March 4, 1952 F. C. BEYERS 2,587,687

TOY GUN

Filed Dec. 17, 1946 2 SHEETS--SHEET 1

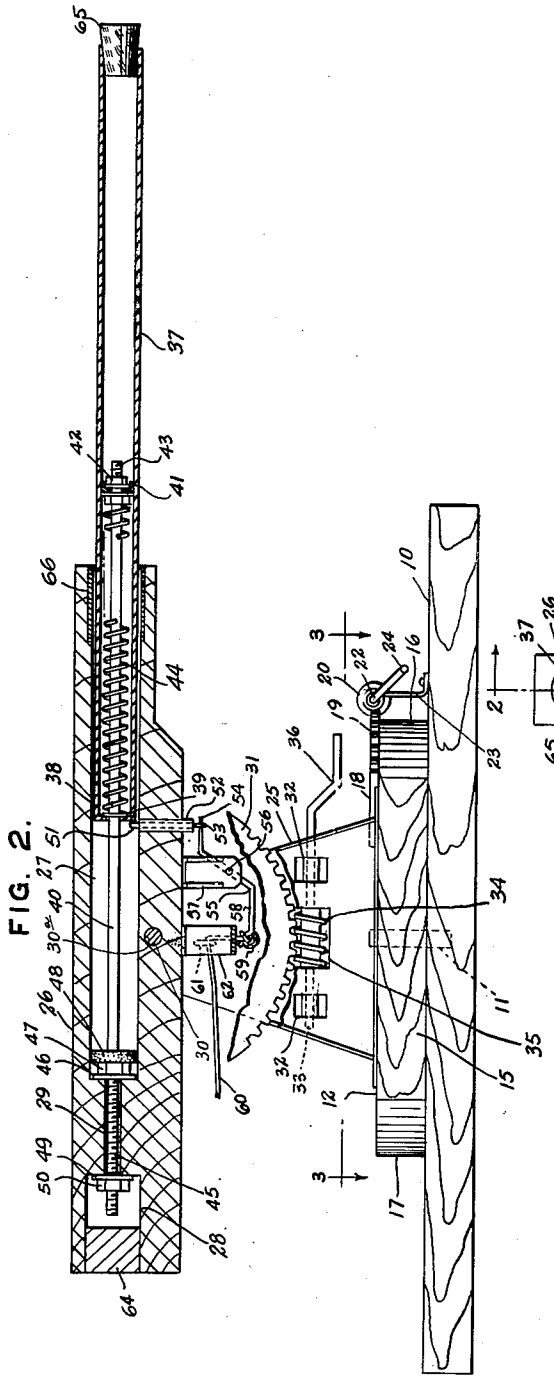


FIG. 2.

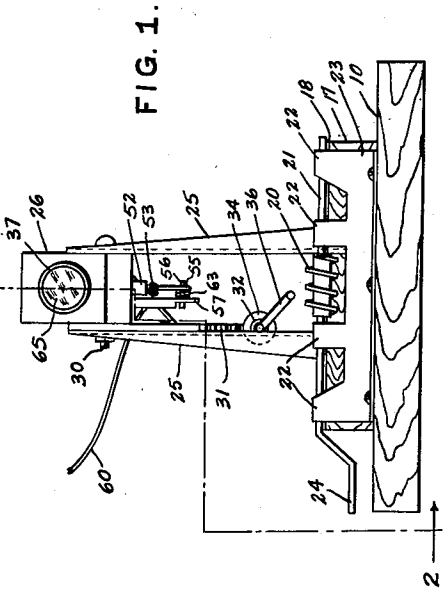


FIG. 1.

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FIG. 3.

