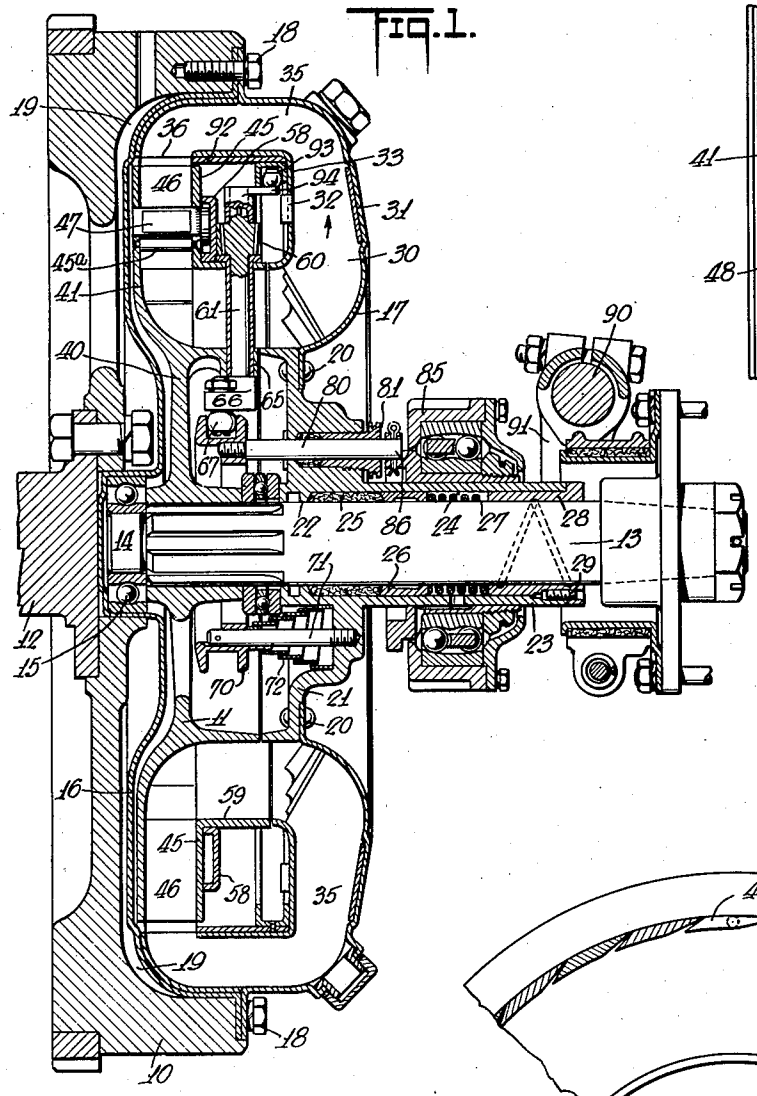
May 24, 1932. G. A. KLIMEK 1,859,448

HYDRAULIC POWER TRANSMITTER

Filed June 19, 1929 2 Sheets-Sheet 1

FIG. 1.



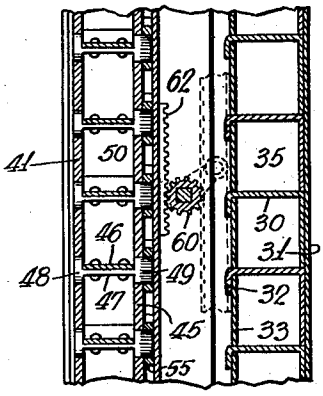


FIG. 5.

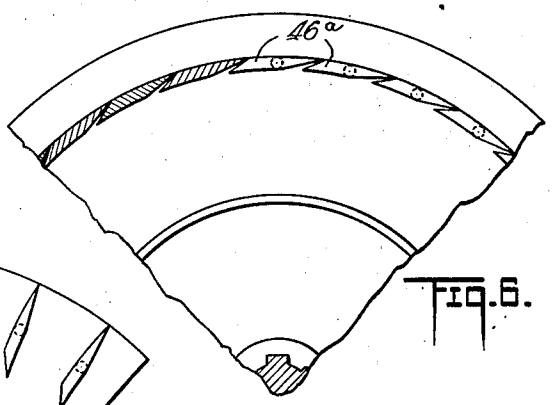


FIG. 6.

