R. E. NEWCOMB.

FLUID PUMP.

APPLICATION FILED JULY 5, 1918.

1,307,210.

Patented June 17, 1919.

3 SHEETS—SHEET 1.

Fig. 1.

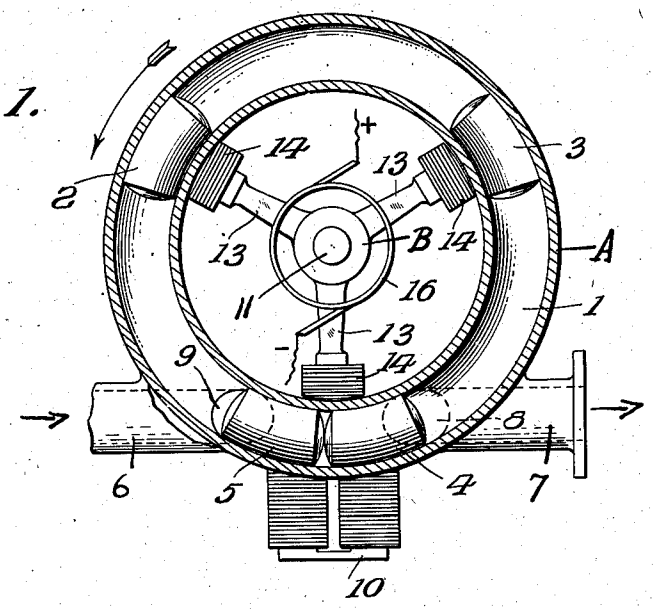
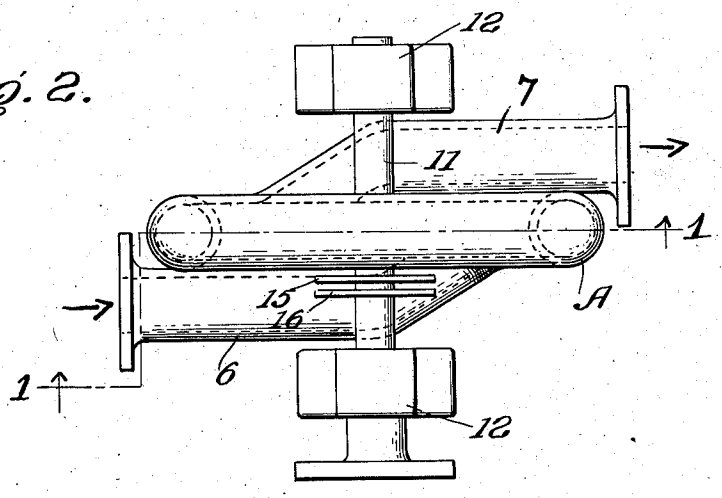


Fig. 2.



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3 SHEETS—SHEET 2.

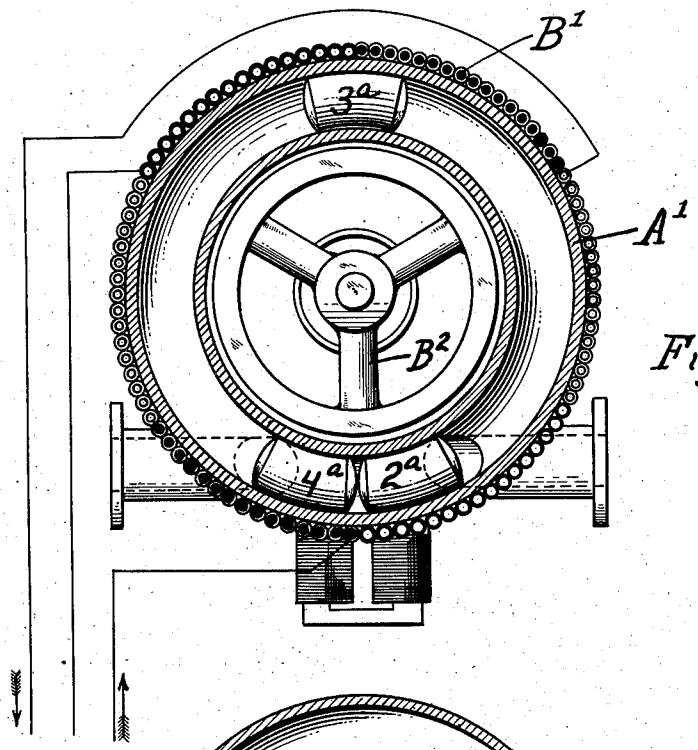

Fig. 3.

