No. 817,629. PATENTED APR. 10, 1906.

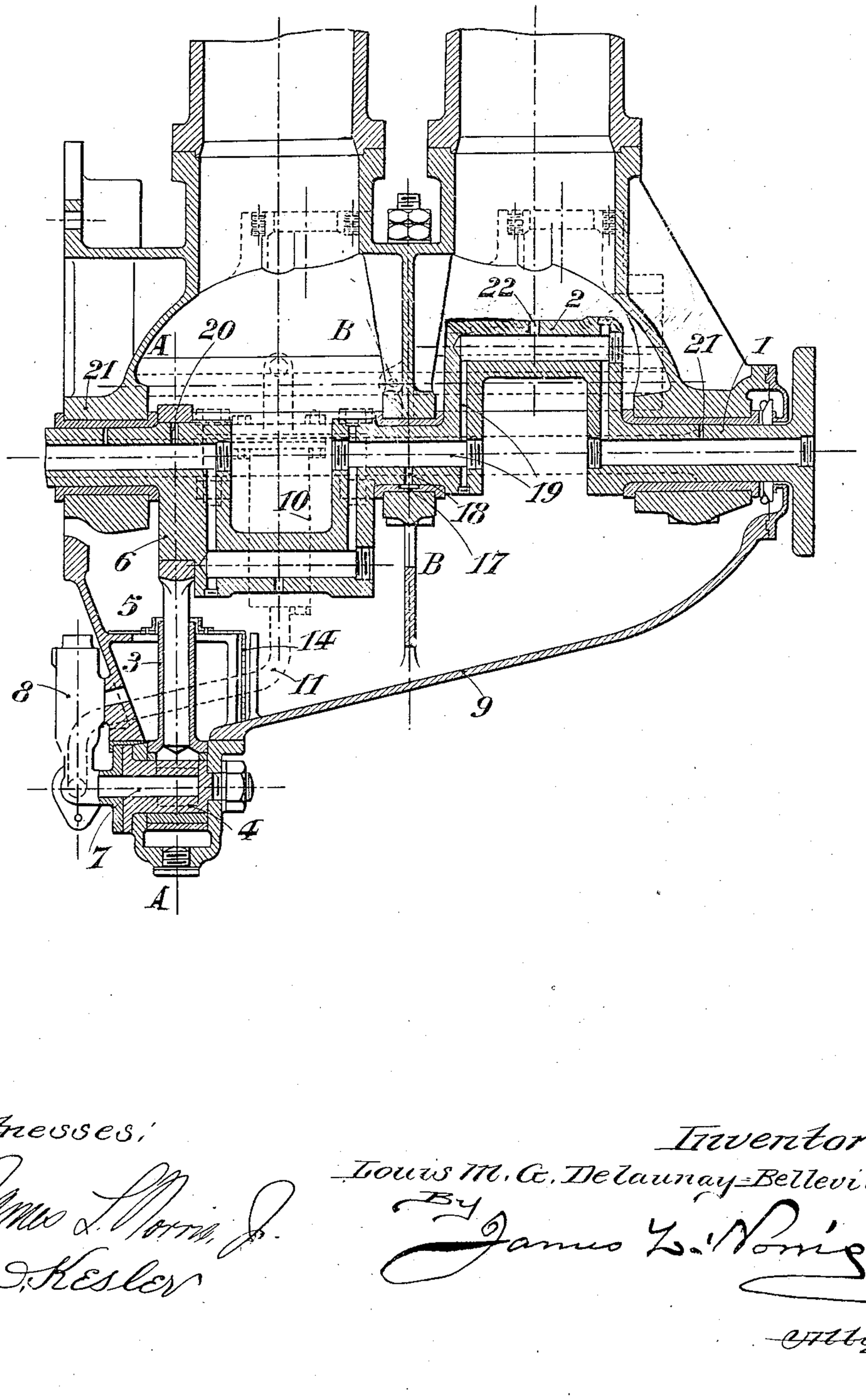
L. M. G. DELAUNAY-BELLEVILLE.

