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GOVERNING MECHANISM FOR ENGINES.

APPLICATION FILED JULY 7, 1914.

1,240,739.

Patented Sept. 18, 1917.

Fig. 1.

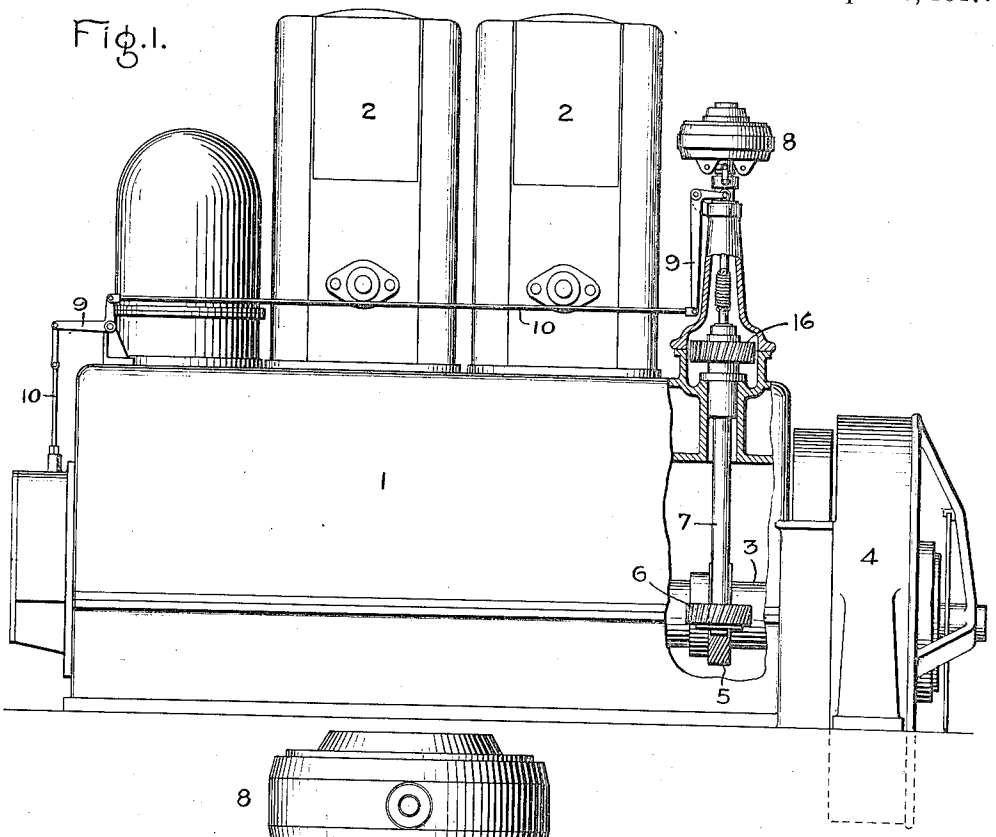
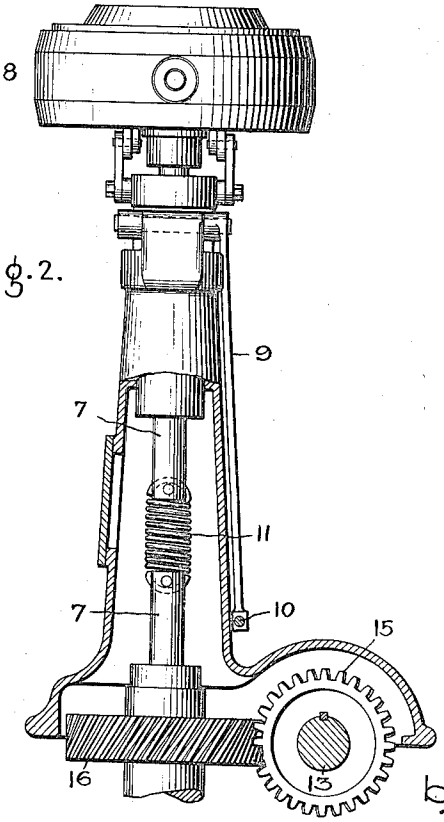


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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GOVERNING MECHANISM FOR ENGINES.

