No. 848,417. PATENTED MAR. 26, 1907.

W. A. WARMAN.

TURBINE MOTOR.

APPLICATION FILED DEC. 2, 1905.

Fig. 1.

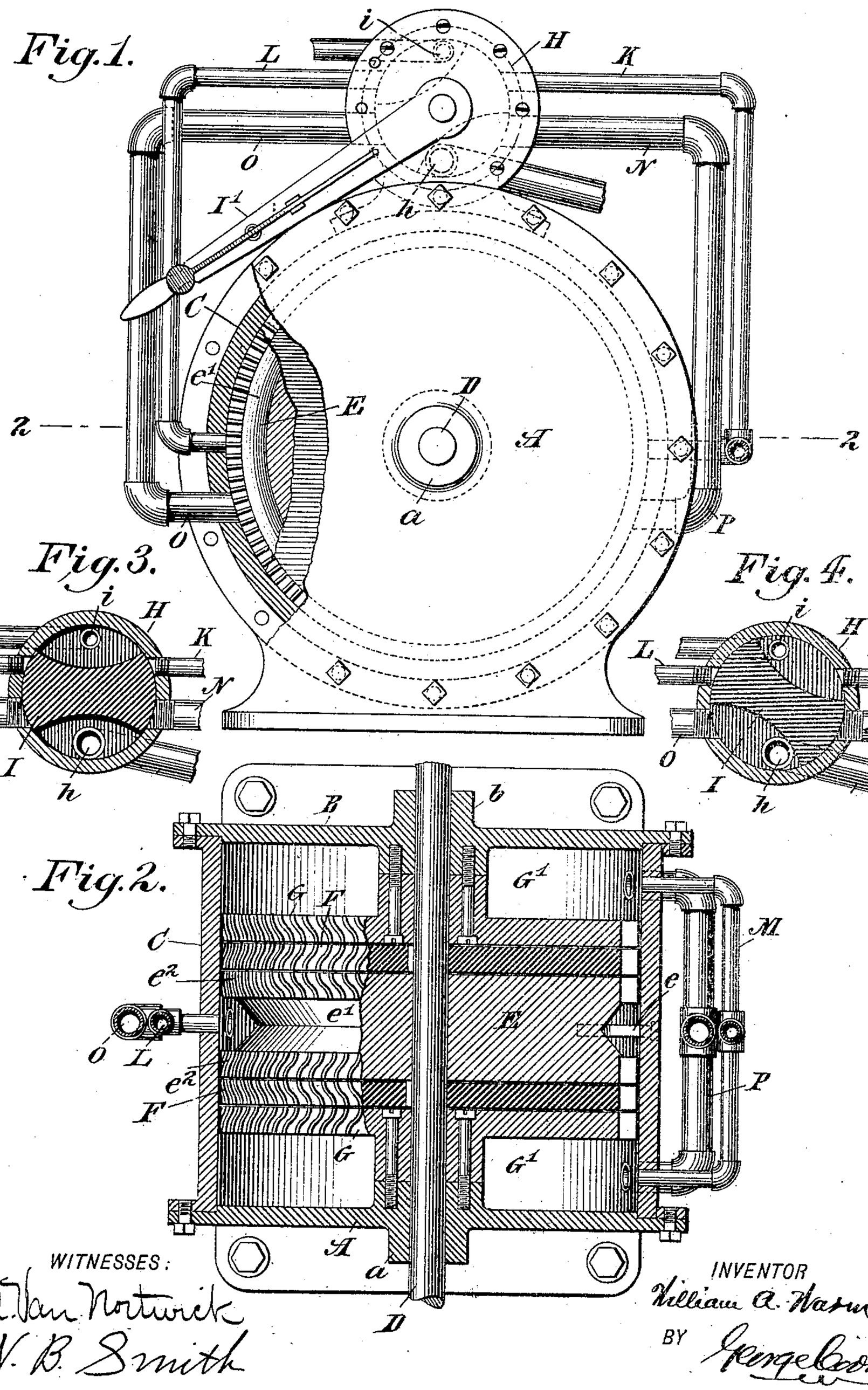

Fig. 3.