DEVICE FOR LUBRICATING UNDER PRESSURE.

APPLICATION FILED FEB. 9, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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3 SHEETS—SHEET 2.

Fig. 2.

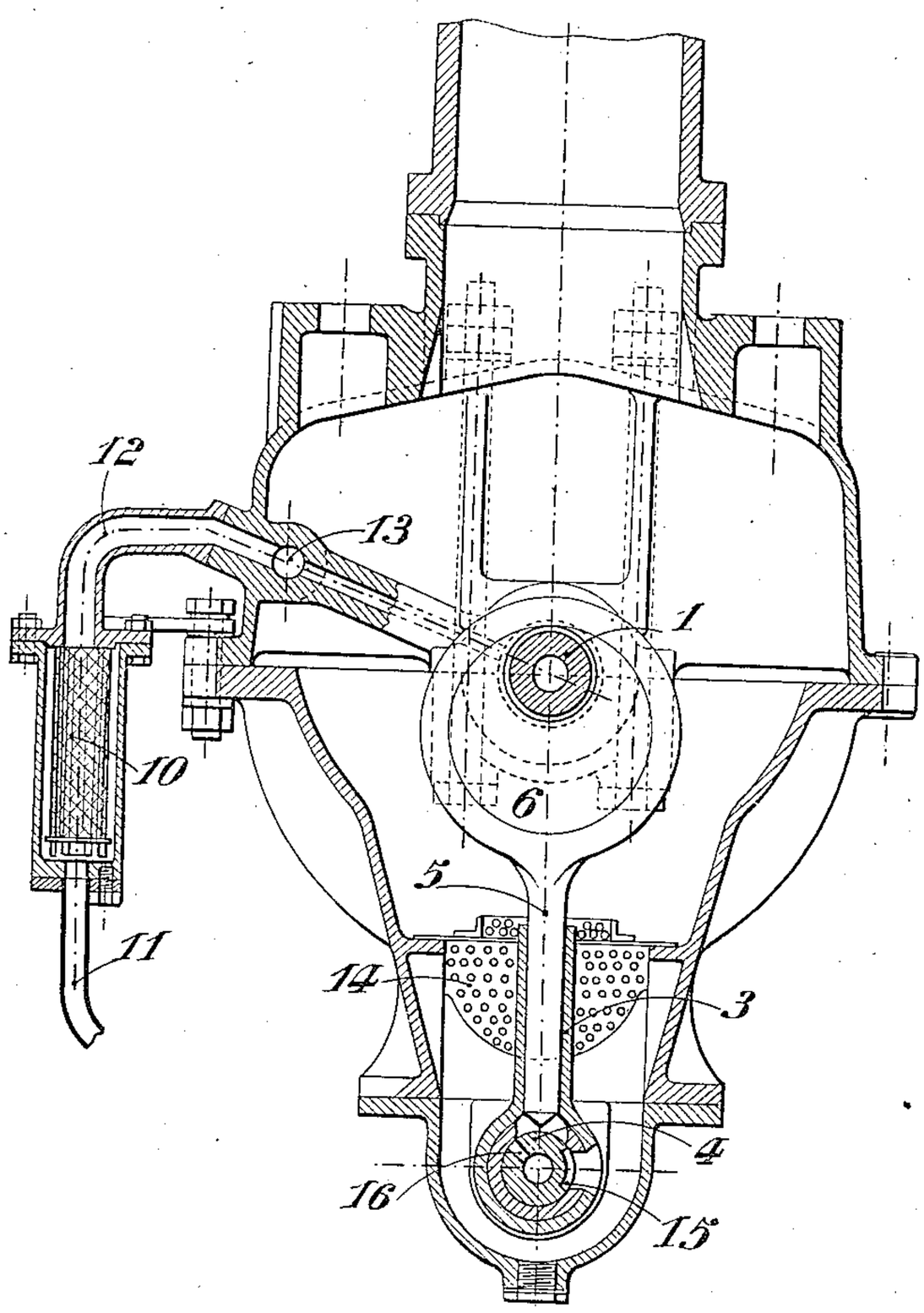
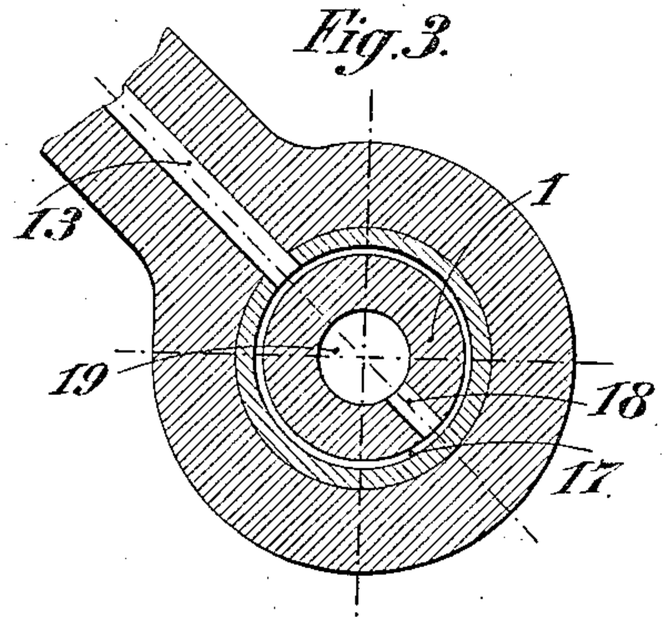


