Dec. 13, 1949 W. E. ARMSTRONG ET AL 2,491,070

CLOSURE RETAINING MEANS

Filed Oct. 27, 1947

Fig. 1.

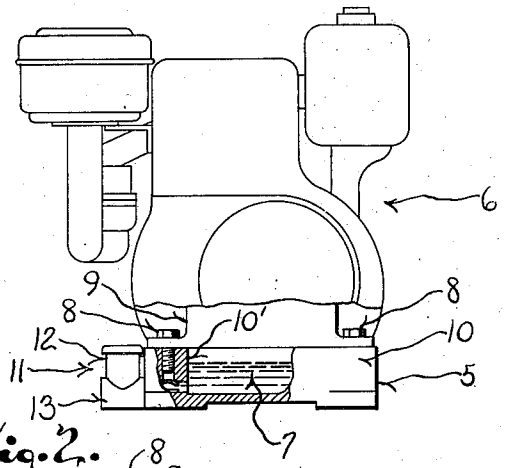


Fig. 2.

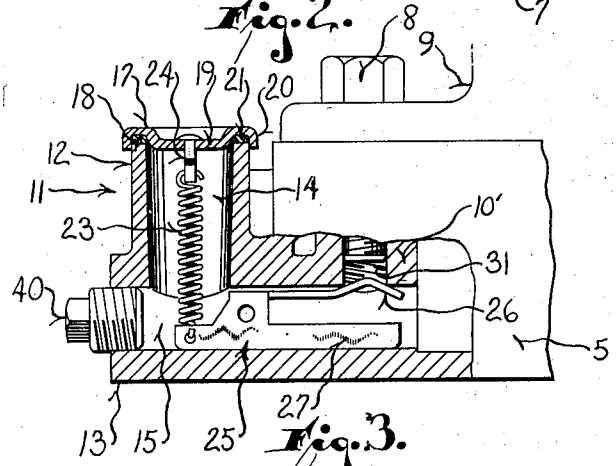


Fig. 4.

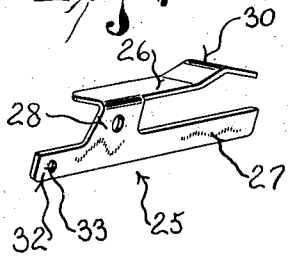
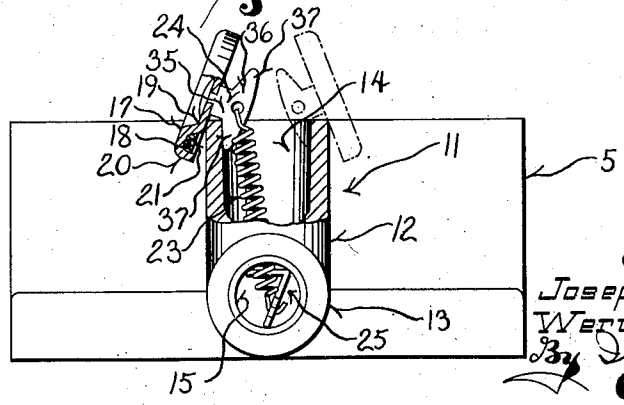


Fig. 3.



Joseph V. Reichenbach
Werner E. Armstrong
By Ira Millon Jones
Attorney

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CLOSURE RETAINING MEANS

Werner E. Armstrong and Joseph V. Reichenbach, Milwaukee, Wis., assignors to Briggs & Stratton Corporation, Milwaukee, Wis., a corporation of Delaware

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3 Claims. (Cl. 220—38.5)

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This invention relates to filler pipes of the type used on small internal combustion engines and the like for the addition of oil to the crankcase of such engines, and has more particular reference to the provision of a novel closure for such pipes.

