H. J. FEYZES.

PUMP.

APPLICATION FILED APR. 7, 1915.

1,265,070.

Patented May 7, 1918.

2 SHEETS—SHEET 1.

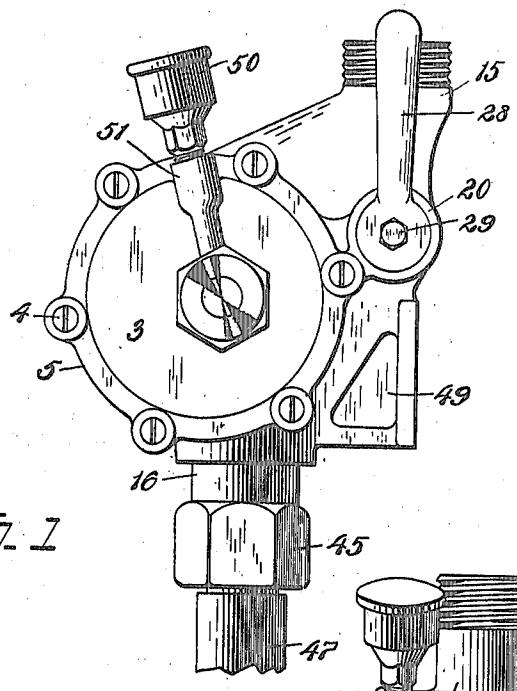


Fig. 1

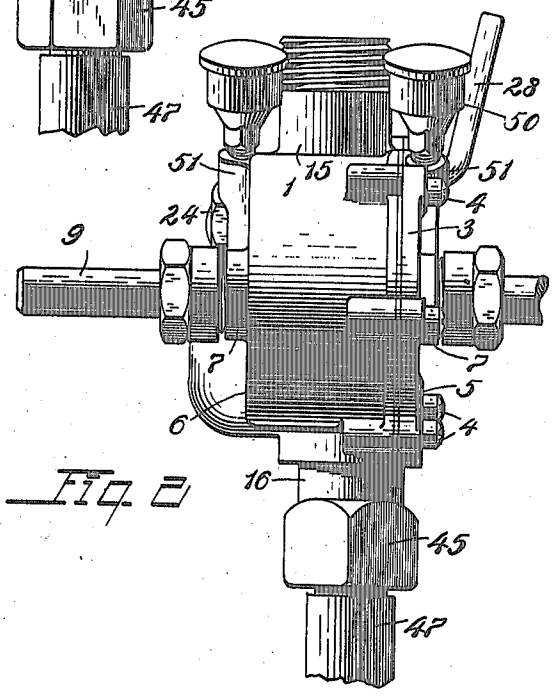


Fig. 2

Witnesses

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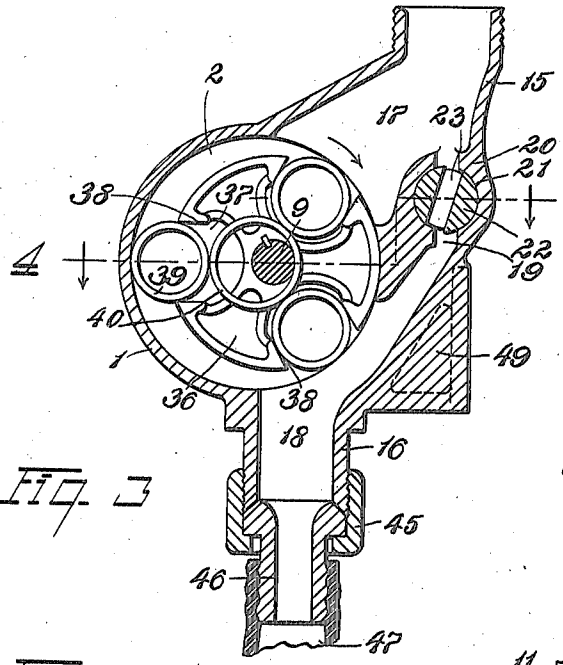


Fig. 3

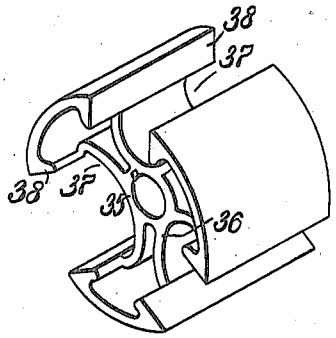


Fig. 5

Fig. 6

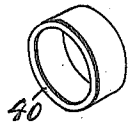
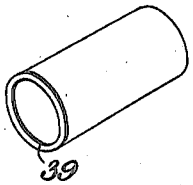


