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[54] **CHEMICAL EJECTING FLASHLIGHT**


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[51] **Int. Cl.**.....**F21v 33/00**

[58] **Field of Search**.....240/6.45, 6.46, 2 FD, 6.4 R; 222/162, 192; 273/84; 128/9, 225, 172.1, 22; 32/69



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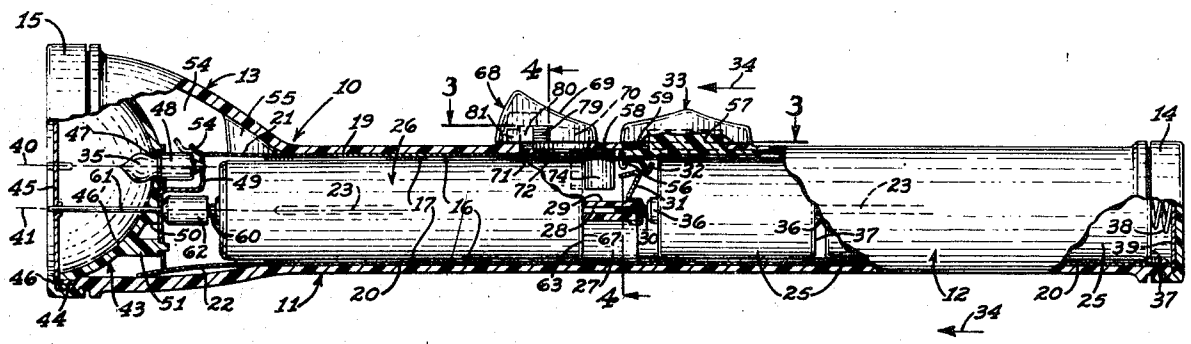
[57] **ABSTRACT**

A dual purpose flashlight containing within its casing a pressurized chemical source which may be actuated to dispense a chemical within the range of the rays of its light by a trigger mounted on the exterior of its casing.


