



Date of Application, 11th Sept., 1906—Accepted, 29th Nov., 1906

COMPLETE SPECIFICATION.

“Improvements in Sight-feed-lubricators”.

I, WILHELM MAYBACH, of Untertürkheim, in the Kingdom of Wurttemberg, German Empire, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 My invention relates to a sight-feed-lubricator, more especially to a sight-feed-lubricator for lubricating several parts intermittently. According to my invention I have arranged a single pumping device for each part to be lubricated. Each pump is actuated in such manner, that an oil-thread and an  
10 air-bubble pass alternately through the sight-tubes in order to be conveyed to the parts to be lubricated.

15 With this object in view provisions are made to bring the pump cylinder into communication alternately with the oil receptacle and with the atmosphere. Owing to the fact that an oil-thread is followed by an air-bubble the length of the oil-thread is clearly limited and from the length of the oil-thread it can be ascertained whether the part to be lubricated receives a large  
20 or small quantity of oil. According to my invention furthermore a special arrangement is provided for regulating the length of the oil thread in accordance with the special circumstances under which the part to be lubricated works.

25 The lubricating apparatus, hereinafter described, is given as an example only and may be modified as required for particular cases without departing from the principle of my invention. To make the invention clear, I refer to the accompanying drawings, in which:

Figure 1 is a central vertical section of a sight-feed-lubricator according  
30 to my invention.

Figure 2 is a horizontal cross-section on line C—D of the Figure 1.

Figures 3 and 4 are fragmentary sections illustrating different positions of the governing organ, as used in connection with my invention.

1 designates the plungers of which in this particular example, eight are  
35 arranged concentrically around a part of the circumference of the float 2. The construction and operation of the float 2 will not be further described, as the float forms no part of the present invention, and will be understood from the drawing. 1<sup>a</sup> are cylinders receiving the plungers 1 and made integrally with the casing 1<sup>b</sup> of the lubricating apparatus.

35 For actuating the plungers 1 a device 1<sup>d</sup>, which will be called an “annular slide-valve” is provided and is mounted on the flange 2<sup>3</sup> of the casing 1<sup>b</sup>. The construction of this annular slide-valve will hereinafter be fully described.

This annular slide valve is provided at or near its upper end with worm  
40 wheel teeth 5<sup>a</sup> gearing with the worm 5. The latter is on the shaft 5<sup>b</sup> which is mounted in a tubular projection 5<sup>c</sup> of the cover 18<sup>3</sup> closing the top end of the casing 1<sup>b</sup>. On the shaft 5<sup>b</sup> is mounted a toothed wheel 6, which can be operated in any convenient manner. 1<sup>e</sup> is a circular continuation of the casing 1<sup>b</sup> for guiding the annular slide-valve when the latter is rotated.

45 The slide-valve 1<sup>d</sup> is provided with an upper, inwardly projecting rim. One part of the rim, as will be seen from Figure 1, gradually descends from the

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left hand side to the lowest point 3<sup>a</sup> near the centre, and from or near to this point the rim ascends again to the point 3<sup>b</sup>. Thus the rim 3 in its circumference has two lowest points 3<sup>a</sup> and two highest points 3<sup>b</sup>. Against this rim 3, which is conveniently bevelled, abut the tapering top ends of the plungers 1 and the plungers are held up to the rim by the springs 25 each spring bearing with its upper end against a plunger and supported by the bottom of the corresponding cylinder 1<sup>a</sup>. Each plunger 1 is arranged in the manner described and will be caused to complete two strokes at each revolution of the round slide-valve by the undulatory rim.

I will now proceed to describe the construction of the annular slide-valve for governing the pump cylinders to admit alternately air and oil thereto and to discharge the air and the oil therefrom to the parts to be lubricated. 24 is an annular flange made integrally with the part 1<sup>a</sup> and provided with two kinds of arc-shaped slots 18 and 20 permitting the plungers 1 to suck up air and oil respectively and arranged diametrically opposite each other and being of a length equal to the parts of the rim which permit upward movement of the plungers. The slot 18 is fitted with a pipe 18<sup>1</sup> extending through the oil in the casing into the space above the latter which is in communication with the atmosphere. 19 and 21 are two arc-shaped recesses or grooves in the flange 24 and of a length equal to the sections of the rim which cause a descent of the plungers, these recesses or grooves also lying diametrically opposite each other and permitting air and oil to be forced from the cylinders into the sight-tubes 15, arranged concentrically on the outside of the casing, when such recesses 19 and 21 put channels 10 and 22 into communication as seen in Fig. 3.

