Aug. 22, 1933. L. L. RICHARDSON 1,923,797

LUBRICATOR FOR PERCUSSIVE TOOLS

Filed March 11, 1929

Fig. 1.

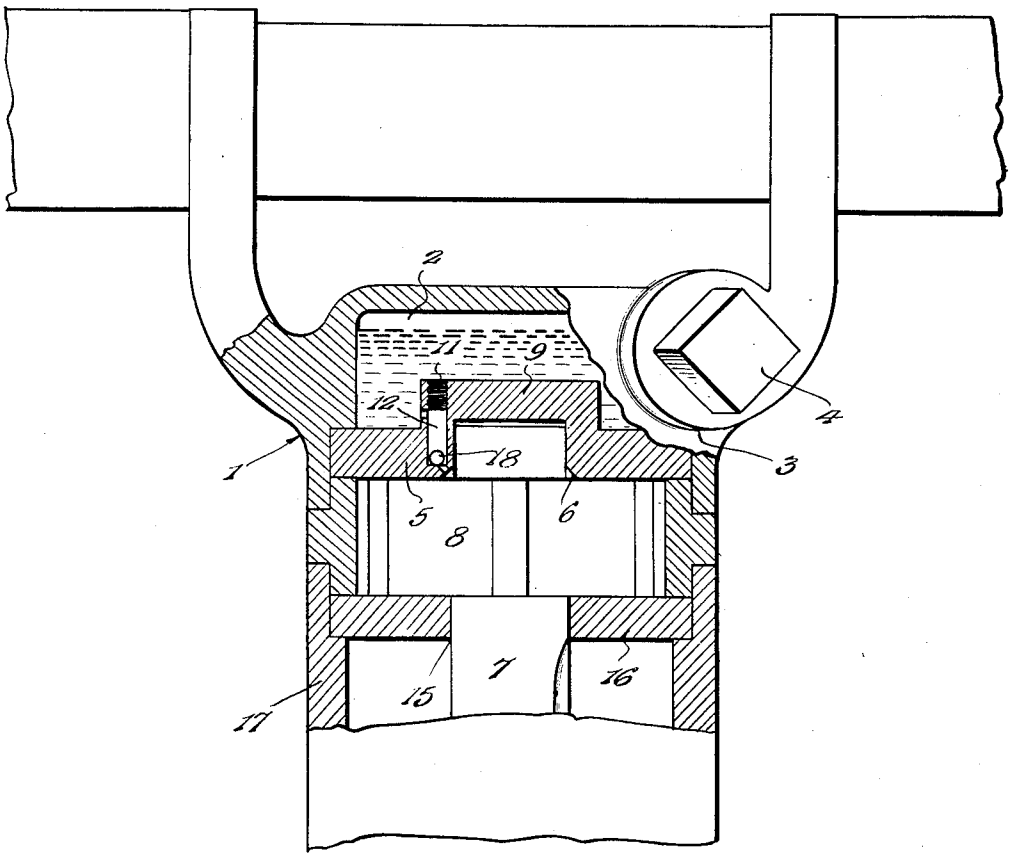
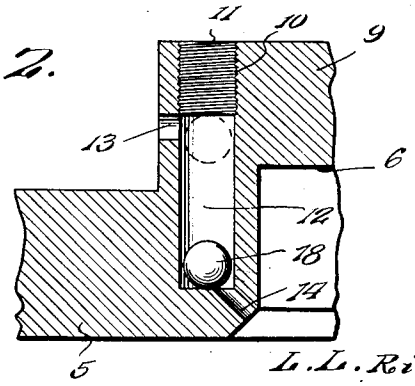


Fig. 2.



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LUBRICATOR FOR PERCUSSIVE TOOLS

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2 Claims. (Cl. 184—55)

The present invention is directed to improvements in lubricators for percussive tools.

The primary object of the invention is to provide a device of this character so constructed that the lubricant will be automatically conducted to the working parts of the tool, regardless of the position of the tool; and further to so construct the device that vibration and air pressure will in no way interfere with the operation thereof.

Another object of the invention is to provide a device of this kind constructed in such manner that the flow of lubricant will be constant.

Another object of the invention is to provide a lubricator of this type where small ports and passages are eliminated in order to prevent clogging by grit or other foreign matter.

With these and other objects in view, this invention resides in the novel features of construction, formation, combination and arrangement of parts to be hereinafter more fully described, claimed, and illustrated in the accompanying drawing, in which:—

Fig. 1 is a cross-sectional view of the back head of a percussion reservoir therein; and Fig. 2 is a cross-sectional view showing the oil passage from the reservoir to the operating parts of the tool on an enlarged scale.

Referring to the drawing, 1 designates the backhead of the tool, and in which is formed a reservoir 2 for containing a copious supply of oil. The reservoir is replenished with oil through the opening 3, said opening being normally closed by the screw plug 4.

A plate 5 constitutes bottom of the reservoir 2, said plate being pressed into the reservoir and has formed in its under surface a recess 6 to accommodate the upper end of the rifle bar 7, said bar having associated therewith the usual ratchet mechanism 8.

