No. 839,085. PATENTED DEC. 18, 1906.

F. C. DORMENT.

ATOMIZER AND LIKE INSTRUMENT.

APPLICATION FILED DEC. 26, 1905. RENEWED NOV. 3, 1906.

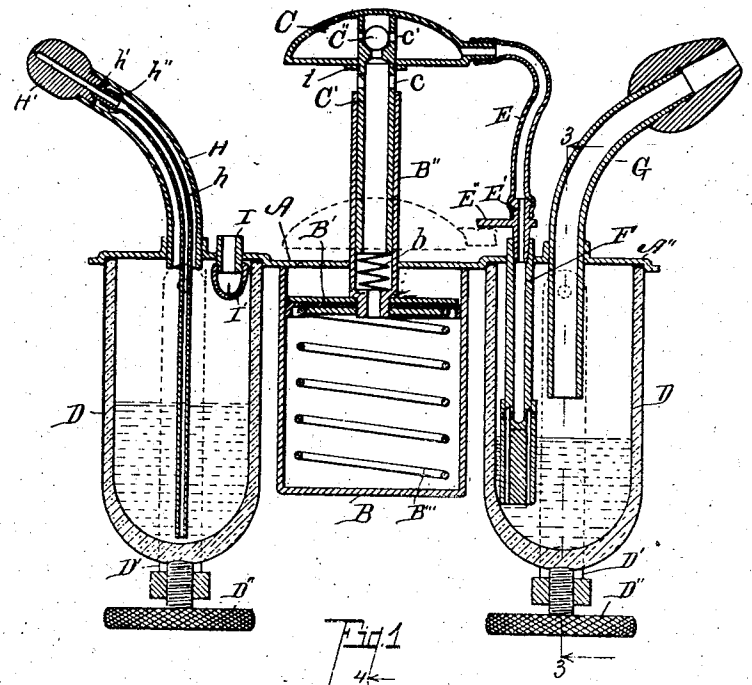


Fig. 1

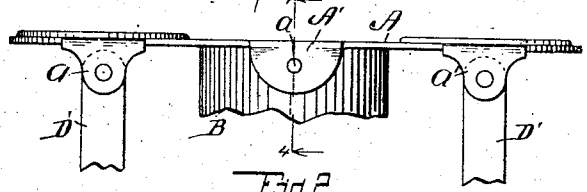


Fig. 2

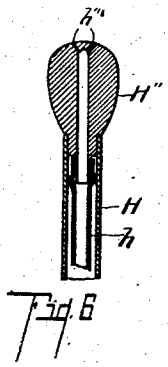


Fig. 6

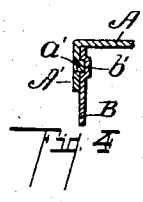


Fig. 4

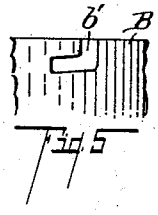


Fig. 5

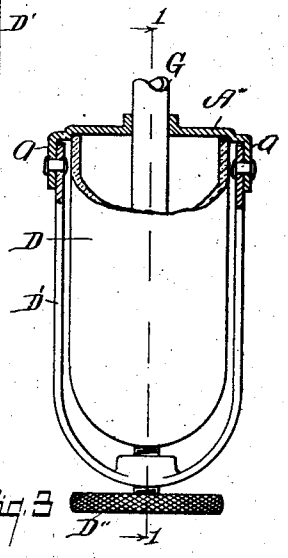


Fig. 3

Witnesses:

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Att'ys

UNITED STATES PATENT OFFICE.

FRANK C. DORMENT, OF KALAMAZOO, MICHIGAN, ASSIGNOR TO L. R. WILLIAMS, OF CHICAGO, ILLINOIS.

ATOMIZER AND LIKE INSTRUMENT.

No. 839,085. Specification of Letters Patent. Patented Dec. 18, 1906.

Application filed December 26, 1905. Renewed November 3, 1906. Serial No. 341,849.

To all whom it may concern:

Be it known that I, FRANK C. DORMENT, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo, State of Michigan, have invented certain new and useful Improvements in Atomizers and Like Instruments, of which the following is a specification.

This invention relates to improvements in atomizers and like instruments.

