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A6S

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(54) Cross bows

(57) A cross bow which can fire both bolts and projectiles comprises a bow 13 attached to a bow slide 14 which performs reciprocating motion relatively to a cross bow stock 10 when the cross bow is being cocked. The slide can be maintained in a selected position along the stock by a pawl and ratchet device (Figure 3). To fire projectiles (e.g. bolts), a projectile holder 29 (also Figures 7, 8) is attached to the bow string 15.

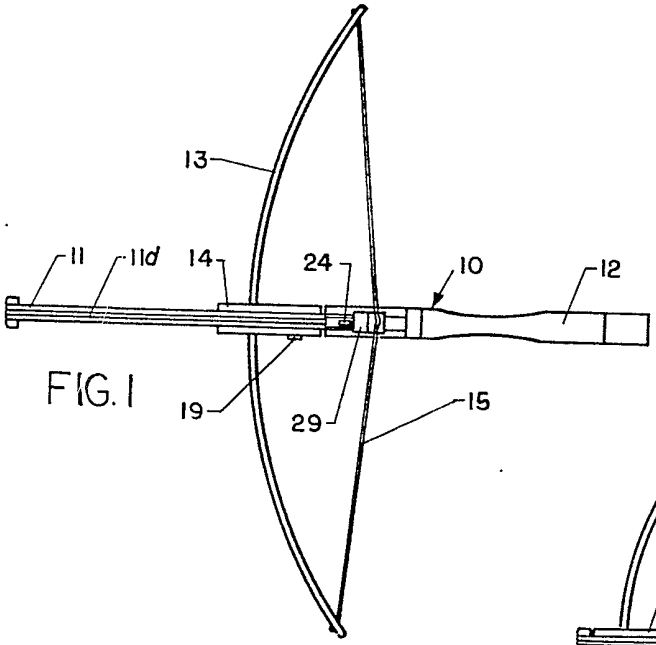

FIG. 1

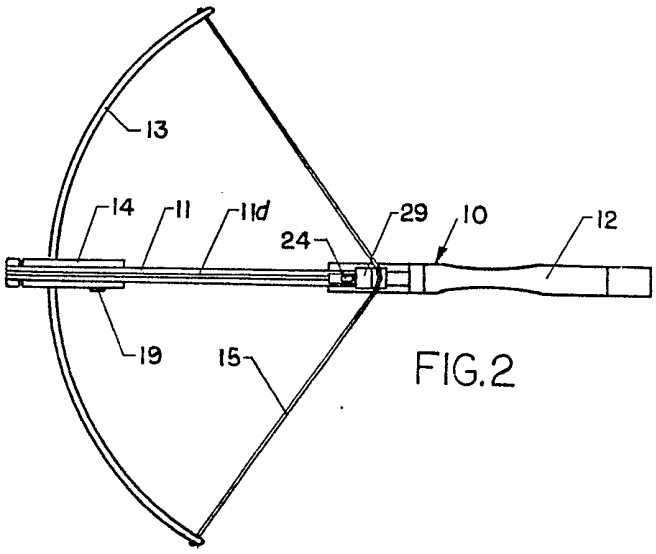

FIG. 2

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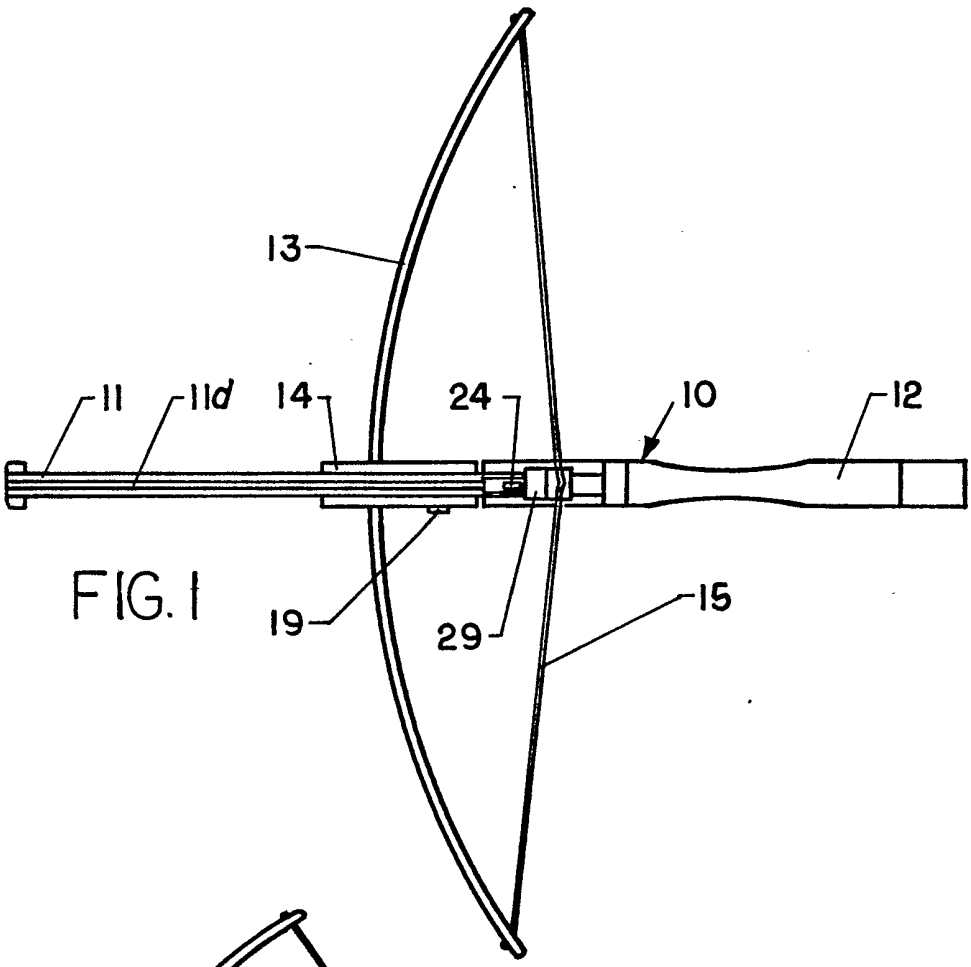


