No. 819,752. PATENTED MAY 8, 1906.

L. GILMORE, JR.

STEAM MOTOR.

APPLICATION FILED MAR. 27, 1902.

2 SHEETS—SHEET 1.

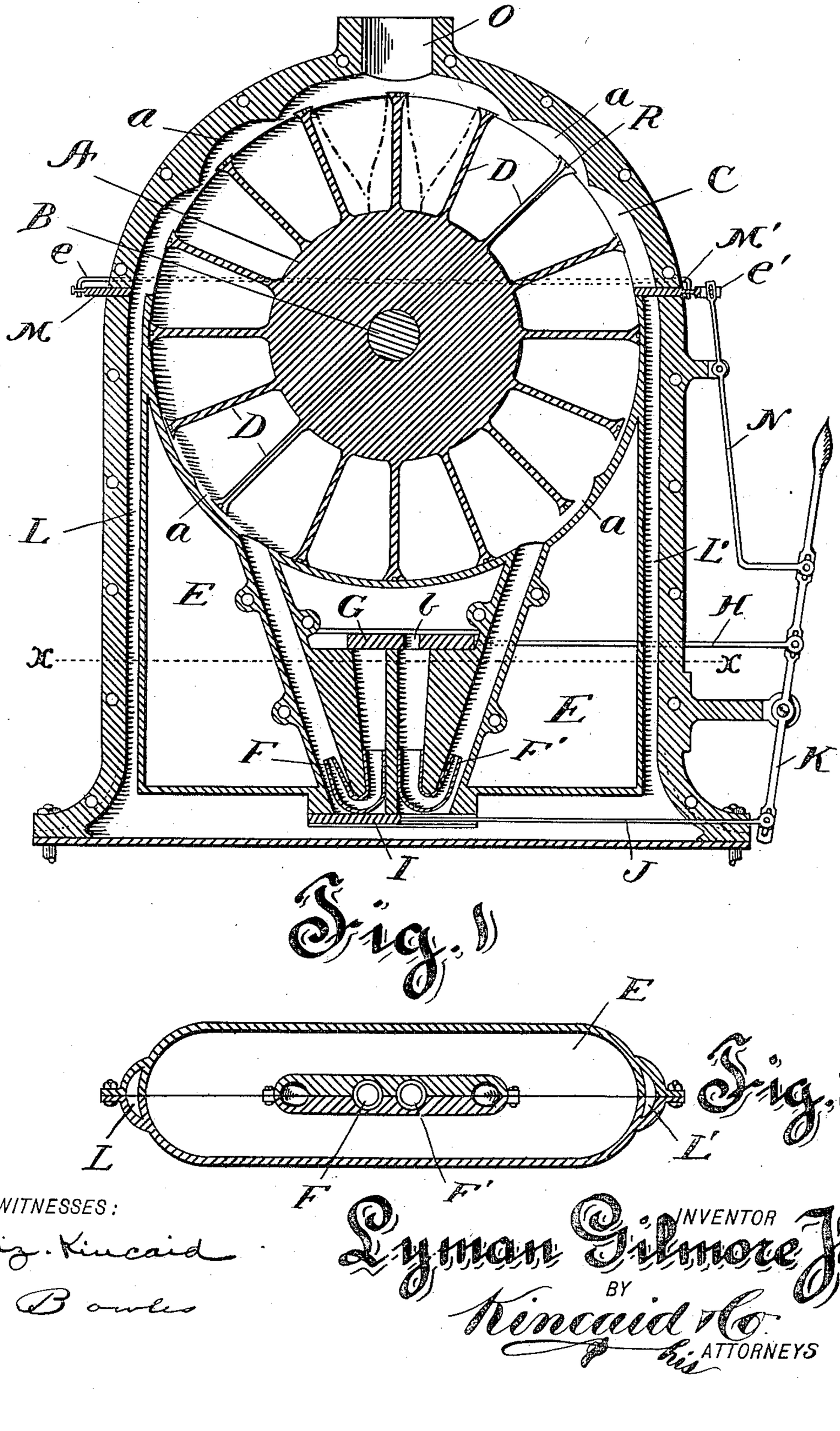

Fig. 1

Fig. 2

WITNESSES:

Eliz. Kincaid

R. Bowles

INVENTOR

Lyman Gilmore Jr.

BY

Kincaid & Co.