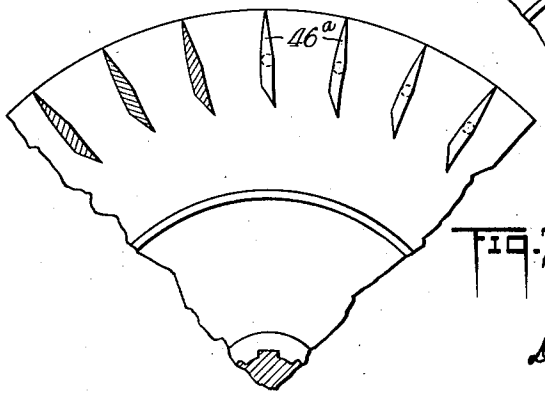


FIG. 7.

INVENTOR
Gustav A. Klimek
BY
Dean Fairbank Albright & Hirsch
ATTORNEYS

May 24, 1932. G. A. KLIMEK 1,859,448

HYDRAULIC POWER TRANSMITTER

Filed June 19, 1929 2 Sheets-Sheet 2

Fig. 2.

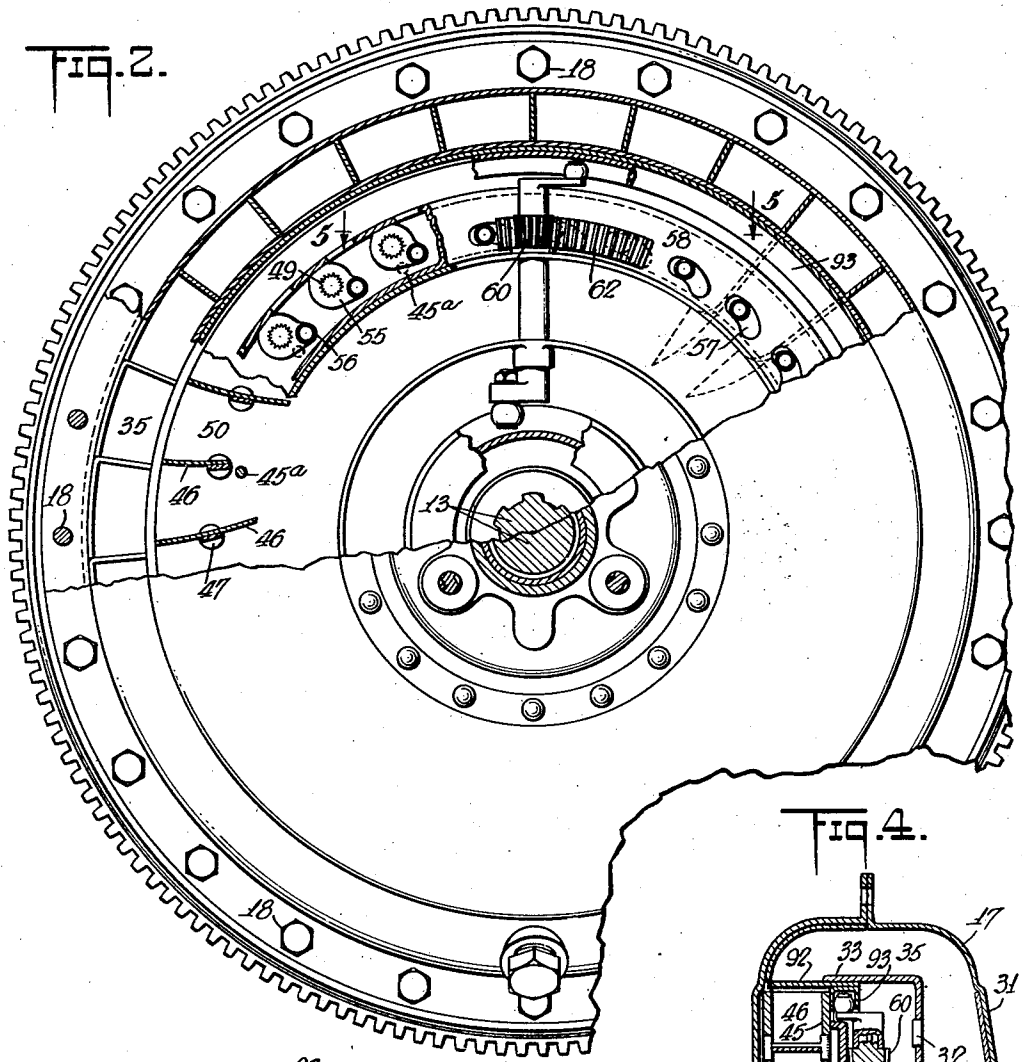


Fig. 4.

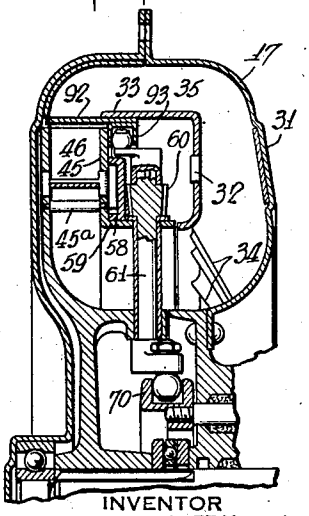
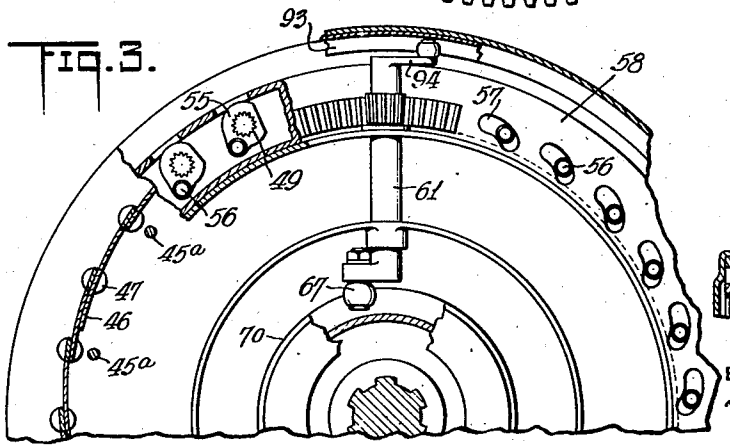


Fig. 3.



INVENTOR
Gustav A. Klimek
BY
Dean Fairbank Wright & Hines
ATTORNEY

Patented May 24, 1932 1,859,448

UNITED STATES PATENT OFFICE

GUSTAV A. KLIMEK, OF EAST RUTHERFORD, NEW JERSEY, ASSIGNOR TO TURBINE PATENTS CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

HYDRAULIC POWER TRANSMITTER

Application filed June 19, 1929. Serial No. 372,086.

The present invention relates to improvements in hydraulic transmissions, and more particularly it pertains to such devices as employ a fluid impelling member, a fluid impelled member in the form of a turbine rotor, and a liquid for effecting an operative driving couple therebetween. This type is known as the Föttinger type and is broadly claimed in U. S. Patent 1,199,359, dated Sept. 26, 1916.

In apparatus of the above described character, the fluid is moved in a circuitous path by the fluid impeller and in its movement, it engages with the vanes or blades of the turbine rotor, and setting up rotary movement thereof transmits therethrough the power of a prime mover to suitable apparatus to be driven.

To permit of continuous rotation of the prime mover and the fluid impelling member without operation of the fluid turbine rotor, the fluid couple between the two is rendered ineffective. This has been accomplished in various ways in the art but for various reasons they have not proven highly efficient.

