

Sept. 18, 1928.

W. G. BROWN

1,684,468

PUMP

Filed Aug. 26, 1926

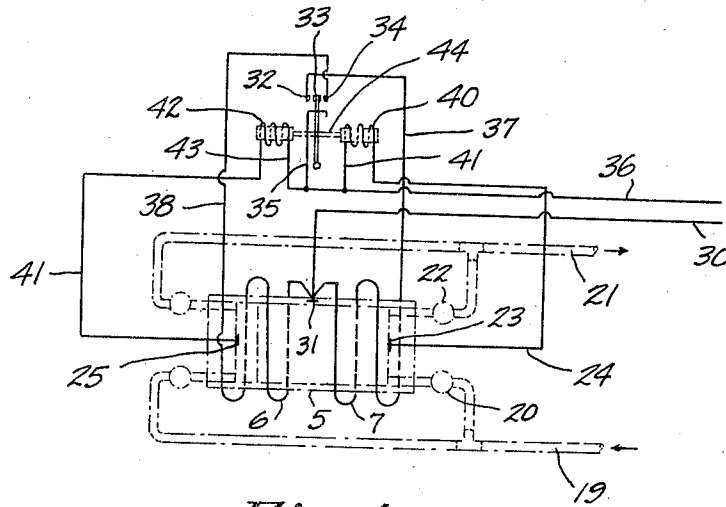


Fig. 1

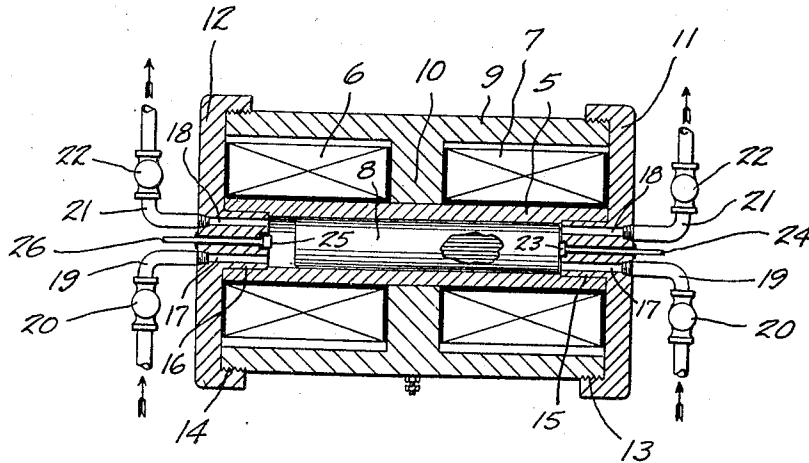


Fig. 2

Inventor

WARREN G. BROWN

By *John Harness*

Attorney

UNITED STATES PATENT OFFICE.

WARREN G. BROWN, OF DETROIT, MICHIGAN.

PUMP.

Application filed August 26, 1926. Serial No. 131,793.

It is the primary object of my invention to provide a pump of cheap and economical construction, and one which is particularly adapted for use as a compressor for an artificial refrigeration system.

Another object of my invention is to provide a pump which is electromagnetically driven so that no reciprocating or moving parts are positioned exteriorly thereof

With the above and other objects in view, my invention consists in the arrangement, combination and construction of the various parts of my improved device as described in the specification, claimed in my claims and shown in the accompanying drawing, in which:

Fig. 1 is a diagram showing the electrical circuit employed with my pump, parts of the pump itself being shown diagrammatically in dotted lines.

Fig. 2 is a longitudinal sectional view of my improved pump.

I have shown a pump cylinder 5 around which is disposed a pair of magnet coils 6 and 7 and within which may be disposed a piston 8, comprising a steel shell having a laminated magnetic core of soft iron pieces. Around the coils 6 and 7 is a sleeve 9 having an inwardly projecting circular flange 10 which bears upon the cylinder 5 and separates the coils 6 and 7. Each end of the sleeve 9 is screw threaded and a pair of caps 11 and 12 are provided, one upon each end of the sleeve. The caps are screw threaded to the sleeve ends as at 13 and 14 and the ends of the cylinder 5 abut the faces of the caps adjacent the centers thereof. The caps are provided with central inwardly projecting portions 15 and 16 which align with and extend into the cylinder 5. An intake passage 17 is provided in each of the projections 15 and 16, as is also an outlet passage 18. A pipe 19 connects with each of the inlet passages and is provided with a suitable conventional check valve indicated diagrammatically at 20. Likewise, a pipe 21 connects with each of the outlet passages and is provided with a check valve indicated diagrammatically at 22.

