

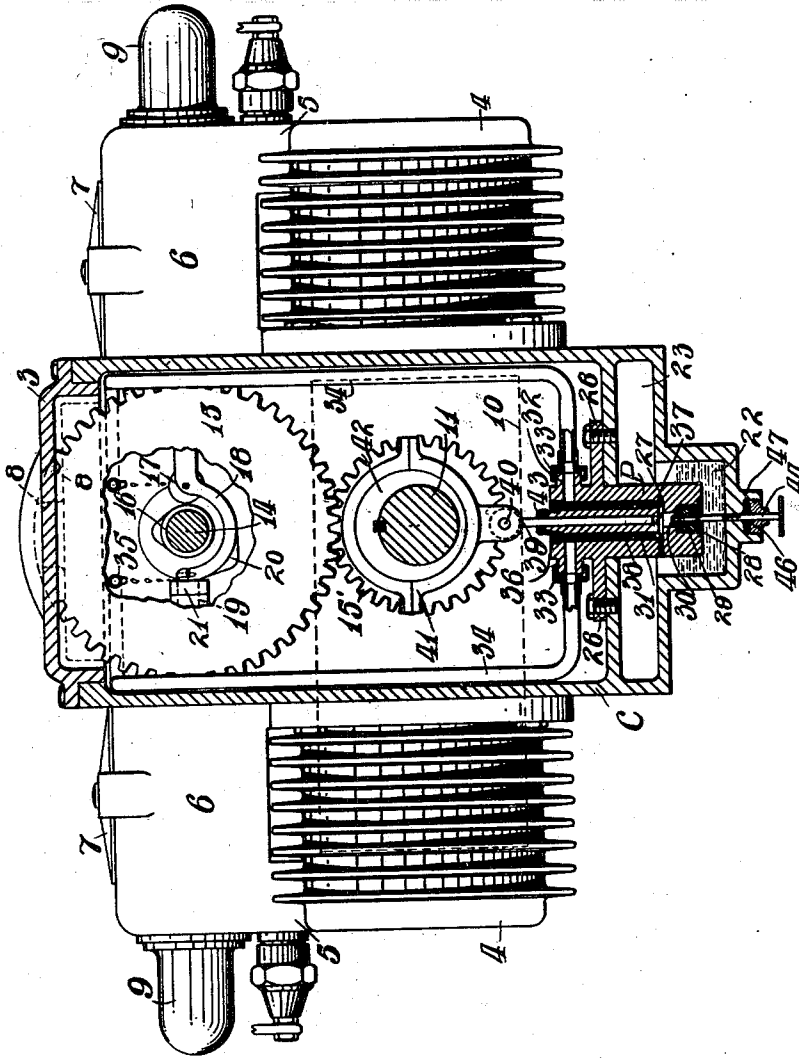
W. I. TWOMBLY.
OIL FEEDING SYSTEM FOR INTERNAL COMBUSTION ENGINES.
APPLICATION FILED MAR. 8, 1911.

1,044,709.

Patented Nov. 19, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:
Howard C. Thompson
Paula Philipp

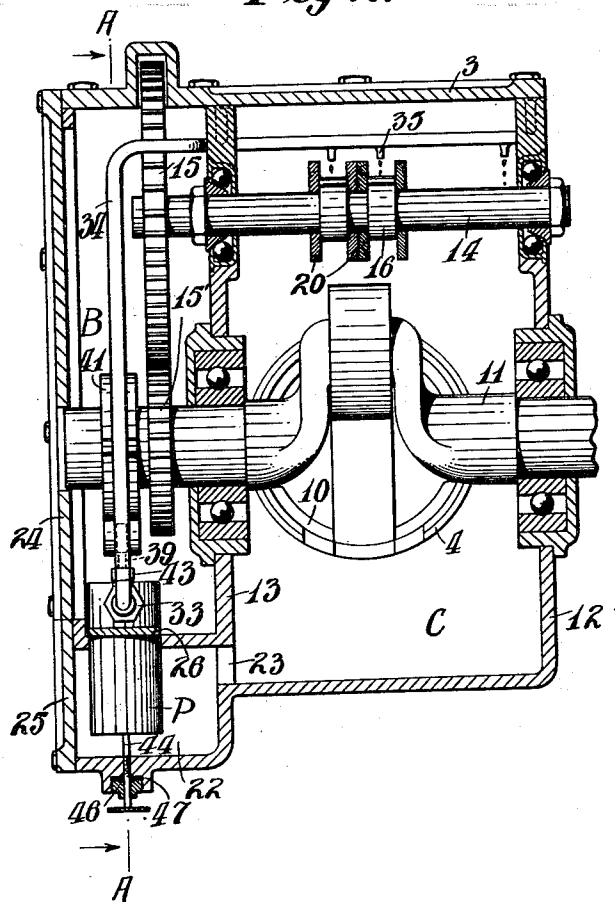
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Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLARD IRVING TWOMBLY, OF NEW YORK, N. Y., ASSIGNOR TO TWOMBLY MOTORS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

