July 12, 1932. W. H. COLBY 1,866,926

CROSSBOW GUN

Filed Dec. 10, 1930 2 Sheets-Sheet 1

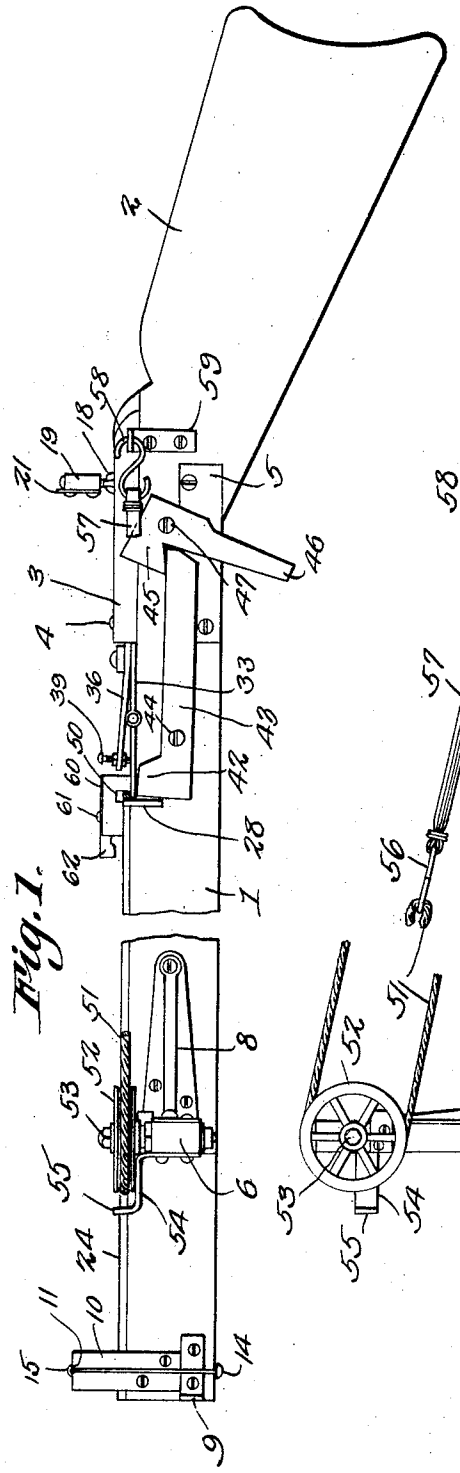


Fig. 1.