FIG. 1

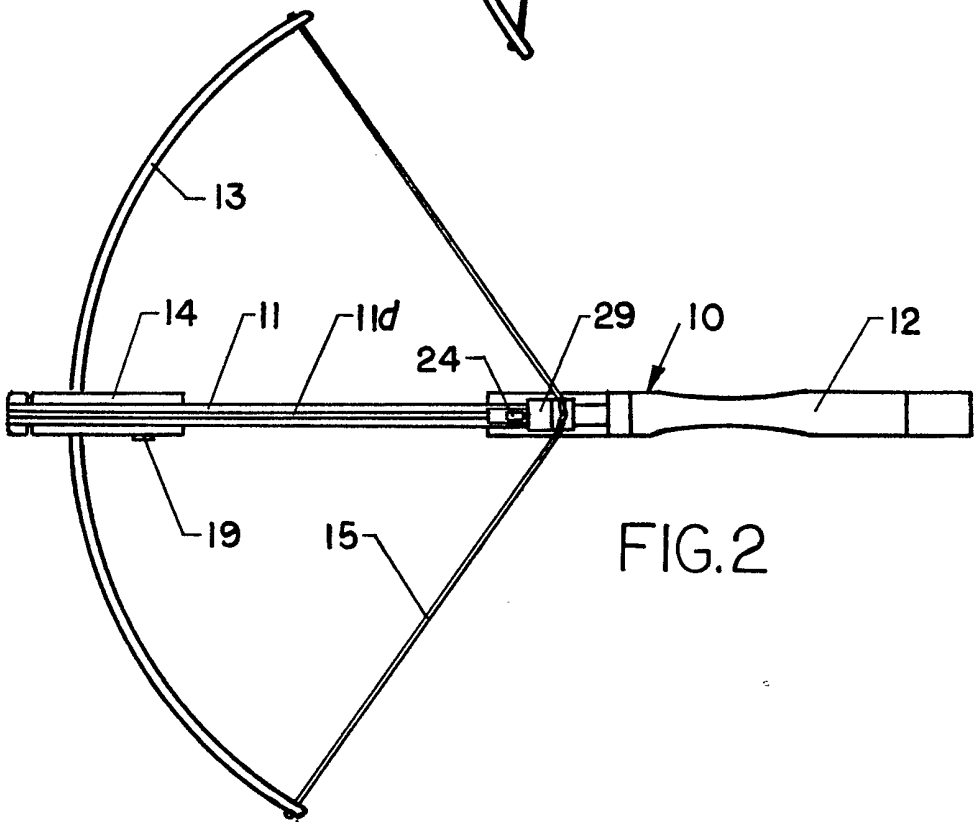


FIG. 2

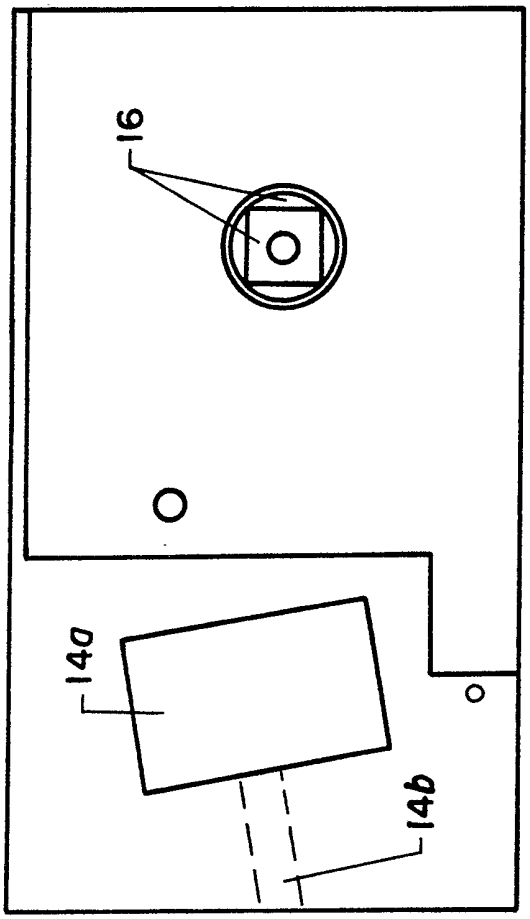

16
14a
14b

FIG.4

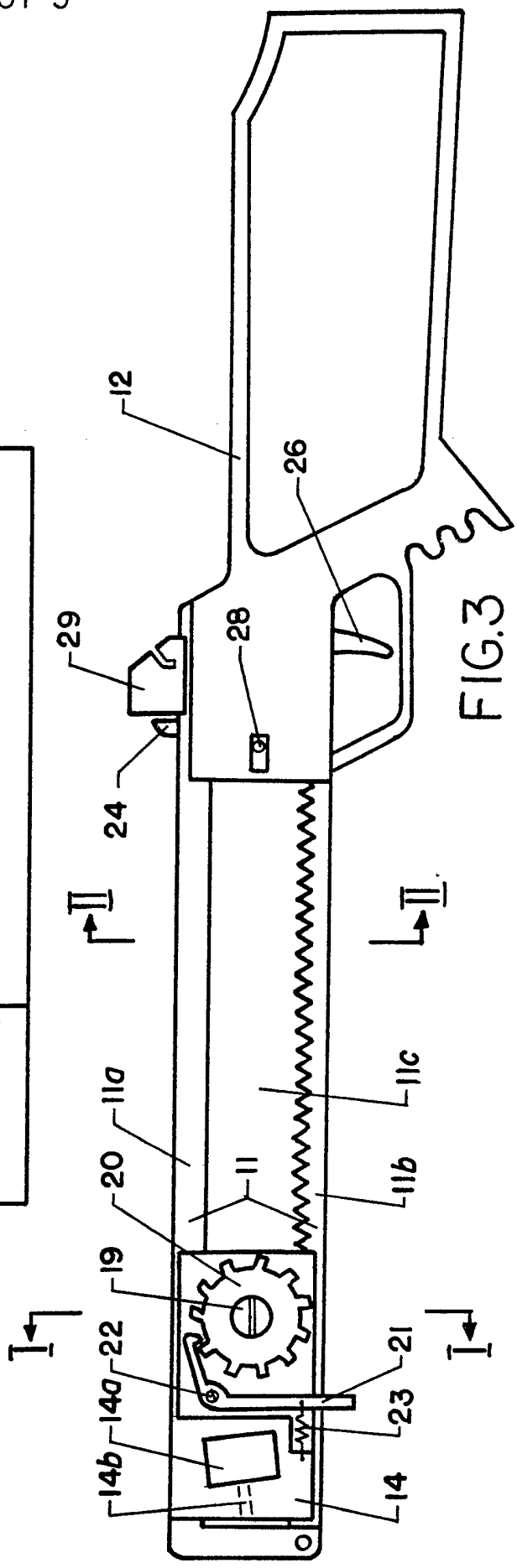

12
26
29
28
24
II
II
11c
11a
11b
20
11
19
I
I
22
21
14a
23
14b
14

FIG.3

FIG.6

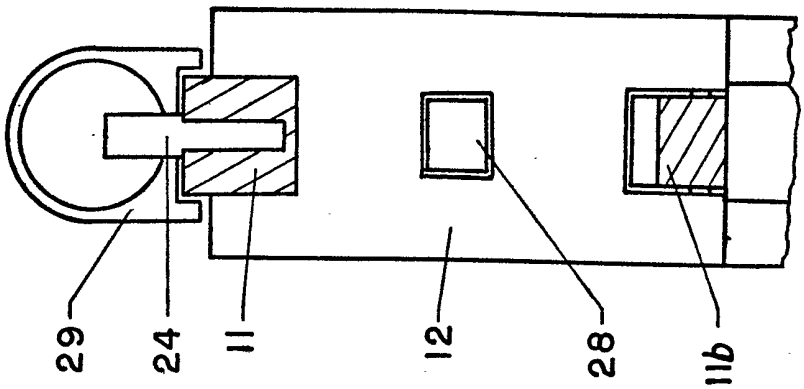


FIG.5

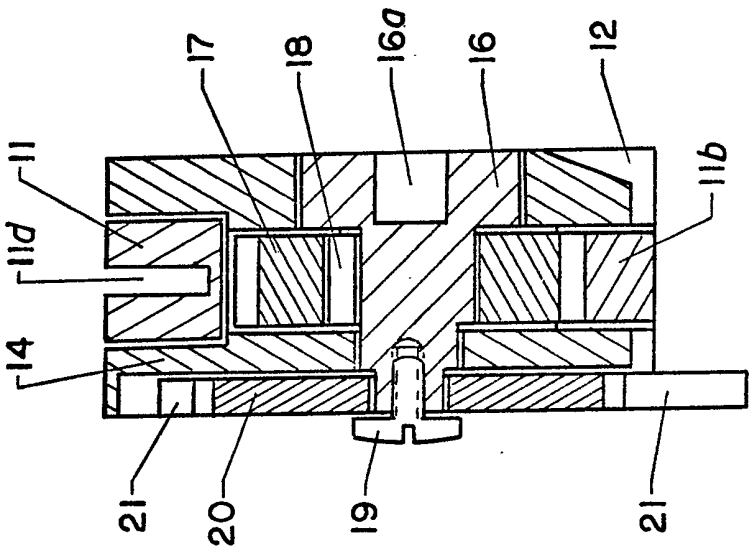


FIG.7

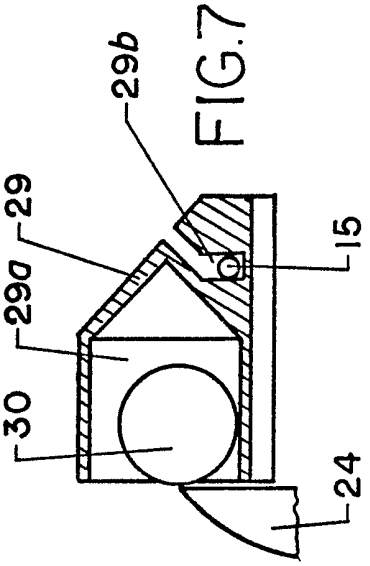
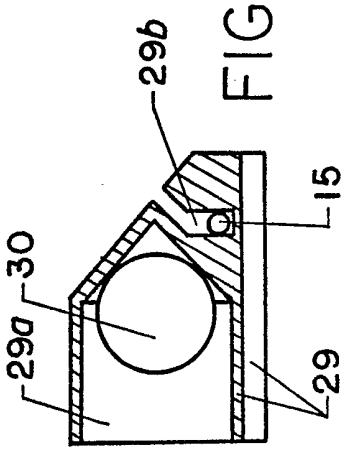


