W. J. WRIGHT.

LUBRICATING SYSTEM FOR INTERNAL COMBUSTION AND OTHER ENGINES.

APPLICATION FILED JUNE 7, 1910.

1,020,007.

Patented Mar. 12, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

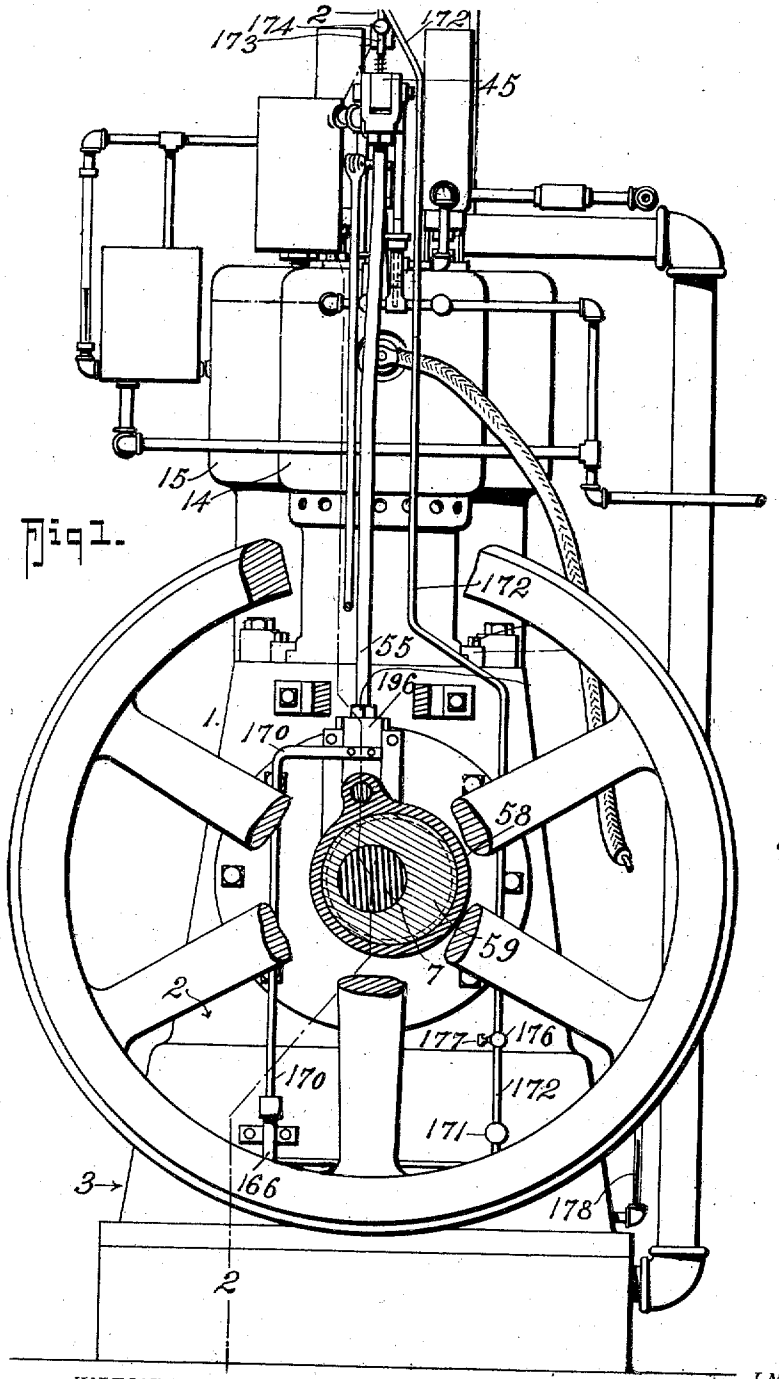
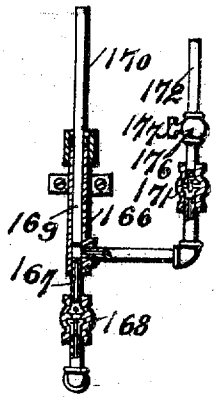


Fig. 3.



