April 16, 1935. H. H. METZGAR 1,997,942

AUTOMATIC PLUG LOCK FOR CONTAINERS

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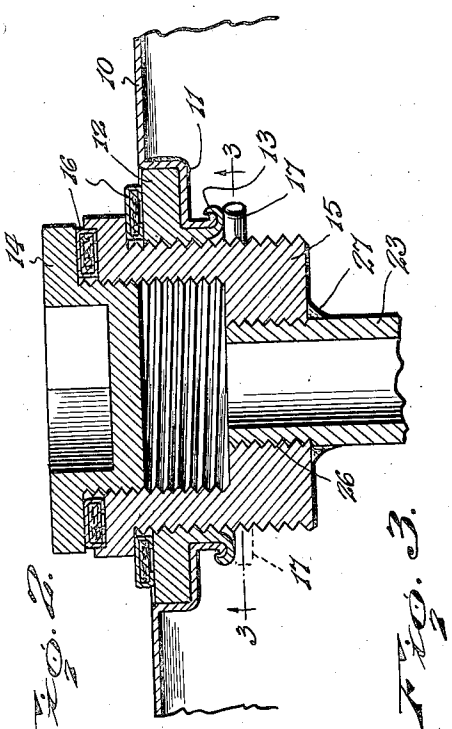


Fig. 2.

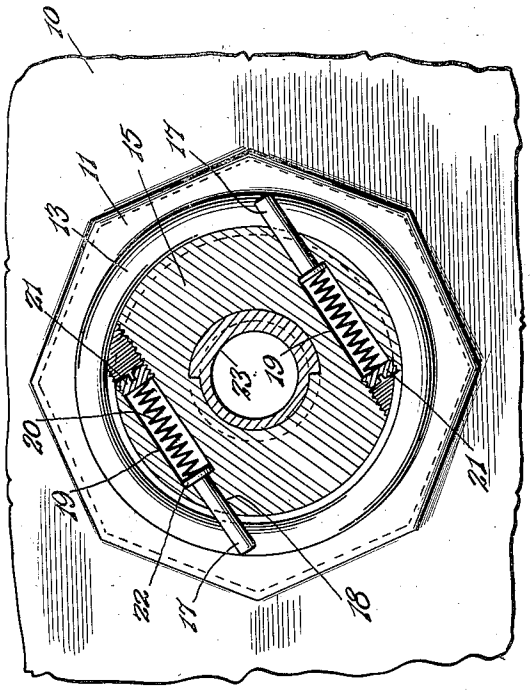


Fig. 3.

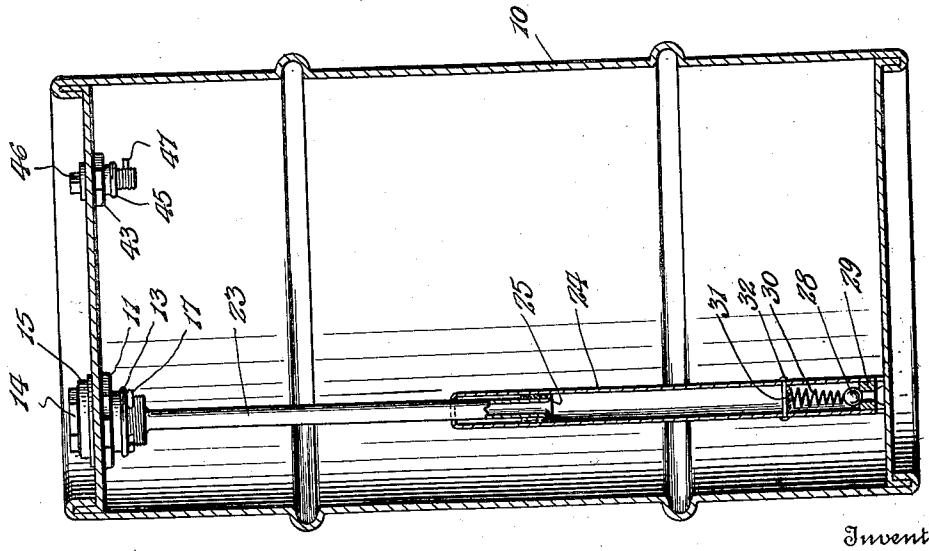


Fig. 1.

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Fig. 4.