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

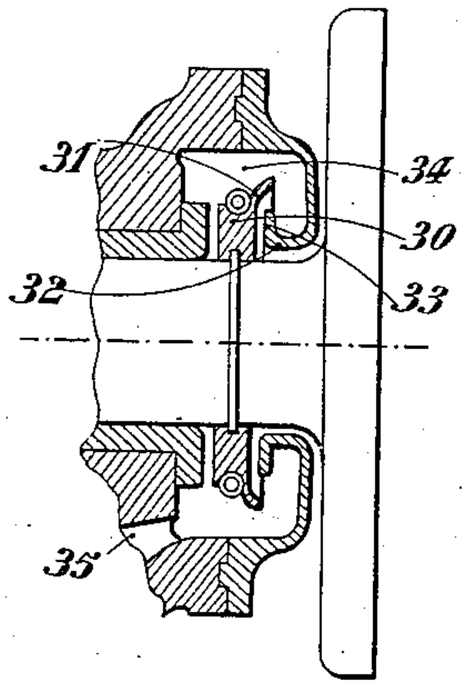


Fig. 6.

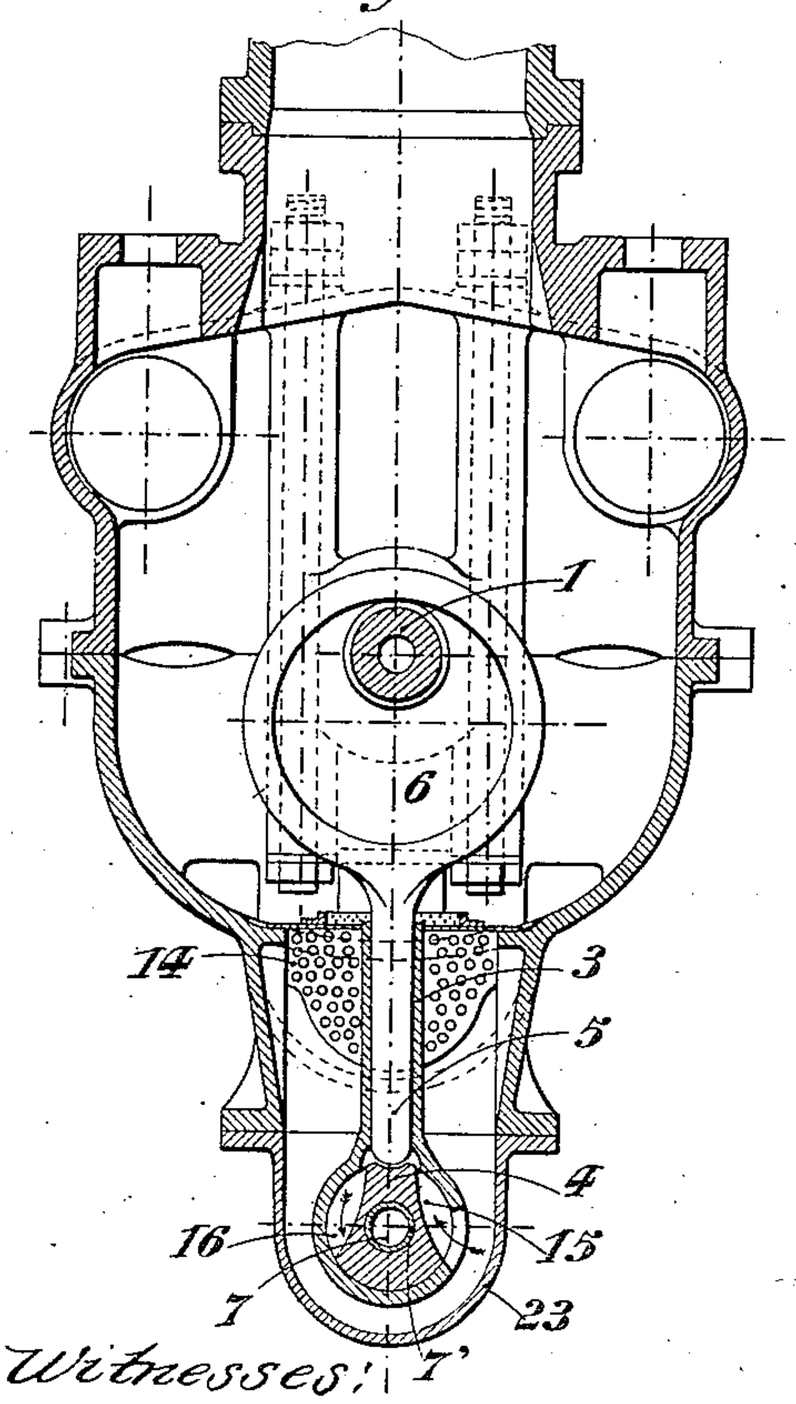


Fig. 5.