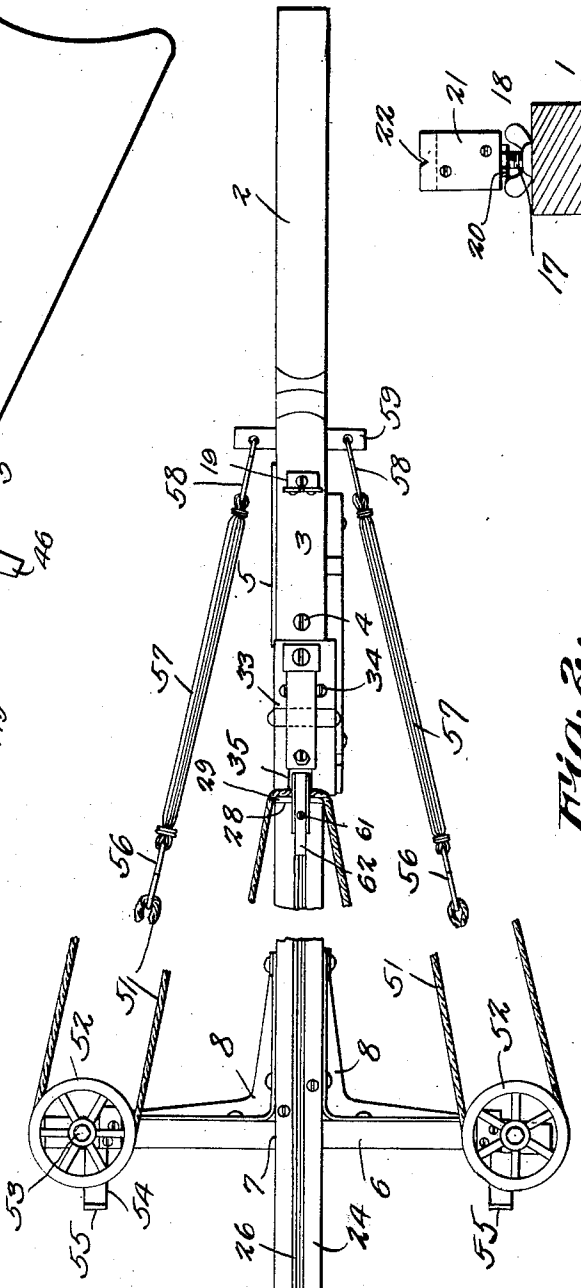


Fig. 2.

Fig. 8.

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CROSSBOW GUN

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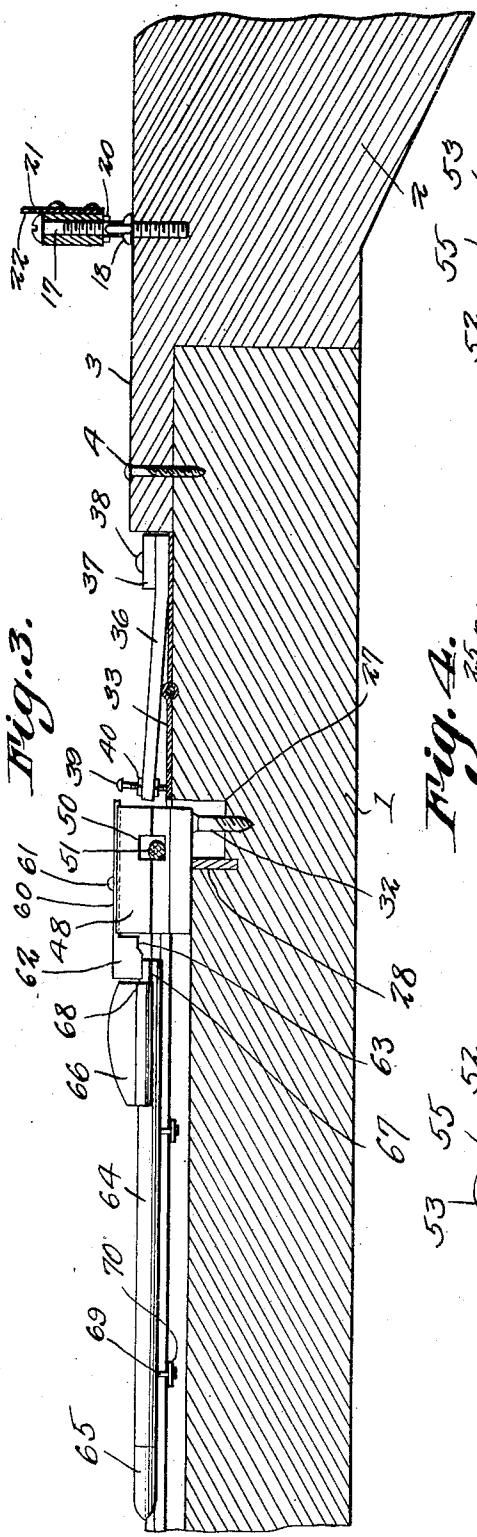


Fig. 3.

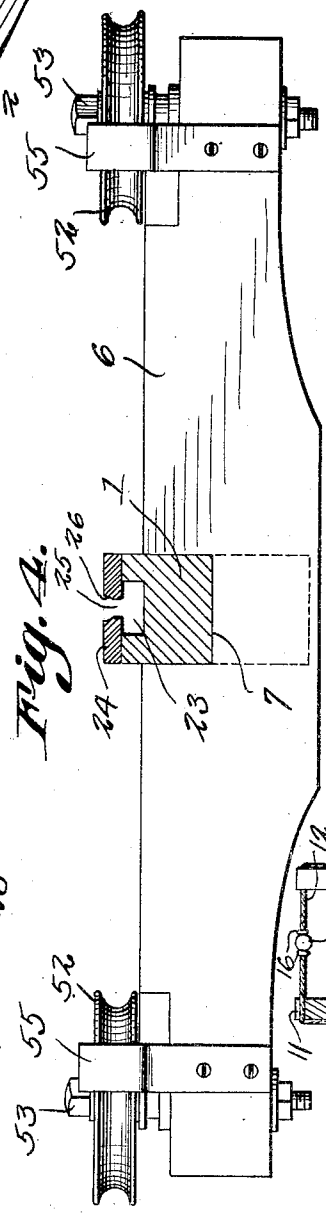


Fig. 4.