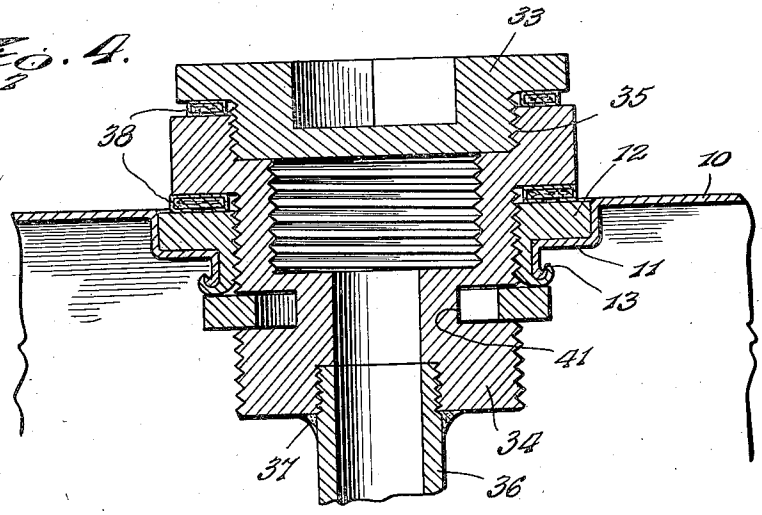


Fig. 5.

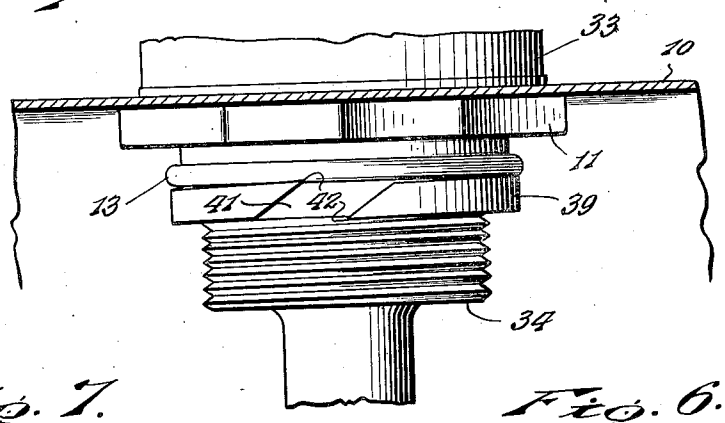


Fig. 7.

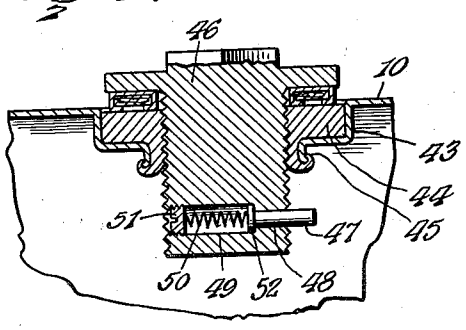
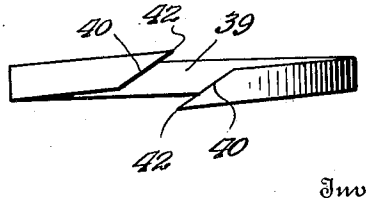


Fig. 6.



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UNITED STATES PATENT OFFICE

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AUTOMATIC PLUG LOCK FOR CONTAINERS

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Application November 17, 1931, Serial No. 575,597

4 Claims. (Cl. 220—39)

This invention relates to non-refillable containers and has for an object to provide more particularly an automatic plug lock for containers, such as cans used to transport, store and dispense high-grade oils.

A further object is to provide an extremely strong, simple and inexpensive device which will render high-grade oil cans pilfer-proof and which, at the same time, may be applied to the standard nuts of the cans already in use without extensive alterations.

A still further object is to provide an inexpensive device of the class described consisting essentially of a reducer and a valve-controlled pipe through which the contents of the oil can may be pumped, in the usual manner, the reducer being provided with novel locking means which positively prevent surreptitious backing out of the reducer even by application of the most powerful wrenches.

A still further object is to provide oil cans, equipped as described in the foregoing, with an air vent plug which also is locked against removal so that the can may not be refilled with inferior oil through the air vent.