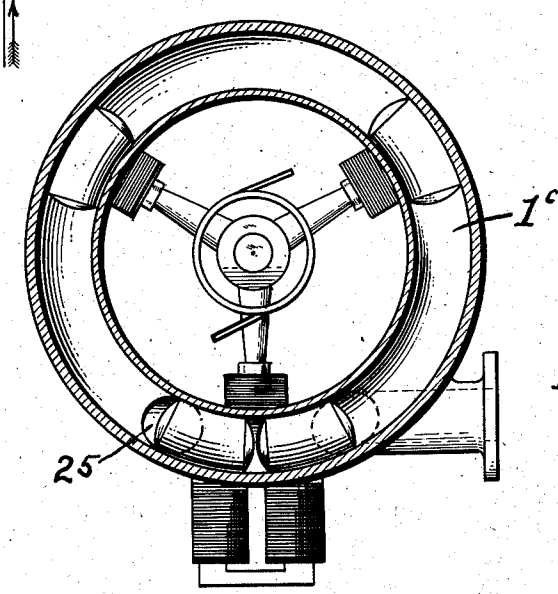

Fig. 7.

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3 SHEETS—SHEET 3.

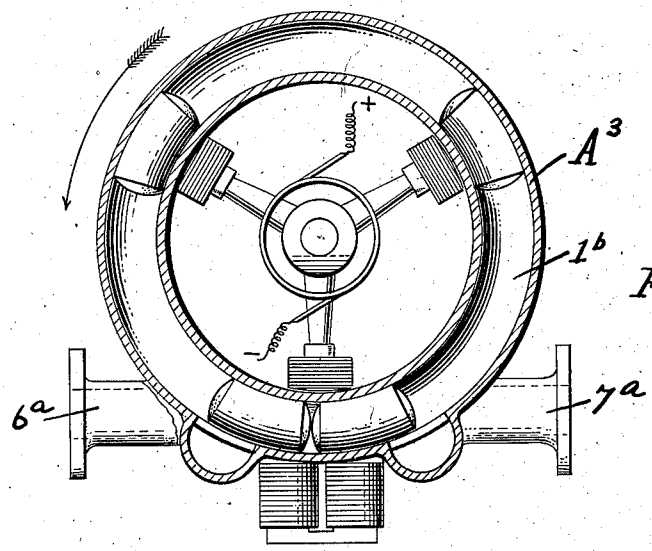

Fig. 4.

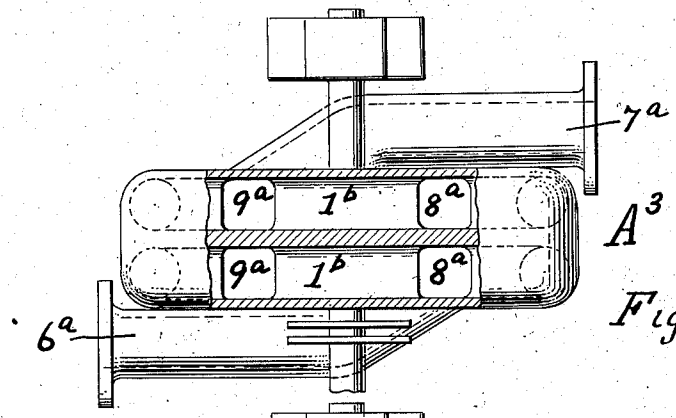

Fig. 5

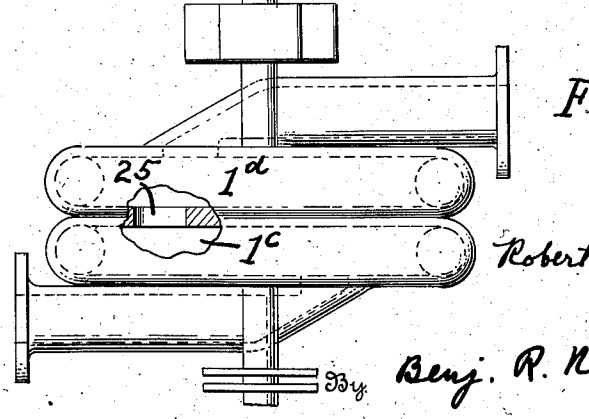

Fig. 6

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UNITED STATES PATENT OFFICE.

