Nov. 20, 1962 L. C. BARNES 3,064,390

ELECTRIC TOY

Filed April 25, 1960

Fig. 1

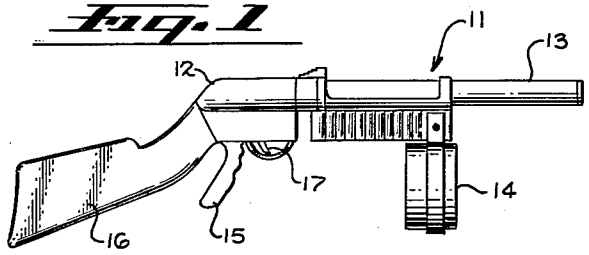


Fig. 3

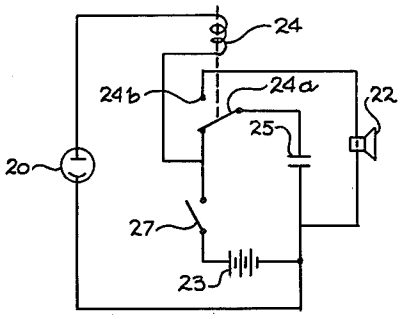


Fig. 2

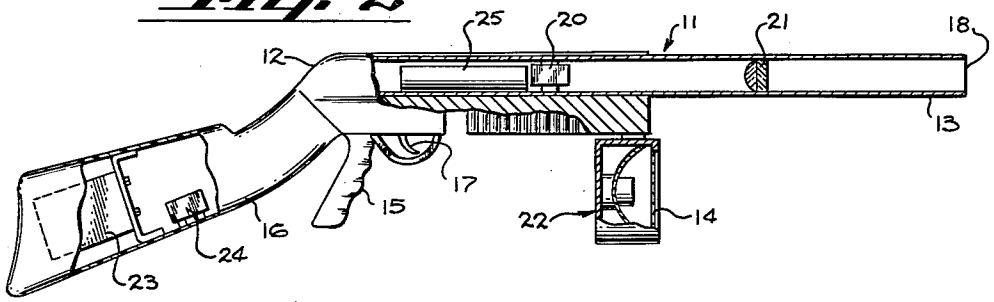


Fig. 4

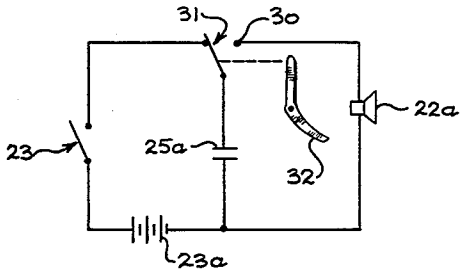


Fig. 5

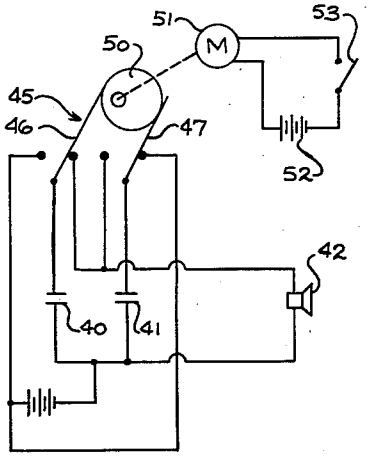
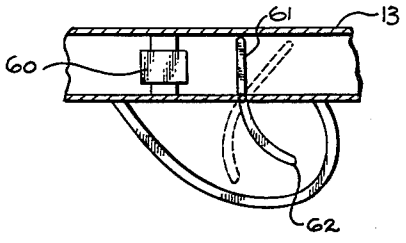


Fig. 6



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ELECTRIC TOY

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2 Claims. (Cl. 46—232)

This invention has to do with electrical toys and simple electric and electronic circuits.

An object of the invention is to provide a novel, electrically operated noise-making device, such as a toy gun, which is completely safe for children to operate.

Another object is to provide a device of the type indicated which is operable in response to the presence of light to produce a loud sound or report.

A further object is to provide a device such as a toy gun which is light-sensitive and controlled in part by a manually operable switch and in part by the light-sensitive means.

Still another object is to provide a toy gun having electrical means for simulating the sound of a rapid fire gun, such as a machine gun, by producing a series of reports in quick succession.

A further object is to provide a simple electric circuit for the production of a loud, sharp noise or report. More particularly it is an object to provide electrical circuit means including a speaker, a source of direct current, capacitance and means for alternately charging the capacitance and discharging it through the voice coil of the speaker.

