

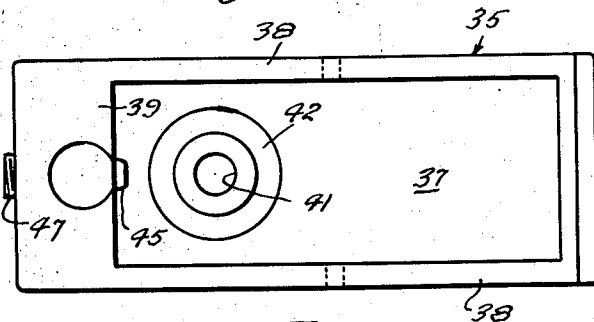
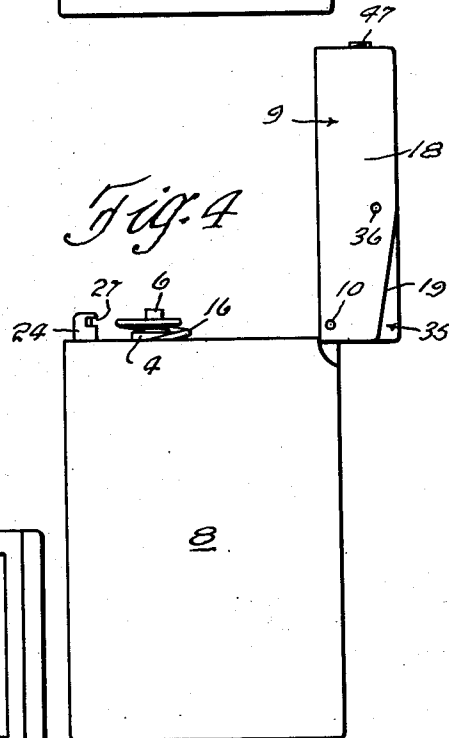
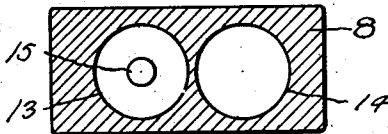
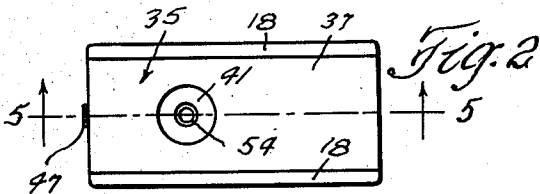
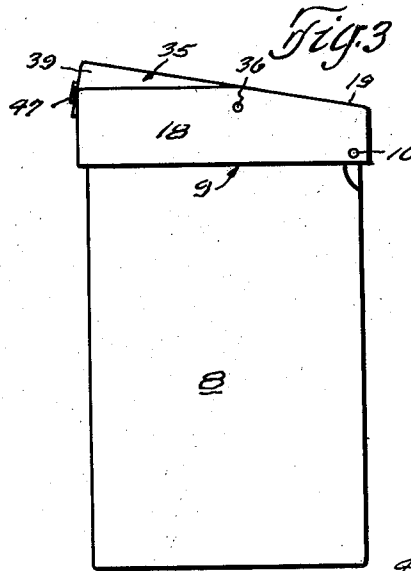
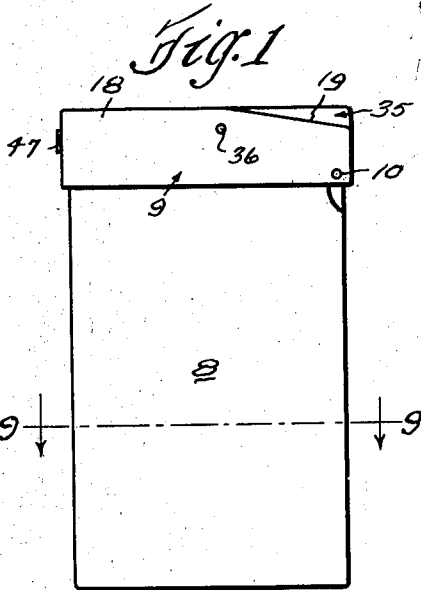
Aug. 19, 1952

