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TOY SIREN AND CHROMATIC GUN

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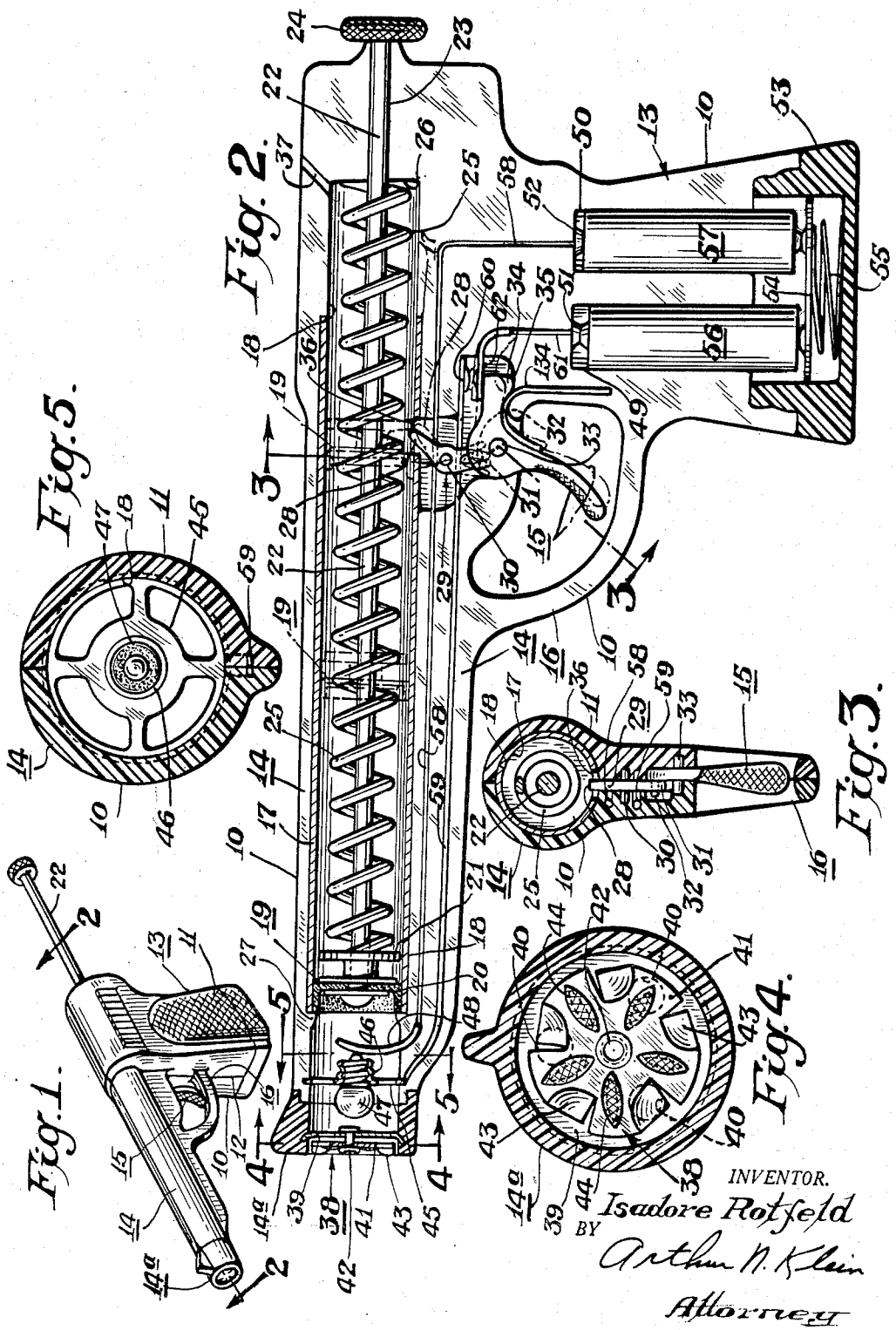


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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TOY SIREN AND CHROMATIC GUN

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4 Claims. (Cl. 46—49)

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The present invention relates generally to toys and more particularly to toy guns, intended for use by children.

An object of the present invention is to provide a new and useful toy gun construction. Another object of the present invention is to provide a novel toy gun construction, which has great visual and auditory appeal for children, as well as being safe and harmless in operation.

Other objects and advantages of the present invention are apparent in the following detailed description, appended claims and accompanying drawings.