WITNESSES:

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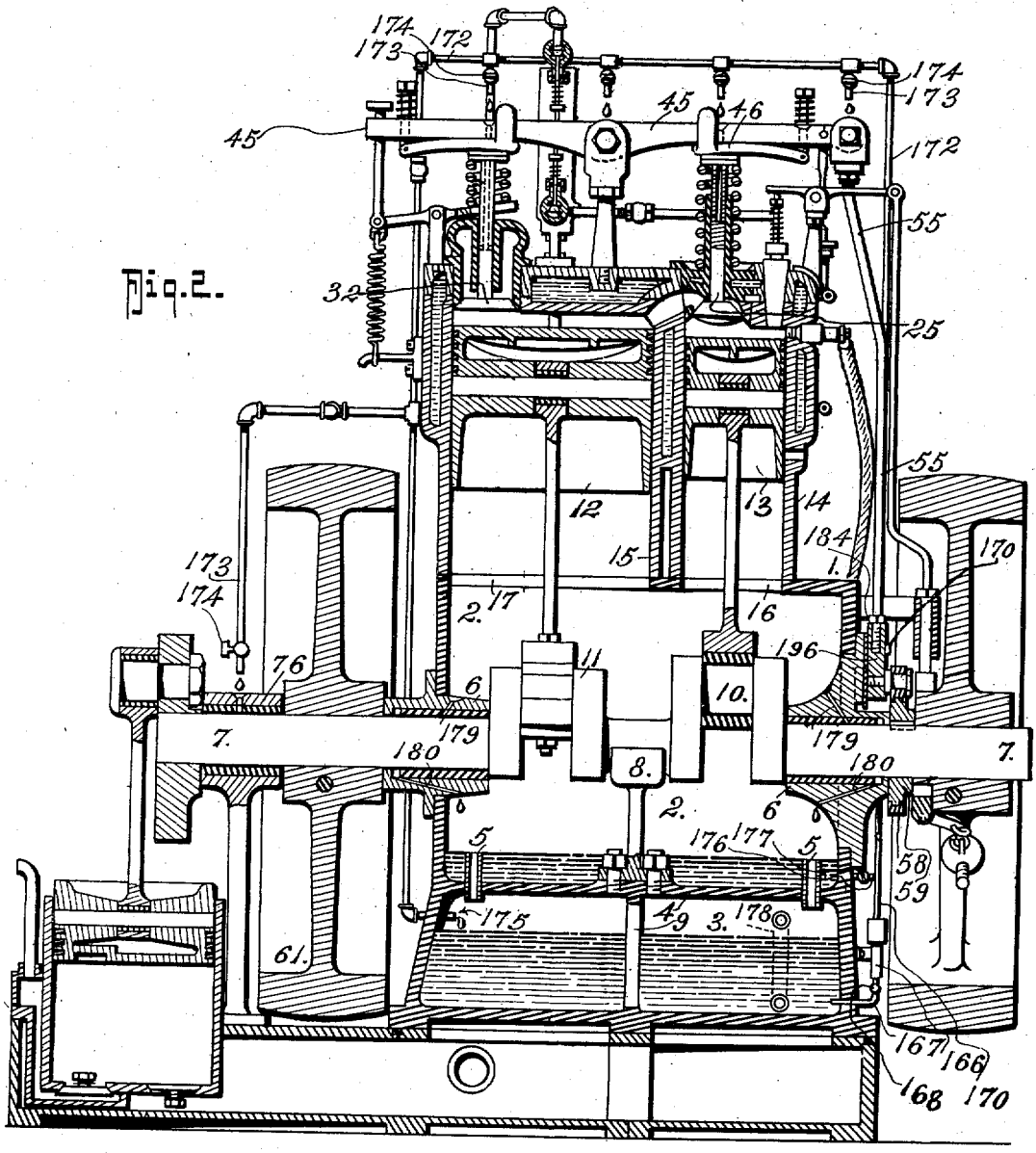
Fig. 2.



