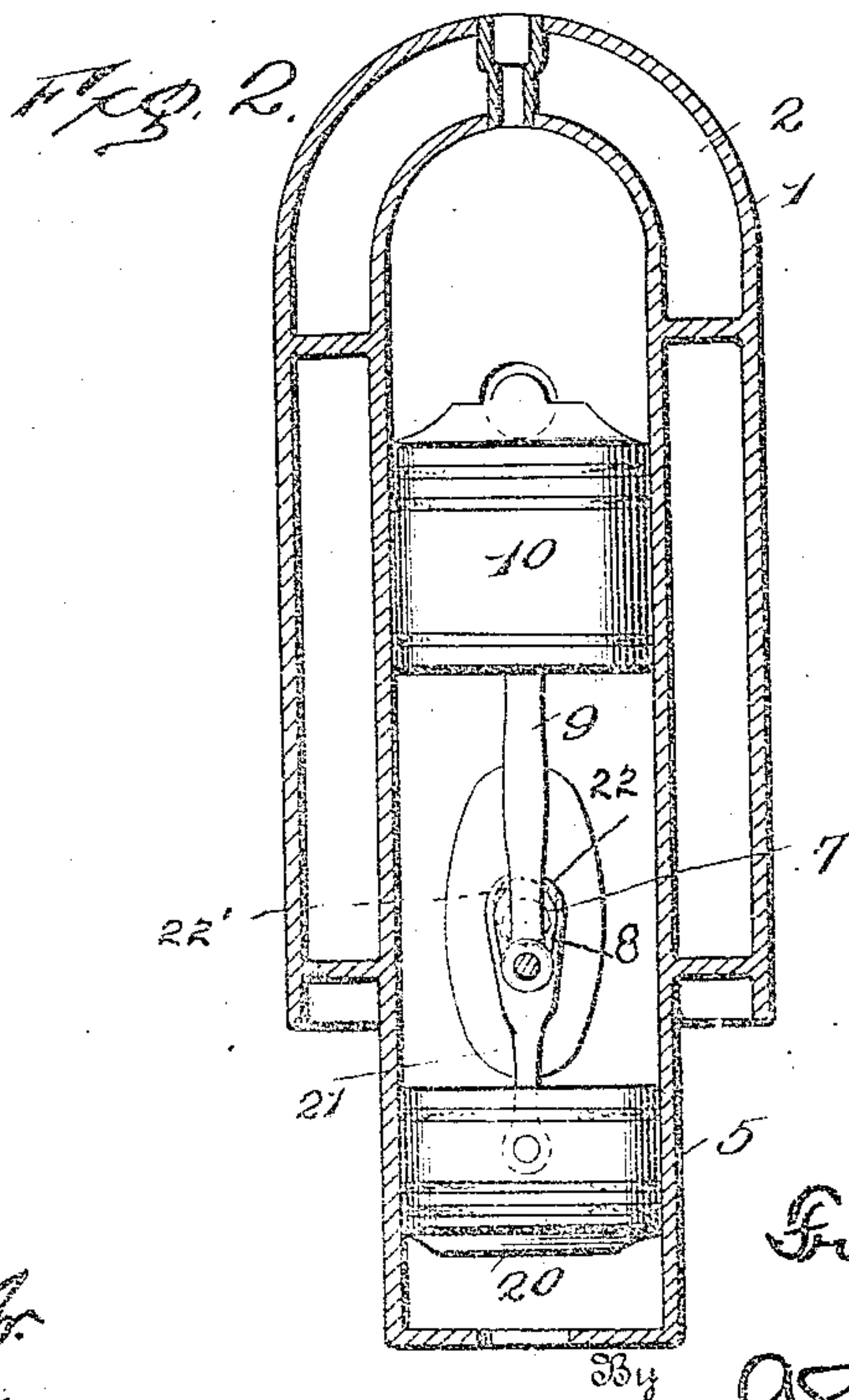
