[Second Edition.]

PATENT SPECIFICATION

Application Date: May 22, 1923. No. 13,417/23. 220,706

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PROVISIONAL SPECIFICATION.

Improvements in Power Transmission.

I, GEORGE CONSTANTINESCO, of "Carmen Sylva", Beechwood Avenue, Oatlands Park, Weybridge, in the County of Surrey, a subject of the King of Great Britain and Ireland, do hereby declare the nature of this invention to be as follows:—

The present invention relates to a method and apparatus for transmitting power from a steadily rotating shaft to a shaft which is to be rotated against a variable resisting torque.

In my Specifications Nos. 185,022, 206,204 and 218,406, I have described various methods of and apparatus for transmitting power from a prime mover or other steadily rotating shaft to a shaft which is to be rotated against a variable resisting torque by splitting the alternating motion derived from the steadily rotating shaft into components, one of these components being caused to oscillate a mass about a mean position, while the other is caused to impart motion in one direction through ratchet devices to a driven shaft.

In the apparatus which I have previously described in the said specifications, one component of the motion transmitted from the driving shaft has been transmitted to an oscillating or reciprocating mass consisting of a solid body, for example, an oscillating flywheel.

In some cases, however, it may be convenient to utilise a column of liquid instead of a solid body to provide the inertia.

The present invention consists in a method and means for transmitting power from a driving shaft to a shaft which is to be rotated against a variable resisting torque by splitting the alternating motion derived from a steadily rotating shaft into component alternating motions, one component motion being caused to give alternating motion to a mass without absorbing energy, while another is caused to actuate unidirectional driving devices acting on the driven shaft, the mass actuated by the first component consisting of a column of liquid of suitable length.

The invention further consists in constructing the apparatus as a polyphase in which two or more impulses differing in phase may be given to the rotor at each oscillation, the different phases being interconnected by interconnecting suitable points in the liquid columns which provide the inertia.

The invention also consists in utilising the mean liquid pressure tapped at a suitable point in the liquid column for maintaining a stable mean position of the gear.

The invention further consists in utilising such mean liquid pressure tapped at a suitable point for controlling the pawls, or other ratchet devices of the unidirectional driving mechanism.

The invention also consists in the use of a liquid column to provide the inertia in apparatus such as described in my Specifications Nos. 206,204 and 218,406.

The invention further consists in the use of a liquid column to provide the inertia in apparatus such as described in my Patent Specification No. 185,022.

The invention further consists in the improved means for transmitting power from a steadily rotating shaft to a rotor hereinafter described.

In carrying the invention into effect according to one example, in order to transmit power from a steadily rotating driving shaft to a rotor which has to be rotated against a variable resisting torque, the crank of the driving shaft is connected by a connecting rod to a pivot to which are attached a pair of connecting rods connected to opposed pistons moving in cylinders which are capable of

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oscillation through a small angle, the heads of these cylinders being in communication with each other through a pipe, the whole space in the cylinder heads and the pipes connecting the heads being kept full of liquid from a reservoir through non-return valves. The liquid column in this pipe forms the inertia. The pivot of the driving connecting rod is also connected to a pivot connected by a stabilising link swinging about a fixed point and the driving pivot of this link is connected to a pair of ratchet devices actuating the motor.

It will be seen that this arrangement is equivalent to that described in my Specifications Nos. 206,204 and 218,406, the liquid column between the ends of the cylinders acting as the equivalent of the oscillating mass described in the said specifications.

According to another modification of the invention, the cylinders in which the pistons connected to the driving connecting rod move are fixed in position, and links are provided between the pivot of the driving connecting rod and the piston rods or plungers. According to another modification, the pivot of the connecting rod remote from the driving crank is directly connected by driving links to the two members which carry the ratchet devices acting on the rotor.

In order to stabilise this form of the apparatus, a piston working in a fixed cylinder may be provided, the piston being connected to a link exerting a pull towards the mean position on one of the pawl carrying members proportional to the mean pressure in the liquid column which acts on the inertia device, the pipe leading to this cylinder being connected to the mean point in the liquid column connecting the cylinders of the inertia device. It will be noted that the pressure at this point remains practically constant for any given speed of rotation of the driving crank.

It will be seen that the arrangement above described may be applied in cases in which a floating lever is employed, the liquid column and cylinders being arranged so that they form the equivalent of the oscillating mass described in my Patent Specification No. 185,022.

It will be seen that for a polyphase arrangement two or more liquid columns and sets of pistons and cylinders may be provided actuating ratchet devices disposed at suitable phase angles around a single rotor; the inertia columns being connected at their mean points.

Dated the 18th day of May, 1923.

W. GRYLLS ADAMS,
87, Victoria Street, London, S.W. 1,
Chartered Patent Agent.

COMPLETE SPECIFICATION.

Improvements in Power Transmission.

I, GEORGE CONSTANTINESCO, of "Carmen Sylva", Beechwood Avenue, Oatlands Park, Weybridge, in the County of Surrey, a subject of the King of Great Britain and Ireland, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to a method and apparatus for transmitting power from a steadily rotating shaft to a shaft which is to be rotated against a variable resisting torque and is a modification of or improvement in the invention claimed in my Specification No. 185,022.