D. D. GREGG ET AL
LIQUID DISPENSING GUN

2,607,627

Filed Nov. 20, 1950

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

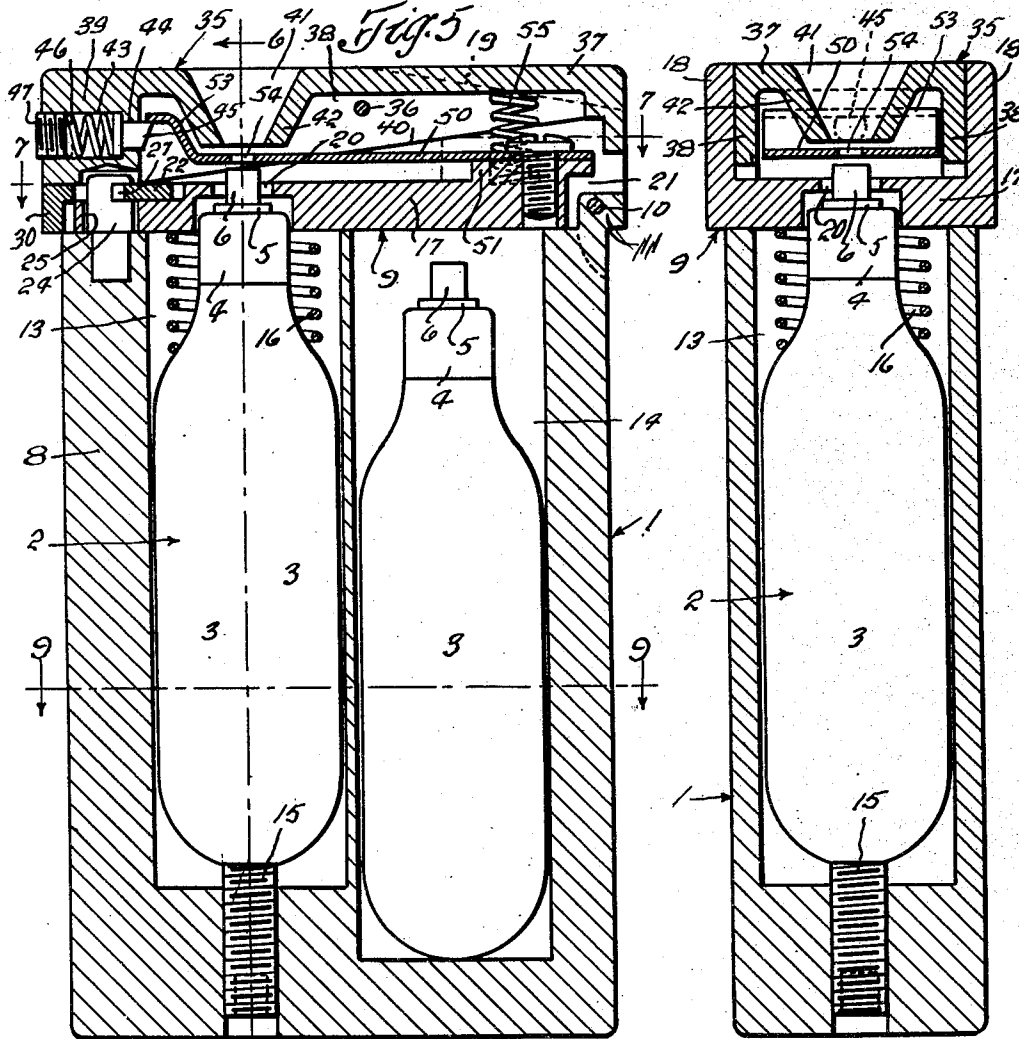


Fig. 6

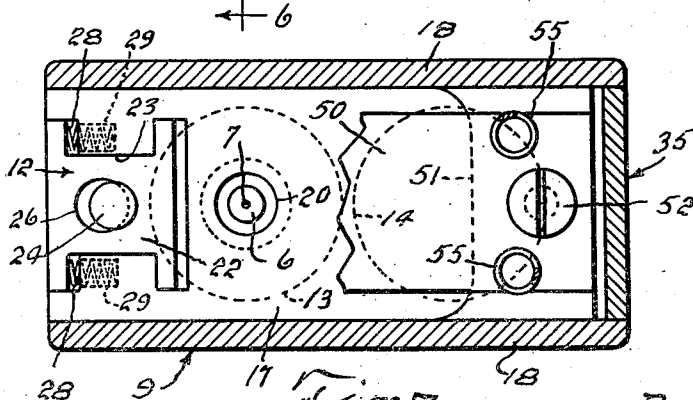


Fig. 7

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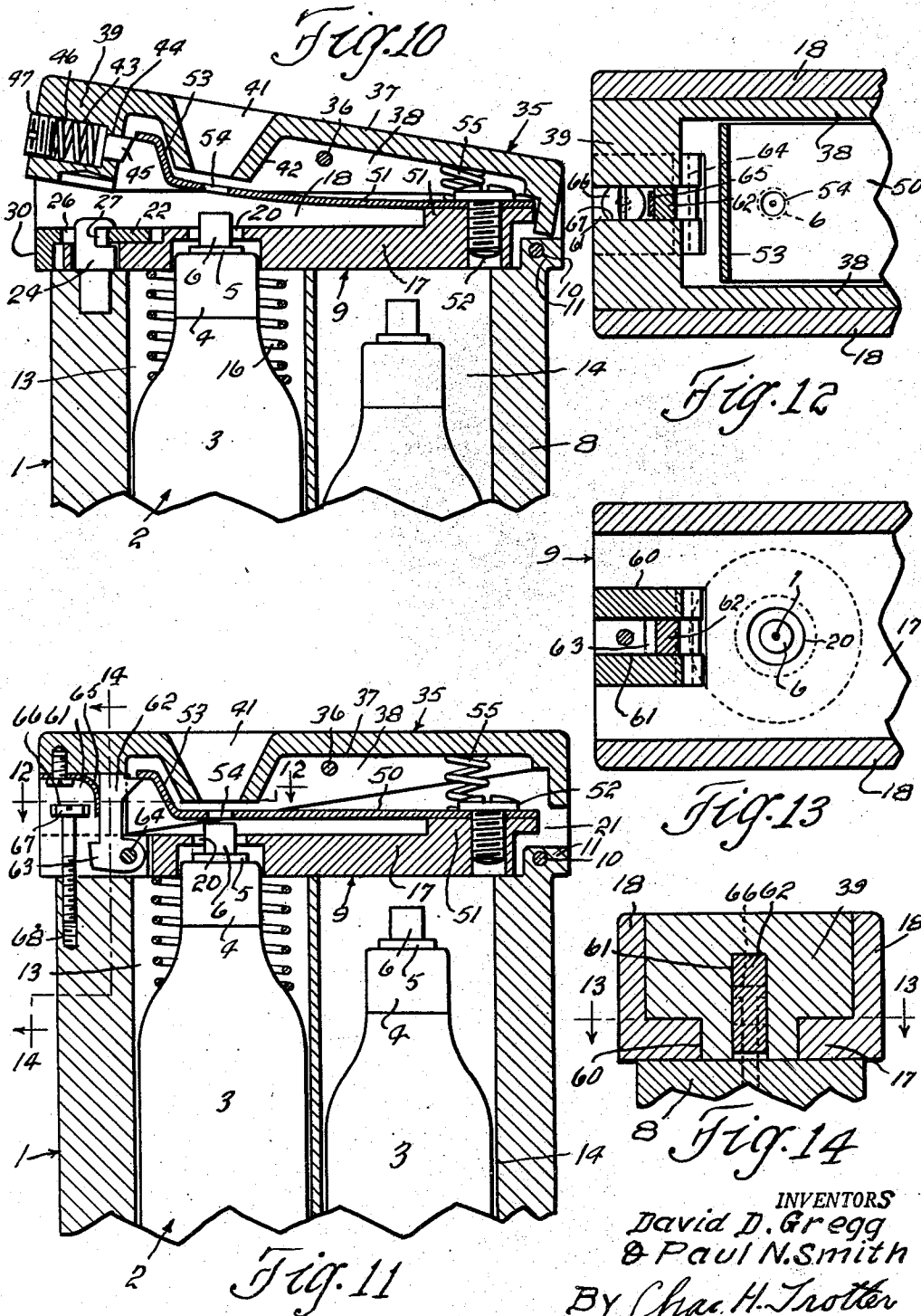
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3 Sheets-Sheet 3



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LIQUID DISPENSING GUN

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10 Claims. (Cl. 299—95)

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This invention relates to a liquid dispensing gun for discharging and atomizing measured quantities of a volatile liquid from a cartridge or container. It is especially adapted for dispensing a deodorant into a kitchen for killing cooking odors, but it can be used equally well for dispensing disinfectant and other air conditioners.

