Sept. 20, 1938. N. N. WISWELL 2,130,634

DEVICE FOR OPENING CANS

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Fig. 1.

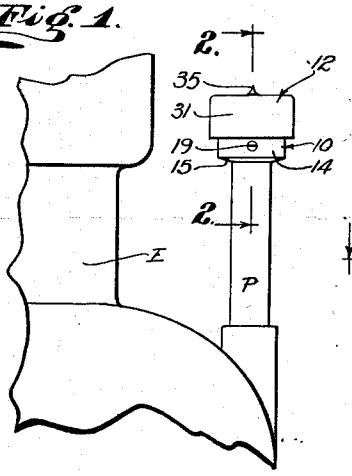


Fig. 2.

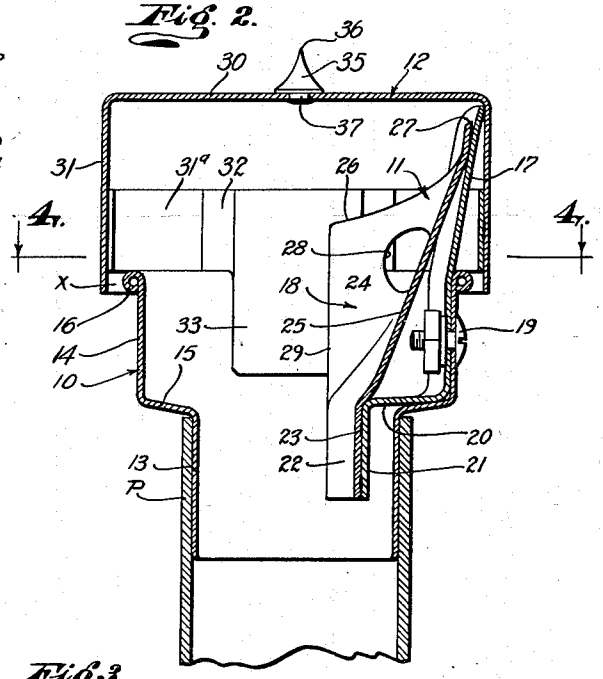


Fig. 3.

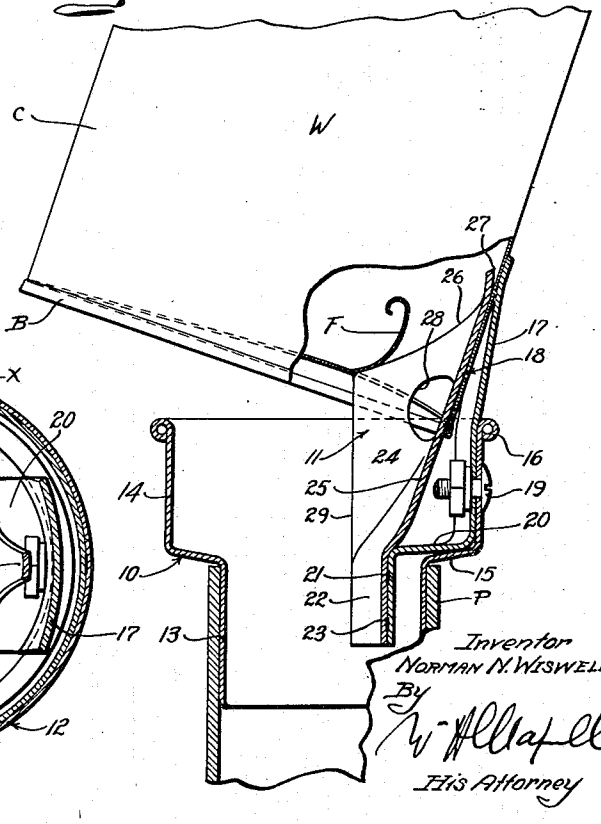
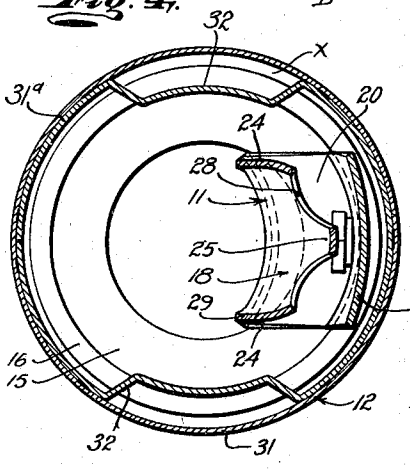


Fig. 4.



