W. W. ANNABLE.

GEARING FOR AXLES OF AUTOMOBILES.

APPLICATION FILED AUG. 24, 1912.

1,104,160.

Patented July 21, 1914.

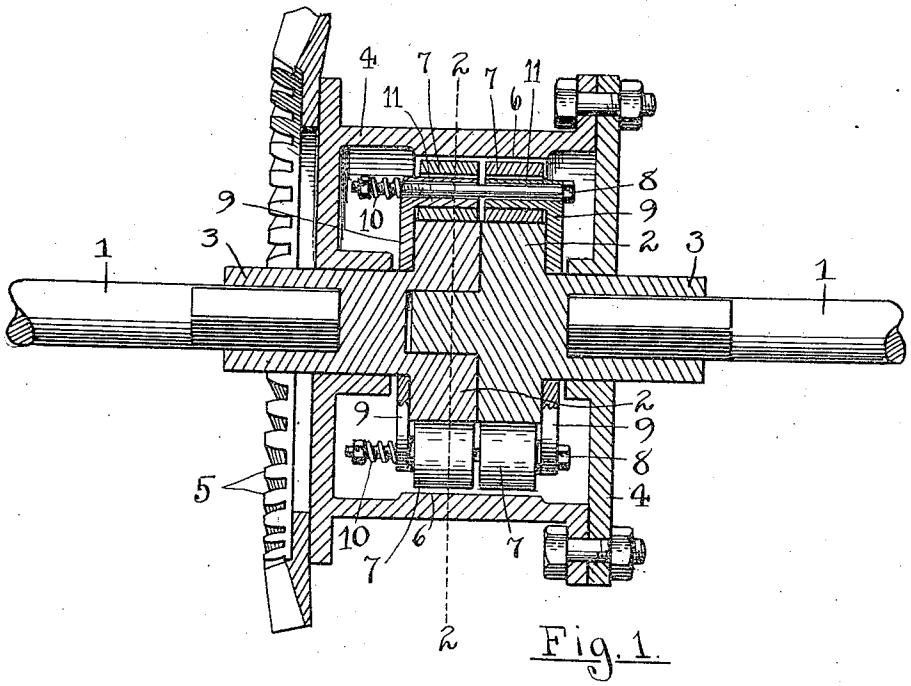


Fig. 1.

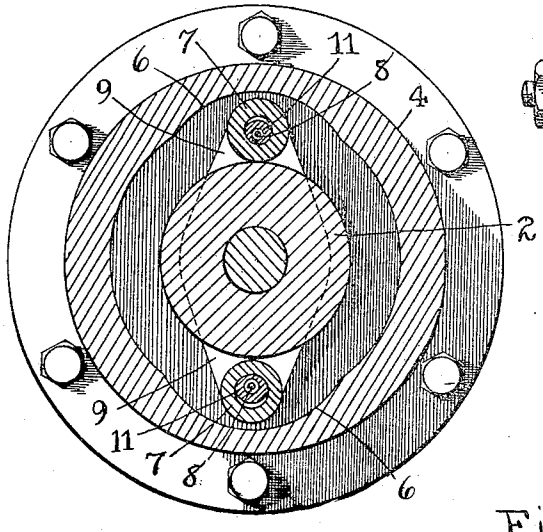


Fig. 2.

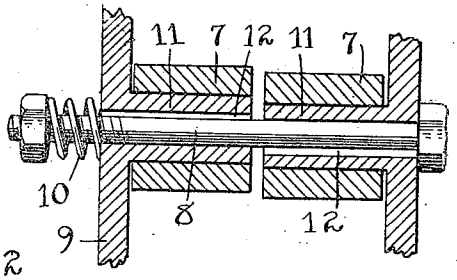


Fig. 3.

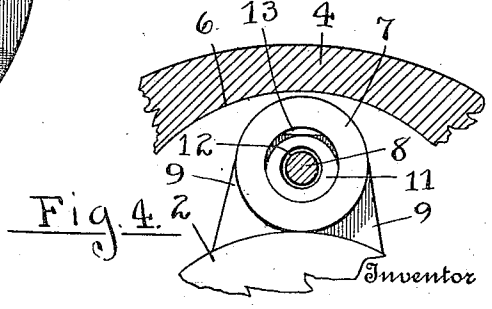


Fig. 4.

Witnesses

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GEARING FOR AXLES OF AUTOMOBILES.

1,104,160. Specification of Letters Patent. Patented July 21, 1914.

Continuation of application Serial No. 609,637, filed February 20, 1911. Renewed December 12, 1911, Serial No. 665,376. This application filed August 24, 1912. Serial No. 716,826.

To all whom it may concern:

Be it known that I, WARREN W. ANNABLE, a citizen of the United States of America, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Gearing for Axles of Automobiles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in gearing for the axles of automobiles and the like as disclosed in my prior application filed February 20, 1911, Serial No. 609,637, and its object is to provide the same with various new and useful features, as will more fully appear by reference to the accompanying drawings in which:—

Figure 1 is a vertical longitudinal section of a device embodying my invention; Fig. 2 a transverse section of the same on the line 2—2 of Fig. 1; Fig. 3 an enlarged detail in horizontal section through the locking rolls; and Fig. 4 an elevation of the same together with adjacent parts.

Like numbers refer to like parts in all of the figures.

1 represents two shafts arranged in line with each other and spaced apart at their adjacent ends. To each shaft is attached a wheel 2 serving as a driven member, these wheels being of substantially equal dimensions and each provided with a hub 3 in which the respective shaft 1 is fixed. Each shaft and its respective driven member is independently rotative.

