No. 846,754. PATENTED MAR. 12, 1907.

D. L. McCLINTOCK.

POWER TRANSMITTING MECHANISM FOR AUTOMOBILES.

APPLICATION FILED JULY 19, 1906.

5 SHEETS—SHEET 1.

Fig. 1.

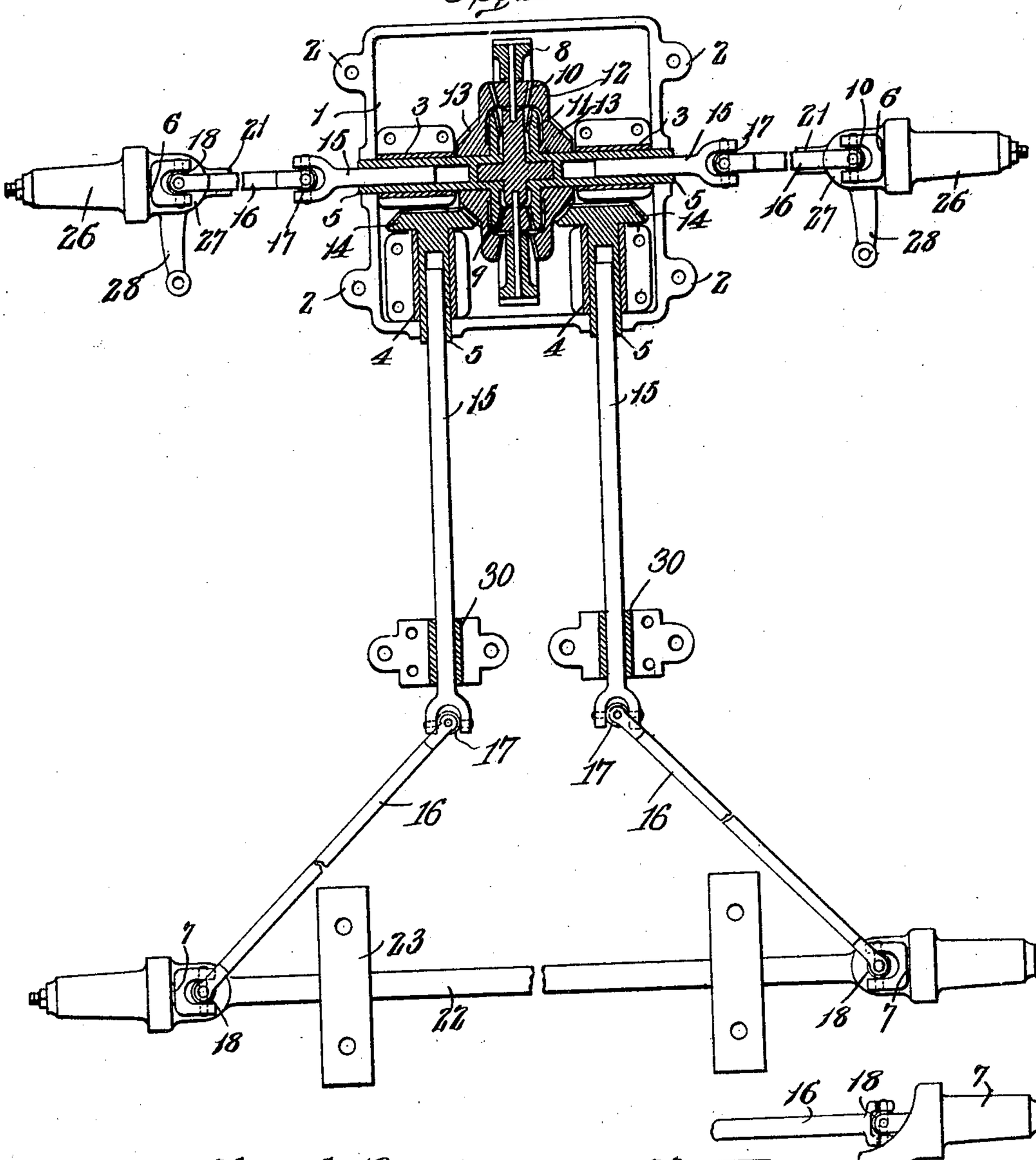


Fig. 5.

