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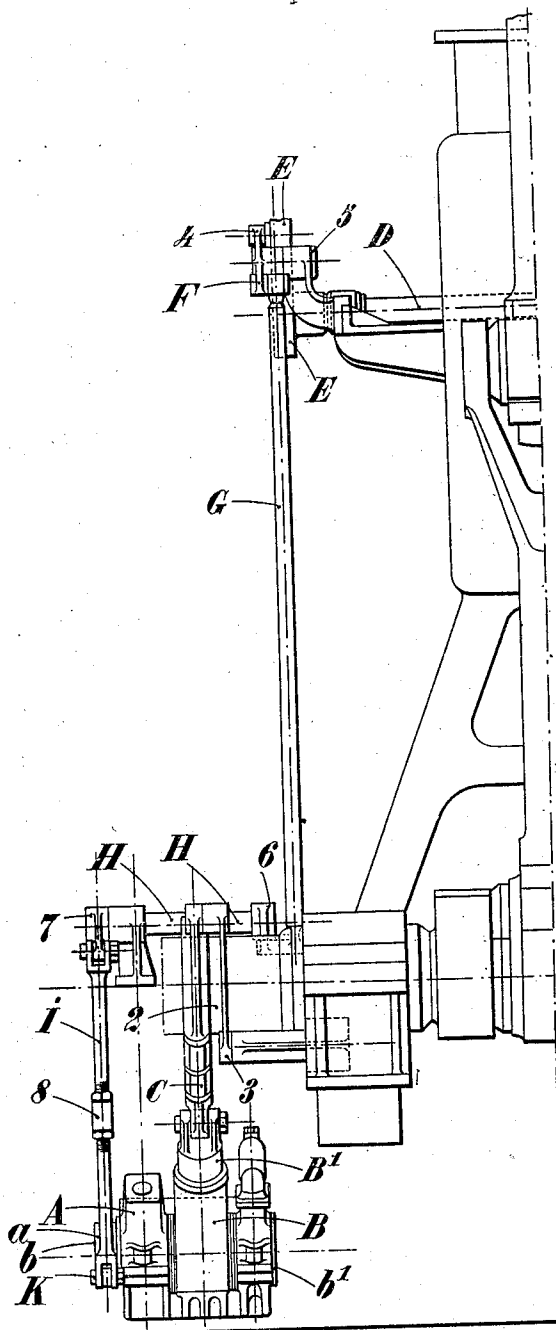
PATENTED OCT. 16, 1906.

L. M. G. DELAUNAY-BELLEVILLE.
LUBRICATING PUMP.

APPLICATION FILED DEC. 4, 1905.

