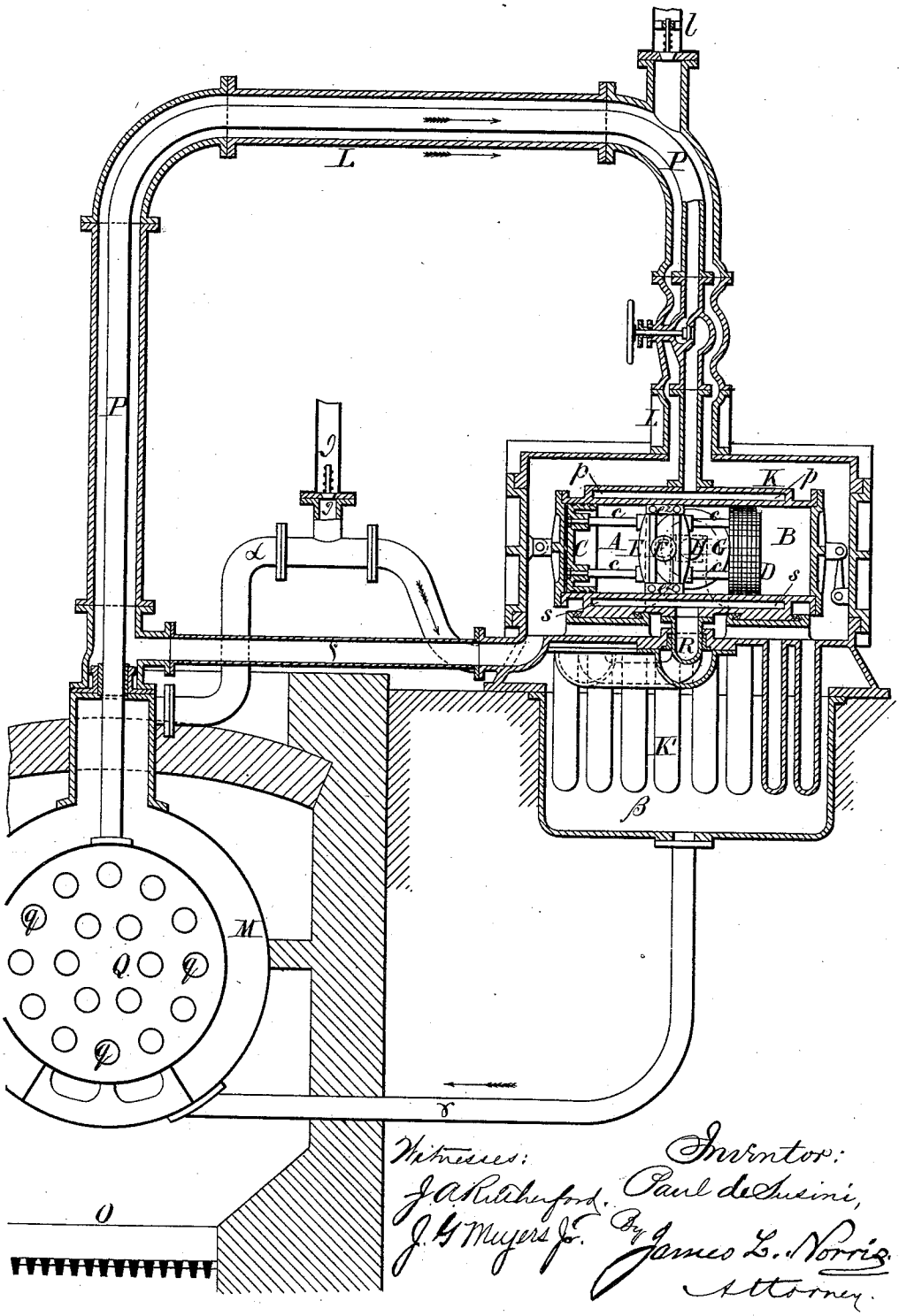
(No Model.)

P. DE SUSINI.

MOTOR ENGINE WORKED BY THE VAPOR OF ETHER OR OTHER VOLATILE LIQUIDS.

No. 451,342. Patented Apr. 28, 1891.



Witnesses:
J. A. Rutherford.
J. G. Myers Jr.

Inventor:
Paul de Susini,
By James L. Norris.
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

PAUL DE SUSINI, OF PARIS, FRANCE.

MOTOR-ENGINE WORKED BY THE VAPOR OF ETHER OR OTHER VOLATILE LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 451,342, dated April 28, 1891.

Application filed December 11, 1890. Serial No. 374,378. (No model.)