For each pump the channels 12, 10 and 22 are provided, of which the channel 22 discharges into the sight-tube 15, whereas the channel 12 is in communication with the cylinder 1<sup>a</sup>.

The working of the arrangement as before described will readily be understood having regard to the foregoing statements. Assuming that the plunger 1 is allowed to move upwards by an ascending portion of the rim 3, then the slot 18 and the pipe 18<sup>1</sup> establish a communication between the atmosphere and the cylinder 1<sup>a</sup>, the air entering the latter through the channels 10 and 12, after having passed through the pipe 18<sup>1</sup> and the slot 18. By the operation of the worm wheel gearing 5, 5<sup>a</sup> the annular slide-valve 1<sup>a</sup> is rotated, whereby the slot 18 will be removed from the channel 10 and the recess or groove 19 will form a communication between the channels 22 and 10. As the plunger 1 is now engaged by a descending cam surface of the rim 3 the air will be forced from the cylinder 1<sup>a</sup> through the channels 12, 10, 19 and 22 into the sight-tube 15 and forces forward an oil-thread 15<sup>a</sup>, as clearly seen in Figure 3. After the plunger 1 has completed its downward stroke, the recess 19 has left the channels 10 and 22 and the slot 20 has arrived over the channel 10, as in Figure 4, to open communication between the cylinder and the oil space. After the plunger 1 has completed its upward stroke, the slot 20 leaves the channel 10 and the arc-shaped or concentric groove 21 will, during further rotation of the slide valve, form a communication between the channels 10 and 22, so that oil can be forced into the sight tube 15, the plunger being simultaneously operated by a descending cam surface of the motive rim 3. In this manner at each revolution of the annular slide valve each pump will be operated twice to force air and oil alternately through the sight tubes to the parts to be lubricated, and as clearly seen, no separate delivery or suction valves are used for the action of the pumps, which is a considerable advantage in a sight-feed lubricator.

For regulating the length of the oil thread that is to say the quantity of oil delivered, there is a set screw 17 for each piston, which screws are adapted to act as stops for the top ends of the plungers. According to the position of these set screws the plunger will be raised to a higher or lower level, so that

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in accordance therewith a larger or smaller oil quantity will be sucked up by the plungers.

The extension 1<sup>e</sup> may be slotted or perforated as at 26 and the valve 1<sup>a</sup> may have slots or perforations 27 which register at the proper times with the openings 26 for admitting oil to the space outside of the valve.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

10 1. A sight-feed-lubricator for lubricating several parts, having for each part to be lubricated a single pumping apparatus, governed in such manner that a connection is established alternately between the atmosphere and the pumping cylinder and between the oil receptacle and the cylinder, so that oil and air are delivered alternately to the parts to be lubricated.

15 2. A sight-feed-lubricator as claimed in Claim 1, in which the pumps are concentrically arranged within the casing of the lubricator, and in which a governing member such as for instance an annular slide valve, is provided for operating all of the pumps and for giving communication alternately between the atmosphere and the pumping cylinder, and between the oil receptacle and the pumping cylinder.

20 3. In a sight-feed lubricator as claimed in Claim 2, an annular slide valve having arc-shaped slots, such as 18 and 20, and arc-shaped recesses or grooves such as 19 and 21, for the purpose of governing the pumps in such manner that an air bubble and an oil thread are alternately forced through the sight-tubes in order to be conveyed to the parts to be lubricated.