6 SHEETS—SHEET 1.

Fig. 1



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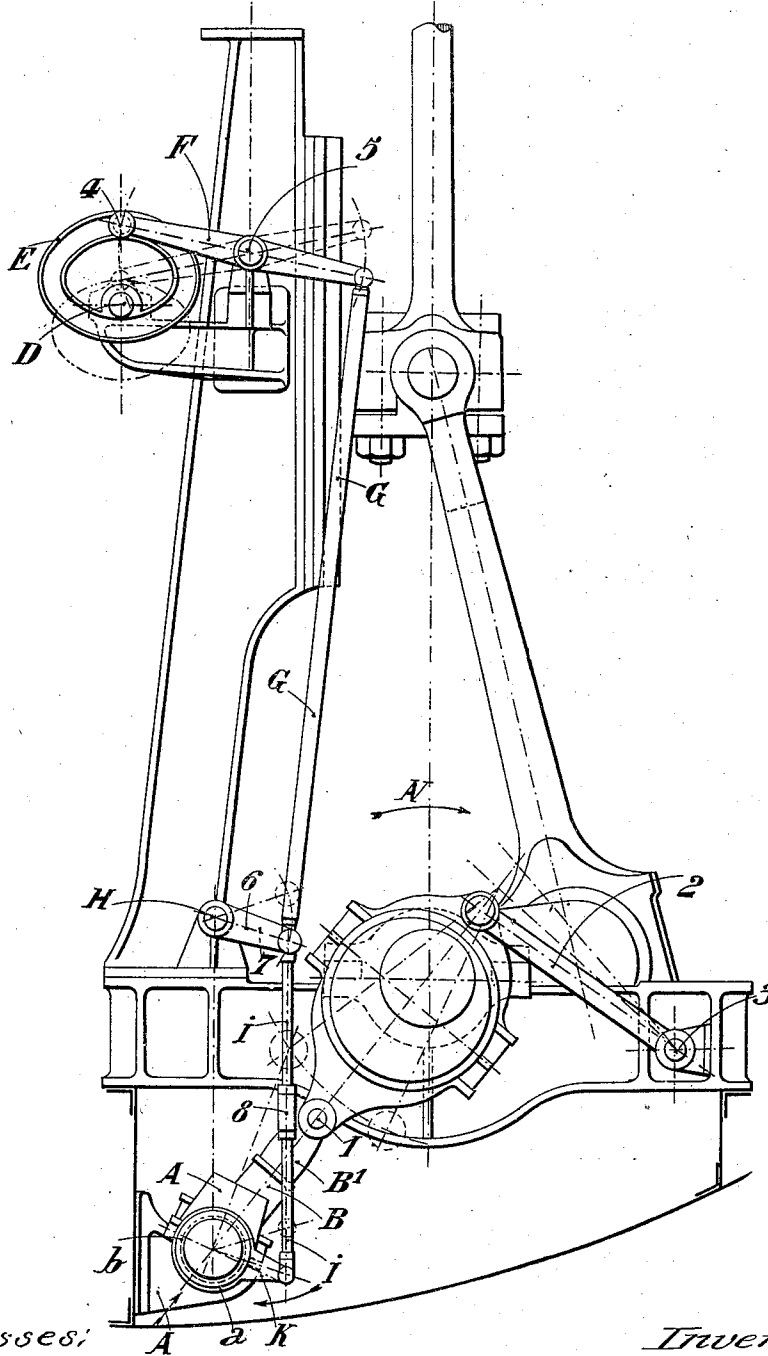
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Fig. 2.

6 SHEETS—SHEET 2.



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6 SHEETS—SHEET 3.

Fig. 3.

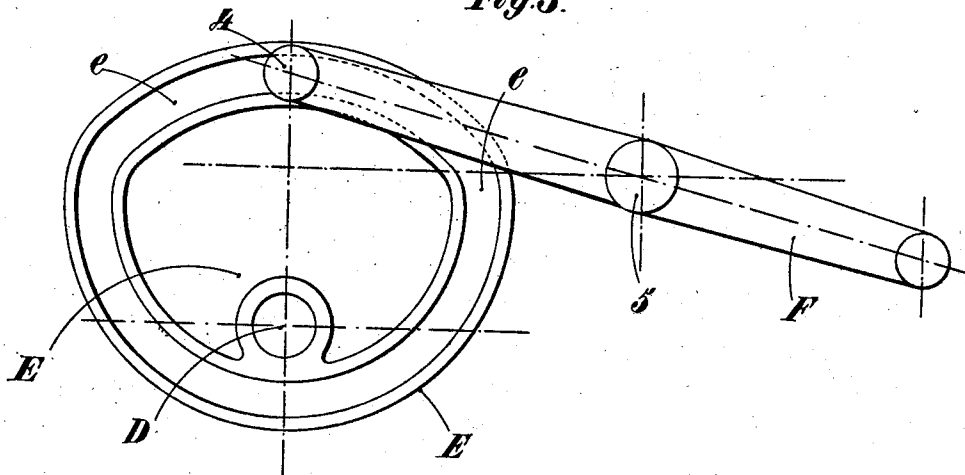
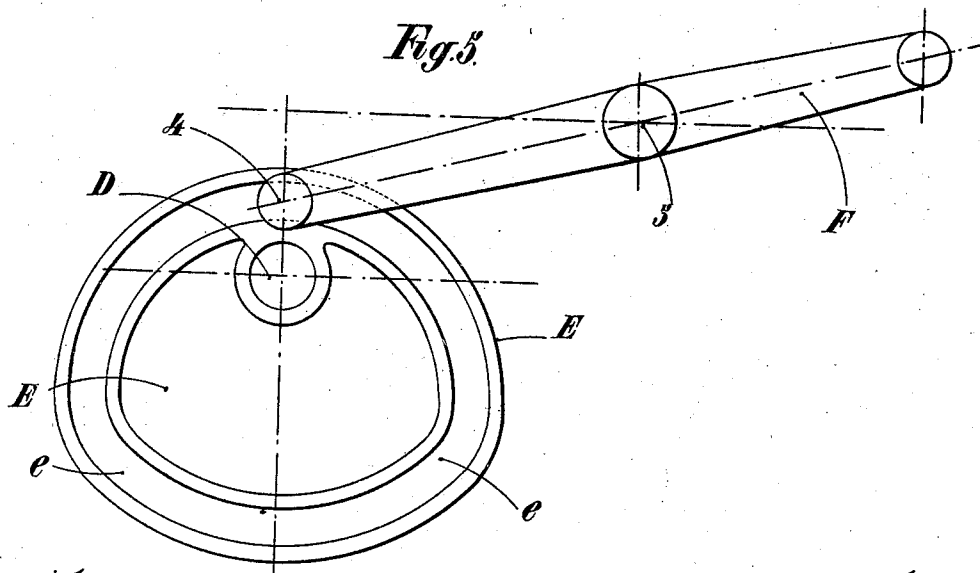


