

(No Model.)

2 Sheets—Sheet 1.

C. A. PARSONS.

APPARATUS FOR LUBRICATING ROTARY MOTORS.

No. 328,711.

Patented Oct. 20, 1885.

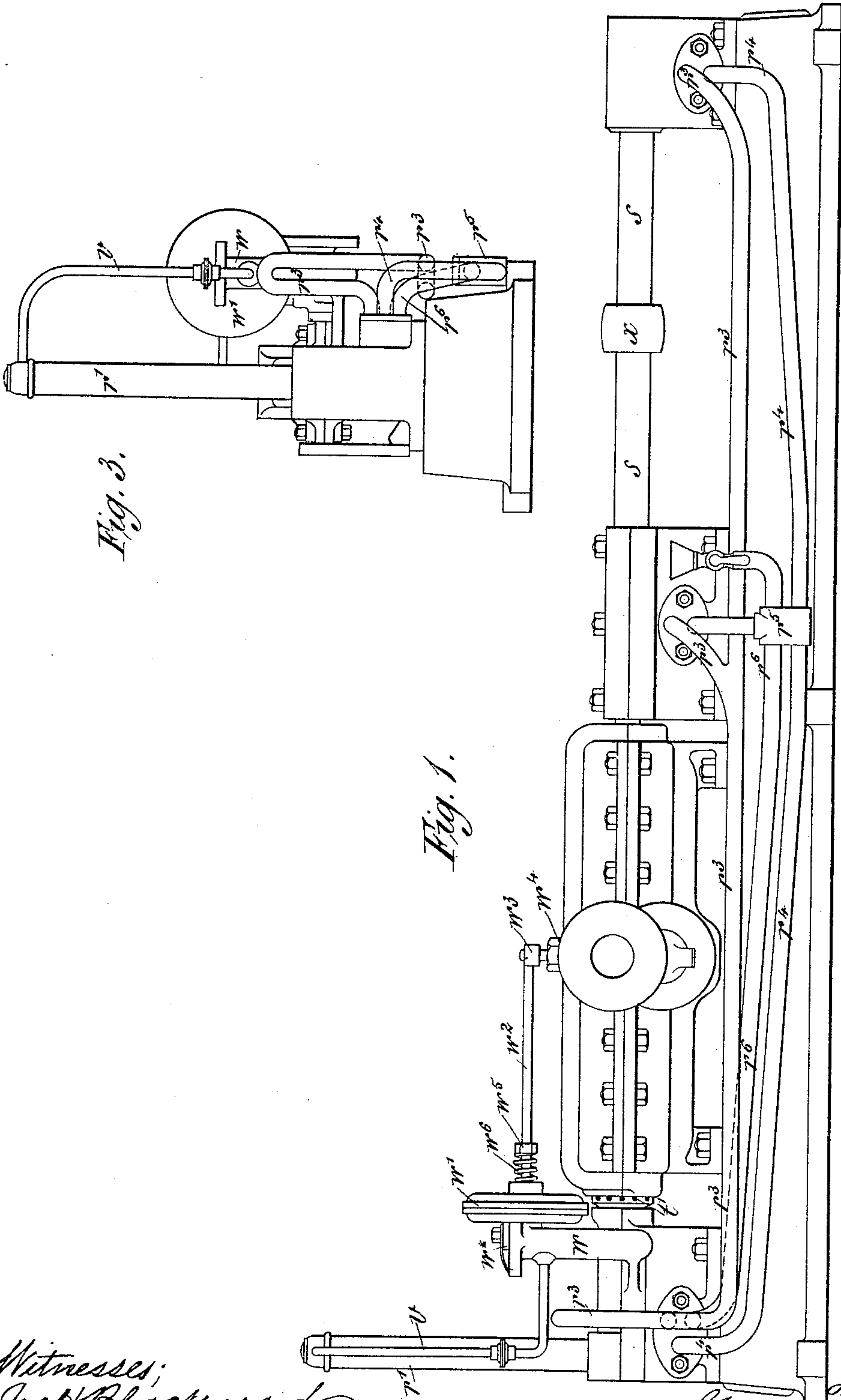


Fig. 3.

Fig. 1.

Witnesses;  
Jost H. Blackwood.  
R. G. DuBois.