It is one of the objects of the present invention to provide a new and improved construction whereby the fluid couple between a fluid impelling member and a fluid impelled turbine rotor may be rendered ineffective, which construction will be highly efficient in its operation.

It is a further object of the invention to provide a new and improved hydraulic power transmitter in which a driving member may remain idle during continued operation of a driven member without employing mechanical clutches and similar devices.

It is a further object of the invention to so construct a device of the aforementioned character that when the fluid couple is rendered ineffective, the fluid impelled member will not be subjected to drag as is customary in devices of this type.

Other objects of the invention relate to certain novel and improved arrangements and combinations of parts hereinafter described and particularly pointed out in the claims, the advantages of which will be readily understood and appreciated by those skilled in the art to which this invention relates.

The invention will be readily understood from the accompanying drawings which illustrate the invention in its preferred forms and the following description of the constructions therein shown.

In the drawings:

Fig. 1 is a sectional view of a hydraulic power transmitter constructed in accordance with the present invention;

Fig. 2 is a view partly in elevation and partly in section, said view being taken at right angles to Fig. 1;

Fig. 3 is a detailed sectional view on a reduced scale showing the several parts of the turbine rotor in an intermediate position between full operative and inoperative positions;

Fig. 4 is a detailed sectional view on a reduced scale showing the parts in the position they assume to render the fluid couple inoperative;

Fig. 5 is a detailed sectional view taken on the line 5—5 of Fig. 2;

Fig. 6 is a fragmentary sectional view showing the vanes or blades of the turbine rotor in their inoperative position, said vanes being of modified form; and

Fig. 7 is a similar view showing the blades of the turbine rotor in their operative position.

The invention as herein illustrated comprises a driving member 10 and a driven member 11. The driving member is suitably secured to the shaft 12 of a suitable prime mover, not shown, and the driving member in the herein illustrated embodiment of the invention preferably constitutes the flywheel of the said prime mover.

The driven member 11 is keyed to a shaft 13 suitably connected to the mechanism to be

driven and not herein shown. That end 14 of the shaft 13 which occupies a position closely adjacent the driving member 10, is preferably supported in a bearing such as 15 which bearing is carried by the said driving member 10.

The driven member 11 operates within a suitable housing carried by, and rotatable with the driving member 10. As herein illustrated this housing consists of two parts designated 16 and 17, suitably secured together and to the driving member preferably by the same means such as cap screws 18. The member 16 of the housing preferably nests within the driving member 10 which is recessed as at 19 to accommodate said housing member 16. This housing member also preferably encloses the end 14 of the shaft 13, and the bearing 15 in which it is mounted as heretofore described. To provide for rotatably mounting the housing member 17 upon the shaft 13 said housing member 17 may be secured as at 20 to a flanged bearing member 21 rotatably mounted upon the shaft 13 as at 22, and this bearing member has a sleeve extension 23. The internal diameter of the sleeve extension is slightly larger than the diameter of the shaft 13 to provide a space 24 between the inner face of the sleeve extension and said shaft 13. Carried in this space 24 adjacent the bearing 22, there is a suitable packing 25 placed under compression by a collar 26 and a coil spring 27, one end of which abuts the sleeve 28 which serves to close the open end of the sleeve extension 23. This sleeve 23 is retained in position by a lock bolt or the like 29 as shown in Fig. 1. The housing member 17 carries a plurality of spaced partitions or walls 30 secured thereto in any desired manner as at 31, these walls being secured at their opposite sides as by bent tongues 32, see Fig. 5, to an annular member 33 the cross-sectional form of which is shown in Fig. 1. The lower ends of these partitions 30 are designated by the reference numeral 34 and occupy a position adjacent the flanged bearing member 21 of the housing. These partitions 30 provide a plurality of passages 35, the inner ends of which form the inlets therefor. The outlet ends of the passages 35 are designated by the reference numeral 36, see Fig. 1, and it will be noted that these outlets are disposed radially of the driven member, the purpose of which will be hereinafter described.

