

No. 771,004.

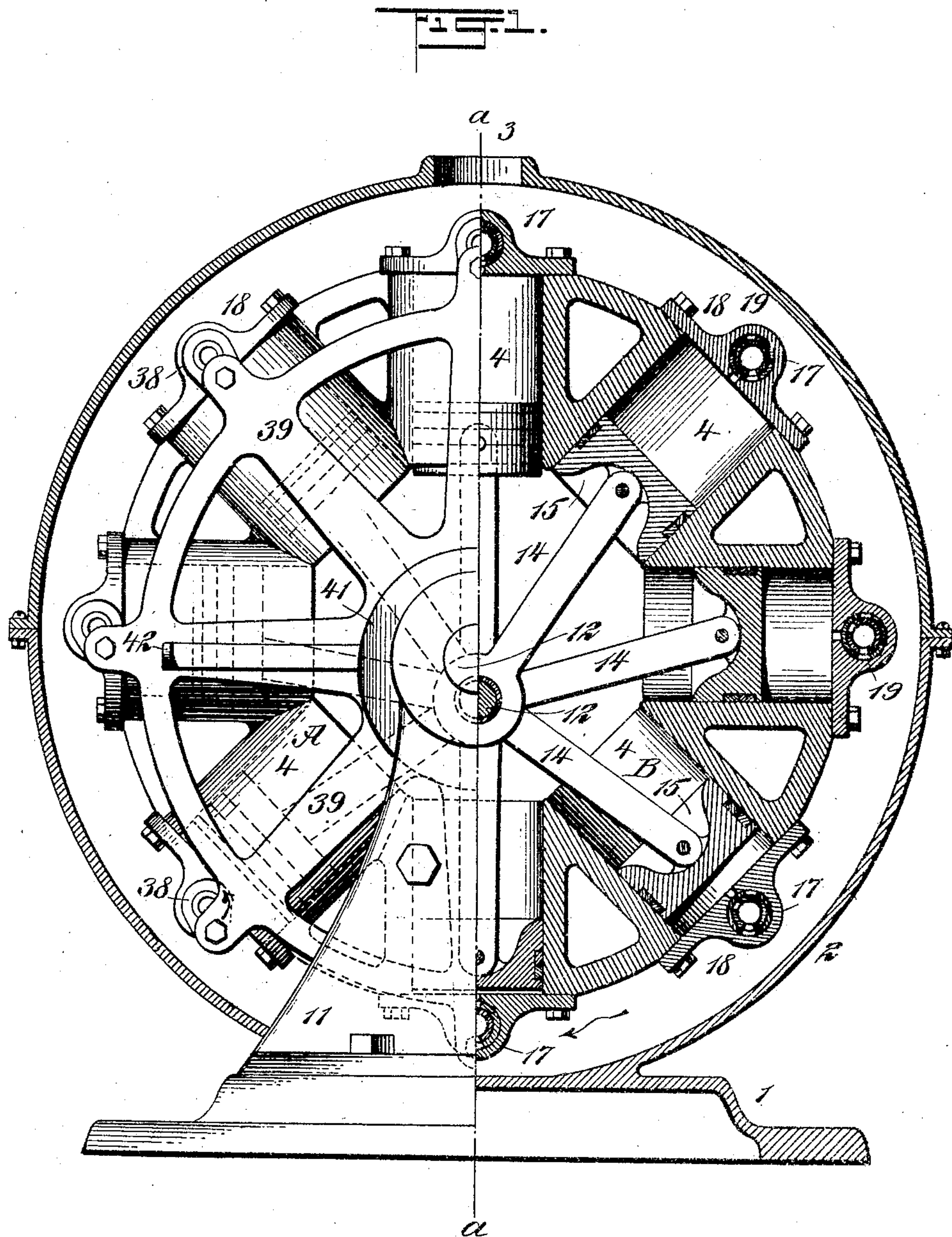
PATENTED SEPT. 27, 1904.

C. F. FOGG.
FLUID MOTOR.

APPLICATION FILED AUG. 9, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses
Julius H. Smith
L. Du Brul.