FIG.8



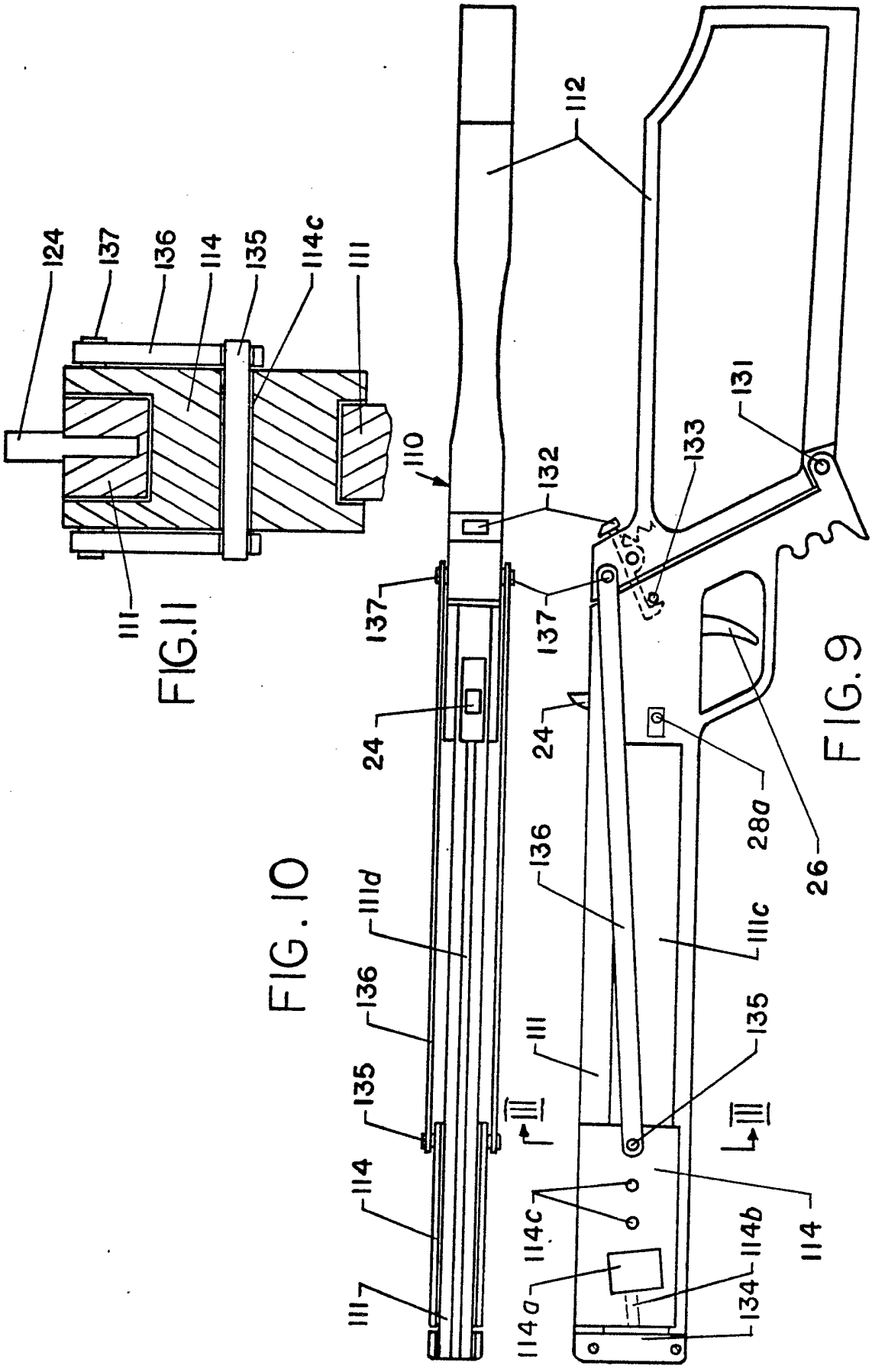


FIG. 11

FIG. 10

FIG. 9

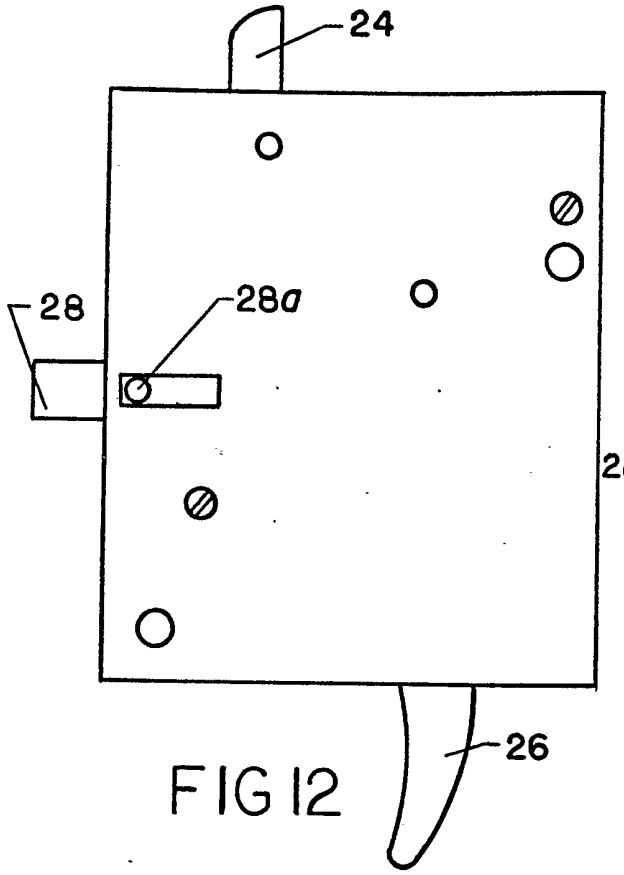


FIG 12

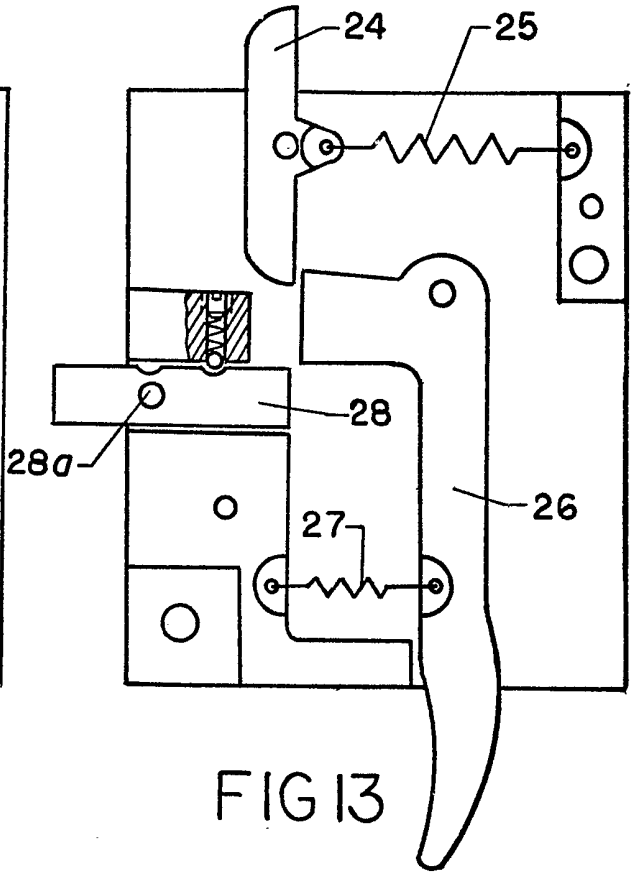


FIG 13

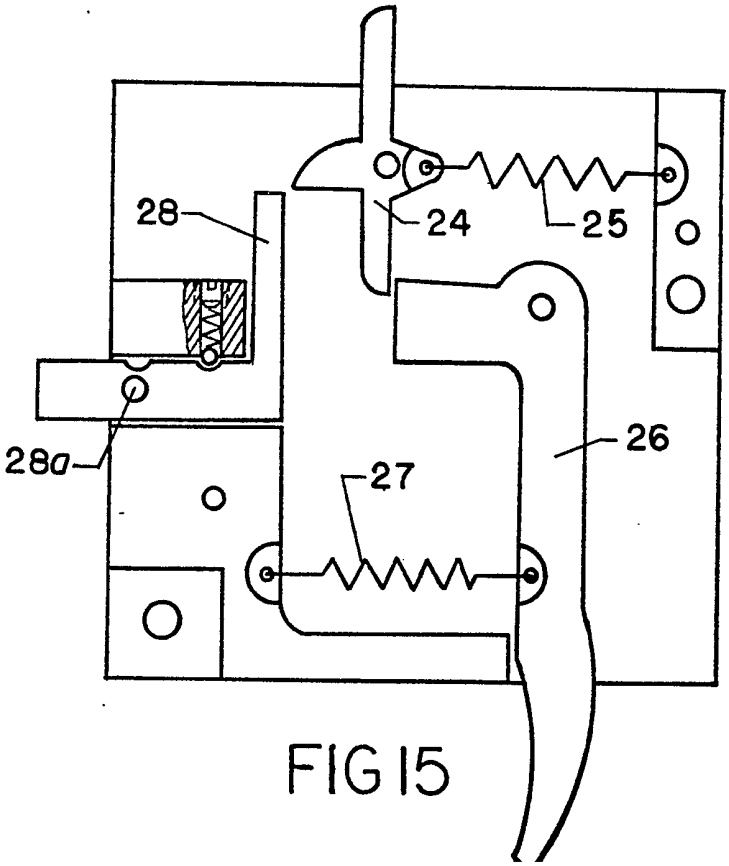


FIG 15

FIG 14

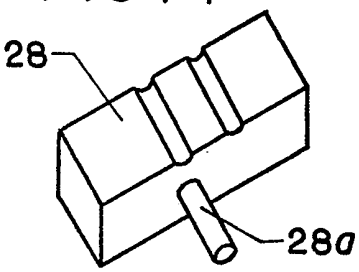
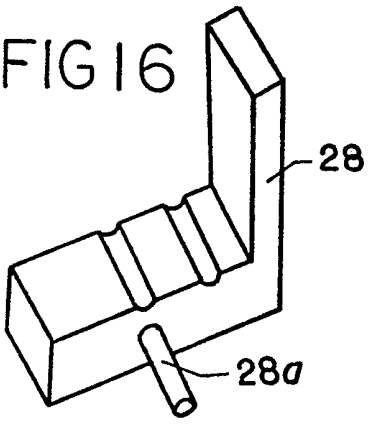


FIG 16



SPECIFICATION

Cross Bows

This invention relates to cross bows as used by sportsmen and hunters for shooting of arrows (bolts) or projectiles and more specifically to movable bow fastening devices and cocking devices for such cross bows.

A known cross bow has a rigidly mounted bow on the end of the stock which incorporates a trigger mechanism for releasing a taut bow string so as to shoot an arrow therefrom.

The first considerable disadvantage of the known cross bow lies in the fact that the known cross bow always has only one bow draw weight because the distance between the bow and the catch of the bow string is the same for each particular cross bow.

Because in the known cross bow the bow is rigidly fixed to the stock, the bow string has to be pulled to the bow string catch during the cocking of the cross bow, using for this purpose user's hands or special cocking devices or means. It is not easy to center the bow string on the bolt when the bow string has full tension of 100—200 Lb. This is the second disadvantage of the known cross bow.

The third disadvantage of the known cross bow lies in the fact that it is not easy to return the bow string to its initial uncocked position without shooting, if desired, after the cross bow was cocked.

Accordingly, it is an object of the present invention to provide a cross bow which avoids the disadvantages of the prior art and has variable bow draw weight from the maximum to zero.

Another object of the invention is to provide a cross bow with a movable slide on which a bow is fastened.

It is a further object of the present invention to provide means in a cross bow for moving the cross bow slide along the stock for the purpose of cocking the cross bow.

It is another object of the invention to provide the cross bow slide with means locking the slide in different desired positions relatively to the catch for the purpose of creating different bow draw weights.

It is also an object of this invention to provide a cross bow with a special projectile holder attached to the bow string and having a special recess to contain a projectile.

It is a further object of the present invention to provide a cross bow with a catch for holding the projectile holder in a cocked position and for concealing the projectile recess of said holder to prevent spontaneous falling out of the projectile before a shot.