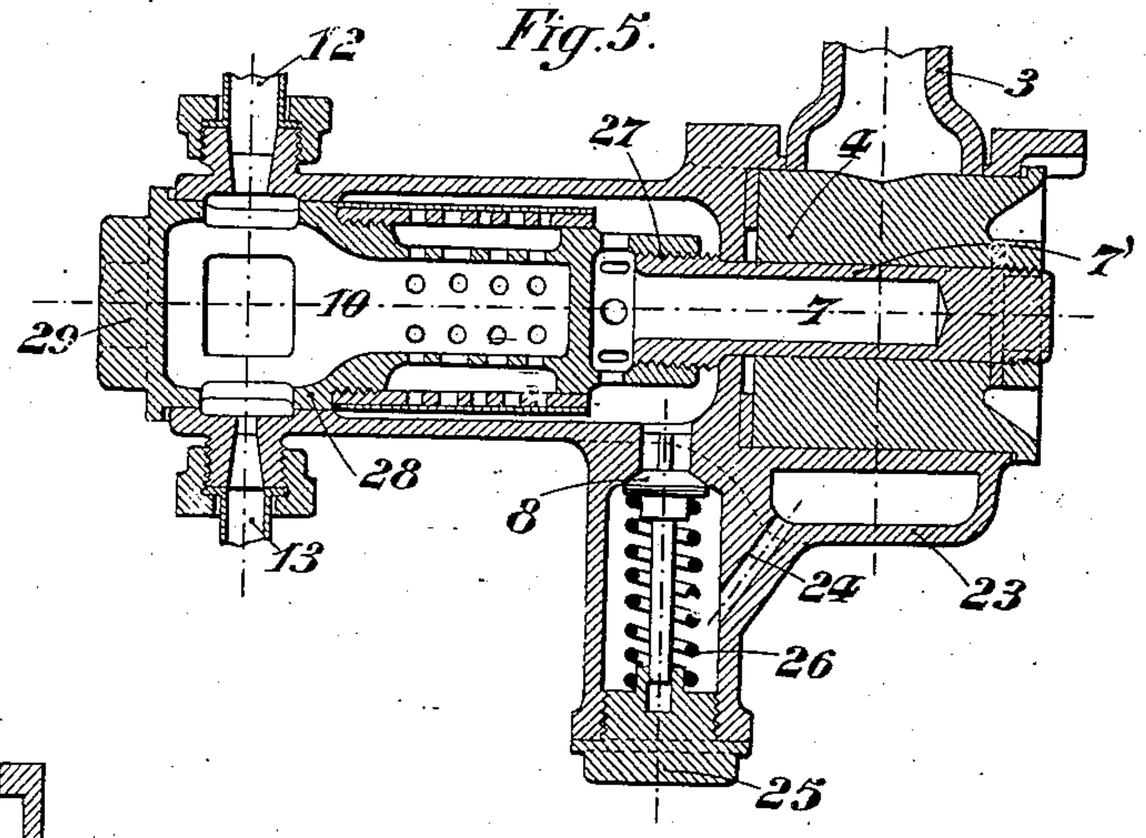
