Nov. 9, 1937. I. D. KELLEY, JR 2,098,454

COMPRESSED AIR GUN

Filed May 4, 1936 2 Sheets-Sheet 1

Fig. 1.

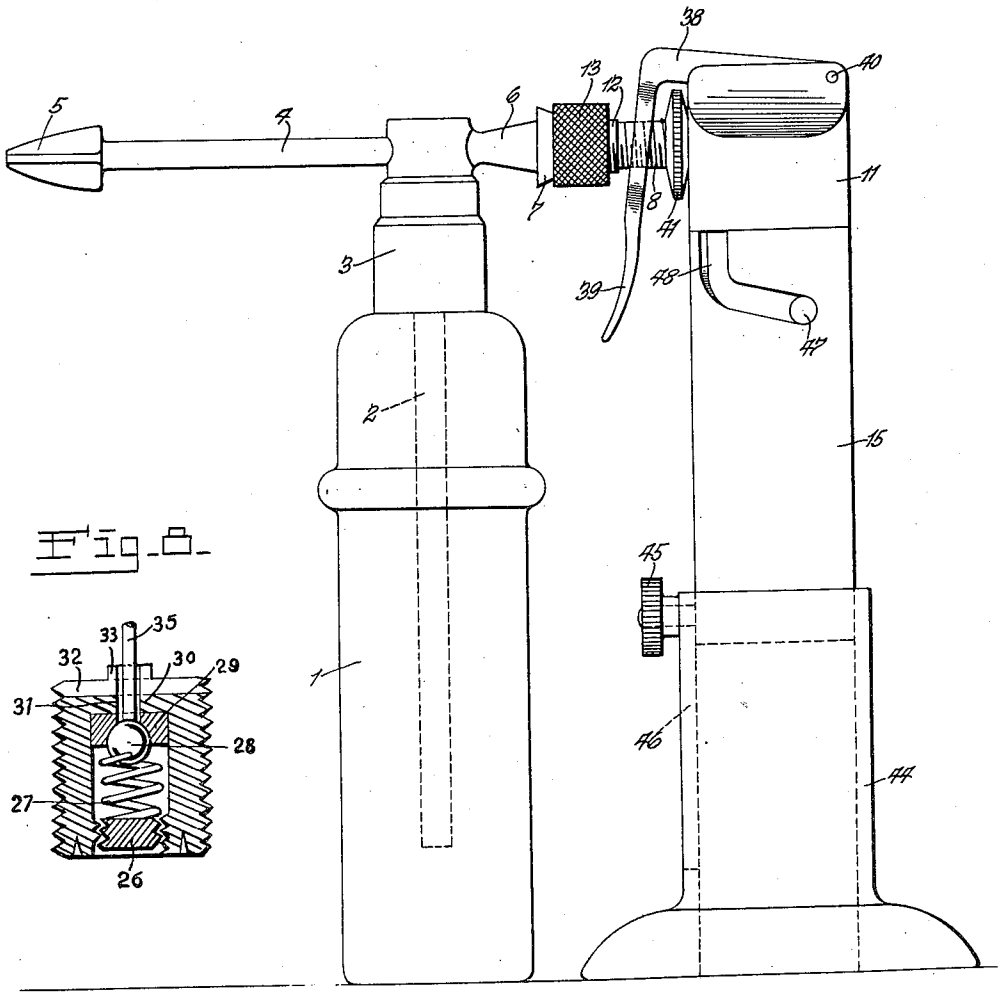


Fig. 2.

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Fig. 2.

