June 2, 1970 R. R. CARBONNEAU 3,515,114

DISC PROJECTING TOY PISTOL

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FIG. 1

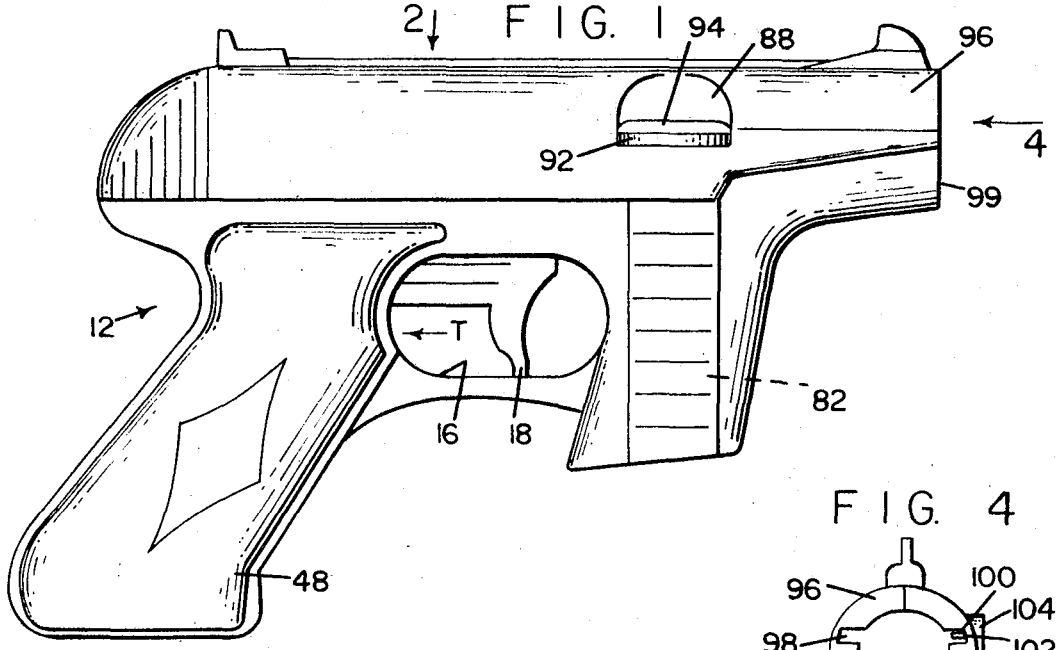


FIG. 4

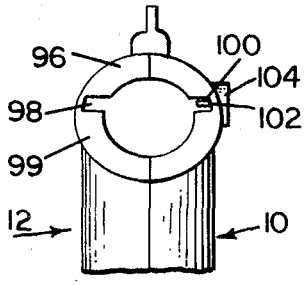
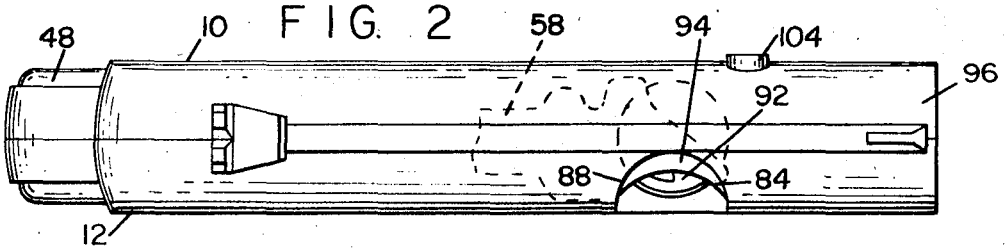