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FLUID-PUMP.

1,307,210. Specification of Letters Patent. Patented June 17, 1919.

Application filed July 5, 1918. Serial No. 243,344.

To all whom it may concern:

Be it known that I, ROBERT E. NEWCOMB, a citizen of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Fluid-Pumps, of which the following is a specification.

My invention relates to fluid pumps and more especially to that class of pumps wherein pistons are employed which are moved by means other than mechanical connections.

I am aware that it is generally old to move the pistons of a pump rectilinearly by the use of a magnetic field but I propose to utilize magnetic influence to move the pistons of a pump in a continuous or endless orbit thus providing a pump which gives a uni-directional flow having a continuous non-pulsating influx to the suction and likewise a continuous non-pulsating efflux to the discharge, thereby insuring all of the advantages of the usual rotary and centrifugal pumps without the disadvantages of complex construction and, furthermore, giving much better efficiency than that of any centrifugal pump.

An object of the pump constructed according to the present invention is to move the pistons by the magnetic influence of a rotating magnetic field either of the usual rotating type or of the induced type such as occurs in a polyphase induction motor.

In the type of pump here illustrated, pistons are confined for movement in one or more circular or endless pump chambers, and an electrical magnetic field is employed in connection with the pump chambers for moving the pistons in a continuous path around the same. The chamber or chambers is or are provided with inlet and outlet ports for the fluid pumped and between the ports of each chamber is located a device for retarding the movement of each piston during its passage between the ports, so that a vacuum will be created between the piston so retarded and the adjacent preceding piston, thus drawing the fluid into the chamber.

In the drawings;

Figure 1 is a vertical section through the pump taken on line 1—1 of Fig. 2.

Fig. 2 is a top plan view.

Fig. 3 is a view showing the pump constructed for use with an induced rotating field of the class which occurs in an induction motor

Fig. 4 is a vertical sectional view of a pump having a plurality of chambers arranged side by side and having common suction and discharge pipes.

Fig. 5 is a top plan view thereof, partly in section.

Fig. 6 is a top plan view partly in section of the pump having a plurality of chambers arranged side by side and in which the discharge port of one chamber is also the suction port of the next adjacent chamber.

Fig. 7 is a vertical sectional view of the pump shown in Fig. 6.

In detail:

In the embodiment of the invention illustrated in Figs. 1 and 2, the pump comprises a pump casing A having a chamber 1 which is in the form of a substantially circular or endless orbit in which a plurality of pistons 2, 3, 4 and 5 move by means to be hereinafter described. The pump chamber 1 has an inlet pipe 6 and an outlet pipe 7, the interiors of which communicate with the chamber 1, through ports 8 and 9.

Rotating concentrically with the orbit of movement of the pistons is a rotor B driven by any suitable prime mover and carried on a shaft 11 journaled in bearings 12. The rotor B is provided with arms 13 carrying at their outer ends the magnets 14 energized by current supplied thereto by slip rings 15 and 16 from any extraneous source.

Between the inlet and outlet ports 8 and 9, respectively, is a stationary magnet 10 which acts to momentarily retard the movement of each piston during passage between the two ports and until the adjacent preceding piston has advanced sufficiently to create a vacuum between the two pistons as, for instance, in the drawing, the piston 4 has been retarded while the piston 3 is now moving at its usual rate away from the inlet port 8; thus a vacuum is created between the two pistons 3 and 4 which draws the fluid in through the inlet port 8 and, at the same time, the piston 5 moving at its usual rate has displaced through the outlet port 9 that bulk of fluid which has been previously drawn in between pistons 4 and 5, and as the piston 2 continues it engages the piston 5 and thus forces the piston 5 out of range of

the influence of the stationary magnet and itself becomes retarded thus repeating the cycle of operations and, in this way, substantially continuous streams of fluid are drawn into and discharged from the casing.

