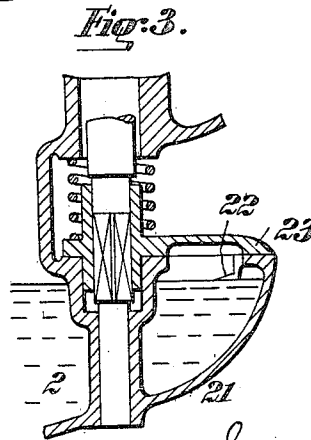
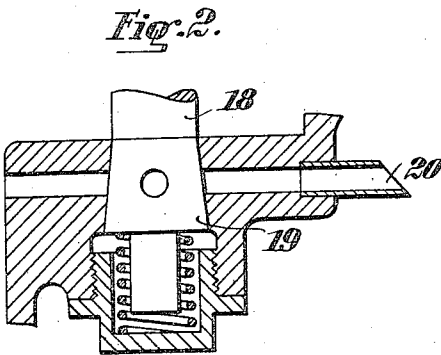
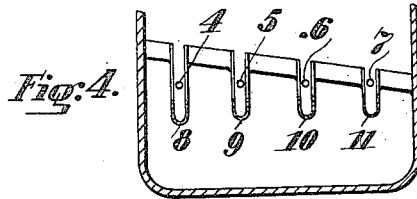
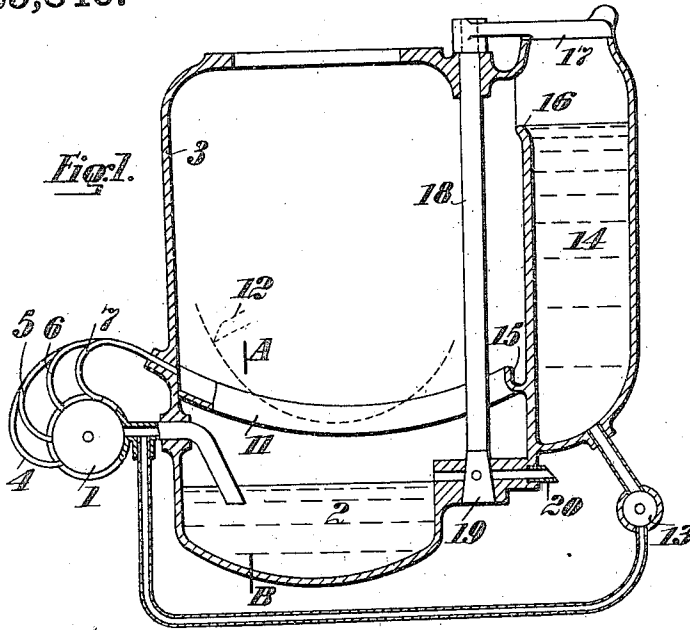


H. MAYER & G. SCHLATTER.
CIRCULATING LUBRICATING SYSTEM.
APPLICATION FILED JAN. 31, 1916.

Patented May 15, 1917.

1,225,840.



Inventors:
Heinrich Mayer,
Gustav Schlatter,
By *Heinrich Schlatter* atty

UNITED STATES PATENT OFFICE.

HEINRICH MAYER AND GUSTAV SCHLATTER, OF ARBON, SWITZERLAND, ASSIGNORS
TO THE FIRM OF ADOLPH SAURER, OF ARBON, SWITZERLAND.

CIRCULATING LUBRICATING SYSTEM.

1,225,840.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, HEINRICH MAYER, citizen of the German Empire, and GUSTAV SCHLATTER, citizen of the Swiss Confederation, and residing at Arbon, Switzerland, have invented certain new and useful Improvements in Circulating Lubricating Systems; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to a circulating lubricating system and the like.

The essential feature of known circulating lubricating systems is that the circulating oil pump, driven by the motor, removes circulating oil from a recess in the crank-case of the motor and conveys this oil to the places where it is used. The oil which is not used flows away and collects in the recess in the crank-case, *i. e.* in the circulating oil tank in order to be removed from it again to be circulated afresh.

One part of the oil is used up in the bearings, and another part when passing through the places to be lubricated is not only rendered impure owing to its contacting with hot walls, but also decomposed and its quality is impaired. This oil flows into the circulating oil tank and mixes with the stock of circulating oil, constantly making this worse and worse. When the engine works for a long time the circulating oil is of such a poor quality that the lubrication becomes more and more imperfect.

According to the present invention this defect is obviated by employing a second tank filled with fresh oil, from which another pump, the so-called fresh oil pump, takes fresh oil in regulatable quantities and supplies it at a suitable place to the circulating oil. In this manner the oil which becomes impure is improved by adding fresh oil and acquires its former lubricating capacity. The addition of fresh oil is regulated by means of known devices in such a manner that, owing to an adjusting device, the pump is able to supply more or less fresh oil to the circulating oil tank. This second pump, *i. e.* the fresh oil pump, may be built by itself independently of the former or

together with it, it being likewise driven by the motor.

One illustrative embodiment of the invention and a modification of part thereof are diagrammatically represented by way of example in the accompanying drawings, wherein:

Figure 1 is a vertical sectional elevation showing a circulating lubricating plant according to the invention.

Fig. 2 is a like view showing a detail on an enlarged scale,

Fig. 3 is a like view of a modification, and

Fig. 4 is a section taken on the line A—B in Fig. 1 showing the oil scooping channels and the lower part of the crank chamber.

