping the cross piece of the stirrup **200.**

When it is desired to swing the bow pieces B into the extended position the archer may place one foot in the stirrup **200** and hold the front end of the bow to facilitate forcing the bow pieces B in position in their respective bow hinge latch mechanisms to thereby string the

bow B. It will be appreciated that the ends of the bow strings E will be affixed to the opposite ends of the bow pieces B prior to the pivotally mounted bow piece hinges being swung into the open or extended position to draw such bow strings taut.

Also, in cocking the bow of the present invention an archer may place one foot in the stirrup **200** at the front end of the main frame and thereby free both hands for use in drawing the bow string E taut and latching it in the trigger mechanism for firing.

In using the automatic cross-bow of the present invention it will be appreciated that the bow pieces B may be secured in suitable openings **160***c* in the bow blocks **160** and the bow string E secured to the opposite ends of such bow pieces. Thereafter, the bow pieces may be pivoted from the retracted position shown in FIG. **3** of the drawings to the extended position shown in FIG. **2** of the drawings to thereby draw the bow string E taut and place the bow pieces in the position for firing of a cross-bow C. It being appreciated that when the bow blocks **160** have been moved to the extended position the locking pins **180** and **181** carried therein will be lodged in the opening **195** in the bow mounting block **163** to thereby securely lock such bow pieces in their extended position.

With the arrow case or container K latched in position in the main frame F and with the arrows A stored in such case or container K in position for firing, the cross-bow is ready for loading and cocking. When the bow string E is drawn back and latched in the firing mechanism T, the bow string E engages the upstanding pins **20***e* and **21***e* to spread apart the gates or jaws **20** and **21** to thereby permit the uppermost arrow **16** in the case K to be urged upwardly by the spring **60** until such arrow engages the central longitudinally extending member **44** that is disposed above the central opening **15** through which such arrow passes. When the bow string E is set against trigger latch or trigger block **77**, the jaws **20** and **21** will be closed by means of the springs **20***g* and **21***g* and the upper inclined surfaces will thereafter support the arrow shaft **16** and the firing chamber in position for firing. After the safety release **112** has been moved to position for firing and the trigger **100** actuated to fire the arrow, the cross-bow is then ready for reloading of the next arrow in the storage case K. When the bow string E is again pulled back to cock the bow and latched on the trigger block **77**, the gates **20** and **21** will again be opened to permit the next uppermost arrow **16** to be moved upwardly through the opening **15** in the main frame F and to position in the firing chamber for firing. Thereafter, firing may be repeated until the supply of arrows in the case K has been exhausted.

The foregoing disclosure and description of the invention are illustrative and explanatory thereof, and various changes in the size, shape, and materials as well as in the details of the illustrated construction may be made without departing from the spirit of the invention.

What is claimed is:

1. An automatic loading cross bow comprising:

a. a main frame;

b. bow means mounted on said main frame for firing arrows therefrom along a firing axis;

c. first means in said main frame for aligning arrows in position on said main frame for firing;

d. clip means connected to said main frame for storing a plurality of arrows thereon;

e. discharging means in said clip means for discharging arrows therefrom;

f. feeding means in said main frame for feeding arrows one at a time from said clip means into said positioning means for aligning arrows for firing; and

g. said first means including a pair of laterally spaced jaws slidably mounted on said main frame with a second means for opening said jaws when the cross bow is cocked to permit an arrow to be moved from storage in said clip means into firing position, in which said arrow is supported by said spaced jaws.

2. The invention of claim **1** wherein:

said main frame has a central opening therein; and

said second means for opening said jaws includes a plurality of diagonally disposed slots in each of said jaws, said diagonally disposed slots extending rearwardly and outwardly from said central opening in said main frame, guide pins secured to said main frame and extending into each of said diagonal slots, and a third means in each of said slots for resiliently connecting said pins to said jaws.

* * * * *