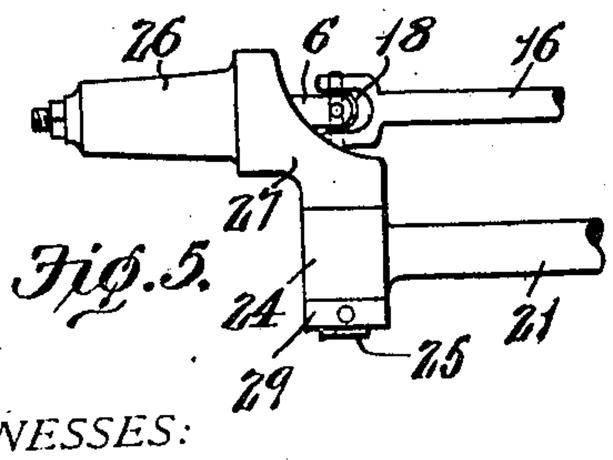
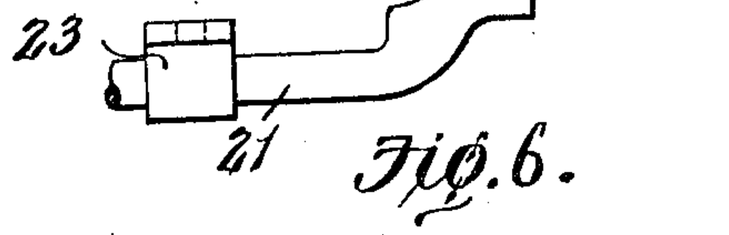


Fig. 6.



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5 SHEETS—SHEET 2.

Fig. 2.