With the advent of atomic weapons and the mushrooming growth of so-called "science-fiction" comic books and radio and television programs based thereon, there has been an ever increasing demand among children, in recent years, for toy guns which simulate these weapons in action. The conventional toy gun, firing caps or making a clicking sound when the trigger is pulled, does not appeal to the average child's imagination and does not satisfy the need for new and exciting toy weapons.

Accordingly, the present invention contemplates a novel toy gun construction, which is simple and inexpensive to manufacture and which operates in an entirely new manner, so as to have great appeal to the average child, satisfying both the visual and the auditory senses, while being entirely harmless, so as to be acceptable to the child as a believable toy atomic weapon.

Generally speaking, the novel toy gun of the present invention is intended to combine the visual effect of flashing multi-colored lights or sparks with the auditory effect of a wailing noise or siren, in a manner calculated believably to simulate the operation of an atomic weapon in the child's imagination.

For the purpose of illustrating the invention, there is shown in the accompanying drawings one form thereof which is presently preferred. It is to be understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown, and that the several parts and elements can be variously arranged and organized, without departing from the spirit or essential attributes of the invention.

Referring to the accompanying drawings, in which like reference characters indicate like parts throughout:

Figure 1 is a perspective view of a toy pistol forming one embodiment of the present invention.

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Figure 2 is a vertical cross-sectional view, on an enlarged scale, taken generally along the line 2—2 of Fig. 1, the plunger rod being shown in forward position.

Figure 3 is a cross-sectional view taken generally along the line 3—3 of Fig. 2.

Figure 4 is an enlarged cross-sectional view taken generally along the line 4—4 of Fig. 2.

Figure 5 is an enlarged cross-sectional view taken generally along the line 5—5 of Fig. 2.

In Figs. 1–5, I have shown a toy pistol forming one embodiment of the present invention, the body of which is made up of a pair of complementary, matching sections 10 and 11, molded or otherwise suitably formed of synthetic resin or other appropriate material, and adhesively joined together along a continuous median line 12, in a manner well known in the toy pistol art.

For simplicity, the pistol body is shown as conventional in external appearance, with a handle or grip 13, a barrel 14 extending forwardly from the upper end of the handle, a trigger 15, and a trigger-guard 16, as best shown in Figs. 1 and 2. It is to be understood, however, that the external appearance of the toy pistol may be varied considerably, and that simulated, non-working parts or elements may be added to make the gun more closely approximate the child's conception of an atomic weapon, in appearance.

An open-ended steel cylinder 17 is fitted within the bore 18 of the barrel 14 and terminates short of the ends of the bore. Slidably mounted within the cylinder 17 is a piston 19 provided with a cup-shaped gasket or washer 20 of leather or the like forming a fluid-tight seal with the cylinder. The piston 19 is also provided with an annular locking-flange 21 disposed rearwardly of the gasket and spaced apart axially somewhat therefrom. An elongated rod 22 extends rearwardly from the piston 19, beyond the rear end of the bore 18, through a reduced-bore 23 coaxial with the cylinder, and emerges at the rear of the body, an enlarged knob 24 being formed at the rearmost protruding end of the piston rod 22.

A relatively strong compression spring 25 is disposed within the bore 18, being seated against the back wall 26 of the bore 18 and bearing against the locking-flange 21 of the piston 19 so as to urge the piston and piston rod forwardly within the cylinder 17 (i. e., from right to left in Fig. 2) to the forwardmost position shown in solid lines in Fig. 2, as limited by the stop 27.

The piston and piston rod are adapted to be moved rearwardly against the pressure of the