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UNITED STATES PATENT OFFICE.

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LUBRICATING SYSTEM FOR INTERNAL-COMBUSTION AND OTHER ENGINES.

1,020,007. Specification of Letters Patent. Patented Mar. 12, 1912.

Application filed June 7, 1910. Serial No. 565,518.

To all whom it may concern:

Be it known that I, WILLIAM J. WRIGHT, residing at Franklin, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Lubricating Systems for Internal-Combustion and other Engines, of which the following is a specification.

My invention is an improved apparatus or system of lubricating engines which are exposed to high temperatures, whereby efficient lubrication of all the moving parts is had and in such manner as to consume the least possible power from the engine, the oiling system being operated by the engine itself.

In its general nature the invention resides in providing a closed crank case in connection with the engine cylinder or cylinders and in connection also with an oil reservoir whereby the working strokes of the piston or pistons will effect a compression of the medium within the crank case and oil reservoir to cause a spraying of oil to take place in the crank case and engine cylinder on the return stroke of the pistons; the invention consisting further in providing a system of piping from the oil reservoir to the various parts to be oiled and back again to the oil reservoir to cause a constant circulation of the oil through the main duct or distributing pipe from the reservoir back to the reservoir, a suitable pump being provided for effecting the circulation, the pump being operated from a moving part of the machine.

The invention also resides in those novel combinations, construction and arrangements of parts which will be hereinafter fully described and then be specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which:—

Figure 1, is an end elevation of an engine embodying the invention, parts being broken away, and other parts being shown in section for convenience of illustration. Fig. 2, is a central vertical longitudinal section on the line 2—2 of Fig. 1. Fig. 3, is an enlarged detail section of the oil pump.

In the drawings in which like numerals, less the references, indicate like parts in all of the figures, 1 designates the main supporting frame of the engine which includes the crank case 2 and the oil reservoir 3, the oil reservoir being separated from the crank case by a partition 4, into which the overflow pipes 5 are secured.

The frame 1 is provided with side bearings 6—6 for the crank shaft 7 and is further provided with an intermediate bearing 8 supported on the partition 4, which is underbraced by a post 9.

Within the crank case 2, the crank shaft 7 has cranks 10 and 11 one of which, 10, is for one piston 13, and the other one, 11, is for the other piston 12. The engine cylinders are designated by 14 and 15, respectively, and have their open ends bolted over the holes 16 and 17 in the case 2.

The engine is provided with valves 32 and 25 which are opened and closed by a rocker arm 45 operated through a rod 5—5 from the crank shaft 7 by suitable cam devices 58 and 59 as best indicated in Fig. 1 of the drawings.

46 are what I term "hushers" interposed between the rocker arms 45 and the valves 32 and 25, respectively. The bearings 6 have lubricating bores 179 opening through the top and 180 draining toward the bottom through which lubricant may pass to and around the shaft 7 and excess lubricant return to the case 2.

76 designates an auxiliary crank shaft bearing having a lubricant bore.

The oiling system by means of which the moving parts of my invention are thoroughly lubricated is a combined force feed and spray system. An oil pump 166 is secured to the frame 1 and has its inlet piped through a pipe 167 with the reservoir 3, a back check valve 168 being provided to prevent the oil flowing backwardly from the pump 166 to the reservoir 3.

The piston 169 of the pump 166 is connected by a rod 170 to the slide 196 to be operated by the cam 59.

The outlet of the pump 166 delivers through a back check valve 171 from which a main feed or distribution pipe 172 which has short laterals 173 to convey the oil to the several parts to be lubricated, and each of the laterals 173 has a stop cock 174 by means of which the flow of oil to the bearings may be regulated the end of which pipe 172 delivers at 175 back into the oil reservoir 3. The pipe 172 also has a lateral 176 that is provided with a stop cock 177 and is connected to deliver oil into the crank case 2 but keep the oil in such case at a constant level and cause it to flow into the pipe 5.