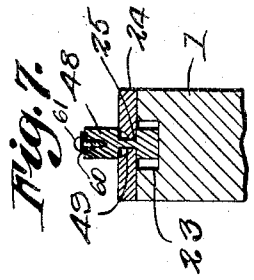


Fig. 7.

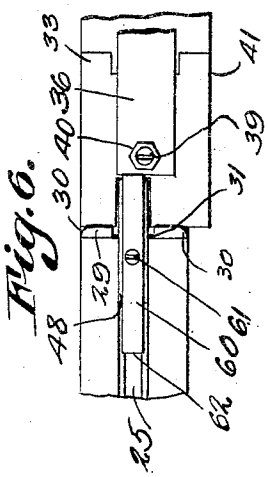


Fig. 6.

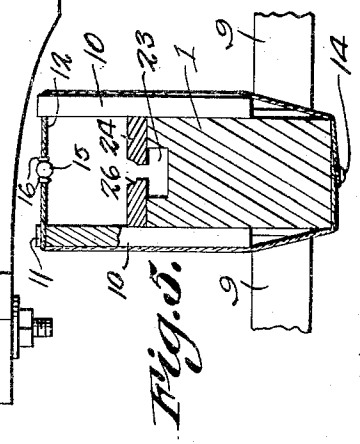


Fig. 5.

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UNITED STATES PATENT OFFICE

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CROSSBOW GUN

Application filed December 10, 1930. Serial No. 501,380.

This invention aims to provide a gun of the cross-bow type which can be manufactured cheaply, out of stock materials, by a boy, novel means being provided for holding the projectile on the slide, or in the barrel, depending on the nature of the projectile, novel means being provided whereby the gun may be made short in the barrel and short in the cross tree, the gun, nevertheless, having great strength and propelling power. Another object of the invention is to improve the sight. A further object of the invention is to improve the lock and trigger mechanism.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the invention appertains.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings:

Figure 1 shows in side elevation, a gun constructed in accordance with the invention, parts being broken away;

Figure 2 is a top plan wherein parts are broken away;

Figure 3 is an enlarged longitudinal section;

Figure 4 is a transverse section taken ahead of the cross tree;

Figure 5 is a transverse section taken at the muzzle of the piece, and disclosing one of the sights;

Figure 6 is a fragmental top plan;

Figure 7 is a transverse section taken through the barrel;

Figure 8 is a sectional view showing the rear sight in elevation.

The gun forming the subject matter of this application comprises a frame, which, preferably, is made of wood. The frame comprises a barrel 1 and a stock 2 abutting against the rear end of the barrel. The stock 2 has an extension 3 which overlaps the upper edge of the barrel 1, as shown in Figure 3, a securing element 4 passing downwardly through the extension 3, into the rear end of the barrel 1. Splice plates 5, made of metal, are attached to the sides of the frame, and serve to hold the stock and the barrel together. Although the stock and the barrel have been shown as being made in two pieces, a mechanic will understand that these parts may be fashioned in one piece if desired.

The cross tree 6 is short, the cross tree and the barrel 1 being notched together, as shown at 7. The cross tree 6 is held on the barrel 1 by brackets 8 secured in the angles formed by the parts 1 and 6, the brackets being shown very clearly in Figures 1 and 2 of the drawings.

Angle brackets 9 are secured to opposite sides of the barrel 1, at the muzzle of the piece, as shown in Figure 2, and the outstanding arms of the angle brackets form foot holds which are used in the loading of the gun, in a way which will be explained hereinafter.

