W. H. FISHER.

ROTARY MOTOR.

APPLICATION FILED MAR. 2, 1920.

1,395,267. Patented Nov. 1, 1921.

Fig. 1.

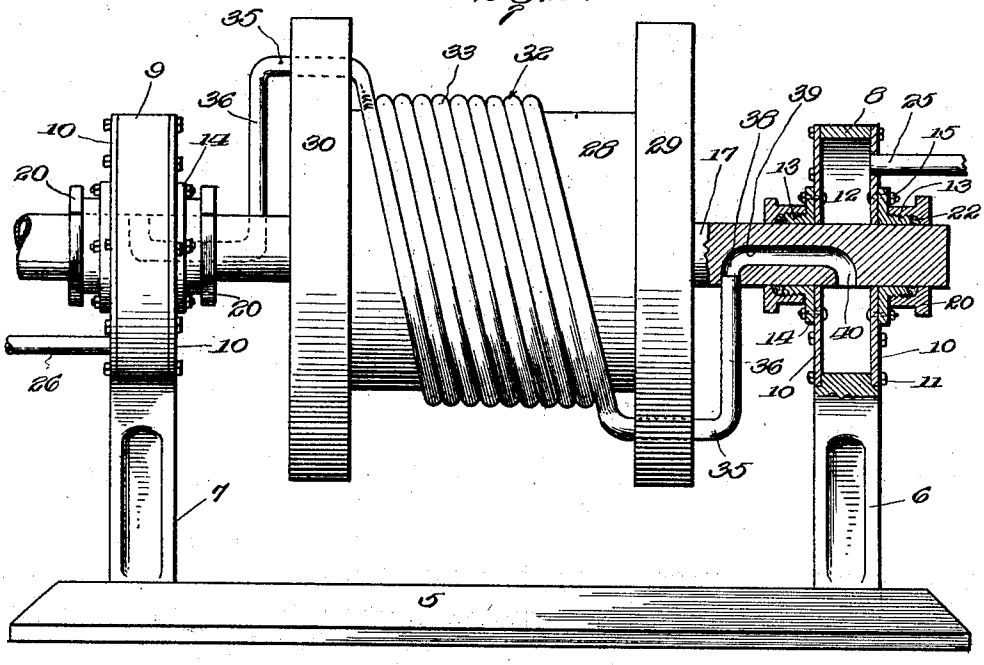


Fig. 2.

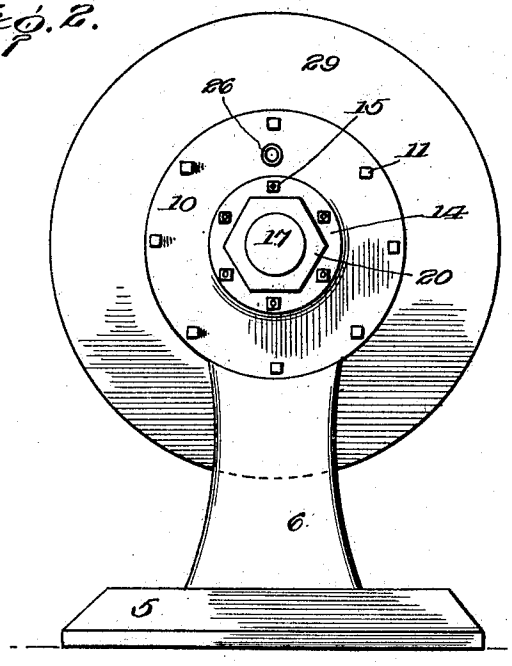


Fig. 3.

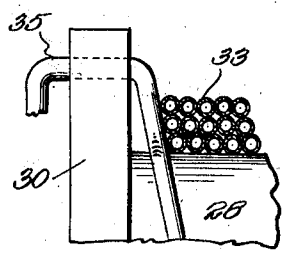
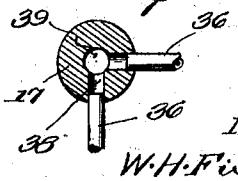


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ROTARY MOTOR.

1,395,267. Specification of Letters Patent. Patented Nov. 1, 1921.

Application filed March 2, 1920. Serial No. 362,834.

To all whom it may concern:

Be it known that I, WILLIAM H. FISHER, a citizen of the United States, residing at Minocqua, in the county of Oneida and State of Wisconsin, have invented certain new and useful Improvements in Rotary Motors, of which the following is a specification.

This invention relates to improvements in rotary motors having novel means for utilizing fluid under pressure as a source of power.

An important object of this invention is to provide a rotary motor having a drum provided with a coil through which is adapted to pass fluid under pressure so that the action of the fluid in passing through the individual convolutions of the coil will result in the rotation of the drum.

A further object of this invention is to provide a rotary motor having a drum above which is arranged a coil having novel means whereby fluid under pressure may be passed through the coil in either direction whereby the drum of the motor may be rotated in either a clockwise or anti-clockwise direction.

A further object of the invention is to provide a rotary motor of the class described which is efficient, simple to operate and desirable in use.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawing forming a part of this application,

Figure 1 is a side elevation of the rotary motor embodying the invention, parts thereof being shown in section.

Fig. 2 is an end elevation of the same.

Fig. 3 is a detail elevation of the drum of the motor having a slightly modified form of coil.

Fig. 4 is a detail section through the shaft indicating a modification.