Small internal combustion engines of the type herein chiefly concerned are usually equipped with a pan-like base providing a reservoir for a quantity of oil. A boss on the exterior of the base having a nearly upright bore was previously provided for the introduction of oil into the base and to facilitate the addition of oil it was customary to thread a pipe nipple into the upper end of the bore to bring the inlet of the filler pipe to a level above the oil level maintained in the pan-like base. The upper end of the filler nipple was usually closed by a more or less conventional pipe cap having means thereon engageable by an ordinary wrench for turning the cap on and off the nipple.

While this past construction was mechanically satisfactory, it was subject to the objection that the wrench for removing the cap was not always conveniently available with the result that inspection of the oil level in the filler tube was often neglected. In some instances, inspection of the oil level in the filler pipe was discouraged to such an extent that damage resulted to the engine by reason of lack of oil.

Hence, it is one of the objects of this invention to provide a filler pipe closure for internal combustion engines and the like by which inspection of the oil level is greatly facilitated and may be accomplished without the use of wrenches or other tools.

Another object of this invention resides in the provision of a filler pipe cap or closure which has means thereon providing for engagement with the mouth of the filler pipe for the support of the cap in an edgewise tilted position on the pipe providing access of the interior thereof for inspection of the oil level therein or for the addition of oil to the reservoir connected with the pipe.

Still another object of this invention resides in the provision of an improved filler pipe which may be used to advantage with any kind of liquid containing or storage receptacle.

A further object of this invention resides in the provision of a filler pipe having a self closing cover capable of being latched in an open position on the mouth of the filler pipe but which is caused to automatically seat itself properly in place on the filler pipe when released from its latched open position.

With the above and other objects in view, which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

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The accompanying drawing illustrates one complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a side elevational view of a small internal combustion engine showing the application of this invention thereto;

Figure 2 is an enlarged view of a portion of the pan-like base for the engine having portions of the filler tube broken away and shown in section to illustrate the closure means therefor;

Figure 3 is an end elevation of the base shown in Figure 2 and likewise having parts of the filler tube broken away and shown in section;

Figure 4 is a perspective view of the anchor means to which the closure for the filler pipe is attached.

Referring now more particularly to the accompanying drawing in which like numerals indicate like parts, the numeral 5 designates a base for a small internal combustion engine 6. The base 5 is of pan-like construction so as to provide a reservoir for a quantity of lubricant 7, and the engine is attached to the top open side of the base as by means of cap screws 8 passing through flanges on the bottom of the crankcase 9 of the engine and threading into bosses 10 and 10' on the base, the former being located on the exterior of the base at one end thereof as seen in Figure 1, and the latter being located near the opposite end of the base but in the interior of the base adjacent to the oil filler pipe 11.

The filler pipe 11 is cast integral with the base 5 and comprises an upright branch 12 and a horizontal branch 13 leading inwardly from the bottom of the upright branch to the end wall of the base. Communicating holes or passages 14 and 15 are cored in the upright and horizontal branches respectively of the filler pipe, and it is to be noted that the hole 15 in the bottom or horizontal branch of the pipe has its inner end opening to the interior of the pan-like base near the bottom wall thereof while the outer end of this hole opens to the exterior of the casting.

Inasmuch as the pan-like base is only partially filled with oil in use, the upright or inlet branch 12 of the filler pipe has its mouth terminating adjacent to the top edge of the base; and a readily detachable cap 17 engaged over the rim of the inlet branch of the filler pipe, as shown best in Figure 2, is provided to close the pipe against admission of dirt or other foreign material thereinto.

The underside of the cap has an annular seat 18 to receive the mouth of the filler pipe, and the

central portion 19 of the cap is depressed to enter the mouth of the pipe and cooperate with an annular flange 20 extending around the outer periphery of the cap to hold the cap more or less centered on the pipe. If desired, a gasket 21 may be attached to the cap at the seat portion thereof to more effectively seal the mouth of the filler pipe.