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Fig. 5.

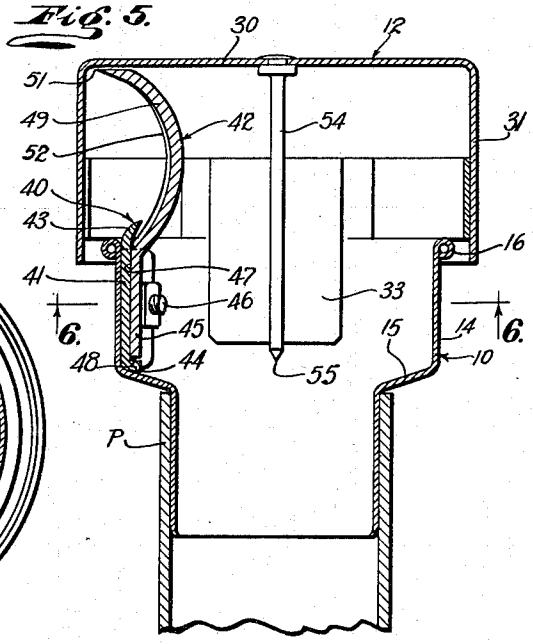


Fig. 6.

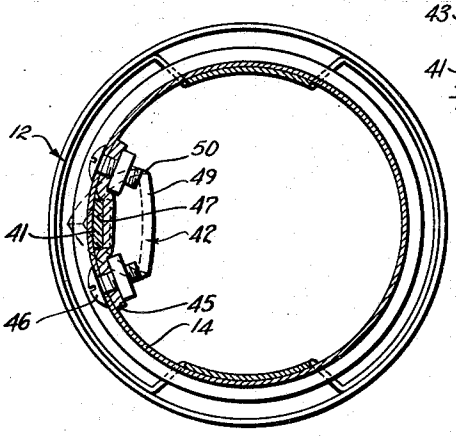


Fig. 7.

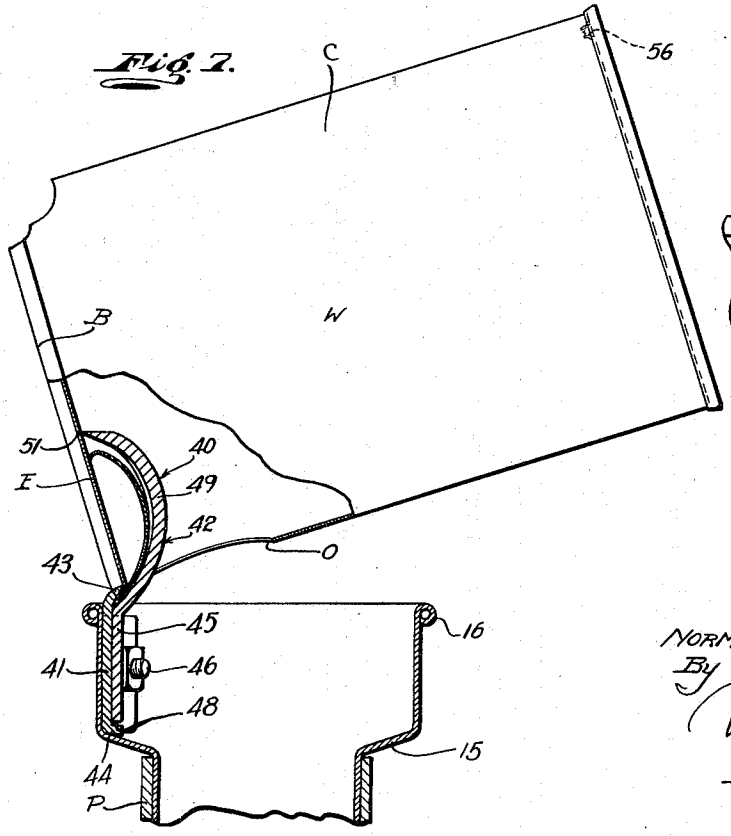
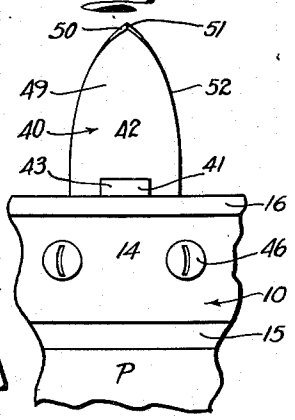


Fig. 8.



