[Second Edition.]

PATENT SPECIFICATION.

Application Date: Nov. 7, 1922. No. 30,432/22. 206,700

Complete Left: Feb. 19, 1923.

Complete Accepted: Nov. 15, 1923.

PROVISIONAL SPECIFICATION.

An Improved Method and Apparatus for Transmitting Power from a Steadily Rotating Shaft to a Driven Shaft.

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 methods and means for transmitting power from a prime mover to a shaft which is to be rotated against a variable resisting torque as described in my Patent Specification No. 185,022, and has for its object to provide means by which the mean position of the parts is maintained independently of the direction of rotation of the driven member.

In the said specification, I have described various arrangements in which a steadily rotating crank transmits motion to a floating lever which is connected to an effective mass capable of oscillation and to a pair of unidirectional driving devices acting on a rotor.

With such a device the stability of the system, by which the mean position of the oscillating members is maintained, depends on the direction of rotation of the driven member.

According to the present invention the various parts are arranged in such a manner that the system is stable independently of the direction of rotation of the driven member.

The invention consists in constructing the apparatus so that the bearing of the oscillating effective mass has one degree of freedom in the line of the floating lever, while a second bearing with one degree of freedom is provided linked to a point on the mean line of the floating lever.

The invention further consists in allowing the necessary freedom by mounting the bearings in question in slides, so that their movement is limited one in one direction and the other in the opposite direction.

The invention further consists in securing the necessary degrees of freedom in the bearings by mounting the pivot of the effective mass on a link swinging about a fixed point and prevented from moving in one direction while free in the opposite direction, a point on the mean line of the floating lever being connected to a second link pivoted at a fixed point and free in one direction but prevented from moving in the opposite direction, the stops being so arranged that the freedom allowed to the pivoted links is in opposite directions.

The invention also consists in the improved means for rendering a system of the type described stable so that the mean position is maintained as hereinafter described.

In carrying the invention into effect according to one example as applied to the case in which the constantly rotating crank is connected to one end of the floating lever which is connected at another point of a flywheel capable of oscillation and at its other end to a bearing of unidirectional driving devices acting on a rotor; the oscillating flywheel instead of being pivoted at a fixed point is carried at one end of a link whose other end is pivoted at a fixed point. A stop is provided acting on this link and preventing motion in one direction, while allowing free movement in the opposite direction. Another point on the main line of the floating lever is pivoted to a link also capable of swinging about a fixed pivot, a suitable stop being provided to prevent movement of this link in the direction in which the former link is free to move and to allow free movement in the direction in which the said former link is restrained.

With this arrangement, it will be seen

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that the whole system will be stable independently of the direction of rotation of the driven member. This will be obvious by considering that the condition of stability is that the forces reacting on the unidirectional driving devices from the driven member in all cases should be directed away from the pivot about which the oscillating effective mass turns.

It will be seen that when reversal of rotation of the driven member occurs, the reaction forces are also reversed, but by means of the half pivots which allow free motion in one direction only, the direction in which the axis of the pivoted inertia mass is restrained is also reversed, so that stability of the system is maintained independently of the direction of rotation of the driven member.

Instead of supporting the pivots on links as above described, the bearings which have to be restrained in opposite directions may be mounted in blocks sliding in guides with suitable stops in the required direction, or any suitable type of half bearing allowing free motion in one direction only may be employed.

Dated the 7th day of November, 1922.

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

COMPLETE SPECIFICATION.

An Improved Method and Apparatus for Transmitting Power from a Steadily Rotating Shaft to a Driven Shaft.

I, GEORGE CONSTANTINESCO, of "Carmen Sylva", Beechwood Avenue, Oatlands Park, Weybridge, in the County 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 methods and means for transmitting power from a prime mover to a shaft which is to be rotated against a variable resisting torque as described in my Patent Specification No. 185,022, and has for its object to provide means by which the mean position of the parts is maintained independently of the direction of rotation of the driven member.

In the said specification, I have described various arrangements in which a steadily rotating crank transmits motion to a floating lever which is connected to an effective mass capable of oscillation and to a pair of unidirectional driving devices acting on a rotor.