It relates particularly to an improved combination atomizer, sprayer, and nasal douche, such as is illustrated in Letters Patent No. 828,722, granted to me August 14, 1906, and is a modification and in some respects an improvement on the structure there shown.

The objects of this invention are, first, to provide an improved instrument of the class described adapted for use either as an atomizer or nebulizer or as a sprayer; second, to provide an improved spraying device by which the spray is delivered in a practically continuous stream; third, to provide an improved spraying device which may be quickly converted into a nasal douche; fourth, to provide an improved combination atomizing and spraying device which is very compact in structure and convenient to use.

Further objects and objects relating to structural details will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined, and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical longitudinal section of my improved combination atomizing and spraying device, taken on a line corresponding to line 1 1 of Fig. 3. Fig. 2 is a view showing structural details of the means for supporting the medicament-flasks and the air-pump. Fig. 3 is a detail view, partially in section, taken on a line corresponding to line 3 3 of Fig. 1. Fig. 4 is a detail section taken on a line corresponding to line 4 4 of Fig. 2. Fig. 5 is a detail showing structural details of the air-pump cylinder. Fig. 6 is a detail longitudinal section through the douche attachment H″, showing the same in position on the spray-tube H.

In the drawings the sectional views are taken looking in the direction of the little arrows at the ends of the section-lines, and similar letters of reference refer to similar parts throughout the several views.

Referring to the drawings, A is a plate which is provided with cap portions A″ for the medicament-receptacles D. These cap portions are preferably formed by stamping up portions of the plate A. The cap-plate is also provided with a pair of downwardly-depending ears A′, having inwardly-projecting lugs *a* formed thereon to engage the grooves *b′* in the pump-cylinder B. These grooves are so arranged that by a twisting movement the pump-cylinder is tightened against the plate and secured thereto. The plate A is also provided with downwardly-projecting ears *a′*, located at each side of the caps A″. To these ears are pivoted yokes D′, which may be swung down under the receptacles D, as clearly appears from the drawings. Thumb-screws D″, arranged to engage the bottoms of the medicament-receptacles for clamping them in place, are carried by these yokes. The thumb-screws are preferably provided with flat or disk-like heads which serve as supports for the instrument. It is evident that the receptacles can be very quickly removed when it is desired to clean or refill the same or change the medicament therein, also to afford access to the atomizing and spraying devices should the same become clogged.

The pump-cylinder is preferably arranged between the medicament-receptacles, so that it may be easily connected to either. The connections by which this is accomplished will be pointed out later.

By the means described the pump-cylinder is effectively supported and the construction is very economically and readily assembled.

The plunger B′ is of the usual or any desired construction. The plunger-rod is made up of sections B″ and C′, the section C′ being telescopically arranged in the section B″. Both sections are tubular and together form the air-delivery passage for the pump. The plunger-rod section B″ is secured to the plunger and opens through the same into the

cylinder B. On the upper end of the plunger-rod section is a hollow finger-piece C, into which the plunger-rod delivers. The upper end of the section C′ is formed into a valve-seat, and a ball-valve, as C″, is arranged therein to serve as a check-valve, preventing the return of the air. Below the finger-piece C the rod-section C′ is provided with inlet-ports *c*. The section C′ is held normally upward by the spring *b*, so that when the plunger-rod is in its normal position the intake-ports *c* are open. The plunger is held normally up in the pump-cylinder by the coiled spring B‴, which is arranged under it. This spring is of greater tension than the spring *b*, so that when the pressure is applied to the plunger-rod the section C′ slides into the section B″, thereby closing the intake-ports. A gasket *i* is arranged so that the upper end of the section B″ engages the same, so that the intake-ports are effectively sealed on the downward movement of the plunger.

The air is delivered from the chambered finger-piece C by means of the flexible tube E, which is provided with a tip E′, adapted to be inserted in the atomizing-tube F or in the nipple I of the sprayer-receptacle, as may be desired. The atomizer-tube F may be of any desired construction, and as the same forms no part of this invention I do not describe it in detail herein. The delivery-tube G of the atomizer is carried by the cap-plate A, as clearly appears from the drawings. This delivery-tube preferably extends well into the receptacle, so that it serves as a trap to prevent the spilling of the medicament.

The pump construction and its connections are substantially those illustrated and described in my application for Letters Patent hereinbefore referred to.

