A. STRAND.

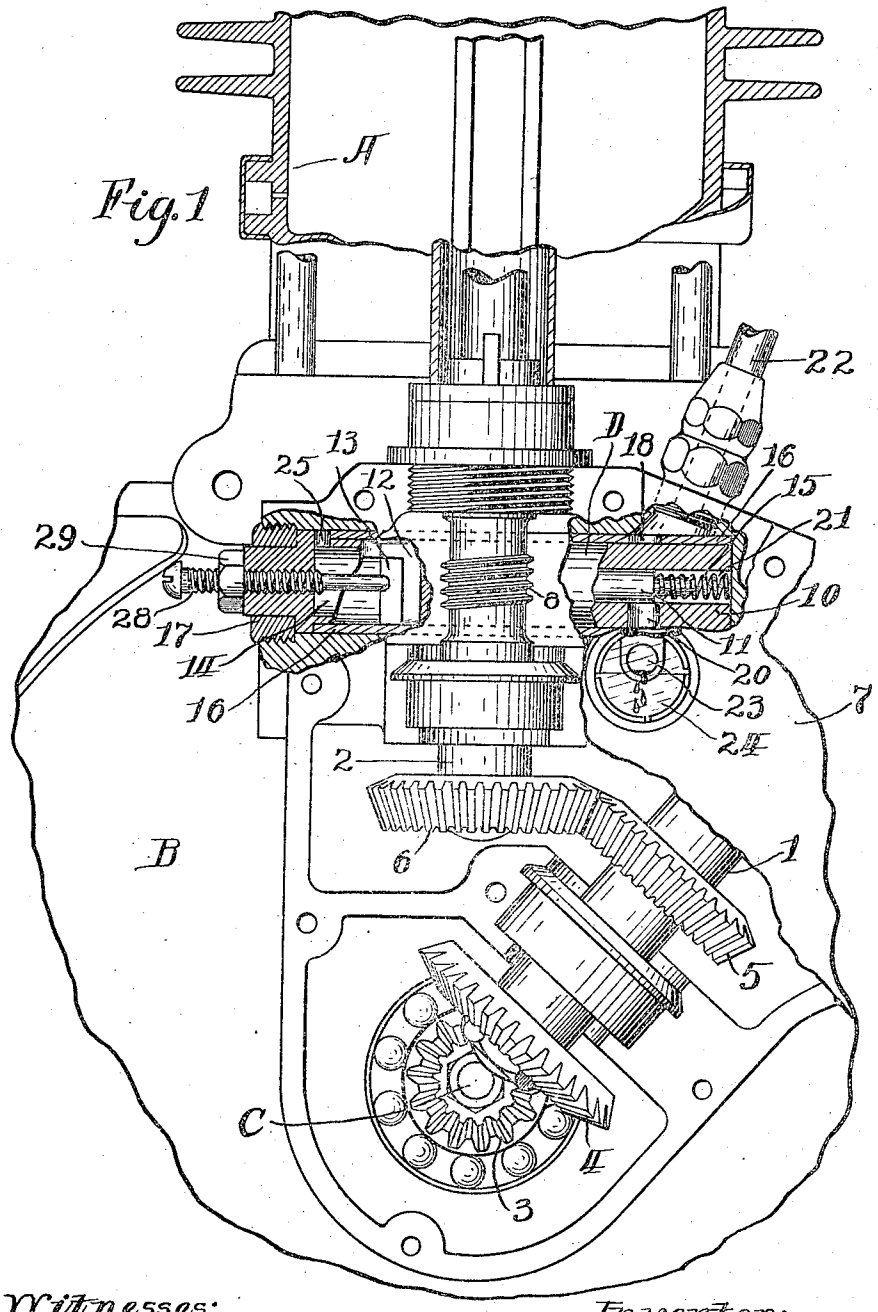
OIL PUMP.

APPLICATION FILED JUNE 4, 1915.

1,279,480. Patented Sept. 17, 1918.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

A. STRAND.

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2 SHEETS—SHEET 2.