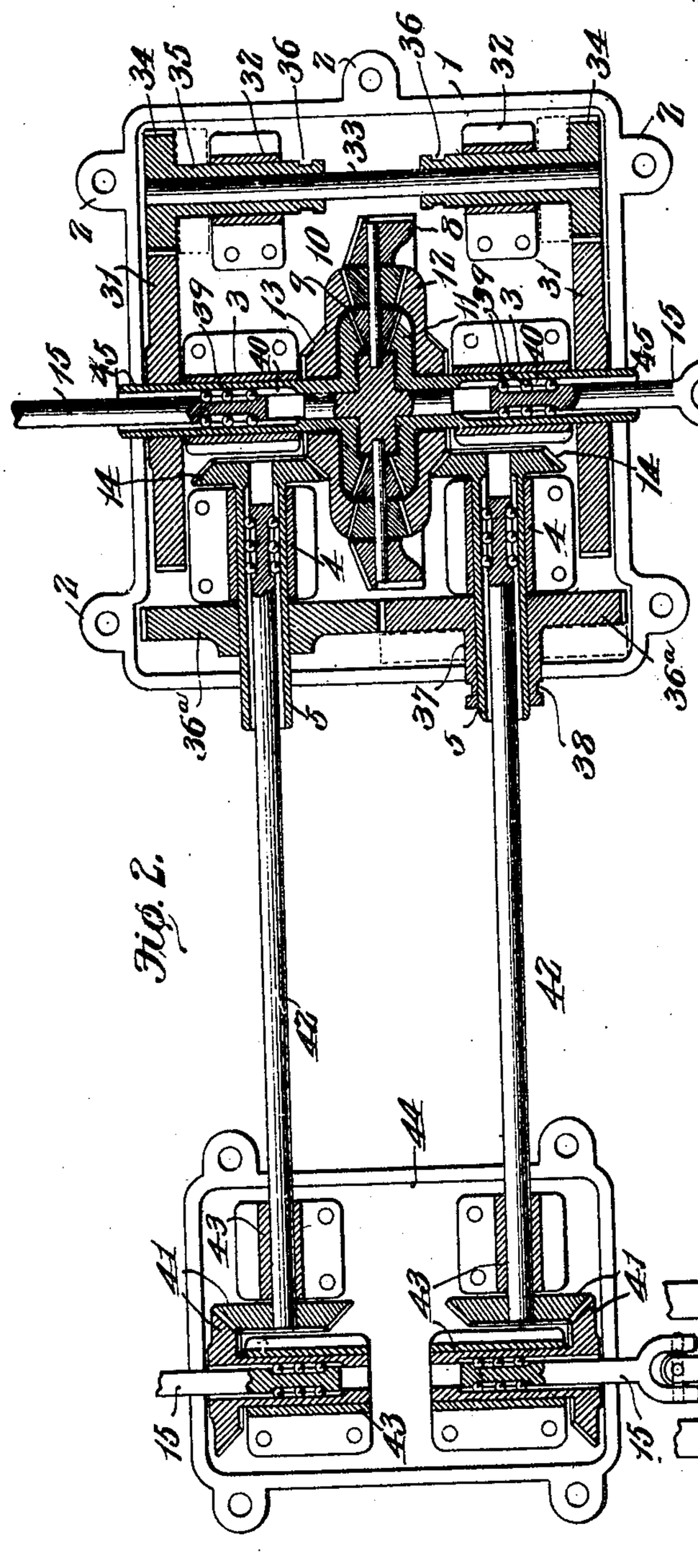

Fig. 8.

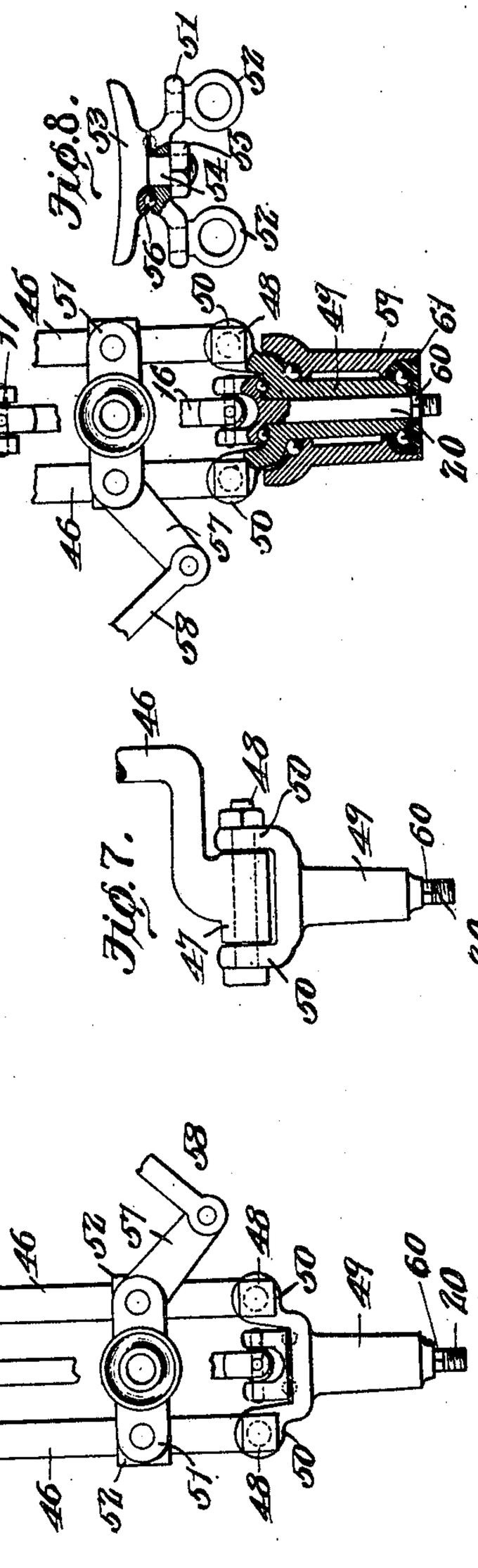

Fig. 7.

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5 SHEETS—SHEET 3.

Fig. 3.