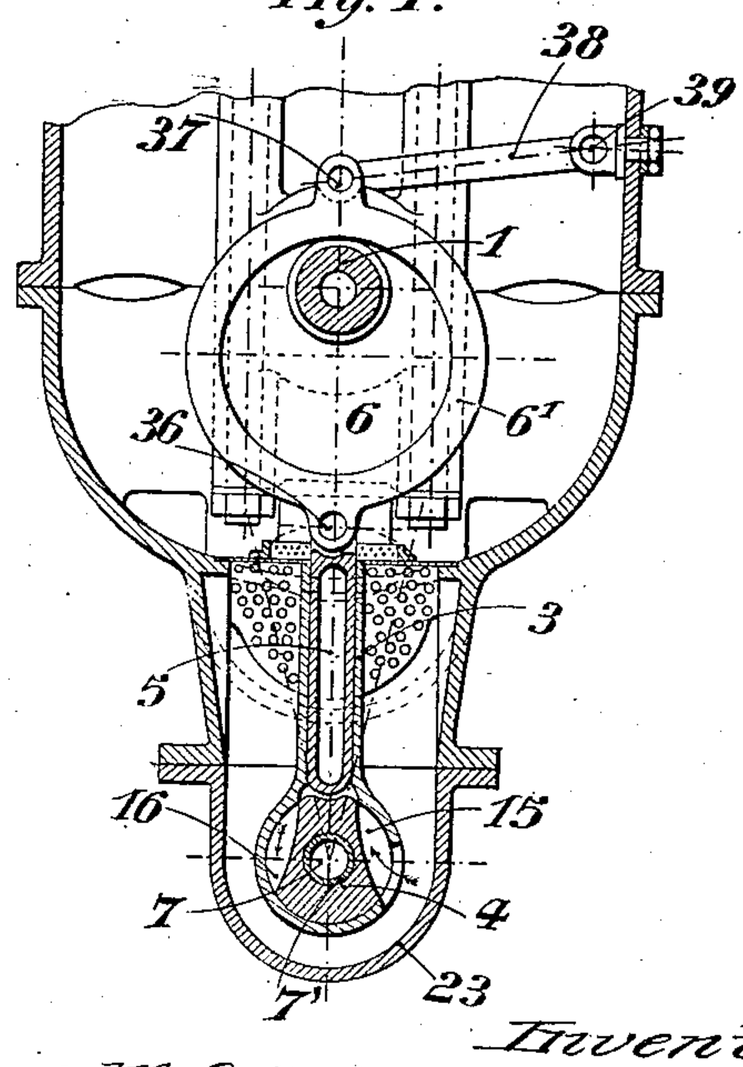


