No. 774,782 PATENTED NOV. 15, 1904.

L. D. ROBINSON.

POWER TRANSMITTING MECHANISM.

APPLICATION FILED JAN. 22, 1904.

NO MODEL.

Fig. 1.

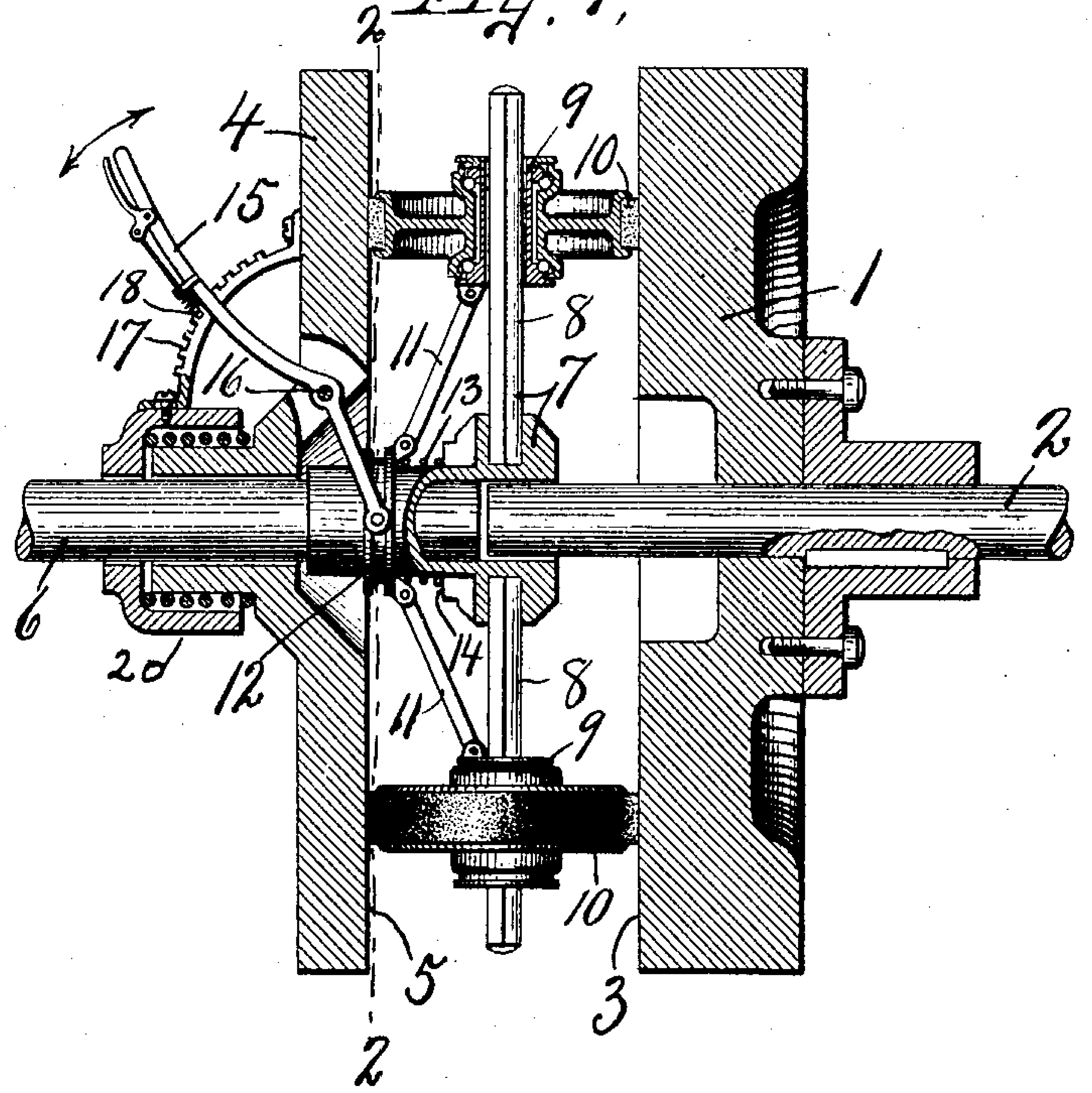
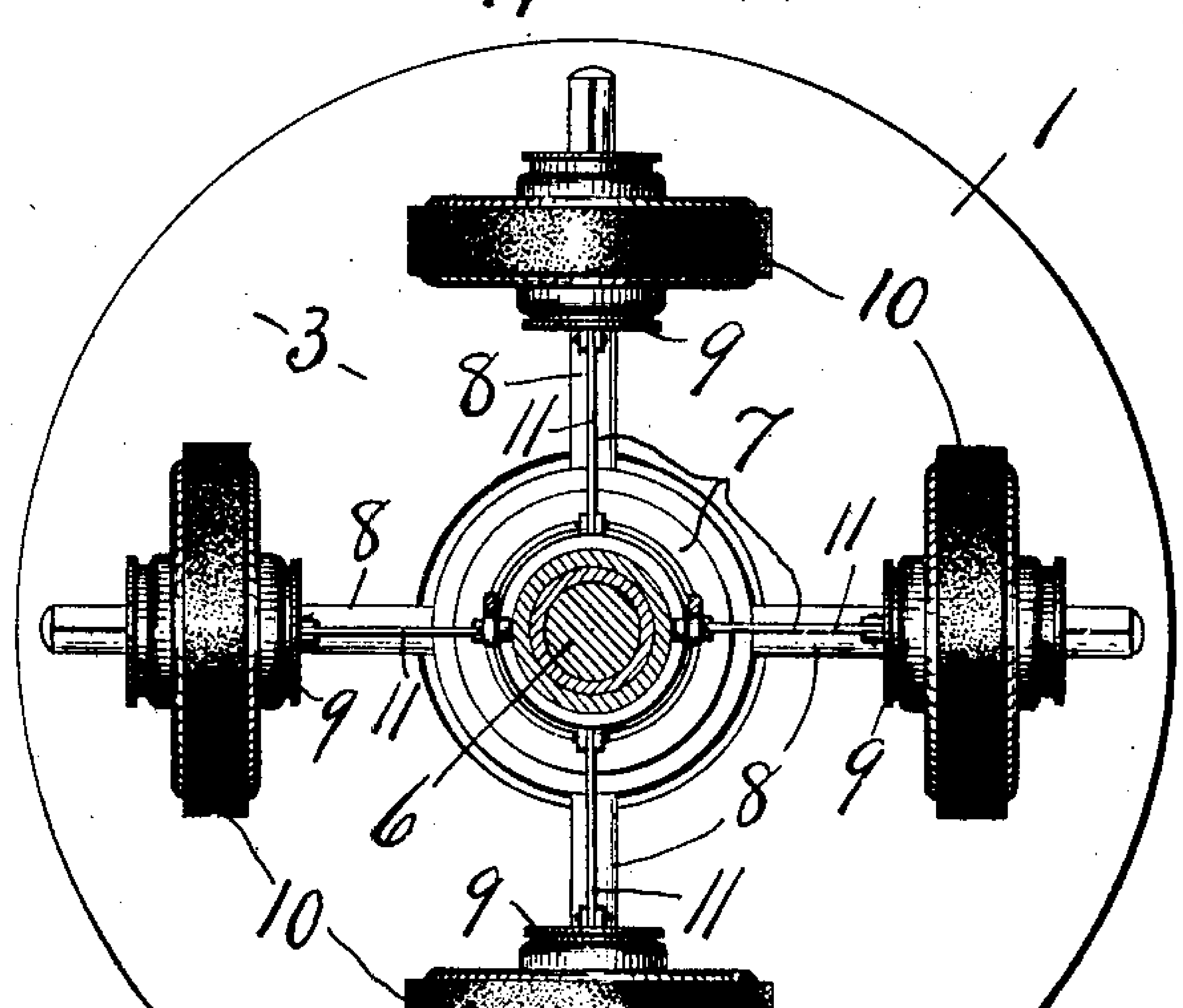