**14 Claims, 5 Drawing Figures**



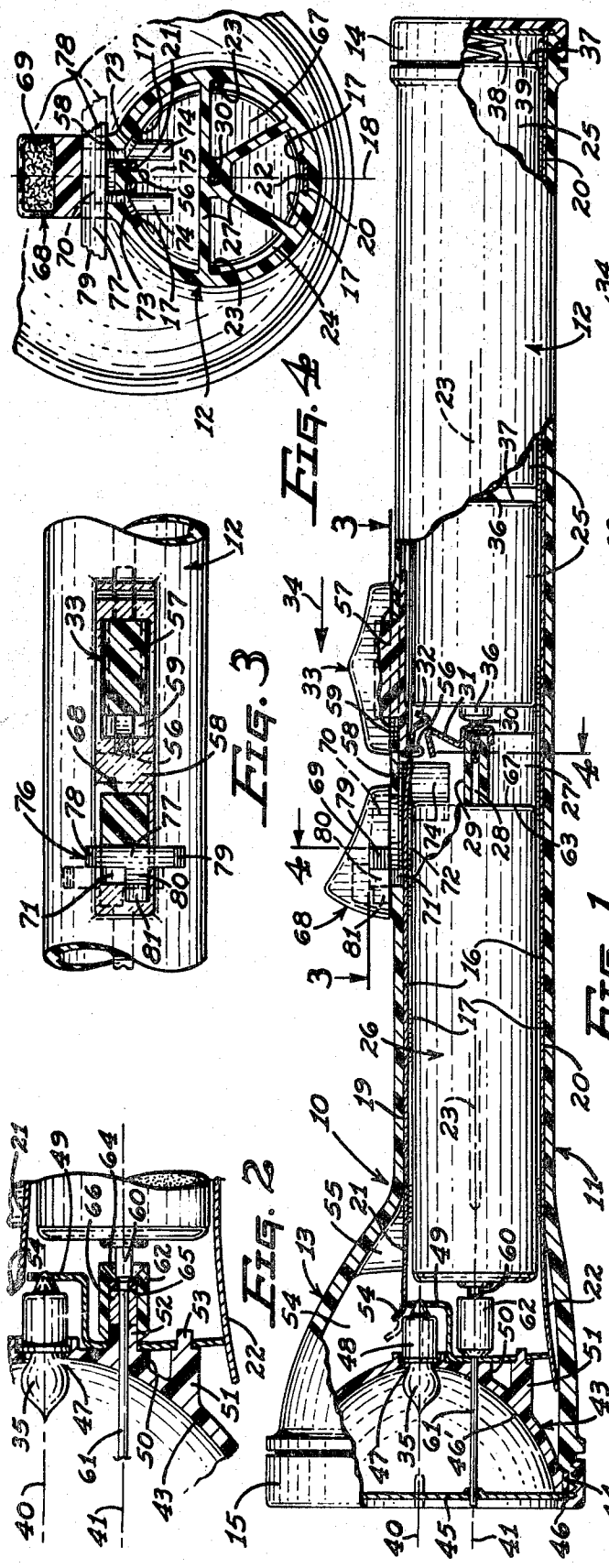


Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5

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# CHEMICAL EJECTING FLASHLIGHT

## BACKGROUND OF THE INVENTION

This invention relates to flashlights and more particularly to flashlights incorporating chemical dispensers.

1. Field of the Invention

This invention relates to a hand held device for spraying chemicals and more particularly to a flashlight which dispenses chemicals within the pattern of its rays of light and is particularly effective as a non-lethal weapon.

2. Description of the Prior Art

Heretofore chemical dispensers have been designed for dispensing the product without regard to the purpose for which the chemicals were intended. Flashlights have been used for producing rays of light and non-lethal weapons have been designed to look like guns. None of these devices have been effectively combined.

## SUMMARY OF THE INVENTION

In accordance with the invention claimed an improved flashlight is provided having the usual casing containing a switch on its outside for connecting an electric bulb to a source of battery power which flashlight also contains a source of pressurized chemicals arranged to be dispensed in the range of the rays of light of the flashlight by a triggering means mounted on the exterior of the flashlight.

It is, therefore, one object of this invention to provide a new and improved non-lethal weapon.

A further object of this invention is to provide a new and improved flashlight for dispensing chemicals.

A still further object of this invention is to provide a new and improved flashlight for dispensing chemicals in the range of its rays of light.

A still further object of this invention is to provide a new and improved flashlight which can dispense chemicals substantially parallel to the rays of light of the flashlight.

A still further object of this invention is to provide an improved flashlight which can be actuated at will to dispense chemicals through the rays of its light.

Further objects and advantages of the invention will be apparent as the following description proceeds and the features of novelty which characterize this invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

## BRIEF DESCRIPTION OF THE DRAWING

The present invention may be more readily described by reference to the accompanying drawing in which:

FIG. 1 is a sectional view of the flashlight of this invention with some parts shown in elevation and broken away;

FIG. 2 is a fragmentary enlarged sectional view of a portion of the front or light source and chemical dispensing end of the flashlight;

FIG. 3 is a fragmentary top plan view of a portion of the flashlight barrel with some parts shown in section taken substantially on the line 3 — 3 of FIG. 1;

FIG. 4 is an enlarged transverse vertical sectional view through the barrel of the flashlight taken substantially on the line 4 — 4 of FIG. 1; and



FIG. 5 is a sectional view similar to FIG. 1 showing a modified form of the flashlight of this invention.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring more particularly to the drawing by characters of reference FIG. 1 discloses a dual purpose flashlight **10** comprising a hollow housing or casing **11** having longitudinally extending tubular rear barrel portion **12** and an integral circular and offset front portion **13**. The inner components of the flash-light are retained in their respective positions in the barrel and head portions by suitable closure caps, such as closure cap **14** threaded on the rear end of barrel portion **12** and the closure cap **15** threaded on head portion **13** of the casing. All of the components of the flashlight are preferably fabricated of a high impact strength, chemical resisting plastic material such as polyethylene or the like, to prevent corrosion or other damage to the flashlight especially under the severe handling and usage to which this particular type of flashlight might be subject to.

