

March 24, 1964

G. M. STEVENS  
CROSSBOWS

3,125,998

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2 Sheets-Sheet 1

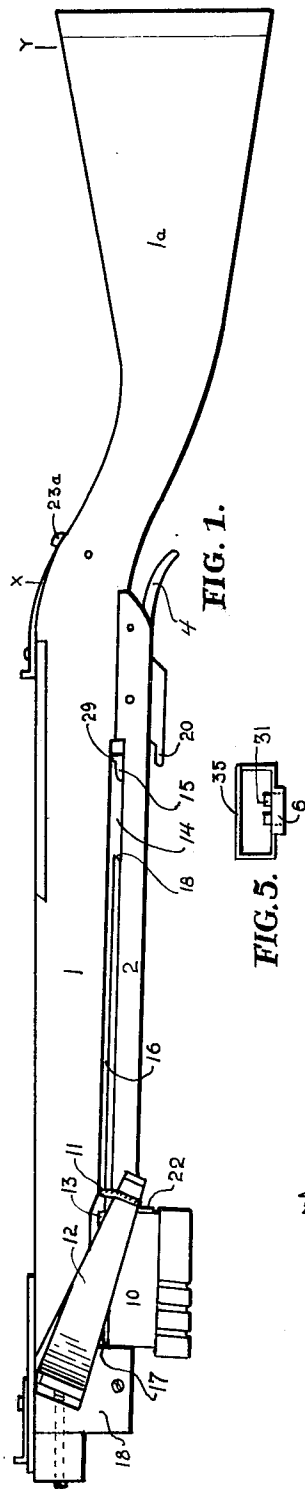


FIG. 1.



FIG. 5.

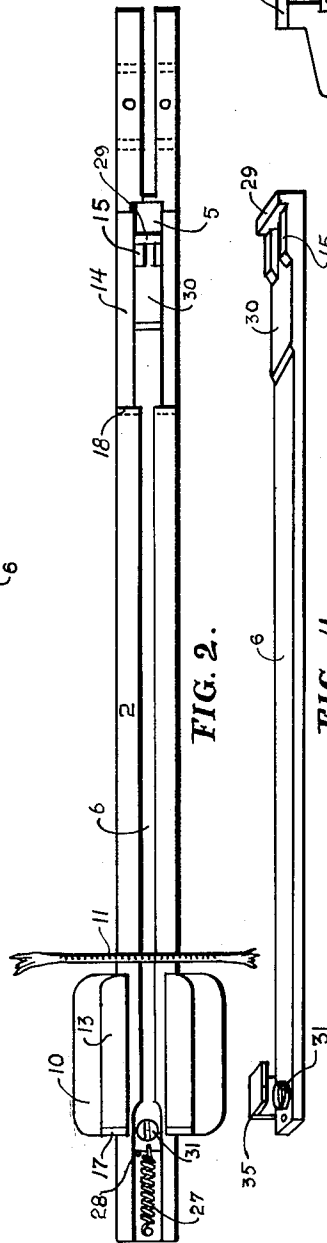


FIG. 2.

FIG. 4.



FIG. 8.

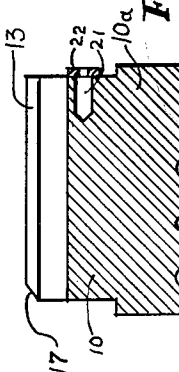


FIG. 6.

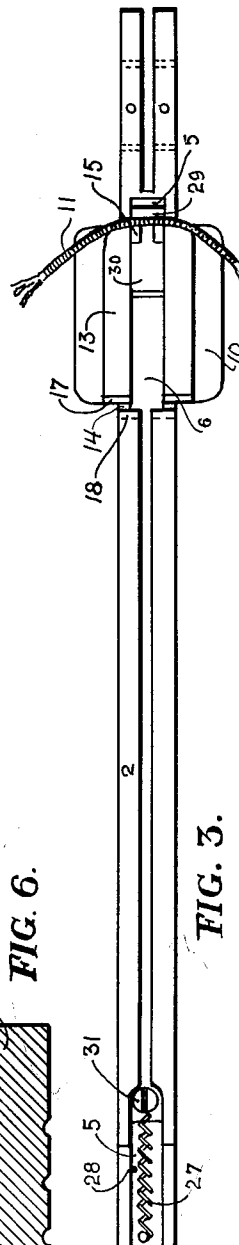


FIG. 3.