The head 1 and the ratchet mechanism are mounted upon the cylinder 17 which is of conventional construction well known in the art. A piston (not shown) is arranged to reciprocate in the cylinder 17 under the influence of motive fluid conducted thereto by suitable valve and passages. The valve construction together with the passages for conducting fluid to both ends of the cylinder and the piston construction are all well known in the art and it is not deemed necessary for a complete disclosure of this invention to do more than to refer to the art such as is illustrated by Patent No. 1,809,284 for a disclosure of such valve and passages for operating a piston. It is inherent in the operation of a pneumatic tool of this type that, in the space above the piston in and about the ratchet mechanism the pressure will fluctuate widely throughout a cycle of operation.

A boss 9 extends upwardly from the bottom 5 and into the reservoir, and in which is formed an eccentrically located threaded opening 10 adapted to receive the screw plug 11, said plug serving as a closure for the upper end of the chamber 12 which extends partly into the plate 5 and boss 9.

The upper end of the chamber 12 communicates with the reservoir through the horizontally disposed port 13, while the lower end thereof communicates with the recess 6 through the inclined passage 14. Obviously, oil admitted to the chamber 12 through the port 13 will flow from the passage 14 to lubricate the ratchet mechanism 8 and from thence through the opening 15 of the rifle bar guide plate, 16 mounted as customary in the upper end of the cylinder 17, and in which the hammer, not shown, reciprocates.

A ball 18 is retained in the chamber 12 by the plug 11, the diameter of the ball being slightly less than that of the chamber so that while oil can flow at all times past the ball, the flow thereof will be retarded by the ball to prevent a too rapid flow of oil from the passage 14 into the tool.

Since the plug 11, constitutes the top of the chamber 12, and the bottom of the chamber is disposed on an angle of 90° to the rifle wall thereof, the ball cannot at any time close the port 13 and passage 14, thus permitting oil to enter and leave the chamber.

The oil reservoir being in the motive fluid line a pressure corresponding to that in the fluid line will be built up in said reservoir. When motive fluid is admitted to move the piston the pressure in the line will be momentarily reduced, thus causing oil to flow from said reservoir to the operating parts of the tool. When the motive fluid is cut off from the piston the pressure in the line will be momentarily built up to normal again and the flow of oil will be retarded or momentarily stopped due to this increased pressure. The intermittent feeding of the oil through the restricted passage and the vibration of the tool will cause movement of the ball 18 within the chamber 12.

As before pointed out fluctuating pressure about the ratchet mechanism is inherent in pneumatic tools of the type to which this invention relates. The recess in the boss 9 is in

fluid communication with the head of the cylinder and therefore is subjected to such fluctuations in pressure. When the pressure is increased motive fluid passes through the orifice 14 into the chamber 12 and about the ball 18, there being a few thousands of an inch clearance about the ball, from passage 12 through the aperture 13 and into the reservoir 2. Thus a high pressure is built up within the reservoir 2 which tends to force lubricant out of that reservoir through the passages 12, 13 and 14. Due to the small clearance between the ball 18 and the walls of the passage 12, it will be moved upwardly during the passage of motive fluid from the cylinder into the reservoir 2. As the cycle of operation of the pneumatic tool continues the pressure within the top of the cylinder, and at the orifice 14 will be reduced below that existing in the reservoir 2 so that oil will be forced out of the reservoir 2 through aperture 13 of passage 12 and orifice 14 into the cylinder 2 which will lubricate the ratchet mechanism as well as the piston and associated moving parts. The ball 18 by virtue of its relatively small spacing from the walls of the passage 12 acts to regulate the flow of lubricant through the passage 12. By providing such a construction a passage 12 may be provided which is not subject to clogging by debris in the lubricant. The spacing between the walls of the passage 12 and the ball 18 is kept clear and free from clogging by the movement of the ball 18 under the influence of motive fluid passing from the cylinder to the reservoir 2, under the influence of lubricant passing from the reservoir 2 into the cylinder and also under the influence of vibration of the tool of the operation. Thus a practical, easily manufactured, form of automatic means for supplying lubricant to the tool 1 which is so constructed as to be free from clogging and to automatically clear itself from debris in those operations has been provided.

While the invention has been described in detail by way of illustration it is not intended so to limit the invention inasmuch as variations in the construction and arrangements of the parts thereof may be made without departing from the spirit and scope of the invention as defined in the following claims.

What is claimed is:—

1. The combination with a fluid actuated tool having an oil containing reservoir therein, of a chamber between the reservoir and the interior of the tool, said chamber having a port opening into its upper end for conducting lubricant from the reservoir to the chamber, and having a passage leading from the lower end of the chamber to the interior of the tool for conducting lubricant from the chamber to the working parts of the tool, a ball mounted within the said chamber and freely movable therein for restricting the flow of lubricant through and from the chamber, the said passage and said port being disposed remote the surface of the ball to assure continuous fluid passage from the reservoir to the interior of the tool.

2. The combination with a fluid actuated tool having an oil containing reservoir therein, of a chamber between the reservoir and the interior of said tool, said chamber having a port adjacent the upper end wall of said chamber for conducting lubricant from the reservoir to the chamber and having a passage adjacent its lower end wall for conducting lubricant from the chamber to the working parts of the tool, a member mounted within said chamber and completely reciprocable therein for restricting the flow of lubricant through and from the chamber, said passage and said port being disposed remote said member and free from obstruction by said member to assure the continuous fluid passage from the reservoir to the interior of said tool.

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