J. O. SCHIRMER.

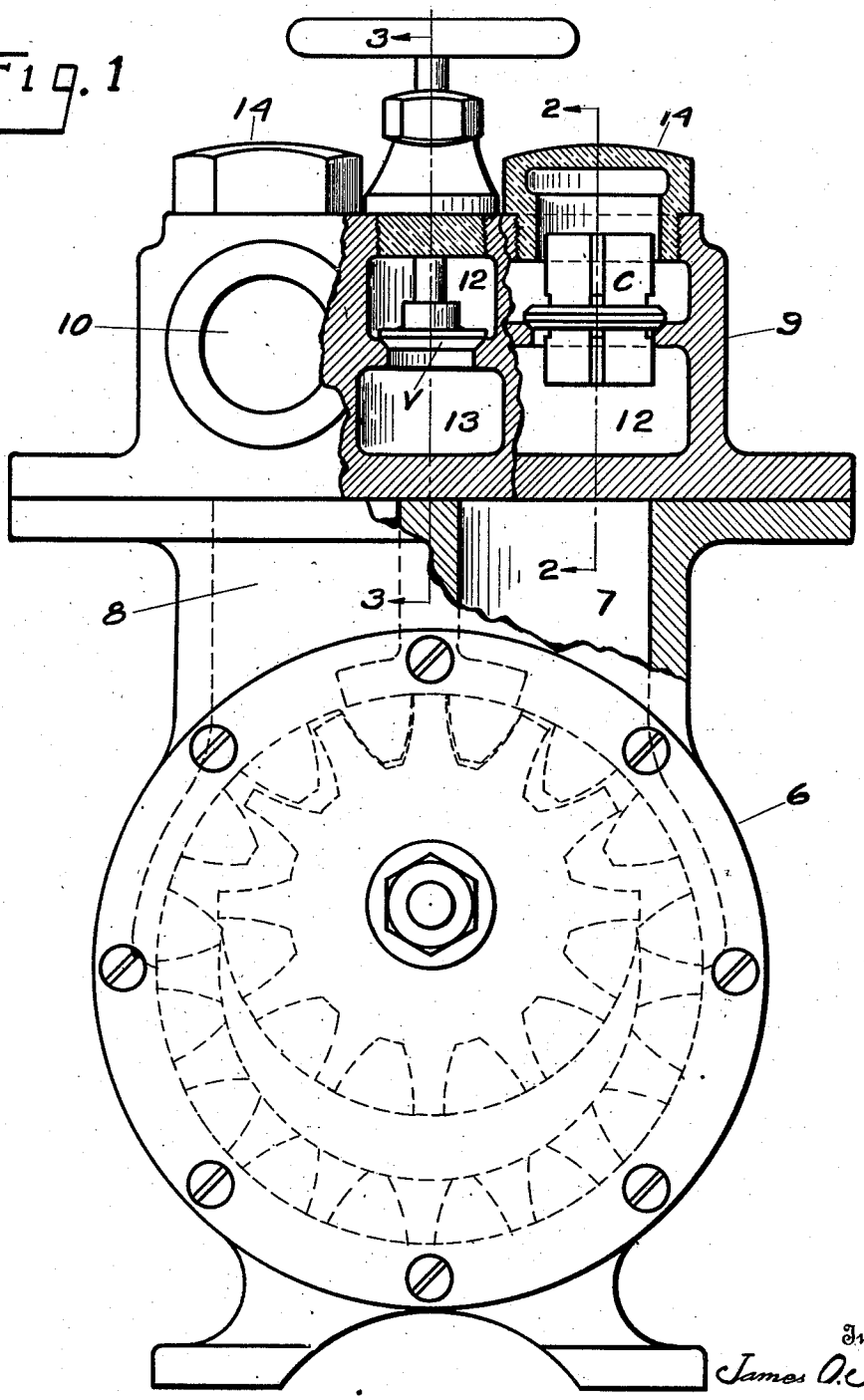
AUTOMATIC REVERSING DEVICE FOR ROTARY PUMPS.

APPLICATION FILED DEC. 2, 1918.

1,307,602. Patented June 24, 1919.

