L. H. ROGERS.

ROTARY PUMP AND BLOWER.

APPLICATION FILED MAY 4, 1918.

1,317,989.

Patented Oct. 7, 1919.

3 SHEETS—SHEET 1.

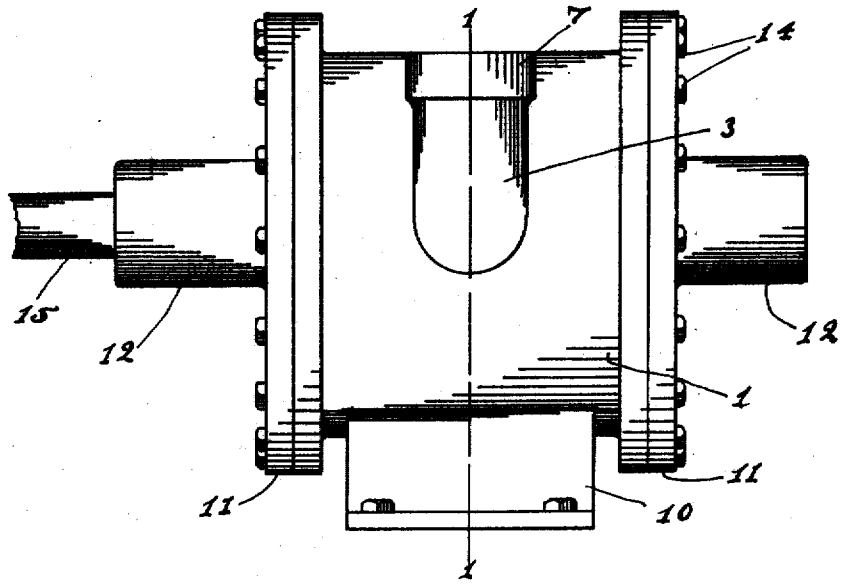


Fig. 1.

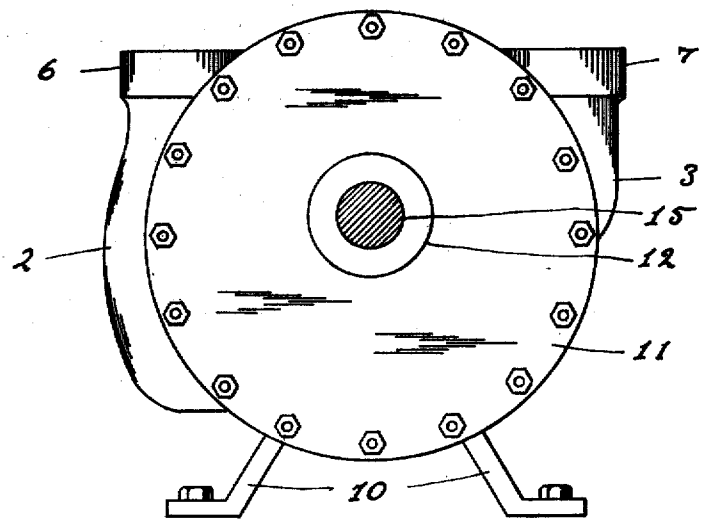


Fig. 2.

Inventor

Lee H. Rogers

By W. F. Davis & Son

Attorney

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

L. H. ROGERS.

ROTARY PUMP AND BLOWER.

APPLICATION FILED MAY 4, 1918.

1,317,989.

Patented Oct. 7, 1919.