Standards 10 are secured to opposite sides of the barrel 1, at the muzzle thereof, the lower ends of the standards resting on the angle brackets 9. In the upper ends of the standards 10 there are notches 11 in which a flexible element 12, preferably a piece of string, is slidably adjustable. The flexible element 12 extends downwardly along the standards 10 as shown in Figure 5, and underneath the barrel 1, the lower ends of the flexible element 12 being tied to a projection 14, such as a nail, in the lower edge of the barrel. A bead 15 is held by knots 16 on the flexible element 12 and is located between the standards 10.

It will be obvious that by untying the flexible element 12 from the projection 14, the element may be adjusted in the direction of its length, thereby to move the bead 15 crosswise of the barrel and to make allowance for windage. Especial attention is directed to the simplicity of the fore sight thus provided.

The rear sight is shown in Figures 1 and 8 of the drawings. It comprises a screw 17

threaded for adjustment into the extension 3 of the stock 2 and held in adjusted positions by a wing nut 18, threaded on the screw 17 and adapted to bear against the upper edge of the stock. The body 19 of the sight is in the form of a block, through which the screw or support 19 passes. The body 19 is rigidly held on the screw 17 by a lock nut 20, which being threaded on the screw 17, bears against the lower end of the body 19, the body 19 thus being clamped securely between the head of the screw and the lock nut, in addition to being threaded on the screw. A plate 21 is secured to the body 19 and has a notch 22 in its upper edge, adapted to cooperate with the bead 15 of Figure 5, in sighting the gun.

When it is desired to adjust the rear sight vertically, the operator slacks away the wing nut 18 and threads the screw 17 upwardly and downwardly in the stock 2, the body 19 and the plate 21 forming a finger piece by which the screw 17 may be rotated, as aforesaid. After the desired vertical adjustment of the rear sight has been effected, the wing nut 18 is threaded down on the screw 17, to a seat against the stock 2, thereby preventing the screw 17 from rotating, and the sight, thus, being held in the position to which it has been adjusted vertically.

In the upper edge of the barrel 1, a longitudinal guideway 23 is formed. Strips 24 are secured to the upper edge of the barrel 1 and overhang the guideway 23. The strips 24 are spaced apart to form a slot 25 communicating with the guideway 23. The upper, inner edges of the strips 24 are concaved to form a longitudinal groove 26.

A transverse recess 27 extends through the barrel 1, as shown in Figure 3, and forms a transverse shoulder 28 at the back end of the barrel 1. To this shoulder 28 is secured a metal keeper plate 29, the edges 30 of which are rounded, the metal keeper plate 29 being provided in its upper edge with a notch 31 which registers with the guideway 23. An adjustable support 32, preferably a screw, is threaded into the barrel 1 at the base of the transverse recess 27.

A throwoff 33 is provided, and, preferably, is a common hinge, the rear member of which is secured to the barrel 1, in advance of the forward end of the extension 3 of the stock 2, screws 34 being used, if desired, to attach the rear member of the throw-off to the barrel 1. The throw-off 33 extends forwardly to the keeper plate 29, the forward end of the throw-off being provided with a notch 35 that registers with the transverse recess 27 in the barrel 1.

The forward end of the throw-off 33 is held down on the upper edge of the barrel (Figure 3) by a spring 36, in the form of a strip, held on the barrel 1 by a block 37 and a securing element 38, the securing element 38 passing down through the block 37, the spring 36, and through the rear end of the throw-off 33 into the barrel 1. Some might prefer to use merely a piece of resilient wood in making the spring 36, and there is no objection to this. An adjusting device for the spring 36 is provided, and preferably, is in the form of a small screw 39 threaded vertically through the forward end of the spring 36 and held in adjusted positions by lock nuts 40, the lower end of the screw 39 bearing on the vertically movable, forward end of the throw-off 33. Obviously, by adjusting the screw 39 in the direction of its length, the spring 36 may be caused to exert more or less pressure on the forward end of the throw-off 33.

