

[54] **ELASTIC BAND PROJECTILE PROJECTING DEVICE**

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[51] Int. Cl. **F41b 7/00**

[58] Field of Search 124/41, 29, 40, 35, 124/34, 21, 50, 17, 31; 74/530, 527, 528

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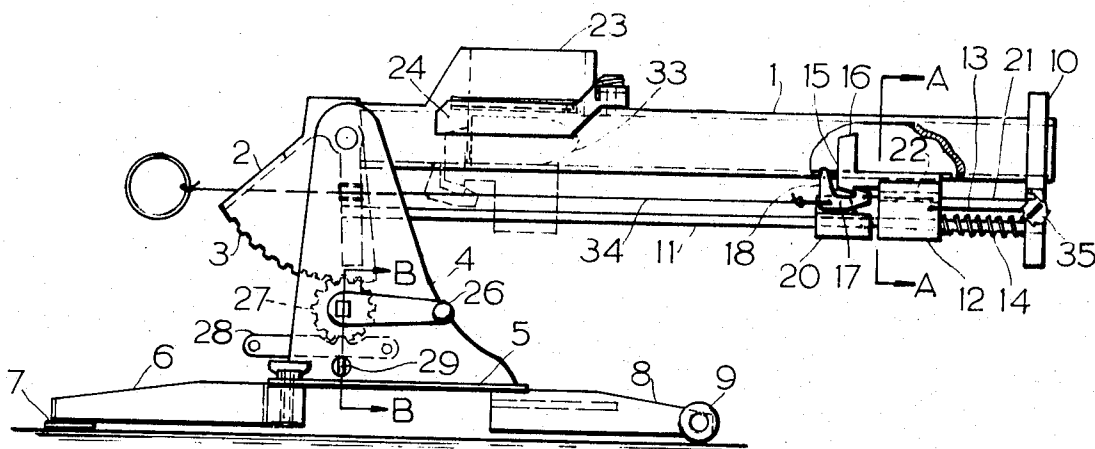
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[57]

ABSTRACT

A projectile projecting gun having a gear arrangement for changing the elevation of the gun barrel. Below the barrel of the gun there are two slidable structures that ride on a track. The forwardmost structure is the unit that receives and propels a projectile. The rearmost structure pulls the forwardmost structure to a projectile receiving position, where, after receiving a projectile, a pivoted portion of the rearmost structure is pivoted so as to release the forwardmost structure so that the latter structure may propel the projectile. The rearmost structure is pulled along forwardly with the forwardmost structure by a common elastic band, the band furnishing the force necessary to project an object. The rearward movement of the forwardmost structure causes an arm to be cammed away so that one projectile may be positioned in the barrel for firing. The barrel of the gun may be locked in a desired position. After the barrel has been locked in a desired position a separate safety lock may be used to releasably hold the above mentioned lock for the barrel.

