[Second Edition.]

PATENT SPECIFICATION

Application Date: March 26, 1926. No. 8304/26. **273,014**

Complete Left: Jan. 25, 1927.

Complete Accepted: June 27, 1927.

PROVISIONAL SPECIFICATION.

Driving Gear for Motor Vehicles and for other purposes.

I, GEORGE CONSTANTINESCO, of "Carmen Sylva", Beechwood Avenue, Oatlands Park, Weybridge, in the County of Surrey, British subject, do hereby declare the nature of this invention to be as follows:—

This invention relates to a method and means of eliminating the differential gear in motor vehicles.

The invention consists in driving separately each wheel of the axle of a motor vehicle by two independent shafts, each shaft receiving rotary impulses from a single engine driving one primary shaft from which alternating motions are split between oscillating masses and unidirectional driving mechanisms driving the two independent shafts by power transmission means acting on the principle of the subject matter of my prior Patent No. 185,022.

The invention is applicable not only to motor vehicles but to any other purpose where it is desired to drive more than one shaft from one single engine.

This invention gives a method by which the engine may be kept running at a steady speed while two or more shafts automatically drive independently variable loads. For instance, all four wheels of a vehicle may be driven from one engine by this method, thereby dispensing with complicated differentials.

According to one embodiment of my invention the rear wheels are mounted independently and driven by reversing mitre gearing, each wheel having a gear to itself. The middle or driving pinion of each gear is mounted on a shaft, the two shafts being actuated preferably in opposite directions by separate unidirectional driving gears, each of which receives a step by step motion from an oscillator. The oscillators are connected together by a rod so that they move together and one of them is driven from a prime mover through an inertia device on the principle explained in my prior specification above referred to.

In a modification the oscillators may be stabilized for no load conditions by resilient or other suitable links, for example, they may be connected together by a spring link in addition to the above mentioned connecting rod.

The invention may be embodied in a great variety of forms of which the above are examples, and the arrangement may be made polyphase by multiplying the number of cranks in the prime mover and the unidirectional driving devices.

Dated the 26th day of March, 1926.

CARPMAELS & RANSFORD,
Agents for Applicant,
24, Southampton Buildings, London, W.C. 2.

COMPLETE SPECIFICATION.

Driving Gear for Motor Vehicles and for other purposes.

I, GEORGE CONSTANTINESCO, of "Carmen Sylva", Beechwood Avenue, Oatlands Park, Weybridge, in the County of Surrey, British subject, 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 invention relates to driving gear mainly for motor cars by which the usual differential gear is dispensed with.

It consists in driving each wheel of the axle of a motor vehicle independently by two shafts each of which receives unidirectional impulses from a single engine driving one primary shaft. Alternating motions derived from this shaft are split between one or more oscillating masses and unidirectional driving mechanism which actuates the two independent shafts by power transmission means acting on the principle of the subject matter of my prior Patent No. 185,022. The invention, however, is applicable not only to motor vehicles but to any other purpose where it is desired to drive more than one shaft from a single engine.

The invention provides a method by which the engine may be kept running at a steady speed while two or more shafts automatically drive independently variable loads. For instance, all four wheels of a vehicle may be driven from one engine by this method, thereby dispensing with complicated differentials.

According to one embodiment of my invention the rear wheels are mounted independently and driven by reversing mitre gearing, each wheel having a gear to itself. The middle or driving pinion of each gear is mounted on a shaft, the two shafts being actuated preferably in opposite directions by separate unidirectional driving gears, each of which receives a step by step motion from an oscillator. The oscillators are connected together by a rod so that they move together and one of them is driven from a prime mover through an inertia device on the principle explained in my prior specification above referred to.

In a modification, the oscillators may be stabilized for no load conditions by resilient or other suitable links, for example, they may be connected together by a spring link in addition to the above mentioned connecting rod.

The invention may be embodied in a great variety of forms of which the above are examples, and the arrangement may be made polyphase by multiplying the number of cranks in the prime mover and the unidirectional driving devices.

Referring to the accompanying drawings, which show embodiments of my invention:

Figure 1 shows in diagram a form in which the oscillating members of the unidirectional driving devices are connected by a rod.

Figure 2 shows in diagram a modification in which the oscillating members are in addition connected by a spring link.

Figure 3 shows in diagram a device similar to that shown in Figure 1 with a modified form of inertial mass.

Figures 4 and 5 are detail views of the back axle of a motor vehicle showing means for reversing.