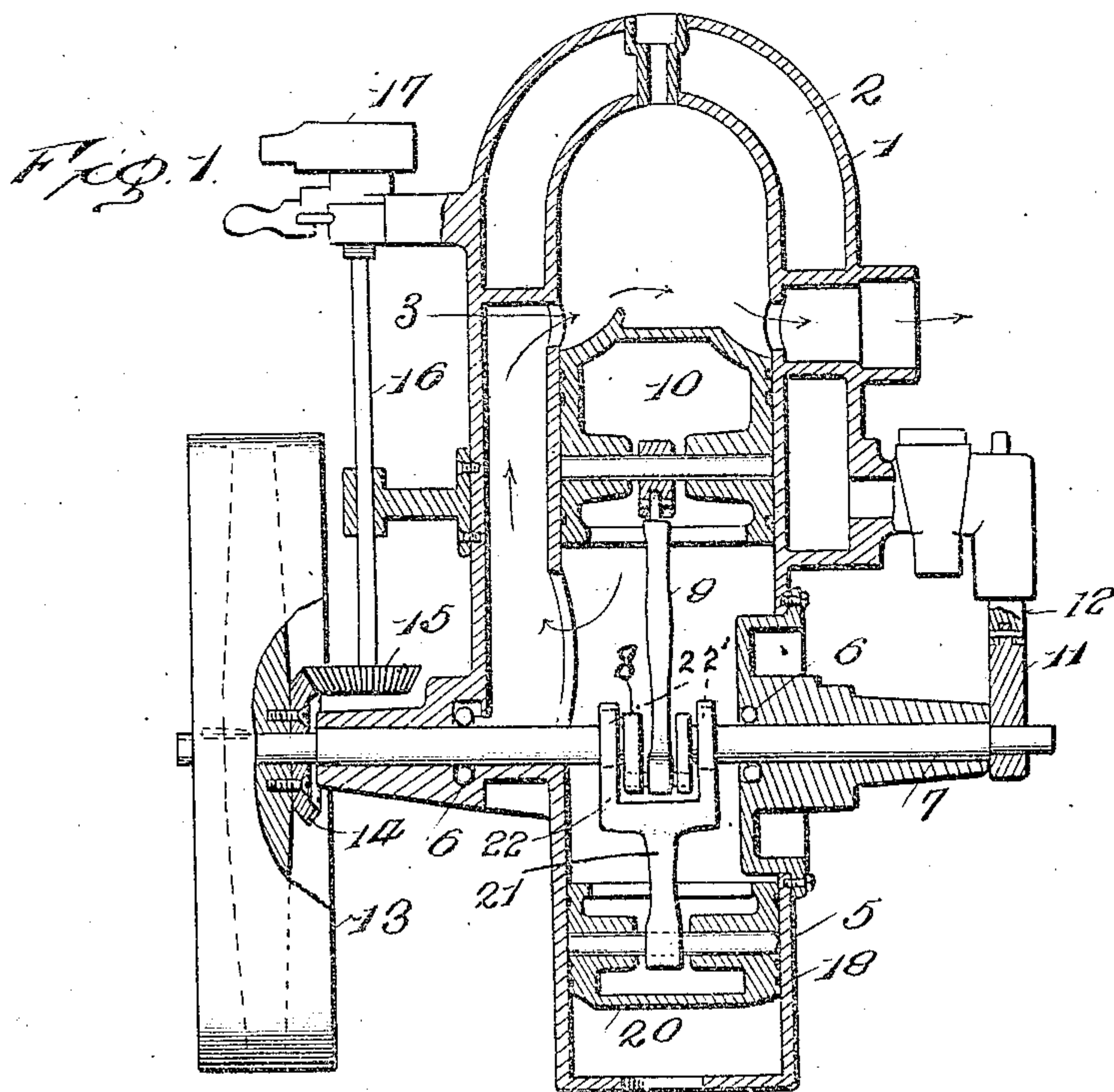