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Patented Sept. 20, 1938 2,130,634

UNITED STATES PATENT OFFICE

2,130,634

DEVICE FOR OPENING CANS

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Application November 19, 1934, Serial No. 753,659

3 Claims. (Cl. 184—105)

This invention relates to a device for opening receptacles and relates more particularly to a device for application to the breather pipe of an engine and operable to open cans of lubricant for the lubrication of the engine. A general object of the invention is to provide a simple, compact and effective device for application to the breather pipe of an automotive engine that is operable to readily open cans of oil and the like to allow the contents to drain into the engine.

Another object of the invention is to provide a can opening device of the character mentioned that may be easily and quickly arranged or fixed in position on the lubricant receiving pipe and breather pipe of the engine of an automotive vehicle or the like.

Another object of the invention is to provide a device of the character mentioned that embodies a novel and effective combination of a cutter and guide that supports the opened can in an inclined position so that its contents may fully and completely drain into the pipe.

Another object of the invention is to provide a device of the character mentioned embodying a cap for normally covering its upper end and embodying means for allowing the free breathing of the crank case of the engine.

Another object of the invention is to provide a device of the character mentioned that is operable to form a large opening in the side wall of a can to allow the free draining of the contents of the can into the breather pipe, which opening mutilates the can to such an extent that it is unfit for refilling.

Another object of the invention is to provide a device of the character mentioned that is very compact and that does not interfere with the draining or pouring of bulk oil into the lubricant receiving breather pipe. The device of the present invention is such that a funnel or the spout of a lubricant dispensing receptacle may be readily inserted in the pipe for the purpose of draining lubricant into the crank case of the engine.

Another object of the invention is to provide a device of the character mentioned that embodies a novel and improved cutter for making a large discharge or drain opening in the side wall of the can.

A further object of the invention is to provide a can opening device of the character mentioned that is simple and inexpensive of manufacture.

The various objects and features of my invention will be fully understood from the following detailed description of typical forms and applications of the invention, throughout which description reference is made to the accompanying drawings, in which:

Fig. 1 is a fragmentary elevation view of a portion of an engine illustrating one embodiment of the invention arranged in position on the breather pipe. Fig. 2 is an enlarged vertical detailed sectional view taken substantially as indicated by line 2—2 on Fig. 1. Fig. 3 is a fragmentary vertical detailed sectional view of the device with the cap removed and illustrating an opened can in position on the cutter. Fig. 4 is a transverse detailed sectional view taken as indicated by line 4—4 on Fig. 2. Fig. 5 is a vertical detailed sectional view of another embodiment of the invention. Fig. 6 is a transverse detailed sectional view taken as indicated by line 6—6 on Fig. 5. Fig. 7 is a fragmentary vertical detailed sectional view of the device illustrated in Figs. 5 and 6 showing the cap removed and illustrating an opened can in position to drain into the breather pipe and Fig. 8 is a fragmentary side elevation view illustrating the cutter of the device shown in Figs. 5, 6 and 7.

The present invention may be embodied in forms for use on various types and classes of engines and may be embodied in the form of attachments, or appliances, and as original fixtures or parts of the engine structure. In the following detailed disclosure I will describe two typical embodiments of the invention that may be considered as original fixtures of the engine or as attachments to replace the usual or customary caps found on the breather pipes of automotive engines. It is to be understood that the invention is not to be construed as limited or restricted to the specific forms or applications about to be described but is to be taken as including any features or modifications that may fall within the scope of the claims.

The form of the present invention illustrated in Figs. 1 to 4, inclusive, of the drawings, includes, generally, a body 10 to be attached or applied to the breather pipe P of the engine E, means 11 on the body for opening cans to drain into the pipe P and a cover or cap 12 for the body 10.