The driven member preferably comprises a main body portion 40 having a flanged portion 41, and the diameter of this driven member is such that the peripheral edge of the flanged portion thereof occupies a position in close relation to the outlet ends 36 of the passages 35. An annular member 45 is carried by the driven member, in spaced relation to the flanged portion 41 thereof, by means of rivets or studs 45*a*, and in the space between the parts 45 and 41 there are a plurality of vanes or blades 46 and a plurality of connecting studs or rivets.

These vanes or blades, as shown in Fig. 5, are each carried upon a bearing member 47, each end of which is rounded as at 48 and 49 to provide for pivotally or rotatably mounting the blades in the parts 41 and 45 respectively. The blades 46 divide the space between the flanged portion 41 of the driven member, and the annular member 45 into a plurality of radially extending passages 50, the inlet ends of which are juxtaposed to the outlet ends 36 of the passages 35, while the outlet ends of these passages 50 are juxtaposed to the inlet ends of the passages 35. Thus if the housing or casing is filled with a suitable liquid, upon rotation of the driving member, the said liquid will be caused to move through the passages 35 and 50 in the direction of the arrow in Fig. 1, and that if the vanes or blades 46 are in the position in which they are shown in Fig. 2, rotary movement of the driven member 11, and a driving of the shaft 13 will result.

To provide for free rotation of the driving member 10 without imparting a driving force to the driven member 11, the vanes of blades are adapted to be moved to the position in which they are shown in Fig. 3. For this purpose, each of the bearing members 47 of the vanes or blades 46 is provided upon its end 49 with a plate 55, see Figs. 2 and 3, and each plate carries a crank or eccentrically positioned pin 56. Each pin 56 is received in its respective cam slot 57 in an annular member 58. The annular member 45 is flanged as at 59 to form a support for the cam-slotted annular member 58, and also the bearing about which it turns. It will thus be seen that as the cam-slotted member 58 is rotated, the cam slots 57 thereof operating upon the eccentric pins or cranks 56 will rock the bearing members 47 of the vanes or blades 46 to position said vanes or blades in either their operative or inoperative position.

The plate 55 on the end of the bearing member 47 has a cam face which engages the inner side of the outer flange of the annular member 58, see Fig. 2, thereby locking vanes 46 against rotation when they are under full fluid engagement. The cam slot 57 has a straight portion which will allow the plate 55 to disengage from the annular member 58 when said member is rotated through the shaft 61 in order to bring the driven member into an inoperative position.

The cam slotted annular member 58 is rotated by means of a gear 60 mounted upon said shaft 61, which gear meshes with a segmental gear 62 carried by the cam-slotted member 58, and thus each time the shaft 61 is rotated, through the medium of the gear 60 and the segmental gear 62, said cam-slotted annular member will be rotated.

The shaft 61 is preferably rotatably mounted as at 65 in the driven member 11 and its lower end is provided with a crank 66 having an antifriction bearing member preferably in the form of a ball-like member 67.

Means is provided for operating the shaft 61 from the exterior of the housing or casing, and this means is similar to that described in my Patent 1,786,433. Briefly stated, this means preferably comprises a peripherally channeled member 70 supported for sliding movement upon the member 21 of the driving member by rods or the like 71, and the antifriction bearing member 67 of the shaft 61 travels in the peripheral channel of this annular member 70. Springs 72 preferably surround the rods 71 and exert their force to maintain the channeled annular member 70 in the position in which it is shown in Fig. 1, in which position, the shaft 61 through the medium of the gears 60 and 62 and the cam-slotted annular member 58 position the vanes or blades 46 in the operative position in which they are shown in Fig. 2.

If the channeled member 70 be moved to the right in Fig. 1, the shaft 61 will operate the gear 60 which in turn will operate the cam-slotted annular member 58 to move the vanes or blades to their inoperative position, in which position they are shown in Fig. 3.