These and other objects will be apparent from the drawing and the following description. Referring to the drawing:

FIG. 1 is a side elevational view of a toy gun embodying the invention;

FIG. 2 is an enlarged elevational view of the gun of FIG. 1 with the body or casing broken away in part to expose the electrical components and other parts;

FIG. 3 is a wiring diagram of the circuitry and components employed in the toy gun of FIGS. 1 and 2;

FIG. 4 is an alternate and simplified form of circuit which can be utilized for producing a sharp, loud noise;

FIG. 5 is a wiring diagram illustrating a circuit for producing a series of reports; and

FIG. 6 is a fragmentary sectional view of a portion of a toy embodying mechanical means for controlling the light reaching photoelectric cell.

More particularly describing the invention, FIG. 1 illustrates a typical toy 11 in the form of a sub-machine gun which may be made of metal and plastics. The gun has a body or casing 12 which includes a barrel 13, a circular ammunition magazine 14, pistol grip 15, stock 16 and trigger 17. The barrel 12 is preferably open at its end 13, or it can be closed by a light-transmitting wall of glass or plastic. Within the barrel I provide a photoelectric cell device 20 and preferably between this and the end of the barrel a suitable lens or lens system 21 to concentrate the light upon the device 20. Within the magazine portion 14 I provide a permanent magnet speaker 22. The body of the gun may also house a battery designated 23, a relay 24 and a condenser 25.

Referring now to FIG. 3, in order to create a loud popping of the speaker 22 simulating the sound of a discharged gun, I provide the battery 23 which is connected to charge the condenser 25 when switch 27 (which may be operated by the trigger of the gun) is closed. When relay 24 is energized, as occurs when sufficient light strikes the photoelectric cell device 20, the movable contact finger 24*a* of the relay engages contact 24*b* to connect the speaker 22 across the condenser 25. As a result, the condenser discharges through the speaker causing a loud, sharp noise. A permanent magnet speaker should be used and the condenser connected across the terminals leading to the voice coil.

The switch 27 must be closed and the photoelectric cell 20 exposed to sufficient light in order to operate relay 24 and hence cause discharge of the condenser through the speaker. Switch 27 may be dispensed with, but if this is done, some other steps should be taken to disconnect the battery when the device is not in use.

A simpler form of the invention is shown in FIG. 4 wherein the speaker 22*a* is connected to terminal 30 of a switch 31 designed to be operated by the trigger 32 of the gun or other means. The normal position of the switch 31 closes a circuit through battery 23*a* and the condenser 25*a*, thereby charging the condenser. Upon operating the switch, the condenser may be made to discharge through the speaker causing the latter to pop. A switch 23 may be included in the charging circuit to open the circuit when the device is not in use thereby prolonging the life of the battery.

In FIG. 5 I show a form of the invention designed to provide a succession of noises or reports by alternately discharging two condensers designated 40 and 41 through a speaker 42. This is accomplished by the switch means 45 and including the two movable contacts 46 and 47 one position of which serves to close a charging circuit through one of the condensers and close a discharging circuit through the other condenser and the speaker. The other position of the switch means serves to discharge the first condenser through the speaker and connect the other condenser for charging. Switch means 45 may be operated by a rotatable cam 50 which is driven by an electric motor 51 powered by battery 52. The motor circuit is shown controlled by a switch 53.

When switch 53 is closed the motor is driven to rotate cam 50 which reciprocates the switch elements 46 and 47 alternately to connect the condensers 40 and 41 to the battery and to the speaker.

I may also control the circuit shown in FIG. 3, or one similar thereto by means of a shutter, diaphragm or valve interposed between the photoelectric cell device 20 and the source of light, as shown in FIG. 6, wherein the photoelectric device 60 is shown placed behind a flap type valve 61 integral with a trigger 62. Thus the photoelectric device 60 is shielded from light until the trigger is pulled.

Although I have illustrated and described a preferred form of my invention, I contemplate that various changes and modifications can be made therein without departing from the invention, the scope of which is indicated by the following claims.

I claim:

1. In a toy gun, a gun body casing having an opening at the front; a photoelectric cell means in said casing disposed to receive light only through said opening; a condenser charging circuit including a condenser, a source of direct current, and a normally open manually operable switch in series; a loudspeaker; a relay having its coil in series with said photoelectric cell means, said source of direct current and said manually operable switch; and a normally closed relay switch in said charging circuit operable, in response to current flow through said photoelectric means, to open said charging circuit and connect said condenser across said speaker.

2. In a toy gun, a gun body casing having an opening at the front; a photoelectric cell in said casing disposed to receive light only through said opening; a condenser charging circuit including a condenser, a source of direct current; a loudspeaker; a relay having its coil in series

with said photoelectric cell and said source of current; a normally closed relay switch in said charging circuit operable, in response to current flow through said photoelectric cell to open said charging circuit and connect said condenser across said speaker; a gun trigger pivotally mounted on the casing; and a closure member between said cell and said opening in said casing and controlled by said trigger.

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