With such a device the stability of the system, by which the mean position of the oscillating members is maintained, depends on the direction of rotation of the driven member.

According to the present invention the various parts are arranged in such a manner that the system is stable independently of the direction of rotation of the driven member.

The invention consists in constructing the apparatus so that the bearing of the oscillating effective mass has one degree of freedom in the line of the floating lever, while a second bearing with one degree of freedom is provided linked to a point on the mean line of the floating lever.

The invention further consists in allowing the necessary freedom by mounting the bearings in question in slides, so that their movement is limited one in one direction and the other in the opposite direction.

The invention further consists in securing the necessary degrees of freedom in the bearings by mounting the pivot of the effective mass on a lever swinging about a fixed point and prevented from moving in one direction while free in the opposite direction, a point on the mean line of the floating lever being connected to a second lever pivoted at a fixed point and free in one direction but prevented from moving in the opposite direction, the stops being so arranged that the freedom allowed to the pivoted levers is in opposite directions.

The invention also consists in the improved means for rendering a system of the type described stable so that the mean position is maintained as hereinafter described.

In carrying the invention into effect according to one example as applied to a case in which the constantly rotating crank is connected to the middle of a floating lever which is connected at one end by a crank e^1 to a flywheel or weighted lever k capable of oscillation and at its other end to a pair of unidirectional driving devices acting on a rotor; the oscillating flywheel instead of being pivoted at a fixed point is pivoted at f to one end

of a lever *g* pivoted at a fixed point *h*. A stop *n* is provided acting on this lever at its other end *m* and preventing motion in one direction, while allowing free movement in the opposite direction. Another point on the mean line of the floating lever *d* is connected by a link *l* to a lever 2 also capable of swinging about a fixed pivot 3, a suitable stop 5 being provided to prevent movement of this lever 2 in the direction in which the former lever *g* is free to move and to allow free movement in this direction in which the said former lever *g* is restrained.

With this arrangement, it will be seen that the whole system will be stable independently of the direction of rotation of the driven member. This will be obvious by considering that the condition of stability is that the forces reacting on the unidirectional driving devices from the driven member in all cases should be directed away from the pivot about which the lever carrying the mass turns.

Referring to the accompanying drawings:—

Figure 1 is a front elevation;

Figure 2 is a plan of apparatus according to the invention;

Figure 3 is a section on the line 3—3, Figure 2;

Figure 4 is a section on the line 4—4, Figure 2;

Figure 5 is a section on the line 5—5, Figure 2;

Figure 6 is a section on the line 6—6, Figure 2;

Figure 7 is a section on the line 7—7, Figure 1.

In the form of the invention illustrated, the steadily rotating driving shaft *a* carries an eccentric *b* connected by a strap *c* with a floating lever *d*. The floating lever is connected at one end *e* by a link e^1 to a pivot *f* on a lever *g* pivoted about a fixed axis *h*, the pivot *f* also serving as the pivot of an oscillating inertia member *k* in the form of the lever having masses *l* at its ends. The lever *g* is provided with an upward extension *m* which serves as a stop acting against a fixed stop *n*. The other end of the floating lever *d* is pivoted at *o* to a pair of connecting rods *p q* operating oscillating members *v s* which act on sliding members *t u* which engage intermittently with members *v w* keyed to the rotor shaft *x*. The end *o* of the floating lever *d* is connected by a link 1 with a lever 2 pivoted at a fixed point 3 and carrying an abutment 4 adapted to engage with a fixed stop 5.

It will be seen that with this arrangement the mean position of the floating lever *d* will vary according to the direction of rotation and consequent reaction through the connecting rods *p q* of the rotor on the end of the floating lever to which it is connected.

Referring to Figure 1, when the rotor is moving clockwise, it will be seen that the reaction tends to move the mean position of the floating lever to the left, consequently the abutment of the floating lever in this case between the pad 4 and the stop 5 on the right hand side of the apparatus. For movement of the rotor in the reverse direction the reaction is in the opposite direction causing the abutment *m* on the lever *g* to bear against the fixed stop *n*.

