Nov. 2, 1943. A. M. WOLF 2,333,611

VEHICLE DRIVING MECHANISM

Filed Nov. 30, 1939

Fig. 1.

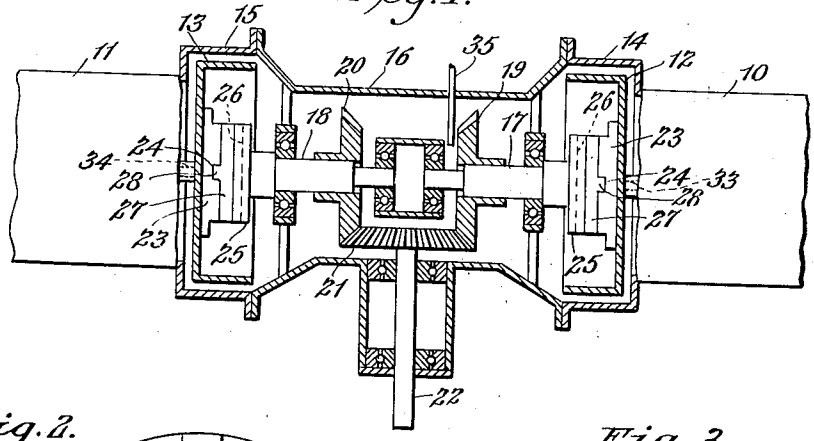


Fig. 2.

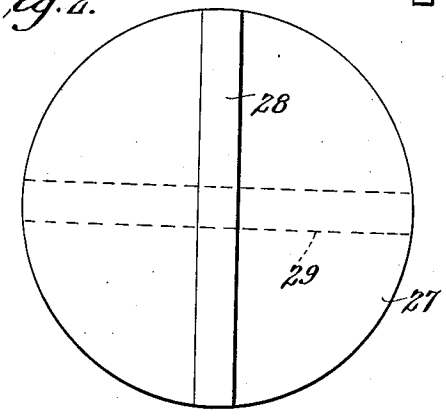
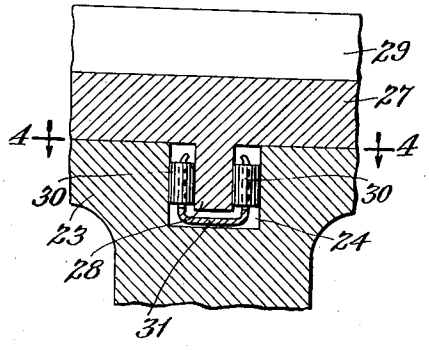


Fig. 3.



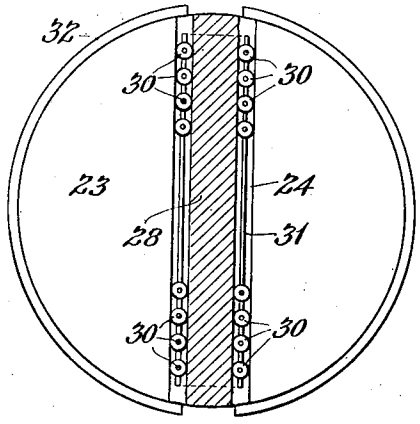


Fig. 4.

INVENTOR.
Austin M. Wolf,

BY M. C. Lyddane

ATTORNEY.

Patented Nov. 2, 1943 2,333,611

UNITED STATES PATENT OFFICE

2,333,611

VEHICLE DRIVING MECHANISM

Austin M. Wolf, Plainfield, N. J.

Application November 30, 1939, Serial No. 306,844

2 Claims. (Cl. 64—31)

This invention relates to vehicle driving mechanism, the subject matter of the present application constituting a continuation-in-part of my pending application for patent, Ser. No. 73,584, filed April 9, 1936, now Patent No. 2,185,165, issued December 26, 1939, which in turn is a continuation of my original application Ser. No. 612,057 filed May 18, 1932.

Generically considered, it is the object of my present invention to provide a very simple, inexpensive and compact arrangement of the prime mover or engine and power input and take-off shafts together with power transfer gearing, and incorporating means whereby, in the event of misalignment of the engine crank shaft and the power input shaft, a positive driving connection is maintained with a smooth and uninterrupted flow of power through the transfer gearing to the take-off shaft.

More particularly, it is the object of the invention to provide connecting means between the engine fly-wheel and the power input shaft embodying an Oldham type coupling provided with means which permits of substantially frictionless relative axial displacement between the fly-wheel and power input shaft while maintaining a positive driving connection therebetween.

With the above and other objects in view, the invention consists in the improved vehicle driving mechanism and the form, construction and relative arrangement of its several parts as will hereinafter be more fully described, illustrated in the accompanying drawing and subsequently incorporated in the subjoined claims.

In the drawing wherein I have illustrated one simple and practical embodiment of the invention, and in which similar reference characters designate corresponding parts throughout the several views:

Fig. 1 is a plan view, partly in section, illustrating one embodiment of the present invention.

Fig. 2 is a detail elevation of the male element of the coupling connection between the engine fly-wheel and power input shaft.

Fig. 3 is a detail horizontal sectional view of two of the coupling elements and

Fig. 4 is a sectional view taken substantially on the line 4—4 of Fig. 3.

Referring in detail to the drawing, in Fig. 1 thereof, I have shown the present invention as employed in connection with a pair of laterally spaced apart internal combustion engines 10 and 11 respectively, having their crank shafts disposed in axial alignment. To the opposed ends of the engine crank shafts, the drum type fly-wheels 12 and 13 respectively are suitably fixed. These fly-wheels are enclosed by the housings 14 and 15 respectively which are rigidly secured to the ends of the respective engines 10 and 11.