Fig. 5.



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6 SHEETS—SHEET 4.

Fig. 4.

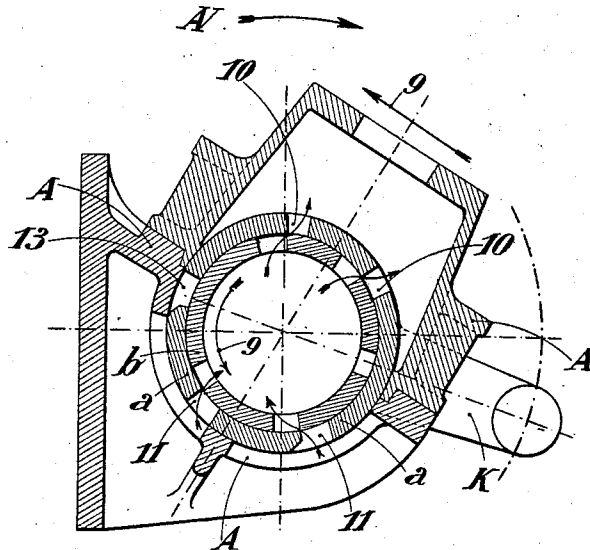
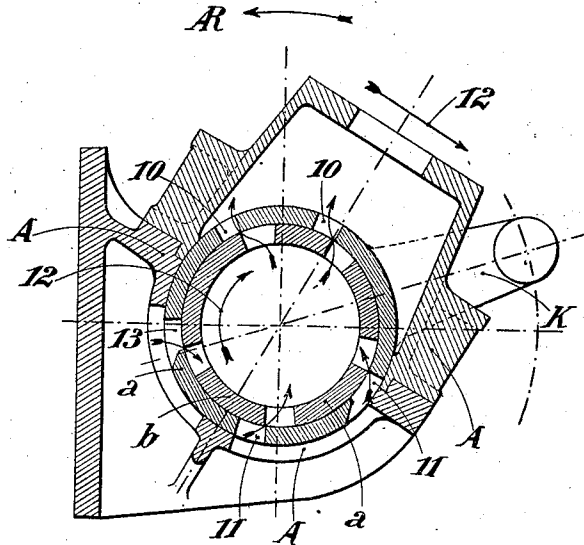


Fig. 6.



