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DISCHARGE CAP FOR SPRAY DEVICES

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Fig. 1.

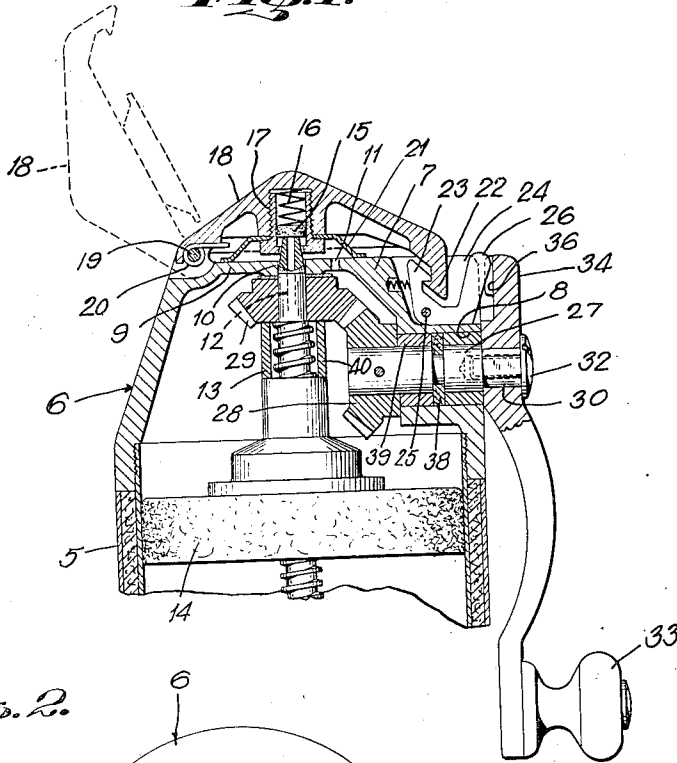
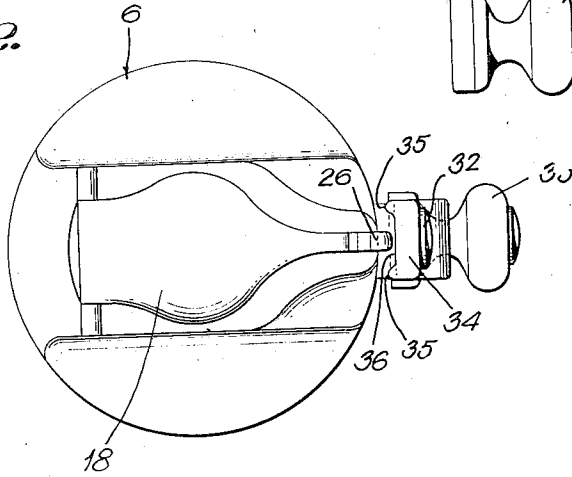


Fig. 2.



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DISCHARGE CAP FOR SPRAY DEVICES

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10 Claims. (Cl. 299—93)

This invention relates to spraying devices including such devices known as fire extinguishers and the object of the invention is to provide a discharge cap for devices of the kind under consideration having means normally sealing the discharge nozzle of the cap and means automatically actuated in the operation of the spray device for releasing the seal and closure for said nozzle and clearing the nozzle to facilitate discharge of the contents of the spray from said nozzle. The novel features of the invention will be best understood from the following description when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed, and in which the separate parts are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a sectional view through the cap end of a spray device made according to the invention, and

Fig. 2 is a plan view of the structure as seen in Fig. 1.

In spray devices of the kind under consideration, it has usually been the custom to perform several operations in preparing the device for use. When dealing with fire fighting or extinguishing apparatus, it is especially important that the spray devices are as fool-proof as possible and that a minimum amount of operations be required in order to avoid delay or confusion. In most instances, with devices of this kind, it has been necessary to perform several operations in preparing the spray device for use and these operations have brought about the undesirable confusion and delay above referred to.

Our improved discharge cap or head eliminates these objectionable features in providing first a crank handle operation, of which is apparent to anyone grasping the device, and second in automatically releasing the nozzle closure in the operation of rotating the crank and simultaneously discharging the contents of the device by continued rotation of the crank. Further, with a structure of this type and kind, the cylinder or casing of the device may be conveniently held between one hand and the body, while the crank is rotated by the other hand, thus providing a firm support of the device and facilitating guidance of the spray discharged from the nozzle thereof.

In Fig. 1 of the drawing, we have indicated at 5 part of the casing or container of a spray device; at 6 is shown a cap or head detachable with the open end of the container, the side

walls of the cap being contracted throughout the major part of the circumference thereof, except for a radial enlargement 7, which has an aperture 8 therein. The outer end of the cap has a closure wall 9, centrally of which is an opening 10, to one side of which is a small vent passage 11. The opening 10 is arranged in alignment with the center of the casing 5 and is adapted to receive the nozzle discharge end 12 of a drive screw 13 which extends longitudinally through the casing and feeds a piston or plunger 14 in both directions through the casing.

With the present construction, the screw is tubular in form so that in the downward movement of the plunger 14, the material in the casing is discharged upwardly through the nozzle 12.