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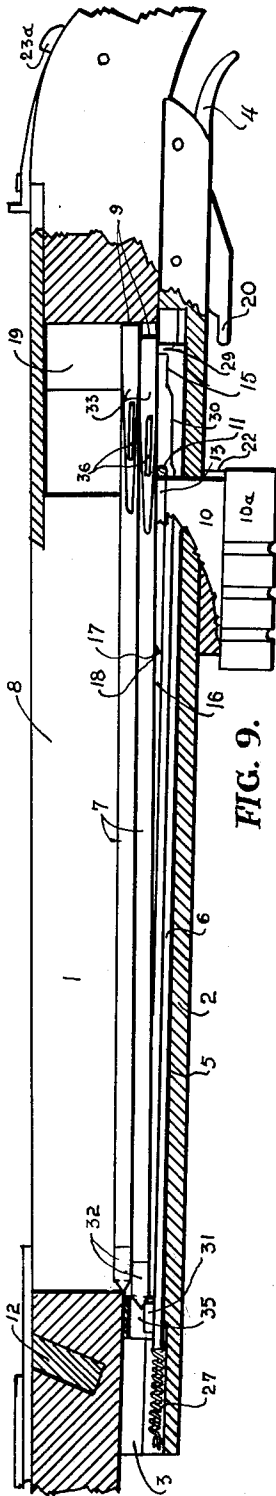


FIG. 9.

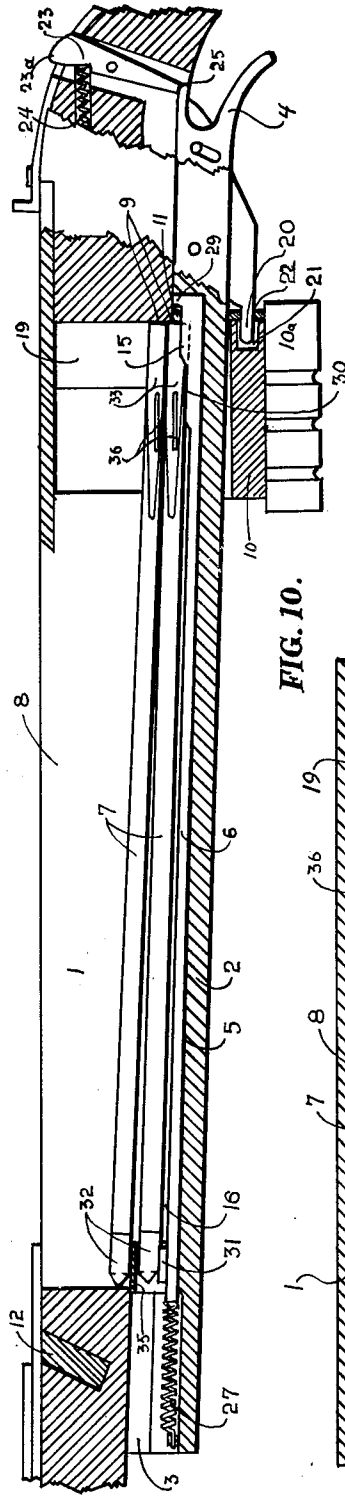


FIG. 10.

