J. R. KINNEY.

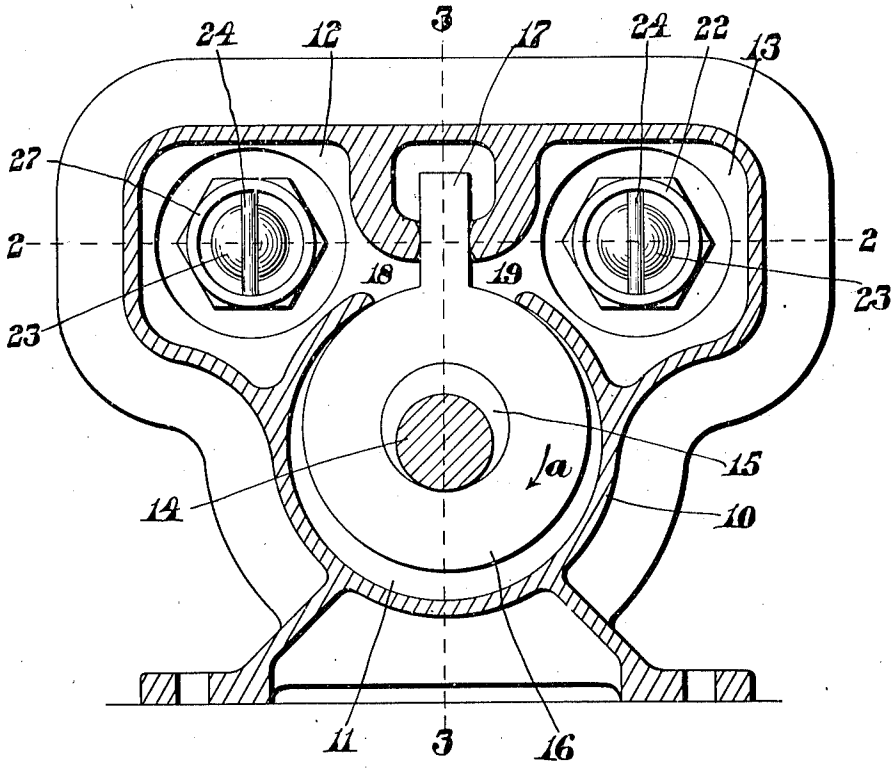
ROTARY PUMP FOR REVERSING ENGINES.

APPLICATION FILED SEPT. 26, 1910. RENEWED JAN. 12, 1912.

1,035,449. Patented Aug. 13, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS-SHEET 2.

Fig. 2.