On the inner end of the nipple I of the spray-receptacle is a valve, preferably consisting of a rubber cap I′, having a slit in the crown thereof. The air from the pump readily opens this valve, but back pressure closes it. I prefer this form of valve on account of its economy. It is evident, however, that any check-valve would perform the same function.

The spraying device consists of an outer air-tube H, which is carried by the cap-plate, and the inner liquid-tube *h*, which projects downwardly into the receptacle. A spray-tip H′, adapted to fit into the tube H, is provided. This tip is provided with a suitable nipple *h*″ on its inner end, on which the liquid-tube *h* is arranged. The tip H′ is provided with air-passages *h*′, which connect the main passage thereof with the air-tube H. Thus arranged by connecting the delivery-tube E of the pump to the nipple I the air is delivered into the sprayer-receptacle and as it passes through the tip H′ it draws the medicament from the receptacle and delivers the same in a spray. The pressure of the air in the receptacle also assists in elevating the liquid, so that the device throws a very large volume of spray in proportion to its size.

When it is desired to convert the sprayer into a nasal douche, the spray-tip H′ is removed and the tip H″ is substituted therefor. In the tip H″ the air-passages *h* are omitted, so that the medicament is forced out by pressure of the air in the receptacle. The douche-tip H″ is preferably provided with two or more delivery-orifices *h*‴, so that the medicament is spread out thereby and delivered in a number of fine streams rather than in one solid stream.

By arranging the parts as I have illustrated and described they may be very quickly adjusted for use as an atomizer, spraying device, or as a nasal douche. It is found in practice that it is frequently desirable to use a douche or spray for first washing or cleansing the parts to be treated and then applying the medicament by means of the atomizer. In some instances the douche is preferred or considered more desirable and in others the sprayer, and it is sometimes desired to use both, first one and then the other. By my improved instrument I provide a structure whereby all of these operations can be carried out. The structure is very simple and compact and is very easy to operate. By the arrangement of the pump and valves I am enabled to secure a practically continuous flow of the medicament—that is, of course, when the pump is operated with a reasonable speed. When desired, the pump may be locked in its inner position by means of the tip E′ of the delivery-tube, which is provided with a projecting finger E″, adapted to engage the cap or finger-piece C of the plunger.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a cap-plate having a pair of caps formed thereon by stamping up portions thereof; in medicament-receptacles; a pair of downwardly-projecting ears on said plate located between the said caps, having inwardly-projecting lugs thereon; a pump-cylinder having grooves therein arranged to receive the said lugs whereby said pump-cylinder is secured in position; downwardly-projecting ears on said cap-plate arranged at each side of the said caps thereon; yokes arranged to swing under said receptacles pivoted on said ears; thumb-screws carried by said yokes arranged to engage said receptacles for clamping them in position, said thumb-screws having disk-like heads adapted to form supports; an atomizer-tube arranged through said cap-plate projecting into one of said receptacles; a delivery-tube for said receptacle, arranged through said cap-plate; a spray device carried by said cap-plate, projecting into the other receptacle;

a nipple arranged through said cap-plate opening into said last-named receptacle; a plunger for said pump-cylinder arranged through said cap-plate; and an air-delivery tube for said pump, adapted to be connected to the said atomizer-tube or to the said nipple, as may be desired, for the purpose specified.

2. The combination of a cap-plate having a pair of caps formed thereon by stamping up portions thereof; medicament-receptacles; a pair of downwardly-projecting ears on said plate located between the said caps, having inwardly-projecting lugs thereon; a pump-cylinder having grooves therein arranged to receive the said lugs, whereby said pump-cylinder is secured in position; downwardly-projecting ears on said cap-plate arranged at each side of the said caps thereon; yokes arranged to swing under said receptacles, pivoted on said ears; thumb-screws carried by said yokes, arranged to engage said receptacles for clamping them in position; an atomizer-tube arranged through said cap-plate projecting into one of said receptacles; a delivery-tube for said receptacle, arranged through said cap-plate; a spray device carried by said cap-plate, projecting into the other receptacle; a nipple arranged through said cap-plate opening into said last-named receptacle; a plunger for said pump-cylinder arranged through said cap-plate; and an air-delivery tube for said pump, adapted to be connected to the said atomizer-tube or to the said nipple, as may be desired, for the purpose specified.