Referring to Figure 1, 1 represents in diagram the flywheel of an engine, not shown. 2 is the engine crank connected by a link 3 with a mass 4 which is thus oscillated. The mass 4 is carried on an arm 5 pivoted at 6 to a lever 7 which is loosely mounted on one of the driven shafts 8. The other driven shaft 9 carries an arm 10 loosely mounted upon it and connected to the lever 7 by a rod 11. The shafts 8 and 9 are parallel and are mounted in fixed bearings indicated diagrammatically at 12 and 13. The lever 7 and the arm 10 drive the shafts on which they are mounted unidirectionally by any suitable means indicated by arrows 14 and 15 which represent pawls acting on rotors 16 and 17. The motion of the prime mover is thus split between the oscillating mass and the driven shafts after the manner described in my prior specification above cited. If, for example, the torque on either shaft becomes excessive so that the lever 7 and the arm 10 cannot oscillate, the point 6 becomes fixed and the whole motion of the engine is absorbed by the inertial mass. If, on the contrary, there is no torque, the point 6 can move freely and the motion of the inertial mass is little or nothing. Intermediate torques produce intermediate results, the motion in all cases being split between the unidirectional devices and the inertial mass in proportions varying with the torque as fully described in my prior specification.

Figure 2 shows a modification in which corresponding parts are correspondingly numbered. The modification consists in connecting the lever 7 and the arm 10 by a spring 18 as well as by the connecting rod 11, the spring giving additional stability to the motion. The straight lever 7 and the arm 10 are replaced by bell-crank levers as shown and indicated by the same numerals.

Figure 3 is a view similar to Figure 1, in which the inertial mass 4 is differently mounted.

Figures 4 and 5 show the arrangement of, for example, the rear wheels of a car adapted for operation by the gearing above described. 8 and 9 are the twin

shafts as before. They terminate in sleeves 19 within which are splined stub shafts 20 each of which carries a mitre-wheel 21. The sleeves are carried by ball bearings 22 and each sleeve is surrounded by a stuffing box 23 in the housing 24. The mitre wheel 21 gears with corresponding pinions 25 and 26 which are loose on the axle 27, either being brought into driving engagement for forward or reverse drive with the axle 27 by a sliding clutch member 28 which is splined on the axle. Both clutch members are actuated from the same central rod 29 by links 30 disposed toggle-wise. The mechanism for actuating the clutch member 28 is shown more particularly in Figure 5. Each link 30 is connected to a lever 31 which is mounted on a shaft 32 carrying a pair of arms 33. The arms engage with a half-collar 34 which is recessed into the clutch member 28. The axle 27 is mounted in ball bearings 35 and passes through a stuffing box 36 and it carries at its outer end the wheel 37 and brake drum 38 in the usual way.

It will be understood that the above described arrangements are illustrative only and may be modified in many ways. All four wheels may be independently driven by an obvious multiplication of the device.

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. Means for driving more than one shaft from a single prime mover comprising unidirectional driving devices operatively connected with the said shafts, and means for splitting the motion derived from the prime mover between the said driving devices and an inertial mass or masses in proportions dependent on the torques opposing the motion of the said shafts.

2. A driving device as claimed in Claim 1 comprising a pair of parallel shafts, a crank operated by the prime mover, oscillating members mounted loosely on the shafts, a rod connecting the said oscillating members, means for causing the said oscillating members to drive the shafts unidirectionally, an inertial mass mounted on one of the oscillating members, and a link operatively connecting the said mass with the crank.

3. A driving device as claimed in Claim 2 in which the oscillating members are connected by a spring link in addition to the connecting rod.

4. A driving device as claimed in Claim 2 or 3 adapted to drive any pair of coaxial wheels of a motor vehicle, in which one of the said shafts is operatively connected by mitre gearing with one of the two portions of the vehicle axle, and the other shaft similarly connected with the other portion, each mitre gear having two driven wheels loosely mounted on its axle portion and brought alternatively into operative connexion with the said portion by a clutch for reversing.

5. A driving device for motor vehicles as claimed in Claim 4, in which the clutches are operated from the one actuating rod by linkage.

6. The adaptation of means as claimed in any of the preceding claims for driving all the wheels of a motor vehicle from the same engine.

7. Driving devices substantially as described with reference to the accompanying drawings.

Dated the 25th day of January, 1927.