3 SHEETS—SHEET 1.

Fig. 1




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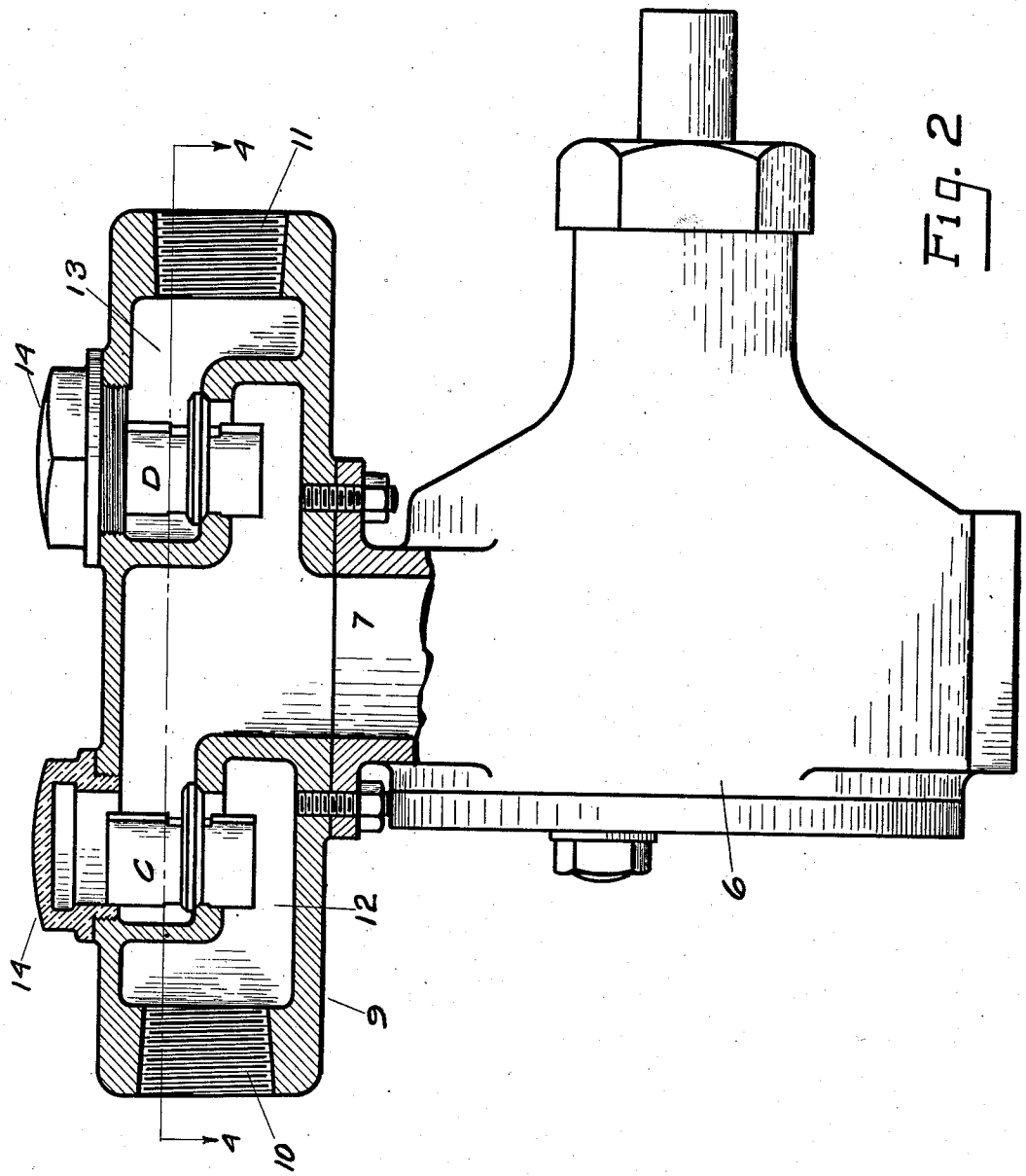



Fig. 2

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3 SHEETS—SHEET 3.