3. The combination of a cap-plate having a pair of caps formed thereon by stamping up portions thereof; medicament-receptacles; a pair of downwardly-projecting ears on said plate located between the said caps, having inwardly-projecting lugs thereon; a pump-cylinder having grooves therein arranged to receive the said lugs whereby said pump-cylinder is secured in position; downwardly-projecting ears on said cap-plate, arranged at each side of the said caps thereon; yokes arranged to swing under said receptacles, pivoted on said ears; thumb-screws carried by said yokes arranged to engage said receptacles for clamping them in position, said thumb-screws having disk-like heads adapted to form supports; an atomizer-tube arranged through said cap-plate projecting into one of said receptacles; a delivery-tube for said receptacle, arranged through said cap-plate; a spray device carried by said cap-plate, projecting into the other receptacle; a nipple arranged through said cap-plate opening into said last-named receptacle; a plunger for said pump-cylinder; and an air-delivery tube for said pump, adapted to be connected to the said atomizer-tube or to the said nipple, as may be desired, for the purpose specified.

4. The combination of a cap-plate having a pair of caps formed thereon by stamping up portions thereof; medicament-receptacles; a pair of downwardly-projecting ears on said plate located between the said caps, having inwardly-projecting lugs thereon; a pump-cylinder having grooves therein arranged to receive the said lugs, whereby said pump-cylinder is secured in position; downwardly-projecting ears on said cap-plate arranged at each side of the said caps thereon; yokes arranged to swing under said receptacles pivoted on said ears; thumb-screws carried by said yokes, arranged to engage said receptacles for clamping them in position; an atomizer-tube arranged through said cap-plate projecting into one of said receptacles; a delivery-tube for said receptacle, arranged through said cap-plate; a spray device carried by said cap-plate, projecting into the other receptacle; a nipple arranged through said cap-plate opening into said last-named receptacle; a plunger for said pump-cylinder; and an air-delivery tube for said pump, adapted to be connected to the said atomizer-tube or to the said nipple, as may be desired, for the purpose specified.

5. The combination of a cap-plate having a pair of caps formed thereon by stamping up portions thereof; medicament-receptacles; a pair of downwardly-projecting ears on said plate located between the said caps, having inwardly-projecting lugs thereon; a pump-cylinder having grooves therein arranged to receive the said lugs whereby said pump-cylinder is secured in position; downwardly-projecting ears on said cap-plate arranged at each side of the said caps thereon; yokes arranged to swing under said receptacles, pivoted on said ears; thumb-screws carried by said yokes arranged to engage said receptacles for clamping them in position, said thumb-screws having disk-like heads adapted to form supports; an atomizing device for one of said receptacles, carried by said plate; a spray device carried by said cap-plate for the other of said receptacles; a plunger for said pump-cylinder, arranged through said cap-plate; and an air-delivery tube for said pump, adapted to be connected to the said atomizer device or to the said spray device, as may be desired, for the purpose specified.

6. The combination of a cap-plate having a pair of caps formed thereon by stamping up portions thereof; medicament-receptacles; a pair of downwardly-projecting ears on said plate located between the said caps, having inwardly-projecting lugs thereon; a pump-cylinder having grooves therein arranged to receive the said lugs, whereby said pump-cylinder is secured in position; downwardly-projecting ears on said cap-plate arranged at each side of the said caps thereon; yokes arranged to swing under said receptacles, pivoted on said ears; thumb-screws car-

ried by said yokes arranged to engage said receptacles for clamping them in position; an atomizing device for one of said receptacles, carried by said plate; a spray device carried by said cap-plate for the other of said receptacles; a plunger for said pump-cylinder, arranged through said cap-plate; and an air-delivery tube for said pump, adapted to be connected to the said atomizer device or to the said spray device, as may be desired, for the purpose specified.