The oscillating members *r s* operate as described in my Specification No. 205,293 and carry pins 11, 12 passing through apertures in inertia rings 13, 14 which can slide axially on keys 15 on the sliders *t u*. The rings 13, 14 are embraced by forks 17, 18 carried by a frame 19 which is movable in the axial direction by means of the rod 20. The pins 11, 12 are cut away at different points along their length so that in one position of the inertia rings relative movement is allowed in one direction between the slider and the oscillator so that the surfaces of the larger teeth 21 ride on each other causing axial movement of the slider and engagement of the small teeth 22 thereon with the small teeth on the rotor *b*.

In the mean position of the rings relative movement of the slider and oscillator is prevented in either direction thus giving a free wheel position; while in a third position relative movement in the opposite direction is allowed causing engagement of the small teeth for movement of the oscillator in the opposite direction.

It will be seen that when reversal of rotation of the driven member occurs, the reaction forces are also reversed, but by means of the half pivots which allow free motion in one direction only, the direction in which the axis of the pivoted inertia mass is restrained is also reversed, so that stability of the system is maintained independently of the direction of rotation of the driven member.

Instead of supporting the pivots on links as above described, the bearing which have to be restrained in opposite directions may be mounted in blocks sliding in guides with suitable stops in the required direction, or any suitable type of half bearing allowing free motion in one direction only may be employed.

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. Apparatus for transmitting power of the type described constructed so that the bearing of the oscillating effective mass has one degree of freedom in the line of the floating lever, while a second bearing with one degree of freedom is provided linked to a point on the mean line of the floating lever.

2. Apparatus of the type described having the bearings referred to mounted is slides so that their movement is limited, one being limited in one direction and the other in the opposite direction.

3. Apparatus of the type described in which the necessary degree of freedom in the bearings is obtained by mounting the pivot of the effective mass on a lever swinging about a fixed point and prevented from moving in one direction, while free in the opposite direction, a point on the mean line of the floating lever being connected by a second link to a lever pivoted at a fixed point and free in one direction but prevented from moving in the opposite direction, the stops being so arranged that the freedom allowed to the pivoted levers is in opposite directions.

4. The improved means for rendering a system of the type described stable so that the mean position is maintained hereinbefore described and illustrated.

Dated the 19th day of February, 1923.

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

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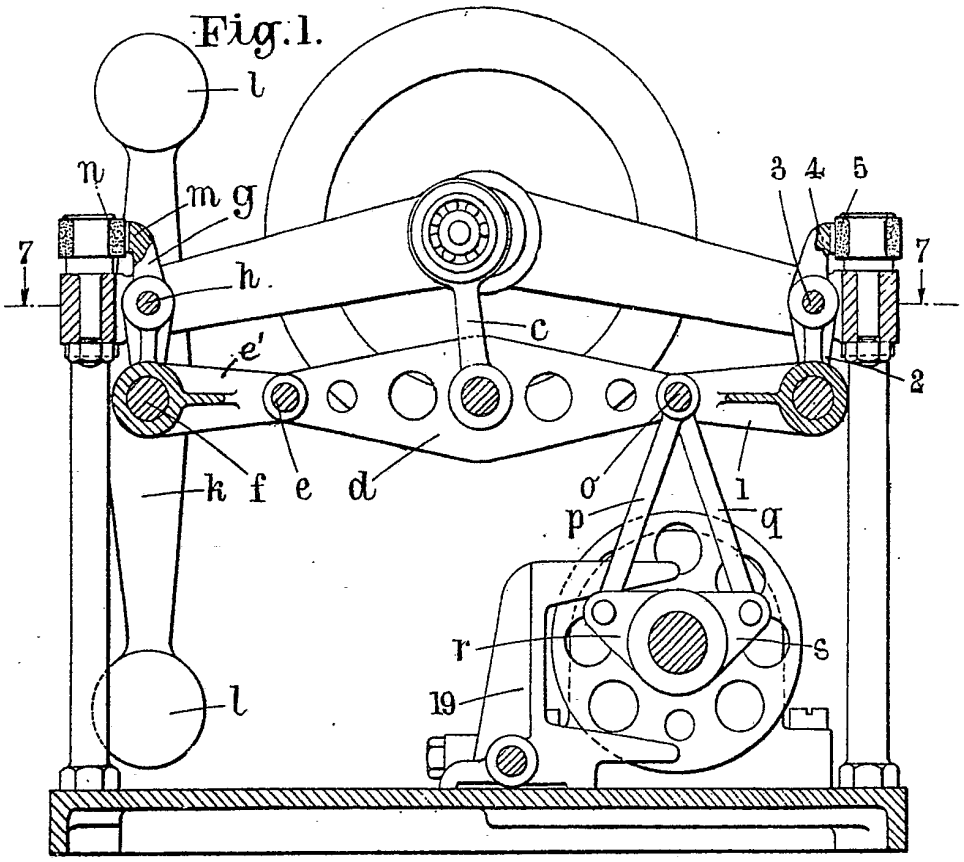
Fig.1.



