

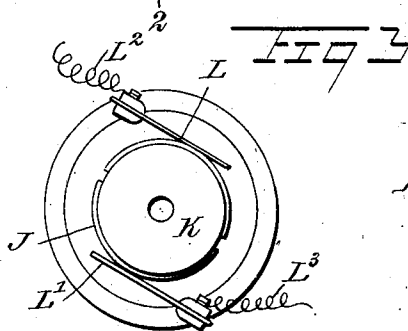
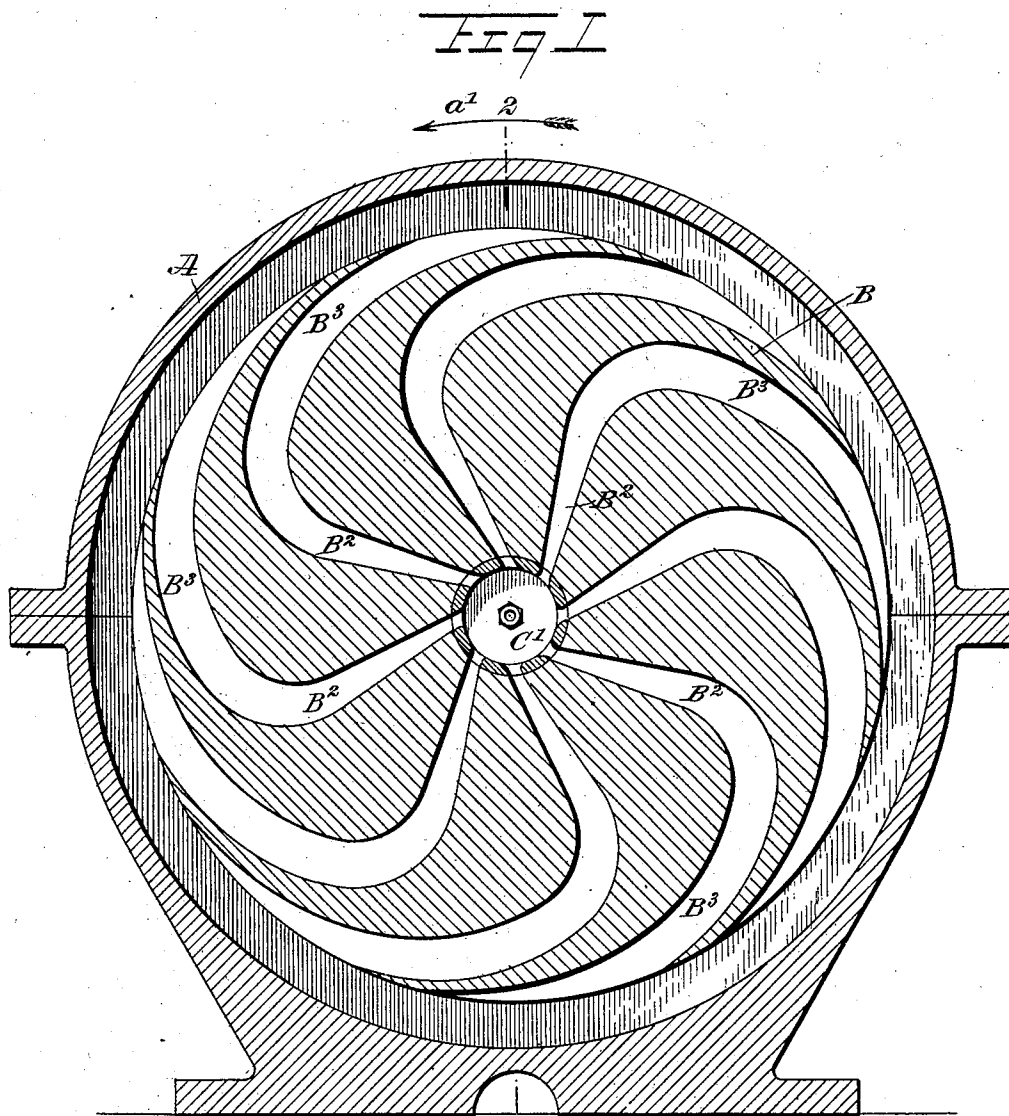
No. 762,175.

PATENTED JUNE 7, 1904.