7. The combination of a cap-plate having a pair of caps formed thereon by stamping up portions thereof; medicament-receptacles; a pair of downwardly-projecting ears on said plate located between the said caps, having inwardly-projecting lugs thereon; a pump-cylinder having grooves therein arranged to receive the said lugs whereby said pump-cylinder is secured in position; downwardly-projecting ears on said cap-plate arranged at each side of the said caps thereon; yokes arranged to swing under said receptacles pivoted on said ears; thumb-screws carried by said yokes arranged to engage said receptacles for clamping them in position, said thumb-screws having disk-like heads adapted to form supports; an atomizing device for one of said receptacles, carried by said plate; a spray device carried by said cap-plate for the other of said receptacles; a plunger for said pump-cylinder; and an air-delivery tube for said pump, adapted to be connected to the said atomizer device or to the said spray device, as may be desired, for the purpose specified.

8. The combination of a cap-plate having a pair of caps formed thereon by stamping up portions thereof; medicament-receptacles; a pair of downwardly-projecting ears on said plate located between the said caps, having inwardly-projecting lugs thereon; a pump-cylinder having grooves therein arranged to receive the said lugs whereby said pump-cylinder is secured in position; downwardly-projecting ears on said cap-plate arranged at each side of the said caps thereon; yokes arranged to swing under said receptacles pivoted on said ears; thumb-screws carried by said yokes arranged to engage said receptacles for clamping them in position; an atomizing device for one of said receptacles, carried by said plate; a spray device carried by said cap-plate for the other of said receptacles; a plunger for said pump-cylinder; and an air-delivery tube for said pump, adapted to be connected to the said atomizer device or to the said spray device, as may be desired, for the purpose specified.

9. The combination of a cap-plate having caps thereon; medicament-receptacles; a pump-cylinder carried by said plate; yokes arranged to swing under said receptacles, pivoted on said cap-plate; thumb-screws carried by said yokes arranged to engage said receptacles for clamping them in position, said thumb-screws having disk-like heads adapted to form supports; an atomizing device carried by said cap-plate for one of said receptacles; a spraying device carried by said cap-plate for the other receptacle; a plunger for said pump-cylinder arranged through said cap-plate; and means for connecting said pump to the said atomizing or spraying devices, as may be desired, for the purpose specified.

10. The combination of a cap-plate having caps thereon; medicament-receptacles; a pump-cylinder carried by said plate; yokes arranged to swing under said receptacles, pivoted on said cap-plate; thumb-screws carried by said yokes arranged to engage said receptacles for clamping them in position; an atomizing device carried by said cap-plate, for one of said receptacles; a spraying device carried by said cap-plate, for the other receptacle; a plunger for said pump-cylinder arranged through said cap-plate; and means for connecting said pump to the said atomizing or spraying devices as may be desired, for the purpose specified.

11. The combination of a cap-plate having caps thereon; medicament-receptacles; a pump-cylinder carried by said plate; yokes arranged to swing under said receptacles, pivoted on said cap-plate; thumb-screws carried by said yokes arranged to engage said receptacles for clamping them in position, said thumb-screws having disk-like heads adapted to form supports; an atomizing device for one of said receptacles; a spraying device for the other receptacle; a plunger for said pump-cylinder; and means for connecting said pump to the said atomizing or spraying devices, as may be desired, for the purpose specified.

12. The combination of a cap-plate having caps thereon; medicament-receptacles; a pump-cylinder carried by said plate; yokes arranged to swing under said receptacles, pivoted on said cap-plate; thumb-screws carried by said yokes arranged to engage said receptacles for clamping them in position; an atomizing device for one of said receptacles; a spraying device for the other receptacle; a plunger for said pump-cylinder; and means for connecting said pump to the said atomizing or spraying devices, as may be desired, for the purpose specified.

13. The combination of a cap-plate having caps thereon; medicament-receptacles; a pump-cylinder carried by said plate; yokes for securing said receptacles to said cap-plate; an atomizing device for one of said receptacles, carried by said cap-plate; a spraying device for the other receptacle, carried by said cap-plate; a plunger for said pump-cylinder arranged through said cap-

plate; and means for connecting said pump to the said atomizer or spray device, as may be desired, for the purpose specified.

14. The combination of a cap-plate having caps thereon; medicament-receptacles; a pump-cylinder carried by said plate; yokes for securing said receptacles to said cap-plate; an atomizing device for one of said receptacles; a spraying device for the other receptacle; a plunger for said pump-cylinder; and means for connecting said pump to the said atomizer or spray device, as may be desired, for the purpose specified.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

FRANK C. DORMENT. [L. S.]

Witnesses:
W. R. QUIN,
MARY BURKE.