The body 10 is a tubular member adapted to be attached to or positioned on the upper end of the pipe P to constitute a continuation thereof. The shape of the body 10 and the manner of mounting or attaching the body to the pipe depends upon the character of the pipe P and whether the device is an original fixture or an attachment. In the particular case illustrated in the drawings the upper portion of the breather

pipe P is plain and without threads and the pipe projects vertically from the crank case of the engine. The body 10 may include a lower portion 13 of reduced diameter adapted to rather snugly or tightly fit in the upper portion of the pipe P. If desired, the body portion 13 may be rigidly secured to the pipe P as by welding, screws or other suitable means. The major wall portion 14 of the body which projects above the upper end of the pipe P is preferably of greater diameter than the pipe providing a downwardly facing shoulder 15 at or immediately adjacent the upper end of the pipe. The upper end of the body 10 is open or unobstructed when the cap 12 is removed. An outwardly rolled edge or bead 16 may be provided on the upper end of the body 10. From the above it will be seen that the body 10 is a simple, integral member that is inexpensive to manufacture.

The means 11 is operable to cut an opening in a can C that is forced downwardly against it and is adapted to thereafter support the can in an inclined position to allow its contents to drain into the breather pipe P. The can opening means 11 includes a can engaging member or guide 17 and a cutter 18. The guide 17 is rigidly attached to the major upper portion 14 of the body and projects upwardly therefrom. In the preferred construction the guide 17 lies or bears against the inner surface of the body portion 14 and the portion of the guide thus contacting with the body is curved to conform thereto. One or more screws 19 may attach the guide 17 to the body 10. The guide 17 has an inwardly projecting flange 20 which seats on the body shoulder 15 and has a tongue 21 projecting downwardly at the inner end of the flange. The active portion of the guide 17 which projects upwardly beyond the upper end of the body 10 is inclined downwardly and inwardly with respect to the longitudinal axis of the body 10 and pipe P. This active portion of the guide 17 is preferably arcuate or curved in horizontal cross section to have proper guiding and bearing engagement with the can C as will be hereinafter described. The opposite vertical sides of the guide 17 may be straight and parallel while the upper end of the guide may be suitably rounded.

The cutter 18 is positioned adjacent to and inwardly of the guide 17 and the cutter and guide are proportioned and mounted to be covered by the cap 12 and to be readily accessible for use upon the removal of the cap from the body. The cutter 18 is operable to cut a large clear opening in an end of the can C when the can is forced downwardly against it. The can-opening cutter 18 is an elongate member provided at its lower end with a shank 22. The shank 22 bears against the inner side of the tongue 21 and is secured thereto as by welding 23. The major or active portion of the cutter 18 which extends upwardly from the chank 22 is substantially U-shaped in transverse cross section, having spaced side parts 24 and a transversely curved portion 25 extending between and connecting the side parts 24.

In accordance with the invention the cutter 18 is pitched, being inclined downwardly and inwardly toward the central longitudinal axis of the body 10 and pipe P. The curved outer portion 25 of the cutter is pitched at a greater angle than the guide 17 and its upper part may normally engage the inner surface of the guide. The upper edges or ends 26 of the side parts 24 curve or slope upwardly and outwardly to converge at a point 27 at the upper end of the cutter. The edges or ends 26 are preferably flat and substantially normal to the adjacent side surfaces of the cutter whereby the corners occurring at the line of juncture of the ends 26 and the external surfaces of the cutter act as shearing edges during the formation of the opening in the can C. The extreme upper portion or point portion of the cutter 18 is preferably bent or inclined upwardly and inwardly with respect to the guide 17 so that the bead B of the can C may be entered between the point 27 and the guide 17 and the point is operable to pierce the end wall of the can immediately within or adjacent the bead. The upper end or point 27 on the upper end of the cutter 18 is preferably spaced a short distance below the upper end of the guide 17. With the guide 17 and cutter 18 proportioned in this manner the guide constitutes a shield or guard for the cutter. Openings 28 are provided in the walls of the cutter 18 to allow the contents of the can C to drain downwardly from around the cutter. The inner edges or ends 29 of the side parts 24 may be straight and substantially vertical as illustrated in Figs. 2 and 3 of the drawings.