It is another object of the invention to provide a cross bow with a trigger device having an automatic safety locking mechanism comprising a movable part which engages the cross bow trigger or the cross bow catch when the bow slide is moving rearwards and is pushing the movable part of the safety locking mechanism in the engagement with the trigger or the catch during cocking of the cross bow.

It is a further object of the present invention to provide a cross bow which can be easily converted from shooting of bolts to shooting of projectiles, especially lead balls.

Other objects and advantages of the present invention will be apparent from the accompanying description when considered in conjunction with the following drawings, in which:

Fig. 1 is a top plan view of the cross bow in an initial precocked position with the bow slide moved rearwards;

Fig. 2 is a top plan view of the cross bow in a cocked position with the bow slide moved forward as much as possible;

Fig. 3 is an enlarged side elevational view of the cross bow of Fig. 2 with a bow and a string removed;

Fig. 4 is an enlarged side view of the left hand side of bow slide with a ratchet gear wheel, a pawl and a pawl spring removed;

Fig. 5 is an enlarged cross-sectional view of the cross bow of Fig. 3 taken along line I—I;

Fig. 6 is an enlarged fragmentary cross-sectional view of the cross bow of Fig. 3 taken along line II—II;

Fig. 7 is an enlarged cross-sectional view of a projectile holder with a lead ball before a shot;

Fig. 8 is an enlarged cross-sectional view of a projectile holder with a lead ball while the holder is moving during a shot;

Fig. 9 is a side elevational view of the cross bow of a further modification in a cocked position with a bow and a string removed and with the bow slide moved forward as much as possible;

Fig. 10 is a top plan view of the cross bow of Fig. 9;

Fig. 11 is an enlarged fragmentary cross-sectional view of the cross bow of Fig. 9 taken along line III—III;

Fig. 12 is a side elevational view of the trigger unit for the cross bows with safety stem in a "Fire" position;

Fig. 13 is a side elevational view, partly in section, of the trigger unit of Fig. 12 with a left side plate removed;

Fig. 14 is a perspective view of the safety stem of the trigger unit in Figs. 12 and 13;

Fig. 15 is a side elevational view, partly in section, of the trigger unit of another modification with a left side plate removed; and

Fig. 16 is a perspective view of the safety stem of the trigger unit in Fig. 15.