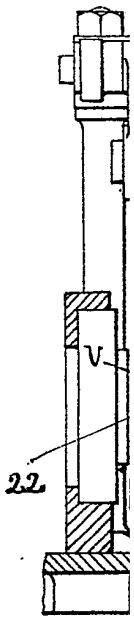


Fig.2.

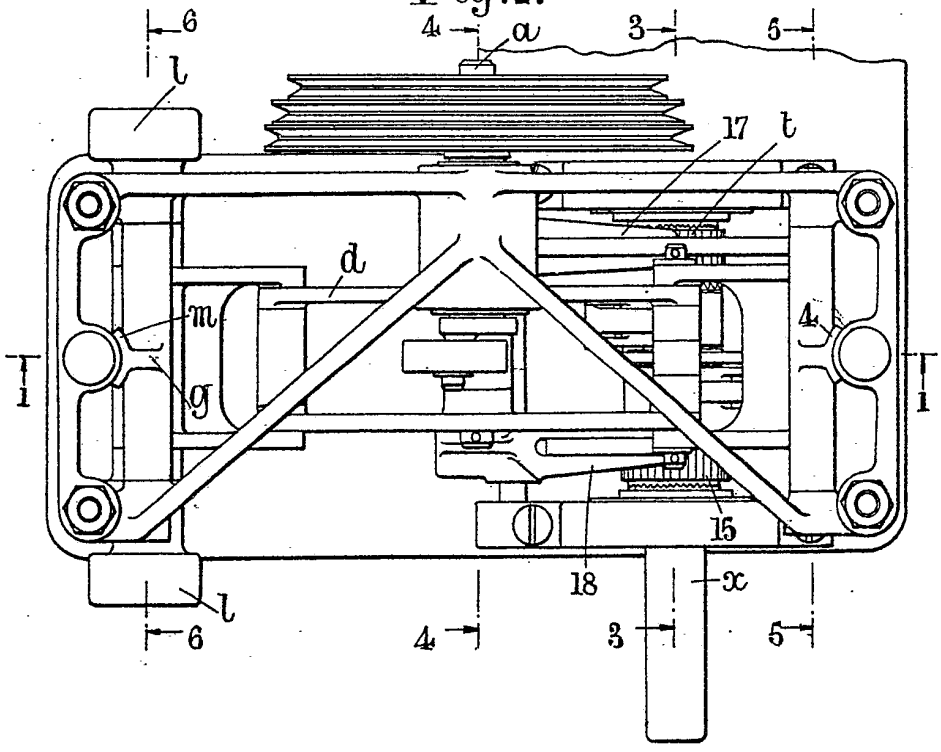


Fig. 3.