H. T. LEES.
EXPLOSION TURBINE.
APPLICATION FILED JUNE 3, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:

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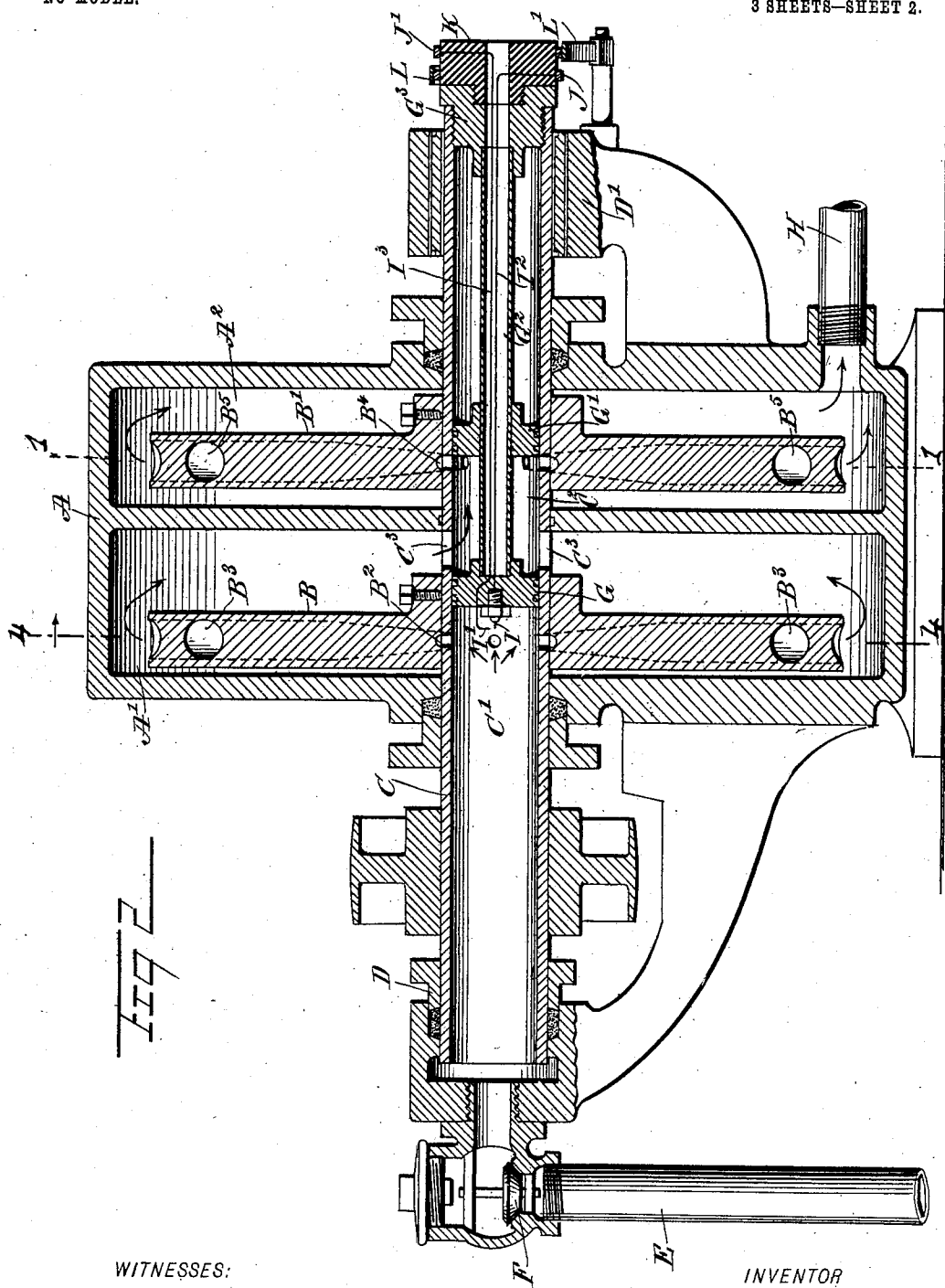