The inner perimeter of bore **16** of barrel portion **12** is provided on its upper and lower surfaces with pairs of integral escarpments **17**, spaced mid-way from the vertical center line **18** to form upper and lower recesses or cavities **19** and **20** in which the metallic spring leads **21** and **22** are enclosed in sliding relation therein. The inner flat surfaces and edges of the escarpments **17**, together with longitudinally extending and inwardly projecting integral beads **23**, are adapted to provide a circular insulative space **24** between the cylindrical metallic inner components of the flashlight, including several "D" batteries **25** and an aerosol container **26**, the purpose of which will be further described.

Located approximately mid-way longitudinally of bore **16** of the barrel portion **12** is positioned a bridge piece **27** integral with casing **11** which serves to reinforce barrel portion **12** and has a central bore **28** and a flat transverse top portion **29** which serves to support and rigidly retain, as by means of a round headed screw **30**, a flexible metallic contact member **31**. Member **31** is adapted to be put in electrical contact with the downwardly extending hooked rear end **32** of the metallic spring lead **32** when the thumb activated switch **33** is pushed forward in the direction of arrow **34**.

Batteries **25** which supply the electrical energy to illuminate a standard flashlight bulb **35**, are arranged in the rear of bore **16** of barrel portion **12** in the usual manner, that is, with their center posts **36** contacting either the head of screw **30** or the bottom metallic surface **37** of an aligned battery. The bottom surface of the rearmost battery is contacted by the usual metallic spring **38** which is compressed between the bottom surface of the battery and a metallic washer or lining **39** secured in closure cap **14**. Lining **39** contacts the rear flanged end of metallic spring lead **22** when the closure cap is screwed in place, thereby partially completing the flashlight's electrical circuit.

The center of the circular shaped front head portion **13** of flashlight casing **11** is offset upwardly on the vertical center line **18**, from the horizontal center of the tubular barrel portion **12**, as indicated in FIG. 1 and 2, by their respective center lines **40** and **41**. This design feature causes the flashlight to always lay in an upright

position when at rest and allows for quick pickup, ease of operation, and other desirable features. The inner walls of head portion **13** define a hollow cavity **42** which communicates with bore **16** of barrel portion **12** in which a parabolic shaped reflector **43** is removably mounted in a non-rotative manner. Reflector **43** is locked in position by suitable projecting lugs **44** which mate with notches formed in the inner periphery of the circular wall which forms the front access end of head portion **13**. A glass or clear plastic lens **45** is removably and non-rotatatively secured between the front face of the reflector **43** and the circular flange **46** of the open end front closure cap **15** when the cap is screwed onto the threaded front end of head portion **13**.

The parabolic reflector **43** is preferably fabricated of insulative plastic material and its front reflective face **46'** is coated with a smooth brilliant surface material such as chrome or silver, having good reflective properties, to provide a strong beam of light when illuminated by bulb **35**. Bulb **35** projects through a suitable counterbored hole **47** centered on line **40** and is adapted to receive and support the circular flange of the metallic rear end portion **48** of the conventional bulb. Bulb **35** is held securely in position for good electrical contact and easy removable by spring pressure applied to the rear contact end portion **48** of the bulb by the upper end of the flexible metal lead member **49**.