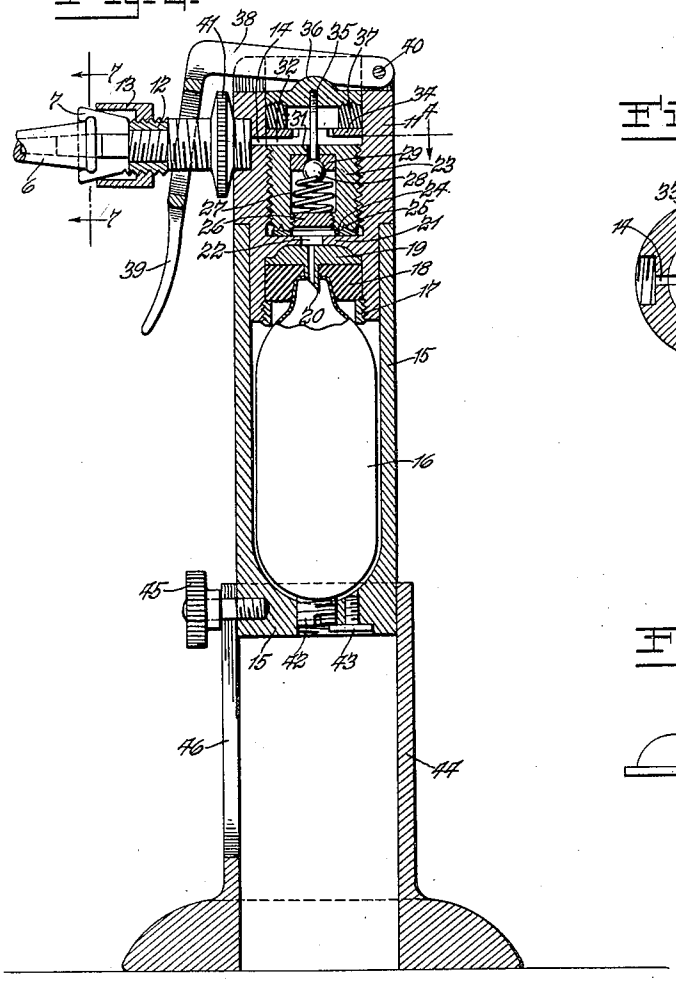


Fig. 4.

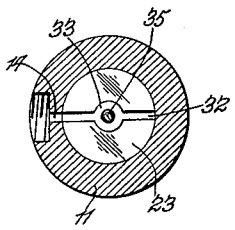


Fig. 5.

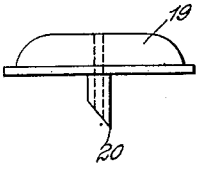


Fig. 3.

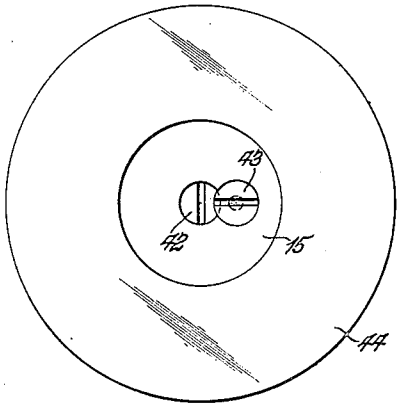


Fig. 6.

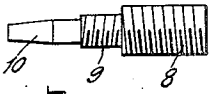
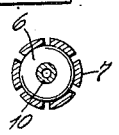


Fig. 7.



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UNITED STATES PATENT OFFICE

2,098,454

COMPRESSED AIR GUN

Isaac Dee Kelley, Jr., St. Louis, Mo.

Application May 4, 1936, Serial No. 77,797

4 Claims. (Cl. 221—73.5)

This invention relates to a compressed air gun, designed and adapted for use in controlling the discharge of compressed air from the container attached to and extending into the body of the instrument, and the device is specially useful for spraying liquids and medicaments.

An object of the invention is to provide an improved portable instrument for controlling and discharging compressed air through a nozzle opening into and from a liquid container, whereby the liquid may be properly discharged in the form of a fine spray and thereby applied for its intended and desired purposes over and upon any portions of the human body, or elsewhere, as required for the application of the intended treatment.

Another object of the invention is to provide a highly simplified and a practicable instrument of the type herein disclosed and specially designed for use by physicians and surgeons in the treatment of patients requiring or needing the application of sterilizing or medicated liquids or sprays.

Various other objects of the invention should be apparent from the following description, reference being made to the annexed drawings, in which—

Fig. 1 is a side elevation of a device embodying the invention.

Fig. 2 is a vertical transverse sectional view of the compressed air gun or device illustrating most of the essential features of the invention.

Fig. 3 is a bottom plan view of the device shown in Fig. 2.

Fig. 4 is a transverse sectional view of a part of the device shown in Fig. 2 on the line 4 of said Fig. 2.

Fig. 5 is an enlarged side elevation illustrating the puncturing device for the cartridge or shell in which the compressed air or gas is contained.

Fig. 6 is a side elevation of the threaded tubular discharge member or nozzle that is screwed into the compressed air gun.

Fig. 7 is a sectional view on the line 7—7 of Fig. 2.

Fig. 8 is an enlarged sectional view showing details of the invention.

The bottle or container 1 is of conventional construction and is designed and adapted to contain a liquid suitable for the desired purpose. A tube 2, as usual, extends down into the bottle or container 1, has its lower end open and its upper end opening through a fixture 3 into a tube 4 having a spray discharge nozzle 5 attached thereto, as is conventional.