The cap 17 is detachably maintained in a closed and operative position by means of a tension spring 23 having its upper end attached to a hook member 24 fixed to and projecting downwardly from the central portion 19 of the cap, while the lower end of the tension spring is attached to an anchor member 25 in the horizontal branch 15 of the filler pipe. The tension of the spring 23 is sufficient to firmly hold the cap seated on the mouth of the filler pipe while permitting the cap to be manually lifted off the mouth of the pipe for inspection of the oil level in the base or for the addition of oil thereto.

The anchor member 25 preferably comprises superimposed upper and lower spring blades 26 and 27 respectively, disposed at an acute angle to one another and joined near one end thereof by a strap 28 common to both of the blades. The blades are tensioned so as to tend to spring apart, and the upper blade 26 lies substantially horizontally along the upper wall surface of the passage 15 while the lower blade 27 engages substantially edgewise with the wall surface of the passage 15 at the bottom thereof.

Due to the spring bias on the blades, the anchor member 25 is firmly secured in the branch passage 15, and if desired, the outer free end of the upper blade may have an upwardly projecting detent portion 30 formed thereon of a size to enter the hole 31 in the boss 10' at the interior of the base into which one of the cap screws 8 threads. The lower end of the hole 31 thus provides a cooperating detent element for the detent portion 30, and engagement of the offset portion 30 into the hole serves to preclude accidental axial shifting of the anchor member in the lower passage 15.

In assembly the anchor member 25 is inserted into the passage 15 from the outer open end thereof with the free ends of the spring blades facing the base 5. The spring 23 has its lower end attached to the anchor member for such assembly of the latter and is easily accessible through the upright passage 14 of the filler tube at the time the detent 30 on the upper blade 26 snaps into the hole 31 on the base. Thereafter, the spring 23 is attached to the hook member 24, and the outer end of the passage 15 is closed either by a soft metal plug pressed into place in a well known manner, or by a removable drain plug 40 threaded into the outer end of the passage so as to allow the engine to be drained of oil upon removal of the plug.

When in its operative position, the anchor member 25 is disposed in the lower passage 15 with the strap 28 at the inner side of the lower end of the passage 14 and so that a rearward extension 32 of the lower blade 27 lies in line with the upper passage 14. A hole 33 in this rearward extension provides for attachment of the lower end of the spring with the anchor member so that the upward reaction force on the anchor member is borne substantially directly by the upright strap 28.

The cap 17 is of novel construction and is designed not only to effectively seal the mouth of the filler pipe but to also support itself upon an

edge portion of the filler pipe at its mouth as shown in Figure 3. For this purpose it will be noted that the hook member 24 comprises a relatively narrow stem 35 connected centrally with the cap, and carries a crosshead 36 at its lower extremity. The head is spaced from but overlies the undersurface of the cap and is formed with opposite ears 37 which project laterally from the side edges of the stem and cooperate with the underside of the cover to receive and substantially grip an edge portion of the filler pipe at its mouth, as best shown in Figure 3, to releasably support the cap in an edgewise tilted position affording access to the interior of the filler pipe.

It is important to note that the ears 36 extend far enough out from the stem 24 of the hook member as to preclude closure of the cap in an accidental manner by the force of the spring 23 when the cap is in its edgewise tilted position hooked over the mouth of the filler pipe.

The cap 17 is readily hooked over the mouth of the filler pipe by lifting the cap off the pipe a slight distance and then swinging the same on an axis substantially normal to the axis of the upright branch of the pipe to engage the upper edge portion of the filler pipe between one or the other of the ears and the underside of the cap. Closure of the cap may be effected either by the exertion of pressure on the upper edge of the cap to induce downward pivotal motion of the cap about the fulcrum provided by the edge of the pipe engaged by the hook member to effect automatic closure of the cover with a snap action by the spring along with centering of the cover snugly on the mouth of the filler pipe, or the cap may be raised slightly to disengage it from the upper edge of the pipe and then swung toward a flat position in which the spring 24 pulls the cap snugly and squarely down onto the mouth of the filler pipe.