his ATTORNEYS

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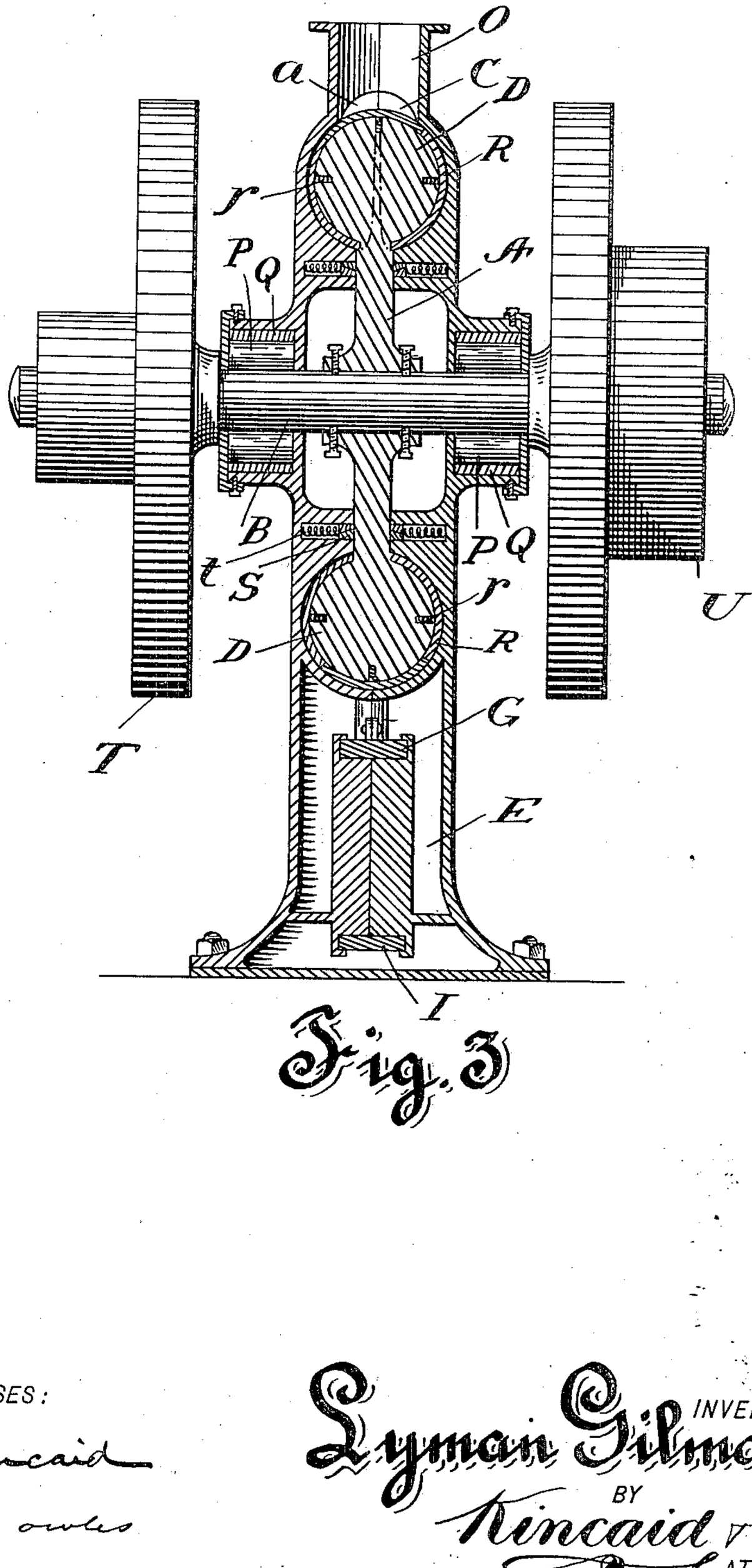

Fig. 3

WITNESSES:

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UNITED STATES PATENT OFFICE.

LYMAN GILMORE, JR., OF COLFAX, CALIFORNIA.

STEAM-MOTOR.

No. 819,752. Specification of Letters Patent. Patented May 8, 1906.

Application filed March 27, 1902. Serial No. 100,306.

To all whom it may concern:

Be it known that I, LYMAN GILMORE, Jr., a citizen of the United States, residing at Colfax, in the county of Placer, State of California, have invented certain new and useful Improvements in Steam-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.

My present invention is an improvement in an upright steam-motor; and it has for its object to produce a motor which will possess the requisite strength and durability and which will be especially simple in construction and efficient in operation.

I have arranged the parts in such a manner that the maximum effect of the steam is utilized, and in addition to the direct impelling force of the steam I have employed a combination of ejectors to create both a suction and forcing of the steam, which when added to the direct force manifestly increases the percentage of efficiency.

My steam-motor is designed to meet the necessity of a reversible motor to take the place of non-reversible turbine and rotary steam-engines and is adapted to marine use, is positive in action, controlled entirely by one lever, and readily reversed.

The motor is economical in the use of steam, using it from a high to an extremely low pressure with but a minimum of operative parts, the action of the steam upon the operative parts being similar to an ejector which feeds the boiler against its own pressure by adding momentum to the feed. The motor, however, adds momentum to an increased volume of steam, thereby increasing the power by momentum, as well as by increasing the volume of the steam per square inch with the same pressure as that of the steam as it issues from the ejector-nozzles.

The manner in which the steam is circulated around and upon the operative parts allows every pound of steam to be converted into power. The use of the ejector principle also is very important, as it reduces the speed to a certain extent, thereby avoiding the difficulty of the motor jarring itself to pieces, as has often occurred in a direct motor.

I am enabled to accomplish the above results by the mechanism illustrated in the accompanying drawings, in which similar letters of reference represent corresponding parts.