Referring more in detail to the drawings, and first to a cross bow disclosed in Figs. 1—8, which can shoot both bolts and projectiles.

The cross bow may be seen to comprise a stock 10 having a fore end portion 11, a butt 12, a bow slide 14 with a bow 13 attached to it and a bow string 15 attached to the corresponding ends of the bow 13.

The fore end portion 11 consists of two parts, namely, an upper part 11a and a lower part 11b and has a bow slide recess 11c in which the bow slide 14 is located. The upper and the lower inside surfaces of the recess 11c form the guideways along which the bow slide 14 can perform reciprocating motion relatively to the stock when the cross bow is being cocked. The external surface of the upper part 11a of the fore end portion 11 has a shape conforming to

the shape of a projectile holder 29 for guiding of said holder during its movement. Besides, the upper external surface of the upper part 11a of the fore end portion 11 has a guideway 11d along which a bolt can be projected by the string when the latter is released from the catch.

The bow slide 14 has an aperture 14a of rectangular shape corresponding to the cross section of the bow 13, which is fastened to the bow slide 14 by a screw (not shown) located in a threaded hole 14b. Besides, on the bow slide 14 is mounted an intermediate element 16 having a square recess 16a for connecting with a wrench by which the cross bow can be cocked. On this element 16 is mounted by a dowel 18 a gear wheel 17, the teeth of which engage the teeth of the lower part 11b of the fore end portion 11 which is formed as a gear rack. Another ratchet gear wheel 20 is mounted on a square projection of the element 16 and is fastened to this projection by a screw 19. The teeth of the ratchet wheel 20 engage a pawl 21 which is pivotally mounted on the bow slide 14 by a screw 22 and is under the action of a tension spring 23.

The ratchet gear wheel 20, the pawl 21, the screw 22, the spring 23, the gear wheel 17 and the gear rack 11b are components of locking means which allow the slide 14 to move in one direction (to left) and do not allow the slide 14 to move in an opposite direction (to right) without disengaging the pawl 21 from the ratchet gear wheel 20.

The gear rack 11b, the gear wheel 17 and an additional wrench (not shown), the square projection of which enters into a square recess 16a of the element 16, are components of cocking means.

In the rear part of the fore end portion 11 there is a slot which extends from the upper surface to the lower surface of the fore end portion 11. In this slot a trigger unit is located. This trigger unit may be one of two modifications shown in Figs. 12, 13 and 15. Both trigger units have a catch 24 being under the action of a tension spring 25. The catch 24 is held in the cocked position by a pivotally mounted trigger 26 which is under the action of a tension spring 27. In the left part of the trigger unit a safety stem 28 is located which has two positions, namely, "Fire" and "Safe" positions. In the "Fire" position the stem 28 does not engage the trigger 26 or the catch 24 and the latter can be pivoted counter-clockwise when the trigger does not engage it. In the "Safe" position the stem 28 engages the trigger 26 in the unit of Figs. 12 and 13, or the catch 24 in the unit of Fig. 15, and thereby a shot can not be done.

As mentioned above, the invented cross bow can fire bolts and projectiles. For shooting of projectiles the projectile holder 29 is connected to the string 15 and placed on the external surface of the upper part 11a of the fore end portion of the stock which has the shape conforming to the shape of the holder 29. This projectile holder 29 has a recess 29a to contain a projectile (preferably balls of different sizes) and the rear part of the recess 29a is shaped as a cone, sphere or other, serving to center a ball shaped projectile during a shot. In the rear part of the projectile holder 29 there is an opening 29b in which the string 15 is disposed.

The invented cross bow has actually three positions, namely, a postshooting position, a precocked position and a cocked position.

The postshooting position is a position in which the slide of the cross bow stays after a shot.

The cocked position (see Fig. 2) is a position in which the slide of the cross bow is moved to the fore end of the cross bow from the extreme right position when the bow string or the projectile holder is engaged by the catch with the purpose of strengthening the bow string tension and bending the bow. In this cross bow this position is very indefinite because the slide of the cross bow can be located in any position from the extreme left position to almost the extreme right position, depending on desired bow draw weight. The further the slide is moved to the left, the greater bow draw weight is.

The precocked position (see Fig. 1) is a position in which the slide of the cross bow is located in the very extreme right position closest to the catch and the bow string or the projectile holder is engaged by the catch.

There is a little difference between projectile shooting and bolt shooting from this cross bow. So if the user wants to fire a projectile, he places the projectile in the recess 29a of the holder 29 when the cross bow is in the right position close to the catch 24, but when the holder 29 is not engaged by the catch yet and only after this the user moves the holder 29 to the right to engage the holder 29 with the catch 24. If the user wants to fire a bolt, then he places the bolt on its guideway 11d only after the bow string 15 is engaged by the catch 24. The rest of manipulation with this cross bow is the same for shooting both bolts and projectiles.

Operation

a) The shooter uses bolts.

For cocking the cross bow when it is in the postshooting position the user first of all disactivates the locking means by turning counter-clockwise the pawl 21 disengaging it from the ratchet gear wheel 20 and holding said pawl 21 in said position. After this the user moves by hand the slide 14 maximum rearwards. When the bow slide 14 reaches the projecting left part of the safety stem 28, the slide 14 pushes the stem 28 to the right to the "Safe" position and the rear part of the stem 28 will dispose under the left upper part of the trigger 26 (Fig. 13) or under the left part of the catch 24 (Fig. 15), thereby preventing the catch 24 from being turned counter-clockwise from its initial position if the shooter unintentionally pulls the trigger 26. Simultaneously the bow string 15 reaches the catch 24 and pushes the upper part of the catch rearwards and clockwise till the upper part of the catch 24 lowers under the lever of the bow string 15 allowing the latter to pass above, and then the catch 24 under the action of the spring 25 turns counter-clockwise to its initial position engaging the bow string 15. After this the user releases the pawl 21 activating the locking means again. Now the cross bow is in the precocked position, and for cocking the cross

bow when it is in said precocked position it is necessary to move the slide 14 with the bow 13 to the left to a desired cocked position in accordance with a desired bow draw weight which can vary from a few lbs. to the maximum possible bow draw weight. The simplest way to move the slide 14 and the bow 13 to the left is to push the bow 13 by hand or even by foot to the left. If, however, the user is not strong enough to do this, then he can use for this purpose a mechanic's wrench having a square projection for connection of conventional sockets. The user needs to insert the square projection of the wrench into the square recess 16a of the element 16 and to turn this element 16 clockwise by the wrench. Then the gear wheel 17 will move forward, because of engagement between it and the gear rack 11b, moving the slide 14 with the bow 13 to the desired cocked position.

When the cross bow is cocked and a bolt is placed on its guideway the cross bow is ready to fire.