FIG. 2



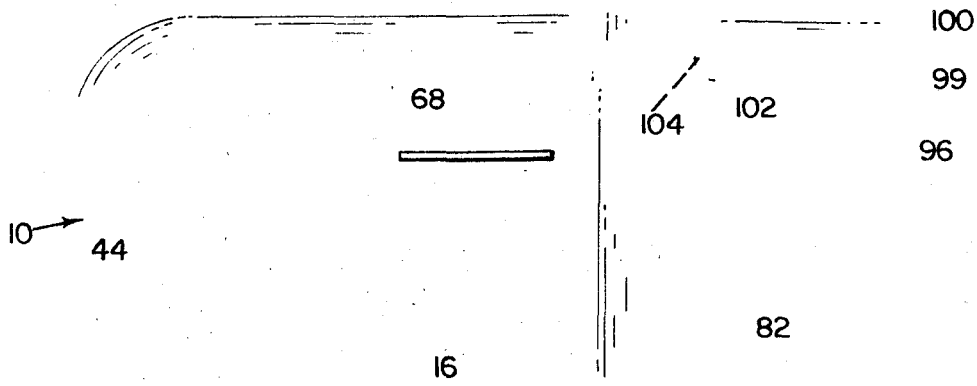


FIG. 3

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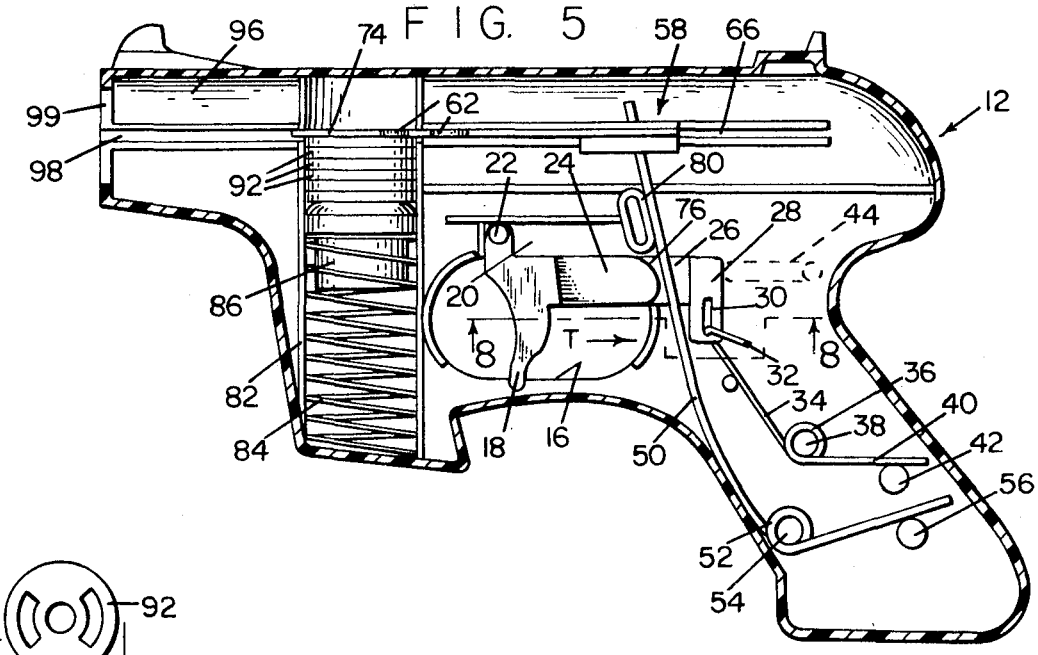
FIG. 5



