

A. J. SHINN.
MOTOR.

APPLICATION FILED SEPT. 26, 1911.

Patented June 25, 1912.

2 SHEETS-SHEET 1.

1,030,337.

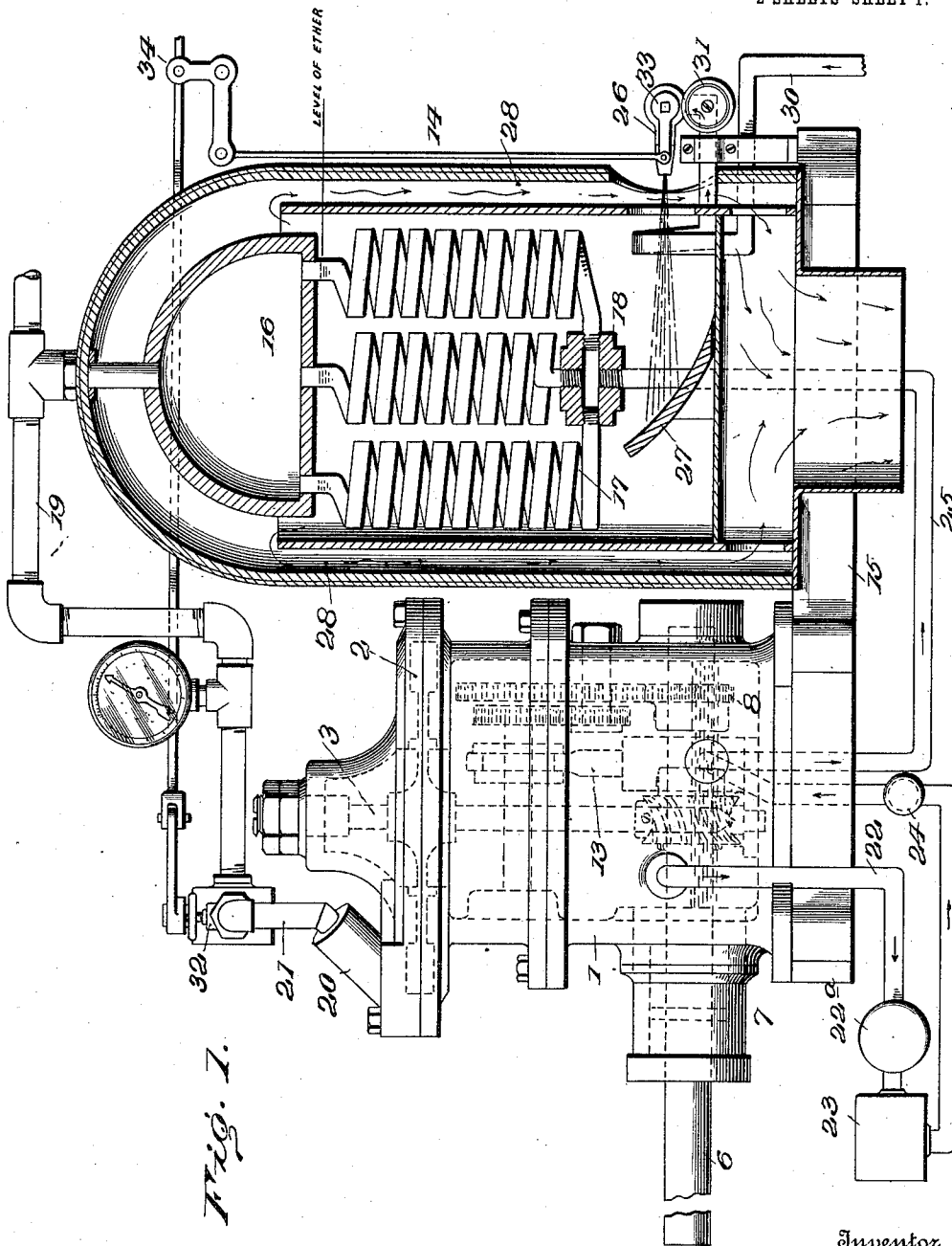


Fig. 1.