One of the features of the closure means of this invention is that the anchor member has spring blade arms biased apart into engagement with the walls of the lower passage under pressure, and the bias on the blades is sufficient to enable the anchor member to be used with passages having a greater diameter than that shown.

From the foregoing description taken in connection with the accompanying drawing, it will be readily apparent to those skilled in the art that this invention provides an improved closure for filler pipes and that the inspection of oil levels is greatly facilitated and effected without the use of wrenches for removal of the cap. It will also be apparent that it is impossible to misplace the cap since it is at all times connected with the filler pipe.

What we claim as our invention is:

1. In a liquid reservoir having a filler pipe including an upright inlet branch and a substantially horizontal branch leading into the reservoir from the lower part of said inlet branch, said filler pipe being adapted to have a cap detachably seated flatwise on the upper end of its inlet branch to close the same, said cap having a spring attached to its underside and anchored within the filler pipe to yieldingly hold the cap seated on the pipe: unitary means in said horizontal branch of the filler pipe providing an anchor for said spring, said anchor comprising an upper blade adapted to lie with its flat sides substantially horizontal and along the upper wall surface of the horizontal branch of the filler pipe between the reservoir and the junction of said branches of the pipe, and a lower blade attached

to one side edge of the upper blade and bent downwardly at an acute angle thereto for engagement of its lower free edge with the lower wall surface of said horizontal branch, said blades being biased apart so as to engage the inner wall surfaces of said horizontal branch under spring pressure; a rigid extension on the lower blade projecting into the junction between said branches of the filler pipe and providing for the attachment of the spring thereto; and a detent portion on one of said blades engageable with a cooperating detent element in said horizontal branch of the pipe to hold the anchor against axial shifting in said horizontal branch.

2. The anchor means set forth in claim 1 wherein said blades are joined together near the junction of the branches of the filler pipe and have their free ends projecting toward the reservoir and away from the upright branch of the pipe, and wherein said detent portion on the anchor comprises an upwardly offset portion on the free end of the upper blade of the anchor engageable in a depression in the upper wall surface of the horizontal branch of the pipe.

3. In a liquid reservoir having a filler pipe including an upright inlet branch and a substantially horizontal branch leading into a reservoir from the lower part of said inlet branch, the bore of said horizontal branch being extended through the side of the filler pipe adjacent to the junction of its branches so as to provide a drain opening in the pipe for draining the reservoir with said opening normally closed by a detachable plug, said filler pipe being adapted to have a cap detachably seated flatwise on the upper end of its inlet branch to close the same, and said cap having a spring attached to its underside and anchored within the filler pipe to yieldingly hold the cap seated on the pipe: unitary means in said horizontal branch of the pipe providing an anchor for said spring, said anchor being readily insertable into the horizontal branch through

said drain opening of the pipe and comprising an upper blade adapted to lie substantially flatwise horizontally along the upper wall surface of the horizontal branch of the pipe between the reservoir and the junction of said branches of the pipe, and a lower blade attached to one side edge of the upper blade near the junction of the branches of the pipe and bent downwardly at an acute angle thereto for engagement of its lower free edge with the lower wall surface of said horizontal branch along a line lying substantially directly beneath the center line of the horizontal branch and equidistant from the opposite side edges of the horizontal blade, said blades having their free end portions which project toward the reservoir biased apart so as to be engageable with the inner wall surfaces of the horizontal branch under spring pressure; and a rigid integral extension on said anchor means adjacent to the connection between the blades thereof, said extension projecting into the junction of the branches to provide for attachment of said spring to the anchor.

WERNER E. ARMSTRONG.
JOSEPH V. REICHENBACH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
332,068	Fay	Dec. 8, 1885
678,024	Morris	July 9, 1901
793,962	Roth	July 4, 1905
1,047,012	Elliott	Dec. 10, 1912
2,099,558	Dibelka et al.	Nov. 16, 1937
2,133,520	Ritz-Woller	Oct. 18, 1938

FOREIGN PATENTS

Number	Country	Date
452,902	Great Britain	Sept. 1, 1936