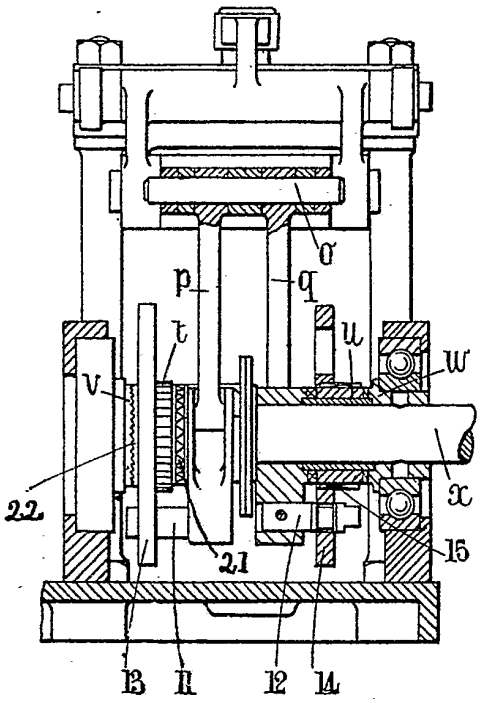


Fig. 4.

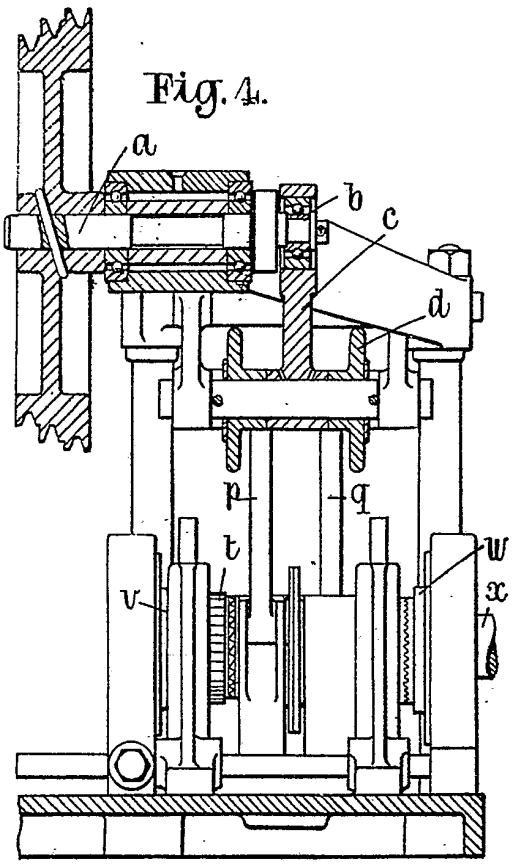
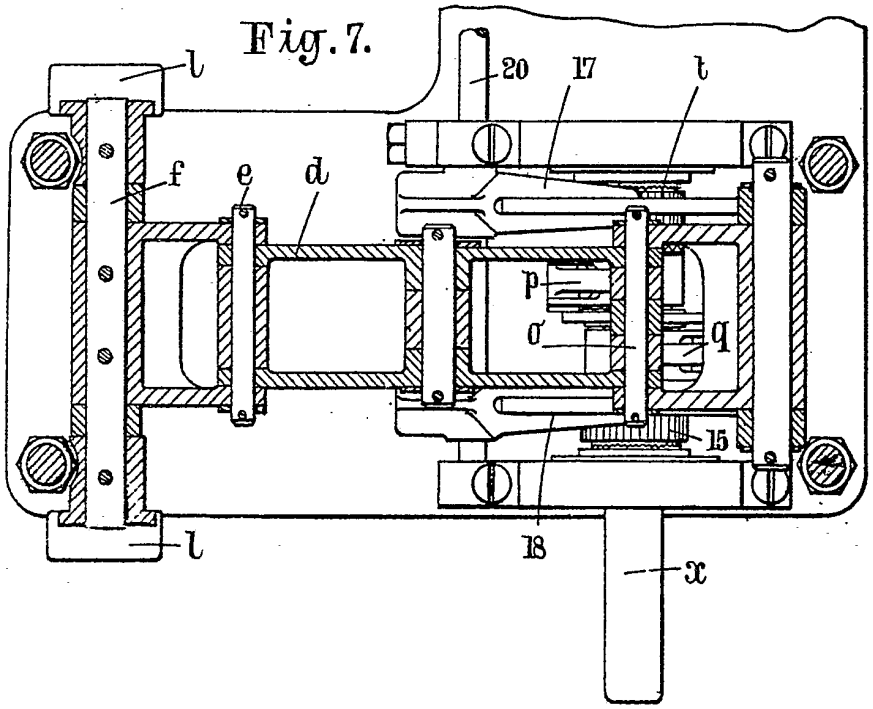


Fig. 7.