To fire the cross bow the user moves the safety stem 28 to the left in the "Fire" position using for this purpose the lateral part 28a of the stem 28. After this if the user turns the trigger 26 counter-clockwise he disengages by it by the left upper part of the tripper 26 from the lower part of the catch 24. The catch 24 under the action of the bow string 15 will turn counter-clockwise releasing the string 15 which together with the bolt is propelled forwardly. The spring 25 immediately returns the catch 24 to its initial position and when the user releases the trigger 26 the spring 27 also returns the trigger 26 to its initial position. Now the cross bow is in the postshooting position again, and for firing the next bolt the cycle has to be repeated.

b) The shooter uses projectiles

For cocking the cross bow when it is in the postshooting position the user first of all disactivates the locking means by turning counter-clockwise the pawl 21 disengaging it from the ratchet gear wheel 20 and holding the pawl 21 in this position. After this the user moves by hand the slide 14 maximum rearwards. When the bow slide 14 reaches the projecting left part of the safety stem 28, the slide 14 pushes the stem 28 to the right to the "Safe" position and the rear part of the stem 28 will dispose under the left upper part of the trigger 26 (Fig. 13) or under the left part of the catch 24 (Fig. 15), thereby preventing the catch 24 from being turned counter-clockwise from its initial position if the shooter unintentionally pulls the trigger 26. Simultaneously the rear part of the projectile holder 29 reaches the upper front part of the catch 24. In this position a projectile 30 is placed in the recess 29a of the projectile holder 29 and after this the projectile holder 29 is moved rearwards. During this movement the projectile holder 29 pushes the upper part of the catch 24 rearwards and clockwise till this upper part of the catch 24 lowers under the bottom part of the projectile holder 29 allowing the latter to pass above, and then the catch 24 under the action of the spring 25 turns counter-clockwise to its initial position shutting the projectile recess 29a of the holder 29 to prevent spontaneous falling out of the projectile 30 from the recess 29a. Besides, the catch 24 does not allow the projectile holder 29 to move forward till the user pulls the trigger. Now the cross bow is in the precocked position, and to cock the cross bow when it is in this precocked position it is necessary to move the slide 14 with the bow 13 to the left to a desired cocked position in accordance with a desired bow draw weight using for this the user's hand, foot or a mechanic's wrench as described above. The firing process for projectile shooting and for bolt shooting is the same and was described above.

Referring now to Figs. 9, 10 and 11 wherein the general features of the cross bow of the second variation are shown.

The cross bow may be seen to comprise a stock 110 having a fore end portion 111, a butt 112, a bow slide 114 with a bow (not shown) attached to it and a bow string (not shown) attached to corresponding ends of the bow.

The butt 112 is connected with the fore end portion 111 for pivoting movement relative thereto about a transverse pivot axis by a pivot pin 131.

To the butt 112 is pivotally attached a spring-loaded locking lever 132 which is a part of locking means, the second part of which is an axle 133 attached to the rear part of the fore end portion 111. These locking means serve to lock the butt 112 in its working horizontal position when the butt 112 is maximum turned counter-clockwise and its fore end surface is parallel to the rear end surface of the fore end portion 111.

The fore end portion 111 has a slide recess 111c in which the bow slide 114 is located. The upper and the lower inside surfaces of the recess 111c form the guideways along which the bow slide 114 can perform reciprocating motion relatively to the fore end portion 111 when the cross bow is being cocked. The fore end of the fore end portion 111 is shut by a part 134 which fastens together the upper and the lower parts of the fore end portion 111.

The external upper surface of the fore end portion 111 has a shape conforming to the shape of a projectile holder 29 for guiding this holder during its movement. Besides, the external upper surface of the fore end portion 111 has a guideway 111d along which a bolt can be projected by the string when the latter is released from the catch.

The bow slide 114 has an aperture 114a of a rectangular shape corresponding to the cross section of the bow (not shown), which is fastened to the bow slide 114 by a screw (not shown) located in a threaded hole 114b. Besides, the bow slide 114 has three through holes 114c in each of which can be located a pivot pin 135 connected fore end parts of two cocking members 136 to the bow slide 114. The rear parts of these cocking members 136 are connected to the butt 112 by a pivot pin 137. Both these cocking members 136 have the same elongated form and are arranged parallel to one another on opposite sides of the fore end portion 111.

In the rear part of the fore end portion 111 there is a slot which extends from the upper surface to the lower surface of the fore end portion 111. In this slot

a trigger unit is located. This trigger unit may be one of two modifications shown in Figs. 12, 13 and 15 described above.

Just as the cross bow in Figs. 1—8, the cross bow in Figs. 9—11 can fire bolts and projectiles. For shooting of projectiles, the projectile holder 29 is connected to the string and placed on the external surface of the upper part of the fore end portion 111 of the stock which has the shape conforming to the shape of the projectile holder 29.

The cross bow of the second variation also has three positions, namely, a postshooting position, a precocked position and a cocked position.

The postshooting position is a position in which the slide of the cross bow stays after a shot.

The precocked position is a position in which the bow slide is located in the very extreme right position closest to the catch and the bow string or the projectile holder is engaged by the catch. In this position the butt 112 is inflected downwards relatively to the fore end portion 111.

The cocked position is a position in which the bow slide is moved to the fore end of the fore end portion of the cross bow from the precocked position and the cross bow butt 112 is locked in its working horizontal position by locking lever 132. For this cross bow, there are three cocked positions depending onto which of three holes 114c the cocking members 136 are attached. The further the bow slide is moved to the left, the bigger the bow draw weight is. So, for the cross bow of Fig. 9 the bow draw weight is maximum. If the cocking members 136 are attached to the very left hole 114c then the bow draw weight is minimum.

There is a little difference between projectile shooting and bolt shooting from this cross bow and this difference is the same as for the cross bow of the first modification described above.

Operation

a) The shooter uses bolts

For cocking the cross bow when it is in the postshooting position the user first of all presses the projecting right part of the locking lever 132 downwards turning the locking lever 132 clockwise and disengaging it with the axle 133. Then, by pivoting the butt 112 about the pivot pin 131, the cocking members 136 together with the bow slide 114, and the bow with the string attached to the bow slide, can be moved rearwardly. When the bow slide 114 reaches the projecting left part of the safety stem 28, the slide 114 pushes the stem 28 to the right to the "Safe" position and the rear part of the stem 28 will dispose under the left upper part of the trigger 26 (Fig. 13) or under the left part of the catch 24 (Fig. 15) thereby preventing the catch 24 from being turned counter-clockwise from its initial position if the shooter unintentionally pulls the trigger 26. Simultaneously the bow string reaches the catch 24 and pushes the upper part of the catch rearwards and clockwise till the upper part of the catch 24 lowers under the level of the bow string allowing the latter to pass above and then the catch 24 under the action of its spring turns counter-clockwise to the initial position engaging the bow string.

Now the cross bow is in the precocked position and to cock it the user turns the butt 112 counter-clockwise moving by it the bow slide 114 with the bow on it forward and bending the bow. When the butt 112 reaches its working position and the locking lever 132 engages the axle 133 the cross bow is in the cocked position. Now the user places a bolt on its guideway 111d and after this the cross bow is ready to fire. The firing process for this cross bow is the same as for the cross bow of the first modification described above.

b) The shooter uses projectiles

For cocking the cross bow when it is in the postshooting position the user first of all presses the projecting right part of the locking lever 132 downwards turning the locking lever 132 clockwise and disengaging it from the axle 133. Then, by pivoting the butt 112 about the pivot pin 131, the cocking members 136 together with the bow slide 114, and the bow with the string and the projectile holder 29 attached to the bow slide, can be moved rearwardly. When the bow slide 114 reaches the projecting left part of the safety stem 28, the slide 114 pushes the stem 28 to the right to the "Safe" position and the rear part of the stem 28 will dispose under the left upper part of the trigger 26 (Fig. 13) or under the left part of the catch 24 (Fig. 15) thereby preventing the catch 24 from being turned counter-clockwise from its initial position if the shooter unintentionally pulls the trigger 26. Simultaneously the rear part of the projectile holder 29 reaches the upper front part of the catch 24. In this position a projectile 30 is placed in the recess 29a of the projectile holder 29 and after this the projectile holder 29 is moved rearwards. During this movement the projectile holder 29 pushes the upper part of the catch 24 rearwards and clockwise till the upper part of the catch 24 lowers under the bottom part of the projectile holder 29 allowing the latter to pass above, and then the catch 24 under the action of the spring 25 turns counter-clockwise to its initial position shutting the projectile recess 29a of the holder 29 to prevent spontaneous falling out of the projectile 30 from the recess 29a. Besides, the catch 24 does not allow the projectile holder 29 to move forward till the user pulls the trigger.

Now the cross bow is in the precocked position and to cock it the user turns the butt 112 counter-clockwise thereby moving the bow slide 114 with the bow on it forward and bending the bow. When the butt 112 reaches its working position and the locking lever 132 engages the axle 133 the cross bow is in the cocked position and is ready to fire. The firing process for this cross bow is the same as for the cross bow of the first modification described above.

