June 11, 1940. R. L. OHLS 2,203,874

GOVERNOR

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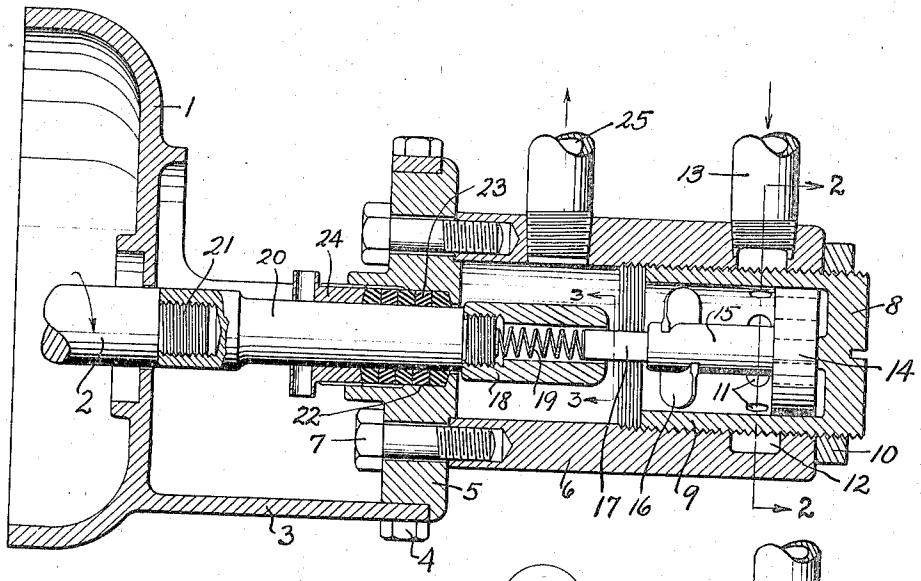


Fig. 1.

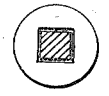


Fig. 3.

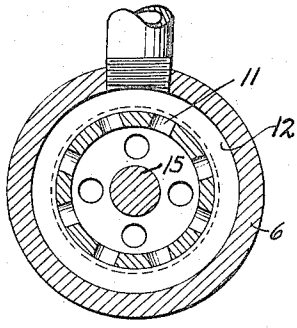


Fig. 2.

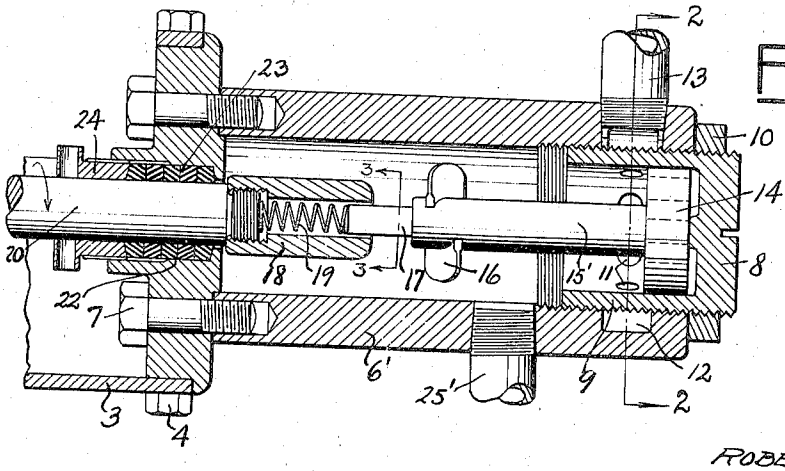


Fig. 4.

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GOVERNOR

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9 Claims. (Cl. 137—158)

This invention relates in general to governors, and more particularly to that type of governor which is adapted to control the speed of a rotary engine, or other engine having a rotating part.

The general object of this invention is to provide a governor which will accurately control the speed of such an engine within very small limits, and which will be substantially free from trouble due to breakdowns, wear, etc.