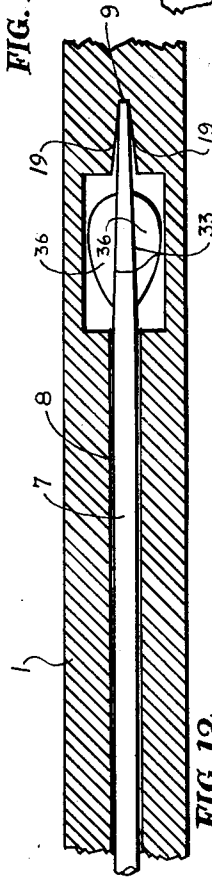


FIG. 12.

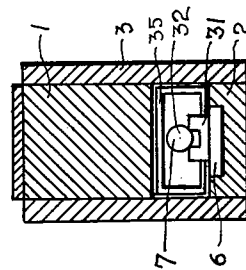


FIG. 13.

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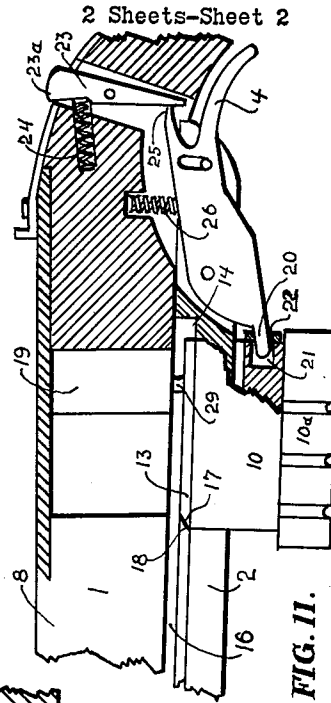


FIG. 11.

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7 Claims. (Cl. 124-25)

This invention relates to crossbows, particularly repeating crossbows.

It is the object of the invention to provide greater safety; to assure greater accuracy and ease of handling, with simplicity of mechanical operation.

Other objects and advantages will become apparent from the following description of which the accompanying drawings form a part, and then set forth in the claims.

To better clarify the type and extent of the improvements, the corresponding elements in Patent 2,554,966 and the present drawings bear like numerals.

FIGURE 1 is a side view of a crossbow embodying my invention, with parts in their normal or static position.

FIGURE 2 is a top view of the barrel proper as detached from the stock, with parts as in FIGURE 1.

FIGURE 3 is a similar view of the barrel proper, showing the parts as under full stress with the retractor fully drawn.

FIGURE 4 is a perspective view of the sliding element that positions and secures the arrow for firing.

FIGURE 5 is an end view, from the front, of the sliding element illustrating the arrow tip positioner.

FIGURE 6 is a longitudinal section through the retractor showing the cavity that receives the forward projection which forms part of the crossbow safety device as well as being a part of the firing mechanism.

FIGURE 7 is an end view of the retractor from the rear, showing the wear plate through which the trigger extension operates and also shows the flared portion above the hand grip which protects the shooter's fingers.

FIGURE 8 is a cross section through the barrel proper with an arrow in place.

FIGURE 9 is a longitudinal section through the magazine and barrel proper when the retractor is partially drawn and with 2 arrows in place.

FIGURE 10 is a similar view to FIGURE 9, showing the retractor fully drawn in the locked position, and also the safety elements when in the "on" position.

FIGURE 11 is a longitudinal section of the breech, showing the safety elements in the "off" position at moment of firing.

FIGURE 12 is a horizontal section through the rear of the magazine, showing the V-shaped butt receiver with an arrow in place.

FIGURE 13 is a cross section through the forward end of the stock, just behind the bow.