The cover or cap 12 is readily removable from the body 10 to make the can opening means 11 accessible and operative and to allow lubricant to be poured or drained into the pipe P. The top 30 of the cover or cap 12 may be flat and may be substantially horizontal when the cap is in position on the body 10. The cap 12 has a cylindrically curved side wall 31 extending downwardly from the top 30. The side wall 31 is of greater diameter than the body portion 14 and surrounds the bead 16 with substantial clearance.

Means is provided for removably retaining the cap 12 in its proper position on the body 10. A strip or band 31a of sheet metal or the like extends around the inner surface of the side wall 31. The band 31a is shaped or formed to have circumferentially spaced parts 32 spaced inwardly from the wall 31. In the particular case illustrated in the drawings there are two diametrically opposite parts 32. The parts 32 are preferably curved substantially concentric with the wall 31. Integral springlike fingers 33 project downwardly from the parts 32. The fingers 33 project downwardly beyond the lower edge of the wall 31 to enter the body 10 when the cap is arranged on the body. The fingers 33 are transversely curved to substantially conform to the internal surface of the body portion 14. The spring fingers 33 are located and formed to bear outwardly against the body wall with substantial force when inserted in the body. The resiliency of the parts 32 and the fingers 33 maintains the fingers in tight cooperation with the wall of the body 10 to properly steady the cap and prevent the cap from vibrating or rattling on the body. The parts 32 engage the upper end or bead 16 of the body 10 to limit the downward movement of the cap on the body. The spring fingers 33 cooperate with the inner wall of the body 10 to hold the side wall 31 of the cap spaced outwardly from the bead 16 in concentric relation thereto so that an annular passage X is provided between the body 10 and cap 12 to allow for the free breathing of the engine.

Means is provided on the cap 12 to form or cut an air inlet opening in an end of the can C to facilitate the rapid draining of the contents from the can. In the form of the invention illustrated in Figs. 1 to 4 of the drawings this

means comprises a piercing element or cutter 35 projecting from the upper surface of the top 30. The cutter 35 may be substantially conical and may project from the center of the top 30. A sharp point 36 is provided at the upper end of the cutter 35 to pierce or penetrate a wall of the can C. A pin 37 projects from the base of the cutter 35 through an opening in the top 30. The pin 37 may be riveted over to secure the cutter 35 to the top 30 of the cap.

The cap 12 is normally arranged on the body 10 as illustrated in Figs. 1, 2 and 4 of the drawings, to extend across the upper end of the body and enclose the projecting portions of the guide 17 and cutter 18. The spring fingers 33 removably retain the cap on the body in a manner so that it does not vibrate or rattle. The annular space X between the wall of the body 10 and the side wall 31 of the cap provides for the free breathing of the engine. The cap 12 may be easily disengaged or removed from the body 10 when it is desired to drain or pour lubricant into the pipe P. The assembly of the guide 17 and cutter 18 is spaced at one side of the longitudinal axis of the body 10 and does not appreciably obstruct the opening through the body. A funnel or the pouring spout of a dispensing receptacle may be inserted in the body 10 for the purpose of pouring bulk lubricant into the pipe P and crank case of the engine E.

When it is desired to drain the contents of a sealed container or can C into the pipe P the cutter 35 may first be employed to form an air inlet opening in an end of the can. The can may be arranged in a vertical position on a suitable support and the cap 12 inverted and arranged so that the point 36 of the cutter 35 engages the upper end of the can adjacent the upper bead B. The cap 12 may then be struck or forced downwardly to drive the cutter 35 through the upper end wall of the can.

