Aug. 8, 1933. E. J. GULICK 1,921,670

FLOAT CONTROLLED SUCTION INTAKE DEVICE FOR FORCED FEED LUBRICATING SYSTEMS

Filed Jan. 29, 1932

Fig 1

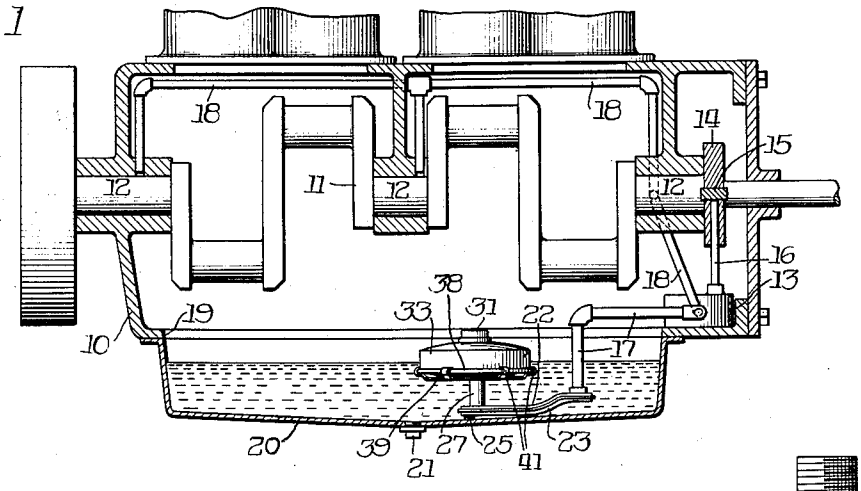


Fig 2

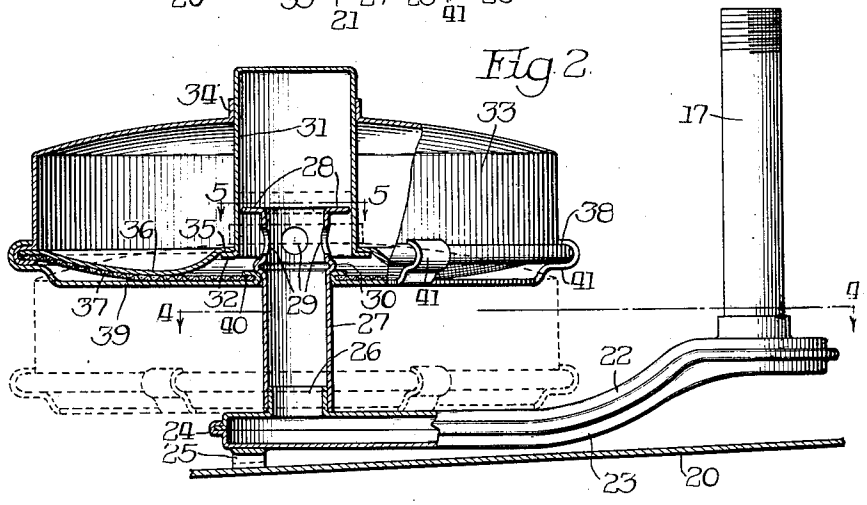


Fig 3

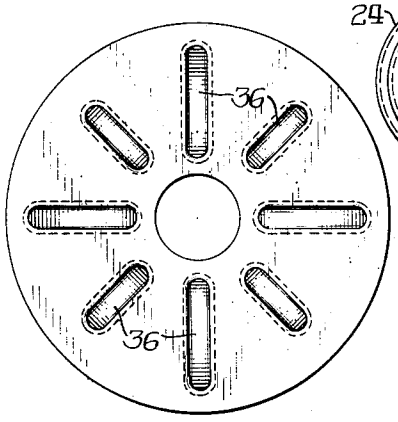


Fig 4

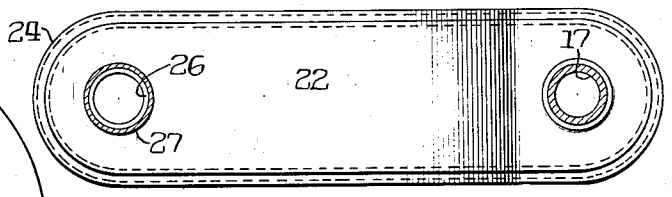
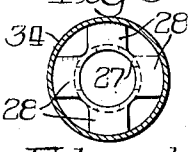


Fig 5



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FLOAT-CONTROLLED SUCTION INTAKE DEVICE FOR FORCED FEED LUBRICATING SYSTEMS

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4 Claims. (Cl. 184—6)

This invention relates to float controlled suction intake devices for forced feed lubricating systems such as are extensively employed in connection with internal combustion engines, especially in automobile practice.