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3 SHEETS

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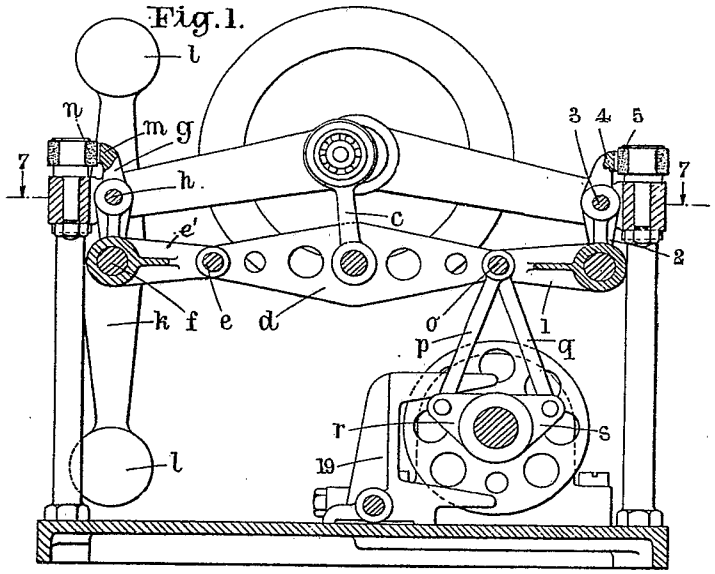
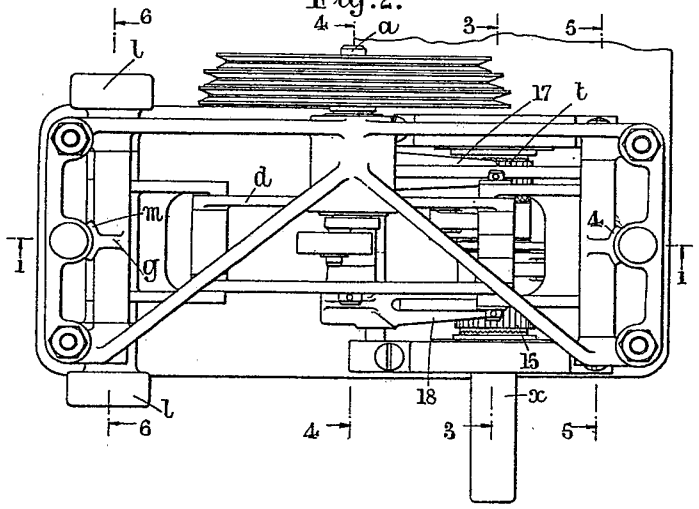
SHEET 1





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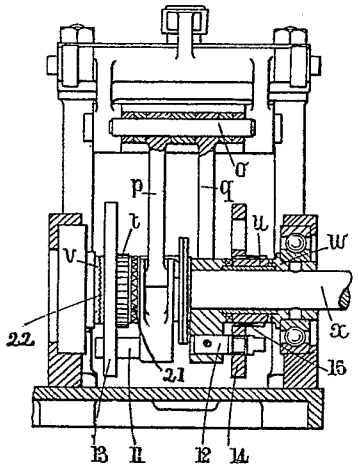