Other objects and advantages will become apparent from the following description, taken in connection with the accompanying drawing, it being understood that the same set forth certain embodiments of this invention, by way of illustration and example only, and that the same are not to be taken by way of limitation.

In the drawing:

Fig. 1 is a vertical cross section view through a governor constructed in accordance with this invention.

Fig. 2 is a transverse vertical cross section through the same structure, taken along the line 2—2 of Fig. 1.

Fig. 3 is a similar view taken along the line 3—3 of Fig. 1 and showing a detail of the construction.

Fig. 4 is a view similar to Fig. 1, but showing a slightly modified form.

Referring now more specifically to the drawing, the numeral 1 indicates the housing of a rotary or other engine, and the numeral 2 the rotating shaft of such an engine. The housing 1 in the engine shown is provided with a bracket 3, to which is bolted, by means of bolts 4, one of the heads 5, of the governor structure to which this invention applies.

Secured to this head 5, and extending in a direction away from the housing 1, is a hollow member 6, which forms the housing for the governor. This member is secured to the head 5 by means of cap screw 7, or by any other similar suitable means.

The opposite end of the housing 6 is provided with internal threads adapted to receive a plug member 8, which has a skirt extending a substantial distance along the inner wall of the housing 6, as shown at 9, and which is locked at position by means of a lock nut 10. The inner wall of this skirt 9 is machined to form a substantially cylindrical opening, and is provided at one portion of its length with lateral openings 11, which communicate with an annular chamber or space 12, this space 12, in turn, being in communication with the input line 13.

Mounted for rotation, and for longitudinal movement within the cylindrical opening of the skirt 9, is a piston-like element 14, having a stem 15, extending toward the head 5, and on this stem 15, there are mounted a plurality of propeller blades 16, these blades being of such shape that when rotated within a fluid, they will tend to move in a longitudinal direction with respect to the housing 6.

The left hand end of the extension 15, as seen in Figure 1, is formed with a square cross section, shown more in detail in Figure 3 of the drawing, and is designated by the numeral 17. This portion is adapted to fit within the socket member 18 of similar cross section, and to bear against a spring 19, which tends at all times to urge the piston 14 and its connected parts toward the right hand end of the device as seen in Figure 1.

The socket 18 is carried by means of a threaded connection on a short length of shaft 20, which is secured by a threaded connection 21 to the end of the power shaft 2 of the engine, and which passes through a stuffing box 22 in the head 5. This stuffing box 22 is provided with conventional packing element 23, and with a gland nut 24 of conventional design.

In operation, it will be seen that the power fluid to be supplied to the engine will enter the governor device through the pipe 13, and the openings 11. It will then flow toward the left, as shown in Figure 1, and will flow out through a pipe 25, to the intake of the engine. As the speed of the engine increases, the speed of rotation of the shafts 2 and 20 will increase, and hence the speed of rotation of the piston 14 will increase. Inasmuch as the propeller blades 16 are carried on the piston 14, the speed of these propeller blades will likewise increase, and there will be a tendency for the propeller blades, the piston 14, and the associated parts to move toward the left, as the speed of the engine increases. This will be due not only to the flow of power fluid past the propeller blades, but also to the increased rotation of the propeller blades, and the reaction of these blades on the power fluid.

As the piston 14 is moved toward the left, it will be seen that it will begin to cover up the ports 11, and thus reduce the flow of power fluid to the engine 1. And, naturally, as the flow of power fluid to the engine is reduced, the speed of the engine will be reduced, and the reaction of the propeller blades upon the power fluid within the governor will likewise be reduced. A

position of equilibrium will be attained, which will serve to regulate the speed of the engine.

Referring now to Figure 4, the device illustrated is substantially the same as that shown in Figure 1, with the exception that the governor housing 6', and the stem 15', are made longer, and the outlet pipe 25' is positioned so that the power fluid will not flow past the propeller blades 16.

The operation of the device just described will be identical with that shown in Figure 1, with the exception that the flow of the power fluid will have no effect upon the propeller blades 16. Instead, the entire effect upon these propeller blades will be caused by the reaction of these blades due to their rotation, and this rotation will take place in a portion of the power fluid where that fluid is static.