OIL-FEEDING SYSTEM FOR INTERNAL-COMBUSTION ENGINES.

1,044,709.

Specification of Letters Patent.

Patented Nov. 19, 1912.

Application filed March 6, 1911. Serial No. 612,666.

To all whom it may concern:

Be it known that I, WILLARD IRVING TWOMBLY, a citizen of the United States, residing in the borough of Manhattan, in the city, county, and State of New York, have invented new and useful Improvements in Oil-Feeding Systems for Internal-Combustion Engines, of which the following is a specification.

10 This invention relates to oil feeding mechanism for internal combustion engines, and relates particularly to a mechanical oil feeding system wherein the oil is forced under pressure to the operative parts of the engine, such as the crank-shaft bearings, the valve mechanism, the valve-operating cam shaft and piston, the excess oil draining off and being again utilized. With this object in view I provide the crank case, having a crank shaft journaled therein, with an oil reservoir, a pump of the reciprocating type being supported within the crank case so that the pump body extends into said reservoir, said body having a normally closed inlet communicating with the oil in the reservoir and normally closed outlets branching out from said inlet with ducts connected to said outlets to lead the oil to the operative parts of the engine. The pump piston or plunger is connected to and operated by the crank shaft, the upward stroke of the pump piston causing the inlet to be opened and drawing oil into the pump body; the downward stroke of the piston causing said inlet to be closed and simultaneously therewith the opening of the outlets to force the oil therethrough and the connected ducts. The oil reservoir has an opening in the bottom with a plug screw threaded therein, a needle valve passing through said plug and screw threaded into the opening in the reservoir to engage in the inlet in the pump body, and adjustable to increase or decrease the size of said inlet to regulate the flow of oil. By removing the plug and needle valve the opening in the reservoir may serve as a means to drain the oil from the reservoir.

In the drawings accompanying and forming a part of this specification, Figure 1 is a front end elevation of an opposed cylinder engine with my improved oiling system applied thereto, the crank case being in section taken substantially on the line A—A of Fig. 2, and the pump also shown in section; and

Fig. 2 is a sectional side elevation of the engine, the section being taken substantially midway through the crank case showing the location of the pump and the manner of leading the oil to the operative parts of the engine.

Similar characters of reference designate like parts throughout the different views of the drawings.

For the purpose of illustration I have shown my improved oil feeding system in connection with an internal combustion engine of the opposed cylinder type, as disclosed in my co-pending application filed August 15, 1910, Serial No. 577,179, comprising a rectangular or box like crank case, (designated in a general way by C,) open at the top and having a removable cover 3. Opposed piston cylinders 4, 4 are fixed to the side of the case, each cylinder being provided with an upwardly projecting portion 5 to constitute a combustion and valve chamber, the said chambers having a projecting channel shaped portion 6 adapted to abut against the adjacent side of the crank case, and with the side of the crank case and combustion chamber constituting a fuel chamber open at the top and having a removable cover 7. The said chambers 6 are suitably connected to the source of fuel supply, and fuel supplied to the cylinders from said chambers. The burnt gases are exhausted from the cylinders through pipes 9. A piston 10 (shown in dotted lines in Fig. 1) operates in a pair of opposed cylinders and is connected to a crank shaft 11, journaled in the end walls 12 and 13. A valve-operating cam-shaft 14 is also journaled in the walls 12, 13 parallel with and driven from the crank shaft by a gear 15 fixed to said shaft meshing with a pinion on the crank shaft. The cam shaft has cams 16 fixed thereon to engage with rollers 17 carried by yoke shaped members 18, to which are connected the stems 19 of the exhaust valves to operate said valves. Cams 20 are also fixed on said shaft at opposite sides of the cams 16 to engage with the stems 21 of the fuel-intake valves to operate the latter, said valve stems being hollow and slidably mounted on the stems of the exhaust valves.