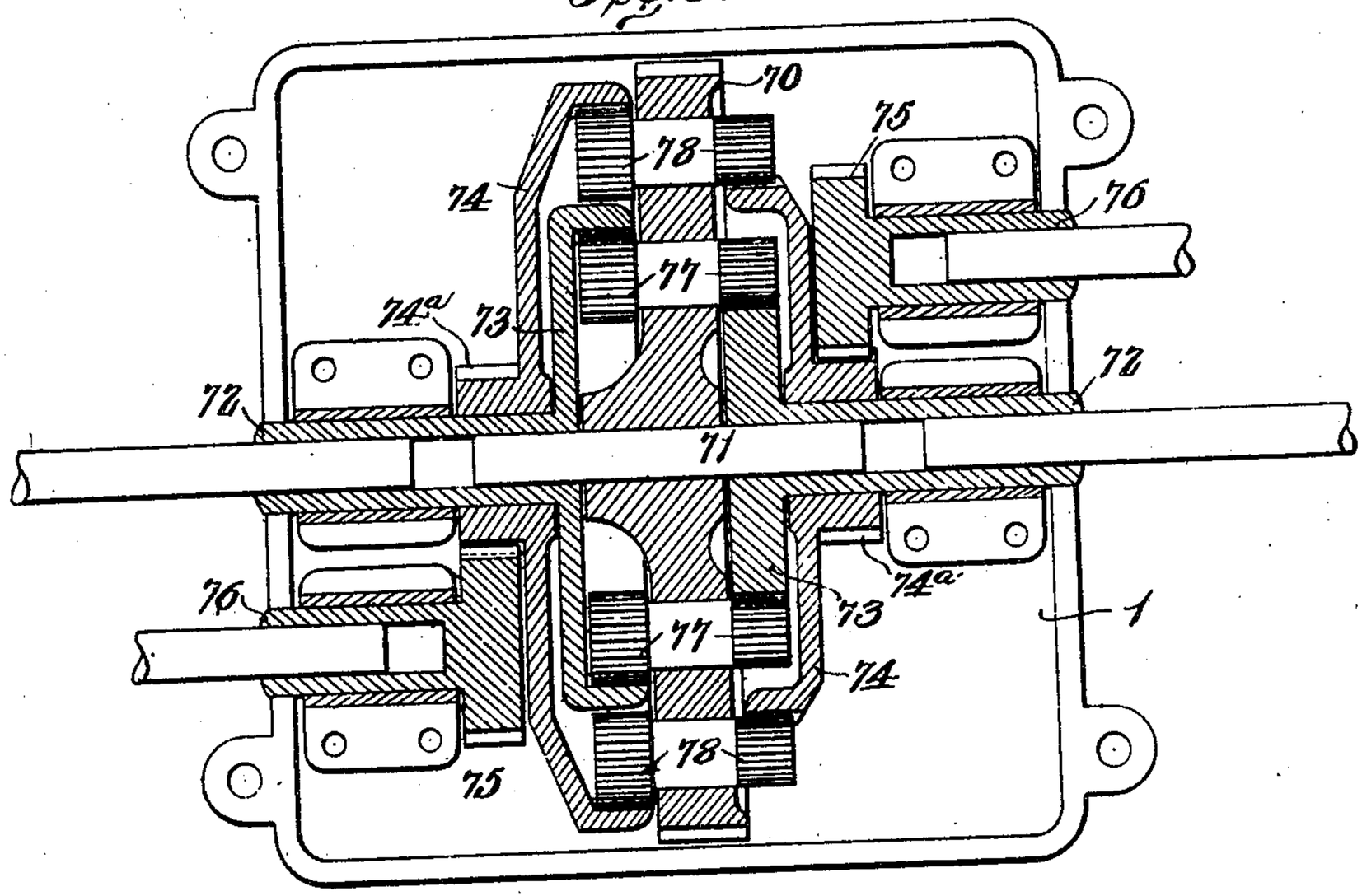