Fig. 7.



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UNITED STATES PATENT OFFICE.

LOUIS MARIE GABRIEL DELAUNAY-BELLEVILLE, OF NEUILLY-SUR-SEINE, FRANCE.

DEVICE FOR LUBRICATING UNDER PRESSURE.

No. 817,629. Specification of Letters Patent. Patented April 10, 1906.

Application filed February 9, 1905. Serial No. 244,943.

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 Seine, France, have invented certain new and useful Improvements in Devices for Lubricating Under Pressure, of which the following is a specification.

This invention has for its object a device for lubricating under pressure explosion-engines, and more especially explosion-engines for motor vehicles or boats and transmission mechanism of said vehicles or boats.

In the motor-vehicles the lubrifaction under pressure of the various parts of the motor and of the transmission mechanism can be obtained with one and the same pump set in action by the motor-shaft or with a pump for the motor and another one for the transmission mechanism. The lubrifaction under pressure has for its result to maintain between the rubbing-surfaces a coating of oil, preventing metallic contacts between these parts, and thus the main part of the friction is avoided without using ball-bearing or the like. A pressure-gage on the forcing-pipe of the oil-pump shows to the engineer if the lubrifaction of the various parts of the motor and of the mechanism is produced normally and safely.

In the lubrifaction of motor-vehicles it is expedient to take into consideration the variable inclinations of the motor-shaft according as the vehicle is on a level, hilly, or descending road. In order that the lubrifaction be insured, it is necessary that the suction-point of the pump be maintained constantly at the lowest point of the casing of the motor or mechanism for each inclination of the vehicle.

The oscillating axis of the pump which has provided in it the suction and forcing apertures is mounted in a cup mounted at the lowest part of the casing. This cup may be taken away for inspecting and keeping in good order the feeding-journals. The cup constitutes a tank receiving the oil dropping down in the casing from the lubricated parts. The casing of the motor constitutes in its lower part an inclined channel, the lowest part of which ends at the cup of the pump. The inclination of the channel is such that always for each position which may be taken by the vehicle the oil flows to the cup. Generally the pump is mounted at the rear of the motor, because the working of the motor is the greatest when the vehicle is ascending a hilly road, and consequently the lubrifaction must be better insured in this case. On descending roads the oil continues to flow to the cup of the pump if the angle of the lowest part of the casing with the motor-shaft is greater than the angle of the road with a horizontal plane. If it has been foreseen that the vehicle may descend roads having an inclination of ten, twelve, or fifteen per cent., the lowest part of the casing must have at least an inclination of ten, twelve, or fifteen per cent. with respect to the motor-shaft. The cup could be mounted at another point of the casing—for instance, in the middle—but always it must be at the lowest part of the said casing.

In the accompanying drawings, Figure 1 is a vertical section of a two-cylinder motor provided with a lubricating device according to this invention. Fig. 2 is a transversal section of said motor on line A A of Fig. 1. Fig. 3 is a section through the line B B of Fig. 1. Fig. 4 is a sectional detail. Fig. 5 is a longitudinal sectional view of a modified form. Fig. 6 is a vertical section of the modified form shown in Fig. 5. Fig. 7 is a sectional view of another modified form.