Fig. 7



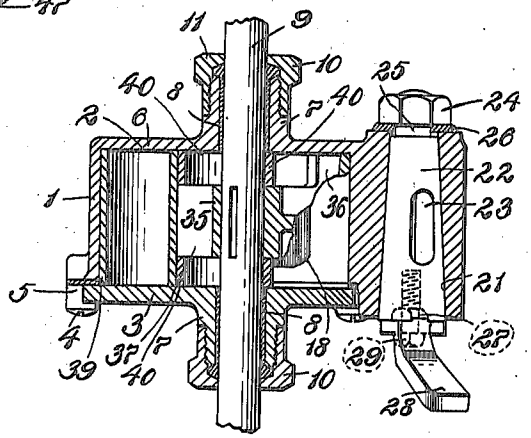


Fig. 4

Witnesses
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UNITED STATES PATENT OFFICE.

HENRY J. FEYZES, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO THE PETERS MACHINE & MFG. COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

PUMP.

1,265,070. Specification of Letters Patent. Patented May 7, 1918.

Application filed April 7, 1915. Serial No. 19,624.

To all whom it may concern:

Be it known that I, HENRY J. FEYZES, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to improvements in rotary pumps; and it has for its object to provide a pump of the aforesaid character that is extremely efficient, and that is of general utility; and, in the particular embodiment of the invention shown and described herein that is especially suitable for use with internal combustion engines for circulating cooling fluids through the jackets thereof. In this connection it may be stated that a further object of the invention is to provide a rotary pump, the capacity or output of which may be very easily controlled and changed at will, without altering the speed of the pump.

Further objects of the invention are to provide a pump of the above nature that operates very easily and quietly; that is extremely durable; that is constructed in such manner as to afford easy access to the operating parts thereof; to design the pump so that such parts may be easily removed and replaced; and to utilize, for the wearing parts of the pump standard supplies that can be easily and cheaply secured; to provide a rotary pump that can be driven with equal efficiency in either direction; and to provide a pump that is adapted to be connected with inlet and outlet pipes of various capacities.

The above, and further objects which will become apparent as this description proceeds, are attained in a pump constructed in accordance with the accompanying drawings, which form a part of this specification, and while I will proceed to describe the embodiment of the invention illustrated therein, in detail, I wish to be understood as not limiting myself to the structural details thereof, further than is required by the terms of the annexed claims and is rendered necessary by the state of the prior art. In the drawings, Figure 1 is a side elevation of my improved pump; Fig. 2 is an elevation taken from the left of Fig. 1; Fig. 3 is a substantially central vertical section through the pump in a plane parallel to Fig. 1; Fig. 4 is a horizontal section through the pump, the view being taken substantially on the line 4—4 of Fig. 3; and Figs. 5, 6 and 7 are perspective views of the rotor, one of the pistons and one of the retaining rings, respectively.

Taking up a detail description of the invention by the use of reference characters, 1 represents a casing that has a substantially cylindrical chamber 2, the open side of which is adapted to be closed by a cover 3, that is held to the casing by screws 4, a gasket 5, of suitable packing material, being interposed between the cover and the casing member. Extending outward from the cover 3, and from the circular wall 6 of the casing, and arranged in axial alinement with each other, are hollow bosses 7, the bores whereof contain suitable bushings 8 within which a shaft 9 is journaled. The bosses 7 are threaded for the application of gland nuts 10 between the respective ends of which and the adjacent ends of the bosses 7, is adapted to be compressed packing material 11, to effectually seal the shaft bearings against leakage.

The casing 1 is provided with an upper and a lower extension 15 and 16, respectively, through the respective ones of which extend the ports 17 and 18. The former port communicates with the chamber 2, to one side of its vertical axis and above its horizontal axis, while the latter port communicates with said chamber on the same side of its vertical axis and below the horizontal axis thereof. These ports may be of the same width, and the width of port 18 may be ascertained from Fig. 4. Direct communication between ports 17 and 18 may be established through a by-pass 19 that is formed in an enlargement 20 on the side of the casing 1. The by-pass is intersected by a transverse, tapered bore 21 which contains a correspondingly shaped valve body 22, having a through port 23. The valve body is retained within its bore by a nut 24 that is threaded upon an extension 25 of the reduced end of the valve body, and a washer 26 is interposed between said nut and the adjacent surface of the casing. The large end of the valve body has a groove 27 for the reception of a fin on the hub of the han-

dle 28, and a screw 29 secures the handle to the valve body.

