

E. MOEWES & A. VISCHER.
INTERNAL COMBUSTION ENGINE.
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1,024,862.

Patented Apr. 30, 1912.

Fig. 1.

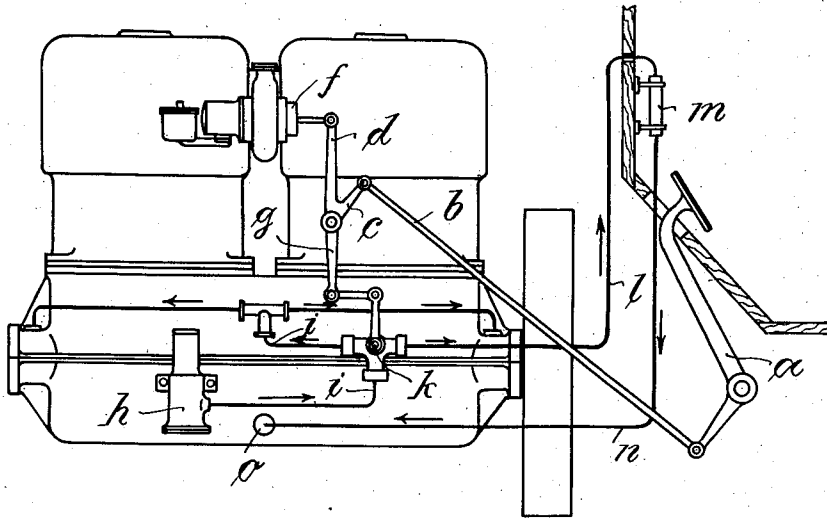
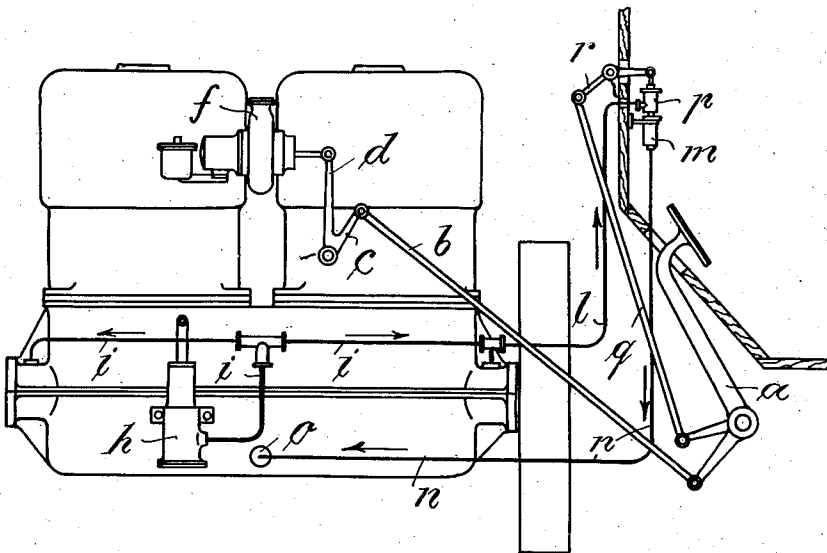


Fig. 2.



Witnesses:
Corinne Myers.
Vera Paulsen.

Inventor:
Ernst Moewes
Alfred Vischer
by L. K. Böhm,
Attorney

UNITED STATES PATENT OFFICE.

ERNST MOEWES, OF MARIENFELDE, NEAR BERLIN, AND ALFRED VISCHER, OF CANNSTATT, GERMANY, ASSIGNORS TO THE FIRM OF DAIMLER MOTORENGESELLSCHAFT, OF UNTERTÜRKHEIM, NEAR STUTTGART, GERMANY.

INTERNAL-COMBUSTION ENGINE.

1,024,862.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, ERNST MOEWES, a subject of the King of Prussia, and resident of Marienfelde, near Berlin, Germany, managing director, and ALFRED VISCHER, a subject of the King of Wurtemberg, and resident of 42 Ludwigstrasse, Cannstatt, German Empire, engineer, have invented new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

This invention relates to internal combustion engines, in which a so-called accelerator-lever or pedal is provided by which the carbureter is controlled, so that more or less fuel or air may be admitted to the working cylinders and the working power of the engine accordingly varied. It is then desirable to supply more or less lubricating oil to the working parts of the engine according to the power developed by the engine, and this invention has for its object to provide an improved arrangement for automatically regulating the supply of lubricating oil.

It is already known to control the supply of lubricant according to the speed of the engine by connecting the lubricating oil regulator with the spark timing device. Such arrangements fulfil their purpose to a certain extent, inasmuch as the friction of the parts to be lubricated increases with increased speed but such arrangements do not take into account the fact that the friction set up is not only dependent on the speed of the engine but is also affected by the varying pressure in the engine due to the varying load on the engine, that is to say, the friction is dependent on the turning moment of the engine. The load and turning moment of the engine are however almost directly proportional to the charge supplied to the engine which is determined by regulating the throttle-valve of the carbureter.

The object of the present invention is therefore to enable the supply of lubricant to be so regulated that, on an increased supply of combustible to the engine cylinder, the supply of lubricant may be correspondingly increased, and vice-versa, as a greater quantity of lubricating oil is required on increasing the engine power owing to the greater friction resulting therefrom.

According to this invention the accelerator-pedal is connected with an arrangement for regulating the supply of oil as well

as to the carbureter, so that the supply of oil to the parts to be lubricated is automatically varied simultaneously with the control of the carbureter and consequent variation in the supply of combustible to the engine.

In order that the invention may be more clearly understood reference is made to the accompanying drawings whereon two methods of carrying out the invention are illustrated by way of example.

