J. B. FISHER.

SUCTION INTAKE FOR PUMPS.

APPLICATION FILED JAN. 14, 1920.

1,421,440. Patented July 4, 1922.

Fig. 1.

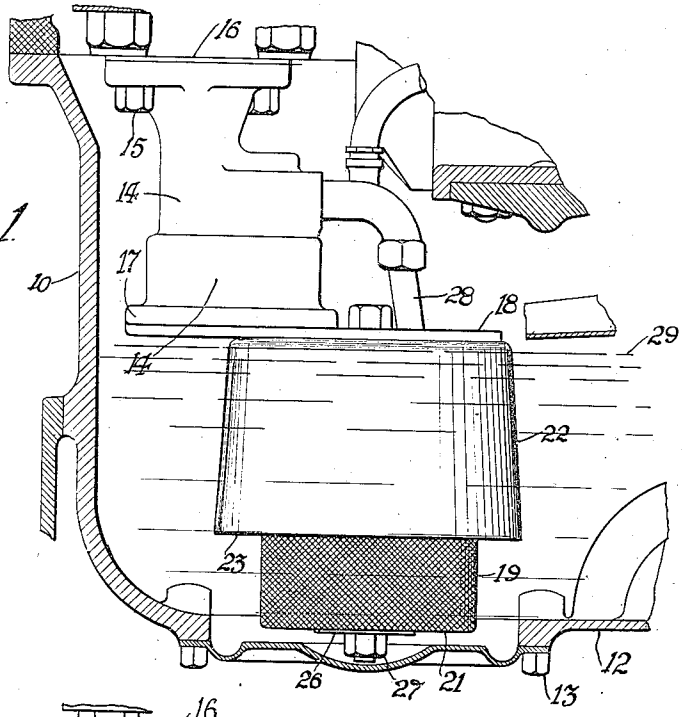
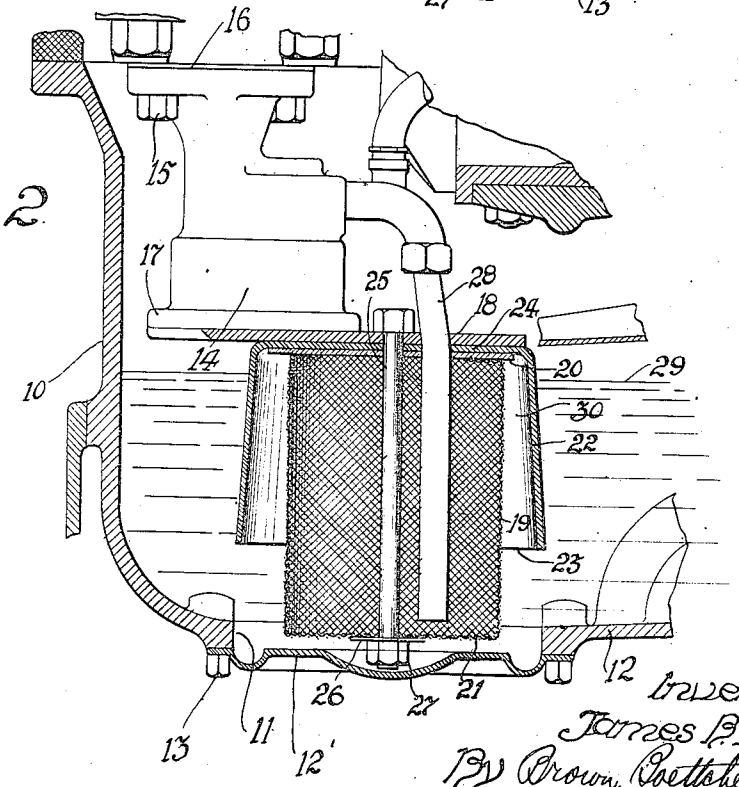


Fig. 2.



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UNITED STATES PATENT OFFICE.

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SUCTION INTAKE FOR PUMPS.

1,421,440. Specification of Letters Patent. Patented July 4, 1922.

Application filed January 14, 1920. Serial No. 351,304.

To all whom it may concern:

Be it known that I, JAMES B. FISHER, a citizen of the United States, residing at Waukesha, in the county of Waukesha and State of Wisconsin, have invented a certain new and useful Improvement in Suction Intakes for Pumps, of which the following is a clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The present invention relates to pumps and more particularly to improvements in suction boxes and screens for use in connection with lubricating oil pumps for supplying lubricating oil to the bearings of an internal combustion engine.

I have found that in the use of a screen in connection with the suction intake of a lubricating oil pump for use in the crank cases of internal combustion engines, the suction of the pump is often destroyed when the oil level in the crank case is not maintained at a predetermined point, in other words, when the oil level drops below the upper end of the screen. This is partly due to the admittance of air to the intake of the pump through the screen, and partly due to fouling of the screen by the heavy constituents often found in lubricating oils.

Therefore, the primary object of my invention is to provide means on the screen whereby the pump suction, and consequently the operativeness of the pump is maintained until practically the supply of oil in the crank case is exhausted, and while most users of internal combustion engines are apt to neglect to keep the oil at a certain predetermined level, nearly all users will at least replenish the supply of oil in the crank case before complete exhaustion of the supply. Thus my present invention practically insures operation of the pump at all times, it not being required that the oil level be kept at a certain predetermined point, it only being necessary that there be a reasonable quantity of oil in the crank case to insure against loss of suction of the pump.