spring 25 by manually grasping and pulling the knob 24, from the full-forward position of Fig. 2 to the rearmost position of Fig. 1, in which the locking-flange 21 is adapted to be engaged by the end 28 of a locking-member 29 having a horizontal pivot 30 disposed slightly below the bore 18, and also having a downwardly-directed bifurcated portion or yoke 31 making sliding engagement with a pin 32 formed on the trigger 15 somewhat above the trigger pivot 33. A bent spring 134 normally tensions the trigger 15 clockwise in Fig. 2, the pin 32 and yoke 31 simultaneously rotating the locking-member 29 counterclockwise to the limiting position shown in solid lines in Fig. 2, wherein the trigger-extension 34 is seated against the shoulder 35 in the handle 13, and wherein the upper end 28 of the locking-member 29 extends through a slot 36 in the cylinder 17 and into the path of the locking-flange 21. In this way, the piston is automatically locked when it is manually pulled to the rearmost position shown in dash-dot lines in Fig. 2. However, when the trigger 15 is pulled (against the pressure of its spring 134) to rotate it counterclockwise in Fig. 2, the locking-member is rotated clockwise to move its upper end 28 downward and out of engagement with the locking-flange 21, as shown in dash-dot lines in Fig. 2, whereupon the piston is released and shoved forward by the spring 25, compressing the air in the forward end of the cylinder, as will be explained more fully hereinbelow. A vent opening 37 leading to the rear end of the bore 18 keeps atmospheric air pressure behind the piston regardless of its position.

Mounted in a detachable muzzle 14–*a* of the barrel 14 is a siren, indicated generally by the reference character 38 and including a fixed plate 39 peripherally seated against the bore 18 and having a plurality (for example three) of restricted orifices 40, through which the air compressed in front of the spring-urged piston 19, during the forward stroke thereof, escapes in the form of small, high-velocity jets or blasts. The siren 38 also includes a rotor disc 41 revolubly mounted on the front side of the plate 39 by means of a shaft 42 and provided with a plurality (for example five) of small peripherally distributed blades or fins 43 extending forwardly at an angle to the plane of the rotor disc and disposed in alignment with the orifices 40, as indicated in Figs. 2 and 4. The rotor disc 41 is also provided with a plurality of different-colored, circumferentially-distributed, faceted glass brilliants or "jewels" 44, set in appropriately-shaped openings in the rotor plate and adapted to transmit light therethrough.

Mounted in the bore 18, intermediate the siren 38 and the front end of the cylinder 17, is a spider 45 shown in Figs. 2 and 5, having a central threaded socket 46 adapted to hold a small electric bulb 47 of the type commonly used in flashlights. A resilient contact-member 48 extends upwardly into the bore 18 from the lower portion of the barrel 14 slightly to the rear of the spider 45; the free end of the contact-member 48 being adapted to bear against and make electrical contact with, the center post of the bulb, while the socket 46 makes electrical contact with the threaded collar of the bulb, in conventional manner.

The handle 13 is provided with a pair of spaced, side-by-side downwardly-opening cylindrical chambers or sockets 49 and 50, provided, at their upper ends, with tapered electrical contact-posts 51 and 52 respectively. The handle 13 is also provided with a lowermost removable cap 53 having an electrical contact plate 54 supported upon, and urged upwardly by, a helical spring 55, as shown in Fig. 2. A pair of small conventional flashlight-type dry-cell batteries 56 and 57 are adapted to be inserted into the chambers 49 and 50, so that the positive center post of one is uppermost while the positive center post of the other is lowermost.

The lower ends of the batteries extend downward beyond the ends of the chambers and are adapted to be contacted by the spring-urged contact plate 54, so as to effect an electrical connection between the positive center post of one battery and the negative end wall of the other battery. In other words, the plate 54 connects the two batteries in series to provide the necessary voltage for the bulb 47, through wiring to be hereinafter described.

An electrical conducting wire or metal strip 58 leads from the contact 52 upward within the handle 13 and forward within the lower portion of the barrel 14 and connects with the resilient contact-member 48. Another conducting wire or strip 59 leads from the spider 45 rearward along the lower portion of the barrel 14 to a fixed switch-contact 60 located somewhat above the trigger-extension 34, while a conducting wire or strip 61 leads upward from the contact 51 to a resilient switch-contact 62 normally tensioned downward against the trigger-extension 34 and away from the fixed switch-contact 60. It can be seen that, when the trigger 15 is pulled from the solid-line position to the dash-dot-line position of Fig. 2, the electrical circuit from the batteries to the bulb 47 is closed, and the bulb is lit. On the other hand, when the trigger is released and returns to its original position, under the action of the bent spring 134, the switch-contact snaps back to open position, breaking the circuit to the bulb 47.

The operation of the toy gun is as follows. The knob 24 is first grasped and pulled outward to the position of Fig. 1, thereby drawing the piston rearwardly within the cylinder, compressing the spring 25, until the piston reaches the position shown in dash-dot lines, at the right of Fig. 2, wherein it is locked by the upper end 28 of the locking-member 29. The trigger 15 is then pulled to release the piston, which is then driven forward suddenly by the spring 25.