In the drawing wherein for the purpose of illustration are shown several preferred embodiments of the invention, the numeral 5 designates a flat base of elongated formation upon which the improved motor is mounted. The end portions of the horizontal base are provided with standards 6 and 7 which support the rotor of the motor. As illustrated in Fig. 1, an annulus 8 is formed integral with the upper portion of the standard 6 and is in longitudinal alinement with the annulus 9 of the standard 7. A pair of cover plates 10 are arranged in spaced parallel relation on opposite sides of each annulus and are secured to the same by an annular series of fastening bolts 11 and thereby form an annular fluid chest 12 within each annulus.

As will be observed with reference to Fig. 1, each of the cover plates is provided with a bearing 13 having an annular flange 14 secured to the cover plate by bolts or other suitable fastening means 15. A shaft 17 has its end portions rotatably extended through the pairs of alined bearings 13 and the chest 12 and may have a gear, a pulley wheel or other suitable power transmitting means mounted thereon so as to convey the power generated by the motor to a suitable point of use. A packing nut 20 is threaded onto the outer portion of each bearing 13 and is adapted to be rotated for pressing packing 22 into fluid-tight engagement with the adjacent portions of the shaft. The inner end of each bearing and the adjacent portion of each packing nut 20 are beveled so that as the nut is tightened the annular packing element will be brought into liquid-tight engagement with the shaft. In this manner each of the chests 12 is rendered liquid tight to a high degree.

A motor constructed in accordance with this invention is adapted to use steam or compressed air as a source of power and the steam or compressed air, as the case may be, may be supplied to either of the annular chests 12 through the medium of pipes 25 and 26. When the steam is supplied through the pipe 25 to one of the steam chests, the pipe 26 is employed to carry the steam from the motor. Likewise, when the steam or compressed air is admitted to one of the annular chests 12 by the pipe 26, the pipe 25 will be employed as an exhaust pipe.

A drum 28 is keyed or otherwise secured upon the shaft between the standards 6 and 7 and is provided at its ends with annular flanges 29 and 30. The numeral 32 designates a coil having a plurality of closely arranged convolutions 33 wound about the drum between the annular flanges 29 and 30. The tubing from which the coil is formed has its end portions arranged in L-shaped formation to form arms 35 and 36. The arms 35 of the coil are extended through the flanges 29 and 30 to secure the coil in a set position on the drum whereby the steam or compressed air in passing through

the convolutions of the coil is prevented from moving the coil with relation to the drum. The arms 36 are disposed radially with relation to the shaft and are extended into radial passages 38 in the shaft. The radial passages 38 communicate with longitudinally extending passages 39 which in turn are in communication with radial passages 40 opening into the annular chests 12. Communication is therefore established between the chests and the convolutions of the coil so that the steam may be directed through the convolutions of the coil for imparting a rotary motion to the drum.

Assuming that steam or compressed air is supplied through the pipe 25 to the associated chest 12, the steam or compressed air will be directed under pressure through the radial opening 40 at the right hand side of Fig. 1. Upon entering the said radial passage 40, the steam will be directed through the communicating passage 39 into the radial passage 38 and then through the radial arm 36 of the coil. The steam under pressure will be further directed through the arm 35 extended through the flange 39 and then through the convolutions of the coil. In passing through the convolutions of the coil a frictional engagement between the steam and the walls of the coil will take place which will result in the rotation of the motor in the direction of flow of the steam. Upon leaving the convolutions of the coil, the steam will be directed through the arm 35 carried by the flange 30 and then through the arm 36 shown in the left hand portion of Fig. 1. The steam is then directed through the chest formed within the annulus 9 and is finally passed through what is now the exhaust pipe 26.

When it is desired to reverse the motor, the steam or compressed air may be supplied through the pipe 26 and exhausted through the pipe 25 for reversing the coil.

It will be observed that in a motor constructed in accordance with this invention the fluid under pressure is not supplied to the shaft from the ends of the same but is directed radially into the passages in the shaft and it is therefore possible to eliminate objectionable friction to a high degree which adds appreciably to the efficiency of the motor.

In the form of the invention illustrated in Fig. 3, the coil is provided with a plurality of tiers so as to provide an increase in the working capacity of the motor.

With reference to Fig. 4 it will be noted that a plurality of separate coils may be arranged about the drum and connected with additional radial passages 38 in the shaft 17 so that each of the separate coils may have communication with the chests 12.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred embodiment of the same and that such minor changes in construction and arrangement of parts may be made as will remain within the spirit of the invention and the scope of what is claimed.

Having thus described the invention, what is claimed as new is:

A rotary motor including a pair of spaced standards, an annulus rigid on the upper end of each standard in the vertical plane of the standard, the annuli being in axial alinement, cover plates secured on opposite sides of said annuli thereby forming a pair of motive fluid chests, a rotary shaft extending through said chests and having radial openings within the respective chests, said shaft having a second set of radial openings without and between the chests and longitudinal bores establishing communication between the radial openings in the chests and the respectively adjacent radial openings, a drum mounted on the shaft between the standards, a coil arranged about and fixed to said drum, each end portion of said coil extending into a second named radial opening in the shaft, motive-fluid pipes each having an end opening into one of the chests, and fluid-tight bearings for the shaft mounted on the outer faces of all the cover plates.

In testimony whereof I affix my signature.

WILLIAM H. FISHER. [L. S.]