The subject matter of the invention is particularly designed to meet with the conditions outlined above and is especially suited for use in connection with lubrication systems for internal combustion engines, but, of course, it is not limited to its present adaptation and use, as similar conditions may and often do exist in many other classes of machinery, particularly where as important a problem must be met by insuring constant and efficient lubrication of moving parts.

I meet the above conditions, and accomplish the object outlined above by providing a shroud or shield for association with the screen, which substantially, completely houses the screen and forms a pocket thereabout in which the oil or other liquid is trapped, so that when suction is applied to the interior of the screen a vacuum will be created within the screen and shield which will insure operation of the pump by maintaining the suction thereof until the oil or liquid level falls below the lower end of the shield, the shield being of such a length as to practically insure against such an occurrence as the user of the engine will almost invariably replenish the supply of oil before the same reaches such a low level. I do not limit myself to any particular shape of screen, nor to the exact manner in which the same is supported, but I shall describe hereinafter a preferred embodiment of the invention, this being brought forth in the following specification and the claims appended thereto, taken in connection with the accompanying drawing, in which:

Figure 1 is a side elevation of the suction screen of my invention, and

Figure 2 is a vertical section of the same.

Referring more particularly to the drawing, 10 designates the lower half of the crank case of an internal combustion engine, the same being provided with a hand opening 11 in the bottom 12 thereof. The opening 11 is closed by a removable cover 12* secured in position by means of bolts 13 or the like.

14 designates the casing of a rotary pump for furnishing lubricating oil to the bearings of the internal combustion engine, the pump being supported within the crank casing by means of bolts 15 engaging in a suitable bracket 16 formed integrally with the engine base. The pump is provided with a base portion 17 from which extends a bracket 18, the latter being secured to the base 17 in any suitable manner.

The bracket 18 supports the suction screen and shield of my invention. The screen is designated 19 and is preferably cylindrical in shape, said screen having a plate 20 secured to the upper end thereof and having

a bottom portion 21. The shield is designated 22 and is preferably cylindrical in shape, the side walls thereof flaring slightly outwardly as shown and spaced from the screen, the shield terminating as at 23 at a point above the lower end of the screen and spaced from the bottom of the crank casing. The end wall 24 of the shield is disposed between the plate 20 and the bracket 18, and a bolt 25 passes through said bracket, plate and the end wall of said shield and through the bottom of said screen, a suitable washer 26 being carried by the lower end of the bolt and the latter carrying a nut 27 for maintaining the shield and screen assembled on said bracket. The suction pipe or intake 28 extends from the pump 14 down through the chamber formed by the screen 19 and terminates at a point adjacent the bottom 21 of said screen.

The liquid level, which in the present case is the level of the lubricating oil in the crank case, is at 29, and it will be apparent that without the use of the shield 22, as soon as the liquid level drops below the top of the screen 19 the liquid contained within the screen would be removed by the suction pipe 28 and then the suction pipe would begin to draw air, as the oil would not pass through the meshes of the screen rapidly enough to maintain the suction. However, when the shield is used it will be apparent that even though the liquid level does fall below the top of the screen as it is shown in the drawing, a vacuum is established at 30 within the shield and within the screen, particularly within the latter, which acts to cause the oil to be forced through the screen. Thus the heavy constituents of the oil are taken care of and the pump will not draw any air until the liquid level falls below the lower edge of the shield.

While I have shown a specific embodiment of my invention, it will be realized by those familiar with the art that minor changes may be made therein without materially departing from the spirit in the invention, for instance, the shield may be made of different shape and lengths and may be made to surround the screen entirely for protective purposes and be provided with the necessary openings near its bottom. Various other changes may be made without departing from the spirit and scope of the invention as claimed.

I claim:

1. In combination, an oil reservoir, a cylindrical screen, means for exposing said screen directly to the oil in said reservoir throughout its entire circumference over the lower portion of its length, means for keeping the entire length of said screen submerged in oil as long as the oil level in said reservoir is above the upper end of the exposed portion, and a pocket in the bottom of said reservoir below said screen for storing accumulated sediment.

2. In combination, an oil reservoir, a cylindrical screen, means for exposing said screen directly to the oil in said reservoir throughout its entire circumference over the lower portion of its length, and means for keeping the entire length of said screen submerged in oil as long as the oil level in said reservoir is above the upper end of the exposed portion.

3. In combination, an oil reservoir, an oil pump spaced from the bottom thereof, an inverted cup-like shield below the bottom of said pump, and an upright cup-shaped screen in said shield projecting beyond the open end thereof.

4. In an intake, a cup-shaped screen opening upwardly, a pocket below said screen for storing sediment, and a cup-shaped shield opening downwardly and housing the upper portion of said screen.

5. In an intake, a cylindrical screen, and a cup-shaped shield over the upper end of said screen, said shield terminating above the lower end of said screen to expose the entire lower end of said screen directly to the liquid surrounding the intake, and sealing said intake from air as long as the liquid level is above its lower end.

6. In an intake, a cup-shaped screen opening upwardly, and a cup-shaped shield opening downwardly, said shield closing the upper end of said screen and providing an annular space around the upper portion of said screen, said shield sealing said intake against the admission of air as long as the liquid level remains above its lower end.

7. In combination, an oil reservoir, an inverted cup-shaped shield having its lower lip well below the normal oil level in said reservoir, a screen in said cup extending below the level of the edge of said cup, and means for withdrawing oil from inside said screen.

8. In combination, an oil reservoir, a cup-shaped screen opening upwardly, means for withdrawing oil from inside said screen, and a pocket in the bottom of said reservoir below said screen, said pocket having a removable bottom.

In witness whereof I hereunto subscribe my name this 2d day of January, 1920.

JAMES B. FISHER