For moving the member 70 to the right in Fig. 1, driving rods 80 mounted in stuffing boxes 81 in the bearing member 21 of the driving member are provided. These driving rods 80 are connected to a suitable bearing member 85 as at 86, and said bearing member 85 is slidably mounted upon the sleeve extension 23 of the driving member 10.

The reference numeral 90 designates a rock shaft operated manually in any desired manner, and said rock shaft is connected by suitable linkage 91 only partially herein shown to the bearing member 85 in such a manner that each time the rock shaft 90 is moved in an anticlockwise direction, the bearing member 85 will likewise be moved to the right to operate the driving rods 80 and the vanes or blades 46 in the manner heretofore described.

Means is provided for intercepting the flow of fluid when the vanes or blades 46 are moved to their inoperative position, and this means preferably comprises a barrier or wall mounted for movement across the discharge end 36 of the passages 35. In the present embodiment of the invention, this means for intercepting the movement or flow of the fluid is preferably operated by the same means as employed for operating the vanes or blades 46 and is preferably operated simultaneously with the operation thereof.

As shown in Fig. 1, the means employed for intercepting the flow of fluid through the passages 35 and 50, consists of an annular member 92 snugly fitted within the annular member 33 when the vanes or blades 46 are in their operative position as shown in Fig. 1. Carried by the annular member 92 upon the inner circumference thereof, there is a channeled member 93 and operating in said channeled member 93 there is a crank 94, which crank is carried by the upper end of the shaft 61 and is operated thereby each time the shaft is operated. The crank 94 may be provided with an antifriction bearing member for engagement within the channeled member 93, and as shown herein, this antifriction member is preferably spherical in form and of such dimension that it engages the inner faces of the side walls of said channeled member 93.

From the foregoing, it will be apparent that each time the shaft 61 is operated as heretofore described to effect an operation of the vanes or blades, the annular member 92 will be simultaneously operated to intercept the flow of fluid through the passages 35 and 50. For example, with the several parts in the position in which they are shown in Fig. 1, if the shaft 61 be rotated to move the vanes or blades 46 to their inoperative position, through the medium of the crank 94, the annular member 92 will be simultaneously moved to position across the discharge ends 36 of the passages 35 to intercept the flow of fluid through the passages 35 and 50, in which position it is shown in Fig. 4 of the drawings.

In the construction above described the vanes or blades 46 are thin, curved plates which, when in closed position, overlap as shown at the left hand side of Fig. 3. In Figs. 6 and 7 I have shown blades 46*a* which are somewhat thicker and shorter, but the ends are beveled so that when the blades are moved to closed position as shown in Fig. 6 the beveled ends engage to form a substantially smooth, cylindrical, outer surface.

While the invention is herein embodied in a preferred form, it will be understood that it is not limited to that form in which it is illustrated, and that it may be developed in various other forms which rightfully fall within the purview of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A turbine rotor for hydraulic power transmitters comprising a plurality of movable vanes or blades connected to said rotor for rotation therewith, a crank associated with each of said vanes or blades, and means engaging said cranks for moving said vanes or blades into and out of operative position, said means including an oscillatory ring member having cam slots in which said cranks are operatively mounted and normally movable with said rotor, a segmental gear carried by said ring member, and means engaging said segmental gear for oscillating said ring member with respect to said rotor.

2. In a hydraulic power transmitter, a fluid impelling member, a fluid impelled turbine motor, a fluid for effecting an operative fluid couple therebetween, a plurality of adjustable vanes or blades for rendering said turbine rotor ineffective, a ring-like member for intercepting the flow of said fluid, and means for moving said ring-like member axially of the turbine rotor simultaneously with the adjusting of said vanes or blades.

3. A hydraulic power transmitter including a driving member, a driven member, said members forming therebetween a chamber for the circulation of an impelling liquid therein, a plurality of vanes or blades mounted in said chamber, an annular member extending along the core center of said chamber, and connected to said vanes or blades, and means for effecting the relative circumferential movement of said annular member with respect to said blades or vanes, for adjusting the position of said blades or vanes selectively into operative or inoperative position.