Inventor,  
Charles A. Parsons  
by M. Doolittle Attorney

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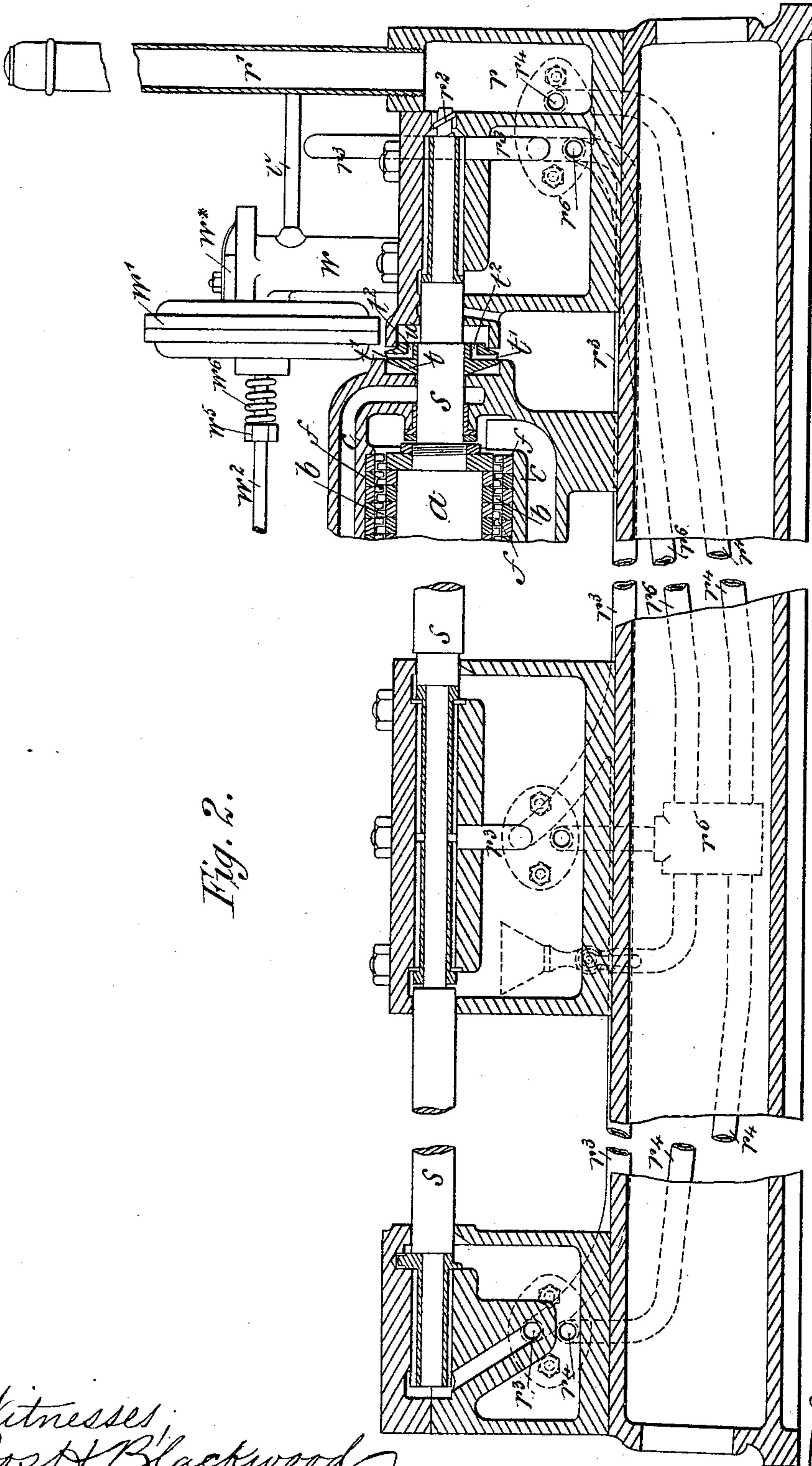


Fig. 2.

Witnesses:  
J. H. Blackwood  
R. G. DuBois

Inventor,  
Charles A. Parsons  
by W. Doolittle attorney.



# UNITED STATES PATENT OFFICE.

CHARLES ALGERNON PARSONS, OF GATESHEAD-ON-TYNE, COUNTY OF DURHAM, ENGLAND.