The outer end of the nozzle 12 protrudes through the wall 9 and is sealed by a pad 15 seated firmly on the end of the nozzle by a spring 16. The pad and spring are supported in a thimble-shaped cup 17 detachable with respect to a closure plate 18. This plate is pivoted, as seen at 19, to one recessed side of the cap 6 and a spring 20 is arranged on the pin engaging the cover 18 and the wall 9 in such manner that, when the cover is released, the spring will automatically move the same into the dotted line position shown. A cup-shaped spring disc 21 is supported on the inner portion of the cap 18 by the cup 17 and this disc engages the top wall 9 beyond the limits of the vent 11 to seal said vent when the device is in inoperative position.

On the wall of the cover 18, opposite the pivot 19, is a downwardly projecting hook shaped catch 22 adapted to be engaged by a pawl 23 arranged in a recessed portion 24 of the enlargement 7 and pivoted, as seen at 25. The pawl 23 includes an outwardly and angularly extending finger 26 which projects beyond the outer surface of the cap 6, when the cover 18 is in closed position.

Mounted in the aperture 8 of the cap is a stub shaft or pin 27, to the inner end of which is secured a bevelled pinion 28, which meshes with a corresponding pinion 29 keyed to the screw shaft 13. Secured to the outer reduced end 30 of the shaft 27 is a crank 31 held in position by a screw 32. The end of the crank 31 is preferably offset with respect to the cylinder 5 and has a knob or hand-piece 33 projecting from the pivot end of the crank and preferably in alignment with the operating end is a cam 34 having cam surfaces 35 on the inner surface of the outer end portion thereof in posi-

tion to engage the finger 26. In the normal position, the finger 26 will be arranged in the recessed portion 36 between the cam surfaces and if desired suitable means may be provided to temporarily support the handle member in this position. However, if the spray device is maintained, when not in use in the upright position, gravity will support the crank in the desired position.

The pin 27 has a reduced portion 37, around which is supported a packing ring 38, which seals the pin or shaft mounting in the aperture 8. Bushings 39 are also disposed on the pin or shaft 27 at opposite sides of the packing 38.

In the use of the device, the cylinder or tubular casing 5 will preferably be arranged between the arm and the body of the operator with the hand of this arm arranged near the cap end 6 of the device. The other hand will then grasp the crank and in the first part of the rotation thereof, the finger 26 will be thrown inwardly by engagement with one of the cam surfaces 35, thus throwing the pawl 23 out of engagement with the catch 22 releasing the cover 18, which then automatically swings into fully open position and continued rotation of the crank will move the plunger 14 downwardly in the casing and discharge the contents thereof through the nozzle 12. After the desired amount of the contents has been discharged for any intended purpose, the cover plate 18 can be swung into closed position with the crank in the downwardly hanging position, shown in Fig. 1. This operation will automatically move the pawl 23 into engagement with the catch 22 and the parts will again assume the sealed position.

It will be understood that our invention is applicable to spray devices of any type and kind and it will appear that by reason of the simple matter of holding and supporting the device, the spray may be accurately directed on the desired object. In fire extinguishing spray devices, it will be apparent that greater efficiency is provided in putting out a fire, particularly in that the waste of the discharged fluid is minimized. Further, the device becomes more efficient due to the fact that instantaneous discharge of the extinguishing fluid is provided.

The fool-proof characteristics of the spray device will be understood from the fact that when a user purchases the device he is told that for operation all that it is necessary to do is to rotate the crank. With other devices, directions for use are applied to the device and in that several things must be done, the operator forgets and in the excitement and haste, he hurriedly reviews directions or instructions and then proceeds to operate.

Our discharge cap or head becomes highly efficient from the standpoint that first fractional rotation of the crank fully opens the nozzle and thus continued operation of the crank will produce an instantaneous spray discharge. The device may be well described as having a trigger-like action.

It will be apparent that by sealing the vent as described, the contents of the container in conjunction with which the discharge cap is employed may be protected against admission of air or foreign particles of any kind.

While the device has been described generally as a spray device and specific reference has been made also to fire extinguishers, it will be apparent that the discharge cap may be used on containers, dispensers of any type or kind for dis-

persing light or heavy fluids or even heavy oils or syrups. In some of these uses, the dispensing will be intermittent to control portions discharged. In these cases it will also appear that the sealing means will operate to preserve the contents of the container intermediate the periods of dispensing the contents.

Having fully described our invention, what we claim as new and desire to secure by Letters Patent is:

1. The combination with the cylinder of a spray device having a discharge at one end, of a cap detachable with respect to said end of the device, a crank supported in one wall of the cap, a spring actuated cover pivoted on said cap and controlling said discharge, means in the cap and on said cover for retaining the cover in closed position against the action of said spring, and means on said crank engaging the last named means of the cap to automatically release said cover for movement into open position.

2. A discharge control unit for spray devices, said unit comprising a casing having a discharge opening centrally thereof, a cover pivotally supported to the casing, a spring actuated sealing pad supported in the cover in registering alignment with said casing opening, a pawl supported on the casing, means on the cover engaging the pawl to support the cover in closed position on said casing, means on the casing operatively engaging said pawl to automatically release said cover, said last named means comprising a crank rotatable on the casing, and said crank having cam surfaces engaging said pawl.