4. A hydraulic power transmitter including a driving member, a driven member, said members conjointly forming an annular chamber therebetween for the circulation of an impelling fluid, an annular hollow core ring extending circumferentially along the core center of said chamber, a plurality of blades or vanes pivotally mounted on a wall of said core ring, an annular ring mounted inside said core ring, and cooperating with said blades or vanes, means for shifting said core ring circumferentially with respect to said blades or vanes, and means responsive to the last mentioned movement of said annular ring for adjusting the position of said blades or vanes into operative or inoperative position.

5. A hydraulic power transmitter including a driving member, a driven member, said members being coaxial and forming a working chamber for the circulation of impelling fluid therein, a plurality of movable vanes or blades, each pivotally mounted on an axis disposed parallel to the axis of rotation of said members, a crank associated with each of said vanes or blades and disposed at the ends of the vanes or blades near the core center of said chamber, and an oscillatory ring member extending along the core center of said working chamber, and engaging said cranks for moving said vanes or blades into and out of operative position.

6. A hydraulic power transmitter including a driving member, a driven member, said members being coaxial and conjointly forming a working chamber therebetween for the circulation of impelling fluid therein, a plurality of vanes or blades, each pivotally mounted on an axis disposed parallel to the axis of rotation of said members, a crank associated with each of said vanes or blades, and disposed near the core center of said working chamber, and an oscillatory ring member having cam slots in which said cranks are operatively mounted, said ring being mounted in the core center of said working chamber, and means for oscillating said ring member to move said vanes or blades into or out of operative position.

7. A hydraulic power transmitter including a driving member, a driven member, said members conjointly forming a working chamber for the circulation of an impelling fluid therein, an annular hollow core ring extending along the core center of said chamber, a plurality of vanes or blades, each pivotally mounted in said core ring, an oscillatory ring member located in said core ring and operatively connected to said vanes or blades, and a shaft extending radially from outside said working chamber into the interior of said core ring, and engaging said ring member, and means for rotating said shaft to oscillate said ring member.

8. A hydraulic power transmitter including a driving member, a driven member, said members being coaxial and conjointly forming a working chamber for the circulation of an impelling fluid therein, a plurality of vanes or blades pivotally mounted on axes disposed parallel to the axes of rotation of said members, means for adjusting said movable vanes or blades about their pivot points for rendering said driven member ineffective, a cylindrical member normally positioned in the core center of said working chamber, and means for shifting said cylindrical member axially into the path of the impelling fluid to intercept said fluid.

9. A hydraulic power transmitter including a driving member, a driven member, said members being coaxial and conjointly forming a working chamber for the circulation of an impelling fluid therein, a plurality of vanes or blades pivotally mounted on axes disposed parallel to the axes of rotation of said members, means for adjusting said movable vanes or blades about their pivot points for rendering said driven member ineffective, a cylindrical member normally positioned in the core center of said working chamber, and means for shifting said cylindrical member axially into the path of the impelling fluid to intercept said fluid simultaneously with the adjustment of said vanes or blades into inoperative position.

10. A hydraulic power transmitter including a driving member, a driven member, said members being coaxial and conjointly forming a working chamber for the circulation of an impelling fluid therein, a hollow core ring extending along the core center of said chamber, a plurality of vanes or blades, each pivotally mounted at one end of said core ring, a crank associated with each of said vanes or blades, and disposed in said core ring, an

oscillatory ring engaging said cranks, and disposed in said core ring, a shaft extending radially from a point outside said chamber, and having the outer end engaging said ring member, a cylindrical member normally disposed inside said core ring, and means responsive to the rotation of said shaft for shifting said cylindrical member into said working chamber in the path of the impelling liquid, and simultaneously moving said vanes or blades about their pivot points to render them ineffective.

Signed at New York, in the county of New York and State of New York, this 10th day of June, A. D. 1929.

GUSTAV A. KLIMEK.