Many types of cocking and locking means can be used with the invented cross bows, but one of them has to be mentioned particularly. This is a hydraulic cocking and locking means which has the very same components as a hydraulic car jack (i.e. a hydraulic cylinder, a hydraulic valve, a pumping lever and a

ram), but these components will have much smaller dimensions because a car weight is many times greater than a bow draw weight.

Although but a few variations of the present invention have been illustrated and described, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

CLAIMS

1. In a cross bow for shooting bolts and projectiles which comprises a stock, a bow and a bow string, the improvement including:

(a) a movable bow slide to which said bow is attached, said bow slide being attached to said stock in such a manner that it performs reciprocating motion relatively to said stock when said cross bow is being cocked;

(b) slide locking means fixing said slide in different determined positions relatively to said stock-

(c) a projectile holder which is attachable to said bow string, said holder having a recess for containing a projectile;

(d) a releasable catch for holding said bow string and said projectile holder in a cocked position;

(e) trigger means operatively associated with said catch for effecting release of said bow string and said projectile holder therefrom;

(f) said stock having at least one longitudinally extended guideway conforming to the shape of said bow slide for guiding of said bow slide during its movement;

(g) said stock further having longitudinally extended guide surface conforming to the shape of said projectile holder for guiding of said projectile holder during its movement.

2. A cross bow according to claim 1, further including cocking means to move said bow slide with said bow attached to it relatively to said stock.

3. A cross bow as claimed in claim 2 in which said cocking means include a gear wheel and a gear rack.

4. A cross bow as claimed in claim 2 in which said cocking means include a hydraulic drive having at least one hydraulic cylinder, one ram, one hydraulic valve and one pumping lever.

5. A cross bow as claimed in claim 2 in which said cocking means include a lever pivoted on said stock and at least one cocking member-link one end of which is pivotally attached to said lever and another end of which is pivotally attached to said bow slide.

6. A cross bow as claimed in claim 2 in which said stock includes an elongated fore end portion and a butt pivotally attached to the latter, said cocking means including said butt and at least one cocking member-link one end of which is pivotally attached to said butt and another end of which is pivotally attached to said bow slide.

7. A cross bow as claimed in claim 1 in which said slide locking means include a ratchet gear wheel and a spring loaded pawl.

8. A cross bow as claimed in claim 1 in which said catch conceals said recess of said projectile holder to prevent spontaneous falling out of a projectile before a shot when said cross bow is cocked.

9. A cross bow as claimed in claim 1 in which said recess of said projectile holder has a surface in its rear part which centres a ball-shaped projectile during a shot.

10. A cross bow according to claim 1 in which said bow slide has a rear part, further including safety locking means acting upon said trigger means, said safety locking means having at least one movable element having its front end contacting said rear part of said bow slide when the latter is in a rear position, said movable element releasably engaging said trigger means when said rear part of said bow slide acts upon a front end of said movable element moving said movable element in the engagement with said trigger means when said bow slide is being moved rearwards and is near said trigger means, said safety locking means having safe and fire positions formed so that in said safe position said movable element of the safety locking means engages said trigger means preventing the latter from being moved to make a shot, whereas in said fire position said movable element of said safety locking means disengages said trigger means allowing the latter to be moved to make a shot, said movable element of said safety locking means having a projecting part to move manually said movable element to said fire position and to disengage said movable element from said trigger means when said bow slide is moved forward from its rear position.

11. A cross bow according to claim 10, further including a spring-loaded fixing means to fix said movable element of said locking means in said safe and fire positions.

12. A cross bow according to claim 1 in which said bow slide has a rear part, further including safety locking means acting upon said catch which has an engaging formation to be engaged by said safety locking means, said safety locking means including at least one movable element having its from end contacting said rear part of said bow slide when the latter is in a rear position, said movable element releasably engaging said engaging formation of said catch when said rear part of said bow slide acts upon a front end of said movable element moving said movable element in the engagement with said engaging formation of said catch when said bow slide is being moved rearwards and is near said catch, said safety locking means having safe and fire positions formed so that in said safe position said movable element of the safety locking means engages said catch preventing the latter from being turned to release said bow string and said projectile holder, whereas in said fire position said movable element of the safety locking means disengages said catch allowing the latter to be turned to release said bow string and said projectile holder for a shot, said movable element of said safety locking means having a projecting part to move manually said movable element to said fire position and to disengage said movable element from said catch when said bow slide is moved forward from its rear position.

13. A cross bow according to claim 12, further

including a spring-loaded fixing means to fix said movable element of said locking means in said safe and fire positions.

14. In a cross bow comprising a stock, a bow, a bow string, a releasable catch for holding said bow string in a cocked position, trigger means operatively associated with said catch for effecting release of said bow string therefrom, the improvement including:

(a) a movable bow slide to which said bow is attached, said bow slide being attached to the stock in such a manner that it performs reciprocating motion relatively to said stock when the cross bow is being cocked;

(b) slide locking means fixing said slide in different determined positions relatively to the stock;

(c) said stock having at least one longitudinally extended guideway conforming to the shape of said bow slide for guiding of said slide during its movement.

15. A cross bow according to claim 14, further including cocking means to move said bow slide with said bow attached to it relatively to said stock.

16. A cross bow as claimed in claim 15 in which said cocking means include a gear wheel and a gear rack.

17. A cross bow as claimed in claim 15 in which said cocking means include a hydraulic drive having at least one hydraulic cylinder, one ram, one hydraulic valve and one pumping lever.

18. A cross bow as claimed in claim 15 in which said cocking means include a lever pivoted on said stock and at least one cocking member-link one end of which is pivotally attached to said lever and another end of which is pivotally attached to said bow slide.

19. A cross bow as claimed in claim 15 in which said stock includes an elongated fore end portion and a butt pivotally attached to the latter, said cocking means including said butt and at least one cocking member-link one end of which is pivotally attached to said butt and another end of which is pivotally attached to said bow slide.

20. A cross bow as claimed in claim 14 in which said slide locking means include a ratchet gear wheel and a spring loaded pawl.

21. A cross bow according to claim 14 in which said bow slide has a rear part, further including safety locking means acting upon said trigger means, said safety locking means having at least one movable element having its front end contacting said rear part of said bow slide when the latter is in a rear position, said movable element releasably engaging said trigger means when said rear part of said bow slide acts upon a front end of said movable element moving said movable element in the engagement with said trigger means when said bow slide is being moved rearwards and is near said trigger means, said safety locking means having safe and fire positions formed so that in said safe position said movable element of the safety locking means engages said trigger means preventing the latter from being moved to make a shot, whereas in said fire position said movable element of said safety locking means disengages said trigger means allowing the latter to be moved to make a shot, said movable element of said safety locking means having a projecting part to move manually said movable element to said fire position and to disengage said movable element from said trigger means when said bow slide is moved forward from its rear position.

22. A cross bow according to claim 21, further including a spring-loaded fixing means to fix said movable element of said locking means in said safe and fire positions.

23. A cross bow according to claim 14 in which said bow slide has a rear part, further including safety locking means acting upon said catch which has an engaging formation to be engaged by said safety locking means, said safety locking means including at least one movable element having its front end contacting said rear part of said bow slide when the latter is in a rear position, said movable element releasably engaging said engaging formation of said catch when said rear part of said bow slide acts upon a front end of said movable element moving said movable element in the engagement with said engaging formation of said catch when said bow slide is being moved rearwards and is near said catch, said safety locking means having safe and fire positions formed so that in said safe position said movable element of the safety locking means engages said catch preventing the latter from being turned to release said bow string, whereas in said fire position said movable element of the safety locking means disengages said catch allowing the latter to be turned to release said bow string for a shot, said movable element of said safety locking means having a projecting part to move manually said movable element to said fire position and to disengage said movable element from said catch when said bow slide is moved forward from its rear position.