Fig. 4.

Fig. 2.

WITNESSES:

M. Van Nortwick

N. B. Smith

INVENTOR

William A. Warman

BY Georgebook

ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM A. WARMAN, OF NEW YORK, N. Y., ASSIGNOR TO KELLER MECHANICAL ENGRAVING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

TURBINE-MOTOR.

No. 848,417. Specification of Letters Patent. Patented March 26, 1907.

Application filed December 2, 1905. Serial No. 289,942.

To all whom it may concern:

Be it known that I, WILLIAM A. WARMAN, a citizen of the United States, and a resident of New York, borough of Manhattan, in the county of New York and State of New York, have made and invented certain new and useful Improvements in Turbine-Motors, of which the following is a specification.

My invention relates to an improvement in turbine-motors adapted for use in connection with water, gas, steam, or other elastic fluid, the object being to provide a motor so constructed and arranged that it will be evenly and perfectly balanced, and thereby relieve the shaft of any end thrust.

A further object of my invention is to so construct the motor that it may be easily and readily reversed, and with these and other ends in view consists in certain novel features of construction and combinations of parts, as will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in end elevation of my improved motor, a part or portion thereof being broken away. Fig. 2 is a sectional view taken on the line 2 2 of Fig. 1. Figs. 3 and 4 are sectional views of the valve, showing the same in its several different positions.

My improved motor comprises a motor proper and a suitable casing, the latter being constructed in any desired way, that illustrated in the drawings consisting of the end plates A B, bolted or otherwise secured to the central cylindrical portion C, said end plates A B being provided with the bearings *a b*, in which is journaled a shaft D. On this shaft D is loosely mounted a wheel E, prevented from rotation by means of the screw or bolt *e* passing through the casing and into said wheel, as illustrated in Fig. 2, and which wheel is provided at about the center of its rim or periphery with a groove or recess *e'*, that illustrated in the drawings being V-shaped in cross-section. On the rim of this wheel E and to each side of the recess are formed the curved vanes e^2, between which the elastic fluid passes on its way into or out of the recess *e'*, the diameter of said wheel F being such as to nicely fit within the cylindrical portion C of the casing. On each side of the wheel E and tightly keyed or otherwise secured to the shaft D are the wheels or disks F, the rims or peripheries of which are also provided with curved vanes, the diameter of said disks or wheels being such as to allow them to rotate within the central portion C of the casing. On each side of the rotating disks F are located the disks G, also provided with curved vanes on their rims or peripheries, said disks G being secured against movement by bolting or fastening them to the end plates B or, if desired, to the central portion C of the casing and together with the end plates A B form chambers G'.

To the casing of the motor is secured a valve-chamber H, containing the valve I, and in which valve-chamber is an exhaust-port *h* and an inlet-port *i*, the latter being connected with some suitable reservoir of steam, water, gas, or other supply of elastic fluid, by means of which the motor is to be operated.

From the valve-chamber H leads the inlet-pipes K L, the former being connected to the pipe M, the ends of which latter lead into the chambers G' between the end plates A B and disks G, the pipe L leading through the casing C into the recess *e'*, formed in the wheel E.

From the valve-chamber H lead the exhaust-pipes N O, the former—that is, the pipe N—being connected with the pipe P, the ends of which lead into the chambers G', the pipe O leading into the chamber or recess *e'*, formed in the wheel E.