3 SHEETS—SHEET 2.

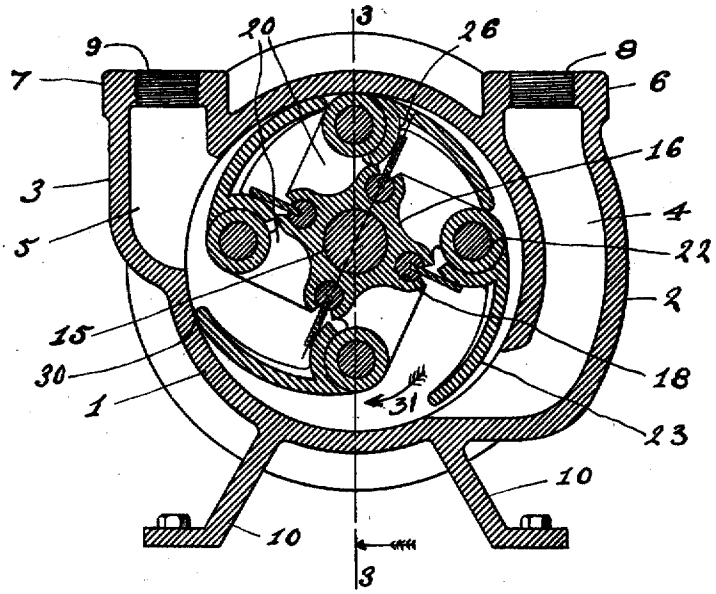


Fig. 3.

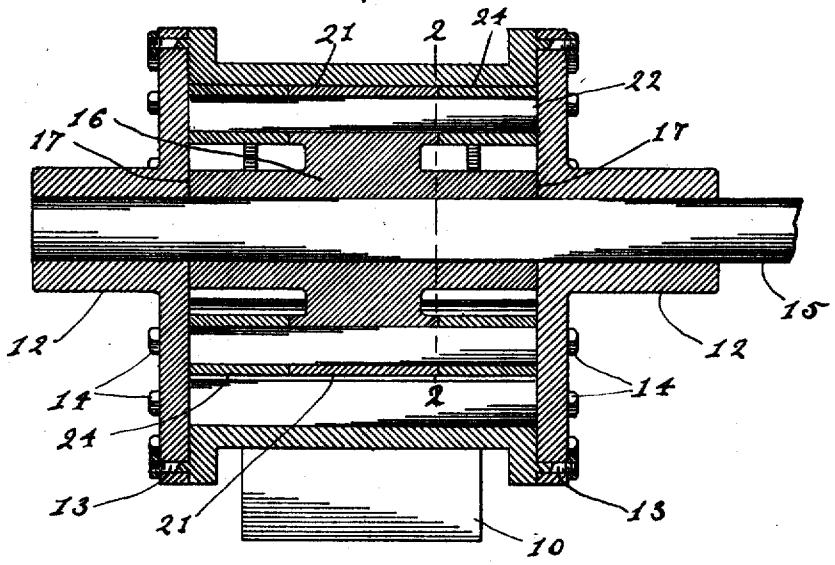


Fig. 4.

Inventor

Lee H. Rogers

By W. F. Davis & Son

Attorney

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

L. H. ROGERS.

ROTARY PUMP AND BLOWER.

APPLICATION FILED MAY 4, 1918.

1,317,989.

Patented Oct. 7, 1919.

3 SHEETS—SHEET 3.

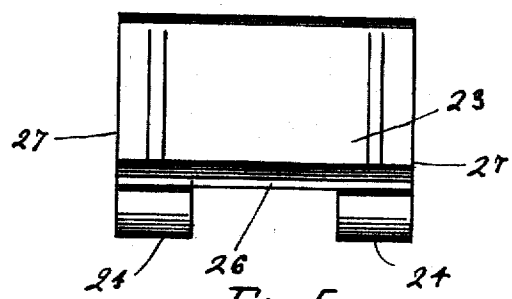


Fig. 5.

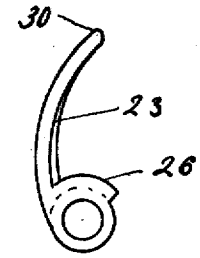


Fig. 6.

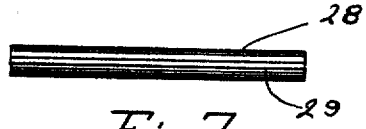


Fig. 7.

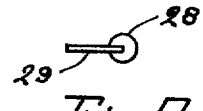


Fig. 8.