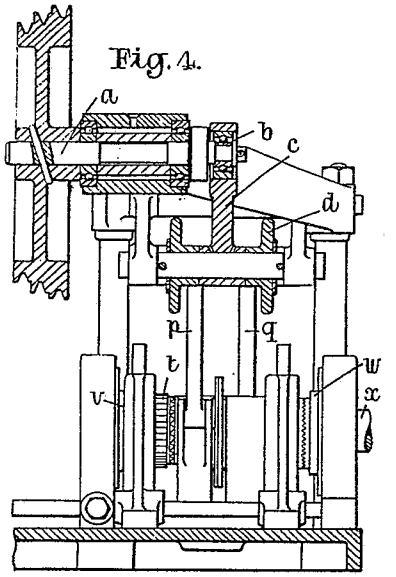

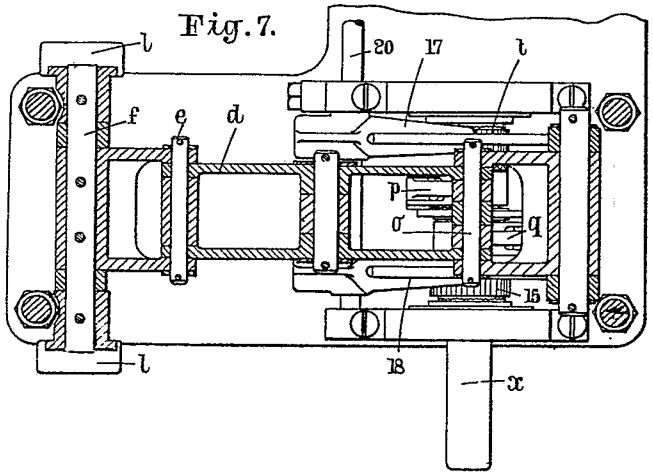

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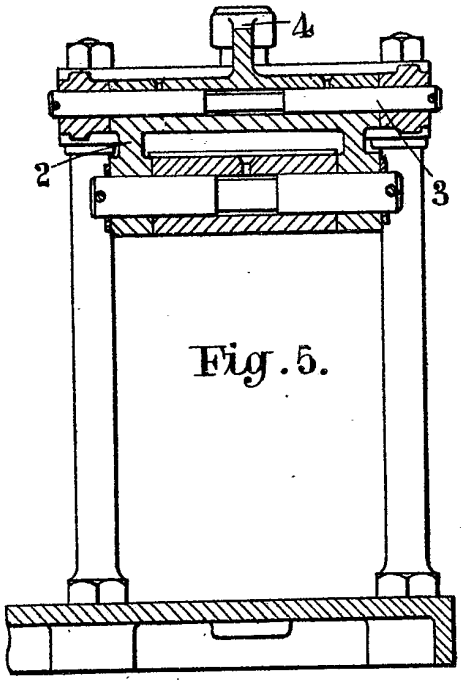

Fig. 5.

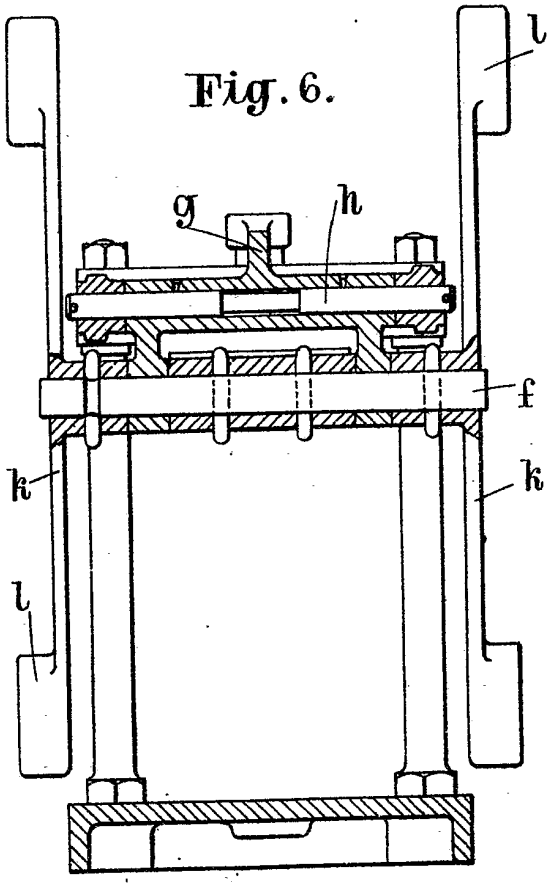

Fig. 6.

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