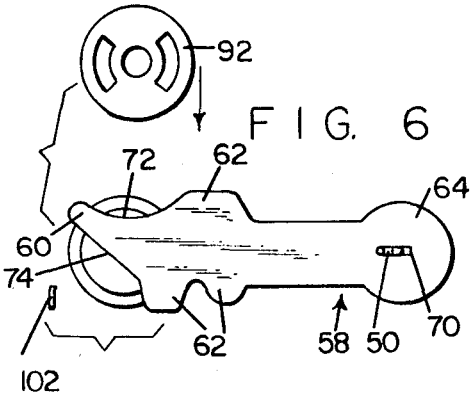


FIG. 6

FIG. 8

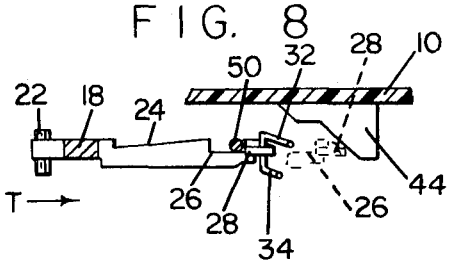
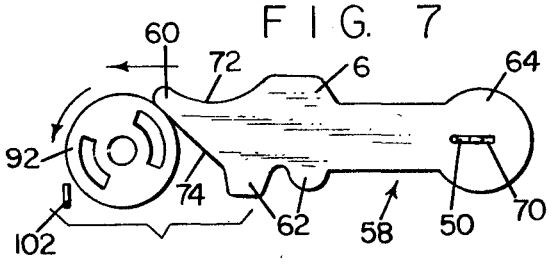


FIG. 7



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DISC PROJECTING TOY PISTOL

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U.S. Cl. 124—27 3 Claims

ABSTRACT OF THE DISCLOSURE

A toy pistol including a retractable trigger spring pressed to impel a plunger acting to strike and impel the top one of a stack of discs, causing the disc to ride forwardly through a guideway, which keeps it generally horizontal, and out the barrel of the piston, there being a flexible pin located in the guideway for the disc which is impinged upon by the periphery of the disc as it is impelled through the guideway, the flexible pin causing the disc to spin rapidly on its axis as it leaves the barrel enhancing accuracy. The plunger includes an angled forward extension which strikes the disk at an edge thereof remote from the edge engaged by the pin.

This invention relates to a toy pistol of the type utilizing a trigger-retracted impelling plunger to a knock-off point where a spring urges the plunger forwardly to impinge upon a projectile, in this case the top one of a stack in a magazine, causing the projectile to be impelled along a short barrel and out the muzzle; in this case, the projectile e.g. being in the form of a disc, the barrel having a guideway or firing track on the disc leading to the muzzle; in the guideway there is positioned a flexible pin impinged upon by the disc at its periphery as it is urged forwardly under the influence of the impeller plunger so as to cause the disc to spin rapidly as it leaves the muzzle of the toy gun maintaining a more accurate trajectory.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which:

FIG. 1 is a view in elevation looking at the right-hand side of the toy gun;

FIG. 2 is a top plan view looking in the direction of arrow **2** in FIG. 1;

FIG. 3 is a view in elevation with the right-hand part of the toy gun removed, showing the interior construction of the left-hand part of the gun;

FIG. 4 is a view in elevation looking in the direction of arrow **4** in FIG. 1, and showing the guideway or firing track for the projectile;

FIG. 5 is a view in elevation of the inside construction of the right-hand part of the gun, the left-hand part being removed;

FIGS. 6 and 7 are diagrammatic views illustrating the action of the impeller-plunger, and

FIG. 8 is a section on line **8—8** of FIG. 5, showing the action of the trigger and its cam.

The present gun is conveniently made as for instance of plastic with some metal parts such as the springs, etc. and comprises in general two main parts, a left-hand part **10** in the form of a molded shell and a corresponding and cooperating right-hand part also in the for of a molded shell indicated at **12**. These two shells are adapted to be connected together in the for of a housing for all of the gun parts. Each shell part has a through trigger opening which is indicated at **16** for both gun parts as together they form the finger opening for the trigger **18**.

This trigger is rectilinearly retracted by the operator's finger according to the arrows T in FIGS. 1 and 5. The trigger is not pivoted but it is loosely mounted and rectilinearly guided in a guideway as at **20** by an integral pin **22** and it is capable of slight lateral motion as will be made more clear hereinafter.