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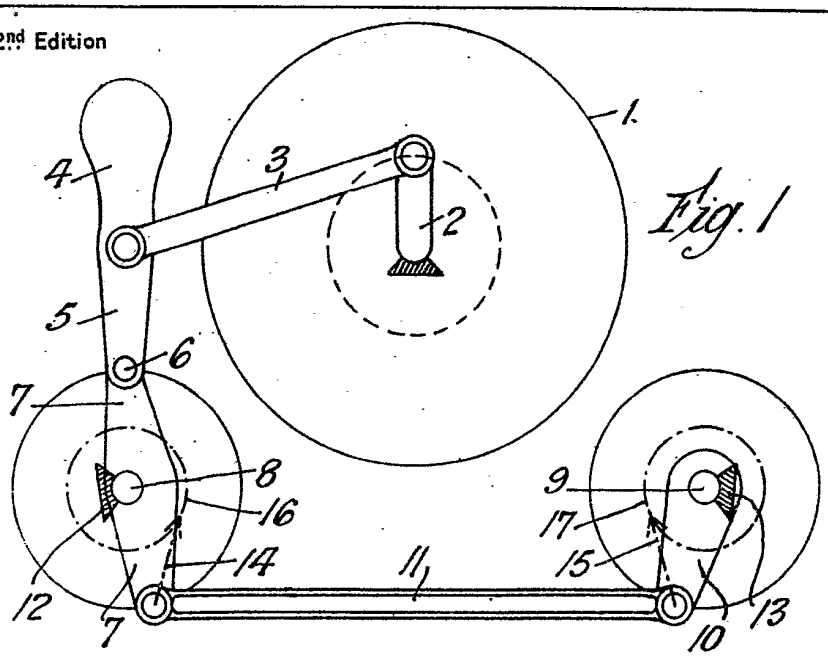

Fig. 1

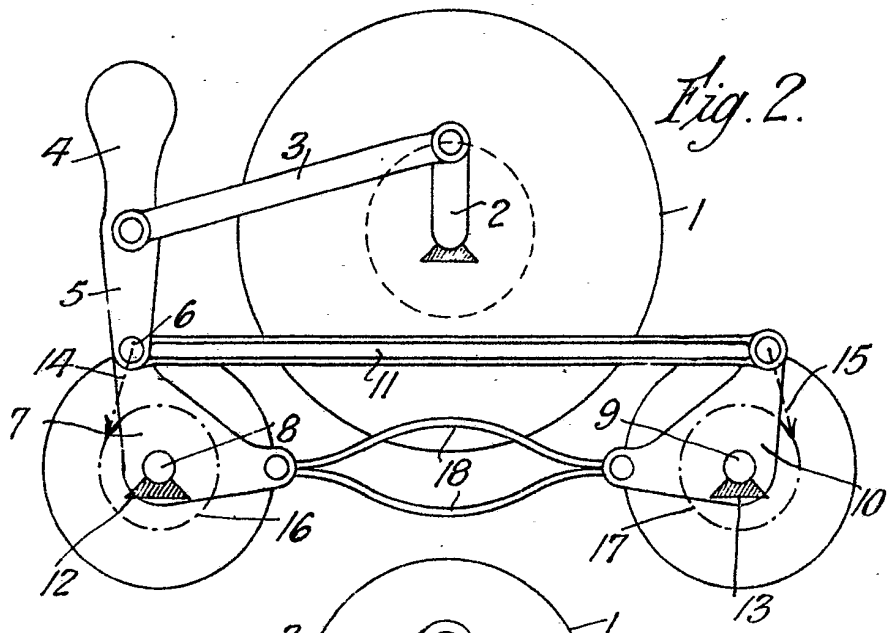

Fig. 2.

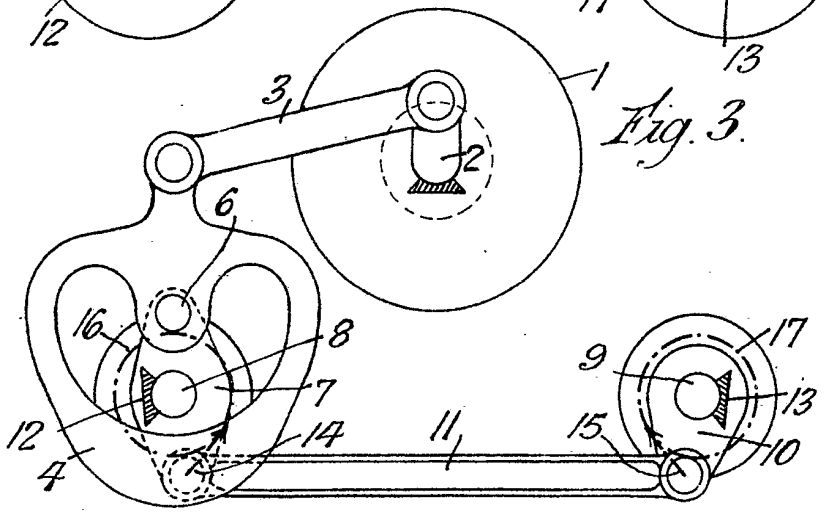

Fig. 3.

