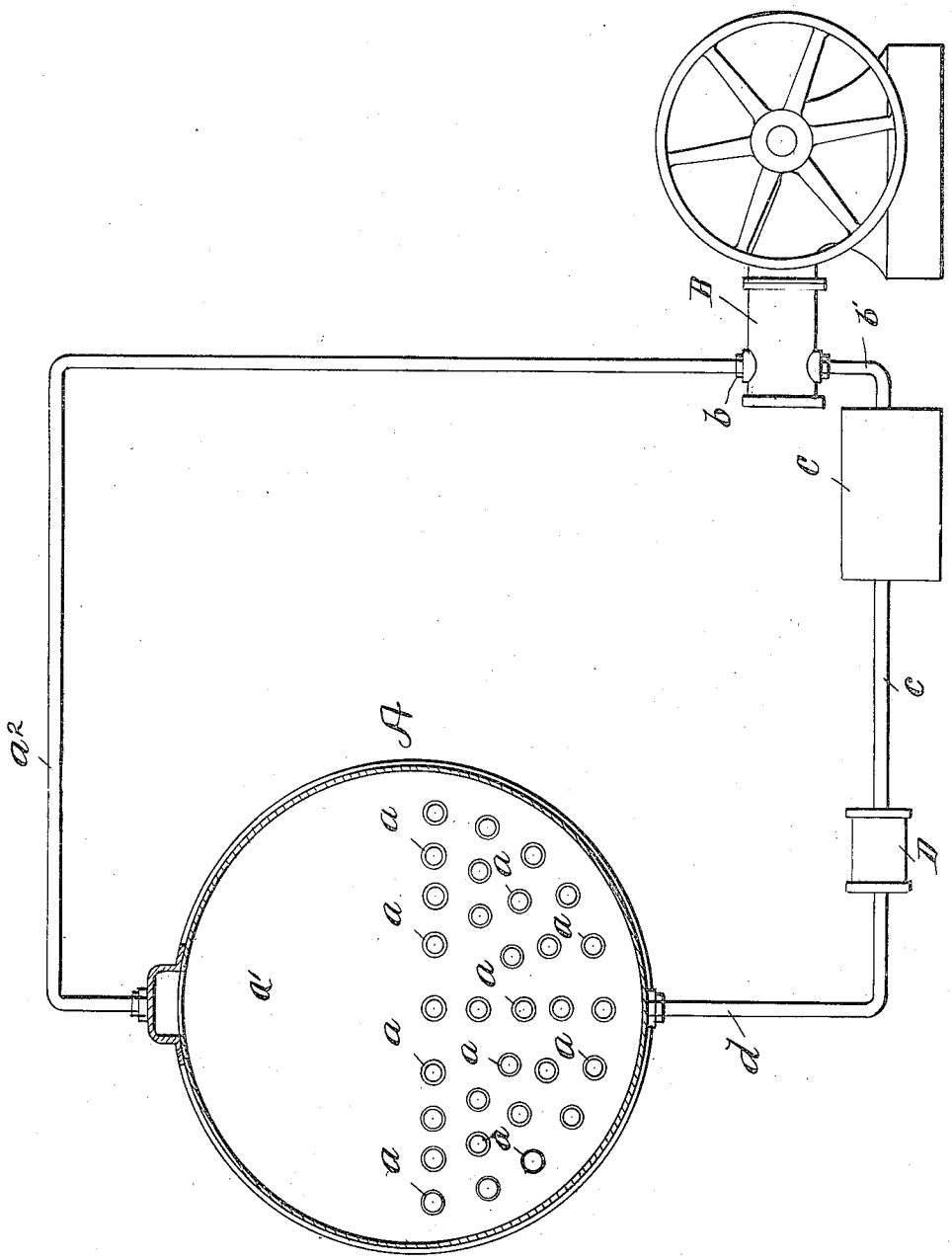
No. 869,897. PATENTED NOV. 5, 1907.

F. X. GOVERS.

VAPOR GENERATION AND POWER SYSTEM.

APPLICATION FILED MAR. 16, 1906.



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VAPOR-GENERATION AND POWER SYSTEM.

No. 869,897. Specification of Letters Patent. Patented Nov. 5, 1907.

Application filed March 16, 1906. Serial No. 306,477.

To all whom it may concern:

Be it known that I, FRANCIS X. GOVERS, a citizen of the United States, residing at Owego, in the county of Tioga and State of New York, have invented certain new and useful Improvements in Vapor-Generation and Power Systems, of which the following is a specification.

My invention relates generally to systems and processes for the production of power, but it has particular reference to the production of vapors of volatile liquids for use in power generating apparatus.