The trigger itself is best shown in FIG. 5 and includes a rearwardly projecting tapering side portion **24**, see particularly FIG. 8, at the end of which there is a lateral notch **26** and a downwardly extending portion **28** having a slot **30** therein for the reception of the turned-over end **32** of the trigger spring **34**.

In the action of the toy gun, the spring may ride to some extent in slot **30**. Spring **34** may be of a simple piece of resilient wire or the like having a coil at **36** wrapped around a post **38** with a tension end **40** bearing against another post **42**, so that the trigger **18** when retracted as for instance to the right in FIG. 5, will be automatically returned by spring **34** to the normal position thereof which is shown in FIG. 5.

There is an inclined cam **44** which may be molded integrally with the left-hand gun part **10**. The position of this cam is illustrated in FIG. 5 in dotted lines but of course it is not a part of gun part **12**. The function of this cam is illustrated in FIG. 8 wherein it will be seen that when the trigger generally indicated at **18** is retracted until the portion at **28** strikes the inclined surface of the cam at **46**, the entire trigger will be slightly moved downwardly, see the dotted lines in FIG. 8. This action is toward the right as respects the shooter who is holding the handle or grip of the gun **48**; but when the trigger returns to its normal position as above described, it is guided by the frame of the gun parts and is returned to its normal position which is shown in solid lines in FIG. 8.

The reason for this action resides in the provision of main spring **50** which may be of a simple kind having a coil **52** on the pin **54** and having a reaction point against another pin **56**. This spring is loosely connected with respect to an impeller plunger which is generally indicated at **58**.

This impeller plunger has a general shape which is shown in FIGS. 6 and 7 and is essentially a flat plate having a forward offset nose **60**, side guide wings **62**, **64** riding in guideway **66** as for instance on right gun part in FIG. 5, and **68** on the left gun part in FIG. 3, so that it is limited to a rectilinear motion, but because the end of the spring **50** extends through a hole **70** there is a relative motion allowed between the spring and the impeller plunger.

It will be noted that this impeller plunger has a forward lateral concave surface **72** and corresponding thereto an inclined forward surface **74**, these surfaces being at either side of the projecting nose **60**, see FIGS. 6 and 7.

The main portion of the main spring **50** is normally located in the lateral notch **26** of trigger **18** as clearly shown in FIGS. 5 and 8 and when the trigger **18** is retracted as described, a shoulder at **76** which forms a side of the recess **26** bears against the spring **50** and carries it to the rear until such time as the portion **28** of the trigger strikes the inclined surface **46** of cam **44**. When this happens, the trigger is bodily moved for instance downwardly in FIG. 8, see the dotted lines, or to the right of the shooter to release spring **50** allowing the same to move powerfully forwardly carrying the impeller plunger **58** with it until the spring is stopped by a projection at **80** located on the main shell part **12** as shown in FIG. 5. This stop limits the motion of the projector impeller plunger which is rigidly guided at both sides by the wings **62**, **64** in the guideways **66**, **68**.

When the trigger **18** is then released by the finger, it moves to the left in FIG. 5 under influence of its spring

34 and as stated previously it then moves from its depressed condition due to cam surface 46 to its normal position whereupon the tapered surface 24 serves to underlie the main portion of the main spring 50 causing it to ride up surface 24 and once more snap into notch 26 over the shoulder 76.

It will therefore be seen that each time the trigger is pulled, the impeller plunger 58 is moved to its rearwardmost position, spring 50 is released, the impeller plunger moves powerfully forward until stopped by stop 80 and therefore it will be seen that the toy gun is self-cocking and acts in a manner equivalent to a semi-automatic firearm.