Fig. 2.



Witnesses:

F. E. Arthur,

H. E. Chase

Inventor:

Lynn D. Robinson

By

Howard P. Denison

Attorney.

No. 774,782. Patented November 15, 1904.

UNITED STATES PATENT OFFICE.

LYNN DANA ROBINSON, OF BINGHAMTON, NEW YORK.

POWER-TRANSMITTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 774,782, dated November 15, 1904.

Application filed January 22, 1904. Serial No. 190,159. (No model.)

To all whom it may concern:

Be it known that I, LYNN DANA ROBINSON, of Binghamton, in the county of Broome, in the State of New York, have invented new and useful Improvements in Power-Transmitting Mechanism, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in power-transmitting mechanism, and refers more particularly to that class in which the motion is transmitted from one revoluble part to another through the medium of friction gears or disks.

The primary object is to produce a variable-leverage connection between the driving and driven members and to permit the use of different sizes of intermediary friction-disks for varying the speed of the driven member.

Another object is to produce means for adjusting the intermediary disks radially to vary the leverage between the driving and driven parts.

Other objects will appear in the following description.

In the drawings, Figure 1 is a longitudinal sectional view of my improved transmitting mechanism, showing the means for adjusting the intermediary disks radially. Fig. 2 is a transverse sectional view taken on line 2 2, Fig. 1.

Similar reference characters indicate corresponding parts in both views.

This device is particularly applicable for use in connection with the propelling mechanism of automobiles, and I have therefore shown a balance-wheel 1 as mounted upon a driving-shaft 2 of an engine, said balance-wheel being keyed or otherwise secured to the shaft 2 and is provided with a suitable friction-face 3 at right angles to the axis of rotation. A non-rotatable disk 4 is suitably mounted and arranged at one end of the disk 1 and is provided with a friction-face 5, facing the driving member 1, the disk 4 being held from rotation by any desired means not necessary to herein illustrate or describe.

Interposed between the disks 1 and 4 and secured to a second shaft 6 is a spider or rotary frame 7, having radial projecting arms 8, which are preferably angular in cross-section to receive sleeves 9, which are provided with openings therethrough, also angular in cross-section and fitting upon the rotary arms 8, so as to move lengthwise thereon. Journaled upon these levers are intermediary friction-disks 10, which are interposed between and engage the friction-faces 3 and 5 of the disks 1 and 4, so that when the driving member 1 is rotated the intermediary disks 10 are rolled circumferentially around the face of the non-rotatable disk 4, thereby rotating the spider or frame 7 and shaft 6, which is secured thereto in the same direction of rotation as the driving member 1 and its shaft 2. These shafts 2 and 6 are arranged end to end in axial alinement with each other, and it therefore follows that the disks 10 travel in circular paths around the face of the disk 4. Any number of these disks 10 may be employed to transmit motion from the driving member 1 to the frame 7 and shaft 6, and in this instance I have shown a series of four, each of which is arranged equidistant from the axis of revolution, so as to travel in substantially the same circular path around the face 5 of the disk 4, and in order to hold these disks equidistant from said axis I preferably connect each of the sleeves 9 by a link 11 to a suitable collar 12 on the hub of the frame 11, so as to rotate with the frame 7 and shaft 6.

The collar 12 is movable axially on said hub, and the links 11 are pivotally connected to their respective sleeves 9 and also to the collar 12, so that as the collar is moved axially it operates to simultaneously move all of the disks 10 radially an equal distance toward and from the axis of revolution of the frame 7 as may be desired. This radial outward movement of the disks 10 is effected automatically by centrifugal force due to the rotation of the frame 7, and in order to partially counteract this centrifugal action I place a coil-spring 13 around the hub of the frame 7 and between the collar 12 and a shoulder 14 on the hub, it being understood that the collar 12 is drawn inwardly by the outward movement of the disks 10 and that the links 11 serve to equalize the movement of the disks to keep them a uniform distance from the axis of rotation of the frame 7. This radial movement of the disks is preferably controlled manually, and I have therefore shown a lever 15, fulcrumed at 16, on the non-rotatable disk 4, the inner end of said lever being operatively connected to the collar 12 to move it endwise, and the outer end is movable along a toothed rack 17 and is provided with a spring-operated pawl 18 to engage the toothed rack 17 and hold the lever 15 and collar 12 in their adjusted positions, thereby serving to hold the sleeve 9 and the disks 10, mounted thereon, at any position desired.

It is now apparent that the disks 10 are yoked or linked to the frame 7 through the medium of the links 11 and collar 12, which serve to limit the outward sliding movement of the disks, and thereby prevent their accidental displacement from the radial arms 8; but these links are detachably connected to the sleeves 9 to permit the disks 10 to be removed from the outer ends of the arms 8 to replace them with disks of a different size, the object of this being to vary the leverage of the disks 10 between the adjacent faces of the two disks 1 and 4, as it is evident that any variation in the diameter of the disks causes a like variation in the leverage. For example, the power is applied at the point of contact between the disk 10 and face of the disk 1, and the fulcrum is the point of contact of said disk with the face of the disk 4, while the load, which is the rotation of the frame 7 and shaft 6, is applied at the center of the disk 10, and therefore any increase in the diameter of said disk 10 requires greater power from the driving member 1 to rotate the frame 7 and shaft 6. In like manner this leverage may be increased or diminished by moving the disks 10 radially with reference to the axes of the frame 7—that is, the outward movement of the disks 10 increases the leverage on the arms 8, and therefore requires less power to rotate the frame 7, while, on the other hand, the movement of the disks 10 inwardly reduces the leverage and requires a greater power to drive said frame.