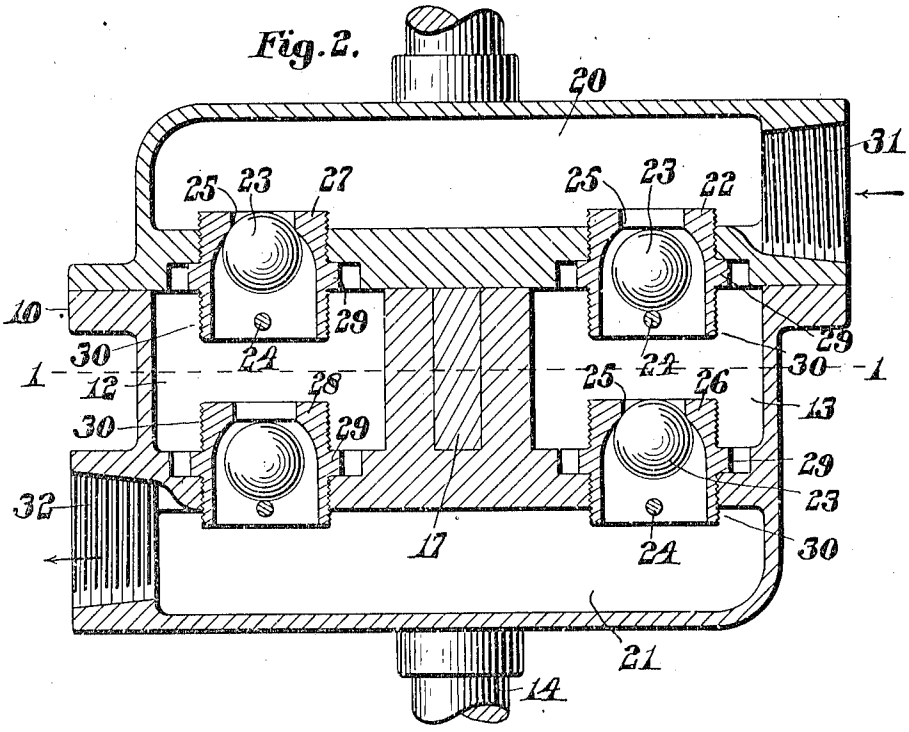
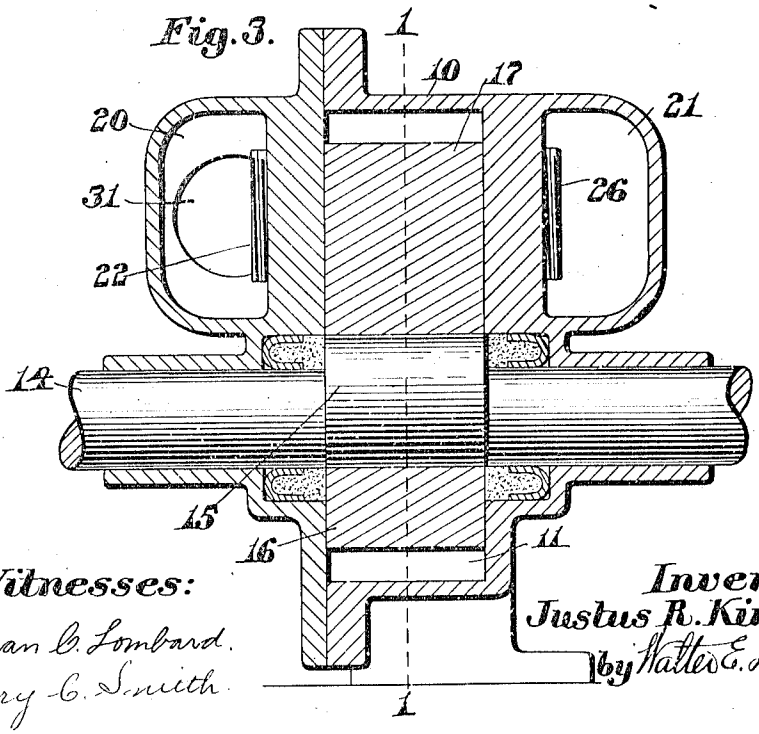


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ROTARY PUMP FOR REVERSING-ENGINES.

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Application filed September 26, 1910, Serial No. 583,952. Renewed January 12, 1912. Serial No. 670,952.

To all whom it may concern:

Be it known that I, JUSTUS R. KINNEY, a citizen of the United States of America, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Rotary Pumps for Reversing-Engines, of which the following is a specification.

This invention relates to rotary pumps and has for its particular object the production of a pump that may be used in connection with reversing engines and maintain a continuous flow of fluid in one direction without regard to the direction of rotation of the piston.

The invention consists of certain novel features of construction and arrangement of parts which will be readily understood by reference to the description of the drawings and to the claims hereinafter given.

Of the drawings: Figure 1 represents a vertical section of a pump embodying the features of the present invention. Fig. 2 represents a horizontal section of the same, the cutting plane being on line 2, 2 on Fig. 1, and Fig. 3 represents a transverse section of the same, the cutting plane being on line 3, 3 on Fig. 1.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 10 represents a casing provided with a cylindrical piston chamber 11, with which communicate two auxiliary chambers 12 and 13. Centrally disposed within the piston chamber 11 is a revoluble shaft 14, having formed thereon an eccentric 15, on which is mounted the annular piston member 16, a portion of the periphery of which is always in contact with the inner wall of the piston chamber 11. This annular member 16 is provided with a radial blade 17 interposed between the passages 18 and 19, leading respectively to the auxiliary chambers 12 and 13. The blade 17 effectually prevents the passage of any fluid from one auxiliary chamber to the other except as it is forced by means of the piston 16 through the piston chamber 11. On one side of the auxiliary chambers 12 and 13, and in the same horizontal plane therewith, is an inlet compartment 20, while on the opposite side in the same horizontal plane therewith, is an outlet compartment 21.