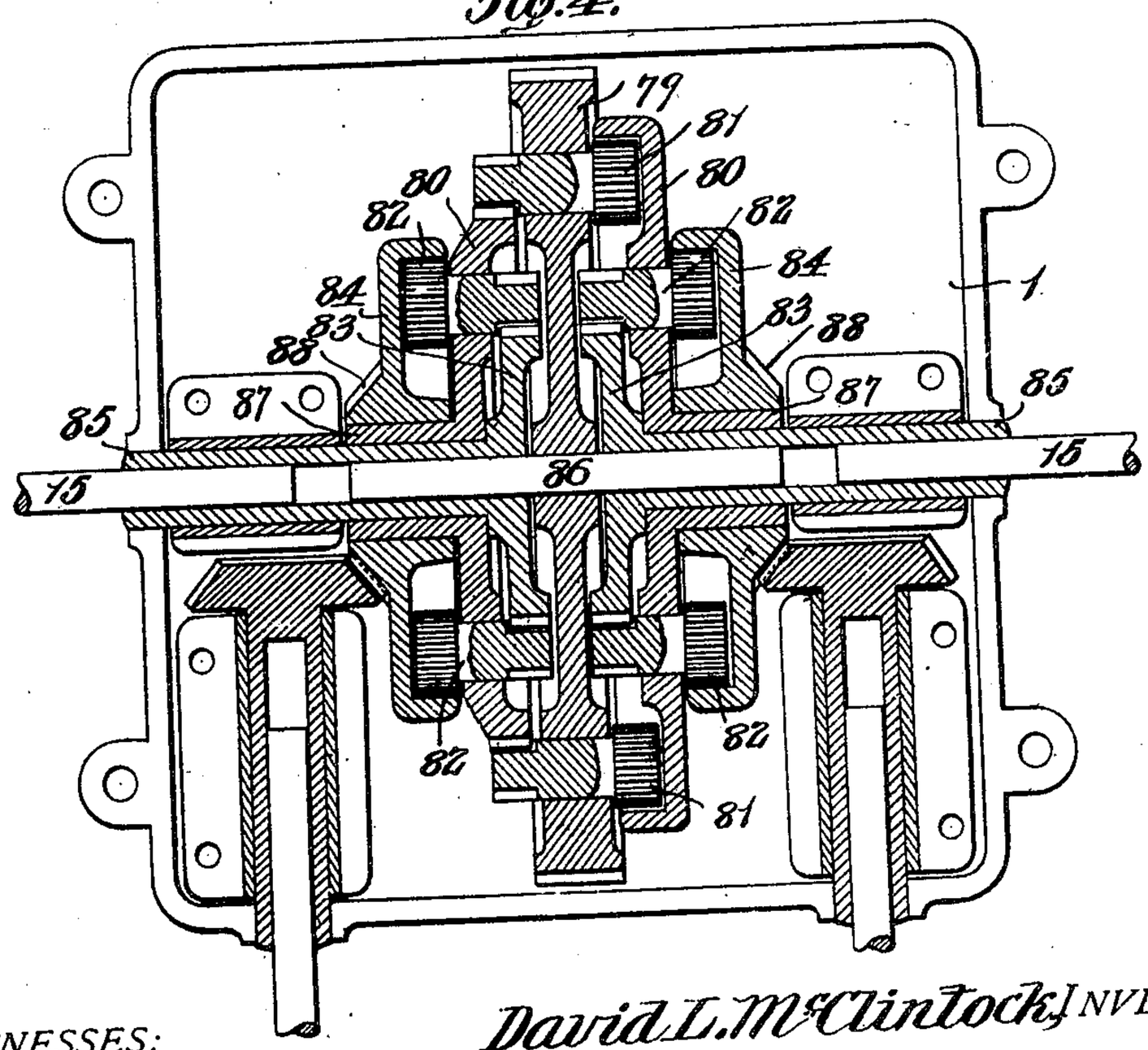