F. HOWES.  
TWO-CYCLE GASOLENE ENGINE.  
APPLICATION FILED SEPT. 10, 1907.

983,369.

Patented Feb. 7, 1911.



Witnesses  
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# UNITED STATES PATENT OFFICE.

FRED HOWES, OF BURLINGTON, VERMONT.

TWO-CYCLE GASOLINE-ENGINE.

933,369.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed September 10, 1907. Serial No. 392,189.

*To all whom it may concern:*

Be it known that I, FRED HOWES, a citizen of the United States, residing at the city of Burlington, in the county of Chittenden and State of Vermont, have invented certain new and useful Improvements in Two-Cycle Gasoline-Engines, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in two-cycle gasoline engines.

The object of my invention is to provide an engine of this character in which the amount of vapor forced into the combustion chamber is increased; thus increasing the power of the engine without changing any of its operative parts.

Another object of my invention is to provide a more simple construction and arrangement of the parts to accomplish the above result.

In the accompanying drawings Figure 1 is a vertical sectional view of a two cycle engine embodying my invention. Fig. 2 is a vertical sectional view taken at right angles to Fig. 1.

Referring now to the drawings 1 represents the engine cylinder, which is of the usual structure, having the water jacket 2 surrounding the outer end, the said cylinder having the inlet port at one side and the outlet port at the opposite side. The inner end of the cylinder 1 is in communication with the crank casing 3, the said crank casing carrying ball bearings 6 in which is mounted the shaft 7; the said shaft carrying a crank 8 to which is connected the pitman 9. The opposite end of the pitman is connected to the piston 10 in any well known manner, and said piston being of any well known form now in use. Carried by the outer end of the shaft 7 is an eccentric 11 operating the pump rod 12, causing a circulation of the water through the water jacket 2. Carried by the opposite end of the shaft 7 is a fly-wheel 13, and within said fly wheel is a bevel gear 14 meshing with the bevel-gear 15 carried by the shaft 16 and by means of which the commutator 17 is operated.

My invention consists in forming the working cylinder with an extension forming the crank case 3, and the pump cylinder 18, said cylinder being of the same bore as the working cylinder and having an outer open end. The casing 18 forms a cylinder in

which the piston 20 is adapted to snugly fit. The shaft 7 on each side of the crank 8 is provided with an eccentric 22' around which are arranged the eccentric rings 23, which converge downwardly and are rigidly carried by the pitman 21. The pitman 21 is connected to the piston 20 and the eccentrics and the crank are so arranged as clearly shown in Fig. 2 of the drawings that the pump piston and working piston travel toward each other and away from each other on the different strokes thereof, so that the charge is compressed between the same. The eccentrics, as shown in Fig. 2, are of such a size that the throw of the pump piston is considerably less than that of the working piston. By this construction and arrangement of the engine piston and the pump piston, it will be seen that the same movement of the crank shaft which forces upward the vapor which is held in the main body of the ordinary engine, also draws an increased amount of vapor which is held in the additional or lower chamber instead of creating the ordinary vacuum. After the explosion takes place the engine piston and the pump piston, owing to the position of the crank and eccentrics, are drawn together, and thus the vapor in the upper and lower chambers is compressed, causing a greater compression within the crank casing. When the engine piston has passed the inlet port 3, owing to a greater compression, a greater amount of vapor will be forced into the combustion chamber, whereby an additional power of 50 to 75% is obtained. While I have shown and described this form of pump it will be understood that I do not care to limit myself to the same. The specific construction and arrangement of parts may be readily varied.

Having thus described my invention what I claim and desire to secure by Letters Patent, is:

The combination in a two-cycle engine, having the cylinder extended forming a crank case and a pump cylinder of the same diameter, of a crank shaft extending through the cylinder and having a crank therein, a working piston in one end of the cylinder, said cylinder above the piston having a communication with the crank case, a piston rod connecting the crank and working piston, eccentrics carried by the crank shaft on each side of the crank, rings surrounding the eccentrics and having downwardly ex-

tending arms converging into a pitman, a  
pump piston within the extended end of  
the cylinder and connected to the pitman,  
whereby the working piston and pump pis-  
5 ton work in opposite directions concentri-  
cally, the stroke of the pump piston being  
shorter than that of the engine piston.

In testimony whereof I do affix my signa-  
ture in presence of two witnesses.

FRED HOWES.

Witnesses:

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