To all whom it may concern:

Be it known that I, PAUL DE SUSINI, a citizen of France, residing at Paris, France, have invented certain new and useful Improvements in Motor-Engines Worked by the Vapor of Ether or other Volatile Liquids, of which the following is a specification.

In the specification to an application filed August 7, 1890, Serial No. 361,252, I described a construction of motor-engine worked by the vapor of ether and other volatile liquids, wherein both the vapor-generator and the motor-engine, as also the pipes connecting the former with the latter, were inclosed by casings filled with glycerine or other suitable liquid, which was made to circulate from the one casing to the other through pipes.

According to my present invention I avoid the use of a large body of glycerine, which is comparatively expensive, by entirely separating the two casings inclosing, respectively, the motor-engine and the generator and only filling that for the former with glycerine, while that for the latter is filled with water. The casing containing the generator is heated by the fire and the glycerine in the other casing is heated by providing in connection therewith a chamber communicating with the water-casing by circulating-pipes, so that the heated water circulates through the said chamber, and thus imparts the required heat to the glycerine.

I will describe the invention with reference to the accompanying drawing, which shows a vertical section through the motor-engine and generator with their casings and communicating pipes.

A B are the two single-acting open-ended motor-cylinders, whose pistons C D are connected by rods *c c* to a cross-head E, acting upon the crank-pin F of a plate G on the engine-shaft H, the engine being constructed and operating in precisely the same way as described in my former application, and consequently not requiring further description.

Q *q* is the vapor-generator communicating with the cylinders of the motor-engine by the pipe P and passages *p*, and M is the surrounding casing filled with water heated by a furnace O, and K is the casing of the motor-engine filled with glycerine and provided with a tubular extension L, also filled with glycerine, inclosing the vapor-pipe P, and *ρ* a return-pipe connecting the bottom of the casing K with the lower end of the tubular extension L, thus forming a complete circuit or "thermosiphon," through which the glycerine circulates continuously.

Below the casing K is a closed chamber *β*, communicating at top by a pipe *α*, with the top of the casing M and at bottom by a pipe *γ* with the bottom of the casing M. The chamber *β* and pipes *α γ* being also filled with water, it will be seen that they form with the casing M a second circuit or thermosiphon, through which the water heated by the fire at O circulates continuously. The casing K has pendent tube K′ projecting down into the chamber *β*, and which, being filled with glycerine, effectually takes up the heat from the water in the chamber and communicates it to the body of the glycerine in the casing K. An expansion-chamber *ϑ*, having a safety-valve *ϑ′*, is provided on the pipe *α* of the water-thermosiphon, so as to prevent any dangerous accumulation of pressure, and a similar expansion-chamber with safety-valve *l* is provided on the tubular extension L of the glycerine-thermosiphon for preventing all excessive pressure therein which might occur until the glycerine is completely dehydrated.

R is the pipe leading the exhaust-vapors from the exhaust-passages *s s* of the motor-engine to a condenser, which may be of any suitable known construction, such as that described in my said prior application. On account of the economy effected in the quantity of glycerine used, the above-described construction is more particularly applicable to larger motor-engines.

Having thus described the nature of this invention and the best means I know of for carrying the same into practical effect, I claim—

1. In an ether-vapor engine, the combination of a vapor-generator, a casing inclosing the same filled with water or other suitable liquid, a furnace for heating such liquid, so as to volatilize the ether, a motor-engine worked by the ether-vapor from the generator, a casing inclosing the motor-engine and the pipe conveying the ether-vapor to it and filled with glycerine or other suitable liquid,

and a chamber communicating by pipes with the casing of the vapor-generator, so that the hot water can circulate from the latter to the former, such chamber being in contact with the casing inclosing the motor-engine, so that the heat of the water in the chamber is transmitted to the glycerine in the casing of the motor-engine and of the conduit-pipe, substantially as described.

2. In an ether-vapor engine, a casing surrounding the vapor-generator filled with water or other suitable liquid, a furnace for heating the water in the said casing, a casing surrounding the motor-engine and the conduit-pipe for the supply of ether-vapor thereto, such casing being filled with glycerine or other suitable liquid, a chamber forming part of the said casing communicating by two pipes with the casing inclosing the vapor-generator, so that the heated water in the last-named casing can circulate through the said chamber, and thereby heat the glycerine or other liquid in the casing to which it is connected, and a pipe connecting the last-named casing with the end of the casing surrounding the vapor-supply pipe next the vapor-generator.

3. The combination of ether-vapor generator Q, vapor-supply pipe P, motor-engine A B and parts connected therewith, casings M L K β, filled with liquid heated by fire-grate O, and connecting-pipes α γ ρ, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 22d day of November, A. D. 1890.

PAUL DE SUSINI.

Witnesses:
V. MOUL,
WM. GODEFROY.