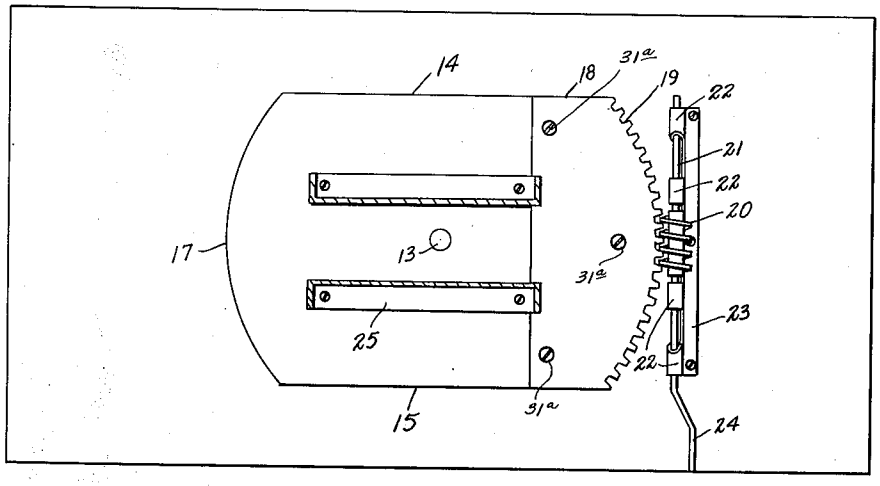


FIG. 4.

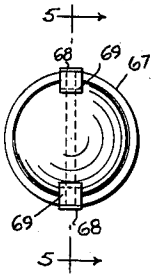


FIG. 5.

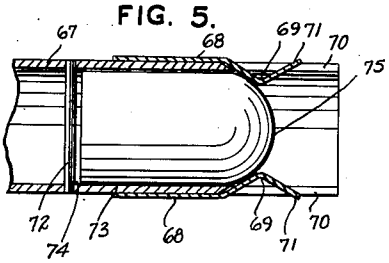


FIG. 6.

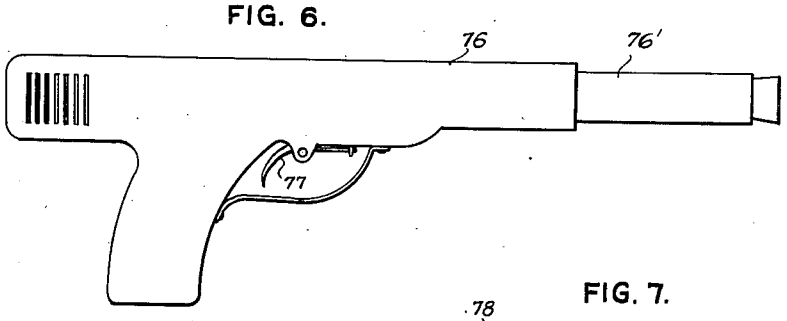
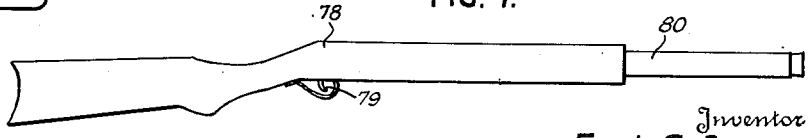


FIG. 7.



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TOY GUN

Fred C. Beyers, Tonasket, Wash.

Application December 17, 1946, Serial No. 716,750

1 Claim. (Cl. 124—14)

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My invention relates to toys and more particularly to toy guns of the compressed air type.

The object of my invention is to provide a toy gun having a barrel slidably supported by the breech or stock respectively and sliding rearwardly, when the gun is discharged, producing a fair imitation of the gun barrel movement caused by the recoil of a regular fire arm.

Other objects of my invention may appear in the following specification describing my invention with reference to the accompanying drawings illustrating several preferred embodiments of my invention.

It is however to be understood, that my invention is not to be limited or restricted to the exact construction and combination of parts described in the specification and shown in the drawings, but that such changes and modifications can be made, which fall within the scope of the claim appended hereto.

In the drawings:

Figure 1 is an elevational end view of a toy anti-aircraft gun according to my invention.

Figure 2 is a longitudinal sectional view taken on line 2—2 in Figure 1.

Figure 3 is a sectional view taken on line 3—3 in Figure 2.

Figure 4 is an elevational end view of the muzzle end of a modified form of a gun barrel according to my invention with a special projectile inserted therein.

Figure 5 is a sectional view taken on line 5—5 in Figure 4.

Figure 6 is an elevational side view of a toy pistol equipped with a floating barrel according to my invention, and

Figure 7 is an elevational side view of a toy shot gun or rifle equipped with a floating barrel according to my invention.

Referring now in detail to the drawings and the anti-aircraft toy gun shown in Figures 1 to 3 has a substantially rectangular base 10, which can be made from any suitable material. Centrally therein a pivot pin 11 is embedded or securely inserted and extends upwardly therefrom.

