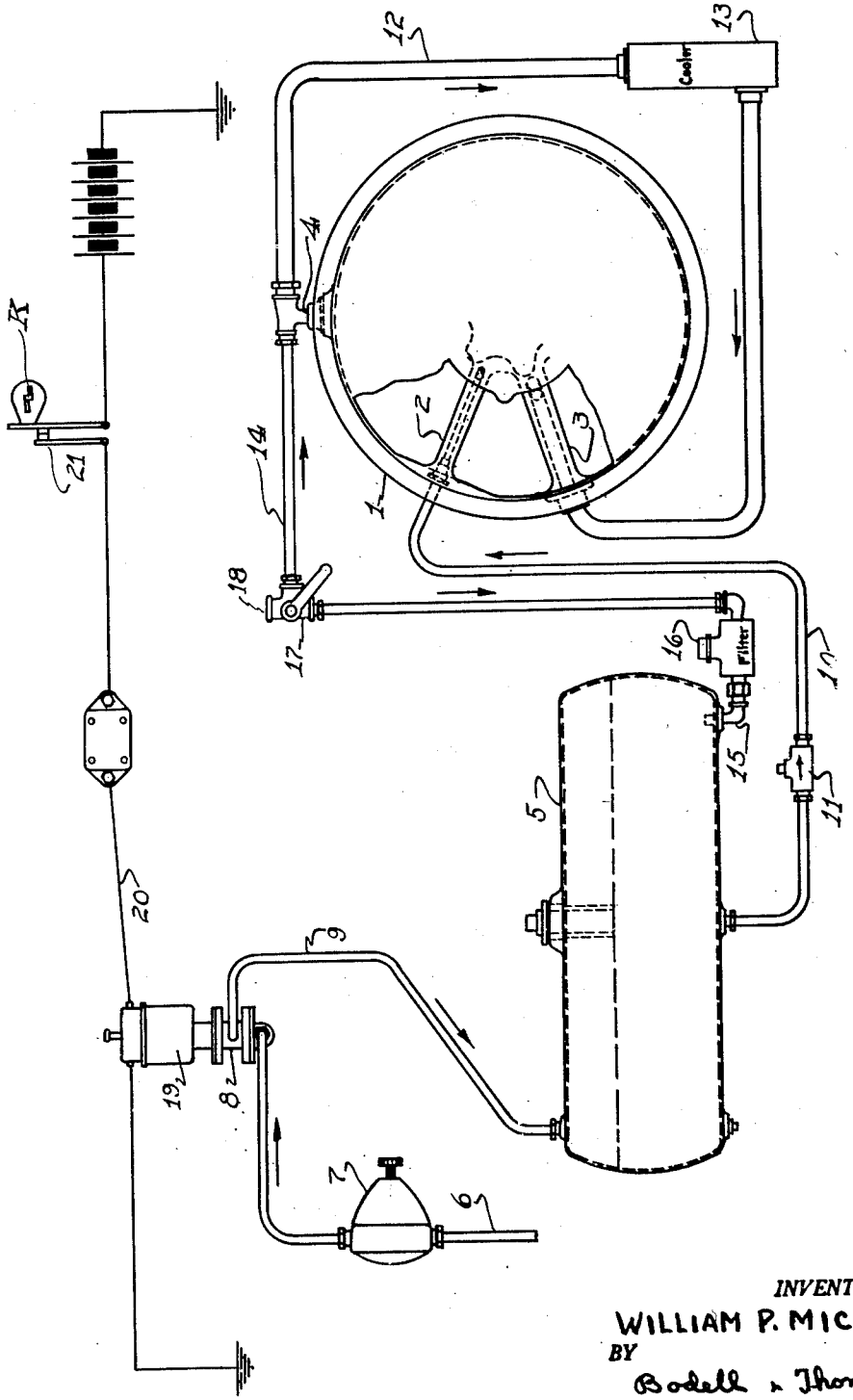
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FLUID SYSTEM FOR HYDRAULIC TORQUE CONVERTERS

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FLUID SYSTEM FOR HYDRAULIC TORQUE CONVERTERS

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2 Claims. (Cl. 60—54)

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This invention relates to hydraulic converters which include a stationary outer casing and a pump wheel, a reactor and a runner or turbine in the casing, and has for its object a fluid system including a fluid supply tank kept under a predetermined air pressure in order to maintain a steady and even pressure to the converter casing, the tank being used in place of the usual pump. With the usual pump, there is not sufficient pressure when idling, and frequently too much pressure when the converter is being operated at higher speeds. By the use of the tank in the fluid system, the pump is dispensed with and the flow of fluid to the converter to keep it full is steady and even, so that constant pressure is maintained.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawing which is a diagram of this fluid control system.