## APPARATUS FOR LUBRICATING ROTARY MOTORS.

SPECIFICATION forming part of Letters Patent No. 328,711, dated October 20, 1885.

Application filed June 25, 1885. Serial No. 169,776. (No model.) Patented in England April 23, 1884, No. 6,735; in France November 6, 1884, No. 165,199; in Belgium November 6, 1884, No. 66,794; in Italy December 31, 1884, XXXIV, 484, and in Canada July 21, 1885, No. 22,122.

*To all whom it may concern:*

Be it known that I, CHARLES ALGERNON PARSONS, a subject of the Queen of Great Britain and Ireland, residing at Gateshead-on-Tyne, in the county of Durham, Kingdom of Great Britain and Ireland, have invented new and useful Improvements in Apparatus for Lubricating Rotary Motors, (for which I have obtained Letters Patent in Great Britain, No. 6,735, dated April 23, 1884; France, No. 165,199, November 6, 1884; Belgium, No. 66,794, November 6, 1884, and Italy, Reg. Att., Vol. XXXIV, No. 484, December 31, 1884,) of which the following is a specification.

My invention has reference to the lubricating of the bearings of motors of the turbine type—that is to say, motors in which the actuating-fluid operates between fixed and moving vanes or blades—and this application is a division of my application No. 147,964, filed November 14, 1884, which embraced the present invention. According to this invention, the lubrication is effected by forcing lubricant to the parts to be lubricated, and for this purpose a centrifugal pump is employed, which it is convenient to make of the type in which the fan or revolving part is constructed like a screw-propeller mounted on the end of a shaft. From this pump the oil is taken to the bearings as required with a constant circulation. The oil can also be used as a carrier of heat to reduce the temperature of those parts liable to grow hot. If the pump be of a kind that will not lift, I use a suction-fan mounted on the motor-shaft to raise the oil on the suction side. This fan may also be employed to govern the supply of actuating-fluid by causing variations of pressure, according to the speed at which it is driven, on a diaphragm or piston in connection with a throttle or supply valve. The speed of the motor may be regulated by an adjustable spring acting against this varying pressure, or by the admission of air through a graduated regulating-tap into the exhausting side of the fan.

In order that others skilled in the art to which my invention pertains may be enabled to make and use the same, I proceed to more

fully describe it by reference to the annexed drawings, whereof—

Figure 1 is a side elevation of a motor provided with means according to this invention for lubricating the same. Fig. 2 is a longitudinal section of parts of said motor. Fig. 3 is an end view of the left-hand end of Fig. 1.

The general construction of the motor shown is the same as fully described in the specification of my said application, No. 147,964, and is not claimed as forming part of the invention the subject-matter of my present application for Letters Patent; but for the sake of clearness I deem it convenient to state here that *a* is a cylindrical enlargement on shaft *s*.

*b b* are blades on *a*, to rotate within the casing *c*.

*f f* are fixed blades within the casing *c*.  
*x* is the driving-pulley on shaft *s*.

The means adopted according to my present invention for lubricating the bearings are shown as the same are arranged when it is desired to utilize the suction-fan, also for regulating the speed of the motor.

*r* is a chamber to contain lubricant.

*r'* is a stand-pipe in communication with this chamber.

*r''* is a small screw-pump fixed on the motor-shaft *s*.

Figs. 1 and 2 show clearly the arrangement of oil-pipes.

*r'''* is a delivery-pipe with branches and leads to all the bearings, except the one lubricated directly by the screw-pump.

*r'''' r''''* are the return-pipes, which lead directly to a central junction-piece, *r''''*, whence the lubricant is conveyed to the chamber *r*, Fig. 2, by *r''''*, and again drawn by the pump. I prefer to place the junction-piece *r''''* in the center, in order that the screw-pump may draw in all positions of the motor in case of its being used on board ship. *t* is the suction-fan. In the example illustrated it serves the double purpose of exhausting air from the stand-pipe *r'*, and regulating the speed of the motor by suitable arrangements connected with it, which I will explain presently. The suction-fan *t*, which revolves with the motor-shaft *s*, is



formed as a solid body with a number of radial holes,  $t'$ , connected by transverse holes  $t^2$  to a cavity,  $u$ , which is in direct communication by a small pipe,  $v$ , Fig. 1, with the top of the stand-pipe  $r'$ . The centrifugal force acting on the air in the radial holes causes the partial vacuum or suction necessary to raise the lubricant in the stand-pipe  $r'$ , so that the small screw-pump  $r^2$  can force the lubricant into the bearing, and cause it to circulate by means of the pipes described to the other parts that require lubrication and back again to the chamber or reservoir  $r$  connected with the stand-pipe  $r'$ .