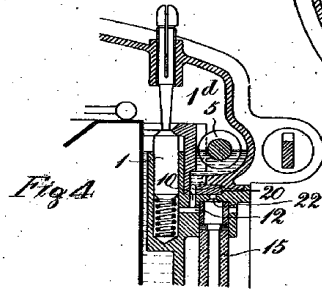
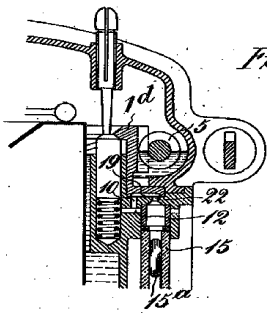
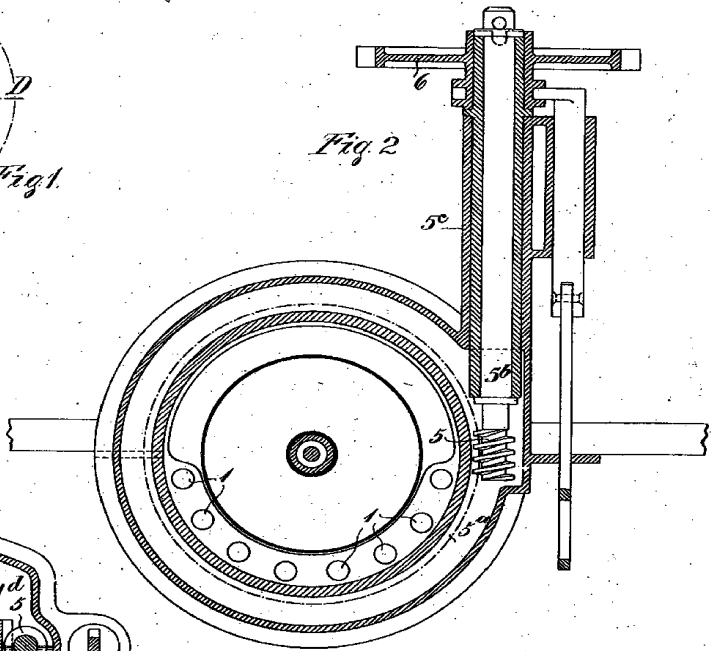
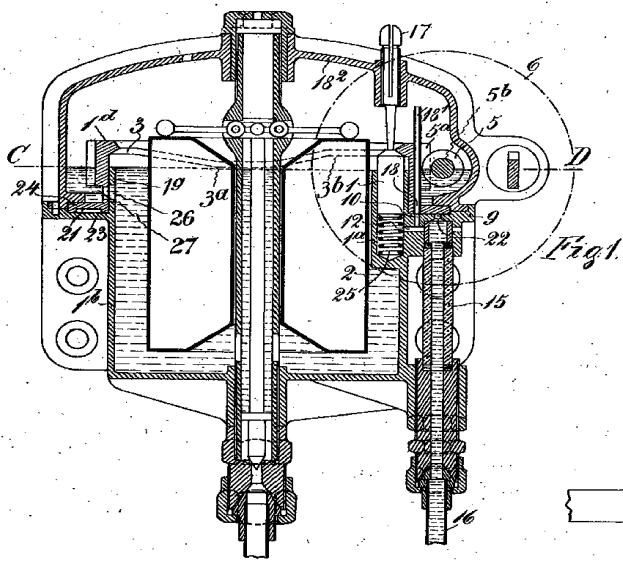
25 4. The sight-feed-lubricator constructed and operated substantially as described and illustrated.

Dated this 11th day of September 1906.

JENSEN & SON

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Chartered Patent Agents.