Threaded into the wall between the auxiliary chamber 13 and the compartment 20 is a valve casing 22, in which is positioned a ball 23, having a movement longitudinally of said casing 22, its outward movement being limited by a pin 24, extending through said valve casing. Said casing is provided with a valve seat 25, against which the ball 23 may be forced to close the said valve and prevent the passage of fluid therethrough. In alinement with the valve casing 22, and threaded into the wall between the auxiliary chamber 13 and the compartment 21 is a similar valve casing 26. In like manner a valve casing 27 is threaded into the wall between the auxiliary chamber 12 and the compartment 20, and in alinement therewith, threaded into the wall between said auxiliary chamber 12 and the compartment 21, is a valve casing 28. All of these valve casings, 22, 26, 27 and 28 are alike, and each is provided with a seat 25 and a pin 24, between which and said seat 25 the ball 23 is free to move. Each valve casing is provided with a hexagonal flange 29, centrally disposed between its two ends, while the periphery of the body portion of said casings on either side of said flange 29 is threaded as at 30 so that said valve casings may be reversed when desired and inserted into the walls with the enlarged open end outward as indicated in the upper part of Fig. 2, or with the enlarged open end inward as indicated in the lower part of Fig. 2. When the valves are positioned as indicated in said Fig. 2, and fluid is admitted to the compartment 20 through the opening 31, and the shaft 14 is rotating in the direction of the arrow *a* on Fig. 1, the suction caused by the rotation of the piston 16 will cause the ball 23 in the valve casing 22 to be moved against the pin 24, thus permitting the fluid in the compartment 20 to pass through the said valve casing 22 into the auxiliary chamber 13. The rotation of the piston 16 will cause the fluid to be drawn through the passage 19 into the piston chamber 11, and forced through said piston chamber and passage 18 into the auxiliary chamber 12. This flow of fluid into the auxiliary chamber 12 will cause the ball 23 in the valve casing 27 to be moved against the seat 25 and effectually prevent the passage of any fluid through said valve casing 27 into the compartment 20. The force of the fluid will, however, cause the ball 23 in the valve casing 28 to be moved against the

stop pin 24 and open this valve so that the fluid may pass into the compartment 21 and therefrom through the outlet 32. The suction caused by the rotation of the piston 16 will cause the ball 23 in the valve casing 26 to be drawn to its seat and close this valve, preventing the passage of fluid through said valve casing 26 into the compartment 21, but even in case this valve should remain partially open owing to any excessive force of the fluid passing through the valve casing 22, such fluid as may pass through said valve casing into the compartment 21 would pass therefrom through the outlet 32 with the rest of the fluid being forced through the valve casing 28.

Should the shaft 14 be caused to rotate in the opposite direction the ball 23 in the valve casing would be drawn over to its stop pin 24 and the fluid entering the compartment 20 through the inlet opening 31 would pass through said valve casing 27 and be forced through the passage 18 to the piston chamber 11 into the passage 19 and auxiliary chamber 13, the pressure therein causing the ball 23 in the valve casing 22 to be forced against the seat 25 preventing any return of the fluid into the compartment 20. The fluid entering the auxiliary chamber 13, forcing the ball 25 in the valve casing 26 to its stop pin 24, thus permitting the fluid to pass into the compartment 21 to be discharged through the outlet 32. It is obvious, therefore, that with a device constructed as is herein set forth, the rotation of the piston 16 may be in either direction without changing the direction of the flow of fluid. Obviously this is of great advantage in connection with reversing engines where it is desired to maintain the flow of fluid continuously in one direction.

It is believed that the operation and many advantages of a device of this construction will be readily understood without any further description.

Having thus described my invention, I claim:

1. In a device of the class described the combination of a casing having a piston chamber provided with a single opening in the wall thereof; a revoluble piston therein adapted to rotate in either direction; two auxiliary chambers communicating with said piston chamber by means of said opening; means for preventing direct communication between said auxiliary chambers; an inlet compartment on one side of said chambers; an outlet compartment on the other side thereof; and means interposed between said chambers and compartments whereby the rotation of the piston in either direction will cause a continuous flow of fluid in one direction.