5 The arrangement for regulating the admission of actuating-fluid to the motor by means of the fan  $t$  is as follows: The fan is in direct communication with a diaphragm or piston through a cored hole passing through the up-  
 10 right portion of the bearing-casting marked  $w$ , Figs. 1 and 2, from the cavity  $u$  to a casing,  $w'$ . This diaphragm or piston is connected by a rod,  $w^2$ , and arm  $w^3$  to the spindle of the throttle-valve  $w^4$ . Between the casing  $w'$  and  
 15 a collar or nut,  $w^5$ , on the rod  $w^2$  is a spiral spring,  $w^6$ . The fan by its rotation creates a partial vacuum at one side of the diaphragm or piston, which produces a sucking action counteracted by the spiral spring. Should,  
 20 however, the speed of the motor exceed that for which the spring is set, the diaphragm or piston will be moved in opposition to the spring, and by operating the throttle-valve will regulate the admission of steam accord-  
 25 ingly.

$w^*$  is a graduated tap through which more or less air can be admitted at will to regulate the pressure on the pump side of the diaphragm or piston, so that the action of the  
 30 diaphragm or piston can be in this way modified and the speed of the motor controlled.

What I claim is—

1. Apparatus for lubricating the bearings of a rotary motor, (or pump,) comprising a cen-  
 35 trifugal or rotary pump, a suction passage or pipe, and passages or pipes to convey lubricant to the parts to be lubricated, substantially as described.

2. Apparatus for lubricating the bearings of  
 40 a rotary motor, (or pump,) comprising a centrifugal pump, a suction passage or pipe, a stand-pipe, a suction-fan, chamber for lubricant, a delivery passage or pipe from said

pump with branches or leads to the bearings or parts to be lubricated, return-pipes with  
 45 junction-piece  $r^5$ , and pipe  $r^6$ , substantially as described.

3. Apparatus for lubricating the bearings of a rotary motor, (or pump,) comprising a centrifugal pump,  $r^2$ , a suction pipe or passage,  $v$ , a stand-pipe,  $r'$ , and a suction-fan,  $t$ , said suction-fan being connected with the throttle-valve that regulates the speed of the motor, as  
 50 and for the purpose specified.

4. The combination, with a motor (or pump) 65 comprising a hollow cylinder or cylinders furnished internally with blades, a moving cylinder or cylinders carrying blades on its or their exterior, and a shaft whereon said moving cylinder or cylinders is or are mounted to  
 70 rotate within said hollow cylinder or cylinders, of a centrifugal or screw pump mounted directly upon the motor-shaft for forcing lubricant or cooling-fluid to the parts to be lubricated or cooled, substantially as described. 75

5. The combination, with a motor (or pump) comprising a hollow cylinder or cylinders furnished internally with blades, a moving cylinder or cylinders carrying blades on its or their exterior, and a shaft whereon said moving cyl-  
 80 inder or cylinders is or are mounted to rotate within said hollow cylinder or cylinders, of a centrifugal or screw pump to circulate lubricant or cooling-fluid, and a suction-fan to raise the level of such lubricant or cooling-fluid in the  
 85 stand or suction pipe or chamber and enable the centrifugal or screw pump to start and to keep in action, substantially as described.

6. The combination, with a motor (or pump) comprising cylinders  $a$ , with blades  $b$   $b'$   $b^2$ , a  
 90 casing,  $c$ , with blades  $f$   $f'$   $f^2$  fixed within said casing, and a shaft,  $s$ , whereon said cylinders  $a$  are formed or mounted, of a centrifugal pump,  $r^2$ , mounted on said shaft  $s$ , a suction-fan,  $t$ , a suction passage or pipe,  $v$ , a stand-  
 95 pipe,  $r'$ , and chamber  $r$ , a delivery-pipe,  $r^3$ , with branches or leads to the bearings to be lubricated, return-pipes  $r^4$ , junction-piece  $r^5$ , and pipe  $r^6$ , substantially as described and illustrated.

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Witnesses:

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