Fig. 12

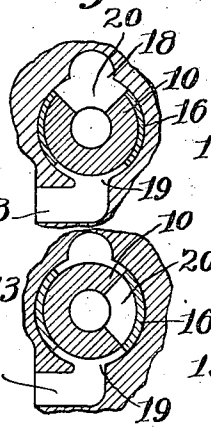


Fig. 13

Fig. 11

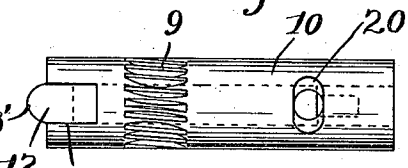


Fig. 5

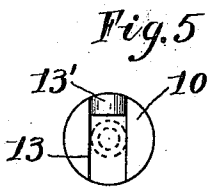


Fig. 6

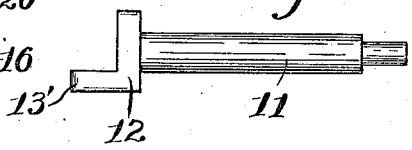


Fig. 7

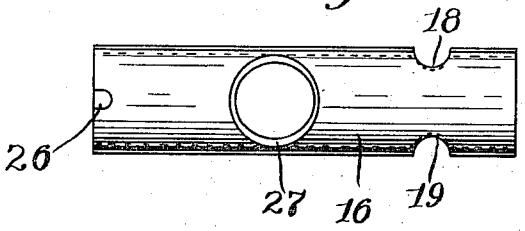


Fig. 3

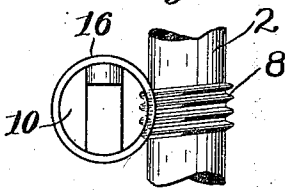


Fig. 8

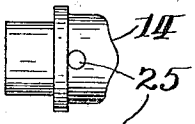


Fig. 10

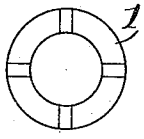


Fig. 11

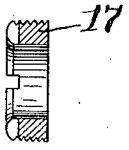


Fig. 9

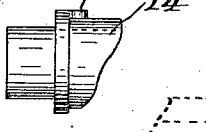
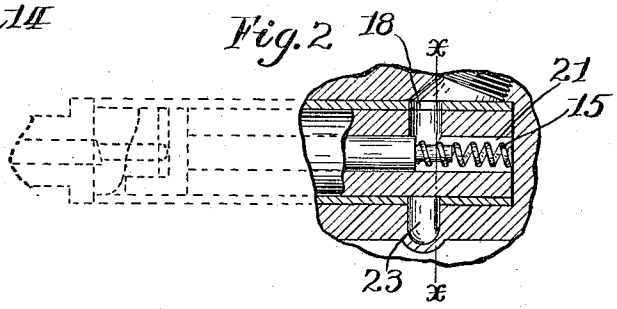


Fig. 2



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ANDREW STRAND, OF MINNEAPOLIS, MINNESOTA.

OIL-PUMP.

1,279,480. Specification of Letters Patent. Patented Sept. 17, 1918.

Application filed June 4, 1915. Serial No. 32,226.

To all whom it may concern:

Be it known that I, ANDREW STRAND, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and useful Improvement in Oil-Pumps, of which the following is a specification.

My invention relates to oil pumps of the rotary cylindrical type, which is compact and is adapted to be easily adjusted at will to feed a desired amount of oil. There are no ball or check valves to get out of order and oil cannot flow through the pump when the pump is not operating for when the supply vent is open the outlet is closed and vice versa.

A further object of my invention is to provide a sight in the casing covering the oil pump which exposes the outlet vent of the pump to the operator so that the amount of oil being fed by the pump can be easily determined at a glance. The pump has only two moving parts, a sleeve and a plunger within the sleeve.

In the accompanying drawings forming part of this specification similar letters refer to similar parts throughout the several views, in which:

Figure 1 is a detail partly in section of a gas engine cylinder and crank case illustrating my pump in the discharging position;

Fig. 2 is a detail of my pump illustrated in the intaking position;

Fig. 3 illustrates a portion of the pump and worm gear on the cam shaft which rotates the pump;

Fig. 4 illustrates a longitudinal view of the sleeve and plunger therein;

Fig. 5 is an end view of Fig. 4;

Fig. 6 is a view of the plunger removed from the sleeve;

Fig. 7 is a view of the casing in which the sleeve rotates;

Figs. 8 and 9 are views of the cam which operates the plunger;

Figs. 10 and 11 are views of the collar which holds the pump and parts in position in the crank case;

Figs. 12 and 13 are sectional views on the line X—X of Fig. 2.

In the drawings, A indicates a gas engine cylinder a portion of which is broken away, the cylinder being secured to the crank case B in the usual manner, only a portion of the crank case being shown.

The crank shaft C drives the cam shafts 1 and 2 through a series of gears, 3, 4, 5, and 6, which are exposed by the breaking away of the cover plate 7.

In the upper portion of the crank case and horizontally disposed is the oil pump D, which is rotated by the worm gear 8 formed on the shaft 2 and which meshes with the gear 9 formed on the sleeve 10. Centrally and axially disposed in the sleeve 10 is a plunger 11 having a head 12 which is free to slide longitudinally in the slots 13 in the end of the sleeve 10, and thus, when the sleeve 10 is rotated the plunger 11 rotates with it. The head 12 has a projection 13′ which is held against the cam 14 by a coil spring 15, engaging the opposite end of the plunger 11. The sleeve 10 rotates within a sleeve housing or bearing 16 which is driven tightly into the casing B and held in place by the cam 14 and nut 17. The sleeve housing 16 has an elongated inlet vent 18 on the upper side and an elongated outlet vent 19 on the lower side which coincide with an elongated vent 20 in the sleeve 10 during the rotation of the sleeve 10. The vent 20 in the sleeve 10 opens into the plunger chamber 21 in the sleeve 10 and is so constructed that a quarter turn of the sleeve 10 will open or close the vent 20 with the openings 18 and 19. Thus, as is illustrated in Fig. 12 the vent 20 is completely opened to inlet vent 18 and in Fig. 13 the vent 20 is closed but in readiness to open into communication with the outlet vent 19.