Charles F. Fogg, Inventor
By his Attorney A. M. Pierce.

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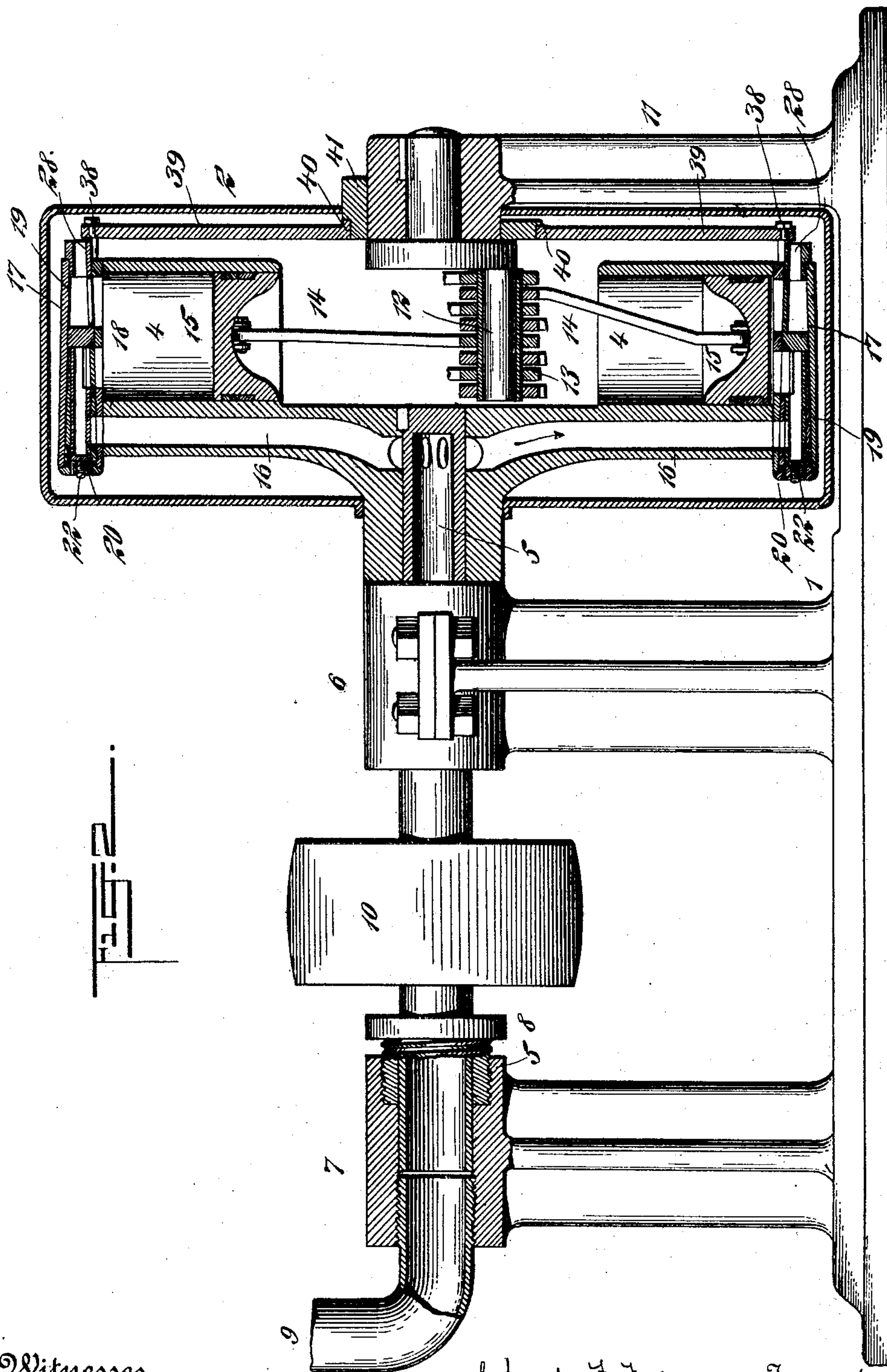
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3 SHEETS—SHEET 2.