The gun is designed for use with a cartridge having an atomizing nozzle and a valve which is opened by depressing the nozzle. As long as the nozzle is held depressed the treating liquid will be forced out of the nozzle by vapor pressure in an atomized spray which quickly vaporizes as it is discharged. With most devices for dispensing liquids from cartridges of this character, the tendency is to hold the discharge control valve open too long which results in a wasteful use of the treating liquid. In order to prevent this wasteful use of treating liquid, we provide in our dispensing gun trigger actuated mechanism which will cause the discharge of only a predetermined small amount of liquid each time the trigger is operated.

Our improved dispensing gun comprises a case in which the cartridge of treating liquid is carried, and a pivoted cap which is normally locked in closed position but which may be unlocked and swung to open position when it is desired to change a cartridge. The cap carries a pivoted trigger and trigger actuated mechanism which is operative to quickly depress the cartridge nozzle a fixed amount and then release it each time the trigger is actuated. The trigger is designed to be quickly actuated and then released but it may be held in actuated position any length of time without affecting the amount of treating liquid discharged from the cartridge. Spring means returns the trigger to normal position when it is released after each actuation.

The principal object of the invention is to provide a very simple, efficient and inexpensive device for dispensing predetermined amounts of treating liquid from a cartridge having a discharge nozzle and a valve which is opened by depressing the nozzle.

Another object of the invention is to provide in a device of this character means by which the amount of liquid discharged by each actuation of the device can be varied as desired.

Other and more limited objects of the invention will be apparent from the following specification and the accompanying drawings forming a part thereof wherein:

Fig. 1 is a side elevation of a dispensing gun,

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constructed according to our invention, showing it in normal inoperative position;

Fig. 2 is a top plan view of the gun as shown in Fig. 1;

Fig. 3 is a view similar to Fig. 1 showing the trigger in actuated position;

Fig. 4 is a view similar to Fig. 1 showing the cap swung to open position to permit access to the cartridge;

Fig. 5 is an enlarged central vertical section, taken on the line 5—5 of Fig. 3;

Fig. 6 is a vertical section, taken on the line 6—6 of Fig. 5;

Fig. 7 is a horizontal section, taken on the line 7—7 of Fig. 5;

Fig. 8 is a bottom plan view of the trigger removed from the cap;

Fig. 9 is a horizontal section on the scale of Figs. 1 to 4, taken on the line 9—9 of Figs. 1 and 5;

Fig. 10 is a view similar to Fig. 5 showing the trigger in actuated position;

Fig. 11 is a view similar to Fig. 5 showing a slightly modified form of the device;

Fig. 12 is a fragmentary horizontal section, taken on the line 12—12 of Fig. 11;

Fig. 13 is a fragmentary horizontal section, taken on the line 13—13 of Fig. 14; and

Fig. 14 is a fragmentary vertical section, taken on the line 14—14 of Fig. 11.

Referring now to the drawings by reference characters, the numeral 1 indicates generally our improved dispensing gun, and the numeral 2 indicates a cartridge in which the treating liquid to be dispensed by the gun 1 is contained under vapor pressure. The cartridge 2 comprises a cylindrical container 3 having a reduced upper end which is closed by a cap 4. A normally closed valve 5 having a nozzle 6 with an axial atomizing discharge opening 7 are suitably mounted in the cap 4. The valve 5 is yieldingly biased to closed position and is opened by depressing the nozzle 6 and will remain open as long as the nozzle is depressed. The valve 5 is of standard well known construction and is manufactured by various different concerns. Consequently it is not shown and described in detail herein. As long as the valve 5 is open liquid will be forced out the discharge opening 7 by vapor pressure in a finely atomized spray. As soon as the nozzle 6 is released the valve 5 will automatically close and stop the discharge of liquid.