1 designates the outer casing or housing of the hydraulic converter, this being formed with a primary inlet 2 from the periphery thereof radially inward toward the axis of the converter. 3 designates a secondary inlet similarly arranged, and 4 an outlet. The torque converter may be of any well known construction or type, for instance, such as seen in Lysholm Patent 1,934,936, November 14, 1933.

5 designates a pressure tank for the fluid to which a predetermined air pressure is applied to the surface of the fluid from a suitable source through a pipe 6 having a pressure regulating valve 7 therein, and also having a control valve 8, the outlet pipe 9 of which opens into the top of the tank 5. The tank has an outlet pipe 10 having a suitable back flow check valve 11 therein, the pipe 10 leading to the primary inlet 2 of the converter.

12 designates a circulating pipe leading from the outlet 4 to the secondary inlet 3 of the converter, a suitable heat exchanger or cooler 13 being located in the pipe 12. The pipe 12 is one branch or return pipe of a circulating system. 14 designates another branch or pipe of the circulating system, this leading from the outlet 4 to the tank 5 and opening through the bottom of the tank at 15. The pipe 14 has a suitable filter 16 therein. It also has a valve 17 therein, this being a three-way valve operable into a closed position, or into an open position, or into a third position in which the converter is vented at 18 to the outer air.

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The valve 8 in the air pipe 6 is electrically operated as by a solenoid 19 connected in an electric circuit 20 in which the ignition switch 21 of the vehicle is located. When the ignition switch 21 is closed by the turning of the ignition key K, the solenoid is energized to open the air valve 8, permitting the air under pressure to build up on the surface of the fluid in the tank 5. The fluid is forced from the tank at an even rate into the primary intake 2 to the center of the converter and thrown out centrifugally by the rotors or the pump wheel and turbine or runner therein. Some of the fluid, of course, passes directly from the runner back to the pump wheel while a considerable portion passes out through the outlet 4 and circulates back to the converter casing through the pipe 12 and the secondary inlet 3. With the valve 17 set in its normal postion, also some of the fluid returns directly to the tank 5 through the outlet pipe 14, but this valve may be opened to the outer air to vent the pressure system during filling of fluid into the tank. The turbine casing must be kept full and when, through loss of fluid, it becomes low, the valve 17 is operated to vent the turbine to the outer air through the pipe 14 while oil is being fed into the turbine casing from the tank 5 through the pipe 10 while the pump wheel and runner are idle, or not rotating.

The air pressure applied to the surface of the oil in the tank through the pipe 9 and the pressure regulating valve 7 is less than the pressure created at the periphery of the rotors of the converter and hence, the pressure of the oil through the outlet 4 and the pipe 14 is greater than the air pressure applied to the surface of the oil in the tank 5 through the air pipe 9, as the outlet is located at the periphery of the casing 1. For example, the pressure regulator may be set to permit forty pounds, pressure to be applied to the surface of the fluid in the tank while the pressure at the converter outlet is from seventy to eighty pounds. By reason of the use of the pressure tank, a pump is dispensed with and the pressure of the air on the fluid in the tank is always steady and even and hence, the operation of the converter steady, even and more satisfactory than when a pump is used to supply the fluid to the converter.

What I claim is:

1. A fluid system for hydraulic torque converters which comprise a stationary circular casing enclosing the axially alined pump wheel and turbine of the torque converter, the casing having an inlet for the hydraulic fluid communicating

with the axial portion of the casing and an outlet leading from the peripheral portion of the casing, the system being characterized by a closed supply tank for hydraulic fluid, a source of pressure air, pressure regulating means to maintain the fluid in said tank under constant predetermined and uniform air pressure less than the pressure of said fluid generated within the peripheral portion of the casing, the tank having an outlet from the bottom thereof to the inlet of the converter and a return pipe from the outlet of the converter to the bottom of the tank to supply fluid from said tank to said converter and return fluid to said tank at points below the level of the fluid in said tank.

2. A fluid system for hydraulic torque converters which comprise a stationary circular casing enclosing the axially alined pump wheel and turbine of the torque converter, the casing having an inlet for the hydraulic fluid communicating with the axial portion of the casing and an outlet leading from the peripheral portion of the casing, the casing also having a second inlet opening into the axial portion of the casing, a conduit

connecting the peripheral outlet and the second inlet; the system being characterized by a closed supply tank for hydraulic fluid, a source of pressure air, means to maintain the fluid in said tank under constant predetermined and uniform air pressure less than the pressure of the fluid generated in the casing at the peripheral outlet, a conduit leading from the bottom of the tank to the first inlet of the casing, and a conduit leading from the peripheral outlet of the casing to the bottom of the tank to return fluid to said tank below the level of the fluid in said tank.

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