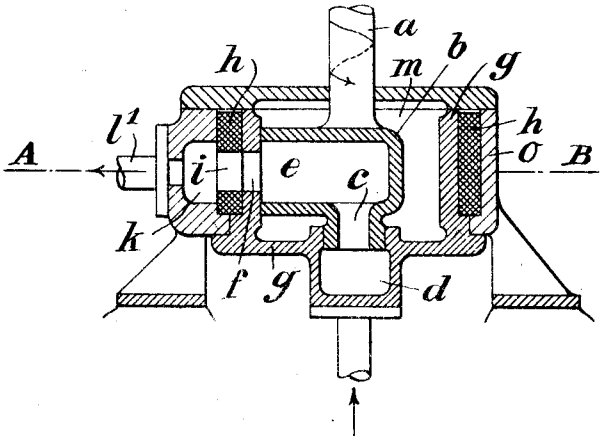
H. HOLZWARTH.

APPARATUS FOR ACTUATING AND GOVERNING PARTS OF GAS TURBINES AND OTHER MOTIVE POWER DEVICES.

APPLICATION FILED DEC. 30, 1912.

1,084,740. Patented Jan. 20, 1914.

FIG. 1.



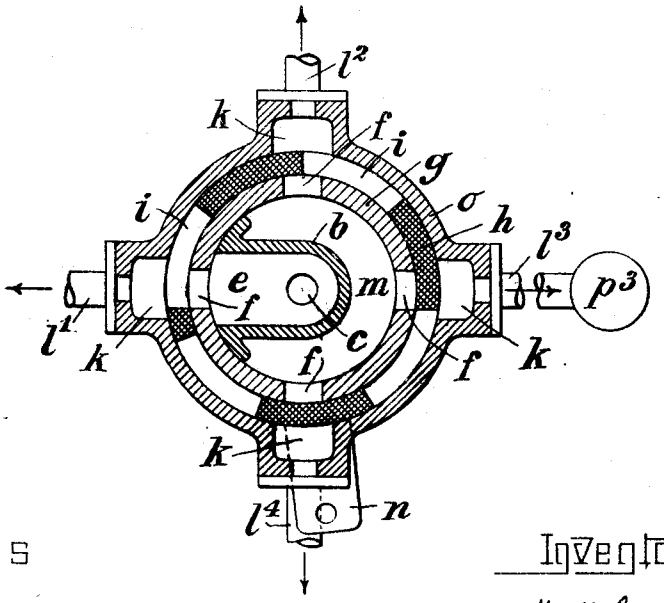


FIG. 2.

Witnesses

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HANS HOLZWARTH, OF MÜLHEIM-ON-THE-RUHR, GERMANY.

APPARATUS FOR ACTUATING AND GOVERNING PARTS OF GAS-TURBINES AND OTHER MOTIVE-POWER DEVICES.

1,084,740. Specification of Letters Patent. Patented Jan. 20, 1914.

Application filed December 30, 1912. Serial No. 739,365.

To all whom it may concern:

Be it known that I, HANS HOLZWARTH, a subject of the German Emperor, residing at Mülheim-on-the-Ruhr, in the Empire of Germany, have invented certain new and useful Improvements in Apparatus for Actuating and Governing Parts of Gas-Turbines and other Motive-Power Devices, of which the following is a specification.

This invention which is shown in the accompanying drawing has for its object a combination of hydraulic actuating gear and hydraulic governing gear for parts of motive power devices. It is intended primarily for gas turbines, more particularly those of the type dealt with in Holzwarth's book "*Die Gas Turbine*," Munich, 1911, "*The Gas Turbine*," London, 1912, which are characterized by a particularly simple, compact and practical construction.

When used with the above mentioned gas turbines, the combined arrangement has the double object of firstly operating successively the members which are to be controlled, and secondly of varying or stopping and starting this operation in dependence on the governor.

In the accompanying drawings: Figure 1 is in axial section; and Fig. 2, a section on the line A—B of Fig. 1 of a combined oil actuating and governing arrangement according to this invention.

It is here assumed that four valves are to be controlled by means of oil under pressure, these valves belonging to four different explosion chambers of the same gas turbines.

A distributer b is rotated by a shaft a and is in communication with a chamber d by means of a central nozzle c which, if desired, may be specially packed. The oil is forced into the chamber d by a pump or the like. The outlet passage e of the distributer b comes, during each revolution, successively into communication with chambers k disposed around it and connected by pipes or suitable passages l_1, l_2, l_3, l_4, with four chambers (of which only one, indicated by p_2, is shown in the drawing) containing the moving devices, for instance pistons, controlling the four valves to be actuated. The arrangement may, for instance, be such that each valve is opened when the distributer supplies oil under pressure to the chamber containing its operating piston. When communication between the distributer passage e and a (respective) chamber k has ceased, this chamber is put into communication with the space m from which the oil returns to the pump or the like. The distributer b however does not move directly past the apertures leading to the chambers k, but works in a separate casing g which has ports or perforations f corresponding to the chambers k.