With the above and other objects in view the invention consists in certain novel details of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings forming part of this specification,

Figure 1 is a longitudinal sectional view through an oil can of ordinary construction equipped with my invention,

Fig. 2 is an enlarged detail sectional view through the reducer and adjacent parts,

Fig. 3 is an enlarged cross sectional view, taken on the line 3—3 of Fig. 2, showing the reducer locking pins in operative position,

Fig. 4 is a sectional view through a modified form of the reducer, in applied position, and equipped with a modified form of locking means consisting of a split spring ring,

Fig. 5 is a side elevation of the parts shown in Fig. 4,

Fig. 6 is a side elevation of the split locking ring and showing the terminals tilted to penetrate the walls of the ring seat,

Fig. 7 is an enlarged sectional view through my improved air vent plug.

Referring now to the drawings in which like characters of reference designate similar parts in the various views, 10 designates a container which may be of any type, but which for the purpose of one example of the application of the invention will be described as a can or barrel of the usual and well known type used to store, ship and dispense lubricating oils. As usual, cans of this type are formed in the head with a countersunk octagon shaped seat 11, as shown best in Fig. 2, into which is pressed a nut 12, the edge of the nut being spun over the edge of the seat, as shown at 13, during fabrication of the head to permanently associate the nut and seat. Usually, also, there is provided a plug 14 which is of sufficient diameter to thread into the nut 12 and seal the opening.

In carrying out the invention, I may take the usual standard plug 14 and reduce its diameter so that it is of somewhat smaller diameter than the diameter of the nut 12. I provide a reducer 15 which is threaded into the nut 12 and receives the modified plug 14. Packing rings 16 may be interposed between the reducer and the plug 14 and between the reducer and the nut 12. To lock the reducer against being surreptitiously backed off, I preferably provide a pair of pins 17, best shown in Fig. 3, these pins being disposed on opposite sides of the axis of the reducer and being arranged parallel to a diameter of the reducer and being also preferably disposed in the same plane. These pins are slidably fitted in cylindrical seats 18 which, preferably, are bored out of the body of the reducer, or that portion of the reducer where the metal is of greater thickness in a radial direction. The seats 18 are uniformly enlarged to provide housings 19 for helical springs 20. A kerfed plug 21 is threaded into each seat to permit of adjustment of the tension of the corresponding spring and, preferably, the corresponding pin 17 is provided with a disk head 22 against which the spring presses to normally urge the pin outwardly, as will be understood.

The spring-pressed pins 17 are so located that when the reducer 15 is threaded home into the nut 12, the pins will spring outwardly underneath the spun-over edge 13 of the nut 12 and positively prevent backing out of the reducer.

In further carrying out the invention, I provide an outlet pipe which, preferably, is formed of an upper section 23 and a lower section 24 telescopically united at their inner ends, as shown at 25. The upper section is threaded into the reducer, as shown at 26. Thereupon, to unite the pipe to the reducer permanently, the pipe is spot welded, preferably, as shown at 27, to the reducer. The lower section 24 of the pipe is equipped with a ball check valve 28 which is pressed downwardly into its seat 29, by means of a helical spring 30, the upper end of the spring being seated upon a screen 31 held in place by means of a rivet 32, or otherwise. The screen prevents insertion of an iron or similar tool to dislodge the check valve 28.

The contents of the can may be dispensed in the usual manner by removing the plug 14 and screwing into the reducer 15 the coupling of the dispensing pump. As will be apparent, after the contents have been exhausted, the check valve

26 cannot be lifted to permit refilling through the reducer since the screen 31 will defeat an attempt being made to dislodge the valve. Moreover, should a wrench be applied to the reducer 15, in an attempt to back out the reducer and surreptitiously refill the can, the pins 17 will positively prevent movement of the reducer in an axial direction so that all that may be accomplished is shearing of the reducer threads while the reducer remains positively locked in place by the pins 17 projecting underneath the spun-over edge 13 of the seat of the nut 12.

A modified form of reducer and locking means therefor is shown in Figs. 4 and 5. The main object of this modified form of reducer is to permit of the standard plug 33 being used without any alterations whatsoever, that is, the plug 33 is the same plug which according to previous practice, screws into the nut 12 of the container 10. The modified reducer 34 is enlarged in diameter, as shown at 35, to receive the standard plug 33 and the reducer is made longer than the first-described form in order to obtain a greater thickness of metal for the proper seating of the split spring locking ring to be presently described. The outlet pipe 36 is threaded into the reducer, as above described, and spot welded thereto, as shown at 37, for the purpose hitherto explained.