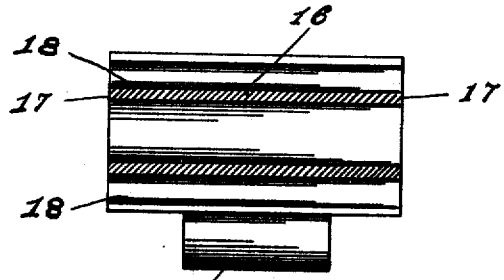


Fig. 9.

Inventor

Lee H. Rogers

By W. F. Davis & Son

Attorney

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

LEE H. ROGERS, OF KANSAS CITY, MISSOURI.

ROTARY PUMP AND BLOWER.

1,317,989. Specification of Letters Patent. Patented Oct. 7, 1919.

Application filed May 4, 1918. Serial No. 232,444.

To all whom it may concern:

Be it known that I, LEE H. ROGERS, 3215 East 27th St., a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Rotary Pumps and Blowers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to improvements in rotary pumps for pumping air, gases and liquids and seeks to provide a simple, efficient and durable pump, which is of extremely inexpensive construction.

Considerable trouble is experienced in the operation of rotary pumps, caused by the wings or air moving blades being positioned during the compression movement thereof, with the out ends of the blades scraping endwise, or nearly so against the cylindrical casing, resulting in wearing grooves and roughness in the casing and the ends of the blades owing to the narrow bearing of the blades on the casing. In rotary pumps heretofore wherein the blades were hingedly connected to the body of the piston, the hinges have not been of a construction that was endurable, and where they have become loose and inoperative it has been found that they could not be repaired and the only remedy was by replacing both body and blades.

It is essential that a rotary pump be provided with blades having a greater width of bearing against the casing, and that the hinge connections of the blades to the body of the piston be more durable and capable of being repaired without renewal.

The present invention seeks to provide an improved rotary pump or blower for creating vacuum and pressure in air and gases and for pumping water and other liquids, with blades provided with endurable and repairable hinged connections to the piston body, and with the blades having sufficient bearing against the cylindrical casing to prevent scraping and cutting of grooves, so that the piston will not leak.

With these and other objects in view the invention consists in the features of construction, combinations and arrangement of parts hereinafter set forth and more particularly pointed out in the appended claims, the accompanying drawings illustrating a structure embodying the improvements.

In the drawings:—

Figure 1 is a view in side elevation with reference to the length of the shaft, of the improved pump.

Fig. 2 is a view in end elevation with reference to the length of the shaft, of the pump.

Fig. 3 is a sectional view of the cylindrical casing taken on line 1—1 of Fig. 1, and of the piston on line 2—2 of Fig. 4.

Fig. 4 is a sectional view taken on line 3—3 of Fig. 3.

Fig. 5 is a side view of one of the piston blades.

Fig. 6 is an end view of one of the piston blades.

Fig. 7 is a view of one of the packing blades and shaft shaped connections as viewed when looking toward the axis of the piston.

Fig. 8 is an end view of one of the packing blades and the connecting shaft.

Fig. 9 is a sectional view of the body of the piston taken on line 4—4 of Fig. 3.

The cylindrical casing is provided with the outer walls 2 and 3 forming the intake and discharge ports 4 and 5 respectively, the walls terminating in the bosses 6 and 7 respectively, which are as shown provided with the screw threads 8 and 9 respectively for pipe connections.

The casing 1 is provided with the integral web shaped projections 10 which form a supporting base, it being understood that the pump may be installed for operation in any position, the base projections sometimes supporting the pump from above instead of from below as shown.

The casing heads 11 of duplicate construction are preferably as shown integral with the boss shaped journal boxes 12 and are secured to the casing by the stud bolts 13 and nuts 14.

The shaft 15 is journaled in the boxes 12 and has rigidly mounted thereon the body 16 of the rotary piston, the ends 17 of the body filling between the heads 11 and provided with the holes 18 longitudinally of the body and approximately parallel to the shaft 15, the holes being provided with the arm 20 located approximately in the center of the length of the body and extending radially outward therefrom with the outer ends of the arms forming the bosses 21 in which the shafts 22 are mounted approximately parallel with the shaft 15.