24. A cross bow according to claim 23, further including a spring-loaded fixing means to fix said movable element of said locking means in said safe and fire positions.

25. In a projectile shooting cross bow comprising a stock, a bow and a bow string, the improvement including:

(a) a projectile holder attached to said bow string and moving together with the latter, said holder having a recess for containing a projectile;

(b) a releasable catch for holding said projectile holder and said string in a cocked position;

(c) trigger means operatively associated with said catch for effecting release of said projectile holder and said string therefrom;

(d) said stock having longitudinally extended guide surface conforming to the shape of said projectile holder for guiding of said projectile holder during its movement.

26. A cross bow as claimed in claim 25 in which said catch conceals said recess of said projectile holder to prevent spontaneous falling out of a projectile before a shot when said cross bow is cocked.

27. A cross bow as claimed in claim 25 in which

said recess of said projectile holder has a surface in its rear part which centres a ball-shaped projectile during a shot.

28. A cross bow according to claim 25, further including:

(a) a movable slide to which said bow is attached, said slide being attached to said stock in such a manner that it performs reciprocating motion relatively to said stock when said cross bow is being cocked;

(b) slide locking means fixing said slide in different determined positions relatively to said stock;

(c) said stock having at least one guideway conforming to the shape of said bow slide for guiding of said slide during its movement.

29. A cross bow according to claim 28, further including cocking means to move the bow slide with the bow attached to it relatively to said cross bow stock.

30. A cross bow as claimed in claim 29 in which said cocking means include a gear wheel and a gear rack.

31. A cross bow as claimed in claim 29 in which said cocking means include a hydraulic drive having at least one hydraulic cylinder, one ram, one hydraulic valve and one pumping lever.

32. A cross bow as claimed in claim 29 in which said cocking means include a lever pivoted on said stock and at least one cocking member-link one end of which is pivotally attached to said lever and another end of which is pivotally attached to said bow slide.

33. A cross bow as claimed in claim 29 in which said stock includes an elongated fore end portion and a butt pivotally attached to the latter, said cocking means including said butt and at least one cocking member-link one end of which is pivotally attached to said butt and another end of which is pivotally attached to said bow slide.

34. A cross bow as claimed in claim 28 in which said slide locking means include a ratchet gear wheel and a spring loaded pawl.

35. A cross bow according to claim 28 in which said bow slide has a rear part, further including safety locking means acting upon said trigger means, said safety locking means having at least one movable element having its front end contacting said rear part of said bow slide when the latter is in a rear position, said movable element releasably engaging said trigger means when said rear part of said bow slide acts upon a front end of said movable element moving said movable element in the engagement with said trigger means when said bow slide is being moved rearwards and is near said trigger means, said safety locking means having safe and fire positions formed so that in said safe position said movable element of the safety locking means engages said trigger means preventing the latter from being moved to make a shot, whereas in said fire position said movable element of said safety locking means disengages said trigger means allowing the latter to be moved to make a shot, said movable element of said safety locking means having a projecting part to move manually said movable element to said fire position and to disengage said movable element from said trigger means when said bow slide is moved forward from its rear position.

36. A cross bow according to claim 35, further including a spring-loaded fixing means to fix said movable element of said locking means in said safe and fire positions.

37. A cross bow according to claim 28 in which said bow slide has a rear part, further including safety locking means acting upon said catch which has an engaging formation to be engaged by said safety locking means, said safety locking means including at least one movable element having its front end contacting said rear part of said bow slide when the latter is in a rear position, said movable element releasably engaging said engaging formation of said catch when said rear part of said bow slide acts upon a front end of said movable element moving said movable element in the engagement with said engaging formation of said catch when said bow slide is being moved rearwards and is near said catch, said safety locking means having safe and fire positions formed so that in said safe position said movable element of the safety locking means engages said catch preventing the latter from being turned to release said bow string and said projectile holder, whereas in said fire position said movable element of the safety locking means disengages said catch allowing the latter to be turned to release said bow string and said projectile holder for a shot, said movable element of said safety locking means having a projecting part to move manually said movable element to said fire position and to disengage said movable element from said catch when said bow slide is moved forward from its rear position.

38. A cross bow according to claim 37, further including a spring-loaded fixing means to fix said movable element of said locking means in said safe and fire positions.

Amendments to the claims have been filed, and have the following effect:—

(a) Claims 14, 21, 23, 25, 28, 29 above have been deleted or textually amended.

(b) New or textually amended claims have been filed as follows:—

(c) Claims 30—38 above have been re-numbered as 29—37 and their appendancies corrected.

14. In a cross bow comprising a stock, a bow and a bow string, the improvement including:

(a) a movable bow slide to which said bow is attached, said bow slide being attached to the stock in such a manner that it performs reciprocating motion relatively to said stock when the cross bow is being cocked;

(b) slide locking means fixing said slide in different positions relatively to the stock;

(c) said stock having at least one longitudinally extended guideway conforming to the shape of said bow slide for guiding of said slide during its movement.

21. A cross bow according to claim 14 in which

said bow slide has a rear part, further including:

releasable retaining means comprising a catch for holding said bow string in a cocked position;

trigger means for releasing said releasable retaining means;

safety locking means acting upon said trigger means, said safety locking means having at least one movable element having its front end contacting said rear part of said bow slide when the latter is in a rear position, said movable element releasably engaging said trigger means when said rear part of said bow slide acts upon the front end of said movable element moving said movable element in the engagement with said trigger means when said bow slide is being moved rearwards and is near said trigger means, said safety locking means having safe and fire positions formed so that in said safe position said movable element of the safety locking means engages said trigger means preventing the latter from being moved to make a shot, whereas in said fire position said movable element of said safety locking means disengages said trigger means allowing the latter to be moved to make a shot, said movable element of said safety locking means having a projecting part to move manually said movable element to said fire position and to disengage said movable element from said trigger means when said bow slide is moved forward from its rear position.

23. A cross bow according to claim 14 in which said bow slide has a rear part, further including:

releasable retaining means comprising a catch for holding said bow string in a cocked position;

trigger means for releasing said releasable retaining means;

safety locking means acting upon said catch which has an engaging formation to be engaged by said safety locking means, said safety locking means including at least one movable element having its front end contacting said rear part of said bow slide when the latter is in a rear position, said movable element releasably engaging said engaging formation of said catch when said rear part of said bow slide acts upon the front end of said movable element moving said movable element in the engagement with said engaging formation of said catch when said bow slide is being moved rearwards and is near said catch, said safety locking means having safe and fire positions formed so that in said safe position said movable element of the safety locking means engages said catch preventing the latter from being turned to release said bow string, whereas in said fire position said movable element of the safety locking means disengages said catch allowing the latter to be turned to release said bow string for a shot, said movable element of said safety locking means having a projecting part to move manually said movable element to said fire position and to disengage said movable element from said catch when said bow slide is moved forward from its rear position.

25. In a projectile shooting cross bow comprising a stock, a bow and a bow string, the improvement including:

(a) a movable bow slide to which said bow is attached, said bow slide being attached to said stock in such a manner that it performs reciprocating motion relatively to said stock when said cross bow is being cocked;

(b) slide locking means fixing said slide in different positions relatively to the stock;

(c) a projectile holder which is attachable to said bow string, said holder having a recess for containing a projectile;

(d) a releasable catch for holding said projectile holder and said bow string in a cocked position;

(e) trigger means operatively associated with said catch for effecting release of said projectile holder and said bow string therefrom;

(f) said stock having at least one longitudinally extended guideway conforming to the shape of said bow slide for guiding of said bow slide during its movement;

(g) said stock further having longitudinally extended guide surface conforming to the shape of said projectile holder for guiding of said projectile holder during its movement.

28. A cross bow according to claim 25, further including cocking means to move said bow slide with said bow attached to it relatively to said stock.

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