Packing rings 38 may be disposed between the plug 33 and the reducer, and between the reducer and the nut 12.

Although the modified form of reducer 34 may be equipped with the above described locking pins, it is, however, preferable to provide a split spring locking ring 39, the terminals of which are beveled and preferably offset oppositely beyond the plane of the ring, as shown at 40. However, the terminals may be in the same plane of the ring, if preferred, instead of being offset. The reducer 34 is provided with an annular groove or seat 41, best shown in Fig. 4, to receive the locking ring, the seat being of sufficient depth to permit of the ring being contracted into the seat and extend flush with the periphery of the reducer, in much the same manner as the piston ring of a piston, to permit of the reducer being screwed home into the nut 12. As will be understood, when the reducer is fully screwed into the nut, the seat 41 will have passed below the spun-over terminal 13 of the nut 12 and, by reason of its resiliency, the ring then expands to lodge underneath said spun-over terminal and positively prevent backing out of the reducer.

By virtue of the ends of the locking ring being offset and beveled, sharpened penetrating points 42 are produced which gouge into the opposite walls of the seat during a surreptitious attempt to back off the reducer and positively hold the ring stationary against dislodgment.

To further render the can pilfer-proof, I also equip the air vent plung with locking means. This is best illustrated in Fig. 7 in which the can 10 is shown as provided with a countersunk seat 43 to receive a nut 44, the edge 45 of which is spun over the edge of the seat in a manner similar to the outlet pipe fitting previously described. The air vent plug 46 is threaded into the nut 44 in a loose fitting manner so that air may escape between the threaded surfaces of the plug and nut to vent the interior of the container. To prevent backing out of the plug to surreptitiously refill the can, I provide a locking pin 47 which is slidably fitted in a cylindrical seat 48 formed in and extending diametrically through the lower end of the plug. The seat is enlarged, as shown at 49, to form a housing for a helical spring 50, the tension of which is adjusted by means of a kerfed nut 51. The spring presses against a disk head 52 which is integral with the pin and slidably fits in the spring housing.

It will be observed that, when the air vent plug 46 is screwed fully home into the nut 44, a considerable space exists between the locking pin 47 and the spun-over terminal 45 of the nut 44. The purpose of this space is to permit of a limited amount of backing off movement of the plug to bring the loose fitting portion of the plug into engagement with the nut to properly vent the can to the atmosphere, when in use.

From the above description, it is thought that the construction and operation of my invention will be fully understood and appreciated without further explanation.

What is claimed is:

1. A non-refillable container having an opening in one wall, a reducer fitted through the opening, and a locking element mounted in the wall of the reducer and adapted to engage the inner surface of the container beyond the opening therein to prevent withdrawal of the reducer, the wall of the reducer preventing access to the locking element when the reducer is in operative position.

2. A non-refillable container having an opening in one wall, a reducer fitted through the opening and having a transverse bore in its inner end portion, said bore being inaccessible from the outer end of the reducer when the reducer is in operative position, a locking pin slidable in said transverse bore and adapted to project therefrom and engage the inner surface of the container to prevent withdrawal of the reducer, and means yieldably holding the pin projected whereby the pin may be held within the reducer while the reducer is being inserted through the opening in the container.

3. A non-refillable container having an opening in one wall, a reducer fitted through said opening and having a transverse bore in its inner end portion, said bore being of different diameters at its opposite ends, a locking pin slidably fitted in that end of the bore having the lesser diameter and provided at its inner end with means to limit its outward movement, a spring housed in that end of the bore having the greater diameter and bearing upon the locking pin to project the same into engagement with the inner surface of the container to prevent withdrawal of the reducer but yielding to permit housing of the pin in the reducer while the reducer is being inserted through the opening in the container, and a nut fitted in said larger end of the bore to adjust the tension of the spring, the wall of the reducer preventing access to the bore when the reducer is in operative position.

4. A non-refillable container having an opening in one wall, a reducer fitted through said opening and having an annular external groove, and a split spring ring fitted in said groove and housed therein while the reducer is being inserted through the opening in the container and adapted to engage against the inner surface of the container as the reducer is inserted whereby to prevent withdrawal of the reducer, the wall of the inserted reducer preventing access to the groove and the ring.

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