Figure 6 of the drawings shows that the forward, vertically movable member of the throw-off 33 extends at 41, outwardly with respect to the barrel 1, at one side of the barrel, so as to overhang a projection 42 (Figure 1) on the forward end of a lever 43, extended lengthwise of the barrel 1 and fulcrumed intermediate its ends thereon, as shown at 44. The rear end of the lever 43 extends beneath a shoulder 45 on a trigger 46 located externally of the frame of the gun, and fulcrumed on the stock 2, as shown at 47.

A slide 48 is mounted for reciprocation on the barrel 1. The slide 48 is I-shaped, in cross section as shown in Figure 7, the lower portion of the slide 48 being movable in the guideway 23, and the upper portion of the slide being above the guide strips 24, the upper and lower portions of the slide being connected by a reduced neck 49, received in the slot 25 which exists between the inner edges of the strips 24. Figure 3 shows that the slide 48 is provided with a transverse hole 50, in which is received the intermediate portion of a flexible element 51, which may be a piece of cord. The flexible element 51 is looped around pulleys 52 journaled for rotation on shafts, such as bolts 53, mounted in the cross tree 6. Angle brackets 54 (Figure 1) are secured to the cross tree 6 and have upstanding fingers 55 located in front of the pulleys 52. When the gun is discharged, the slide 48 generally moves to a position a little ahead of the cross tree 6, and the function of the fingers 55 is to keep the flexible elements 51 in the grooves of the pulleys 52, under such circumstances. The flexible elements 51 are connected by S-hooks 56 or otherwise, to the forward ends of retractile members 57. These retractile members 57 preferably are made up of a plurality of strong rubber bands. There is an advantage in using a plurality of rubber bands in the making of each of the retractile members 57, because when one of these rubber bands breaks, the person using the arm is advised that the retractile members are beginning to give away. The retractile members 57 therefore, do not fail all at once, and snap back into the face of

the shooter. The rear ends of the retractile members 57 are connected by S-hooks 58 or otherwise, with outstanding anchors 59 on the stock 2. The anchors 59 may be angle members, as disclosed in Figures 1 and 2 of the drawings.

A spring strip 60, constituting a projectile retainer, is attached by a securing element 61 to the upper edge of the slide 48, and is vertically movable. The spring strip 60 has a depending head 62 located in advance of the slide 48, and provided in its rear, lower corner, with a seat 63, which is shown in Figure 3. It is possible to use a bullet or slug as a projectile, and when a bullet or slug is used, it travels along the groove 26 of Figures 5 and 4. The slug or bullet is engaged in the seat 63 and is held thereby, owing to the resiliency of the strip 60. Should the shooter incline the barrel 1 downwardly and forwardly, the bullet, therefore, will not roll out of the groove 26, but when the slide 48 arrives at the limit of its forward movement, the bullet will be discharged, the spring 60 being weak. The bullet is not shown in the drawings.

The projectile may be a wooden arrow 64, mounted to slide in the groove 26 and provided with a metal tip 65. At its rear end, the arrow 64 has three vanes 66, two of which project sidewise, in the same plane, the third of the vanes projecting upwardly, as shown in Figure 3. At its rear end, the arrow 64 has a slot 67 (Figure 3) which facilitates the mounting of the vanes on the body portion of the arrow. In the upper rear portion of the arrow 64, there is a slight shoulder 68, adapted to be engaged by the lower, forward corner of the head 62 on the spring strip 60 which is carried by the slide 48. The arrow 64 carries depending pins 69 which extend downwardly through the slot 25 between the strips 24. Friction washers 70 are carried on the lower ends of the pins 69 and bear against the lower surfaces of the strips 24. The function of these washers 70 is to hold the arrow 64 in the groove 26 of the barrel, should the barrel be tilted downwardly and forwardly, but the friction thus created is very slight, and does not interfere appreciably with the discharge of the arrow.