Fig. 4.



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5 SHEETS—SHEET 4.

Fig. 9.

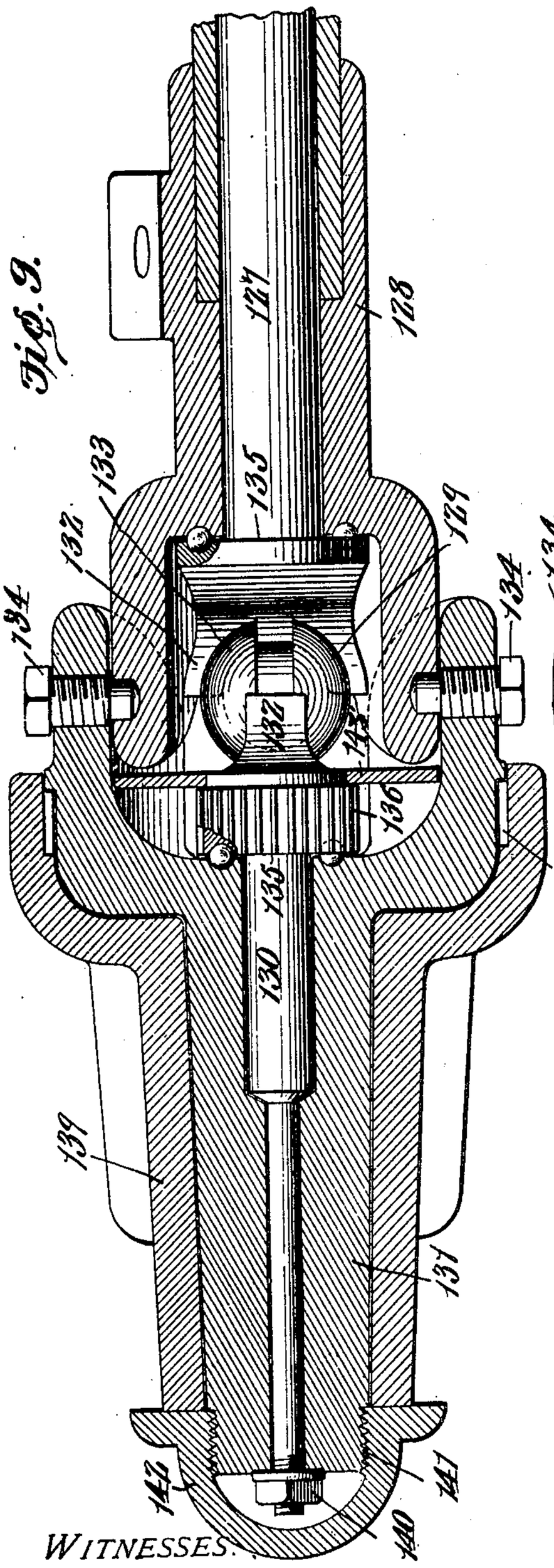
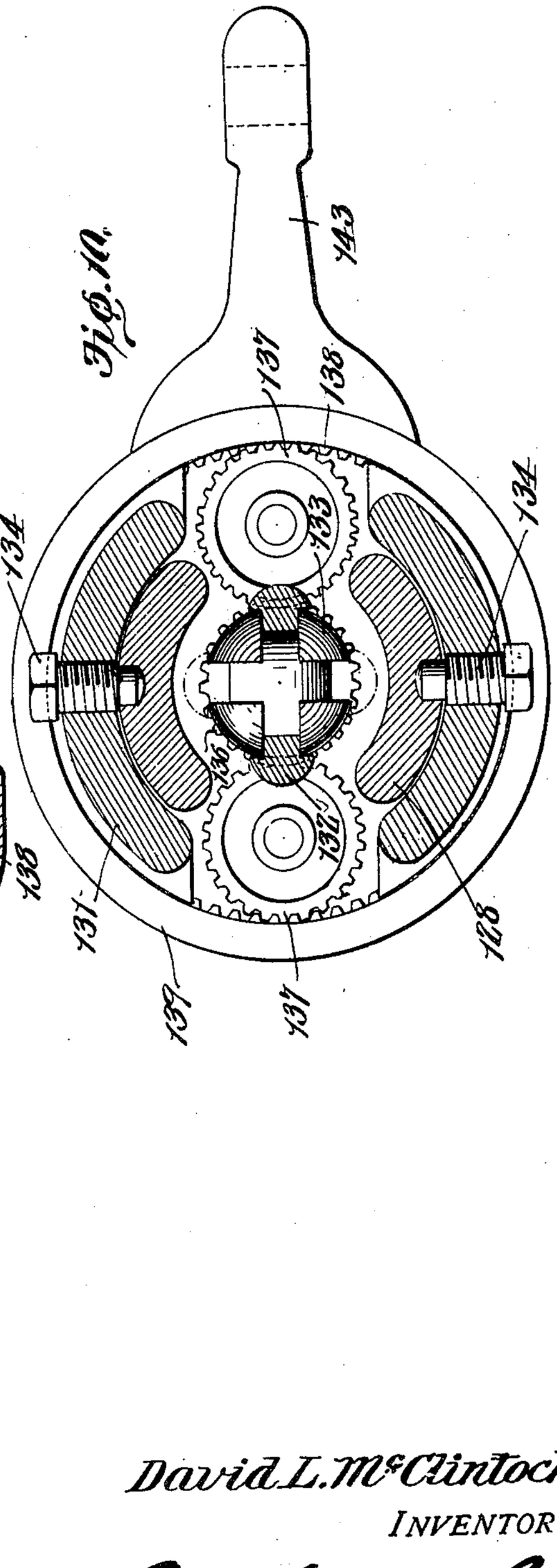