Following the forming of the air inlet opening in the upper end of the can the can C is positioned so that the bead B on its lower end engages the projecting portion of the guide 17 and is received between the guide and the point 27 of the cutter 18. The can C is then pushed or forced downwardly against the cutter 18 so that the point 27 pierces the lower end wall of the can adjacent the bead B. The can C is preferably inclined downwardly and inwardly with respect to the vertical axis of the pipe P when forcing it downwardly on the cutter 18. The guide 17 operates to guide the can when inclined in this manner and engages the side wall W of the can to hold the can in proper cooperation with the cutter 18. As the can C is forced downwardly the cutter 18 and the guide 17 spring or flex to some extent allowing the bead B and the side wall W of the can to be forced downwardly between the contacting upper portions of the guide and cutter. As the can C moves downwardly on the cutter 18 the opening initially formed by the point 27 is enlarged inwardly. The outer corners of the upper ends 26 of the cutter shear through the end wall of the can and the said ends engage the flap F formed by the cut causing it to be rolled upwardly and inwardly. This leaves a large unobstructed opening in the lower end of the can C. The can C is forced downwardly on the cutter 18 until its bead B contacts or engages the bead 16 on the upper end of the body 10. This, of course, limits the downward travel of the can C.

The contents of the can freely drain through the opening formed by the cutter 18, and pass through the body 10 into the pipe P. The gripping contact of the somewhat resilient guide 17 and cutter 18 effectively support and hold the can C in its inclined position so that the operator need not support the can after it has been opened. The can C is further steadied in its tilted position by the engagement of the bead B with the upper end of the body 10. When the contents have drained from the can C the can may be disengaged from the device by raising it or pulling it upwardly out of engagement with the guide 17 and cutter 18. Following the filling or draining of the lubricant into the pipe P the cap 12 may be replaced on the body 10.

Figs. 5 to 8, inclusive, of the drawings, illustrate a form of the invention embodying a can opening means 40 differing in certain respects from the means 11 described above. The body 10 and the cap 12 of the embodiment shown in Figs. 5 to 8, inclusive, of the drawings, may be identical with the body 10 and cap 12 of the previously described embodiment.

The means 40 for cutting the pouring or draining opening in the can C includes a guide or can engaging member 41 and a cutter 42. The member 41 together with the cutter 42 are adapted to receive and cooperate with a bead B of the can C whereupon the can may be swung or forced downwardly on the cutter 42 to cause the cutter to form a large opening in a wall of the can. The guide or member 41 is plate-like and is arranged against the internal surface of the body wall 14. The member 41 may be held or retained in position by the cutter 42 and its securing means as will be hereinafter described. The member 41 has an active portion 43 projecting upwardly beyond the upper end of the body 10. The active portion 43 of the member 41 is inclined upwardly and inwardly with respect to the vertical axis of the body 10. The inner and outer surfaces of the portion 43 are preferably inclined or bevelled to the upper end of the member 41. An inwardly projecting tongue or flange 44 may be provided on the lower end of the member 41. The lower side of the flange 44 may rest on or cooperate with the body shoulder 15.

The cutter 42 projects upwardly beyond the upper end of the body 10 and has a shank 45 attached to the interior of the body wall 14. In practice screws or bolts 46 may rigidly secure the cutter shank 45 to the body. In the form of the invention illustrated in the drawings the shank 45 is bent or formed to have a longitudinal channel 47 which receives the body of the member 41 and a notch 48 is provided in the lower end of the shank 45 to receive the flange 44. With the member 41 received in the channel 47 and the flange 44 received in the notch 48 the screws 46 for securing the cutter to the body 10 effectively clamp or secure the member 41 in position.

The active portion 49 of the cutter projecting upwardly from the body 10 is curved vertically and horizontally. The cutter 42 is mounted or arranged so that its active portion 49 presents a concave outer surface and a convex inner surface. In accordance with the invention the cutter 42 curves upwardly and inwardly with respect to the longitudinal axis of the body 10 and then curves upwardly and outwardly so that its active portion 49 curves upwardly and outwardly and its extreme upper end faces outwardly. The side edges 50 of the cutter curve or converge upwardly to a point 51 at the upper end of the cutter. The edges 50 are bevelled outwardly to join

the outer surface of the cutter portion 49 at sharp cutting edges 52. This bevelling of the edges 50 continues to the upper end of the cutter so that the point 51 is sharpened and faces upwardly and outwardly. The portion of the cutter 42 opposing the active portion 43 of the member 41 is spaced inwardly from the portion 43 and is inclined upwardly and inwardly leaving a space to receive the bead B of the can.

Means is provided on the cap 12 for forming an air vent or inlet opening in the can C. This means comprises a piercing element or cutter 54 riveted or otherwise rigidly secured to the top 30 of the cap. The cutter 54 projects downwardly or longitudinally through the cap 12 and extends beyond the lower ends of the spring fingers 33. A sharpened point 55 is provided on the lower end of the cutter 54 to pierce an end wall of the can C to form an air inlet opening 56.