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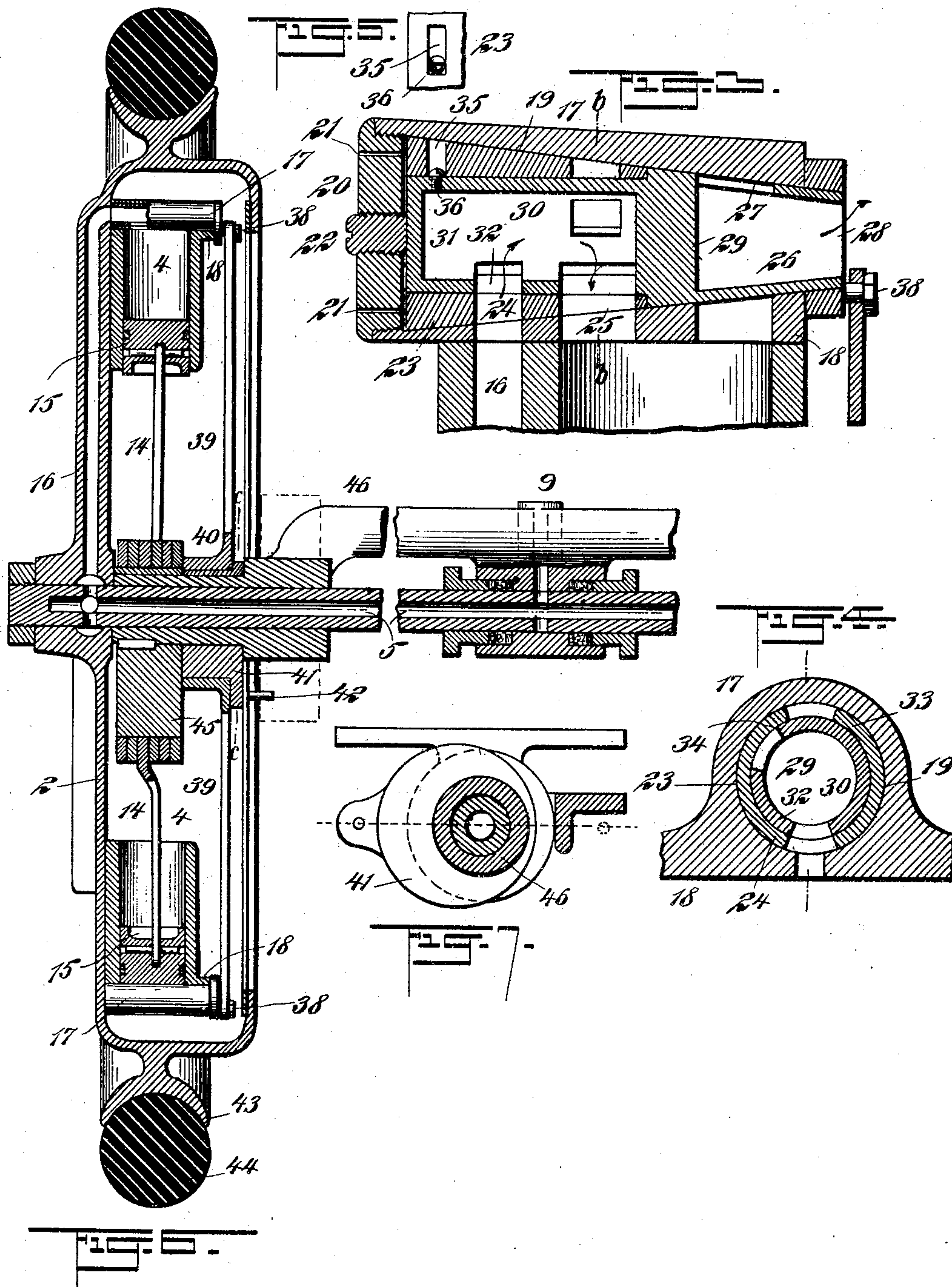
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

CHARLES F. FOGG, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO
CHARLES L. ROWLAND, OF NEW YORK, N. Y.