The prevailing practice in internal combustion engine lubrication for many years consisted in pumping oil from a pool carried in the engine base, or other container, and forcing it through the oil circulating system to the various bearings to be lubricated. In such a system, dirt, water, carbon, gasoline and other deleterious substances would accumulate and collect in the engine base, settling to the bottom of the pool of oil, and since the suction pipe of the pump extended nearly to the bottom of the pool of oil, much of this sediment was pumped to the bearings, frequently causing serious injury. Also, water collecting at the bottom of the pool would freeze in cold weather, partially or wholly sealing the suction pipe of the pump, and thus temporarily putting the lubricating system out of service.

With a view to remedying these faults, I heretofore designed an oiling system for internal combustion engines disclosed in Letters Patent 1,369,239, granted to me February 22, 1921, and characterized by the provision of a lubricant suction inlet member that is buoyantly sustained in the lubricant pool so that only the oil at or near the top of the pool is forced through the lubricating system, the suction inlet member being float controlled and, of course, rising and falling with the variations in level of the oil pool.

The device of my present invention is of the same general character and for the same purposes as that of my former Letters Patent above identified, the objects in view in the present invention being to provide a somewhat simpler and cheaper equipment, and one better designed to effectively seal the suction inlet against the intake of air with the oil.

The device of the present invention, its mode of operation, and the advantages inherent therein will be readily understood by persons familiar with the art to which it relates from the following description, taken in connection with the accompanying drawing wherein I have illustrated one simple and practical embodiment of the principle of the invention, and in which:—

Fig. 1 is a vertical section through the engine base of an automobile motor, showing my present improved suction intake device applied thereto.

Fig. 2 is an enlarged view, partly in side elevation and partly in axial section, of the float controlled suction intake device itself.

Fig. 3 is a bottom plan view of the float, on a reduced scale, with the screen and plate attachment omitted.

Fig. 4 is a top plan view, partly in horizontal section, of a portion of the pump intake or suction pipe, on the line 4—4 of Fig. 2.

Fig. 5 is a detail in horizontal section on the line 5—5 of Fig. 2.

Referring to Fig. 1, 10 designates as an entirety the base or crank case of a multiple cylinder internal combustion engine, within which is mounted the usual crank shaft 11 rotatably supported in bearings 12. 13 indicates an oil circulation pump of the gear type mounted within the engine base and driven by the gears 14 and 15 and the shaft 16 from the engine shaft. 17 designates a portion of the suction inlet pipe of the pump, and 18 designates the discharge pipe of the pump which, through suitable branches leads to the several crank shaft and other bearings for lubrication thereof.

The engine base is formed with a bottom opening 19 which may be covered by an oil reservoir or pan 20 secured to the base in any suitable manner, and equipped with the usual drainage plug 21.

Connected to and communicating with the lower end of the suction inlet pipe 17 is a flattened extension pipe section preferably comprising mating upper and lower sections 22 and 23 united by folded and crimped edges 24, the lower section 23 being preferably provided with a foot 25 resting on the bottom of the oil pan 20, so as to support the extension section of the suction inlet pipe in a substantially horizontal position. The upper member 22 is formed with a threaded upstanding nozzle 26, on which is mounted an upright tubular float guide designates as an entirety by 27. In the form of the invention herein illustrated, the tubular guide 27 is formed at its upper end with a circular group of laterally extended guide lugs 28 (see Fig. 5) for a purpose presently explained, and a slight distance below its upper end with a circular group of ports 29. Slightly below the ports 29, the wall of the guide 27 is bent outwardly to form an annular rib 30 that serves as a stop to limit the upward movement of the float, as hereinafter described.