Fig. 3

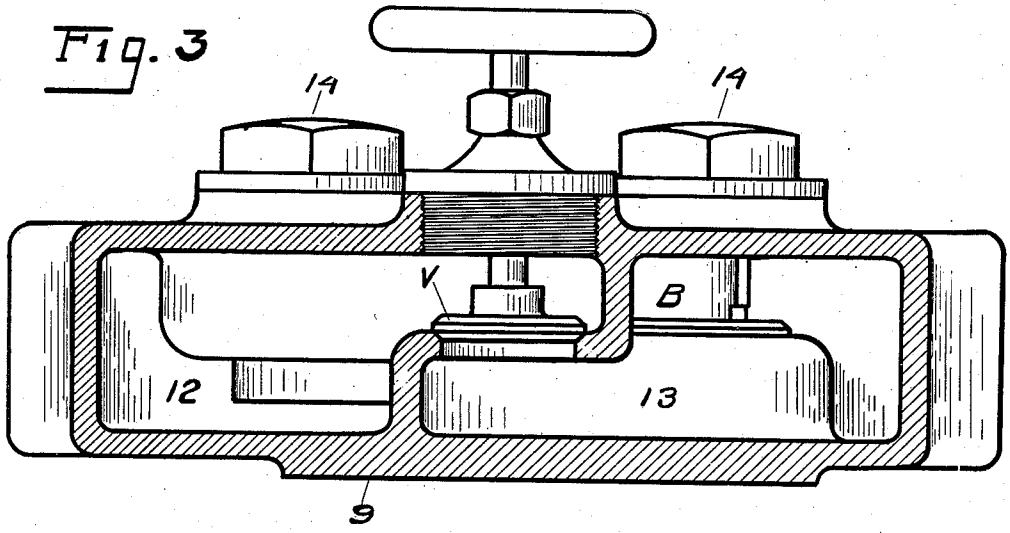
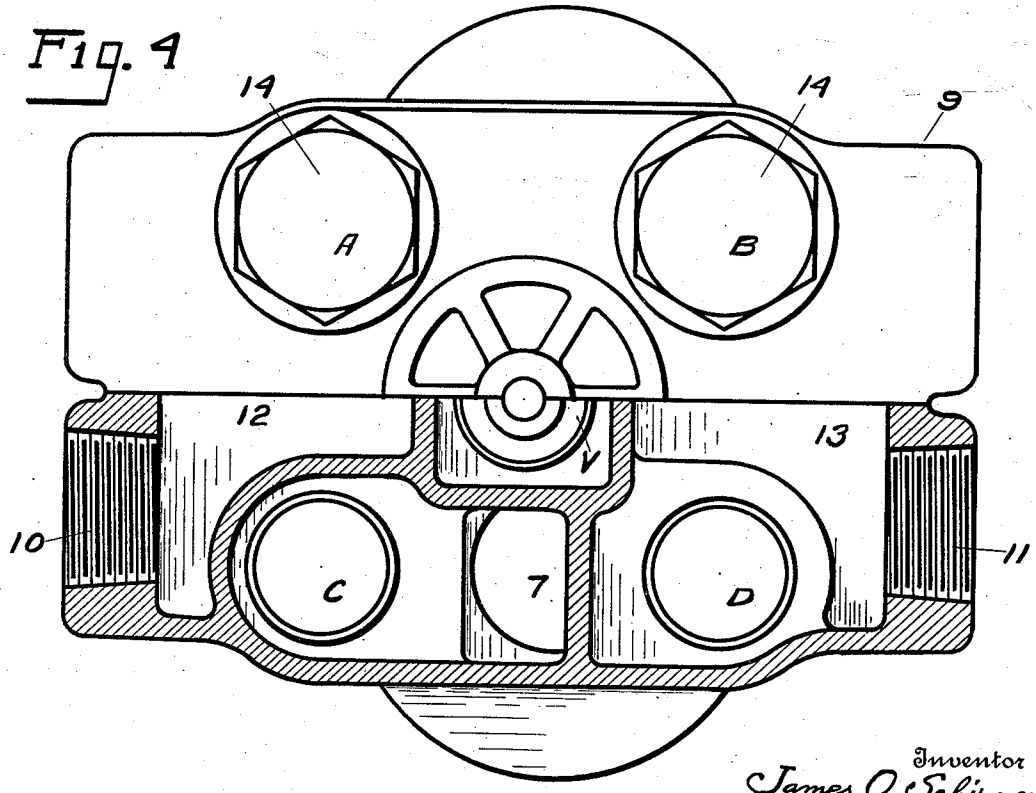



Fig. 4




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# UNITED STATES PATENT OFFICE.

JAMES O. SCHIRMER, OF CLEVELAND, OHIO, ASSIGNOR TO THE VIKING PUMP COMPANY, OF CEDAR FALLS, IOWA, A CORPORATION.

## AUTOMATIC REVERSING DEVICE FOR ROTARY PUMPS.

1,307,602. Specification of Letters Patent. Patented June 24, 1919.

Application filed December 2, 1918. Serial No. 264,981.

*To all whom it may concern:*

Be it known that I, JAMES O. SCHIRMER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Automatic Reversing Devices for Rotary Pumps, of which the following is a specification.