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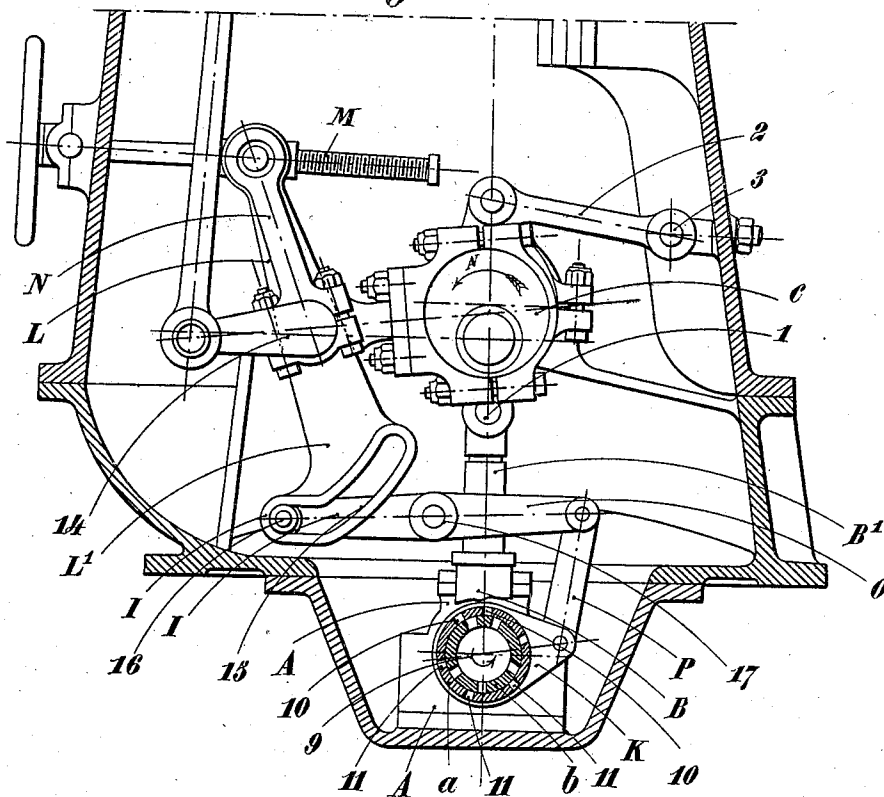
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APPLICATION FILED DEC. 4, 1905.

6 SHEETS—SHEET 5.

Fig. 7.



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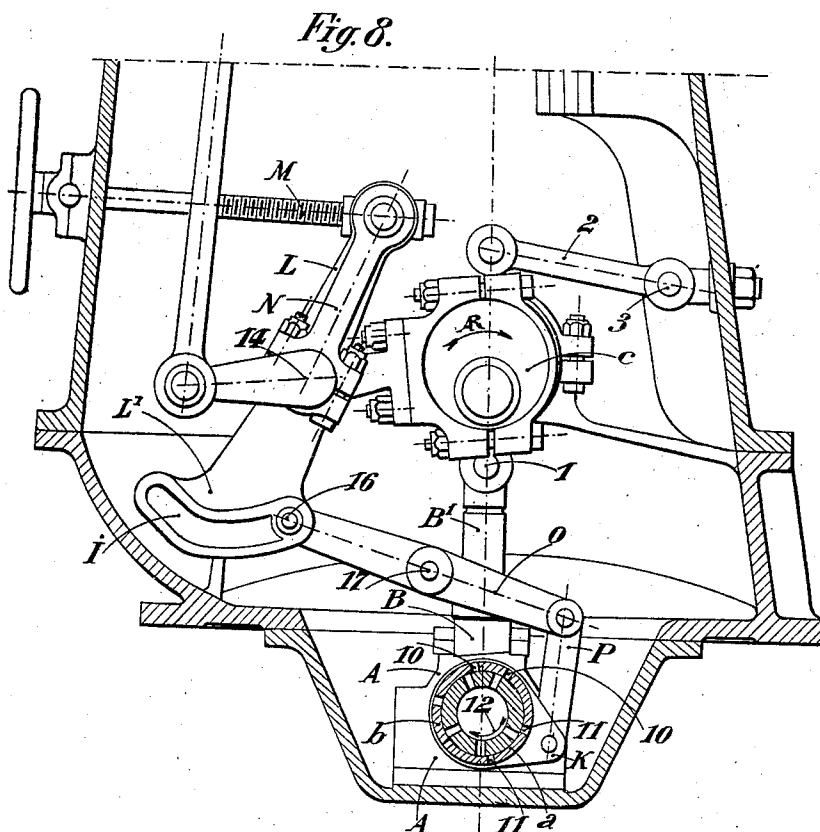
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APPLICATION FILED DEC. 4, 1905.

6 SHEETS—SHEET 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

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LUBRICATING-PUMP.

No. 833,678.

Specification of Letters Patent.

Patented Oct. 16, 1906.

Application filed December 4, 1905. Serial No. 290,224.

To all whom it may concern:

Be it known that I, LOUIS MARIE GABRIEL DELAUNAY-BELLEVILLE, engineer, a citizen of the French Republic, residing at Neuilly-sur-Seine, Department of the Seine, France, (whose post-office address is boulevard Richard Wallace,) have invented certain new and useful Improvements in Lubricating-Pumps, of which the following is a specification.