The dispensing gun 1 comprises a case 8 and a closure cap 9 which is pivotally secured by a

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pivot pin 10 to a boss 11 on the top of the case 8 at the rear end thereof. The cap 9 is normally locked in closed position by a latching mechanism at the forward end of the cap and case which is generally indicated by the numeral 12. The case 8 has two cylindrical cavities 13 and 14 therein. A cartridge 2 from which treating liquid is to be dispensed is contained in the cavity 13 and a spare cartridge 2 is contained in the cavity 14. An adjusting screw 15 which extends up through the bottom of the case 8 into the cavity 13 is provided in order to adjust the position of the cartridge 2 in the cavity 13 with respect to the cap 9. A spring 16 disposed about the reduced upper end of the cartridge 2 maintains the cartridge in the cavity 13 against the adjusting screw 15. After a cartridge in the cavity 13 has been exhausted the latching mechanism 12 is operated to release the cap 9 and then the cap 9 is swung to the position shown in Fig. 4. The exhausted cartridge can then be removed from the cavity 13 and a fresh cartridge inserted therein, after which the cap 9 is closed and the gun is ready for use again.

The cap 9 comprises a base 17 and a pair of spaced parallel upwardly extending side walls 18 the rear sections of which are inclined downwardly as shown at 19. The base 17 has an aperture 20 therethrough in axial alignment with the cavity 13 through which the nozzle 6 of the cartridge in the cavity 13 extends, and is cut away between the side walls 18 at the rear end thereof as shown at 21 to accommodate the boss 11.

The latching mechanism 12 comprises a slide bolt 22 which is slidably mounted in a recess 23 in the top of the cap base 17, and a stud 24 which is carried by the case 8 and extends up through an aperture 25 in the base 17 under the slide bolt 22 and an aperture 26 in the slide bolt 22 which is of larger diameter than the stud 24. The stud 24 has a notch 27 near the upper end thereof into which the slide bolt 22 is normally urged by a pair of springs 28 which are seated in recesses 29 in the forward end of the base 17 and bear against the inner face of the downturned outer end 30 of the slide bolt 22. To unlock the cap 8 the slide bolt 22 is pressed inwardly against the pressure of the springs 28 until the slide bolt leaves the notch 27 in the stud 24. The cap can then be swung upwardly about the pivot pin 10 to open position.

A trigger which is generally indicated by the numeral 35 is pivotally mounted between the side walls 18 of the cap 9 upon a pivot pin 36. The trigger 35 comprises a top 37, two spaced downwardly extending side walls 38 and a relatively thick end wall 39 which extends between the side walls 38 at the forward end of the trigger. The side walls 38 slope upwardly from the end wall 39 to the rear ends thereof, as indicated at 40, to permit the trigger to be rocked on the pivot pin 36. An outwardly flaring frusto-conical aperture 41 disposed in axial alignment with the cavity 13 and aperture 20 extends through a boss 42 which projects downwardly from the inner face of the trigger top 37. A bore 43 having a reduced extension 44 is formed in the end 39 of the trigger 35. A dog 45 which has a tapered outer end, a flattened upper surface and an enlarged base is slidably mounted in the bores 43 and 44, and is normally urged outwardly by a spring 46 in the bore 43. The pressure of the spring 46 may be adjusted by a

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threaded plug 47 in the outer end of the bore 43. A relatively thin flat leaf spring arm 50 has one end thereof fastened to a boss 51 which extends upwardly from the rear end of the base 17 of the cap 9 by a large headed screw 52. The free end of the spring arm 50 extends straight forwardly from the boss 51 between the upper end of the cartridge nozzle 6 and the lower end of the aperture 41 and then upwardly and forwardly over the dog 45 as shown at 53 in Fig. 5. The spring 50 has an aperture 54 therethrough which is of lesser diameter than the nozzle 6 of the cartridge and is disposed in axial alignment with the cavity 13 and the apertures 20 and 41.

To release a predetermined amount of liquid in an atomized spray from the cartridge 2, it is only necessary to depress the rear end of the trigger 35 downwardly from the position shown in Figs. 1 and 5 to the position shown in Figs. 3 and 10. The depressing of the rear end of the trigger 35 raises the forward end thereof. As the forward end of the trigger moves upwardly the dog 45 flexes the spring 50 by carrying the free end thereof up to the position shown in Fig. 10. At this position the end of the spring 50 slides off of the dog 45 and snaps downwardly past the at rest position shown in Fig. 5 substantially the same distance it had been raised above the normal at rest position by the actuation of the trigger 35. On its downward movement the spring momentarily engages and depresses the cartridge nozzle 6 and then releases it as the spring then returns to its normal at rest position. The depressing of the nozzle 6 opens the valve 5 which allows an atomized spray of liquid to be projected by vapor pressure in the cartridge 2 out through the aperture 54 in the spring 50 and the aperture 41 in the trigger. The distance the nozzle 6 is moved downwardly determines the amount of liquid dispensed at each actuation of the trigger 35, it being understood that the further the nozzle 6 is depressed before it is released the longer the valve 5 will remain open. This amount can be varied by adjusting the screw 15 to position the top of the nozzle 6 either closer to or farther away from the spring 50 in its normal at rest position. After the trigger 35 has been actuated it is released and springs 55 return it to its original position.