Figure 1 is a side-view showing one method of carrying out the invention, in which the oil regulating valve is interposed between a branch oil circuit and a main oil circuit leading to the parts to be lubricated. Fig. 2 is a similar view to Fig. 1 but in which the oil regulating valve is arranged in the branch oil circuit and in proximity to a sight-glass in the circuit.

Referring to Fig. 1 of the drawings, the accelerator-lever or pedal *a* is in the form of a foot-lever and operates a three-armed lever *c* through the rod *b*, the lever *c* being connected by means of its arm *d* with the regulating device of the carbureter *f* and by means of its arm *g* with a three-way cock *k*, which is arranged in a pipe *i* leading from the oil-pump *h* to the parts to be lubricated. A pipe *l* passes from the three-way cock *k* and is connected through a sight-glass *m* with a return pipe *n* leading to the oil-container *o* from which oil is drawn by means of the oil-pump *h*. When the three-way cock is in such a position as to cut off or throttle the supply of oil to the parts to be lubricated, then the excess of oil, which cannot pass through the pipe *i*, passes through the pipe *l*, sight-glass *m* and pipe *n* and is returned to the oil-container *o*. Any suitable means may of course be employed for regulating the oil-supply in lieu of the three-way cock *k*.

According to the arrangement shown at Fig. 2, the lever which is operated by the accelerator pedal *a* by means of the rod *b* comprises only two arms *c* and *d*; the arm *c* being connected to the rod *b* and the arm *d* to the regulating device of the carbureter *f*. The pipe *i*, leading to the parts to be lubricated, is in this case connected to the pipe *l* which communicates with the return pipe *n* leading to the oil-container *o* through an intermediate throttling device *p* and sight-glass *m*. The accelerator pedal *a* is connected by means of an arm at an

angle thereto and by a draw-bar *q* with a lever *r*, by which the throttling device *p* is controlled. When the throttling device *p* is so controlled by means of the accelerator pedal *a* that full communication is established between the pipes *l* and *n*, the greater part of the oil-supply from the oil-pump *h* will then return through these pipes to the oil-container *o*. If however the throttling device is controlled in such a manner that it more or less cuts off communication between the pipes *l* and *n* only a smaller part of the oil will return to the oil-container *o* through these pipes, while the greater part of the oil from the pump *h* will be supplied to the parts to be lubricated by the pipe *i*. In this latter construction the arrangement of the throttling device in the return pipe has the advantage that the choking of the pipes leading to the parts to be lubricated and which by the insertion therein of a throttling device is liable to take place, is obviated. By the arrangement of the throttling device in the return pipe sufficient oil is therefore constantly supplied to the parts to be lubricated, according to requirements, no matter whether the throttling device is working properly or only allows a smaller quantity of oil to pass owing to it being possibly choked.

We claim:

1. In an internal combustion engine, the combination of an accelerator-lever a throttle valve connected therewith and controlling the hydrocarbon fuel supply from the carbureter to the engine, a lubricating oil-container supplying oil to the parts to be lubricated, a regulator controlling the oil supply, and an interconnection between said regulator, accelerator-lever and throttle valve, whereby the oil supply regulator may be controlled simultaneously with the controlling of the hydrocarbon fuel supply from the carbureter so that the oil supply is dependent on the supply of fuel from the carbureter to the engine.

2. In an internal combustion engine, the combination of an accelerator-lever connected with and controlling the carbureter, a lubricating oil-container, a main oil circuit supplying oil from said oil-container to the parts to be lubricated, an oil-pump in said circuit a branch oil circuit communicating with said main oil circuit and a regulating valve for controlling the supply of oil to the parts to be lubricated, said regulating valve being operated simultaneously with the controlling of the carbureter so as to vary the supply of lubricating oil in accordance with the variation in the supply of combustible from said carbureter to the engine.

3. In an internal combustion engine, the

combination of an accelerator lever connected with and controlling the carbureter, a lubricating oil-container, a main oil-circuit supplying oil from said oil-container to the parts to be lubricated, an oil-pump in said circuit, a branch oil circuit communicating with said main oil circuit, a regulating valve for controlling the supply of oil to the parts to be lubricated, said regulating valve being operated simultaneously with the controlling of the carbureter so as to vary the supply of lubricating oil in accordance with the variation in the supply of combustible from said carbureter to the engine, and a sight-glass in said branch oil circuit.

4. In an internal combustion engine, the combination of an accelerator-lever connected with and controlling the carbureter, a lubricating oil-container, a main oil-circuit supplying oil from said oil-container to the parts to be lubricated, an oil-pump in said circuit, a branch oil circuit communicating with said main oil circuit, and a regulating valve in said branch circuit for controlling the supply of oil to the parts to be lubricated, said regulating valve being operated simultaneously with the controlling of the carbureter so as to vary the supply of lubricating oil in accordance with the variation in the supply of combustible from said carbureter to the engine.

5. In an internal combustion engine, the combination of an accelerator-lever connected with and controlling the carbureter, a lubricating oil-container, a main oil-circuit supplying oil from said oil-container to the parts to be lubricated, an oil-pump in said circuit, a branch oil circuit communicating with said main oil circuit, a regulating valve for controlling the supply of oil to the parts to be lubricated, said regulating valve being operated simultaneously with the controlling of the carbureter so as to vary the supply of lubricating oil in accordance with the variation in the supply of combustible from said carbureter to the engine, and a sight glass in said branch oil circuit, said regulating valve being arranged in said branch oil circuit and in proximity to said sight glass.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

ERNST MOEWES.

ALFRED VISCHER.

Witnesses to the signature of Ernst Moewes:

JOSEPH HYPÄ,

HENRY HASPER.

Witnesses to the signature of Alfred Vischer:

ROBERT UHLAND,

ERNST ENTENMANN.