Having described my invention, I claim:

1. In a governor for an engine having a rotary part and actuated by a power fluid, a propeller located in a space adapted to contain such power fluid and connected to said rotary part for actuation thereby, a valve connected to said propeller for controlling the flow of power fluid to said engine, means normally maintaining said propeller in position to hold said valve open and yieldable under the reaction of said propeller in operation against the power fluid to permit said propeller to shift and move said valve toward closed position.

2. In a governor for an engine actuated by a power fluid, a propeller located in a space adapted to contain such power fluid and connected to said engine for actuation thereby, a valve connected to said propeller for controlling the flow of power fluid to the engine, means normally maintaining said propeller in a position to hold said valve open and yieldable under the reaction of said propeller in operation against the power fluid, to permit said propeller to shift and move said valve toward closed position.

3. In a governor for an engine adapted to be actuated by a power fluid, means for causing a reaction against a body of the power fluid depending upon the speed of the engine, said means being shiftable under the influence of such reaction, and a normally open valve for controlling the flow of power fluid to the engine, said valve being connected to said means and shiftable therewith by such reaction toward closed position.

4. In a governor for an engine having a rotary part and actuated by a power fluid, a screw propeller located in a space adapted to contain such power fluid and connected to said rotary part for rotation thereby, said screw propeller being axially shiftable, a valve connected to said propeller for controlling the flow of power fluid to the engine, means normally maintaining said propeller in such axial positon as to hold said valve open, said means being yieldable under the reaction of said propeller in operation against the power fluid to permit said propeller to shift axially and move said valves toward closed position.

5. In a governor for an engine adapted to be actuated by a power fluid, a propeller located in a space adapted to contain such power fluid and connected to said engine for actuation thereby, a piston valve connected to said propeller and shiftable for controlling the flow of power fluid to the engine, means normally maintaining said propeller in position to hold said piston valve open, said means being yieldable under the reaction of said propeller in operation against the power fluid to permit said propeller to shift and move said valve toward closed position.

6. In a governor for an engine having a rotary part and actuated by a power fluid, a screw propeller located in a space adapted to contain such power fluid connected to said rotary part for actuation thereby, a rotatable piston valve directly connected to said propeller and axially shiftable for controlling the flow of power fluid to the engine, means normally maintaining said propeller in such axial position as to hold said valve in open position, said means being yieldable under the reaction of said propeller in operation against the power fluid to permit said propeller to shift and move said rotatable piston valve toward closed position.

7. In a governor for an engine adapted to be actuated by power fluid, a propeller located in the path of flow of said power fluid as it flows toward the engine, said propeller being connected to said engine for actuation thereby, a valve connected to said propeller for controlling the flow of the power fluid to the engine, means for normally maintaining said propeller in position to hold said valve open, said means being yieldable under the reaction of said propeller in operation against the flowing power fluid to permit said propeller to shift and move said valve toward closed position.

8. In a governor for an engine adapted to be actuated by a power fluid, a propeller located in the path of flow of said power fluid toward said engine for actuation thereby, a valve connected to said propeller for controlling the flow of the power fluid to said engine, means normally maintaining said propeller in positon to hold said valve open, said means being yieldable under the reaction of said propeller in operation against the power fluid to permit such propeller to shift and move said valve toward closed position, said propeller being so located in the path of flow of said power fluid that the flow of said power fluid against said propeller will tend to move said propeller in a direction to close said valve.

9. In a governor for an engine adapted to be actuated by a power fluid, a propeller located in a space adapted to contain such power fluid but out of the direct path of flow thereof, said propeller being connected to said engine for actuation thereby, a valve connected to said propeller for controlling the flow of power fluid to the engine, means normally maintaining said propeller in position to hold said valve open, said means being yieldable under the reaction of said propeller in operation against the power fluid to permit the propeller to shift and move said valve toward closed position.

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