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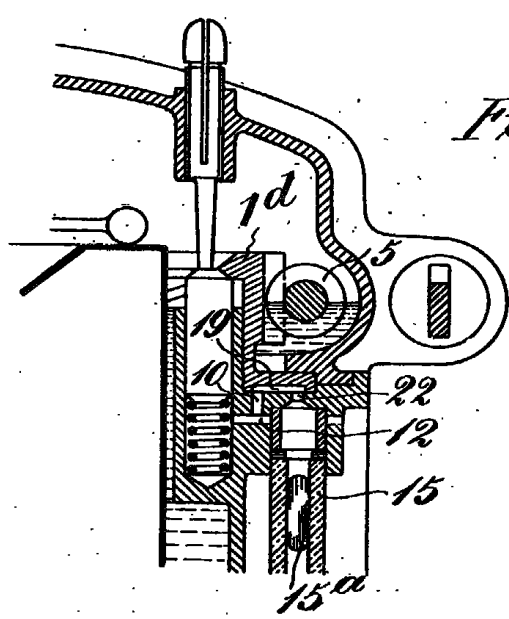
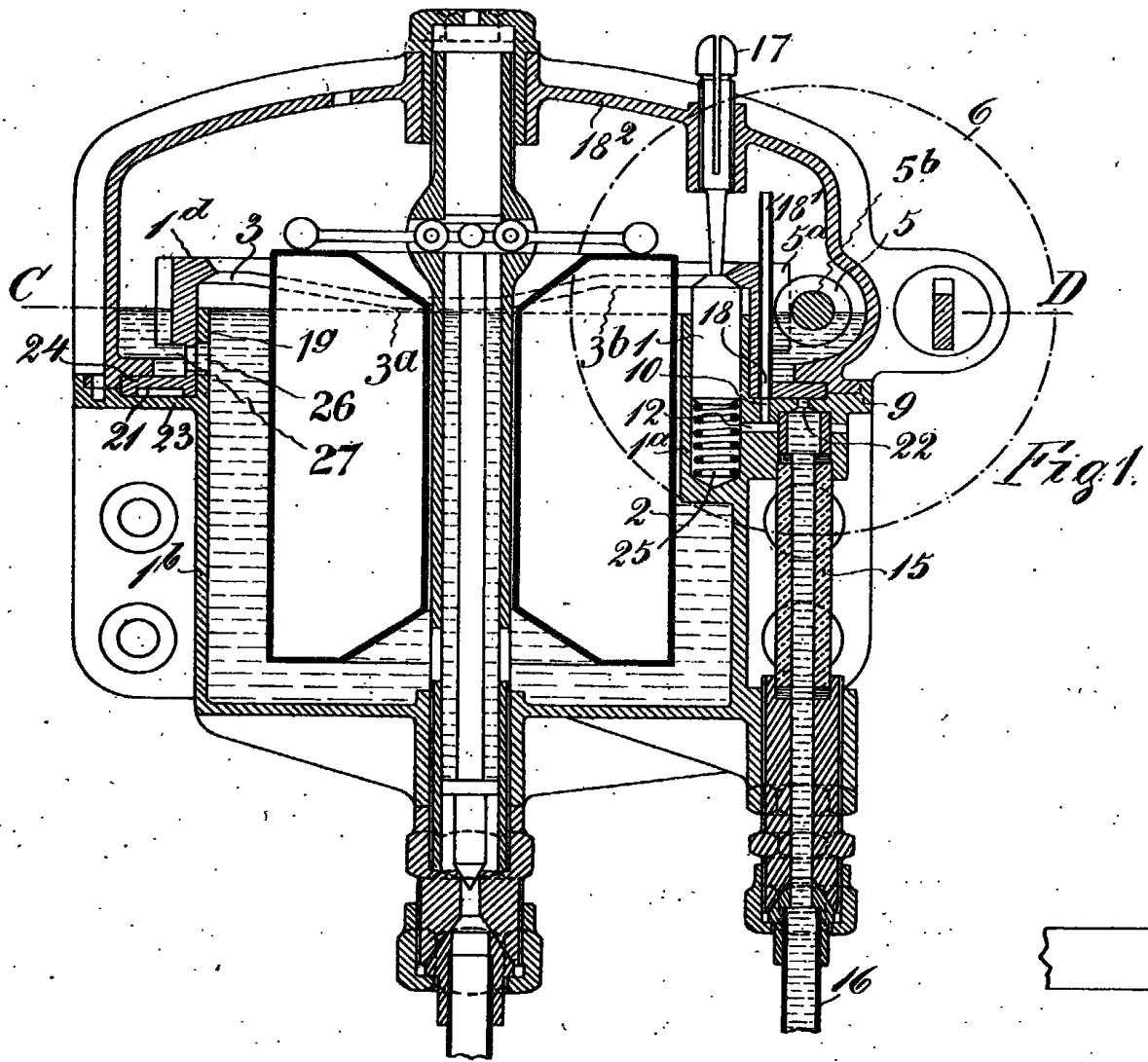


Fig. 3.