FIG 2

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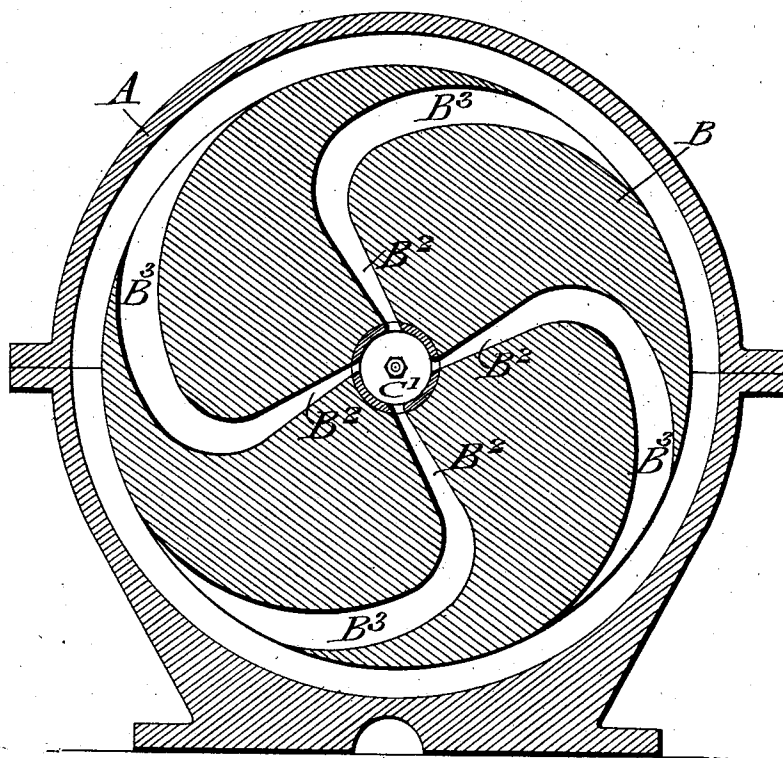
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3 SHEETS—SHEET 3.

Fig 4



Witnesses

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UNITED STATES PATENT OFFICE.

HENRY T. LEES, OF NEW YORK, N. Y.

EXPLOSION-TURBINE.

SPECIFICATION forming part of Letters Patent No. 762,175, dated June 7, 1904.

Application filed June 3, 1903. Serial No. 159,874. (No model.)

To all whom it may concern:

Be it known that I, HENRY T. LEES, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Explosion-Turbine, of which the following is a full, clear, and exact description.

The invention relates to steam or vapor turbines such as shown and described in the Letters Patent of the United States No. 713,997, granted to me November 18, 1902.

The object of the invention is to provide a new and improved turbine, more especially designed and arranged to utilize the motive agent economically and to the fullest advantage to obtain a very low rate of speed.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a cross-section of the improvement on the line 1 1 of Fig. 2. Fig. 2 is a longitudinal sectional elevation of the same on the line 2 2 of Fig. 1 and arranged as a compound explosive-engine, and Fig. 3 is a face view of the circuit-breaker for the sparking plug. Fig. 4 represents a cross-section on line 4 4, Fig. 2.

The casing A of the turbine is provided with a plurality of separated compartments A' A', in which are mounted to turn wheels B and B', secured on the main shaft C, preferably made hollow and journaled in suitable bearings D D', carried by the casing A, as illustrated in Fig. 2. A supply-pipe E connects with one end of the hollow shaft C to deliver an explosive mixture to the said shaft, and the said pipe is provided with a check-valve F to prevent a return-flow of the mixture or fluid-pressure when ignition takes place, as hereinafter more fully described.

The hollow shaft C is provided at the wheels B and B' with transverse partitions G and G', forming chambers C' and C'', of which the

chamber C' is the igniting or explosion chamber and is connected with the apex ends of nozzles B², formed in the wheel B and terminating at their wider outer ends in curved passages B³, discharging into the compartment A', preferably at the peripheral surface of the wheel B. The chamber C'' is connected by ports C³ with the interior of the compartment A', so that the pressure passing from the passages B³ into the compartment A' can pass from the latter through the ports C³ into the chamber C'' to pass from the latter into nozzles B¹ similar to the nozzles B² and likewise connecting with curved passages B⁵ similar to the passages B³. The passages B⁵ open into the compartment A', and the latter is provided with an exhaust-pipe H for carrying off the exhaust-gases.

Into the igniting-chamber C' extends an igniting device having spaced electrodes I and I' connected with wires I² I³, extending through a pipe G², attached to the partition G and extending through the partition G' to connect with a head G³, secured on the outer end of the shaft C. The wires I² and I³ connect with the sectional rings J and J', held on the peripheral surface of a plug K, of hard rubber or other suitable insulating material, and fastened to the head G³, as plainly indicated in Fig. 2. The rings J and J' are engaged by contact plates or brushes L and L', attached to suitable supports held on the bearing D', and the said contact-plates are connected by wires L² L³ with a suitable source of electrical energy, such as a battery or the like.