An electrical contact 23 is provided on the inner end of the projection 15 and a wire 24 extends therefrom to a point outside the cap 11, the opening around the wire being suitably sealed against the escape of gas or liquid from the cylinder. A similar contact 25 is provided on the inner end of the projection

16 and a wire 26 leads therefrom to a point outside the cap 12, said wire being also suitably sealed to prevent the escape of liquid or gas around the same.

It will be apparent from the foregoing that by the addition of electric energy and a suitable reversing switch, the piston 8 may be electro-magnetically reciprocated so as to alternately draw in gas or liquid through the intake pipes 19 and force the same out through the outlet pipes 21 and thus produce a pumping action by reciprocating parts which are completely housed and sealed against leakage.

In Fig. 1 I have shown, diagrammatically, the electric circuit by which my improved device is operated. The circuit may be traced as commencing with the wire 30 leading to the point 31 in the wall of the cylinder 5 where it may contact with the steel tube 8 of the piston. The current may pass from this point through either the coil 6 or 7, depending upon whether the contact 32 or the contact 34 is engaged with the switch arm 33. If the contact 32 be in engagement, the current will pass through the coil 7 and wires 37, 35 and 36 back to the source of power to complete the circuit. If the contact 34 be in engagement with the switch arm 33, the current will pass through the coil 6, wire 38 and wires 35 and 36 to complete the circuit.

Depending upon whether the coil 6 or the coil 7 is functioning, the piston 8 will be drawn to either the contact point 25 or contact point 23. If the piston be drawn to the contact point 23, a second circuit will be established through the wire 30, contact 31, steel shell of the piston 8, contact 23 and wire 24 to the magnetic coil 40, wire 41 and wire 36. If the contact point 25 be in engagement with the piston 8, a circuit will be set up through the wire 30, contact 31, steel shell of the piston 8, contact 25, wire 41, electro-magnetic coil 42, wire 43 and wire 36.

It will be apparent from the foregoing that the coils 40 and 42 alternately function to provide a reverse switch action through the bar 44 which is connected to the switch arm 33 to reciprocate the switch arm between the contact points 32 and 34. Thus, assuming that the piston 8 has been drawn toward the end of the cylinder in which the contact point 25 is located, this action being accomplished by the energizing of the coil 6, the second circuit set up through the wire 41 and

coil 42 by the contacting of the piston with the point 25 will serve to draw the bar 44 toward the coil 42 and thereby make contact between the switch arm 33 and contact point 32. Thus, the coil 6 will be cut out of circuit and de-energized, and at the same time the coil 7 will be cut into circuit and energized to pull the piston toward it. This action will be continued alternately as long as current is supplied from a suitable source of supply.

It will be apparent that I have provided a simple construction of pump which will occupy a small amount of space, and which may be utilized with conventional household alternating current to operate a pump for any one of a number of purposes. It will also be apparent that such a pump is particularly adaptable for use in artificial refrigeration systems because there are no reciprocating or moving parts positioned on the outside thereof, and requiring a seal between the inside and outside, around them.

It will be obvious that various changes may be made in the arrangement, combination and

construction of the various parts of my improved device without departing from the spirit of my invention, and it is my intention to cover by my claims such changes as may be reasonably included within the scope thereof.

What I claim is:

1. A device of the class described comprising a cylinder, a piston adapted for reciprocation therein, a sleeve around the cylinder, a pair of coils in the sleeve and around the cylinder and caps secured on the ends of the sleeve closing the ends of the cylinder.

2. A device of the class described comprising a cylinder, a piston adapted for reciprocation therein, a sleeve around the cylinder, a pair of coils in the sleeve and around the cylinder and caps secured on the ends of the sleeve closing the ends of the cylinder, said caps having projections thereon extended into the cylinder, and electrical conductors extended through the projections adapted for contact with the piston.

WARREN G. BROWN.