3. A discharge unit for spray devices, comprising a casing having a closed end wall, said end wall having a nozzle discharge passage opening into the casing for exposing a nozzle there-through, a crank rotatably mounted on the casing, a cover movably supported on said end wall of the casing, yieldable means on the cover for sealing said nozzle when the cover is in closed position, a catch device supported on said end of the casing and movable independent of said cover, said device and cover having interengaging means for retaining the cover in closed position, and means on said crank operatively engaging said device in the rotation of said crank to release said cover for movement into position exposing said nozzle.

4. A discharge unit for spray devices, comprising a casing having a closed end wall, said end wall having a nozzle discharge passage opening into the casing for exposing a nozzle there-through, a crank rotatably mounted on the casing, a cover movably supported on said end wall of the casing, yieldable means on the cover for sealing said nozzle when the cover is in closed position, a catch device supported on said end of the casing and movable independent of said cover, said device and cover having interengaging means for retaining the cover in closed position, means on said crank operatively engaging said device in the rotation of said crank to release said cover for movement into position exposing said nozzle, said end wall of the casing adjacent said passage having a vent opening, and means independent of said nozzle sealing means for sealing the vent when the cover is in closed position.

5. A discharge unit for spray devices, comprising a casing having a closed end wall, said end wall having a nozzle discharge passage opening into the casing for exposing a nozzle there-through, a crank rotatably mounted on the cas-

ing, a cover movably supported on said end wall of the casing, yieldable means on the cover for sealing said nozzle when the cover is in closed position, a catch device supported on said end of the casing and movable independent of said cover, said device and cover having interengaging means for retaining the cover in closed position, means on said crank operatively engaging said device in the rotation of said crank to release said cover for movement into position exposing said nozzle, and said last named means in combination with said device normally retaining the crank in predetermined position against accidental rotation.

6. In a fire extinguisher device, a discharge cap, means in the cap for exposing the discharge nozzle of the device through one end wall of said cap, a cover pivoted to said wall of the cap, a catch on the cover, a pawl pivoted on the cap and movable relatively to said cover, tensional means supporting the pawl in engagement with the catch of said cover to retain the cover in closed position, means on the cover engaging the nozzle to seal the end thereof when the cover is held in closed position by said pawl, a member on said pawl for actuating the same, and manually actuated means movably supported on said cap and having a part operatively engaging the member of said pawl to move the pawl into position releasing said cover.

7. In a fire extinguisher device, a discharge cap, means in the cap for exposing the discharge nozzle of the device through one end wall of said cap, a cover pivoted to said wall of the cap, a catch on the cover, a pawl pivoted on the cap and movable relatively to said cover, tensional means supporting the pawl in engagement with the catch of said cover to retain the cover in closed position, means on the cover engaging the nozzle to seal the end thereof when the cover is held in closed position by said pawl, a member on said pawl for actuating the same, manually actuated means movably supported on said cap and having a part operatively engaging the member of said pawl to move the pawl into position releasing said cover, and said cap having a vent passage, and means on said cover for sealing said vent passage when the cover is in closed position.

8. A discharge cap for spray devices comprising a substantially cup shaped casing, a nozzle opening in said casing for supporting a discharge nozzle with the end thereof exposed through the casing, a cover pivoted directly to the casing,

resilient means normally supporting the cover in open position, means on the cover for sealing the nozzle when the cover is in closed position, a pawl mounted on the casing and movable relatively to and adapted to engage the cover to support the cover in closed position against the action of said resilient means, and means movably supported on the casing including a part for automatically actuating said pawl in the operation of said last named means to release the cover in the operation of discharging fluid from said nozzle.

9. A discharge cap for spray devices comprising a substantially cup shaped casing, a nozzle opening in said casing for supporting a discharge nozzle with the end thereof exposed through the casing, a cover pivoted directly to the casing, resilient means normally supporting the cover in open position, means on the cover for sealing the nozzle when the cover is in closed position, a pawl mounted on the casing and movable relatively to and adapted to engage the cover to support the cover in closed position against the action of said resilient means, means movably supported on the casing including a part for automatically actuating said pawl in the operation of said last named means to release the cover in the operation of discharging fluid from said nozzle, and said last named means comprising a member manually operated in the discharge of fluid from said spray device.

10. A discharge cap for spray devices comprising a substantially cup shaped casing, a nozzle opening in said casing for supporting a discharge nozzle with the end thereof exposed through the casing, a cover pivoted directly to the casing, resilient means normally supporting the cover in open position, means on the cover for sealing the nozzle when the cover is in closed position, a pawl mounted on the casing and movable relatively to and adapted to engage the cover to support the cover in closed position against the action of said resilient means, means movably supported on the casing including a part for automatically actuating said pawl in the operation of said last named means to release the cover in the operation of discharging fluid from said nozzle, said last named means comprising a member manually operated in the discharge of fluid from said spray device, said cap having a vent aperture, and means on said cover for sealing the vent when the cover is in closed position.

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