Describing next the float itself, this, in the form herein shown, comprises a central upright sealing sleeve 31 closed at its upper end and formed with an external annular flange 32 at its lower end; and a hollow body member 33 encircling the sealing sleeve 31, the top wall of the body

member being welded or otherwise secured to the sealing sleeve at 34, and the bottom wall being similarly welded or otherwise secured to the flange 32, as shown at 35. By reference to Figs. 2 and 3, it will be observed that the bottom wall of the float is formed with a circular group of radial depressed ribs 36, and over these ribs is stretched a screen 37. The outer edges of the bottom wall of the float body and of the screen 37 are crimped in an annular bead 38 on the lower edge of the float body, as clearly shown at the left in Fig. 2. Overlying the screen 37 is a centrally apertured plate 39, the inner periphery of which is folded and crimped to grip the inner periphery of the screen 37, as shown at 40 in Fig. 2, while its outer periphery carries a group of spaced fingers 41 that are bent over the bead 38, so as to securely attach the plate 39 to the float body. The inner periphery of the plate 39 slidably engages the tubular guide 27. The open spaces between adjacent fingers 41 and bounded top and bottom by the bead 38, and the outer peripheral edge of the plate 39, form suction inlet openings for the oil, the later flowing through said openings, through the screen 37, and through the spaces between the ribs 39 into the lower open end of the sealing sleeve 31, thence through the ports 29 to and through the interior of the tubular float guide 27, thence through the nozzle 26 and the suction intake pipe to the pump. And since the float itself is made sufficiently heavy that its lower peripheral portion in which the suction inlet openings are formed is always below the top level of the oil body, as shown in Fig. 1, and since the intake of air is prevented by the sealing sleeve 31, the pump will continuously operate to draw off only oil from the upper portion of the pool; the suction inlet openings being always well above the level of any body of water that, under normal conditions, might form the bottom layer of the pool. As the oil is exhausted from the pool, the float will, of course, gradually descend with the level of the oil; and when the pool is re-filled, the float will rise until arrested by the stop 30, as shown by full lines in Fig. 2. Since the float is guided at two vertically spaced points on the tubular guide 27, it is well supported to resist lateral tilting stresses caused by the swaying movements of the body of oil when the car is traveling, so that the several peripheral inflow orifices are all maintained at substantially the same level.

I have herein shown and described one simple and practical embodiment of the invention, but it is manifest that the structural details may be considerably varied without involving any change in the operative principle of the device or sacrificing any of the advantages secured thereby. Hence, I reserve all such variations and modifications as fall within the spirit and purview of the claims.

I claim:

1. In combination with the lubricant container of an internal combustion engine, a fixed upright tubular float guide mounted in said container, said float guide formed with lateral guide lugs and with a lateral port slightly below its upper end, a float formed with a central upright sealing sleeve encircling and spaced from said float guide and slidably engaged with said guide lugs, a centrally apertured plate attached to said float and having its inner periphery slidingly engaged with said float guide, said plate being provided with suction inlet ports for the flow of lubricant to the lower end of said sealing sleeve, and a suction pipe communicating with the lower end of said float guide.

2. In combination with the lubricant container of an internal combustion engine, a suction pipe in said container, an upright tubular float guide mounted on and communicating with said suction pipe, said float guide formed at its upper end with lateral guide lugs and with a lateral port slightly below said upper end, a float formed with a central upright sealing sleeve encircling and spaced from said float guide and slidably engaged with said guide lugs, and a centrally apertured plate attached at its outer periphery to the lower end of said float and having its inner periphery slidingly engaged with said float guide, said plate being provided with peripheral suction inlet ports for the flow of lubricant to the lower end of said sealing sleeve.

3. In combination with the lubricant container of an internal combustion engine, a suction pipe in said container, an upright tubular float guide mounted on and communicating with said suction pipe, said float guide formed at its upper end with lateral guide lugs and with a lateral port slightly below said upper end, a float formed with a central upright sealing sleeve encircling and spaced from said float guide and slidably engaged with said guide lugs, a centrally apertured plate attached at its outer periphery to the lower end of said float and having its inner periphery slidingly engaged with said float guide, said plate being provided with peripheral suction inlet ports for the flow of lubricant to the lower end of said sealing sleeve, and a stop on said float guide below said port cooperating with the inner periphery of said plate to limit the rising movement of said float.

4. In combination with the lubricant container of an internal combustion engine, a suction pipe in said container, an upright tubular float guide mounted on and communicating with said suction pipe, said float guide formed with lateral guide lugs and with a port in its upper end portion, a float formed with a central upright sealing sleeve encircling and spaced from said float guide and slidably engaged with said guide lugs, the bottom wall of said float being formed with radial channels communicating at their inner ends with the lower end of said sealing sleeve, a screen overlying the bottom wall of said float, and a centrally apertured plate underlying said screen and attached at its outer periphery to the lower end of said float and having its inner periphery slidingly engaged with said float guide, said plate being provided with peripheral suction inlet ports for the flow of lubricant through said screen and channels to the lower end of said sealing sleeve, and a stop on said float guide below said port cooperating with the inner periphery of said plate to limit the rising movement of said float.

EDWARD J. GULICK.