1,240,739. Specification of Letters Patent. Patented Sept. 18, 1917.

Original application filed June 12, 1913, Serial No. 773,160. Divided and this application filed July 7, 1914. Serial No. 849,611.

To all whom it may concern:

Be it known that I, HERMANN LEMP, a citizen of the United States, residing at Erie, county of Erie, State of Pennsylvania, have invented certain new and useful Improvements in Governing Mechanism for Engines, of which the following is a specification.

The present invention is a division of my prior application Ser. No. 773,160, filed June 12, 1913 and is made under the requirements of the United States Patent Office.

This invention relates to governing mechanism for regulating the speed of prime movers, and especially high compression internal combustion engines of the reciprocating type. It is customary to drive the speed governor by a shaft geared to the main shaft of the engine. Experience has demonstrated that inaccuracies in the cutting of gears connecting said shafts frequently result in a slight periodic acceleration or retardation of the speed governor, thus giving rise to minor speed variations of the engine. The same effect is also brought about by slight irregularities in the load or in the action of the engine itself. I have found that by including an elastic means between the main shaft and the governor, as for example by making the governor shaft in two parts connected by a relatively stiff spring, the objections above noted are overcome; the spring transmitting the power necessary to drive the governor but preventing or largely reducing the direct transmission of sudden irregular motions. In other words the inclusion of a relatively stiff elastic connection between the main shaft and the speed governor has the effect of making the governor less sensitive to certain speed variations transmitted to it locally from the engine itself without, however, interfering with its normal capacity to perform work.

In the accompanying drawing which illustrates one embodiment of my invention, Figure 1 is a side elevation of an internal combustion engine driving a compound wound electric generator and equipped with my improved governor. Fig. 2 is a side elevation partly in section showing the governor on a large scale.

The engine has a base 1 supporting cylinders 2, of which one or more may be provided. Each cylinder may have one or two pistons as desired. 3 indicates the main shaft, on which is mounted the rotor of the electric generator 4. The main shaft also carries a spiral gear 5 which meshes with a similar gear 6 on the vertical governor shaft 7. The governor 8 is carried at the upper end of this shaft and controls suitable regulating devices through a system of levers 9 and the connecting rods 10. The particular character of the regulating devices will naturally vary with different types of engines and I therefore consider it unnecessary to specifically illustrate the same.

16 is a gear wheel on the governor shaft 7 which meshes with the gear wheel 15 on a countershaft 13, which countershaft may be that which carries the cam operating certain parts of the engine.

The governor shaft is composed of two parts in axial alinement, the adjacent ends of said parts being separated by a small space. These two portions of the shaft are connected by a helical spring 11 which is relatively stiff so that it will transmit the torsion of the lower part of the shaft to the upper part. The resilience of this spring, however, is sufficient to absorb any slight irregularities in the speed of rotation of the lower part of the governor shaft and hence prevent their transmission to the upper part. As a result of this the governor parts will not keep changing their positions due to slight periodic action or to slight irregularities but will be sensitive to such load changes as should be compensated for engines fitted with my improved mechanism have demonstrated that a sudden irregular motion caused by inaccuracies in the cutting of the gears or in the action of the engine itself, as well as slight periodic accelerations or retardations in speed, fail to have any serious effect upon the steady rotation of the upper part of the governor shaft, by reason of this interposed spring member.

The elastic drive transmits to the centrifugal governor only those variations in speed which are of a considerable amount and last for some time, while quick, short impulses created by external forces or by some local disturbances in the machine (such as vibration of the crank shaft or improper meshing of the gears) are completely wiped out, owing to the inertia of the governor

proper and the resilience of the driving shaft.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is only illustrative, and that the invention can be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

The combination with an engine having a shaft, of a speed governor, a two-part shaft for driving it, gearing connecting the governor shaft to the engine shaft, and a spring connection interposed in the governor shaft between the two parts thereof and through which motion is transmitted from the gearing to the governor whereby any vibration due to irregularities in the engine operation or in the transmission gearing will be absorbed.

In witness whereof, I have hereunto set my hand this third day of July, 1914.

HERMANN LEMP.

Witnesses:

OTTO F. PERSSON,

O. T. FOUCHE.