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Fig. 4.

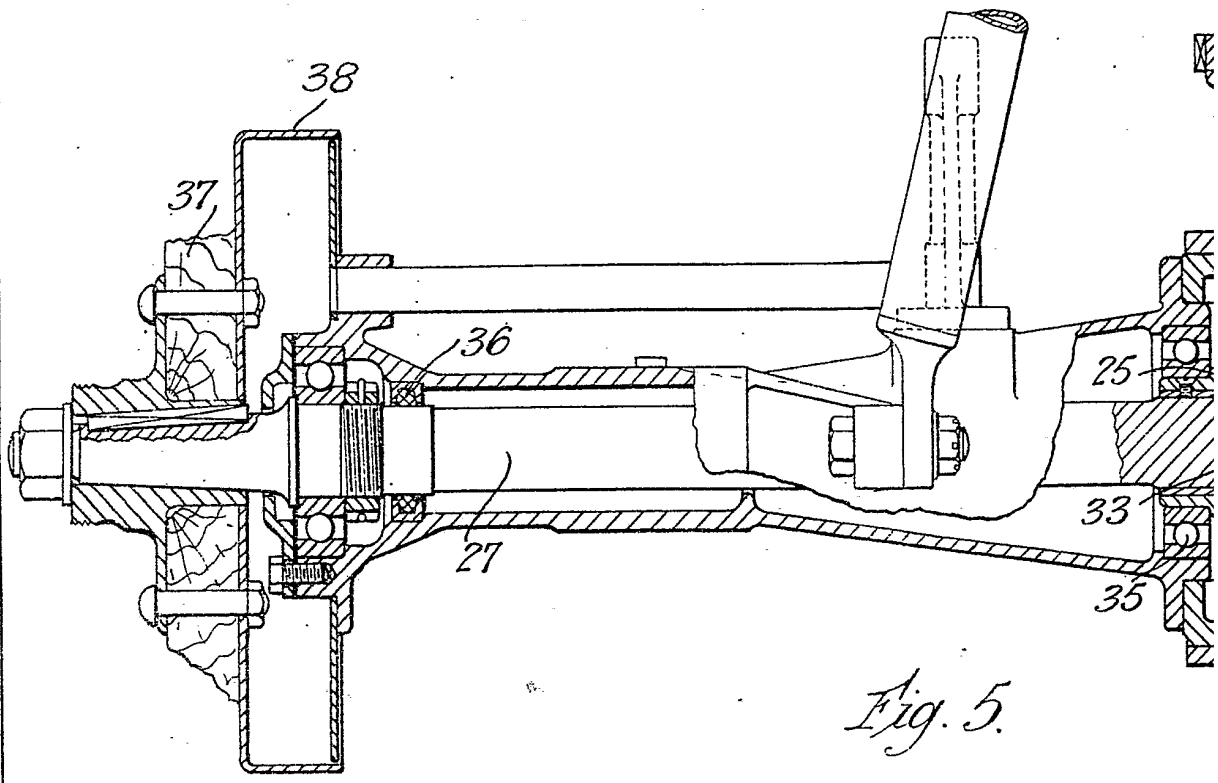

Fig. 5.

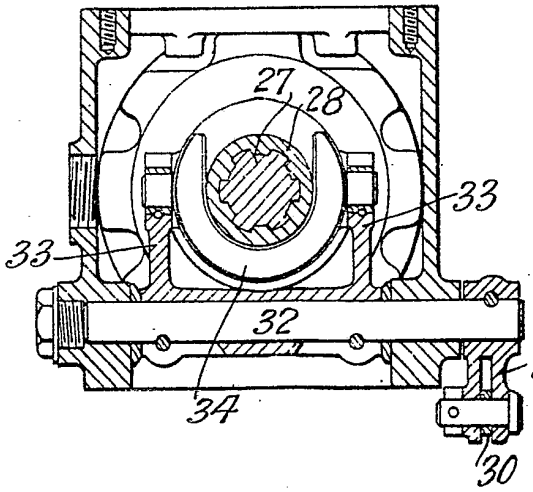

Fig. 4.