To the valve proper, I, is secured the lever or handle I', by which said valve proper, I, may be moved, as shown in Fig. 4, whereby the gas or elastic fluid is allowed to flow into the valve-chamber through the inlet-port *i'*, whence it will flow through the inlet-pipes K M and into the chambers G'. The elastic fluid will then flow through the vanes on the stationary disks G and by impact on the vanes on the wheel F and reaction on the vanes on the wheel E will cause the rotation of said disks F in a certain direction, the elastic fluid flowing through said vanes and into the recess or chamber *e'*, out of which it will pass through the exhaust-pipe O and out through the outlet *h* in the valve-chamber H. If, however, the handle or lever I' be so turned as to bring the valve I into the posi-

tion as indicated in Fig. 3, both the inlet and exhaust pipes will be closed and the motor brought to rest. If the handle or lever be still further turned, so that the valve proper is brought into the position as illustrated in dotted lines in Fig. 1, the gas or elastic fluid will flow through the pipe L into the chamber or recess e', and passing through the vanes formed on the stationary wheel E, rotating wheels F, and stationary wheels G the said rotating wheels will be turned or caused to rotate in the opposite direction, the elastic fluid then passing into the chambers G', out through the exhaust-pipe P, pipe N, and out through the port h in the valve-chamber I. In other words, when the elastic fluid is admitted into the casing on the one side of the rotating disks or wheels the latter will be caused to turn in one direction and when admitted upon the other side of said rotating wheels the latter will be caused to rotate in the opposite direction, the motor being balanced and all end thrust upon the shaft D avoided by locating the rotating disks on both sides of the center thereof and equalizing the pressure of the elastic fluid on the rotating disks located at each end of the motor.

It will of course be understood that the arrangement of inlet and exhaust pipes may be changed, as well as the construction and arrangement of the valve, without in any way departing from the spirit and scope of my invention, it simply being necessary to provide such pipe or pipes to allow of the inlet and outlet of the elastic fluid on opposite sides of the rotating disk, and that a stationary disk be located upon each side of said rotating disk in order that the vanes on the several disks may be so formed and arranged as to cause a change in direction of travel of said rotating disk accordingly as said elastic fluid is admitted and exhausted upon one side or the other of said rotating disks.

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

1. A turbine-motor comprising a casing, a pair of parallel, spaced, stationary disks therein, and provided with vanes, the outermost of said disks being spaced from the ends of the casing to form chambers, a rotatable disk between the pairs of stationary disks and provided with vanes, and means for supplying an elastic fluid to said vanes from either side of the stationary disks whereby the direction of travel of the rotatable disk may be changed.

2. A turbine-motor comprising a suitable casing, a rotating disk located therein and having curved vanes on its periphery and means, including stationary vanes, located on either side of said rotating disk for the admission of an elastic fluid to the latter, and whereby the direction of travel of said rotating disk may be governed, said stationary disks having curved vanes on their peripheries communicating with the vanes of the rotatable disk, substantially as described.

3. A turbine-motor comprising a suitable casing, a stationary disk therein, said disk having a circumferential groove or channel with peripheral vanes at the sides thereof, a stationary disk between each side of the first-named disk and the corresponding end of the casing, and spaced from said first-named disk, rotatable disks in the interspaces between the stationary disks, each of said disks provided with vanes, and means for directing an elastic fluid in either direction through said vanes, whereby the direction of travel of the rotatable disk may be governed, substantially as described.

4. A turbine-motor comprising a suitable casing, a shaft journaled therein, a rotating disk secured to said shaft and having curved vanes around its peripheries, a stationary disk located on each side of said rotating disk and having curved vanes around its periphery, and means provided for the admission and exhaust of an elastic fluid on either side of said rotating disk, whereby the direction of travel of the latter may be changed, substantially as described.

5. A turbine-motor comprising a suitable casing, a rotating shaft journaled therein, a stationary wheel provided with a chamber and having vanes on each side of the latter, a rotating disk provided with vanes secured on each side of said stationary wheel and fastened to said shaft, and stationary disks provided with vanes located on the outside of said rotating disks, an inlet and outlet pipes for admitting and exhausting an elastic fluid on either side of said rotating disks, whereby the direction of travel of the latter may be changed, substantially as described.

Signed at New York, borough of Manhattan, in the county of New York and State of New York, this 27th day of November, A. D. 1905.

WILLIAM A. WARMAN.

Witnesses:
M. VAN NORTWICK,
N. B. SMITH.