A gage glass 178 is provided for the oil reservoir 3 so that the level of the oil therein may be observed.

The bearings 6—6 are oiled through bores 179 into which the oil gravitates, the surplus oil returning to the casing by way of other bores 180.

The cranks 10—11, bearings 6 and 8, pistons 12 and 13, and cylinders 14 and 15 are oiled by the oil spray or vapor generated in the crank case by the movements of the pistons 12 and 13. On their down strokes the pistons 12 and 13 compress the air (or other gaseous or vaporous fluids) in the crank case 2 and as the chambers 2 and 3 are in communication with one another, by means of the pipes 5, through which the overflow oil is passing, the gaseous matters in chamber 3 will be correspondingly compressed; thus as the pistons begin to ascend a negative pressure in case 2 is formed below that in reservoir 3 which causes the compressed air in reservoir 3 to blow through pipes 5 into the crank case 2 in the form of a vapor to fill such crank case with such vapor and thereby thoroughly lubricate the pistons, and cylinders.

In this application, I make no claim to the engine construction, *per se*, as that forms the subject matter of a co-pending application.

From the foregoing, it will be observed that the oil is continually circulating from the reservoir 3 through the main pipe 172 back into the reservoir 3 at 175 while oil passes through the lateral ducts 173 to the various external bearing parts to be lubricated.

The spray within the crank case 2 causes oil to collect in the inlet bores 179 where it passes to the bearings 6 and lubricates the crank shaft 7, the excess lubricant flowing back out of the ports 180 and eventually gravitating into the reservoir 3.

It should be understood that oil is constantly trickling through the pipes 5 from the crank case 2 as it overflows into said pipes 5 so that as the pistons 12 and 13 move on their up-stroke, the difference in pressure of the vapors within the cases 2 and 3 will cause the oil to be sprayed into the case 2, into the pipes 5 from the case 3 and effectively lubricate the pistons 12 and 13 and the cylinder walls as well as the shaft crank bearings, etc.

What I claim is:—

1. In a lubricating system for engines, the combination with the cylinders, pistons, crank shaft and connecting rods between the crank shaft and the pistons; a closed crank case, an oil reservoir, means actuated by the movement of said pistons for filling said crank case with an oil spray for purposes of lubrication, a main duct for conveying oil from said reservoir and back to said reservoir, lateral ducts leading off from said main duct to the parts to be lubricated, an oil pump for forcing oil through said ducts and means for operating said oil pump.

2. In a lubricating system for engines, the combination with the cylinder, piston, crank shaft and connecting rod between the crank shaft and the piston; an oil reservoir, overflow pipes connecting said crank case with said oil reservoir, said engine having a set of external moving parts in contact with one another requiring lubrication, a main distributing duct mounted on the outside of said engine and having its ends connected with said oil reservoir, an oil pump connected with said duct for effecting a continuous circulation of oil through said duct from said reservoir back to said reservoir, and a set of valved lateral ducts leading from said main duct to the external engine parts to be lubricated.

3. In an oiling system for engines, said engines including a working cylinder, a piston, a closed crank case in communication with said cylinder, a crank shaft mounted in bearings in said crank case and having cranks operating in said crank case, a connecting rod between said crank and said piston, said crank shaft bearings having lubricating bores opening into said crank case; an oil reservoir, overflow pipes connecting said crank case with said oil reservoir, said engine having a set of external moving parts in contact with one another requiring lubrication, a main distributing duct mounted on the outside of said engine and having its ends connected with said oil reservoir, an oil pump connected with said duct for effecting a continual circulation of oil through said duct from said reservoir back to said reservoir, a set of valve laterals leading from said duct to the external parts to be lubricated, said overflow pipes between said crank case and said reservoir having a combined cross-sectional area less than that of said cylinder whereby the movement of said piston will effect uneven pressure in said crank case and in said oil reservoir to thereby cause the overflowing oil in said pipes to be sucked and sprayed into said crank case on one stroke of said piston, to lubricate the same.

