

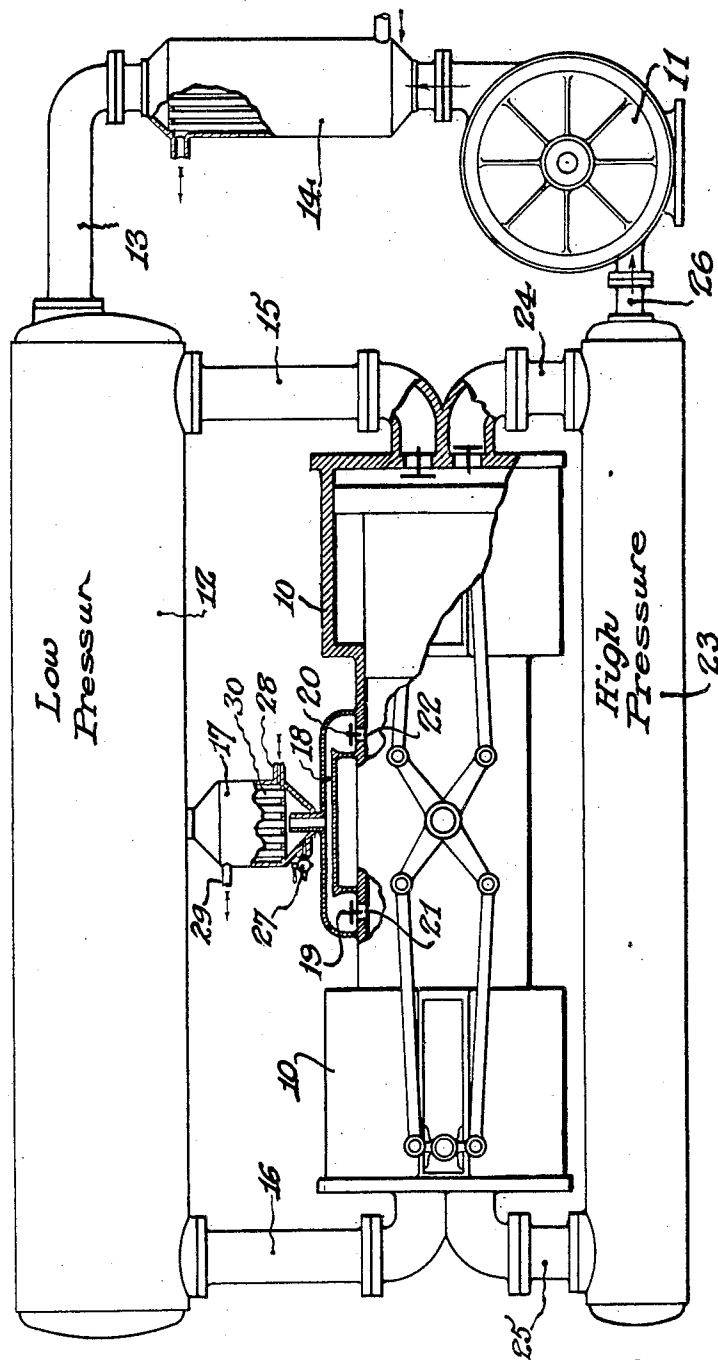
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FLUID TRANSMISSION SYSTEM

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FLUID TRANSMISSION SYSTEM

Application filed June 2, 1927, Serial No. 195,982, and in France June 21, 1926.

My invention relates to improvements in motor compressor apparatus used in connection with motors or turbines operated by the fluid compressed thereby, and the object of my invention lies in the provision of certain novel forms, construction, and combination of parts for providing reliable devices for the purposes stated and to cheapen the cost of manufacture, all of which will hereinafter be fully described and claimed.

A further object of my invention is to provide a device of the character indicated which shall be particularly applicable to the devices forming the subject of the invention described in my co-pending application Serial No. 177,938 filed March 24th 1927, and my United States Patents Nos. 1,747,948, 1,732,693, 1,732,694 and 1,766,682, to which this is a companion application.

Other objects of the invention will be obvious to those skilled in the art to which it relates in the following description taken in connection with the accompanying drawing in which—

The single figure represents a diagrammatic plan view of an apparatus constructed in accordance with the present invention.

Referring to the drawing, 10 represents the compressor cylinders of a main internal combustion motor compressor, in which direct acting pistons similar to those shown in the specification of my United States Patent No. 1,732,693 are mounted to move in opposite directions, the said pistons having combined therewith compressor pistons working in their associated cylinders, the return strokes of the pistons being effected by compressed air coming in the spaces between the ends of the compressor pistons and the delivery ends of the compressor cylinders, said pistons being synchronized by a mechanism similar to that disclosed in my above mentioned United States Patent No. 1,747,948, the said motor cylinders communicating with a fluid motor 11 which may be a turbine of any appropriate kind.