The rack 17 is attached to the disk 4 and has a sliding connection with the fixed collar 20 to permit the disk 4 to be adjusted endwise against the rollers 10 and to hold said rollers against the disk 1.

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

1. In a power-transmitting mechanism, two separate shafts axially alined with each other, separate revoluble parts on the shafts, a non-rotatable part, and revoluble disks on one of the revoluble parts engaged with the other revoluble part and with the non-rotatable part, whereby the disks are rotated upon their axes, and also concentric with the axes of the shafts.

2. In a power-transmitting mechanism, two separate shafts axially alined with each other, separate revoluble parts on the shafts, a non-rotatable part, and revoluble disks on one of the revoluble parts engaged with the other revoluble part and with the non-rotatable part, whereby the disks are rotated upon their axes, and also concentric with the axes of the shafts, said disks being movable radially to and from the axes of said shafts.

3. In a power-transmitting mechanism, two revoluble parts and a non-rotatable part having a common axis, one of the revoluble parts having a radial arm, a disk revolubly mounted on the arm and having an independent axial movement, said disk being in sliding contact or engagement with the other revoluble part and with the non-revoluble part.

4. In a power-transmitting mechanism, the combination with revoluble driving and driven members having a common axis, of a non-revoluble part, power-transmitting disks having sliding connection with the driving and driven members and with the non-revoluble part for transmitting motion from the driving member to the driven member and for varying the leverage between said members.

5. In a power-transmitting mechanism, the combination with revoluble driving and driven members, and a fixed member, the driven member being interposed between the driving and fixed member and revoluble disks mounted upon the driven member with their axes at right angles to the axis of revolution of the driving and driven members, said disks having rolling connection with the driving and fixed members whereby the disks are rotated on their axes and having an independent planetary movement which rotates the driven member, the disks being also movable axially toward and from the axes of the driving and driven members.

6. In a power-transmitting mechanism, the combination with revoluble driving and driven members having a common axis, a fixed member having a circular face concentric with said axis, one or more disks interposed between the driving and fixed members and rolling upon the circular face of the fixed member and driven by the driving member, said disk or disks being movable radially relative to the axis of the driving member and operatively connected to transmit motion to the driven member by its planetary movement.

7. In a power-transmitting mechanism, the combination with a revoluble driving member and a fixed member concentric with the axis of the driving member, a driven member and disks mounted thereon and engaging the driving member and fixed member, and means to move the disks radially of the driving member, the driven member having its axis of revolution coincident with that of the driving member.

8. A power-transmitting mechanism comprising two revoluble shafts arranged end to end, but separate from each other, a driving-

wheel on one shaft and a fixed wheel loosely encircling the other shaft and facing the driving-wheel, a driven member secured to said other shaft and provided with radial arms upon which are mounted sliding sleeves, disks journaled on the sleeves and engaging the revoluble and fixed wheels whereby the rotation of the revoluble wheel rolls the disk concentrically around the face of the fixed wheel and thereby transmits rotary motion to the driven member.

9. A power-transmitting mechanism comprising two revoluble shafts arranged end to end, but separate from each other, a driving-wheel on one shaft and a fixed wheel loosely encircling the other shaft and facing the driving-wheel, a driven member secured to the second shaft and provided with radial arms upon which are mounted sliding sleeves, disks journaled on the sleeves and engaging the revoluble and fixed wheels whereby the rotation of the revoluble wheel rolls the disk concentrically around the face of the fixed wheel and thereby transmits rotary motion to the driven member, and means for moving the disks radially with reference to the driving and driven members.

10. In a power-transmitting mechanism, revoluble driving and driven members and a non-rotatable member all having a common axis, the driven member having radial arms, rollers revolubly mounted on said arms and engaged with the driving and non-rotatable members whereby a planetary movement is imparted to the rollers to rotate the driven member, said rollers being movable axially, and means to hold said rollers in their axial adjusted position.

In witness whereof I have hereunto set my hand this 15th day of January, 1904.

LYNN DANA ROBINSON.

Witnesses:

J. O. STONE,

J. J. WILEY.