This invention relates to lubricating-pumps, more particularly valveless oscillatory pumps for lubricating under pressure the elements of machinery, and aims to provide a means associating with the pump for obtaining an efficient operation of the pump whether the prime mover (engine) is running forwardly or backwardly.

To this end the invention consists of the novel construction, combination, and arrangement of parts hereinafter more specifically described, and illustrated in the accompanying drawings, wherein is shown the preferred embodiment of the invention; but it is to be understood that changes, variations, and modifications can be resorted to which come within the scope of the claims hereunto appended.

In describing the invention in detail reference is had to the accompanying drawings, wherein like reference characters denote corresponding parts throughout the several views, and in which—

Figure 1 is a side elevation of an engine with the pump connected therewith, the axis of the driving-shaft being in the plane of the figure. Fig. 2 is an end elevation, the driving-shaft being perpendicular to the plane of the figure. Fig. 3 is a detail showing the cam for actuating the movable part of the pump, the cam being positioned for the forward running of the engine. Fig. 4 is a section through the pump, showing the position of the suction and discharge orifices for the forward running of the engine. Fig. 5 is a view of the cam for actuating the movable part of the pump, the cam being in the position for the backward running of the engine. Fig. 6 is a view similar to Fig. 4, showing the position of the suction and discharge orifices for the backward running of the engine. Fig. 7 is a sectional elevation showing the position of the mechanism and of the suction and discharge orifices of the pump for the forward running of the engine, and Fig. 8 is a like

view showing the position of the parts for the backward running of the engine.

In the drawings, A denotes the fixed portion of the lubricating-pump, and B the oscillating cylinder thereof. The latter is provided with a pair of trunnions *b b'*. The trunnion *b* is termed the "distributing-trunnion," and between the trunnion *b* and the fixed part A of the pump a movable sleeve *a* is positioned. The fixed part A of the pump is open below the sleeve *a*, and the said open portion is in suitable communication with a lubricant-supply, so that during the suction operation of the pump lubricant will be drawn into the trunnion *b*. That portion of the fixed part A of the pump above the sleeve *a* constitutes a chamber into which the lubricant from the trunnion *b* is forced during the forcing operation of the pump, and from the said chamber the lubricant is forced through suitable conduits or pipe connections (not shown) for supplying the lubricant to the parts to be lubricated. The sleeve *a* and the trunnion *b* are each provided with forcing-orifices 10 and suction-orifices 11, and for suction purposes during back running the trunnion *b* is provided with an additional orifice, (indicated by the reference character 13.) This orifice 13 is not utilized during the forward running of the engine.

The sleeve *a*, which is mounted loosely on the distributing-trunnion *b*, has its orifices so disposed that on the forward running of the engine the suction-orifices of the trunnion *b* come opposite to the corresponding orifices of the sleeve during the suction-stroke, and the exhaust-orifices of the trunnion *b* come opposite to the corresponding orifices of the sleeve during the exhaust-stroke. During the backward running of the engine the suction-orifices of the trunnion *b* come opposite to the orifices 11 of the sleeve during the suction-stroke, and the exhaust-orifices of the trunnion *b* come opposite to the corresponding orifices of the sleeve during the exhaust-stroke.

The cylinder B of the pump oscillates on its trunnions *b b'*, and the inner part of the cylinder is set in communication, through the distributing-orifices of the trunnion *b* and of the sleeve *a* alternately, with a lubricant-supply, and from the latter the pump during its operation sucks the lubricant and then forces it into the chamber of the fixed part A.

of the pump, and from there it is distributed to the elements of the machine.

The piston of the pump is indicated by the reference character B' and is jointed, as at 1, to an eccentric C, carried by a shaft H. The eccentric C is guided by the rocking lever 2, articulated to a fixed point 3.

The reference character D denotes a shaft which is solid with that which operates the steam-distributing sectors, and at one end of said shaft D there is mounted a grooved cam E. (Shown on an enlarged scale in Figs. 3 and 5.) The cam E displaces the movable part of the pump by actuating the following mechanism: A lever F, having its axis of oscillation at 5, carries on one end the roller 4, which travels in the groove *e* of the cam E, and to the other end of the lever F a rod G is attached. The latter at its lower end is connected by a crank-arm 6 to the shaft H. The shaft H also carries a crank-arm 7, articulated to a sectional rod I, which is jointed at its lower end to the lever K, the latter formed integral with the movable sleeve *a* of the pump. A screw tension device 8 is provided upon the rod I for adjusting the same.