On the drawings, 1 is the motor-shaft; 2, the journals of the cranks; 3, the oscillating oil-pump without valve; 4, the fixed part of the pump; 5, the piston of the pump, which is set in motion by an eccentric 6.

7 is the pipe through which the oil is forced to the parts to be lubricated.

8 is a valve communicating with the pipe 7 and used for sending the excess of oil in the casing 9.

10 is a rose-head which communicates with the forcing aperture of the pump through the pipe 11. The rose-head 10 communicates through a pipe 12 with the bearings of the motor which receive the oil.

13 is a pipe branched off the pipe 12 for a pressure-gage, indicating the pressure of the oil after the rose-head 10 and before the parts to be lubricated. Thus if the rose-head is stopped up by impurities the falling down of the pressure shown by the pressure-gage advises the engineer.

14 is a rose-head or filter between the pump and the lowest part of the casing 9 for preventing the impurities contained in the oil penetrating in the pump. The said rose-head or filter 14 is mounted so that it can easily be removed for cleaning or changing.

15 is the suction-aperture and 16, the outlet-aperture, of the pump. The suction-aperture 15 of the pump is opened during the ascending stroke of the piston, and the outlet-aperture 16 is opened during the descending stroke of the piston.

17 is a circular groove of the central bearing, through which passes the oil forced by the pump. All the bearings could also receive directly the oil from the pump.

18 represents conduits in the shaft 1, through which the oil passes in the inner part of the shaft.

19 represents conduits in the shaft 1, in the cranks, and in the journals. The oil is forced continuously in this conduit from pipe 12 through the conduit 18 and the groove 17.

20 is the conduit for lubricating the eccentric 6.

21 represents conduits for lubricating the bearings which do not receive directly the oil from the pump.

22 represents conduits for lubricating the heads of the connecting-rods. The connecting-rods are provided with conduits through which the oil passes to the other end of the connecting-rods.

The oil passes from the casing 9 through the rose-head 14 in the pump, which forces it through the pipes 7 and 11, the rose-head 10, the pipe 12, the circular groove 17 of the bracket, into the conduits 18 19 20 21 22 for lubricating the various parts of the motor. The oil then drops down in the casing from the lubricated parts and returns to the pump.

The lower part of the casing constitutes an inclined channel, making with the motor-shaft an angle which is greater than the greatest inclinations with respect to the horizontal plane of the road on which the vehicle may be used. At the lowest part of the channel is mounted the cup 23, carrying the pump, the valve 8, and the filter 10.

In Figs. 5 and 6 the fixed part 4 is mounted on a holow shaft 7′, the inner part of which constitutes the pipe 7. This shaft fixes this part 4 in the cup 23. The oil which escapes through the valve 8 returns in the cup 23 through the pipe 24. By unscrewing the plug 25 the valve 8 and its spring 26 may be inspected. The filter or rose-head 10 is screwed in 27 on the shaft 7′ and is adjusted in 28 in the fore part of the cup 23. The filter is set in its position or taken away by acting on the screw 29. The oil passes from the filter or rose-head 14 in any suitable manner to the bearings. From the bearings the oil is sent in the various parts as hereinbefore described with reference to Fig. 1. The pipe 13 leads from the filter 10 to the pressure-gage. According to this disposition the valve 8 and filter 10 may be inspected without taking away pipes or other main pieces.

At each end of the shaft 1 a device for preventing the escape of the oil has been provided at the points where the shaft emerges from the casing 9. (See Fig. 4.) On the shaft is mounted a collar 30 in two pieces, carrying a flange 31, inclined outward. This collar is covered by the piece 32, fixed to the casing and carrying near the shaft an inner flange 33. The oil which escapes through the bearing is drawn away by the collar which rotates with the shaft, and it is projected against the wall of the chamber 34. The flanges 31 33 prevent the oil from falling on the shaft 1 outside of the collar 30. The oil flows in the lower part of the chamber 34 and through the pipe 35 returns in the casing 9.