Keyed to the shaft 9, where it passes through the chamber 2, is the hub 35 of a rotor 36. It will be observed that the shaft 9 is eccentric with respect to the cylindrical chamber 2, and that the rotor 36 has a radius equal to the shortest distance between the center of the shaft 9 and the cylindrical wall of the chamber. It will be observed from Fig. 3, that the portion of the cylindrical wall between the adjacent edges of the ports 17 and 18, is nearest the shaft 9, and that the periphery of the rotor will engage only this portion of the wall of the chamber. From this it will be seen that, during a rotation of the rotor, a given point on its periphery gradually leaves this portion of the wall of the chamber, through 180° of the rotation, and through the remaining 180°, gradually approaches said wall. The rotor 36 is provided with a plurality of radial pockets 37, the side walls 38 whereof are substantially parallel; and a cylindrical piston, comprising a sleeve or tube, occupies each of the pockets 37, and is of a diameter to fit between the parallel walls thereof. The peripheral portions of the rotor, and the pistons 39, extend from the circular wall 6 of the casing, to the opposed surface of the cover 3, only sufficient clearance being allowed between the surfaces to permit of perfect freedom of movement. It will be noted from Fig. 4, that the hub of the rotor is of less width than the aforesaid peripheral portions, and piston retaining rings 40 surround the exposed portions of the shaft 9, beyond the ends of the hub. It will be observed from Fig. 3, that the aggregate diameters of two of the pistons 39, and one of the rings 40, is equal to the diameter of the chamber 2. Therefore, the rings 40 act to constantly retain the pistons against the cylindrical wall of the chamber.

The extensions 15 and 16, already referred to, are externally threaded for the application of unions, a union 45 being shown connected to the extension 16. Unions having various sized adapters 46 may be used and the adapters may be corrugated for the application of flexible tubes, such a tube being shown at 47, or the adapters may be threaded for coöperation with metallic pipes or other devices.

A bracket 49 is cast integral with the casing and forms a convenient means of attaching the pump to a supporting structure. Lubricating devices 50 are threaded into the outer ends of the tubular extensions 51, that are cast with the cover 3 and the cylindrical wall 6 of the casing, and the inner ends of these extensions join the bosses 7, and their bores communicate lubricant to the bearings of the shaft 9.

I have already explained how the peripheral portions of the rotor 36 gradually advance toward and recede from the cylindrical wall of the chamber 2 during the rotation of the rotor. Also, how the pistons 39 are retained in constant engagement with the cylindrical wall of said chamber. It is obvious from these two facts, that, when the shaft 9 is rotated, as for instance in the direction of the arrow in Fig. 3, that a suction is created in the port 18, as the adjacent segmental portion of the rotor recedes from the cylindrical wall of the chamber 2, and that the fluid which has been drawn into the chamber, by such action, is confined therein between the adjoining pistons 39, until the advancing piston reaches the rear edge of the port 17. Immediately upon the passage of the pistons beyond such edge, the fluid that has been confined to the rear of said piston, will be expelled gradually through the port by the advancement of the aforesaid segmental portion of the rotor toward the cylindrical wall of the chamber. Assuming that the shaft 9 is driven at a given speed, and that the capacity or output of the pump is more than is desired, such output may be reduced by turning the valve body 22 so as to establish communication between the ports 17 and 18 through the by-pass 19. The opening of the valve will cause some of the fluid that is expelled from the outlet side of the chamber 2 to be drawn back through the by-pass and circulated again through said chamber. This condition naturally reduces the suction within the inlet pipe, and consequently decreases the amount of fluid that is expelled through the outlet pipe. The variable capacity-uniform speed feature of my pump makes it especially valuable for use in cooling systems of internal combustion engines, for, as is well known to those familiar with the art of engine cooling, it is advantageous to change the velocity of the cooling fluid to meet varying conditions under which the engine is required to operate. For instance, in cold weather, the velocity of the fluid may be retarded to maintain a comparatively high temperature of the engine and thus facilitate starting; or in warm weather, the velocity may be increased to more effectually cool the engine.

It is also pointed out that the piston 39 and retaining rings 40 act as roller bearings, and this insures very easy operation of the pump. The pistons 39 and the retaining rings 40 are preferably made of standard seamless steel tubing and therefore can be easily and cheaply replaced if occasion requires.

Having thus described my invention, what I claim is:

A pump of the character set forth comprising a cylindrical casing, and a rotary element mounted within said casing, and ec-

centrically with respect thereto, said casing having an inlet and an outlet port which communicate with its interior through its cylindrical wall and are spaced angularly apart, said casing having an enlargement on that portion of its periphery which is located nearest the eccentrically mounted rotary element and said enlargement having a valve controlled by-pass communicating with said inlet and outlet ports for the purpose described.

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

HENRY J. FEYZES.

Witnesses:
BRENNAN B. WEST,
HUGH B. MCGILL.