In Figs. 11 to 14, inclusive, we have shown a slightly modified form of the invention. In this form of the invention the spring-pressed dog 45 which engages the end of the spring arm 50 and flexes it as the trigger 35 is actuated has been replaced by a slightly different mechanism. Otherwise the construction of the gun is the same as that shown in Figs. 1 to 10, inclusive, and the same reference characters are applied to like parts in the two forms. Referring now in detail to Figs. 11 to 14, the end 39 of the trigger 35 is slotted as indicated at 64 and extends down into a notch in the forward end of the base 17 of the cap 9, as shown at 60, when the trigger 35 is in normal at rest position. A latch 62 having an outward extension 63 is pivotally mounted in the slot 64 on a pivot pin 64. A leaf spring 65 normally urges the upper end of the latch 62 inwardly under the free end of the spring arm 50. A threaded stud having a head 66 with the flattened sides 67 extends up from a threaded aperture 68 in the case 8 into the slot 61. The head 66 overlies the extension 63 of the latch 62 and constitutes an abutment

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which the extension 63 engages, when the trigger 35 has been actuated a sufficient amount. The engagement of the extension 63 with abutment 66 rocks the latch 62 on its pivot 64 and withdraws the upper end of the latch from under the end of the spring arm 50. The spring arm 50 then snaps downwardly and effects the discharge of liquid from the cartridge 2 as previously described. The relative position of the abutment 66 and the extension 63 determines the amount the spring arm 50 will be flexed before it is released, and the amount the spring arm 50 is flexed before release determines the amount of liquid discharged from the cartridge at each actuation of the trigger 35. If a lesser discharge is desired the abutment 66 should be adjusted downwardly and if a greater discharge is desired it should be adjusted upwardly. The flattened sides 67 engaging the side walls of the slot 61 maintain the abutment in adjusted position.

From the foregoing it will be apparent to those skilled in this art that we have provided a very simple and efficient mechanism for accomplishing the objects of our invention.

It is to be understood that we are not limited to the specific constructions shown and described as various modifications may be made therein within the scope of the appended claims.

What is claimed is:

1. A fluid dispensing gun comprising a case adapted to hold a cartridge containing fluid under vapor pressure, a cap normally closing said case, mechanism carried by said cap which is operative when actuated to effect the discharge of a predetermined fraction of the fluid contents of a cartridge in said case, a trigger carried by said cap, and interconnecting means between said mechanism and said trigger through which said mechanism is actuated by said trigger.

2. A fluid dispensing gun comprising a case adapted to hold a cartridge containing fluid under vapor pressure, a cap normally closing said case, mechanism carried by said cap which is operative when actuated to effect the discharge of a predetermined fraction of the fluid contents of a cartridge in said case, a trigger carried by said cap, interconnecting means between said mechanism and said trigger through which said mechanism is actuated by said trigger, and adjusting means by which the amount of fluid discharged from a cartridge in said case by each actuation of said mechanism may be varied.

3. A fluid dispensing gun comprising a case, a cavity in said case adapted to hold a cartridge containing fluid under vapor pressure, a cap normally closing the upper end of said cavity pivotally secured to said case, releasable latching means normally holding said cap in closing position, mechanism carried by said cap which is operative when actuated to effect the discharge of a predetermined fraction of the fluid contents of a cartridge in said cavity, a trigger pivotally mounted on said cap, and interengaging means between said mechanism and said trigger through which said mechanism is actuated by said trigger.