In the modification shown on Fig. 7 means are provided for increasing the angle of oscillation of the pump in motors the dimensions of which are such that the angle of oscillation of the pump is not sufficient for insuring a good distribution. The eccentric-strap is jointed at 36 to the piston 5 and at 37 to a link 38, the other end of which is jointed to the casing at 39. The link 38 acts on the strap and insures a horizontal movement of the articulation 36 when the eccentric moves vertically. The angle of oscillation of the piston is thus increased.

Having thus described and ascertained the nature of my invention and in what manner the same may be performed, I declare that what I claim is—

1. In a lubricating device for explosion-motors and transmission mechanisms the combination with the casing for the motor or the mechanism having the lower portion thereof inclined, thereby forming a channel, of a receptacle at the lowest end of said channel, an oscillating pump mounted in said receptacle, an eccentric on the motor-shaft for giving the motion to the piston and to the oscillating part of said pump, means for carrying the oil from said pump to the parts to be lubricated, means for preventing the impurities being drawn along, and means for relieving the excess of oil at the forcing-aperture of the pump and for again bringing this oil in the casing and to the suction-aperture of the pump, substantially as described.

2. In a lubricating device for explosion-motors and transmission mechanism the combination with the casing for the motor or the mechanism having the lower portion thereof inclined, thereby forming a channel, of a receptacle at the lowest end of said channel, an oscillating pump mounted in said receptacle, an eccentric on the motor-shaft for giving

the motion to the piston and to the oscillating part of said pump, pipes carrying the oil from the forcing-aperture of the pump to the bearings of the motor-shaft, a pressure-gage branched on said pipes, a motor-shaft provided with channels through which the oil is carried from the bearings to the various parts being lubricated, means for preventing the impurities being drawn along, and means for relieving the excess of oil at the forcing-aperture of the pump and for again bringing this oil in the casing and to the suction-aperture of the pump, substantially as described.

3. In a lubricating device for explosion-motors and transmission mechanisms the combination with the casing for the motor or the mechanism having the lower portion thereof inclined, thereby forming a channel, of a receptacle at the lowest end of said channel, an oscillating pump mounted in said receptacle, an eccentric on the motor-shaft for giving the motion to the piston and to the oscillating part of said pump, pipes carrying the oil from the forcing-aperture of the pump to the bearings of the motor-shaft, a pressure-gage branched on said pipes, a motor-shaft provided with channels through which the oil is carried from the bearings to the various parts being lubricated, a rose-head between the pump and the casing, a rose-head or filter mounted between the forcing-aperture of the pump and the distribution-pipe, and means for relieving the excess of oil at the forcing-aperture of the pump and for again bringing this oil in the casing and to the suction-aperture of the pump, substantially as described.

4. In a lubricating device for explosion-motors and transmission mechanisms the combination with the casing for the motor or the mechanism having the lower portion thereof inclined, thereby forming a channel, of a receptacle at the lowest end of said channel, an oscillating pump mounted in said receptacle, an eccentric on the motor-shaft for giving the motion to the piston and to the oscillating part of said pump, pipes carrying the oil from the forcing-aperture of the pump to the bearings of the motor-shaft, a pressure-gage branched on said pipes, channels in the motor-shaft from which the oil is carried from the bearings through said shaft to the various parts being lubricated, a rose-head between the pump and the casing, a rose-head or filter mounted between the forcing-aperture of the pump and the distribution-pipe, an exhaust-valve between the rose-head or filter and the forcing-aperture of the pump, and a pipe leading the excess of oil from the said valve to the casing, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LOUIS MARIE GABRIEL
DELAUNAY-BELLEVILLE.

Witnesses:
HIPPOLYTE JOSSE,
PIERRE LEISSE.