Figure 1 is a vertical central section of the motor. Fig. 2 is a section taken along the line X X of Fig. 1; and Fig. 3 is a central vertical section taken in a direction at right angles to that shown in Fig. 1, the central spindle and connecting fly and belt wheels being shown in elevation.

I will now explain the construction and operation of the invention.

The central disk A is keyed to the central shaft B and rotates in an annular cylinder C. Connected with this disk A are the heads or fins D, which are braced to the central disk by means of thin central webs, the latter being represented in Fig. 1 by means of broken lines. Communicating with the chamber C, but below it, is the steam-chamber E, from which lead the ejector-nozzles F and F′, similarly formed, but directed upward on opposite sides of the central shaft B. The inner surface of the cylinder C is recessed at several points *a* to form chambers which allow the steam to circulate between and operate on a plurality of heads or fins.

In order to control the flow of steam through the ejectors F and F′, I have provided the slide-valve G, which has an induction-port *b* and is operated by the rod H to start, stop, and reverse the motor. Directly below the ejector-nozzles F and F′ is a secondary valve I, operated by the rod J. The rods H and J are connected to the lever K on opposite sides of the fulcrum thereof. Leading from the valve I and communicating with the cylinder C at opposite extremities of the horizontal diameter thereof are the conduits L and L^2, which supply the ejectors with hot steam from the exhaust acting on the periphery of the disk and heads thereof. These passages are controlled by the radial sliding valves M and M′, respectively, and operated by the lever N and connecting-rods *e* and *e′*, the lever N being fulcrumed on the cylinder-casing and connected to the lever K.

Having described the construction of the motor, I will explain the action of the steam on the operative parts thereof.

Assuming that the parts are in relative positions shown, it is manifest that as the steam enters the induction-port *b* and issues from the nozzle F′ that the disk A will revolve through the impact of the steam on the heads. Now to aid this revolution of the central disk and heads the suction from the exhaust in the conduit L caused by the ejectors acts

against each head through the medium of the variable passages *a*. Said suction then unites with the steam discharging from the nozzle F′ and fills the passage-ways leading from the conduit L to the cylinder C with steam, which is discharged against two of the heads continuously. The escaping steam is then compressed between the second and third head, and as the heads move forward the steam is released at the valve M and expands against the remaining heads through the variable passages until it reaches the exhaust O, where it is exhausted practically without pressure. A part of the exhaust-steam is caught by the suction, acts on the heads or fins, and supplies the ejectors with hot steam and prevents condensation, acting in a direction opposite to that of the steam, but on the opposite side of the axis of revolution of the disk. It will be seen that the variable passages in the cylinder are carried inwardly to a sharp point at a number of places to come in contact with the periphery of the heads, thus causing the passage of steam to be shut off and turned on automatically and allowing it to expand to its full capacity before reaching the exhaust. By operating the lever K the port *b* will allow the steam to enter the ejector F, while the valve M will close and the valve M′ open, thereby reversing the action of the motor.

In order to reduce to a minimum the friction of the revolving shaft B, I have employed the roller-bearings P, which are inclosed in a steel casing Q.

Each of the heads or fins D is provided with a peripheral packing-ring R, which is held outward against the cylinder C by means of a yielding spring *r*. The wedge-shaped packing S and packing-ring *t* are to prevent the escape of steam through the bearings of the motor.

The motor is provided with the usual fly and belt wheels T and U, which serve their usual functions.

I am aware that various changes in the form and proportion of parts herein shown can be made without departing from the principles of my invention.

What I claim is—

1. In a steam-motor, a steam-chest, a cylinder having suitable induction and exhaust ports, and variable annular steam passage-ways therein, a plurality of ejectors communicating respectively with the steam-chest and the cylinder and adapted to conduct steam to opposite sides of the piston, a piston rotatably mounted in said cylinder, said piston comprising a disk having radial fins, valves controlling said cylinder passage-ways, and said ejector-passages respectively, and means for operating said valves, substantially in the manner and for the purpose set forth.

2. In a steam-motor, a steam-chest, a cylinder having suitable induction and exhaust ports, and steam passage-ways therein, a plurality of U-shaped ejectors communicating respectively with the steam-chest and the cylinder and adapted to conduct steam to opposite sides of the piston, U-shaped nozzles arranged in said ejector-passages, a piston rotatably mounted in said cylinder and comprising a disk having radial fins, valves controlling said cylinder passage-ways and said ejector-passages respectively, and means for operating said valves.

3. In a steam-motor, an annular cylinder having suitable induction and exhaust ports and having variable passage-ways leading from the exhaust downwardly on each side thereof, ejectors, conduits communicating with said ejectors and the variable passage-ways, a steam-chamber surrounding the ejectors and communicating therewith, a piston rotatably mounted in said cylinder and having radial fins adapted to fit steam-tight with portions of the walls of the cylinder, valves controlling said ejectors, the conduits and the passage-ways respectively, and means for operating said valves.

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

LYMAN GILMORE, JR.

Witnesses:
GEORGE PATERSON,
ELIZ. KINCAID.