Witnesses
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2 SHEETS-SHEET 2.

Fig. 3.

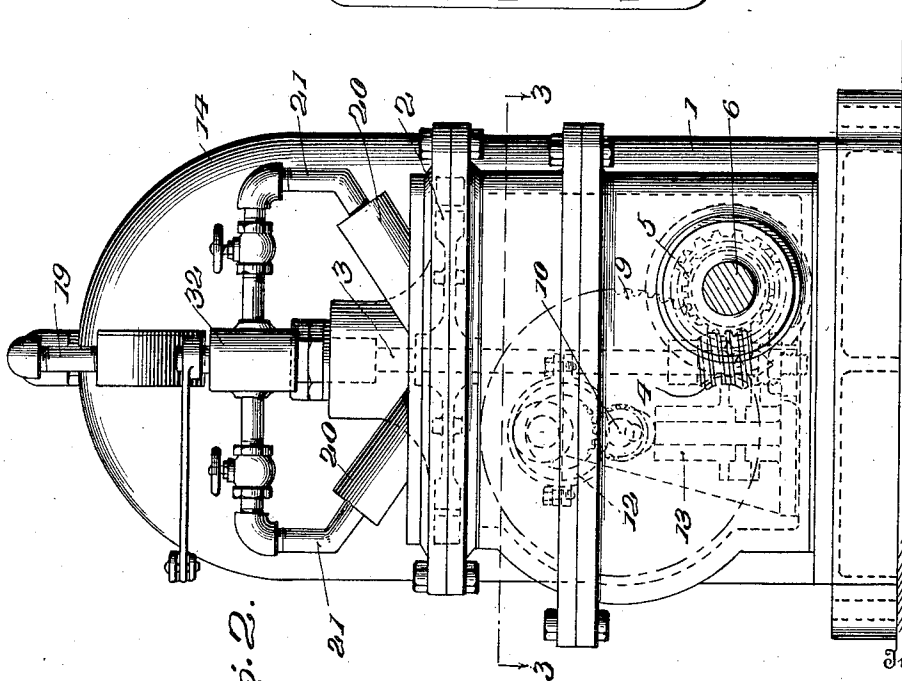
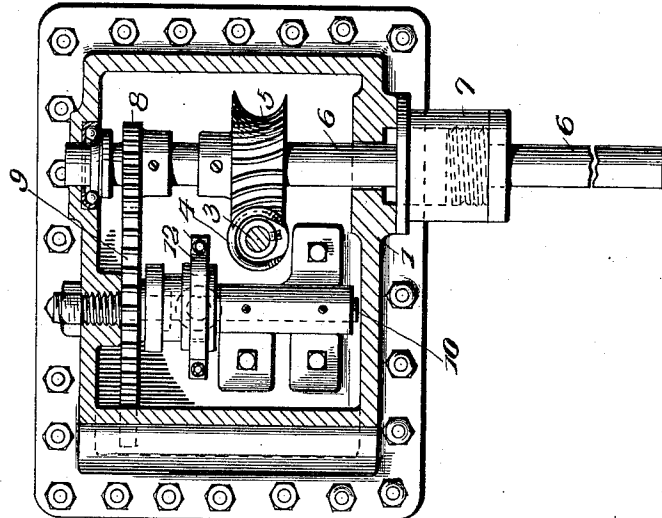


Fig. 2.

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UNITED STATES PATENT OFFICE.

ALBERT J. SHINN, OF WILMINGTON, DELAWARE, ASSIGNOR OF ONE-HALF TO JOHN G. GRAY, OF WILMINGTON, DELAWARE.

MOTOR.

1,030,337.

Specification of Letters Patent.

Patented June 25, 1912.

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To all whom it may concern:

Be it known that I, ALBERT J. SHINN, of Wilmington, in the county of Newcastle and State of Delaware, have invented certain new and useful Improvements in Motors; and I 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.

The primary object of this invention is to provide a simple and comparatively inexpensive motor capable of being operated by ether, or any other highly volatile liquid, which, after the expansive force is utilized, may be recovered and again used.