1 Claim, 8 Drawing Figures



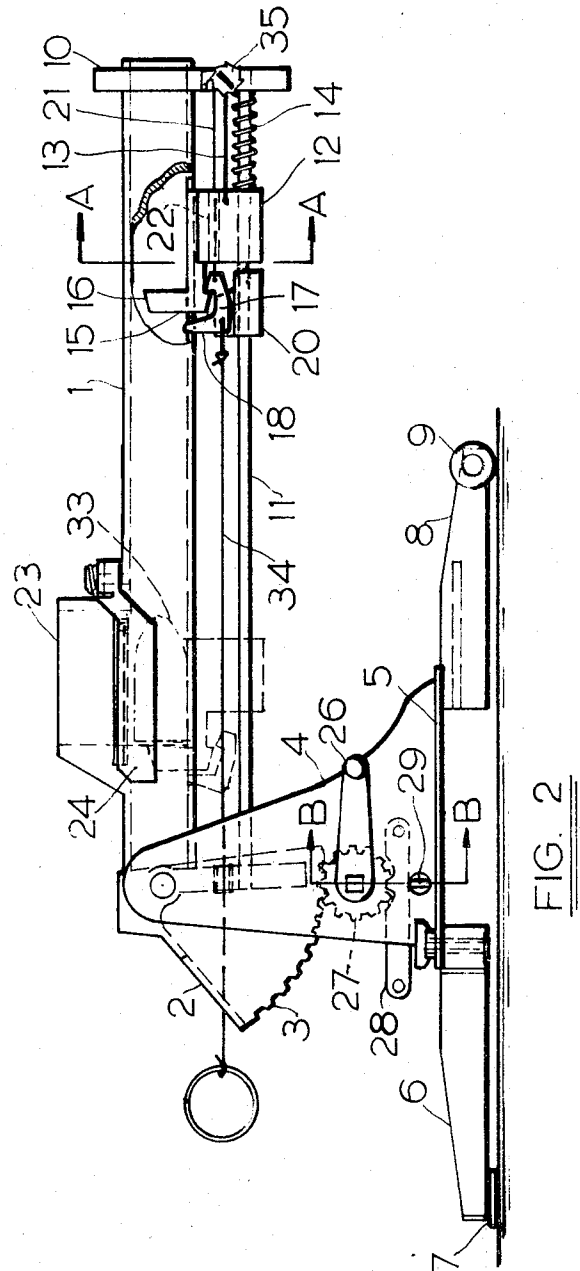
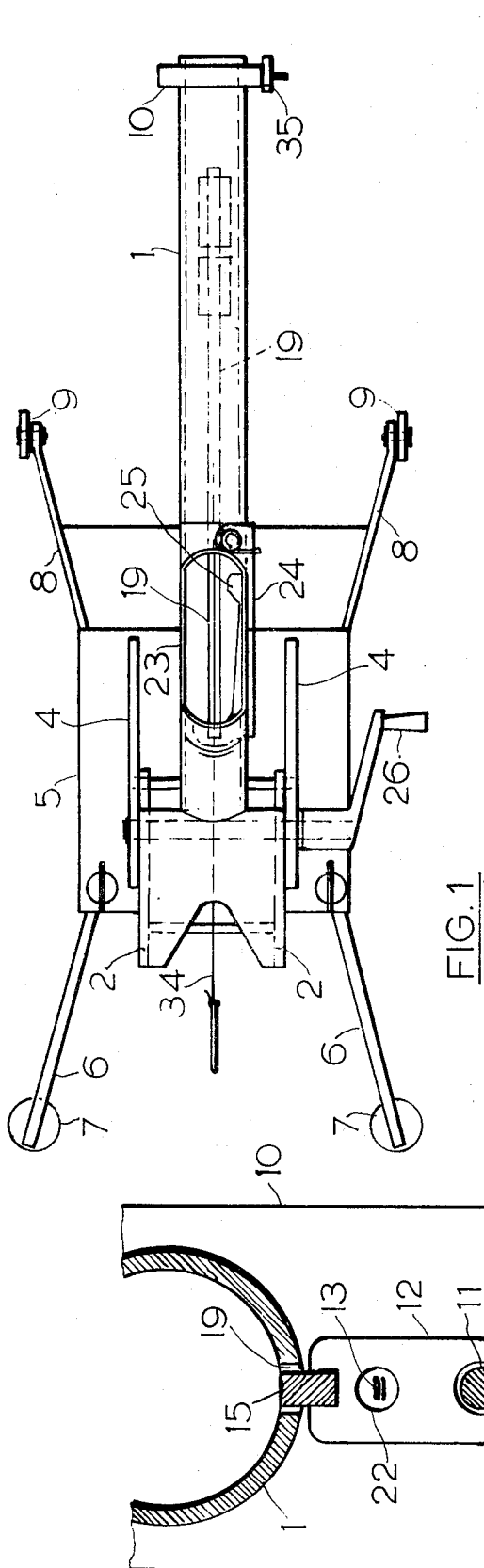
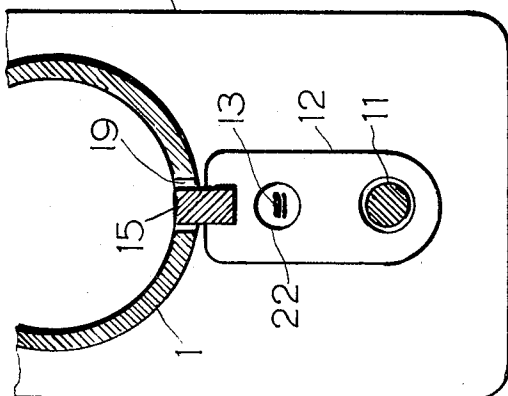