Projecting rearwardly from the lower curved surface of the reflector member **43** and located in vertical alignment on the center line **18**, are the integral bosses **50** and **51** respectively. Bosses **50** and **51** have reduced outer end portions **52** and **53**, respectively, which are adapted to receive and support the lower end of spring lead **49** so as to contact the extreme front flexible end of the lower spring lead **22**, as shown in FIGS. **1** and **2**. The extreme front end of the upper spring lead **21** is provided with a turned up end portion **54**, which normally is held out of contact with the upper end of the lead **49** by a downwardly projecting boss **55** which is an integral extension of the head portion **13**. Lead **21** may be placed in electrical contact with the metal end portion **48** of bulb **35** when it is pushed forward in the direction of arrow **34** by thumb pressure being applied to switch **33** and by the resulting forward movement of a depending lug **56**. Lug **56** extends through an aperature in the rear end of lead **21**. This lug is an integral part of the inner portion **57** of switch **33** and is adapted to slide forward and backward on a flat raised surface **58** of casing **11** and in a rectangular opening **59** formed in the top center of barrel portion **12**. The forward movement of switch **33** serves to complete all the required electrical contacts necessary to activate the flashlight to produce a beam of light. Deactivation of the flashlight is accomplished by simply moving switch **33** in a rearward or opposite direction.

The preceding paragraphs describe the various features pertaining to construction, electrical components and operation of the flashlight. The following description describes a special feature of the design, construction, components and operation of the disclosed structure which accomplish other purposes of this flashlight, namely the ejection of a spray or stream of any desired non-lethal chemical, directly through and parallel with the center of the array of light, when desired.

To accomplish this second purpose there is inserted in the forward end of bore **16** of barrel portion **12** of casing **11**, a cylindrical shaped aersol type container **26**, having a diameter approximately the same as batteries **25**. Container **26** is spaced from the inner wall of bore **16** by the insulative air space **24** and is adapted to freely slide forward or rearward on the inner top surfaces of escarpments **17**.

The characteristics and function of aerosol containers or bombs as they are sometimes referred to, are well known in the art, therefore only the specific features that pertain to and are utilized in this invention will be described. Container **26** may store any kind of colloidal particles in a gas, fluid or liquid under pressure within the container and provides for the ejection of this mixture in the form of a spray or stream from the nozzle end **60** of the container when the nozzle is manually restracted or tilted. The retracting or tilting action opens a spring biased valve (not shown) within the head of the container to release the gas under pressure. It should be understood that any non-lethal type chemical, such as mace, tear-gas or an insecticide could be stored in the aerosol container.

The aerosol container of this invention may be inserted in the front end of flashlight casing **11** by simply removing closure cap **15**, reflector **43** together with lens **45** and their associated parts. An ejection tube **61** and ejection tube holder **62** are arranged to extend through reflector **43**, as shown in FIGS. **1** and **2**. When container **26** is thus inserted its rearward movement is limited by front face **63** of bridge piece **27**. Its forward movement is limited to only a slight change of position by the insertion of nozzle **60** in the rear chamfered end **64** of the ejection tube holder **62**. Slight clearance between nozzle **60** and the chamfered end **64** of the injection tube holder **62** and a suitable O-ring **65** is provided when reflector **43**, lens **45** and associated parts are reinstalled and closure cap **15** tightly secured to casing **11**.

It should be noted that the ejection tube **61** is small in diameter, preferably tubular in cross section containing a minute bore (not shown) and is of sufficient length to extend slightly through lens **45** at its front end. Ejection tube **61** also extends through reflector **43**, lead **49** and into a spacer **66** which bears against one side of O-ring **65** and the flat end surface of the reduced end portion **52** of boss **50**, all of which are secured as by cementing or otherwise, in the bore of ejection tube holder **62**.

The chemically charged aerosol container **26** will always remain stored in the position shown in FIG. **1** until a direct force is applied to the rear surface **67** of the container by means of the manually operated trigger arrangement **68**. The trigger arrangement **68** comprises an exterior actuating portion **69** which is positioned adjacent to and preferably directly forward of and in horizontal alignment with switch member **33** to allow for quick manipulation of one or the other by the operator of the flashlight. The trigger arrangement **68** also includes an interior portion **70**, which extends upwardly through a rectangular opening **71** in the raised flat surface **58** on the top of barrel portion **12** upon which the actuating portion **69** is adapted to slide, forwardly and rearwardly, in a manner similar to electrical switch **33**.