This invention relates to rotary pumps and has for its object to provide improved means for permitting the reversal of the direction of rotation of the pump without reversing the direction of flow in the ultimate discharge pipe. That is to say, between the pump proper and its suction and discharge pipes, a multiple valve is provided which will automatically act to connect the inlet to either side of the pump and connect the discharge to the opposite side of the pump, according to the direction of rotation of the pump, whereby the flow in one direction is continued even if the pump is reversed.

Such an invention is useful in many relations. For example, a reversible engine may drive a pump, as for instance the water circulating pump, the fuel pump, or the oil pump of an internal combustion engine. Certain reversible machine tools also have pumps operating in connection therewith. In these and other relations, it is desirable that the pump continually operate to pump the liquid in the same direction regardless of the direction of rotation, and the present invention accomplishes this object.

One embodiment of the invention is illustrated in the accompanying drawings in which—

Figure 1 is an end elevation partly in section.

Fig. 2 is a side elevation partly in section on the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 is a section on the line 4—4 of Fig. 2.

Referring specifically to the drawings, 6 indicates a rotary pump, as a whole. This may be of any suitable type, provided it is capable of reverse rotation, and the ports and passages thereto are indicated at 7 and 8 respectively, conveniently located at the top of the casing to connect with chambers in a quadruple valve casing 9 conveniently mounted thereon. This casing contains an inlet opening 10 and an outlet opening 11, which functions exist in either direction of rotation of the pump. The inlet port 10 opens to a transverse inlet chamber 12, and the outlet port opens from a transverse outlet chamber 13, these chambers being cored in the casing and separated by diaphragms in which the valve seats are formed. The suction valves are indicated at A and C and the discharge valves at B and D. All these valves open upwardly and are accessible through bonnets 14. The valves A and C communicate with the inlet chamber 12 and the valves B and D with the discharge chamber 13. The valves C and D communicate with the port 7 and the valves A and B with the port 8, but it will be noticed that the port 7 communicates with the upper side of the valve C and with the lower side of the valve D and similarly the two opposite valves with respect to the port 8.

Assuming now that the pump is rotating in clockwise direction in Fig. 1, the port 7 is the inlet, and the suction through the same acts to lift the valve C from its seat and fluid is drawn from the chamber 12, and the same suction tends to hold the valve D to its seat. Passing through the pump the fluid escapes through the port 8 and lifts the valve B and discharges into the chamber 13, and the pressure on top of the valve A holds the same closed.

When the pump is reversed, the suction is through the port 8, and this lifts the valve A and closes the valve B and the liquid flows in reverse direction through the pump and out through the port 7, lifting the valve D and closing the valve C, and discharging into the chamber 13.

Hence the pump may be driven in either direction but the flow through the inlet and outlet will be in the same direction.

For regulating the flow, I provide a by-pass valve V in the partition between the suction chamber 12 and the discharge chamber 13 and by opening this valve, part or all of the flow may be by-passed from one side to the other. I have shown a hand-operated valve, but an automatic pressure actuated valve may be substituted to prevent excessive pressure on the discharge side. This valve V is conveniently located in a central position between the four valves above described.

I have shown one form of this invention

for the purpose of illustration, but obviously the by-pass valve may be omitted, and the arrangement and construction may be modified in various ways within the scope of the invention.

I claim:

1. The combination with a reversible rotary pump the casing of which has inlet and outlet ports side by side, of a single valve casing mounted on the pump casing and having passages opening through one wall thereof to said ports, and said casing having transverse inlet and outlet chambers extending across the same, and valves between the chambers and each of said passages, said valves being all accessible through the wall of the valve casing opposite to said wall.

2. The combination with a reversible rotary pump the casing of which has a pair of inlet and outlet ports standing side by side, of a unitary valve casing removably mounted on top of the pump casing, said valve casing having passages at opposite sides thereof communicating with said ports, and transverse inlet and outlet chambers at opposite ends thereof, a valve between each end of each chamber and each passage, and removable bonnets in the top of the valve casing, through which said valves are accessible.

3. The combination with a reversible rotary pump the casing of which has a pair of inlet and outlet ports located side by side, of a box-like valve casing mounted on the pump casing and having passages at opposite sides thereof communicating with said ports and transverse inlet and outlet chambers at opposite ends thereof, a valve between each end of each chamber and each passage, and a central by-pass valve between said chambers, all of said valves being accessible at the top of said valve casing.

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

JAMES O. SCHIRMER.

Witnesses:

JOHN A. BOMMHARDT,

W. J. MARTIN.