The forward end of the crank case is constructed with a compartment or chamber (designated in a general way by B)

separate from the crank case proper by extending the side walls beyond the wall 13, and has an oil reservoir 22 in the bottom thereof communicating with the bottom of the crank case by an opening 23 for a purpose to be hereinafter described. The forward end of said chamber is open and has a removable cover or wall 24 whereby the interior of such chamber is readily accessible. The front wall of the oil reservoir is also in the nature of a removable cover 25.

My improved oil feeding system comprises a pump (designated in a general way by P) of the reciprocating type, the body of which extends through an opening in the bottom of the chamber B into the oil reservoir 22, and is supported by a pair of arms 26 projecting laterally from the pump body and resting upon the bottom of said chamber. The pump body is provided with a central bore 27 with a plug 28 screw threaded into the bottom having an inlet passage 29 of less diameter than the bore and communicating with the oil in the reservoir, a ball 30 seated by gravity in said inlet within the bore normally closes the inlet. A pair of outlet passages 31 branch out at right angles from the bore, (which may be formed by drilling in from the side of the pump body and then closing the outer end of said drill hole,) and then extend parallel with the bore having outlets in bosses projecting out from the sides of the pump body near the top, as at 32. The portion of the outlet passages extending parallel with the pump bore are formed by drilling in from the top of the pump body and then closing the ends with screw plugs 36. Connected to said outlets as by couplings or unions 33 are ducts 34 extending up the side walls of the crank case then inwardly toward and along the center of said case, having outlet nipples or spouts 35 over the cam shaft and valve mechanism to permit of the dripping of the oil thereon, from whence it drips onto the crank shaft bearings, pistons, and piston and crank shaft connection.

The outlet passages 31 are normally closed by balls 37 seated in the elbow portions formed in said passages, and maintained upon their seats by springs 38 confined between said balls and the plugs 36.

A reciprocatory piston or plunger 39 engages in the central bore 27 of the pump body and is pivotally connected, as at 40, to one of a pair of connected straps 41 encircling a cam or eccentric disk 42 keyed to the crank shaft, said disk as the crank shaft revolves rotating in the straps and reciprocating the piston. The piston may be provided with a suitable stuffing box 43, shown in the present instance as comprising a boss projecting out from the top

of the pump body with a cap screw-threaded thereon and packing interposed between the cap and boss.

To regulate the flow of oil I provide a needle valve 44 having a knurled head, and screw threaded into a tapped hole in the bottom of the oil reservoir, said valve engaging in the inlet 29 in the plug 28 and by screwing it in or out increasing or decreasing the size of said opening. The valve may be provided with a suitable stuffing box to prevent the oozing or dripping out of the oil, and for this purpose the oil reservoir is provided with a boss projecting out from that portion through which the needle valve passes, said boss having a counterbore with a plug 46 screw threaded therein, the valve also passing through said plug, and packing 47 interposed between the plug and the bottom of the counterbore. By removing the valve and plug the said opening may also be utilized to drain the oil from the reservoir.

My improved oil feeding system operates substantially as follows: As the crank shaft 11 rotates the eccentric disk 42 rotating in the strap 41 causes the piston 39 to reciprocate, each revolution of the crank shaft imparting one reciprocation to the piston. During the upward stroke of the piston the sucking action will draw the ball 30 away from its seat and suck the oil from the oil reservoir through the inlet passage 29 in the plug 28, and as the piston descends the ball 30 is again seated and the oil sucked in during the upward stroke of the piston will unseat the balls 37 in the outlet passages 31 against the tension of the springs 38 forcing the oil under pressure through said outlet passages and the connected ducts 34 to the outlets 35, from whence it drips onto the cams and valve mechanism, the surplus oil dripping from said cams and valve mechanism onto the piston, crank shaft bearings, and piston and crank connection. The surplus oil from said latter mechanism drips into the bottom of the crank case from whence it is drained through the opening 23 into the oil reservoir to be again utilized.