The purpose of the invention is to produce a system and process of generating power which will be characterized by high efficiency and absolute safety.

In pursuance of this object, my invention consists in the employment of a liquid having a boiling point lower than that of water and preferably at or less than 80° C. and from which there may be produced an expansible vapor which can be effectually used as a motive force and which vapor is further characterized by non-inflammability and lubricating properties. I have discovered that tetrachlorid of carbon, (CCl_4) possesses these properties in a maximum degree, and, my invention, therefore, further consists in the utilization of said material in the generation of motive power and for lubricating purposes. Said material is inexpensive. It is a heavy liquid which boils at temperatures variously given by the authorities as between 76° C. and 78° C. It has a specific gravity at 0° of 1.6298. Its vapor has a density of 5.24 and is non-inflammable: and, moreover, according to my discoveries, it effectually lubricates the surfaces with which it is brought in contact and, being a vapor, it enters and lubricates spaces which are not efficiently kept lubricated by the ordinary lubricating liquids. For said reasons, the utilization of said material in the generation of power introduces advantages of the utmost importance.

In the accompanying drawings, I have shown an apparatus suitable for use in the generation and utilization of said vapor. In said drawing, A designates a generator of any suitable construction within which the vaporizable liquid, as tetrachlorid of carbon, is placed. Said generator may be provided with tubes *a* which are immersed in said material and through which flow steam or other suitable medium for raising the temperature of the material to or above its boiling point. From the vapor chamber or portion *a'* of said generator a pipe a^2 leads the vapor to the supply or inlet port *b* of a motor B which may be of the ordinary steam engine type or of any other suitable construction. After acting by its expansive force on the piston of said engine and lubricating the same and the wall of the cylinder, the exhaust vapor is conducted by the exhaust pipe *b'* to a condenser C within which it is condensed. It is then conducted by a pipe *c* to a suitable pump D by which it is forced back to the generator through a pipe *d* for re-use.

Among the advantages possessed by the present invention, the following will be noted. The vapor possesses the necessary expansive force or elasticity and tension to be effective as a power medium. It possesses in such respects the qualities of steam, while, as the material boils at a temperature much lower than that of water, its vapor may be produced more economically in respect of the heat used than can steam. Again, it is capable of being used in ordinary steam engines, whereby its utilization is attended with the advantages which flow from the use of such engines, while, at the same time, being non-inflammable, it eliminates the dangers which follow the use of volatile liquids hitherto proposed for use in power systems. Thus it possesses the advantages of both steam and highly volatile liquids heretofore proposed with the disadvantages of neither, and, moreover, having lubricating properties of high efficiency, it has an additional advantage, not possessed by either steam or other systems hitherto employed.

In power systems heretofore employed wherein the vapor of a highly volatile liquid is utilized in the production of power and condensed for re-use, it has been found that the liquid becomes contaminated by the material employed in lubricating the engine cylinder and such material, unless removed, seriously interferes with the operation of the system. Great difficulty has been experienced in satisfactorily removing such lubricating material from the liquid used for the generation of power. It will be seen that these disadvantages are overcome by the utilization of a volatile liquid, as hereinbefore described, which is itself a lubricant.

In addition to the properties hereinbefore set forth, the vapor of tetrachlorid of carbon possesses the property of rendering inflammable vapors with which it is brought in contact non-inflammable. This property is of marked advantage in a liquid for the purpose specified, for the reason that it permits volatile liquids, such as naphtha, vapors of which are highly inflammable, to be safely used in conjunction with it. It is to be understood, therefore, that I contemplate as within the purview of my invention not only tetrachlorid of carbon alone, but said material with other highly volatile liquids whose use has heretofore been exceedingly dangerous by reason of the great inflammability and explotability of their vapors.

Having thus described the invention what I believe to be new and desire to secure by Letters Patent, is:—

1. A system for generating power, comprising a vapor generator, a motor adapted to utilize the expansive force of the vapor, and a condenser, suitably connected in a closed circuit, said closed circuit containing tetrachlorid of carbon and its vapor.

2. In a system for generating power, a vaporizable liquid whose vapor is non-inflammable and adapted to actuate and lubricate the moving parts of a motor, said liquid comprising tetrachlorid of carbon.

3. The process of generating a gaseous vapor for power and lubricating purposes, which consists in inclosing tetrachlorid of carbon in a chamber, heating said tetrachlorid of carbon to a temperature at or above its boiling point, conducting the vapor thus produced into a motor and operating said motor by the pressure of said vapor, and then condensing said vapor and returning it to said chamber for re-use.

In testimony whereof I affix my signature in presence of two witnesses.

FRANCIS X. GOVERS.

Witnesses:
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