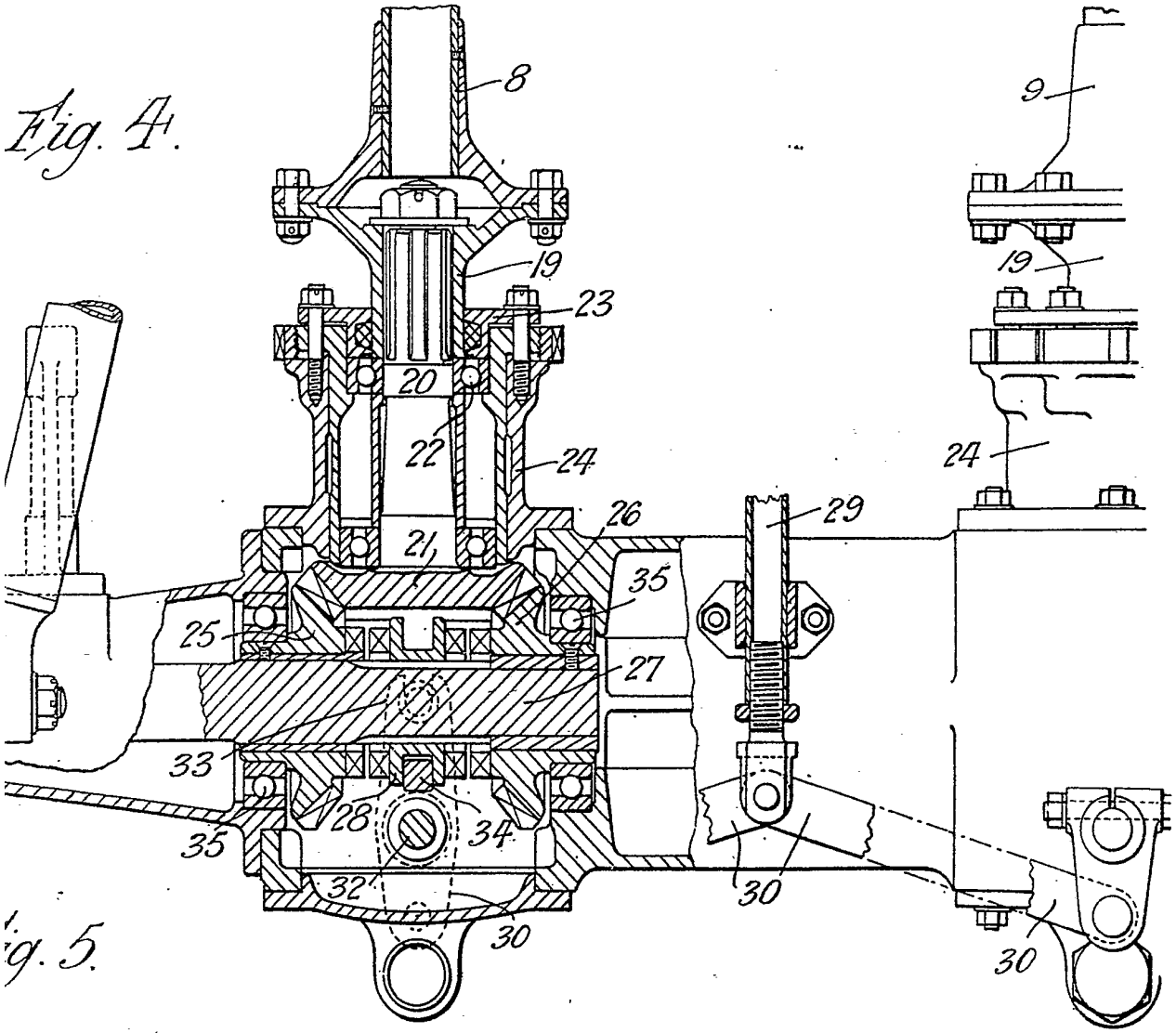

Fig. 5.

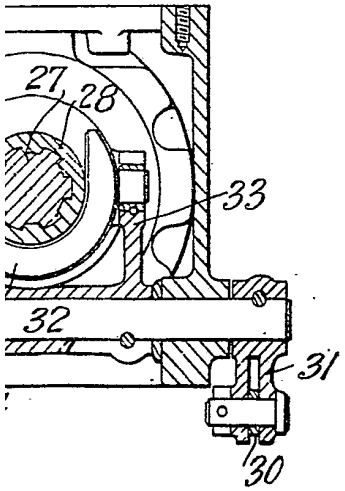

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Fig. 4.