The two main parts of the gun 10 and 12 have molded therein a magazine generally indicated at 82 and together they form a cylindrical fixed magazine in which is a magazine spring 84 normally maintaining a cartridge follower device 86 in uppermost position until depressed by the projectiles loaded into the gun and impinging thereon. It will be seen that the gun part 12 is provided with an inlet 88 forming an entry port for the projectiles. When the impeller plunger 58 is in its normal forward position, the concave edge 72 is just barely visible in this port, see FIG. 1. The impeller plunger 58 being held rigidly in its plane by the guideways 66 and 68, and the cartridge follower 86 being located to impinge upon the same as is perhaps best shown in FIG. 6, the projectiles are inserted in the entry port 88 bearing down upon the edge portion of the cartridge follower 86 that is visible, see FIG. 2. The cartridge follower 86 has a very definitely beveled edge, see 90 in FIGS. 2 and 5, so that it is an easy matter to take the projectiles one by one and depress cartridge follower 86 against the action of spring 84 placing the projectiles in a stack under the nose portion 60 of the impeller plunger 58.

The projectiles are in the form of light weight discs as for instance made of plastic as indicated at 92 and the topmost disc in the magazine is illustrated in FIG. 1 but it is omitted from FIG. 2, FIG. 2 showing the magazine completely empty and FIG. 1 showing the magazine filled. The discs are loaded one by one in the manner of a coin holder or the like and are gradually received downwardly in the magazine 82.

It will be seen that the topmost disc 92 is just under the plane of the impeller plunger 58, but when the latter is withdrawn, the topmost disc 92 is moved slightly upwardly against a stop 94 forming a partial bottom for entry port 88, and when the impeller plunger moves forwardly under the impact of its spring 50, the disc is exactly in position to be solidly struck on its edge by the inclined forward edge 74 as is believed to be clearly illustrated in FIG. 7.

The barrel portion 96 of the toy gun is provided with additional interior opposite and corresponding guideways 98 and 100 which together form a firing track and guide the edges of each disc as it is projected out of the muzzle 99 of the barrel 96 under influence of the impeller plunger. However in one of the guides as at 100 in FIG. 4 there is a flexible pin 102 mounted in fixed position in a post 104 and extending into the firing track 100 so that it is impinged upon by the peripheral edge of the disc as the latter passes the same in its motion out the barrel.

This action clearly will cause a frictional contact with the disc and this in turn causes a very rapid spinning action of the disc as it proceeds further through the barrel and out of the same, so that a very greatly improved trajectory is imparted to the disc which always remains in its plane but spins on its axis.

By repeatedly pulling the trigger, the discs are rapidly projected in the rapid spin generally level trajectory described. When the magazine is empty, it is merely necessary to once more fill the same in the manner described above and the toy gun is once more clearly ready for operation.

I claim:

1. A toy gun for projecting discs, said gun including a barrel, a trigger, a disc impelling plunger, a forward extension on the plunger, a trigger return spring, a main spring for operating the plunger in a direction to cause the forward extension thereof to strike a disc to impel it out through the barrel, means in the barrel at opposite sides thereof forming spaced parallel guides for the opposite edges of a disc, means to hold a disc in the guides in position to be struck by the plunger and thereby impelled along the guides, the forward extension of the plunger being located adjacent one of the guides, the point of impingement of said plunger extension on the disc being offset relative to the center thereof, and means in the barrel adjacent the other guide and in the path of the disc adapted to engage the disc at the edge thereof opposite the edge of the disc struck by the plunger extension, the disc thereby being caused to spin on its axis as it is impelled out of the barrel.

2. The toy gun of claim 1 including means in said gun providing a magazine generally in the form of a cylinder, a magazine follower, a magazine follower spring, and a loading port for loading discs so as to impinge upon and depress said magazine follower one after the other, said magazine being located in the path of said plunger whereby the plunger engages the topmost of said discs for propelling it through the barrel, the discs being flat and circular and adapted to be stacked in the cylindrical magazine.

3. The toy gun of claim 1 wherein the forward extension of the plunger includes an inclined edge extending inwardly and rearwardly from the end of the extension, at least a portion of said inclined edge being adapted to strike and thereby propel the disc.

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U.S. Cl. X.R.

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