Further objects of the invention are to prevent loss by leakage in and around the rotor; to insure lubrication of the working parts; to perfectly balance the rotor; to provide simple and highly efficient means for transmitting the power of the rotor; and to produce an extremely compact, practical motor for power purposes.

The invention will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view partly in elevation and partly in section, with certain parts diagrammatically illustrated. Fig. 2 is an enlarged view of the motor casing, with parts indicated in dotted lines. Fig. 3 is a section on line 3—3, Fig. 2.

Referring to the drawings, 1 designates the motor casing which is fluid tight, the lower portion of the casing being designed to contain a bath of oil as indicated in Fig. 1. The rotor 2 is horizontally-disposed within casing 1, and is mounted on a vertically-disposed shaft 3, the ends of which are carried in suitable bearings. On the lower end of this shaft 3 is a worm 4 which meshes with a worm 5 on a horizontally-disposed driven shaft 6 which extends outwardly from casing 1 through a stuffing box 7. On shaft 6 is a pinion 8 which meshes with a gear wheel 9 mounted on a short shaft 10 within casing 1, and to this gear wheel is affixed an eccentric 12 for operating a circulating pump 13 located within the casing. This pump and the driven shaft are lubricated by the oil bath within the casing.

14 designates a vaporizer, the inclosing casing of which is shown as mounted on an

extension of the base 15 of the motor casing, but this is merely a matter of preference, since the vaporizer may be positioned at any desired point in respect to the motor. Within casing 14 is a dome-shaped chamber 16 from which depends a series of coiled tubes 17 which I have shown in Fig. 1 as connected at their lower ends to a common head 18. The ether or other highly volatile liquid is introduced into the dome until the coils 17 are filled therewith, and upon the application of heat to the coils the ether vapor will pass upwardly into the dome and be conveyed by pipe 19 to the motor casing. I have shown the latter as provided with two oppositely inclined internally threaded bosses 20 with which valved branches 21 of pipe 19 connect, the branch used depending on the direction of rotation of the rotor. These bosses open into the upper portion of casing 1 directly over the vanes of the rotor.

The ether after acting on the rotor is drawn from the casing at a point beneath the rotor and above the oil bath through a pipe 22 which is connected to the suction side of pump 13, and within this pipe is located an expansion tank 22^a, a condenser 23 and a receiver and separator 24, all of which are conventionally indicated in Fig. 1. The vapor thus drawn off by the action of the pump after passing through the expansion tank is condensed, and all particles of oil, if any, are removed and collected in the separator 24. The ether is then delivered by the pump through pipe 25 to the vaporizing coils, said pipe opening into the head 18.

Any suitable means may be employed for heating coil 17, but I preferably use a gasoline burner 26, the flame of which is directed through an opening in casing 14 and by a deflector 27 is directed upwardly against the coils 17 and thence passes downwardly through a side channel 28 formed within the casing and out through the bottom thereof. The gasoline supply pipe 30 is, for a portion of its length, preferably located within casing 14 in the line of the burner flame so as to facilitate the generation of the gas. I have shown a valve 31 located in pipe 30 adjacent the burner.

Any suitable means may be employed for regulating the passage of the vapor to the rotor and also for controlling the burner. Preferably these two agencies are controlled from a common point. Thus, I have shown

in Fig. 1 a throttle valve 32 located in supply pipe 19, and this valve as well as the valve 33 of the burner are connected to a common control conventionally indicated at 34, Fig. 1.

The cycle of operation begins with vaporizing the ether, which vapors are used expansively in the rotor casing for rotating the rotor, and are then taken off directly from the fluid tight casing and allowed to expand and condense, and are then returned in a liquid state to the starting point. The pump by which the vapors are withdrawn from the motor casing and returned to the vaporizing coils being within the fluid-tight casing, it, as well as the driven shaft, is thoroughly lubricated by the oil bath. By making the casing fluid tight I avoid leakage with the result that the ether may be continuously used for a considerable period without having to be replenished. The rotor being horizontally disposed I am enabled to obtain a perfect balance therefor, and by connecting the rotor shaft to the driven shaft through worm gearing I dispense with the cumbersome gear reduction heretofore employed on high speed turbines.