The wings or blades 23 of the piston are provided with the bosses 24, which are mounted on the shafts 22, spanning the bosses 21, and provided with the integral web 26, the latter being parallel to the shaft and curved partially around the boss 21, so no leakage of air gas or liquid can occur between the blades and the boss 21.

The blades 23 are of a length that will allow the ends 27 thereof to bear against the heads 11 but not so tight as to interfere with the blades being rotated by the body 16, so that the piston will rotate easily but not allow any perceptible leakage between any part thereof and the heads 11.

The shaft shaped hinge connections 28 are fitted in the holes 18, and have the packing blades 29 inserted therein as shown and rigidly therewith, the hinge connections forming a seal against air gas and liquid passing therearound in the holes 18, and the blades bearing against the webs 26 of the blades to prevent leakage between the webs and the hinge connections, the latter and the blades reaching from one head 11 to the other head 11 so that no leakage can occur around the ends of the hinge connections and blades.

The shaft 15 is eccentrically located in the cylindrical casing and the edges or outer ends 30 of the piston blades 23 bear against the cylindrical casing so that as the blades pass the intake port 4 the outer ends 30 thereof are extended to a greater distance from the axis of the shaft 15 than when the ends 30 pass over the discharge port 5. From the foregoing it will be understood that the space between each adjacent pair of blades is greater when near the intake port than when near the discharge port 5 so that air gas or liquid will enter between the blades from the intake port and be discharged through the discharge port as the piston rotates.

The piston body 16 rotates in the direction of the arrow 31 and it will be seen by referring to Fig. 3 of the drawings that the ends 30 of the blades 23 are considerably in advance of the hinge shafts 22 in the direction of rotation so that the end 30 of the blades will slide freely within and against the cylindrical casing and they will not scrape endwise against the casing and cut and wear grooves in the casing and in the blades.

The hinge connection of the blades 23 to the body 16, comprising the bosses 21, shafts 22 and bosses 24 form a hinge or pivotal connection that is strong and durable, and that can be renewed when worn by reaming the interior of the bosses with an ordinary reamer of well known construction found in most repair shops, and larger shafts may be inserted in the bosses, and the hinged connection is renewed with no new parts except the shafts which are inexpensive.

The hinge connections 28 do not rotate or move in any direction during the revolution of the piston, unless the pressure between the adjacent pair of blades 23 should increase above the discharge pressure after passing the discharge port 5, in which latter event the packing blades 29 are free to lift from the webs 26 integral with the blades 23 and allow the excess pressure to escape to between the next adjacent pair of blades 23 in advance of and in the direction of rotation from the pair between which the excess pressure occurs.

It will be understood from the foregoing description that the improved rotary pump is of a construction that permits the employment of strong heavy parts, and that it will operate smoothly against high pressure at a high speed and withstand excessive duty owing to the hinge connection of the blades 23 and the extreme advance in the direction of rotation of the ends 30 of the blades 23.

What I claim as new, and desire to secure by Letters Patent is:—

1. In a rotary pump, a cylindrical shaped housing, heads closing the ends of said housing, a main shaft journaled in said heads, said shaft eccentric to the interior of said housing, a rotary piston body rigidly mounted on said shaft within said housing and abutting said heads, arms projecting radially from said body, said arms each terminating in a boss with the axis thereof approximately parallel to said main shaft, a blade hinge shaft in each of said bosses, a piston blade provided with bosses and hingedly connected to said hinge shaft the outer end of said piston blade bearing against the interior of said cylindrical housing at a position considerably in circular advance of the companion shaft, hinge packing shafts in said body, and a packing blade in each of said hinge packing shafts and making connection with the adjacent piston blade.

2. In a rotary pump, a cylindrical housing, heads closing said housing, a main shaft journaled eccentrically in said heads, a piston body on said shaft, arms, projecting radially from said body, shafts passing through said arms, a piston blade hingedly connecting to each of said shafts, and a flat packing blade connecting from each of said piston blades to said body.

LEE H. ROGERS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."