FIG. 3



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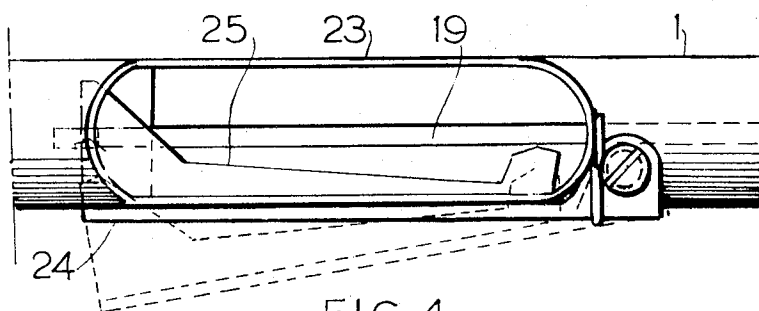


FIG. 4

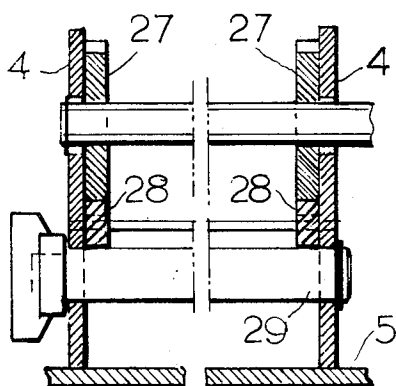


FIG. 5

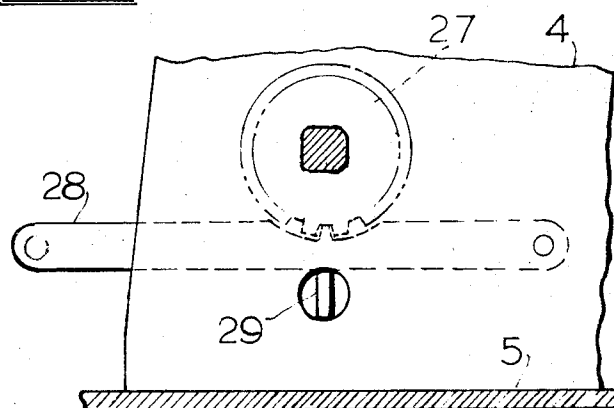


FIG. 6

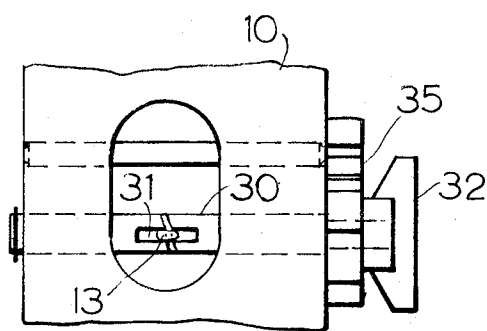


FIG. 7

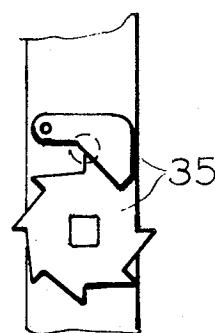


FIG. 8

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ELASTIC BAND PROJECTILE PROJECTING DEVICE

This invention relates generally to toys and particularly to toy guns of the missile firing type in which the firing power is supplied by the elasticity of an elastic band.

There are many toy guns on the market at the present time. These feature primarily the noise factor and the high firing power of the toy, and consequently, many of these toys are considered a safety hazard to the child playing with them, and actually have little educational value, a feature which is considered very desirable at the time by parents.

Toy guns are very popular with children, and this invention takes advantage of this popularity to introduce features into the toy gun to maintain the child's interest and at the same time to get the child acquainted with several common mechanical movements such as meshing gears, locking devices, pawl units, automatic feeders, trigger action, etc. In the scientific end it demonstrates the trajectory principle of missile travel. The nature of the missile used and the power supplied by the elastic band to propel it does not constitute any danger to the child nor is there any danger involved any of the toy's operations.