2. In a device of the class described the combination of a casing having a piston chamber; a revoluble piston therein adapted to rotate in either direction; two auxiliary chambers provided with a single opening in the wall thereof communicating with said piston chamber by means of said opening; means for preventing direct communication between said auxiliary chambers; an inlet compartment on one side of said chambers; an outlet compartment on the other side thereof; an inlet valve from the inlet compartment to one auxiliary chamber; an outlet valve from said inlet compartment to the other auxiliary chamber; an outlet valve from the first mentioned auxiliary chamber to the outlet compartment; and an inlet valve from the other chamber to said outlet compartment.

3. In a device of the class described the combination of a casing having a piston chamber provided with a single opening in the wall thereof; a revoluble piston therein adapted to rotate in either direction; two auxiliary chambers communicating with said piston chamber by means of said opening; an extension on said piston adapted to prevent direct communication between said auxiliary chambers; an inlet compartment on one side of said chambers; an outlet compartment on the other side thereof; an automatic inlet valve from the inlet compartment to one auxiliary chamber; an automatic outlet valve from said inlet compartment to the other auxiliary chamber; an automatic outlet valve from the first mentioned auxiliary chamber to the outlet compartment; and an automatic inlet valve from the other chamber to said inlet compartment.

4. In a device of the class described the combination of a casing having a cylindrical piston chamber, two auxiliary chambers communicating therewith by a single opening, and a compartment on each side of said auxiliary chambers; a revoluble shaft centrally disposed in said piston chamber; an eccentric piston thereon; an annular member on said piston, a portion of the periphery of which contacts with the inner wall of said piston chamber; an extension on said annular member extending through said opening and maintaining a contact with the casing to prevent direct communication between the auxiliary chambers; an inlet valve to one compartment and an outlet valve to the other compartment from one auxiliary chamber; and an outlet valve from the other auxiliary chamber to the one compartment and an inlet valve from said chamber to the other compartment.

5. In a device of the class described the combination of a casing having a cylindrical piston chamber, two auxiliary chambers communicating therewith by a single opening, and a compartment on each side of said auxiliary chambers; a revoluble shaft cen-

trally disposed in said piston chamber; an eccentric piston thereon; an annular member on said piston a portion of the periphery of which contacts in the inner wall of said piston chamber; an extension on said annular member extending through said opening and maintaining a contact with the casing to prevent direct communication between the auxiliary chambers; an inlet ball valve to one compartment and an outlet ball valve to the other compartment from valve from the other auxiliary chamber to one auxiliary chamber; and an outlet ball valve from the other auxiliary chamber to the one compartment and an inlet ball valve from said chamber to the other compartment.

6. In a device of the class described, the combination of a casing having a cylindrical piston chamber, two auxiliary chambers communicating therewith by a single opening, and a compartment on each side of said auxiliary chambers; a revoluble shaft centrally disposed in said piston chamber; an eccentric piston thereon; an annular member on said piston, a portion of the periphery of which contacts with the inner wall of said piston chamber; an extension on said annular member extending through said opening and maintaining a contact with a portion of the casing lying within said opening at a greater distance from the axis of the piston than the walls of said chamber, said extension being adapted to prevent direct communication between the auxiliary chambers; an inlet valve to one compartment and an outlet valve to the other compartment from one auxiliary chamber; an outlet valve from the other auxiliary chamber to one compartment and an inlet valve from said chamber to the other compartment.

7. In a device of the class described, the combination of a casing having a cylindrical piston chamber, two auxiliary chambers communicating therewith by a single opening and a compartment on each side of said auxiliary chambers; a revoluble shaft centrally disposed in said piston chamber; an eccentric piston thereon; an annular member on said piston, a portion of the periphery of which contacts with the inner wall of said piston chamber; an extension on said annular member and integral therewith extending through said opening and maintaining a contact with a portion of the casing lying within said opening, at a greater distance from the axis of the piston than the walls of said chamber, said extension being adapted to prevent direct communication between the auxiliary chambers; an inlet valve to one compartment and an outlet valve to the other compartment from one auxiliary chamber; an outlet valve from the outer auxiliary chamber to one compartment and an inlet valve from one chamber to the other compartment.

Signed by me at 4 Post Office Sq., Boston, Mass., this 21st day of September 1910.

JUSTUS R. KINNEY.

Witnesses:
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NATHAN C. LOMBARD.