In the type of pump illustrated in Fig. 3, a three phase self induced magnetic field is shown at B′, which is coiled about the casing A′, and an armature B^2 rotates between the inner circumference of the casing, as shown. The armature may be used when desired for the purpose of increasing the influence of the rotating field upon the pistons, which in this instance are three in number and designated 2^a, 3^a and 4^a. With this construction the pistons are moved similarly to those previously described in connection with Figs. 1 and 2, but by an induced magnetic field in contradistinction to the moving field previously described.

In the embodiment of the invention illustrated in Figs. 4 and 5, the casing A^3 is shown provided with a plurality of chambers 1^b arranged side by side and having common inlet and outlet pipes 6^a and 7^a. The inlet pipe communicates with both chambers through ports 8^a and the outlet pipe communicates with both chambers through ports 9^a. With this construction, it is obvious that double the amount of fluid will be pumped as with the pump shown in Figs. 1 and 2.

In Figs. 6 and 7, I have shown a multi-chamber pump, in which the fluid after being pumped through the chamber 1^c is passed through a port 25 into the adjacent chamber 1^d and again impelled in that chamber. This arrangement of sections or chambers makes possible a design adapted for high pressure.

While, in the foregoing, I have described preferred embodiments of the invention, it is nevertheless to be understood that, in practice, I may resort to such modifications as fall within the scope of my invention as hereinafter claimed.

I claim:

1. In a fluid pump, a pumping chamber having inlet and discharge ports and confining pistons for movement in a substantially endless orbit, and means for producing a magnetic field for moving said pistons.

2. In a fluid pump, a pumping chamber having inlet and discharge ports and confining pistons for movement in a substantially endless orbit, and rotating means for producing a magnetic field for moving said pistons.

3. In a fluid pump, a pumping chamber having inlet and discharge ports and confining pistons for movement in a substantially endless orbit, and means for producing a magnetic field for moving said pistons continuously in the same direction.

4. In a fluid pump, a pumping chamber having inlet and discharge ports and confining pistons for movement in a substantially endless orbit, means for producing a magnetic field for moving said pistons continuously in the same direction, and means for retarding each piston at a predetermined location in the orbit of its movement to create a vacuum between the piston thus retarded and the preceding piston.

5. In a fluid pump, a pumping chamber having inlet and discharge ports and confining pistons for movement in a substantially endless orbit, means for producing a magnetic field for moving said pistons continuously in the same direction, and means for retarding each piston at a point between the said inlet and discharge in the orbit of its movement to create a vacuum between the piston thus retarded and the preceding piston whereby fluid is drawn into and fills the space between said pistons mentioned.

6. In a fluid pump, a pumping chamber having inlet and discharge ports and confining pistons for movement in a substantially endless orbit, means for producing a magnetic field for moving said pistons continuously in the same direction, and magnetic means for retarding the movement of one piston with respect to the others at a predetermined location in the orbit.

7. In a fluid pump, a plurality of endless pumping chambers each having inlet and discharge ports, pistons mounted for free movement in each chamber, and means for producing a magnetic field for moving said pistons.

8. In a fluid pump, a plurality of endless pumping chambers arranged side by side and each having inlet and discharge ports, pistons mounted for free movement in each chamber, and means for producing a magnetic field for moving said pistons.

9. In a fluid pump, a plurality of endless pumping chambers each having inlet and discharge ports, the discharge port of one chamber serving as the inlet port of the adjacent chamber, pistons mounted for free movement in each chamber, and means for producing a magnetic field for moving said pistons.

10. In a fluid pump, a pumping chamber having inlet and discharge ports and confining pistons for movement in a substantially endless orbit, means for producing a magnetic field for moving said pistons continuously in the same direction, and means for retarding each piston at a predetermined location in the orbit of its movement to create a pressure chamber between the piston thus retarded and the following piston.

11. In a fluid pump, a pumping chamber having inlet and discharge ports and confining pistons for movement in a substantially endless orbit, means for producing a magnetic field for moving said pistons continuously in the same direction, and means for

retarding each piston at a predetermined location in the orbit of its movement to create a pressure chamber between the piston thus retarded and the following piston, and to create a vacuum between the retarded piston and the preceding piston.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ROBERT E. NEWCOMB.

Witnesses:
CALVIN H. CROUCH,
WILBUR K. SEACY.