The drawing, locking and firing of this crossbow will be seen to be nearly identical with that of Patent 2,554,966. The string 11, however lies and operates rearwardly under the lowermost arrow 7 as in Patent 1,985,079. The runners or guide members (13) have bevelled forward ends 17 for ease in sliding under the string on the forward return of the retractor, and form a secure lock with corresponding bevel recessed shoulders 18 when the bow is cocked. The trigger extension 20 enters and is a close fit in the aperture 21 in the wear plate 22 on the retractor 10; and pivotally mounted through the neck of the stock is a safety lever 23 with a thumb extension 23a above the neck in the familiar position used on shot guns. This pivoted safety lever 23 contacts a shoulder 25 above the trigger 4, thus preventing trigger action. Pressure from the shooter's thumb however will compress spring 24 and free the trigger for firing as in FIGURE 11. The trigger spring 26 being stouter than spring 24 will force the trigger back to its

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normal position as in FIGURE 10, so that without pressure from the shooter's thumb the safety goes back "on". And since the bevel 17 and bevel 18 are securely locked by pressure from the bow string, and the trigger extension 20 is a close fit in the aperture 21, the firing mechanism is securely locked against accidental discharge, and the safety latch must be held "off" to fire. It will be seen that while perfectly positive, this safety feature and its operation in no way interferes with the rapid-fire operation of the crossbow.

When retractor 10 has been moved rearwardly so that forward ends 17 drop down behind shoulders 18, the bowstring is latched since the rear end of the retractor remains raised with runners 13 in front of the bowstring (FIG. 10). Then, when safety 23 is released and trigger 4 pulled, the rear of the retractor drops. This clears the runners 13 from in front of the bowstring, the bowstring itself being held upward in the firing plane by risers 15. Thus the string is released and the crossbow fired.

The sliding bar 6 FIGURE 4, which operates in channel 5 below the arrow FIGURE 8 will position the lowermost arrow for firing as accurately as if done by hand in the finest tournament single-shot bows without any special consideration by the shooter. The bar 6 also provides means for preventing the lowermost arrow from sliding forward in the bore, even if pointed downward FIGURE 9, and keeps the feathers clear of the retractor, FIGURES 9 and 10. Another feature highly desirable in fine tournament shooting is the means FIGURES 9 and 10, to hold the stack of arrows off of the lowermost arrow when shooting, since this stack will vary in weight from several arrows to zero. As will be seen in FIGURES 2, 3, 8 and 9, bar 6 is actuated forwardly by a tension spring 27 to a stop 28 and rearwardly when cocking by contact of the string 11 with the vertical projection 29 at the rear of bar 6. This vertical projection 29 also holds the lowermost arrow up in the magazine until the bow is fully drawn, at which time FIGURE 10, the projection 29 is behind the arrow butt, allowing it to drop into firing position onto a raised portion 30 and between risers 15 which holds the string in the firing plane as Patent 2,554,966. There is a slotted magnet 31 partially imbedded near the forward end of bar 6 which in its normal position is just forward of the magazine, FIGURE 9, so that when the next arrow drops, the steel pile 32 is just behind this magnet. On rearward action, this magnet will frictionally force the arrow butt 9 into the butt receiver 34. And since the rear portion of the arrow is held up in the magazine by projection 29 and the tapered sides 33 of the arrow are vertical and the vertical sides 19 of the receiver 34 also tapered into the rear end of the magazine, the arrow will be perfectly positioned as in FIGURE 12. The slight forward action of the retractor due to the bevel 17 slipping under the bevel 18 of the detent recess, will free the arrow butt sufficiently to allow it to drop into the firing position, at the same time the magnet will prevent the arrow from either turning or slipping, giving identical positioning each time the action is worked.

At the same time that the magnet is being drawn under the arrow pile, the bridge 35, FIGURE 10 rigidly secured to bar 6, contacts the bevelled point of the next arrow above, raising it and any arrows above it from contact with the arrow in the missile guide way. Magnet 31 and surface 30 are preferably of sufficient height to support the arrow essentially clear of the normal missile guide way, giving two point suspension for accuracy and it will be seen from FIGURE 13 that the bridge 35 gives the arrow and its fins clearance on delivery. The height of surface 30 in relation to the bottom edge of the rear of butt receiver 34 also acts as a prevention means against

the possibility of an arrow butt becoming wedged under the rear of the magazine.