A revolving base 12 has a centrally located hole 13 therein adapted to receive the pivot pin 11 therein, so that the revolving base can be rotatably mounted on the stationary base 10. The revolving base 12 is narrower than the stationary base 10 and has longitudinal edges 14 and 15 extending parallel to each other. The ends 16 and 17 of the revolving base 12 are formed arcuate and the center of these arcs coincides with the axis of the pivot hole 13.

A plate 18 is fastened on top of the revolving base 12 by means of screws 31*a*, Figure 3. It extends over the right arcuate end 16 of the revolving base and the projecting portion of said plate is formed into a sector worm gear 19, the

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center of which coincides with the center of the arcuate ends 16 and 17 of the revolving base 12.

A worm 20 is rigidly mounted on a shaft 21, which is rotatably supported in a plurality of bearings 22 formed on a bracket 23 securely fastened onto the stationary base 10, so that the worm 20 engages the sector worm gear. On one end of the shaft 21 a crank handle 24 is formed.

Two upwardly extending gun mounts 25 are rigidly mounted on the revolving base 12 at a distance from and parallel to each other and to the longitudinal edges of the revolving base. Adjacent its upper edge and centrally of its width each gun mount 25 is provided with a hole, the purpose whereof is to be described later.

A gun breech 26 has a comparatively long front bore 27 and a comparatively short rear bore 28 therein, and these two bores are connected with each other by a hole 29.

A stove bolt 30 extends through the holes in the two gun mounts 25 and a hole 30*a* is provided in the breech 26 so that the gun breech is supported rockably by said mounts. A washer and nut on the bolt 30 serve to force the gun mounts inwardly, increasing the rigidity thereof. A sector worm gear 31 is rigidly mounted on one side of the gun breech so that it extends downwardly.

On the inner surface of the adjacent gun mount 25, two bearings 32 are firmly mounted supporting a shaft 33 rotatably therein. A worm 34 is rigidly mounted on said shaft between the two bearings 32 and an opening 35 is provided in the gun mount to accommodate the worm, which meshes with the sector worm gear 31. On one end of the worm shaft 33 a crank handle 36 is formed.

A comparatively long gun barrel 37 has an open muzzle end and a closed rear end. In the rear wall 38 a hole 39 is provided and is arranged coaxially with the barrel 37. A piston rod 40 extends through hole 39 in the rear end wall 38 of the barrel 37 and on the front end of said piston rod, located inside the barrel, a piston 41 is adjustably mounted and is secured in adjusted position by means of a nut 42 engaging a thread 43 provided on the front end of the piston rod 40. A helical spring 44 surrounds the piston rod 40 and engages the rear wall 38 of the gun barrel 37 with its rear end and the piston 41 with its front end.

The rear portion 45 of the piston rod 40 is threaded and extends through the hole 29 in the gun breech 26. A washer 46 is mounted on the piston rod portion 45 and a nut 47 on this piston rod portion urges said washer into contact with the rear end wall of the front bore 27. A leather bolster or shock pad 48 is mounted on the piston rod 40 in front of the nut 47.

A second washer 49 is mounted on the part of the threaded rear piston rod portion 45 extend-

ing into the rear bore 28 of the gun breech 26, and a second nut 50 on said threaded piston rod portion 45 secures said washer in permanent contact with the front wall of the rear bore 28.

The outside diameter of the gun barrel 37 is such that the barrel fits slidably in the front bore 27 of the gun breech 26. The helical spring 44 urges the barrel rearwardly into contact with the shock pad 43.

To cock the gun the barrel 37 is pulled outwardly in relation to the breech 26. A stop pin 51 extends through a guide tube 52 inserted in the wall of the gun breech 26. The stop pin 51 has an eye 53 on its lower end, and the end 54 of a crank lever 55 engages this eye. The crank lever is pivotally mounted at 56 on a bracket 57 fastened to the underside of the gun breech 26. The rear end 58 of the crank lever 55 is provided with an eye 59, to which a lanyard 60 is attached and trained through guide 61 on a second bracket 62 on the underside of the breech 26. A coil spring 63 surrounding the pivot pin 56 urges the crank lever 55 to raise the stop pin 51 into the gun breech and into the path of the barrel 37, so that the barrel is secured in cocked position.

The rear opening of the rear bore 28 of the breech 26 is closed by means of a plug 64 or in any other conventional and desired manner.