While I have shown my oil feeding system in connection with an internal combustion engine, it will be obvious that the same may be readily applied to other mechanism, such as pumps, blowers, or the like.

Having thus described my invention, I claim:—

1. An oil feeding system for engines, comprising in combination with the crank case having an oil reservoir and a crank shaft journaled in said case, of a pump body supported by the crank case to extend into the oil reservoir, said body having a central bore and an inlet in the bottom communicating with the oil in the reservoir with a

pair of outlets branching out from said inlet; means to normally close the inlet to the pump body; means to normally close the outlets from the pump body; ducts connected to the outlets and leading to the operative parts of the engine; a piston to reciprocate in the bore of the body, connected to and reciprocated by the crank shaft; said piston during its upward stroke opening the inlet and drawing oil into the pump body and during its downward stroke closing the inlet and opening the outlets forcing the oil through said outlets and the connected ducts; and a needle valve passing through the bottom of the oil reservoir and engaging in the inlet to the pump casing to regulate the flow of oil.

2. An oil feeding system for engines, comprising in combination with the crank case having an oil reservoir and a crank shaft journaled in said case, of a pump body supported by the crank case to extend into the oil reservoir, said body having a central bore, and an inlet communicating with the oil in the reservoir with a pair of outlets branching out from the said inlet; a ball normally seated in and closing said inlet; balls seated in and closing said outlets; springs to maintain said latter balls upon their seats; ducts connected to the outlets and leading to the operative parts of the engine; a piston to reciprocate in the bore of the pump body connected to and reciprocated by the crank shaft; said piston during its upward stroke unseating the ball in the inlet and drawing oil into the pump body and during its downward stroke seating said ball to close the inlet and unseating the balls in the outlets against the tension of the springs forcing oil through said outlets and the connected ducts; and a needle valve screw threaded into the bottom of the oil reservoir and engaging in the inlet of the pump body to regulate the flow of oil.

3. An oil feeding system for engines, comprising in combination with the crank case having an oil reservoir and a crank shaft journaled in said case, of a pump body supported within the crank case to extend into the oil reservoir, said body having a central bore; a plug screw threaded into the bottom of the pump body having an inlet passage of less diameter than the bore in the pump body and communicating with the oil reservoir and said bore; a ball normally

seated in and closing said inlet; outlets branching out from the inlet passage in said plug; balls seated in and closing said outlets; springs to maintain said latter balls upon their seats; ducts connected to the outlets and leading to the operative parts of the engine; a piston to reciprocate in the bore of the pump body; means to connect said piston to and reciprocate it by the crank shaft, comprising an eccentric disk fixed to the crank shaft, a strap encircling the periphery of and in which the disk rotates, said strap pivotally connected to the piston; said piston during its upward stroke unseating the ball in the inlet passage in the plug and drawing the oil into the pump body, and during its downward stroke seating said ball to close the inlet and unseating the balls in the outlets against the tension of the springs, forcing oil through said outlets and the connected ducts; and a needle valve screw-threaded into the bottom of the oil reservoir and engaging in the inlet in the plug to regulate the flow of oil.

4. An oil feeding system for engines, comprising in combination with a crank case having an oil reservoir and a crank shaft journaled in said case, of a pump body supported within the crank case to extend into the oil reservoir, said body having a central bore, and a normally closed inlet in the bottom communicating with the oil reservoir with a pair of normally closed outlets branching out from the inlet; ducts connected to the outlets leading to the operative parts of the engine; a piston to reciprocate in the bore of the body connected to and reciprocated by the crank shaft; said piston during its upward stroke opening the inlet and drawing oil into the pump body and during its downward stroke closing the inlet and opening the outlets forcing the oil through said outlets and the connected ducts; an opening in the bottom of the oil reservoir; a plug screw threaded into said opening; and a needle valve passing through said plug and the bottom of the oil reservoir, said valve engaging in the inlet to the pump body to regulate the flow of oil; said opening also serving to drain the oil from the reservoir.

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