In the said specification & in Nos. 206,204 & 218,406 I have described various methods of and apparatus for transmitting power from a prime mover or other steadily rotating shaft to a shaft which is to be rotated against a variable resisting torque by splitting the alternating motion derived from the steadily rotating shaft into two components, one of these components being caused to oscillate a mass about a mean position, while the other is caused to impart motion in one direction through unidirectional driving devices to a driven shaft.

In the apparatus which I have previously described in the said specifications, one component of the motion transmitted from the driving shaft has been transmitted to an oscillating or reciprocating mass consisting of a solid body, for example an oscillating flywheel.

In some cases, however, it may be convenient to utilise a column of liquid instead of a solid body to provide the inertia.

The present invention consists in a method and means for transmitting power from a driving shaft to a shaft which is to be rotated against a variable resisting torque by splitting the alternating motion derived from a steadily rotating shaft into component alternating motions, one component motion being caused to

give alternating motion to a mass without absorbing energy, while another is caused to actuate unidirectional driving devices acting on the driven shaft, the mass actuated by the first component consisting of a column of liquid of suitable length.

The invention also consists in varying the length of the liquid column by means of a telescopic tube in order to vary the inertia of the mass.

The invention further consists in constructing the apparatus as a polyphase system in which two or more impulses differing in phase may be given to the rotor at each oscillation, the different phases being interconnected by interconnecting suitable points in the liquid columns which provide the inertia.

The invention also consists in the use of a liquid column to provide the inertia in apparatus such as described by my Patent Specifications Nos. 185,022, 206,204 and 218,406.

The invention further consists in the improved means for transmitting power from a steadily rotating shaft to a rotor hereinafter described.

In carrying the invention into effect according to the example diagrammatically illustrated in the drawing; in order to transmit power from a steadily rotating driving shaft to a rotor which has to be rotated against a variable resisting torque, the crank 1 of the driving shaft is connected by a connecting rod 2 to a pivot 3 to which is attached a connecting rod 4 connected to the piston rod 21 of a double acting piston 22 working in a cylinder 23. The ends of the cylinder are in communication through a pipe 24, the whole space in the cylinder heads and the pipe connecting the heads being kept full of liquid from a reservoir through non-return valves 11, 12 or other suitable means. The liquid column in this pipe 24 forms the inertia. The pivot 3 of the driving connecting rod 4 is also connected by a rod 13 to a pivot 15 on a stabilising link 14 as shewn in my Patent Specification No. 22,986 of 1923 swinging about a fixed point and the pivot 15 is also connected to a pair of oscillating members 16, 17 carrying unidirectional driving devices 18, 19 actuating the rotor.

It will be seen that this arrangement is equivalent to that described in my Patent Specification No. 206,204, the liquid column between the ends of the cylinders acting as the equivalent of the oscillating mass described in the said specifications.

In order to vary the inertia the length of the liquid column in the pipe 24 may be varied by using a telescopic U-shaped tube which can be adjusted as desired.

It will be seen that the arrangement above described may be applied in cases in which a floating lever is employed, the liquid column and cylinders being arranged so that they form the equivalent of the oscillating mass described in my Patent Specification No. 185,022.

It will be seen that for a polyphase arrangement two or more liquid columns and sets of pistons and cylinders may be provided actuating ratchet devices disposed at suitable phase angles around a single rotor; the inertia columns being connected at their mean points if desired.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A modification of or improvement in the invention claimed in my Specification No. 185,022 comprising means for transmitting power from a driving shaft to a shaft which is to be rotated against a variable resisting torque by splitting the alternating motion derived from a steadily rotating shaft into component alternating motions, one component motion being caused to give alternating motion to a mass without absorbing energy, while another is caused to actuate unidirectional driving devices acting on the driven shaft, the mass actuated by the first component consisting of a column of liquid of suitable length.

2. Apparatus as claimed in Claim 1 having means for varying the length of the liquid column which provides the inertia in order to obtain a variable inertia effect.

3. Apparatus according to Claim 1 constructed as a polyphase system in which two or more impulses differing in phase may be given to the rotor at each oscillation, the different phases being interconnected by interconnecting suitable points in the liquid columns which provide the inertia.

4. The improved means for transmitting power hereinbefore described with reference to the accompanying drawing.

Dated the 22nd day of February, 1924.

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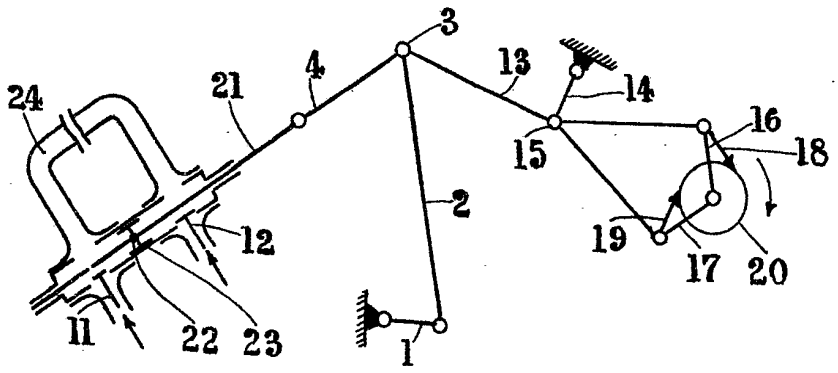
2nd Edition

Fig.1.



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