In describing the invention reference will be made to the attached drawings in which,

FIG. 1 is a plan view of the invention,

FIG. 2 is an elevation of the invention,

FIG. 3 is section A—A through the gun barrel,

FIG. 4 is an enlarged view of the missile feeding mechanism,

FIG. 5 is section B—B showing a detail of the gear locking device,

FIG. 6 is an enlarged view of the gear locking device,

FIG. 7 shows a front view of the elastic tightening device, and

FIG. 8 shows a side view of the above device.

The invention is shown in the drawings, consisting of an elongated cylindrical gun barrel 1 which is open at both ends. To the rear end of the barrel 1, and on each side of it is attached a wall 2 having the shape of a circular segment the bottom round edge of which is provided with gear teeth 3. The barrel 1 with its attached walls 2, is pivotally supported by two side walls 4,4, which are fixed to a base 5. This base is supported at the rear thereof by a pair of foldaway horizontal legs 6,6, equipped with pads 7,7. The front of the base 5 is provided with fixed horizontal legs 8,8, the ends of which are provided with wheels 9,9.

Fixed to the front end of the barrel 1 is a rectangular bracket 10 which supports a round rod 11 located directly below and spaced from the barrel 1. A trigger block 12 which slides upon the rod 11, is attached by means of an elastic band 13 to the bracket 10 and is separated from it by a short spring 14.

The trigger mechanism of the gun consists of two interlocking components; an upper L-shaped part 15 and a lower L-shaped part 17. The part 15 is rigidly attached to the block 12 by the horizontal leg of the L. The vertical leg 16 of the L extends upward and is located within the lower part of the barrel 1. A narrow groove 19 is provided in the bottom of the barrel 1 within which slides the leg 16. The lower L-shaped trigger component 17 is pivotally attached to sliding trigger block 20 which also slides upon the rod 11. The

vertical leg 18 of the trigger part 17 also slides within the groove 19 but is relatively shorter than the vertical part 16. The front end of the trigger part 17 is attached to the bracket 10 by means of an elastic band 21 which passes freely through a hole 22 in the block 12. To the rear of the trigger part 17 is attached a string 34 by means of which the gun is fired.

For loading purposes, the barrel 1 is provided with an open top chamber 23 which is an upwardly extended part of the barrel 1 and communicates with it. A spring loaded pivoted flap 24 is located on the outside of the chamber 23 and at the bottom of it. A horizontal bend 25 in the upper edge of the flap 24 extends into the chamber 24 through a slot in the said chamber provided for that purpose. This bend 25 is shaped to engage the trigger mechanism when it reaches the chamber position in order to release a missile which normally rests upon it, to let it drop into the said barrel.

The aiming of the gun is done by controlling the trajectory path of the fired missile, and this is done by varying the angle of the gun barrel 1 in relation to its base 5. This is accomplished by rotating the handle 26 which is attached to a pair of pinions 27,27, which in turn engage the gear teeth 3,3, on the walls 2,2. After the gun has been adjusted to the required angle it is fixed in position by a joined pair of pivoted bars 28,28, which when raised engage the pinions 27,27, and thus prevent them from rotating. The bars 28,28, are kept from dropping by rotating a rectangular cross bar 29 to a vertical position. The bar 29 is contained within circular holes in the walls 4,4. Normally, this bar is in a horizontal position thus the bars 28,28, are disengaged from the said pinions.

It is obvious that several simpler methods for locking the gun at a required angle, can be used effectively, however, as previously explained, it is intended to provide as many gadgets to the toy as possible to keep the child's interest in it, to keep him busy at it, and to get him acquainted with the construction of various mechanisms.

In order to decrease or increase the firing force the elastic band 13 is either slackened or tightened. This is accomplished by a mechanism located in the bracket 10. It consists of a freely rotating round bar 30 located transversely in the bracket 10. A slot 31 is provided in the center of the rod 30, through which is inserted the band 13, pinned, and then wound upon the bar 31, by means of a winder 32. The rod 30 is prevented from unwinding by a pawl arrangement 35 at one end of the said rod.