4. In a lubricating system for internal combustion engines and the like, a case, an oil reservoir, means actuated by the movement of the engine pistons for filling the case with an oil spray for purposes of lubrication, a main duct for conveying oil from said reservoir and delivering oil back into said reservoir, lateral ducts leading off from said main duct to the engine parts to be lubricated, an oil pump for forcing oil through said ducts, and means for connecting said pump with a moving part of the engine for operating said pump.

5. In a lubricating system for engines, a case, an oil reservoir, overflow pipes connecting said case with said reservoir, a main distributing duct mounted on the outside of the engine and having its ends connected with said oil reservoir, an oil pump connected with said duct for effecting a continuous circulation of oil through said duct from said reservoir back to said reservoir, and a set of valved lateral ducts leading from said main duct to the external engine parts to be lubricated.

6. In a lubricating system for engines, the combination with the cylinders, the pistons, the crank case in communication with the cylinders and pistons, and the crank shaft, and connections between the same and the pistons; of an oil reservoir, overflow pipes connecting said crank case with said reservoir so that oil will flow through said pipes into the reservoir during one stroke of the pistons and be sucked out of said pipes into the crank case in the form of spray during the opposite stroke of said pistons substantially as shown and described.

7. In an engine lubricating system, a closed case in free communication with the engine cylinders and adapted to retain oil, an oil reservoir beneath said case, overflow pipes connecting said case with said reservoir, a main distributing duct mounted on the outside of the engine and having its ends connected with said reservoir, an oil pump connected with said duct for effecting a continuous circulation of oil through said duct from said reservoir back to said reservoir, a set of valved lateral ducts leading from said main duct to the engine parts to be lubricated and including a duct for delivering oil from said main duct into said case, substantially as shown and described.

8. In an engine lubricating system, a closed case in free communication with the engine cylinders and adapted to retain oil, an oil reservoir beneath said case, overflow pipes connecting said case with said reservoir, a main distributing duct mounted on the outside of the engine and having its ends connected with said reservoir, an oil pump connected with said duct for effecting a continuous circulation of oil through said duct from said reservoir back to said reservoir, a set of valved lateral ducts leading from said main duct to the engine parts to be lubricated and including a duct for delivering oil from said main duct into said case, said overflow pipes between said case and said reservoir having a combined cross sectional area less than that of the engine cylinders in communication with the case, whereby the movement of the engine pistons will effect uneven pressure in said case and in said reservoir to thereby cause the overflowing oil in said pipes to be sucked and sprayed into said case on one stroke of said pistons to lubricate the same.

9. In a lubricating system, a closed crank case, a crank shaft mounted in bearings in said crank case, a cylinder mounted on and in free communication with said crank case, a piston operating in said cylinder, a connecting rod between said piston and crank shaft, an oil reservoir beneath said crank case, overflow pipes connecting said crank case with said reservoir to maintain a predetermined level of oil in said crank case, a main distributing duct connected to said reservoir and a valved lateral duct connecting said distributing duct with said crank case, and a pump for forcing oil through said ducts.

10. In an engine lubricating system, the combination with the engine cylinders and pistons, of a case in communication with said cylinders, an oil reservoir beneath said case, overflow pipes connecting said case with said reservoir, so that oil in said case will overflow through said pipes into said reservoir during one stroke of said pistons and be sucked out of said pipes into the case in the form of spray during another stroke of said pistons substantially as shown and described.

11. In an engine lubricating system, the combination with the engine cylinders and pistons, of a case in communication with said cylinders, an oil reservoir beneath said case, overflow pipes connecting said case with said reservoir, so that oil in said case will overflow through said pipes into said reservoir during one stroke of said pistons and be sucked out of said pipes into the case in the form of spray during another stroke of said pistons, a main oil duct having its ends in communication with said reservoir and a valved lateral duct leading off from said main duct and delivering into said case to maintain a constant level of oil in said case, and means for pumping oil through said ducts.

WILLIAM J. WRIGHT.

Witnesses:
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