The interior trigger portion **70** of the trigger arrangement **68** is secured in a cavity in the actuating portion **69**, for example, by cementing, to provide for unified movement of the two parts. The interior trigger portion **70** has an integral lower portion **72** having upper angular or curved surfaces **73** which are adapted to slide freely within the projecting escarpments **17** as shown in FIG. **4**. The lower portion **72** is also provided at its rearmost end with a pair of spaced integral depending arms **74** which form an open space **75** therebetween in which spring lead **21** and switch lug **56** can move without interference from the adjacent trigger parts. The depending arms **74** of the trigger arrangement **68** project downwardly into the open space to the rear of container **26** with their front edge surfaces adjacent the rear surface **67** of the container.

Therefore when manual pressure is applied to actuating portion **69** in a forward direction, as indicated by the arrow **34**, arms **74** will contact the rear surface **67** of container **26** forcing it to move forwardly in barrel portion **12**. This action depresses aerosol nozzel **60** by its contact with O-ring **65**, and opens the valve in the container, causing the particular non-lethal chemical to be ejected in a fluid form from the orifice of ejection tube **61**. As shown in the drawing the fluid is ejected in the same direction and parallel to the center **40** of the light beam as previously described. When manual pressure is released from the trigger or actuating portion **69** of the container it will automatically be returned to its normal position by the spring actuated nozzle **60** returning to its released extended position. This action causes container **26** to move rearwardly until it reaches the front face **63** of bridge piece **27**. O-ring **65** provides a sealing relation between the mating ejection elements during the travel of the container.

When switch **33** is being utilized to activate the flashlight, it is conceivable that the operator's thumb or finger might slip from the switch and accidentally activate the trigger mechanism for container **26** causing gas to be emitted when not wanted. To eliminate this possibility, a safety locking device **76** has been provided, which includes a flat T-shaped piece **77**. Angular serrated ends **78** and **79** of piece **77** are adapted to project through suitable openings in the side walls of the actuating portion **69**, allowing its flat base and forward projecting leg **80** to slide transversely from left to right, or vice-verse, bearing on the flat raised surface **58** of barrel portion **12**. When the T-shaped piece **77** of the locking device **76** is in locked position as shown in FIG. **3**, the projecting leg **80** of the T-piece **77** abuts a raised projection or lug **81** which may be an integral extension of the barrel portion **12**. This action prevents trigger assembly **68** from moving. Should it be desired to make the ejection feature of the flashlight ready for instant use, the operator merely moves T-shaped piece **77** to the right, thereby allowing the projecting leg **80** to bypass lug **81**, allowing the trigger assembly **68** to be moved forward to eject the non-lethal chemical.

Referring now to FIG. **5** of the drawing, it will be evident that the components that make up the dual purpose flashlight of this invention are similar in most respects to those shown in FIGS. **1** — **4** with the exception that the head portion **13** and its assembled components, including the ejection tube **61**, face at right angles to the center of barrel portion **12**. The electrical leads have been modified somewhat by splitting lead **49** into two separate leads **49***a* and **49***b*. Ejection tube holder **62***a* is an integral transverse portion of tubular barrel portion **12**. In addition to the preceding exceptions, an auxilliary compression spring **82** has been added which bears on the ejection tube holder **62***a* and the face of the aerosol container **26** which provide an extra spring as a safety means to return the container to its normal position in the possible event of malfunction of the container nozzle valve spring. In other respects the function and results obtained with the modification illustrated in FIG. **5** are the same as described for the structure shown in FIGS. **1** – **4**.

FIGS. **1** — **5** show the chemical ejecting means as dispersing fluid under pressure out of the flashlight within the beam of light but substantially parallel to the center line of the light reflector. Although this is preferable, it is intended that the fluid may be dispersed out of the flashlight at an angle to the center line of the light reflector, if so desired. Further, the batteries and aerosol container can be mounted in the flashlight in any axial alignment or side by side as required by the flashlight configuration.