The advantages of my invention will be apparent to those skilled in the art.

I claim as my invention:

1. In combination with a rotary motor and a fluid-tight casing therefor, a vaporizer communicating with said casing, said vaporizer being designed to contain ether or other highly volatile liquid, a pump located within said casing and actuated by said motor, said pump being in communication with said vaporizer, and a condenser in communication with said casing and through which the vapors after acting on the motor, are drawn by said pump.

2. In combination with a rotary motor and a fluid-tight casing therefor designed to contain an oil bath, a pump located within said casing and actuated by said motor, said pump being in communication with said vaporizer, a shaft extending into said casing and driven by said motor, said pump and shaft being lubricated by said oil bath, and a condenser in communication with said casing and through which the vapors, after acting on the motor, are drawn by said pump.

3. In combination with a rotary motor and a fluid-tight casing therefor designed to contain an oil bath, a pump located within said casing and actuated by said motor, said pump being in communication with said vaporizer, a shaft extending into said casing and driven by said motor, said pump and shaft being lubricated by said oil bath, a condenser in communication with said casing and through which the vapors, after acting on the motor, are drawn by said pump, and an oil separator intermediate said condenser

and pump for separating any of the oil from the vapors.

4. A motor comprising a vaporizer designed to contain ether or other highly volatile liquid, means for heating the vaporizer, a horizontally disposed rotor, a vertically disposed shaft therefor, a fluid-tight casing for said rotor and shaft, a circulating pump within the casing designed to be actuated by said rotor shaft, a condenser for the vapors after acting on the rotor, and means connecting said condenser with the pump, which latter is also connected with the vaporizer.

5. A motor comprising a vaporizer designed to contain ether or other highly volatile liquid, means for heating the vaporizer, a horizontally disposed rotor, a vertically disposed shaft therefor, a fluid-tight casing for said rotor and shaft, a circulating pump within the casing, a second shaft located within and extending from said casing, and worm gearing intermediate said second shaft and the rotor shaft.

6. A motor comprising a vaporizer for ether or other highly volatile liquids, means for heating the same, a horizontally disposed rotor, a vertically disposed shaft therefor, a fluid tight casing for the rotor having oppositely disposed inlets in line with the periphery of the rotor, means for controlling the admission to said inlets, a circulating pump, means for driving the same, a condenser in communication with said casing and pump, and a connection between the latter and the vaporizer.

7. In a motor, the combination of a casing, a vertical shaft arranged in the casing, a rotor mounted on said shaft in the upper part of the casing, nozzles arranged to direct the working fluid so as to drive the rotor in either direction, a vaporizer, and a pump arranged within the casing and driven by said shaft and adapted to deliver the fluid to said vaporizer.

8. In a motor, the combination of a casing, a vertical shaft arranged in the casing, a rotor mounted on said shaft in the upper part of the casing, a horizontally arranged driven shaft projecting through the casing and having a worm drive connection with said vertical shaft, a vaporizer, and a pump within the casing and driven from the horizontal shaft and adapted to deliver fluid to said vaporizer.

9. In a motor, the combination of a casing, a vertical shaft arranged in the casing, a reversible rotor mounted on said shaft in the upper part of said casing, a horizontally arranged shaft mounted in the casing and projecting therefrom, a worm gear drive connecting said shafts, a pump arranged in the casing and driven from one of said shafts, and reversely arranged nozzles adapted to deliver a motive fluid to said rotor,

said casing being adapted to receive the exhaust from said rotor and having an outlet for the exhaust above said horizontal shaft.

10. The combination with a rotary motor,
5 a vaporizer for said motor designed to contain ether or other highly volatile liquid, a pump actuated by said motor and connected to said vaporizer, said pump drawing off the vapors from said motor and re-
10 turning them to the vaporizer, a burner for the vaporizer having a valve, a throttle valve

for controlling the passage of the vapor to the motor, and means for simultaneously actuating the throttle valve and the burner valve.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

ALBERT J. SHINN.

Witnesses:

BARNET GLUCKMAN,
S. S. ADAMS, Jr.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."