When the barrel 37 is in cocked position a cork 65 or any other suitable plug or wad is forced into the muzzle end of the barrel 37. The gun is aimed by training it by means of the first mentioned worm 20 and sector worm gear 19, and by elevating the breech 26 by means of the second worm 34 and sector worm gear 31. The stop pin 51 is pulled downwardly by actuating the crank lever 55 through the lanyard 60, permitting the gun barrel 37 to slide rearwardly into the gun breech. The air being compressed in the barrel 37 between the piston 41 and the cork 65, expels the latter from the barrel muzzle with a loud bang. The distance, to which the cork is projected, can be regulated by the tension of the spring 44 in the barrel.

To protect the gun breech 26 against excessive wear by the sliding of the barrel 37, a metal lining 66 may be provided in the forward end of the front bore 27 in the gun breech.

Figures 4 and 5 illustrate a modification of the plugged front end of the gun barrel. In this modification the muzzle end of a gun barrel 67 is provided with a plurality of blade springs 68 securely fastened onto the outer surface of the barrel, and having bent, forward portions 69 extending into the bore of the barrel through longitudinal slots 70 in the barrel 67, the foremost ends 71 of the bent spring portions 69 being shaped to extend outwardly through said slots. A stop pin 72 extends diametrically through the barrel at a distance rearwardly of the slots 70 and is secured in the circumferential wall of the barrel. A plug 73, having a disk-like gasket 74 fastened to its rear end fits slidably into the barrel 67 and has a semi-globular front end 75. The length of this plug projectile 73 is such that it engages the spring portions 69 inside the barrel 67 with its front end, when the gasket 74 is arranged in contact with the stop pin 72. The gasket 74 and the springs 68 increase the efficiency of the gun by producing a greater resistance against the displacement of the projectile 73 from the barrel, so that a greater air pressure is needed to discharge the gun.

The rearward movement of the floating gun barrel under the pressure of the helical spring in said barrel produces the effect of a barrel of a real anti-aircraft gun recoiling in consequence of being discharged.

Figure 6 illustrates a gun barrel 76' of the type described mounted on the stock 76 of a pistol. The construction of the gun barrel is exactly the same as described above, with exception that the stop pin 51 in the path of the gun barrel is retracted by means of a trigger 77 instead of a lanyard.

Figure 7 shows a rifle stock 78 equipped with a gun barrel 80 and having a trigger 79 for retracting the stop pin 51 in the path of said barrel.

Having described my invention I claim as new and desire to secure by Letters Patent:

A toy pop gun comprising a holder having a barrel portion with a central bore and a support extending downwardly from the barrel portion intermediate the length thereof, a trigger pivoted on the holder forwardly of the support, said holder having an opening in its barrel portion through which the trigger may be extended, a second barrel slidable within the central bore of the barrel portion of the holder, a rod extending through the second barrel and connected to the rear end of the barrel portion of the holder, a plunger on the outer end of the rod, an operating spring surrounding the rod and extending between the plunger and the rear end of the second barrel to urge the rearward movement thereof, the forward end of the second barrel being adapted to receive a charge of material, said trigger being adapted when extending through the opening in the holder to engage the rear end of the second barrel to normally retain the same in the extended position, said rod being threaded on its rear end, an adjustable lock nut on the threaded end of the rod to retain the rod against rearward displacement and to allow for the proper adjustment of the rod within the second barrel, a cushioning means surrounding the rod and adapted to react against the rear end of the second barrel to cushion and resist the rearward movement thereof at the end of its rearward stroke and upon the second barrel being released from the trigger, and a nut secured to the threaded end of the rod for retaining the same on the holder against forward displacement therefrom.

FRED C. BEYERS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
295,271	Mole	Mar. 18, 1884
304,654	King	Sept. 2, 1884
344,353	Damm	June 29, 1886
381,095	Vavasseur	Apr. 10, 1888
977,549	Roe	Dec. 6, 1910
1,114,615	Hough	Oct. 20, 1914
1,204,803	McCullough	Nov. 14, 1916
1,237,928	MacLean	Aug. 21, 1917
1,248,507	Lefever	Dec. 4, 1917
1,482,424	Zimmerman	Feb. 5, 1924
2,371,059	Mendles	Mar. 6, 1945

FOREIGN PATENTS

Number	Country	Date
1,181	Great Britain	1854
4,078	Great Britain	1915
419,936	France	Nov. 9, 1910