As usual, the tube 4 opens across the fixture 3 and across the open upper end of the tube 2 into an injection tube 6 the outer end of which is connected with a swivel member 7. A tube comprising an enlarged threaded end portion 8, a reduced threaded portion 9 and a nozzle 10 has one end screwed into a member 11 and has its nozzle 10 extending through the swivel member 7 and into the tube 6. A sleeve portion 12 is screwed onto the threaded part 9 and is also externally threaded and has screwed thereon a tubular nut 13 which may be moved into and out of clamping engagement with the swivel member 7 to cooperate therewith in clamping said swivel member 7 on the tube 6 to hold the parts in proper relative adjustment.

The member 11 is tubular and has opening therefrom a port 14 for the discharge of air or gas. The member 11 is attached to a housing or casing 15 designed and adapted to receive and contain a cartridge or shell 16 holding compressed air or gas. The member 11 may be screwed into or otherwise detachably secured to the part 15.

As shown, a retaining ring 17 composed of brass or other appropriate material is screwed into the inner end of the member 11 and supports an elastic cartridge seat 18 of rubber or other appropriate elastic material. A metallic member 19 is mounted in the member 11 upon the cartridge seat 18 and has a tubular puncturing part 20 extending therefrom through and beyond the cartridge seat 18 and functioning to puncture and enter the upper end of the cartridge 16 when said parts are assembled in the relationship shown in Fig. 2 of the drawings.

The wall 21 formed in the member 11 has a port 22 opening into the tubular puncturing portion 20, so that the compressed air or gas can pass from the cartridge 16 therethrough.

A tubular fitting 23 is screwed into the member 11. A leak-proof seal is formed between the inner end of the fitting 23 and the wall 21 by an elastic gasket 24 of rubber or other appropriate material which may have a portion 25 embedded and compressed within a complementary annular groove in the inner end of said fitting 23. A support 26 is screwed into the inner end of the fitting 23 in a sufficiently loose relationship to permit compressed air or gas to pass between the support 26 and the fitting 23, notwithstanding that said parts are attached by threads as shown in Figs. 2 and 8 of the drawings. Thus, when the compressed air or gas is discharged from the cartridge or shell 16, it will pass through

the puncturing tube 20, through the part 24 and thence between the periphery of the support 26 and the wall of the fitting 23, notwithstanding the fact that the support 26 and the fitting 23 are screwed one within the other.

A spring 27 within the fitting 23 has one end seated upon the support 26 and its upper end supporting a ball valve 28 which is pressed against a valve seat 29 by said spring.

The upper end of the fitting 23 is formed with a wall 30 having a port 31 opening therethrough. The valve 28 is supported by the spring 27 in position to close the opening through the valve seat 29 and thereby close the port 31. The upper end of the fitting 23 has a diametrical slot 32 one end of which communicates with the outlet opening 14. This slot 32 functions for the double purpose of a discharge outlet and also as a facility for engaging a screw driver or other tool whereby the fitting 23 may be screwed into and out of the member 11.

The upper end of the fitting 23 is formed with a cylindrical extension 33 around which a metallic washer 34 is placed forming a part of a seal to prevent the escape of air or gas from the member 11 and requiring the air or gas to pass through the port 14 and thence through the nozzle tube. A rod 35 has one end extending through the port 31 and engaging the valve 28, and has its outer end screwed into a support 36 seated upon an elastic gasket 37 mounted on the washer 34. Thus, when the support 36 is forced inwardly in opposition to the resiliency or elasticity of the gasket 37, the rod 35 will open the valve 29 and permit air or gas to pass from the cartridge or shell 16 through the several passages and ports mentioned and through the tubes 6 and 4 to spray the liquid from the bottle or container 1.

An angular lever comprising an arm 38 and an arm 39 has one end of the arm 38 mounted on a pivot 40. The arm 38 engages the support 36 and is operated by the arm 39 to press the support 36 downwardly in opposition to the elasticity or resiliency of the gasket 37 to cause the rod 35 to open the valve 28. Normally, the valve 28 is held closed by the spring 27, as should be understood by reference to Fig. 2 of the drawings. However, the valve 28 may be opened in opposition to the spring 27 by obvious manipulation of the angular lever 38, 39.