Between the outer surface of the casing g and the surface which faces it, that is to say the inner surface of the casing o containing the chambers k, a governing ring h is inserted. This ring can be moved by means of the arm n by the governor or servo-motor. This governing ring also has four ports i which are so arranged that the ports of the separate chambers k and valves may be uncovered in succession by the movement of the governing ring h caused by the governor or servo-motor. The valves or the like may thus be brought into or out of action successively and to varying extents by means of the governor or servo-motor.

The movement of the governing ring may be of any suitable kind (axial displacement, rotation or the like). A rotary movement is preferable and is the one provided in the example of construction illustrated.

I declare that what I claim is:—

1. An arrangement for hydraulically controlling and governing parts of motive power devices, comprising a movable distributer, means for guiding said distributer in a fixed path, a series of ported boxes located along the path of movement of the distributer, a ported slide located between said distributer and said boxes and adapted to be displaced by a governor, means for supplying liquid to the distributer, and connections between the said boxes and the parts to be controlled.

2. An arrangement for hydraulically controlling and governing parts of motive power devices, comprising a rotary distributer, a series of ported boxes disposed around said distributer, a ring provided with ports and located between the said distributer and the said boxes and adapted to be angularly displaced by the governor, means for supplying liquid to the distributer, and means for conveying the liquid from the boxes to the members to be controlled.

3. An arrangement for hydraulically controlling and governing parts of motive

power devices, comprising a distributer, a ported wall against which the outlet port of the distributer fits, means for producing relative movement between said distributer and said ported wall, a series of hollow members having openings located adjacent the ports in said wall and spaced a short distance away from said wall on the side remote from the distributer, a ported slide located between said wall and said members and adapted to be displaced by a governor, means for supplying liquid to the distributer, and connections between the said members and the parts to be controlled.

4. An arrangement for hydraulically controlling and governing parts of motive power devices, comprising a rotary distributer, a circular ported wall adjacent the inside of which the port leading from said distributer is located, a series of hollow members disposed around the outside of said wall and spaced a short distance therefrom and having openings on the side adjacent thereto, a ported ring located between said wall and said members and adapted to be angularly displaced by the governor, means for supplying liquid to the distributer, and means for conveying the liquid from the said members to the parts to be controlled.

5. An arrangement for hydraulically controlling and governing parts of motive power devices, comprising a distributer, a series of hollow members having ports on the side adjacent the distributer, means for producing relative motion between said distributer and said members, a ported slide located between said distributer and said members and adapted to be displaced by a governor, said slide having its ports spaced at different intervals along the path of the distributer as compared with the spacing of the ports in said members, means for supplying liquid to the distributer, and connections between the said members and the parts to be controlled.

6. An arrangement for hydraulically controlling and governing parts of motive power devices, comprising a rotary distributer, a series of hollow members disposed around said distributer and having ports open on the side adjacent said distributer, a ring provided with ports and located between the said distributer and the said members and adapted to be angularly displaced by the governor, the ports in said ring being spaced at different intervals around said ring as compared with the spacing of the ports in said members, means for supplying liquid to the distributer, and means for conveying the liquid from the members to the parts to be controlled.

7. An arrangement for hydraulically controlling and governing parts of motive power devices, comprising a distributer, a ported wall against which the outlet port of the distributer fits, means for producing relative movement between said distributer and said ported wall, a series of hollow members having openings located adjacent the ports in said wall and spaced a short distance away from said wall on the side remote from the distributer, a ported slide located between said wall and said members and adapted to be displaced by a governor, said slide having its ports spaced at different intervals in its length as compared with the spacing of the ports in the said wall, means for supplying liquid to the distributer, and connections between the said members and the parts to be controlled.

8. An arrangement for hydraulically controlling and governing parts of motive power devices, comprising a rotary distributer, a circular ported wall adjacent the inside of which the port leading from said distributer is located, a series of hollow members disposed around the outside of said wall and spaced a short distance therefrom and having openings on the side adjacent thereto, a ported ring located between said wall and said members and adapted to be angularly displaced by the governor, the ports in said ring being spaced at different intervals around said ring as compared with the spacing of the ports in the circular wall, means for supplying liquid to the distributer, and means for conveying the liquid from the members to the parts to be controlled.

In witness whereof, I have hereunto signed my name this 11th day of December 1912, in the presence of two subscribing witnesses.

HANS HOLZWARTH. [L. S.]

Witnesses:
HELEN NUFER,
ALBERT NUFER.