The cap 12 is normally arranged on the body 10 as illustrated in Fig. 5 of the drawings to extend across the upper end of the body 10 and enclose the projecting portions of the cutter 42 and member 41. The spring fingers 33 dependably retain the cap in position on the body in a manner so that the cap may be easily removed when it is desired to drain or pour lubricant into the pipe P. The cutter 42 is disposed at one side wall portion of the body 10 leaving the open upper end of the body substantially unobstructed to receive a funnel or the pouring spout of a dispensing receptacle.

When the contents of a sealed container or can C are to be drained into the pipe P the cutter 54 on the cap 12 may be employed to form an air inlet opening 56 in the upper end of the can. The opening 56 is preferably provided in the upper wall of the can adjacent the peripheral bead B. The can C is then arranged in a position where its lower bead B is received between the portion 43 of the guide member 41 and the cutter 42. The engagement of the portion 43 with the bead B is such that the can C may be swung or forced downwardly and inwardly against the cutter 42. When the can C is forced downwardly and inwardly in this manner the cutter point 51 pierces the side wall W of the can and the edges 52 shear or cut through the wall of the can as the can is swung downwardly. The can C is forced downwardly and inwardly on the cutter 42 until its end wall E engages the point 51 of the cutter 42. The engagement of the wall E with the point of the cutter stops the can in an inclined position such as illustrated in Fig. 7 of the drawings. When the can reaches this position the cutter 42 will have formed the large draining or pouring opening O in the side wall of the can. The opening O faces the open upper end of the body 10 so that the contents of the can may freely drain into the body and pipe P. The engagement of the point 51 with the wall E and the engagement of the guide portion 43 and cutter 42 with the can effectively support the opened can C in the inclined draining position. The opening O is preferably cut in the side wall of the can wall W to be in diagonal relation with the air inlet opening 56 so that the opening 56 is in the uppermost portion of the can when the can is in its inclined position on the device. Following the draining of the contents from the can C the can may be easily disengaged and removed from the guide portion 43 and cutter 42. If desired the drain opening O may be cut in the end wall E of the can by positioning the can with its end wall facing the cutter 42 and its bead B in engagement with the portion 43 and the adjacent path of the cutter and then swinging the can downwardly and inwardly to cause the wall E to be pierced by the cutter 42.

The present invention provides a simple inexpensive device for opening cans that is particularly adapted for application to the breather pipes of internal combustion engines. The can opening device is small and compact so that the body thereof may be provided with a small breather cap 12. The can opening means of the device is such that the cap 12 may house or enclose its projecting parts and yet be of small dimensions. The can opening means forms a large unobstructed opening in the lowermost corner of the tilted or inclined can so that the contents quickly drain from the can into the breather pipe P. The cutter of the form of the invention illustrated in Figs. 5 to 8 of the drawings is operable to form a large opening in the side wall W of the can rendering the can unfit for refilling.

Having described only typical preferred forms and applications of my invention, I do not wish to be limited or restricted to the specific forms and applications herein set forth, but wish to reserve to myself any modifications or variations that may appear to those skilled in the art or fall within the scope of the following claims.

Having described my invention, I claim:

1. A can opening device for use in combination with the lubricant receiving pipe of an engine, said device including, a body on the pipe, and a cutter projecting from the upper end of the body, the cutter being curved upwardly and outwardly to have an outwardly facing point operable to pierce a wall of a can and engageable by another wall of the can to limit its movement.

2. A can opening device for use in combination with the lubricant receiving pipe of an engine, said device including, a body on the pipe, a cutter on the body projecting from its upper end, the cutter having a laterally facing point, and means for guiding a can onto the cutter to have said point pierce its wall.

3. A can opening device for use in combination with the lubricant receiving pipe of an engine, said device including, a body on the pipe, a cutter on the body projecting from its upper end, the cutter having an upwardly and outwardly facing point, a part on the body for cooperating with a bead of a can to guide the side wall of the can against the cutter, and a cap for the body receiving the cutter and said part.

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