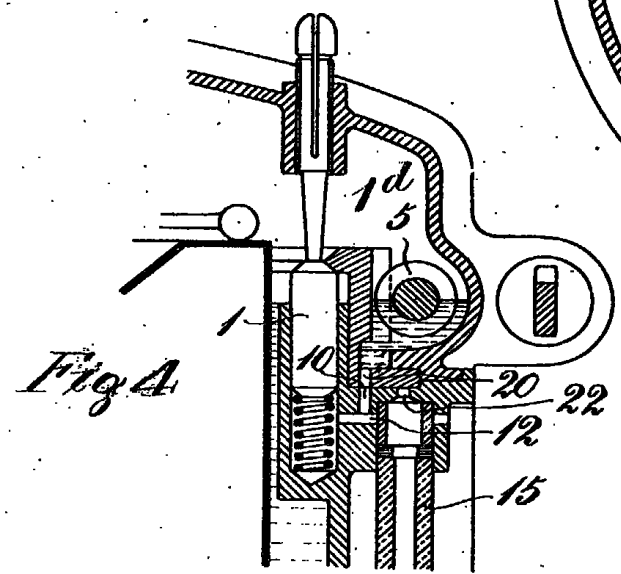
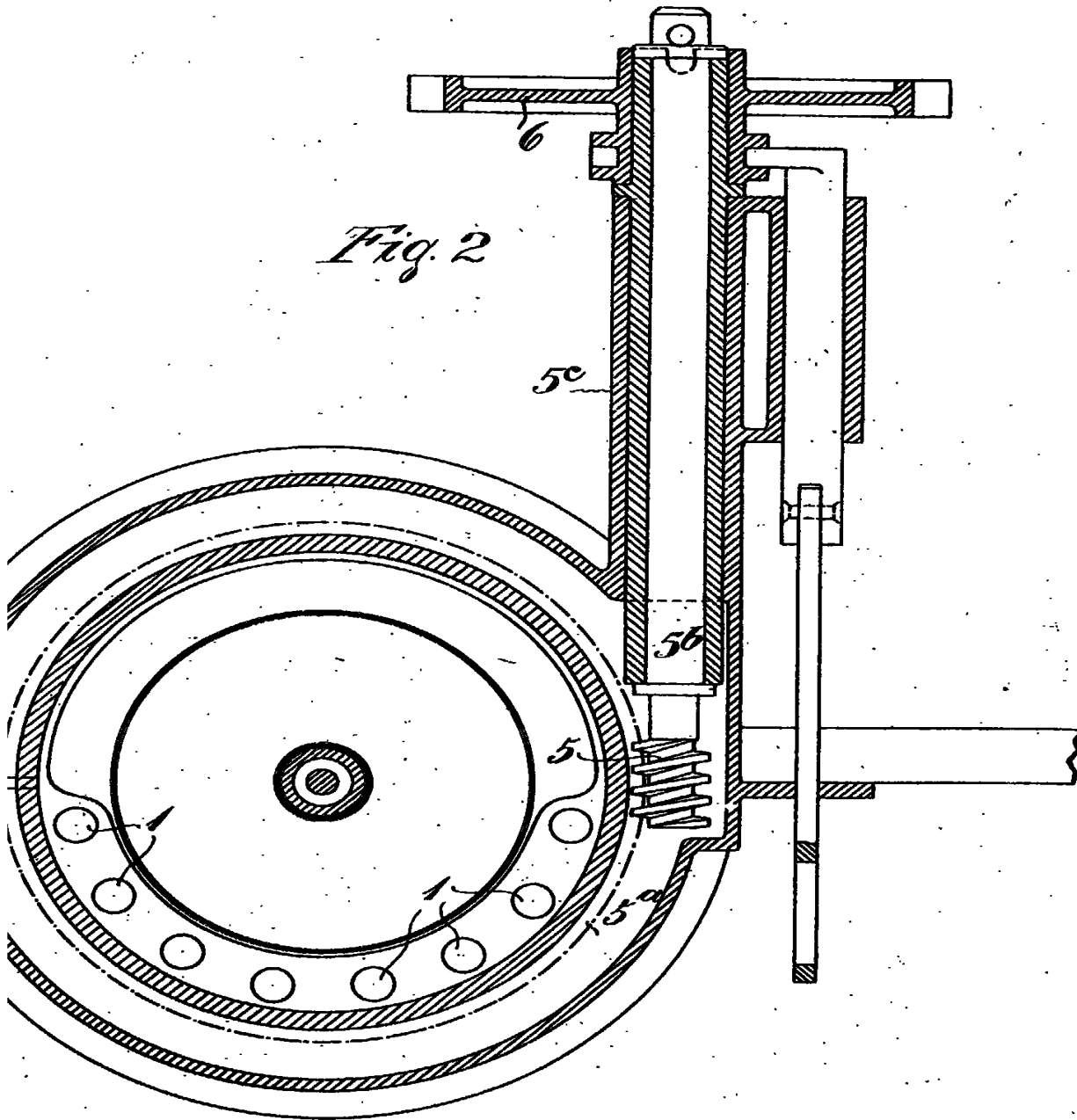


Fig. 4.

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