A compressed gas tank 12 which operates under low pressure receives at one end the exhaust gases of the motor 11 through the pipe 13 and the cooler 14 and feeds the com-

pressor cylinders 10 through the pipes 15 and 16. This cooler 14 has for object to lead gases which are as cold as possible to the reservoir 12 in order to supply the compressor side of the motor compressor under the best yield conditions. The tank is also placed in communication with the motor cylinder of compressor cylinders 10 through a small condensing cooler 17, a pipe 18 and two automatic valves 19 and 20. The condensing cooler 17 comprises a casing having located therein a plurality of open-ended tubes 30 carried by diaphragms at the ends of the tubes, extending completely across the interior of the casing. The diaphragms are perforated to receive the ends of the tubes (as shown at one end) to form a jacketed space around the tubes. This space has an inlet conduit 28 and an outlet conduit 29 through which and the jacketed space an appropriate fluid such as air or water is circulated in the direction of the arrows, the arrangement being such that exhaust gases can pass from the motor cylinder through the automatic valves 19 and 20 and pipe 18 into the cooler 17, the said gases passing through the cooled tubes 30 and into the tank 12. The orifices 21, 22 controlled by said valves are located in the wall of said motor cylinder. The orifices 21 and 22 are so disposed in the motor cylinder of the compressor with respect to the driving pistons thereof that at the moment when the pressure of the burned gases in said motor cylinder is equal to the pressure which must normally prevail in the low pressure tank 12 said orifices will be uncovered by the pistons during their expansion stroke.

A high pressure gas tank 23 receives the fluid compressed by the compressor cylinders 10 through the pipes 24 and 25 and feeds the motor 11 through the pipe 26.

The system is supplied with an inert gas as a circulating fluid, that is, a gas which does not support combustion. The gas I use is taken from the exhaust pipe of the motor cylinder of the compressor previously cooled and separated out from its water of

condensation. The operation of my apparatus takes place as follows:

The motor compressor draws in the fluid contained in the tank 12, continually, compresses it and pushes it back in the tank 23. The motor 11 receives this fluid at high pressure by the tube 26 and exhausts after expansion at low pressure and cooling in the cooler 14, into the tank 12 by way of the conduit 13. The cooler 14 is similar in structure to the cooler 17 and is cooled by the circulation therethrough in the direction of the arrows of an appropriate fluid such as air or water, and has for a purpose to continually throw off the surplus heat contained in the gas after expansion and accomplishment of work in the motor 11, so that the best yield condition is maintained in the compressor cylinders.

The gas losses produced in the system such as through the joints of the apparatus are compensated for by the feeding arrangement comprising the pipe 18, valves 19, 20 and the cooler 17, cooled as heretofore stated by the circulation therethrough of an appropriate fluid, the replenishing of which takes place automatically. At each expansion stroke of the pistons of motor compressor the orifices 21, 22 are uncovered by the motor pistons and when the pressure in the motor cylinder is slightly in excess of that in the tank should the pressure in the tank be less than that required, the valves 19 and 20 are raised and inert gas penetrates the tank 12 after passing through the cooler 17 which both lowers its temperatures and condenses the water held in suspension therein. The drain cock 27 is provided for drawing off this water of condensation at suitable intervals. In this manner the pressure in

tank 12 is constantly maintained in the neighborhood of its normal value. For example, if the pressure in the reservoir 12 drops, by reason of leakages in the channels below a predetermined value, e. g., 71 pounds per square inch, at which pressure it balances the valves 19 and 20, the said valves are so loaded that the pressure of exhaust gases in the motor cylinder will operate to open the valves to allow the gas to pass to the cylinder 12. When, however, the pressure of the gas in the cylinder 12 reaches its predetermined value, i. e., 71 pounds per square inch, this pressure will maintain the valves 19 and 20 closed and the burnt gases are evacuated from the motor cylinder by the opening of the ordinary exhaust outlets of the said cylinder.

Many variations in my apparatus may be made by those skilled in the art without departing from my invention, since

What I claim is—

In a power transmission system employing a gas compressor worked directly by internal combustion and having a piston moving freely in a cylinder, and a closed circuit containing an inert gas, a high pressure tank into which the compressor feeds, a low pressure tank from which the compressor takes its supply, a fluid motor fed from said high pressure tank and exhausting into the low pressure tank, that portion of the cylinder in which the combustion takes place having outlet apertures and passages leading from said apertures to the low pressure tank, and non-return valves associated with said apertures and passages whereby the desired pressure in the closed circuit is maintained.

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