In order to prevent accidental opening of the valve 28, as when the instrument is being carried or transported in a physician's case or the like, a nut 41 is screwed on the threaded part 8 of the nozzle tube and may be screwed outwardly to prevent inward movement of the arm 39 of the angular lever.

It should be clear enough that, when the nut 41 is screwed outwardly against the arm 39 of the angular lever (Fig. 2), the angular lever cannot be operated or moved to actuate the support 36. Thus, the instrument may be locked against accidental opening of the valve.

The cartridge or shell 16 is supported in the housing or casing 15 by a supporting screw 42 having an appropriately formed concavity complementary to the rounded lower end of the cartridge or shell. When the screw 42 is operated to force the cartridge or shell upwardly and to support the cartridge or shell in its upper position, a leak-proof joint is formed between the upper end of the cartridge or shell and the seat member 18, so that no air or gas can escape or pass between said parts. A lock device comprising a screw 43 is provided for the screw 42. The screw 43 is screwed into the lower end of the housing or casing 15 and may be loosened to permit manipulation of the screw 42. After the screw 42 has been moved to its proper adjustment, the screw 43 may be tightened into clamping engagement with the lower end of the screw 42 to prevent the same from becoming accidentally displaced.

As shown, I provide a base 44 into which the lower end of the housing or casing 15 extends. A clamp 45 extends through a slot 46 in the base 44 and may be screwed into the lower end of the housing or casing 15 and into clamping engagement with the supporting base 44 so as to effect rigid attachment of the parts and prevent accidental displacement or movement of one with respect to the other.

The member 11 may be attached to the housing or casing 15 by any appropriate detachable connection. As shown, the member 11 telescopes into the upper end of the housing or casing 15 and has in connection therewith a lug 47 (Fig. 1) engaging in a spiral or bayonet slot 48 in the upper end of the housing or casing 15. Obviously, as shown in Fig. 1, when the member 11 is telescoped into the upper end of the housing or casing 15, the pin or lug 47 will pass along the angular or spiral slot 48 in the manner of a bayonet attachment and will clamp the parts together so that they will be rigidly but detachably held in proper relationship for use of the instrument.

I am aware that this instrument may be modified and varied in numerous particulars without departure from the nature and principle of the invention. I contemplate such variations as may be deemed useful or expedient and, without restricting myself in unessential particulars, I claim:—

1. A device of the character described comprising a cartridge or shell enclosing compressed air or gas, means for puncturing and for forming a passage from said cartridge or shell for the flow of air or gas therefrom, and a support for said means having an outlet passage therethrough, a member attached to said support, an additional support mounted for sliding movements in said first named support, elastic means supporting and providing a seal for said additional support, a valve controlling passage of air or gas through and from said member, a stem attached to said additional support and engaging said valve, a lever pivoted to said first named support for moving said additional support in opposition to said elastic means to open said valve, and means limiting extent of movement of said lever.

2. A device of the character described comprising a cartridge or shell enclosing compressed air or gas, means for puncturing and for forming a passage from said cartridge or shell for the flow of air or gas therefrom, and a support for said means having an outlet passage therethrough; a member attached to said support, an additional support mounted for sliding movements in said first named support, elastic means supporting and providing a seal for said additional support, a valve controlling passage of air or gas through and from said member, a stem attached to said additional support and engaging said valve, a lever pivoted to said first named support for moving said additional support in opposition to said elastic means to open said valve, a spring for closing said valve, and a device settable in

position to prevent accidental operation of said lever.

3. A device of the character described comprising means forming a passage for the flow of air or gas from an enclosure, an outlet tube opening into said passage, a member supporting said means, a support mounted for sliding movements in said member beyond said passage, an elastic device supporting and providing a seal for said support, a valve controlling flow of air or gas through said passage, a spring for closing said valve, a stem attached to said support and movable thereby to move said valve to open position in opposition to said spring, a lever pivoted to said member for moving said support in opposition to said elastic device and said spring to open said valve, and means on said tube for limiting extent of movement of said lever.

4. A device of the character described comprising means forming a passage for the flow of air or gas from an enclosure, a member supporting said means, a support mounted for sliding movements in said member beyond said passage, an elastic device supporting and providing a seal for said support, a valve controlling flow of air or gas through said passage, a spring for closing said valve, a stem attached to said support and movable thereby to move said valve to open position in opposition to said spring, a lever pivoted to said member for moving said support in opposition to said elastic device and said spring to open said valve, and a device supported by a part of said passage forming means for preventing accidental operation of said lever.

ISAAC DEE KELLEY, JR.