The operation of the toy consists of placing several missiles, into the chamber 23. The angle of trajectory is adjusted by rotating the handle 26, and then locking the barrel 1 in position by means of the bars 28 and 29, as above described. When the firing cord 34 is pulled back, the following actions take place in rapid succession — the trigger blocks 12 and 20 travel along the bar 11. When the trigger mechanism reaches the chamber 23, the trigger part 16 engages the part 25 thus pushing it out of the said chamber. This causes the lowest missile to drop into the barrel 1. As the cord 34 is pulled further back, the part 18 of the trigger strikes against the back boundary of the groove 19 thus disengaging the hooks of the trigger parts 15 and 17. The tightly drawn band 13, snaps back into its original position at the same time pulling the trigger mechanism with it. The part 16 hits the rear of the missile 33 and fires it

out of the gun barrel 1. By readjusting the position of the gun in a horizontal plane and the angle of trajectory the gun can be made to hit the target repeatedly.

The preferred type of missile used is made of a light material, such as wood or hollow plastic, in the shape of a bullet. However, various other forms of toy missiles can be used or any other small item such as a button, bottle cap, etc., as long as it fits freely into the said gun barrel. Furthermore, toy missiles which provide a simulated smoke or explosive effect can be shot from this gun if small enough to fit freely into the gun barrel.

Having described the invention, what I claim is:

1. A toy gun designed to fire a missile in a trajectory path using the elasticity of an elastic band as the source of propelling power, comprising in combination:

- a. an elongated tubular gun barrel having a centrally located groove in the bottom thereof, said barrel being pivotally supported at the rear end thereof by a pair of vertical side walls which are fixed to a horizontal base,
- b. two identical walls, in the shape of circular segments the curved bottom of which is provided with gear teeth, each one of said segmented walls being fixed rigidly to each side of said gun barrel; a pair of spaced pinions, meshing with the said wall teeth, which, when rotated, raise or lower the free front end of the gun barrel,
- c. a device for locking the gun barrel in position, comprising a pair of spaced pivoted arms, each of said pivoted arms being provided with a single tooth located directly under said pinions, so that when the said arms are raised, the said tooth locates itself between the nearest two adjacent teeth of the pinion and prevents it from further rotation; and a rectangular bar located under and cross-wise to the said arms rotating freely in circular holes in the said vertical gun barrel supporting walls, so that when said rectangular bar is in a vertical position it holds the said arms locked with said pinions,
- d. the trigger mechanism consists of an interlocking front trigger part and rear L-shaped trigger part which slide freely upon a horizontal bar spaced from, attached and parallel to the underside of the gun barrel, the front trigger part which is of one piece and the rear trigger part which consists of a lower rigid part and mounted thereon a pivoted

part, said front trigger part and said pivoted part being attached to the front of the gun barrel by an elastic band, each of said trigger parts having an L shaped portion with a vertically extending arm projecting into the gun barrel through the said groove therein, the vertical projection of the front trigger part pushes and propels a missile out of the gun barrel, the vertical arm of the L of the rear trigger part, upon contact with the rear boundary of said gun barrel groove, unlocks the parts to release the front trigger part for firing, two elastic bands both attached at their front ends to the front of the gun barrel, the rear end of one of said bands being attached to the front trigger part and serves as the propellant, the rear end of the other being attached to the pivoted part of the rear part and serves to reinterlock the front and rear L-shaped parts after firing,

- f. means for attaching the front end of the propelling elastic band to, and winding upon it, a rotating rod located at the front of the gun barrel, and means for preventing said rod from unwinding said latter mentioned means comprising a pawl arrangement at one end of the rod,
- g. means for loading the gun with missiles consisting of an oval shaped chamber extending upwardly from the gun barrel and at the rear end thereof having an open top and an open bottom entrance into the gun barrel, the said chamber having a slot at one side thereof located at its junction with the gun barrel, a spring loaded pivoted flap abutting one side of said chamber provided with a horizontal bend which slides in and out of said slot serving to hold and release respectively, a missile positioned above the entry into the gun barrel, said horizontal bend being pushed out of said chamber by (the rearward movement of) the trigger mechanism to allow one missile to drop into the firing position within the gun barrel, and
- h. a firing string attached to the pivoted part of the rear trigger part by which the trigger mechanism is pulled towards the rear of the gun barrel to the position where the vertical arm of the rear trigger part contacts the rear boundary of the said gun barrel groove and unlocks the front trigger part for firing.

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