In Figs. 1 and 2 the piston of the oil-pump is at the lower dead-point after just having effected a forcing. No matter in what direction the engine may be running the piston will ascend. Therefore it is essential that the orifices should be positioned for the suction in whatever direction the engine may be running.

The arrows 9 9, Fig. 4, indicate the direction in which the oscillating cylinder B and the distributing-trunnion *b* are about to move. In such position the forcing-orifices 10 10 close, while the suction-orifices 11 11 open as soon as the trunnion is displaced. When the direction of the running of the engine is reversed, the cam E, the roller 4, the levers F and K assume the position shown in Fig. 5, the distributing-trunnion *b* has followed the movement of the lever K, and the orifices are positioned as shown in Fig. 6. In Fig. 6 the direction of movement is shown by the arrows 12 12, and when the parts move in such direction the forcing-orifices 10 10 close, while the suction-orifices 11, 11, and 13 open.

A portion of the groove *e* of the cam E is concentric with the shaft D, carrying the cam. The shaft D and the cam E are capable of displacement through the whole of the corresponding angle without the roller 4, consequently the sleeve *a*, changing position. It is owing to such arrangement that it is possible to cause the admission to vary by the displacement of the suspension of the sectors during forward running without the operation of the pump being affected in a detrimental manner.

In Figs. 7 and 8 of the drawings the displacement of the sleeve *a* is had through the

medium of a Marshall distributing-gear, and in this connection the reversing-lever is indicated by the reference character L and rocks around an axis passing through an arm 14. The lever L is adjusted by a rocking screw M and may be caused to assume the position for forward running, as illustrated in Fig. 7, and for backward running, as illustrated in Fig. 8, and all intermediate positions. N is a suspended rod of the distributing-gear and is independent of the lever L. To cause a displacement of the sleeve *a* in reversing, the lever L is provided with an elongation, as at L', and said elongation L' is formed with a groove 15, in which operates a roller 16, fixed to the extremity of the lever O. The latter is pivotally connected to a rod P, which operates the lever K, formed in one with the sleeve *a*.

In Fig. 7 the whole of the mechanism is in position for forward running. The eccentric C, which drives the piston B' of the lubricating-pump, is at the upper dead-point. The piston has just effected suction. It will descend and force in the direction of rotation of the shaft, and therefore under such circumstances it is essential that the orifices should be properly positioned for the two directions of running. In Fig. 8 the whole of the mechanism is shown as positioned for backward running. The sleeve *a* has been displaced, the orifices have altered their position relatively to the position of the orifices of the trunnion *b*, and consequently the proper working of the pump is obtained. The part I I of the groove 15 is concentric with the axis of oscillation 14 of the lever L. It is therefore possible during forward running to cause the admission to vary by the amount corresponding to the displacement of the lever L without affecting the operation of the pump to any material extent.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a valveless oscillatory lubricating-pump, an oscillatory cylinder having a pair of trunnions, one of said trunnions provided with a series of orifices, and a displaceable sleeve surrounding said trunnion provided with orifices associating with the orifices in said trunnion, combined with means for displacing said sleeve so as to provide for a reversal of the direction of movement of the means for driving the pump.

2. In a lubricating-pump, an oscillatory cylinder provided with a trunnion having suction and exhaust orifices, and a displaceable sleeve provided with orifices and surrounding and having its orifices associating with the orifices in the said trunnion.

3. In a lubricating-pump, an oscillatory cylinder provided with a trunnion having suction and exhaust orifices, and a displaceable sleeve provided with orifices and sur-

rounding and having its orifices associating
with the orifices in the said trunnion, com-
bined with means for operating the pump,
and means for displacing the sleeve so that
5 the operation of the pump will not be affected
during the forward and backward running of
the means for operating the pump.

In testimony whereof I have hereunto set
my hand in presence of two subscribing wit-
nesses.

LOUIS MARIE GABRIEL DELAUNAY-BELLEVILLE.
Witnesses:

PIERRE LEISSE,
FREDERIC W. CAULDWELL.