The operation is as follows: The explosive mixture passes by way of the pipe E and check-valve F into the chamber C', in which the mixture is ignited by an electric spark between the electrodes I and I', and the pressure produced passes through the nozzles B² into the passages B³, from which the pressure is discharged into the compartment A'. Now the motive agent passing through the nozzles is free to expand, owing to the increase in size of the nozzles, so that the velocity of the motive agent is immediately increased, and the same by acting against the walls of the passages B³ causes a rotation of the wheel B in the direction of the arrow a'. (See Fig. 1.)

The pressure from the compartment A' now passes by way of the ports C² into the chamber C² and through the nozzles B² into the passages B², so that the second wheel B' is rotated in the same direction as the wheel B, thus assisting the wheel B in rotating the shaft C to utilize the motive agent to the fullest advantage. The exhaust-pressure finally passes from the compartment A² by way of the pipe H to the outside or other suitable place of discharge.

It is evident that any number of compartments and wheels therein may be used and arranged in the manner described—that is, the motive agent after having exhausted some of its force to rotate the wheel in one compartment passes from the latter to the next wheel and to its compartment, and so on to the following wheel and compartment, to be finally discharged from the last compartment in the series, it being seen that the compounding is effected by having the second wheel provided with a greater number of nozzles than there are in the first wheel.

The rings J and J' may be arranged to produce one, two, or more sparks between the electrodes I and I' for each revolution of the shaft C to give impulses to the wheels B and B' in quick succession to insure a high pressure of the engine.

The power is transmitted to other machinery from the shaft C by gear-wheels, pulleys, or other like devices or directly.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An explosion-turbine comprising a casing having separated compartments, wheels mounted to turn in said compartments, a continuous hollow shaft internally divided and on which said wheels are detachably mounted, flaring nozzles extending from the said shaft outward in each wheel with their contracted ends opening into said shaft and curved passages leading from the outer or wider ends of said nozzles to the peripheral faces of the wheels, the communication between the compartments being through said hollow shaft.

2. An explosion-turbine comprising a casing having separated compartments, wheels mounted to turn in said compartments, a continuous hollow shaft upon which said wheels are detachably mounted and being suitably divided, flaring nozzles extending from the shaft outward with their contracted ends innermost and curved passages communicating with the outer or wider ends of the nozzles and leading to the peripheral faces of the wheels, the communications between the compartments being through said hollow shaft, and means for igniting the gas on the interior of said shaft.

3. A turbine comprising a casing having a plurality of separated compartments, wheels

in the said compartments, and a continuous hollow shaft on which the wheels are detachably secured, the said shaft forming central separated chambers for the said wheels, and the latter being provided with nozzles and connected passages, said passages leading toward the periphery, of which the nozzles open into the central chambers and the passages open into the casing-compartments, the first casing-compartment being disconnected from the second casing-compartment but connected with the second shaft-chamber through said hollow shaft to conduct the exhaust-pressure from the first wheel and its casing-compartment to the casing-compartment of second wheel, as set forth.

4. An explosion-turbine comprising a casing having a plurality of separated compartments, a continuous hollow shaft journaled in the heads of the casing and formed with spaced chambers, the first of which is connected with a supply and with the first compartment, a plurality of wheels detachably secured on the said shaft, one wheel for each compartment, each wheel having nozzles and passages connected with the nozzles, said passages leading toward the periphery and of which the contracted ends of the nozzles open into the shaft-chambers and the passages open into the compartments, the communication from one compartment to the other being through said shaft, and an igniting device in the shaft-chamber connected with the supply intermediate the supply and the contracted ends of the nozzles of the first wheel, as set forth.

5. An explosion-turbine comprising a casing having a plurality of separated compartments, a continuous hollow shaft journaled in the heads of the casing and formed with spaced chambers, one of which is connected with a supply and the next with the first compartment, a plurality of wheels detachably secured on the said shaft, one wheel for each compartment, each wheel having nozzles and passages connected with the nozzles, and of which the contracted ends of the nozzles open into the shaft-chambers and the passages open into the compartments, and an igniting device in the shaft-chamber connected with the supply, the said igniting device comprising spaced electrodes in the said chamber, insulated sectional contact-rings secured to the said shaft and connected with the said electrodes, and fixed contact-plates connected with a source of electrical energy and in engagement with the said rings, as set forth.

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

HENRY T. LEES.

Witnesses:

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