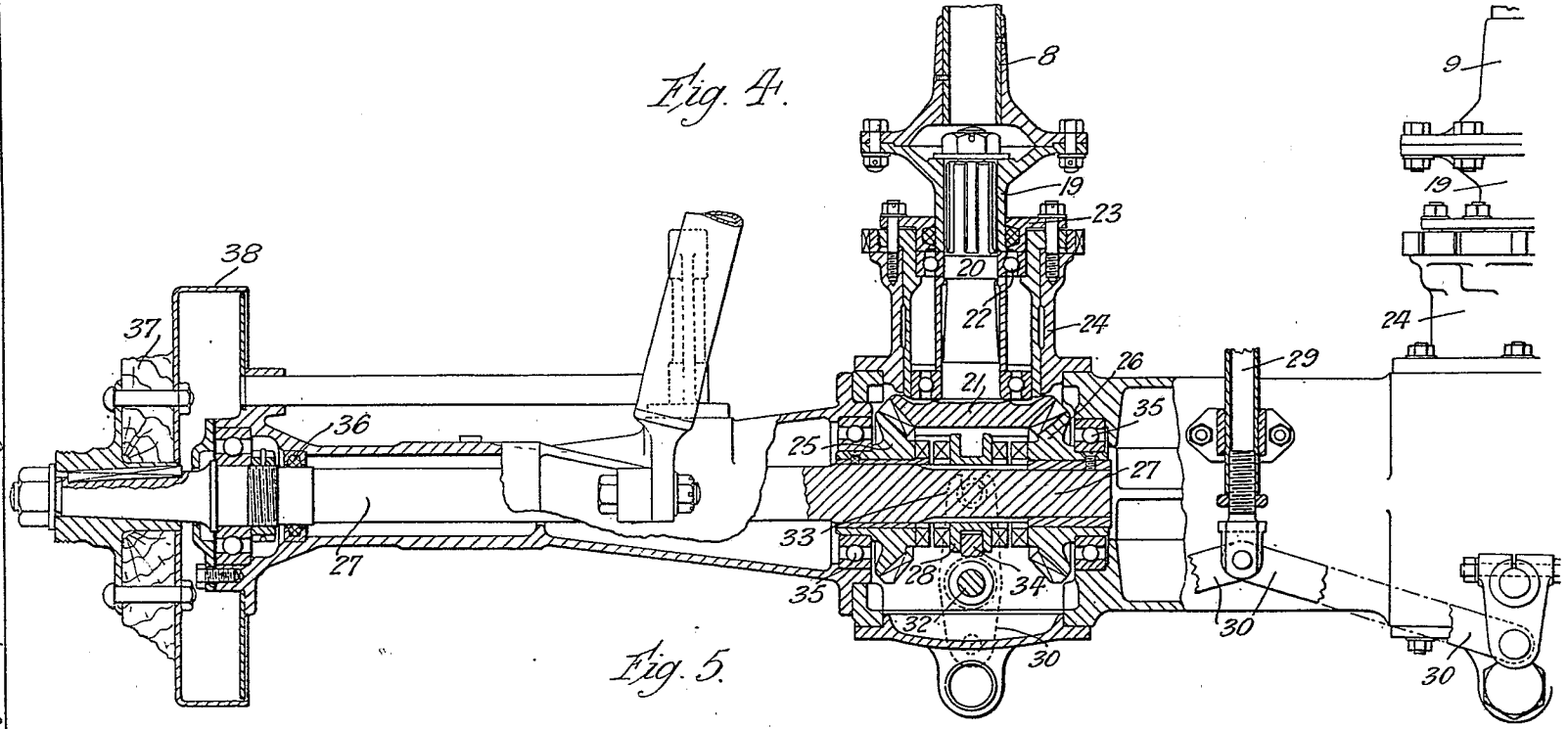
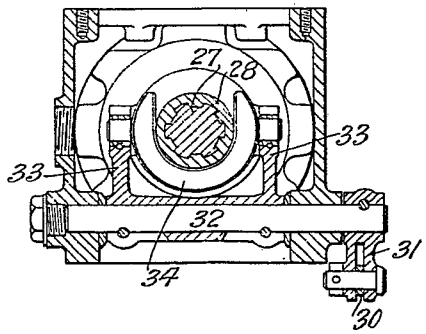


Fig. 5.



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