4 is a case journaled on the hubs 3 and independently rotative about the same. This case is driven by any convenient means, a bevel gear 5 being shown attached thereto. The interior of the case is concentric with the axis of the driven members 2 throughout portions of the circumference and at opposite sides thereof is provided with eccentric portions 6 presenting surfaces oppositely inclined to the surface of the driven members 2, within which portions are arranged locking rollers 7, a pair of such rollers being provided for each driven member 2 to oppositely engage the same, and lock it to the case. The case 4 thus forms the driving member and operates to drive the driven members 2 in either direction, or to be driven thereby, whenever the rollers 7 jam between the eccentric surface of the case and the outer surface of the wheels 2.

Engaging the outer sides of the driven members 2 are oppositely projecting friction plates 9, freely rotative about the axis of the hubs 3, these plates having journals 11 for the rollers 7, opposite the periphery of the respective wheel 2. In the axis of these journals are bolts 8 provided with springs 10 to yieldingly force the friction plates against the outer surfaces of the wheels 2. The bolts 8 are inserted in openings 12 of greater diameter whereby a limited relative movement of the friction plates 9 is provided for. The rollers 7 also have central openings larger than the diameter of the bearings 11, permitting the same to adjust radially to prevent binding of the same when operating to lock the aforesaid members, and also to move relatively to each other to a limited extent.

In operation, the case being driven in either direction will rotate independently until the eccentric surfaces 6 therein engage the rollers 7, which rollers will then bind or jam between the case and driven members 2 and thus operate to drive the latter around with the case. In the event that one shaft runs ahead of the other, as in automobile practice when turning a curve, the clearance on the bolts 8 will permit the wheel 2 on the more rapidly rotating shaft to carry the roller 7 out of engagement with the eccentric surface 6 and thus disconnect this wheel from the case, and permit it to rotate ahead independently. The friction of the plates 9 on the sides of the wheels, carries the rollers around with the wheels and insures prompt locking and unlocking action thereof. The driving member is thus at no time left disconnected from the driven members when the car is coasting with the power shut off, thus preventing any accident due to stoppage of the driving member and sudden picking up of the same by reëngagement with the rapidly running wheels, the operation being such that whenever the power is shut off the driven members will run ahead of the driver and by frictional contact with the plates carry the rollers into locking en-

gagement and the wheels will then drive the driving member forward therewith thus avoiding accident, breakage of the device or serious strains on the same.

What I claim is:

1. An axle gearing for automobiles, comprising two independently rotative driven members, a driving member common to both driven members, separate clutch members to connect each respective driven member with the driving member and separate and independently operative means for moving the respective clutch members into operative engagement actuated by the respective driven member.

2. An axle gearing for automobiles, comprising two independently rotative driven members, a driving member common to both driven members, separate clutch members for connecting the driving member with each driven member, means for moving the said clutch members into operative position, frictionally engaging the driven members and operated thereby and springs to maintain said frictional engagement.

3. An axle gearing for automobiles, comprising two independently rotative driven members, a driving member common to both driven members, separate clutch members to connect each driven member with the driving member, and a plate frictionally engaging each driven member and carried forward thereby, and also connected to the respective clutch members to move the same into operative position, whereby the driven member will operate to drive the driving member.

4. An axle gearing for automobiles, comprising two shafts arranged end to end and independently rotative, a driven wheel fixed on each shaft, a driving member common to both wheels and surrounding the same, clutch rollers between the respective driven wheels and the driving member, a plate frictionally engaging each driven wheel and independently rotative about the same axis, each plate connected to the respective clutch rollers, and means for connecting said plates to limit the relative movement of the same.

5. The combination of two shafts arranged end to end, a wheel on each shaft, a case surrounding said wheels spaced apart therefrom and independently rotative, said case having internal opposing eccentric surfaces, and locking rollers between said surfaces and the wheels, said rollers being connected to each other and having a limited independent movement about the axis of the case and wheels.

6. The combination of two shafts arranged in line and end to end, a wheel fixed on the adjacent end of each shaft, a case having eccentric concavities in the inner surface at opposite sides of the wheels, said case also surrounding the wheels and independently rotative, a locking roller in each concavity opposite each wheel, and means for connecting said rollers opposite the respective wheels to each other to limit their independent rotative movement around the axis of the wheels.

7. The combination of two shafts arranged end to end and independently rotative, a wheel on each adjacent end of the shafts, a case surrounding the wheels and independently rotative said case also having eccentric concavities opposite the wheels, independently rotative plates embracing the wheels and frictionally engaging the same, said plates also having journals projecting between said recesses and the wheels, rollers on said journals and adapted to lock the case to the respective wheels, and means for connecting the plates permitting a limited independent rotation of the same.

8. The combination of two shafts arranged end to end and independently rotative, a wheel on each adjacent end of the shafts, a case independently rotative and surrounding the wheels, said case having eccentric concavities at opposite sides of the wheels, plates embracing the wheels and frictionally engaging the same, said plates also having journals opposite said concavities, bolts extending through said journals, springs on said bolts, and rollers on said journals adapted to lock the case to the wheels, and having a limited independent lateral movement on said journals to independently lock and unlock the case and wheels.

9. The combination of two shafts, independently rotative and arranged end to end, a wheel on each adjacent end of said shafts, a case surrounding said wheels and independently rotative, said case also having eccentric concavities opposite the peripheries of the wheels, plates embracing the wheels and frictionally engaging the same said plates also having journals between said eccentric surfaces and the wheels, bolts connecting the plates and permitting the same a limited independent rotation with the respective wheel, springs on said bolts, and locking rollers on said journals having a limited lateral movement thereon.

In testimony whereof I affix my signature in presence of two witnesses.

WARREN W. ANNABLE.

Witnesses:
PEARLE CARY,
RAY W. LONGFIELD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."