Referring to the drawing, the two tanks, *i. e.* the fresh oil tank 14 and the circulating oil tank 2, are filled from only one place, this being possible owing to an overflow 16 which is provided on the fresh oil tank and leads into the crank chamber 3. As soon as the oil filled into the fresh oil tank has risen up to the overflow it runs over the same into an oil channel 15, from which it flows into a plurality of scoop channels 8, 9, 10 and 11, and overflows therefrom into the circulating oil tank 2 and fills this also. In order that the latter may not be overfilled it is likewise provided with an overflow 20 which leads into the open. When oil flows out of this overflow the second tank 2 has been filled to the desired height. The latter overflow may be substituted, if desired, by a mark visible from the outside. The overflow outlet is controlled by a rotary valve cock 19 mounted on the end of a valve rod 18 which extends upward through and is journaled in the top of the crank case 3.

Fresh oil is supplied to the tank 14 through an inlet in the top which is closed by a pivoted cover 17. As it is desirable and advantageous to open and close the tank and overflow outlet simultaneously, the cover 17 is connected to the valve rod 18 in such a manner that when the cover is turned to close the tank 14 the cock 19 will be rotated by the rod 18 into position for closing the outlet, and vice versa.

A circulating oil pump 1 removes the oil to be circulated from the tank 2 in the crank chamber and forces it through the lubricating tubes 4, 5, 6, 7 into the oil channels 8, 9, 10 and 11. Lubricating tubes 12 scoop the

oil up out of these channels and conduct it to the bearings. A fresh oil pump 13 removes fresh oil from the tank 14 and supplies it to the circulating oil.

5 An important feature of our invention is the construction and arrangement of parts for supplying a quantity of fresh oil to the scoop channels 8—11 during the filling of the circulating tank. Consequently, there is
10 sufficient oil in said channels, before the motor is started and the circulating pumps operated, to supply the oiling tubes 12, which, when the motor is running, operate in a well known manner to scoop the oil
15 from the scoop channels and conduct it to the parts to be lubricated. This arrangement overcomes the necessity of employing a large circulating pump capable of filling the scoop channels by a few turns of the crank
20 when the motor is started.

Fig. 2 shows the cock 19 for the overflow of the circulating oil on an enlarged scale, and Fig. 3 shows a modified form of the same overflow. In this second form the circulating oil tank 2 is connected with an inspection oil vessel 21. This contains an oil-level indicator 22, at which the requisite height of the oil is observed. The vessel 21 is closed
25 by a rotary cover 23 which is so connected by the rod 18 to the cover 17 that both covers
30 are opened or closed simultaneously.

We claim:

1. In a lubricating system, a circulating oil tank, a series of scoop channels above the
35 latter, and a fresh oil tank arranged to overflow into the channels for furnishing a preliminary supply of oil to said channels.

2. In a circulating lubricating system, a circulating oil tank having an overflow outlet,
40 a series of scoop channels above the tank, a fresh oil tank having an inlet port and communicating with the channels and circulating oil tank for furnishing a preliminary supply of oil to said channels, and means to
45 simultaneously open or close said inlet and outlet.

3. The combination with a circulating lubricating system comprising a circulating oil tank and a pump connected thereto, of a
50 fresh oil tank having an overflow opening into the former tank, and means connecting the lower part of the fresh oil tank to the said system.

4. The combination with a circulating lubricating system comprising a circulating
55 oil tank, scoop channels, and a pump for

supplying oil from said tank to said channels, of a fresh oil tank having an overflow leading to said channels and thence to said tank, and means for supplying oil from the
60 fresh oil tank to said system.

5. The combination with a circulating lubricating system comprising a circulating oil tank having an overflow outlet and a pump connected to said tank, of a fresh oil
65 tank having an overflow opening into the former tank for filling the same, a pump for supplying oil from the fresh oil tank to said system, means controlling said outlet and means for closing the inlet of said fresh oil
70 tank operatively connected with the former means.

6. The combination with a circulating lubricating system comprising a circulating oil tank having an overflow outlet, and a pump
75 connected to said tank, of a fresh oil tank having an overflow opening into the former tank for filling the same, means for supplying oil from the latter tank to said system, an oil-level indicator in said outlet, and
80 means for simultaneously closing the inlet of the fresh oil tank and said outlet and for simultaneously opening the same.

7. The combination with a circulating lubricating system comprising a circulating oil
85 tank, scoop channels located above the same, and a pump for supplying oil from said tank to said channels, of an oil channel connected to said scoop channels, a fresh oil tank having an overflow leading to said oil
90 channel, and means for supplying oil from the fresh oil tank to said system.

8. The combination with a circulating lubricating system comprising a circulating oil tank having an overflow outlet, scoop
95 channels located above the same, and a pump for supplying oil from said tank to said channels, of an oil channel connected to each of said scoop channels, a fresh oil tank having an inlet and having an overflow leading
100 to said oil channel, means for supplying oil from the fresh oil tank to said system, and means for simultaneously closing said inlet and said outlet.

In testimony that we claim the foregoing
as our invention, we have signed our names
in presence of two subscribing witnesses.

HEINRICH MAYER.
GUSTAV SCHLATTER.

Witnesses:

FRANK DIMMKE,
EMIL MEILE.