FLUID-MOTOR.

SPECIFICATION forming part of Letters Patent No. 771,004, dated September 27, 1904.

Application filed August 9, 1902. Serial No. 119,005. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. FOGG, a citizen of the United States, residing in the city, county, and State of New York, have invented
5 new and useful Improvements in Fluid-Motors, of which the following is a specification.

My invention relates especially to the construction and arrangement of motors driven by steam, gas, compressed air, &c., and has
10 for its object the provision of a fluid-motor very simple in construction and effective in operation.

To attain the desired end, my invention consists, essentially, in a fluid-motor in which is
15 comprised a plurality of cylinders assembled together and arranged to rotate about a common center, pistons within said cylinders, to which are pivoted rods extending from a fixed crank-pin, a valve carried by each cylinder, a
20 motor-fluid-supply passage communicating with each valve, and a common means for controlling the action of the valves; and my invention also involves certain other novel and
25 useful combinations or arrangements of parts and peculiarities of construction and operation, all of which will be hereinafter first fully described and then pointed out in the claims.

In the drawings, Figure 1 is a side elevation and partial vertical section of my improved
30 motor. Fig. 2 is an axial sectional view thereof at line *a a* of Fig. 1. Fig. 3 is an enlarged axial sectional view of one of the valves. Fig. 4 is a cross-sectional view at line *b b* of Fig. 3. Fig. 5 is a detail of the valve-shells.
35 Fig. 6 is an axial sectional view of my motor as applied to the wheel of a motor-vehicle. Fig. 7 is a cross-sectional view at line *c c* of Fig. 6.

Like numerals of reference wherever they
40 occur indicate corresponding parts in all the figures.

1 is the base of the motor.

2 is the shell or casing, provided with an outlet-opening 3 for the escape of the motor
45 fluid.

4 represents cylinders connected together or cast with a common frame which is keyed to a hollow shaft 5. This shaft is journaled in supports 6 and 7.

8 is a stuffing-box in the support 7.

9 is a motor-fluid-supply pipe fixed in the support 7.

10 is a driving-pulley for taking motion from the motor.

I have illustrated my motor as being provided with eight cylinders; but it is obvious that a greater or less number may be employed without departing from the spirit of my invention.

Mounted in a support 11 is a fixed crank 12.
60 13 is a sleeve upon said crank.

14 represents piston-rods, which engage with the crank 12 and with pistons 15 in the cylinders 4.

16 represents motor-fluid passages or conduits which lead from the shaft 5 to a valve-casing 17, secured to or formed with a cylinder-head 18. The construction of the valves will be best understood by reference to Figs.
65 3, 4, and 5 of the drawings.

19 is a tapering perforation extending through the casing 18. 20 is a head screwed into the larger diameter of this perforation and provided with one or more small perforations 21.
70

22 is an adjusting-screw passing through the head 20.

23 is a tapering valve-shell fitting into the larger part of the perforation in the valve-casing. This shell is provided with ports 24,
80 33, and 25. 26 is a second valve-shell fitting into the smaller part of the tapering perforation 19, being provided with ports 27 and 28.

29 is a transverse partition. 30 is an extension therefrom, which passes through the
85 shell 23, the end of the extension being closed, as at 31.

32 and 34 are the ports in the extension 30.

35 is a slot passing through the shell 23, and 36 is a screw which projects into said slot from
90 the extension 30.

37 is a narrow chamber between the head 20 and end 31 of the extension 30.

Secured to the outer extremity of the shells 26 are cranks 38, connected to a spider or
95 frame 39, the arms whereof project from a ring 40, encircling an adjustable eccentric 41, provided with a manipulating-arm 42.