Although but two embodiments of the invention have been shown and described, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:

**1**. A chemical ejecting flashlight comprising:

a casing for receiving one or more batteries and an aerosol container,

said casing being closed at one end and provided with a light reflector at the other end,

a light bulb mounted in said reflector and electrically connected through an electric switch to the batteries,

an electric switch mounted on the outside of said casing for selectively connecting the batteries to said light bulb to energize said bulb,

chemical discharging means mounted on said reflector to extend outwardly therefrom for discharging fluid under pressure,

said chemical discharging means being adapted to receive at one end the tip of the aerosol container when it is moved longitudinally into said chemical discharging means to cause the aerosol container to discharge at least a part of its fluid under pressure through said chemical discharging means outwardly of said flashlight,

a triggering switch means mounted on the outside of said casing for selectively moving the aerosol container into said chemical discharging means for discharging at least a part of its fluid under pressure.

**2**. The chemical ejecting flashlight set forth in claim **1** wherein said casing receives in axial alignment one or more batteries and the aerosol container and said chemical discharge means comprises a nozzle means.

**3**. The chemical ejecting flashlight set forth in claim **2** wherein said electric switch and triggering switch means are aligned on the outside of said casing longitudinally of the axis of said casing.

4. The chemical ejecting flashlight set forth in claim 1 wherein said chemical discharge means is mounted on said reflector to discharge fluid under pressure from the aerosol container within the zone of the rays of light of said bulb.

5. The chemical ejecting flashlight set forth in claim 1 wherein said chemical discharge means is mounted on said reflector to discharge fluid under pressure from the aerosol container in the same direction as the rays of light of said bulb.

6. The chemical ejecting flashlight set forth in claim 1 wherein said chemical discharge means comprises a nozzle mounted on said reflector for discharging fluid under pressure from the aerosol container through the rays of light of said bulb when said bulb is energized and said aerosol container is moved into said nozzle means.

7. The chemical ejecting flashlight set forth in claim 1 in further combination with an interlocking means mounted on said casing for prohibiting the movement of said actuating means until moved in a predetermined direction.

8. A chemical ejecting flashlight comprising:

a casing for receiving one or more batteries and an aerosol container having a spring biased discharging tip,

said casing being closed at one end and provided with a light reflector at the other end,

a light bulb mounted in said reflector and electrically connected to the batteries,

electric switching means mounted on the outside of said casing for selectively connecting the batteries to said light bulb to energize said bulb,

a nozzle means mounted on said reflector extending from within said casing through said reflector,

a transparent covering mounted on the front of said reflector,

a hollow tube connected to said nozzle means and extending through said covering outwardly of said flashlight,

said nozzle means being adapted to receive within said casing one end of the tip of the aerosol container when it is moved longitudinally into said nozzle means to cause the aerosol container to discharge at least a part of its contents under pressure through said nozzle means, and said hollow tube outwardly of said flashlight,

an actuating means mounted on the outside of said casing for selectively moving the aerosol container into said nozzle means for discharging its contents under pressure,

said nozzle discharging the contents under pressure within the zone of the rays of light of said bulb.

9. The chemical ejecting flashlight set forth in claim 8 wherein said casing is provided for receiving the batteries and aerosol container in axial alignment.

10. The chemical ejecting flashlight set forth in claim 9 wherein said transparent covering comprises a lens.

11. The chemical ejecting flashlight set forth in claim 8 in further combination with an interlocking means mounted on said casing for prohibiting the movement of said actuating means until moved in a predetermined direction.

12. The chemical ejecting flashlight set forth in claim 8 wherein said reflector is off set from the longitudinal axis of said casing.

13. The chemical ejecting flashlight set forth in claim 12 wherein said hollow tube is mounted along the longitudinal axis of said casing.

14. The chemical ejecting flashlight set forth in claim 8 wherein said reflector and hollow tube are arranged to extend outwardly from said casing at an angle to the longitudinal axis of said casing.

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