4. A fluid dispensing gun comprising a case, a cavity in said case adapted to hold a cartridge containing fluid under vapor pressure, a cap normally closing the upper end of said cavity pivotally secured to said case, releasable latching means normally holding said cap in closing position, mechanism carried by said cap which is operative when actuated to effect the discharge of

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a predetermined fraction of the fluid contents of a cartridge in said cavity, a trigger pivotally mounted on said cap, interengaging means between said mechanism and said trigger through which said mechanism is actuated by said trigger, and aligned apertures in said cap and said trigger through which fluid from a cartridge in said cavity is discharged when said mechanism is actuated by said trigger.

5. A fluid dispensing gun comprising a case adapted to hold a cartridge containing fluid under vapor pressure, a cap normally closing said case, a trigger pivotally mounted on said cap, an elongated leaf spring arm having one end thereof rigidly secured to said cap, interengaging means between said trigger and the free end of said spring arm through which said spring arm is flexed and then released when said trigger is actuated, said spring arm being operative when flexed and released to effect the discharge of a predetermined fraction of the fluid contents of a cartridge in said case.

6. A fluid dispensing gun comprising a case adapted to hold a cartridge containing fluid under vapor pressure, a cap normally closing said case, a trigger pivotally mounted on said cap, an elongated leaf spring arm having one end thereof rigidly secured to said cap, interengaging means between said trigger and the free end of said spring arm through which said spring arm is flexed a predetermined amount and then released each time said trigger is actuated, said spring arm being operative when flexed and released to effect the discharge of a predetermined fraction of the fluid contents of a cartridge in said case, and adjusting means by which the amount said spring arm is flexed before it is released may be varied.

7. A fluid dispensing gun comprising a case adapted to hold a cartridge containing fluid under vapor pressure, a cap normally closing said case, a trigger pivotally mounted on said cap, an elongated leaf spring arm having one end thereof rigidly secured to said cap, interengaging means between said trigger and the free end of said spring arm through which said spring arm is flexed and then released when said trigger is actuated, aligned apertures in said cap said spring arm and said trigger, said spring arm being operative when flexed and released to effect the discharge through said apertures of a predetermined fraction of the fluid contents of a cartridge in said case.

8. A fluid dispensing gun comprising a case adapted to hold a cartridge containing fluid under vapor pressure, a cap normally closing said case, a trigger pivotally mounted on said cap, an elongated leaf spring arm having one end thereof rigidly secured to said cap, interengaging means between said trigger and the free end of said spring arm through which said spring arm is flexed and then released when said trigger is actuated, aligned apertures in said cap said spring arm and said trigger, said spring arm being operative when flexed and released to effect the discharge through said apertures of a predetermined fraction of the fluid contents of a cartridge in said case, and means by which the position of a cartridge in said case may be adjusted with respect to said spring arm to vary the amount of fluid discharged by each actuation of said trigger.

9. A fluid dispensing gun comprising a case, a cavity in said case adapted to hold a cartridge containing fluid under vapor pressure, a cap nor-

ably closing the upper end of said cavity removably secured to said case, a finger actuated trigger pivotally secured to said cap, spring means operative to return said trigger to its normal at rest position after each actuation, an elongated leaf spring arm having one end thereof rigidly secured to said cap, a spring pressed dog carried by said trigger and engaging the free end of said spring arm by which said spring arm is flexed and then released when said trigger is actuated, aligned apertures in said cap said spring arm and said trigger, said spring arm being operative when flexed and released to effect the discharge through said apertures of a predetermined fraction of the fluid contents of a cartridge in said cavity, and an adjusting screw extending into said cavity by which the position of a cartridge in said cavity may be adjusted with respect to said spring arm to vary the amount of fluid discharged by each actuation of said trigger.

10. A fluid dispensing gun comprising a case adapted to hold a cartridge containing fluid under vapor pressure, a cap normally closing said case, a trigger pivotally mounted on said cap, an elongated leaf spring arm having one end thereof rigidly secured to said cap, interengaging means between said trigger and the free end of said

spring arm through which said spring arm is flexed a predetermined amount and then released each time said trigger is actuated; said interengaging means comprising a pivoted latch carried by said trigger and spring pressed into engagement with the underside of the free end of said spring arm, an outward extension carried by said latch, and an abutment adjustably secured to said case in position to be engaged by said extension and operative to trip said latch to release said spring when said trigger is actuated; said spring arm being operative when flexed and released to effect the discharge of a predetermined fraction of the fluid contents of a cartridge in said case, said fraction being dependent upon the adjustment of said abutment.

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