In practical operation, the gun is stood up endwise on the ground in a substantially vertical position, the feet of the operator being placed on the foot holds or angle brackets 9, to hold the gun down. That portion of the flexible element 51 which lies between the pulleys 52 is seized and drawn backwardly, the slide 48 moving backwardly also. Ultimately, the slide 48 arrives in the position of Figure 3, and rests on top of the adjustable support or screw 32 of Figure 3. The purpose of this adjustable support 32 is to level up the slide 48, when it is retracted, and to give it a fair start forwardly along the barrel, without binding. When the slide 48 is retracted as aforesaid, the intermediate portion of the flexible element 51 is engaged behind the keeper plate 29, as shown in Figure 2, the rounded corners 30 of the keeper plate preventing a cutting or wearing of the flexible element. When the parts are arranged, as aforesaid, the retractile members 57 are under tension, and if the arrow 64 is used, its shoulder 68 is engaged with the lower forward corner of the head 62 that is carried by the slide 48, as shown in Figure 3. The piece now is in condition to be discharged.

Referring to Figure 1, the operator pulls backwardly on the lower end of the trigger 46, and the shoulder 45 of the trigger tilts the lever 43 on its fulcrum 44, the projection 42 of the lever swinging the forward portion of the throw-off 33 upwardly, the forward portion of the throw-off extending beneath the intermediate portion of the flexible element 51, as shown in Figure 1 of the drawings. Then the forward portion of the throw-off 33 is raised, as aforesaid, the flexible element 51 is lifted clear of the keeper plate 29, and the retractile members 57 advance the slide 48 and the projectile, the flexible elements 51 running over the rotatable pulleys 52. When the forward portion of the throw-off 33 is raised by the action of the lever 43 and the trigger 46, the spring 36 is put under additional tension, the purpose of the strip or spring 36 being to return the parts 33, 42 and 46 to the position of Figure 1, as soon as the trigger 46 is released.

The device is simple in construction, and its simplicity is one of the features to recommend it, since it can be manufactured cheaply out of stock materials, it being practically unnecessary to have any part specially turned out. The parts of the arm may be sold knocked down, to be assembled by the purchaser, or any other suitable arrangement may be made as to the manufacture of the article. Especial attention is directed to the hitch-up of the bow string or flexible member 51. Referring to the provision of the pulleys 52, the cross tree 6 may be short, the gun having, nevertheless, a strong propelling power.

Having thus described the invention, what is claimed is:

1. In a sight, a barrel, standards mounted on the barrel, a flexible element extended between the standards, longitudinally of the standards, and beneath the barrel, means for securing the flexible element adjustably in place, for movement in the direction of its length, and a bead carried by that portion of the flexible element which is between the standards.

2. In a sight, a gun frame, a screw threaded into the gun frame, a sighting body secured to the screw and constituting means whereby

the screw may be rotated to adjust the sighting body with respect to the gun frame, and a lock nut threaded on the screw and engaging the gun frame to hold the screw and the sighting body in any position to which they may have been adjusted by the rotation of the screw.

3. In a device of the class described, a barrel, a cross tree carried by the barrel, pulleys journaled on the cross tree, a slide mounted to reciprocate on the barrel, a flexible element engaged in its intermediate portion with the slide, the flexible element being looped about the pulleys, springs interposed in the flexible elements, and means for anchoring the flexible elements at their rear ends with respect to the barrel.

4. In a device of the class described, a barrel, a cross tree carried by the barrel, pulleys journaled on the cross tree, a slide mounted to reciprocate on the barrel, resilient flexible means engaged in its intermediate portion with the slide and looped about the pulleys, and mechanism for anchoring the rear ends of the said means with respect to the barrel.

5. In a device of the class described, a barrel, a slide movable along the barrel, means for advancing the slide along the barrel, and spring means carried by the slide for retaining a projectile on the barrel, in front of the slide.

6. In a device of the class described, a barrel, a slide movable along the barrel, means for advancing the slide, a spring secured to the slide, and a depending head carried by the spring and located in front of the slide, the head constituting means for retaining a projectile on the barrel, in advance of the slide.

7. In a device of the class described, a barrel provided with a transverse recess, a support mounted for adjustment in the recess transversely of the length of the barrel, a slide mounted to move along the barrel, and means for advancing the slide along the barrel, the rear end of the slide being sustained by the support when the slide is retracted.

8. In a device of the class described, a barrel, a vertically movable throw-off carried by the barrel, a spring overhanging the throw-off, an adjusting device movable in the spring and engaging the throw-off, and mechanism including a trigger, for raising the throw-off, against the action of the spring.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

WILLIS H. COLBY.