The fly-wheel housings 14 and 15 are rigidly connected with each other at their inner open sides by an intermediate housing member 16, in which power input shafts 17 and 18 respectively are rotatably supported in suitable anti-friction bearings. Upon the inner end portion of each of these shafts, a power transfer gear 19 and 20 respectively is keyed or otherwise securely fixed. These gears are in constant mesh with diametrically opposite sides of the gear 21 fixed upon the inner end of the power take-off shaft 22 which is journalled in suitable anti-friction bearings carried by the intermediate housing member 16.

The outer ends of the power input shafts 17 and 18 are connected in power transmitting relation with the respective engine crank shafts by means of flexible coupling devices arranged within the drum shaped fly-wheels 12 and 13 respectively. Since these couplings are of identically the same construction, the following description of one of said couplings will suffice for both.

Preferably, in the interest of simplicity and compactness in the arrangement of mechanical elements, I prefer to use power transmitting couplings of the Oldham type, modified in the manner to be presently described in order to obtain substantially frictionless relative movement between the complementary parts thereof. As is herein shown, each coupling includes a member or disk 23 securely fixed to the inner face of the end wall of the fly-wheel in concentric relation therewith. This member is provided with a diametrically extending groove or channel 24.

A similar coupling member or disk 25 is also fixed to the opposed end of the power input shaft and is likewise provided with a diametrically extending groove or channel 26. Between members 23 and 25, a male coupling member or disk 27 is interposed. The opposite side faces of this disk are provided with diametrically extending ribs 28 and 29 respectively disposed at right angles to each other. One of these ribs is movably positioned in the groove or channel 24 of the coupling member 23 on the engine fly-wheel while the other of said ribs is engaged in the groove or channel of the coupling member 25 on the power input shaft.

In order to eliminate friction as far as possible in the relative movement between said coupling members, I provide, in the opposite end portions of each of the grooves or channels 24

and 26, two series of anti-friction rollers 30, the rollers in each series being distributed between the side walls of the channel and the opposing faces of the ribs 28 and 29 in radially spaced relation to each other. The individual rollers are held in such spaced relationship by mounting the same in the opposite end portions of a sheet metal cage member 31. These anti-friction units are of slightly less length than the respective grooves and have bodily longitudinal movement therein.

In order to prevent outward radial movement of the cage member and anti-friction rollers from the channels 24 and 26, a metal band 32 is suitably secured upon the periphery of each of the coupling members 23 and 25, it being understood that the edge of this band is suitably recessed to permit movement of the rib on the coupling disk 27 therethrough.

Any suitable means may be provided for lubricating the above described couplings, such for instance, as the lubricant supply ducts or passages 33 and 34 respectively in the crank shafts of the engines 10 and 11. A suitable lubricant may also be supplied to the power transfer gearing through the pipe connection 35 with the intermediate housing member 16.

From the foregoing description considered in connection with the accompanying drawing, it will be appreciated that I have provided a very simple, inexpensive and compact arrangement which is particularly advantageous in a driving mechanism for motor vehicles and insures a smooth, continuous and uninterrupted transfer of power from the engine crank shaft to the take-off shaft 22, which is suitably connected through the change speed transmission with the driving axle differential. By the provision of the improved coupling means between the engine crank shaft and power input shaft as above described, displacement of the crank shaft axis relative to the power input shaft, due to wear in the bearings, or other causes, will not result in binding and possible mutilation or stripping of the teeth of the power transfer gears. Notwithstanding such axial displacement between the crank shaft and the power input shaft, there will be maintained, in effect, a substantially rigid connection between said shafts and a continuous uninterrupted transfer of power from the engine crank shaft to the take-off shaft 22. Of course, while I have herein referred to an adaptation of my present invention in connection with a pair of laterally spaced engines, it will be apparent that the invention may also be used in connection with a single engine or prime mover. When access is required to the parts of the power transfer mechanism, such access can readily be obtained by simply disconnecting the intermediate housing 16 so that said housing together with the power input and output shafts and the gearing can be removed as a single unit.

In the foregoing description and the accompanying drawing, I have disclosed a simple and practical embodiment of the invention, but it is to be understood that the combination and relative arrangement of the various mechanical parts is susceptible of more or less modification. Accordingly, my invention is not to be limited in these particulars, since it may also be exemplified in various other alternative structural forms, not herein specifically disclosed, but which may be fairly comprehended as within the spirit and scope of the appended claims.

I claim:

1. In combination with driving and driven shafts, coupling members fixed to opposed ends of said shafts and provided with diametrically extending grooves in their opposed faces extending at right angles to each other, an intermediate coupling member having diametrically extending ribs on its opposite faces respectively positioned in the grooves of said first named coupling members, anti-friction members interposed between the walls of said grooves and the ribs on said intermediate coupling member, and means for retaining said anti-friction members in said grooves while permitting of relative radial movement of said ribs beyond the end of said grooves, said means comprising a band secured upon the periphery of each of said first named coupling members and having diametrically opposed recesses through which said ribs are movable.

2. In combination with driving and driven shafts, coupling members fixed to opposed ends of said shafts and provided with diametrically extending grooves in their opposed faces extending at right angles to each other, an intermediate coupling member having diametrically extending ribs on its opposite faces respectively positioned in the grooves of said first named coupling members, and a roller bearing cage embracing each of the ribs on said intermediate coupling member, spaced rolled bearings mounted in opposite side portions of said cage and engaged with opposite sides of the respective ribs and the opposed walls of said grooves, and means secured to each of the first named coupling members and cooperating with said side portions of the respective roller bearing cages at the ends thereof to prevent bodily radial displacement of the roller bearings relative to the coupling members.

AUSTIN M. WOLF.