The operation of my motor is as follows: Fluid being supplied thereto, the valve of one of the cylinders, as A, being in the position indicated in Fig. 3 of the drawings, such fluid will pass as indicated by the arrows in said figure, starting the first piston and communicating rotation in the direction indicated by the arrow in Fig. 1. This operation will be continued until the fluid is cut off by the rotation of the valve-shells, and when the reverse position of the piston in the first cylinder is reached at the end of the stroke the valve-shells have so revolved as to open the outlet-ports into the space between the cylinders and the inclosing casing. In order to reverse the direction of rotation, the eccentric 41 is turned so as to close the ports 24 and 32 by causing them to fail to register and at the same time opening the ports 33 and 34 by causing them to register. The continuance of the movement of the reversing mechanism carries the valve-shells around until the ports are on the opposite side of the inlet-port to the cylinder, (illustrated in Fig. 4 of the drawings,) thus admitting motor fluid to the cylinder B, reversing the direction of rotation of the motor. As the cylinders revolve around one center and the valve-controlling frame or spider upon another it will be seen that with each revolution of the series of cylinders each valve rotates once upon its own axis, opening and closing all of the ports. As shown, the cut-off is fixed at one-quarter; but, if desired, it may be made at one-half or more by increasing the size of the valve-ports, thus admitting fluid to two or more cylinders at the same time. By permitting the exhaust fluid, such as steam, to escape into the space inclosing the cylinders the entire moving mechanism will be kept at a high temperature, all cold air being excluded from contact therewith, preventing condensation and obtaining very high efficiency of the motor fluid.

In order to prevent binding of the tapering shells in the valve-casing by reason of the steam escaping around and filling the space between the shells and the head 20, I have provided the perforations 21 in said head to permit such escaping steam to pass to the exhaust-chamber, the screw 22 providing nice and effective means of obtaining the requisite adjustment without undue friction.

In the application of my motor to a vehicle I surround the cylinders with a casing which forms the body of the vehicle-wheel. 43 is the rim whereon a tire 44 is placed in the usual manner. Instead of the crank-pin 12 I use an eccentric 45, fixed upon an axle 46; but in other respects the construction and operation is the same as hereinabove described.

Having now fully described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. A fluid-motor in which is comprised a

plurality of cylinders assembled together and carried by a hollow shaft; pistons within said cylinders to which are pivoted rods engaging with a fixed crank-pin; a rotatable valve at the outer extremity of each cylinder; a motor-fluid-supply passage communicating with each valve and with the hollow shaft, and common means for controlling the action of the valves.

2. In a motor of the character herein specified, the combination with a plurality of cylinders assembled together and arranged to rotate about a common center, each cylinder being provided with a valve, of a plate or spider connected to said valves and arranged to rotate upon a center eccentric to the center of rotation of the cylinders.

3. In a motor of the character herein specified, the combination with a plurality of cylinders assembled together and arranged to rotate about a common center, said cylinders being provided with valves, of a plate or spider connected to said valves and arranged to rotate upon a center eccentric to the center of rotation of the cylinders, and means for changing the center of rotation of the plate or spider.

4. A fluid-motor in which is comprised a plurality of cylinders assembled together and arranged to rotate about a common center; a hollow shaft to which said cylinders are connected; supports in which the hollow shaft is journaled; a driving-pulley mounted upon the hollow shaft; motor-fluid passages leading from the hollow shaft to valves carried by the cylinders; a fixed crank-pin to which are connected piston-rods passing to pistons within the cylinders; common means for simultaneously and reversibly controlling the action of the valves, and a jacket surrounding the cylinders.

5. A motor, in which is comprised a plurality of cylinders assembled together and arranged to rotate about a common center, each cylinder carrying and including a valve-casing having a tapering opening therethrough, provided with inlet and outlet ports, a tapering shell having inlet and outlet ports rotatably held in the casing in the larger portion of the tapering perforation, a second tapering shell provided with inlet and outlet ports, a transverse partition, and an extension beyond the partition passing through the first-mentioned shell, said extension being provided with inlet and outlet ports, in combination with a plate or spider connected to said valves, and arranged to rotate upon a center eccentric to the center of rotation of the cylinders, substantially as shown and described.

Signed by me at New York this 3d day of July, 1902.

CHARLES F. FOGG.

Witnesses:

A. M. PIERCE,
L. DU BRUL.