This sudden movement of the piston builds up air-pressure in the front part of the bore, since the air can escape at only a limited rate through the restricted orifices 40. When the pressure of the air equals the pressure of the spring 25, as for example at the intermediate dash-dot-line position of Fig. 2, the piston slows down and thereafter moves forward at a relatively slower speed determined by the rate of drop of air pressure resulting from escape of air through the restricted orifices 40. This escaping air, impinging on the blades 43, spins the rotor disc 41 (clockwise in Fig. 4) of the siren 38, causing the familiar wailing noise associated with sirens.

At the same time, pulling of the trigger lights the bulb 47 as described above, and the light therefrom shines through the different-colored glass jewels 44 of the rotating rotor disc 41. In this way, a number of different-color rotating light beams emerge from the muzzle of the gun, simultaneously with the noise of the siren for as long as the trigger is held in the dash-dot-line position of Fig. 2, and until the piston reaches its

forwardmost position, at which point the rotor disc of course slows to a halt.

By releasing the trigger and re-cocking the piston rod, the gun is ready to be "re-fired."

The present invention may be embodied in other specific forms and, accordingly, the above-described embodiment is to be considered merely as illustrative and not restrictive, reference being made to the appended claims, rather than to the foregoing specification, as indicative of the scope of the invention.

I claim as my invention and desire to protect by Letters Patent the following:

1. In a toy gun having a handle, a trigger and a barrel, mechanism for simultaneously producing a wailing noise and a plurality of moving colored light beams, said mechanism comprising an electric light bulb mounted within the barrel somewhat inward of the muzzle thereof, one or more dry-cell batteries mounted in the handle, an electrical circuit operatively connecting the batteries to the bulb and including a normally-open switch constructed and arranged to be closed when the trigger is pulled, a siren mounted in the muzzle of the barrel and including a rotor provided with a plurality of small light-transmitting colored jewels of glass adapted to be illuminated from within the barrel by the bulb, and means disposed within the barrel for actuating the siren when the trigger is pulled, said last-mentioned means including an open-ended cylinder disposed within the barrel, a piston adapted to move in fluid-tight relation to the cylinder, a spring constructed and arranged to move said piston forwardly within the cylinder so as to compress air in the front end of the barrel behind the siren rotor, said siren having a plurality of restricted orifices arranged to permit gradual escape of air in the form of high-velocity jets adapted to impinge upon, and cause rapid rotation of, the rotor, means for manually retracting the piston against the pressure of its spring, and a pivoted locking-member for holding the piston in retracted position and for releasing it when the trigger is pulled.

2. In a toy gun having a handle, a trigger and a barrel, mechanism for producing a plurality of moving colored light beams, said mechanism comprising an electric light bulb mounted within the barrel somewhat inward of the muzzle thereof, one or more dry-cell batteries, an electrical circuit

operatively connecting the batteries to the bulb and including a normally-open switch constructed and arranged to be closed when the trigger is pulled, a compressed air actuated siren rotor mounted in the muzzle of the barrel and carrying a plurality of driving vanes and a plurality of small light-transmitting colored jewels of glass adapted to be illuminated from within the barrel by the bulb, an open-ended cylinder disposed within the barrel behind the rotor, a piston constructed and arranged to move in fluid-tight relation to the cylinder, a spring constructed and arranged to drive said piston forwardly within the cylinder so as to compress air within the front end of the barrel behind the rotor and thereby to cause rotation of the siren rotor, means for manually retracting the piston against the pressure of its spring, and a pivoted locking-member for holding the piston in retracted loaded position and for releasing it when the trigger is pulled, pulling of the trigger causing air-actuated rotation of the siren rotor so as to produce a prolonged wailing noise and emission of a rotating bundle of colored-light beams from the muzzle of the toy gun.

3. A construction according to claim 2 wherein the piston is provided with a rod extending rearwardly therefrom and emerging from the rear end of the barrel and provided with a knob at its free end, for manual retraction of the piston.

4. A construction according to claim 2 wherein the body of the gun is formed, for the most part, of a pair of matching half-sections of synthetic resin or the like adhesively connected along a continuous medial line, and wherein the cylinder is of metal with a smooth inner surface or bore fitted within and held in place by the interconnected half-sections, and wherein the batteries are fitted within the handle.

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