The inlet vent 18 is fed by the supply pipe 22 and the outlet vent 19 opens into the outlet or discharging passage 23 leading into the crank case. The outlet 23 is visible through a glass covered opening 24 in the cover plate 7 of the crank case. The cam 14 is held from rotation by a pin 25 which engages with the slot 26 in the housing 16. The opening 27 in the housing 16 allows the gear 8 on the shaft 2 to engage the gear 9 on the sleeve 10. A stop bolt 28 threaded through the body of the cam 14 and held in a locked position by the nut 29 is adapted to limit the movement of the plunger 11 longitudinally by engaging the head 12 of

the plunger and thus regulate the amount of oil fed through the pump D during the rotation and reciprocation of the same.

In operation the shaft 2 rotates the gear 8 which rotates the sleeve 10 together with the plunger 11 and at the same time the plunger 11 is moved back and forth longitudinally by the cam 14, and as the vent 20 in the sleeve 10 comes in contact with the inlet vent 18 oil is drawn into the plunger chamber 21 as the plunger is on its intake stroke. When the sleeve 10 has rotated far enough to close the vent 20 from the vent 18, the vent 20 begins to open with the discharge vent 19 and the plunger 11 which is then on its return stroke drives the oil from the chamber 21 into the crank case through the passages 19 and 23. The plunger 11 being reciprocated longitudinally by the cam 14. It being obvious that as the oil flows into the top of the pump and leaves at the bottom, the pump is assisted by gravity and as it only takes a quarter of a revolution of the sleeve and plunger to open or close the inlet and outlet vents, oil can not be compressed in the pump or flow through it unless it is being operated, there being but two moving parts in the pump, the sleeve and plunger.

While I have described and illustrated my invention with one particular cylindrical pump, I wish it understood I do not confine myself to this particular arrangement of parts as described as it is evident my invention may be applied in various manners within the scope of the following claims.

What I claim is:—

1. In a pump, a cylindrical stationary bearing sleeve, a cylindrical rotatable sleeve, axially positioned in said bearing sleeve, a plunger axially positioned within said rotatable sleeve and means for rotating said rotatable sleeve and simultaneously reciprocating said plunger longitudinally in said rotatable sleeve for the purposes specified.

2. The combination in a rotary cylindrical pump, of a rotatable sleeve, a plunger axially located in said sleeve, means for rotating said sleeve and plunger together in the same direction and means for reciprocating said plunger longitudinally in said rotatable sleeve simultaneous with the rotation of said rotatable sleeve and plunger.

3. A rotary cylindrical pump, a rotatable sleeve, a longitudinally reciprocable plunger axially positioned within said sleeve, a circular cam for engaging said plunger, resilient means for holding said plunger against said cam and means for engaging said plunger to hold it out of engagement with said cam, whereby the longitudinal movement of said plunger can be adjusted for the purposes specified.

4. A pump, comprising, a bearing housing rigidly secured in the crank case of an engine, a sleeve rotatably held in said housing, a plunger axially positioned in said sleeve, means for engaging said plunger to cause it to rotate with said rotatable sleeve, cam engaging means formed on said plunger, a cam for engaging said cam engaging means to reciprocate said plunger longitudinally in said rotatable sleeve during the rotation of the same, resilient means for engaging said plunger to hold it into engagement with said cam and means for axially engaging the head of said plunger to adjustably limit the longitudinal movement of said plunger for the purposes specified.

5. An oil pump, comprising, a cylindrical bearing sleeve fixed in the crank case of an engine, inlet and outlet vents formed in said bearing sleeve, a rotatable sleeve adapted to rotate in said stationary sleeve to automatically open and close said inlet and outlet vents, during the operation of said pump, and transparent means in said crank case for exposing the flow of oil from the outlet of said pump for the purposes specified.

6. In an oil pump, the combination with a cylindrical rotatable sleeve having a longitudinal axially positioned chamber, a plunger longitudinally reciprocable in said chamber, a vent in said sleeve communicating with said chamber, a sleeve bearing in which said rotatable sleeve is adapted to rotate, outlet vents formed in said sleeve adapted to coincide with said vent in said rotatable sleeve when said sleeve is rotated, said vent in said rotatable sleeve being adapted to begin to open into said outlet vent upon closing of said inlet vent and adapted to open into said inlet vent upon closing of said outlet vent, means for rotating said rotatable sleeve, a groove formed in said sleeve for engaging said plunger to cause it to rotate with said sleeve and means for reciprocating said plunger longitudinally in said rotatable sleeve chamber simultaneously with the rotation of said rotatable sleeve and plunger.

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Witnesses:
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H. L. FISCHER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."