Since in the repeating crossbow the missile guide way is considerably below the sighting plane, a deep neck is provided X, Y, FIGURE 1, allowing the shooter to bring his eye low enough for such short ranges as 15 or 20 yards, yet the butt stock is made high enough for a shoulder fit at the longer ranges. This feature becomes increasingly important when considering untrained shooters and especially women, many of whom are left eyed and need a deep enough neck on the stock so the right eye may completely pass over the stock in order to bring the left eye in line with the sights.

In the repeating crossbow the string travels underneath the stock instead of above as in orthodox crossbows or very slightly above the shooter's hand hold on the retractor 10. To prevent accidental hurt or injury to the shooter's fingers, this retractor block 10 is flared FIGURE 7 forming a shelf between the hand grip and the string slot 16.

Having described an illustrated a version of my invention, what I claim is:

1. A crossbow of the repeating type wherein the string operates in a slot and is drawn into engagement with the crossbow release mechanism by a retractor slidably mounted on the stock, a missile positioner comprising, a sliding member operating in contact with the missile to be fired, a means to move the said sliding member rearwardly when the string is being drawn, and means to return the said sliding member to its forward position after discharge, a frictional contact surface on the said sliding member, the said surface in contact with the said missile when the bow is being drawn, a stop member at a desired distance in front of the release mechanism, whereby the said missile and each succeeding missile will be moved rearwardly to the said stop member at an exact distance from the string for firing.

2. A crossbow as in claim 1, wherein the frictional contact surface includes a slotted magnet in combination with a missile having a ferrous pile.

3. A device of the type set forth in claim 1, in which the missile has a rear portion tapered to a wedge shape ending in a narrow vertical butt, and the stop member is the rear vertical wall of the magazine butt receiver, the said butt receiver having vertical side walls flared forwardly at a slightly greater angle than the said tapered sides of the missile, the width of the said rear wall of the magazine corresponding to the width of the said vertical missile butt, whereby the rearward movement of the missile butt between the said receiver walls will rotate the missile to establish the missile butt in a perfectly vertical position against the said stop to receive the string on discharge.

4. In a cross bow as in claim 1 having a magazine above and communicating with the missile guide way, a portion of the said missile positioner operating below

the breech of the said magazine to prevent the missile butt from dropping entirely below the magazine breech where it might become wedged on the rearward action of the said retractor.

5. In a repeating crossbow as in claim 1 said missile comprising a finned arrow, the said sliding member having a vertical projection in the string path, the said vertical projection operating under the magazine whereby the arrow is held above the string slot on retractor action, preventing any damage to the said fins.

6. A crossbow of the repeating type wherein the string operates in a slot and is drawn into engagement with the crossbow release mechanism by a retractor slidably mounted on the stock and an arrow, the said arrow positioned for firing by a sliding member operating in contact with the said arrow, a means to move the said sliding member rearwardly when the string is being drawn and means to return the said sliding member to its forward position after discharge, a frictional contact surface on the said sliding member, the said surface in contact with the arrow when the bow is being drawn, a stop at a desired distance in front of the release mechanism, the said arrow having a rear portion tapered to a wedge shape ending in a narrow vertical butt, the said wedge shape forming flat vertical side surfaces, the said vertical surfaces having essentially horizontal fins attached, whereby when the arrow is positioned for firing, the said fins are positioned to travel in the string slot without interference.

7. A crossbow of the repeating type having a magazine of vertically stacked arrows, and wherein the string operates in a slot and is drawn into engagement with the crossbow release mechanism by a retractor slidably mounted on the stock for firing the lowermost arrow of the said stack, an arrow positioner comprising, a sliding member operating in contact with the missile to be fired, a means to move the said sliding member rearwardly when the string is being drawn, and means to return the said sliding member to its forward position after discharge, a member rigidly secured to the forward portion of the said sliding member and operating above the lowermost arrow pile, whereby when the said sliding member is drawn rearwardly the weight of any arrow piles above will not bear on the arrow to be fired.

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