Fig. 10.



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5 SHEETS—SHEET 5.

Fig. 11.

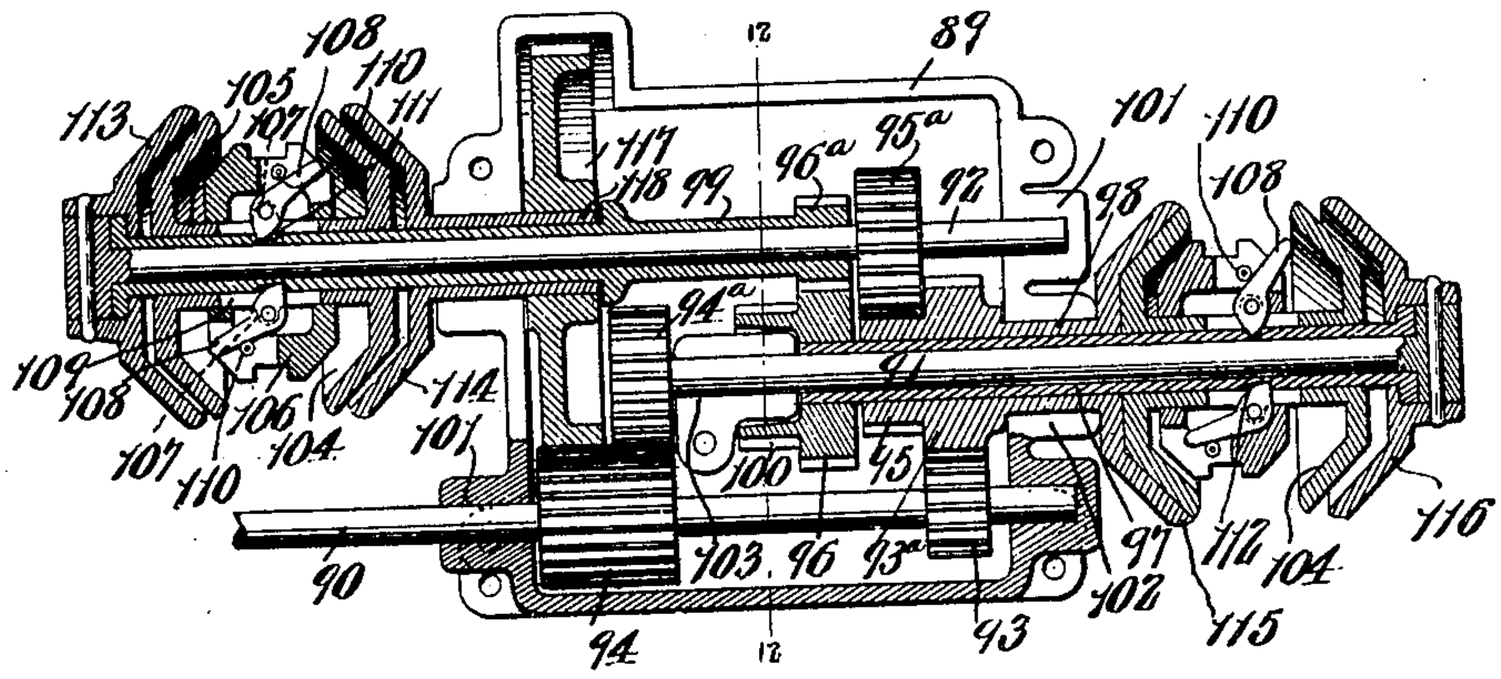


Fig. 12.

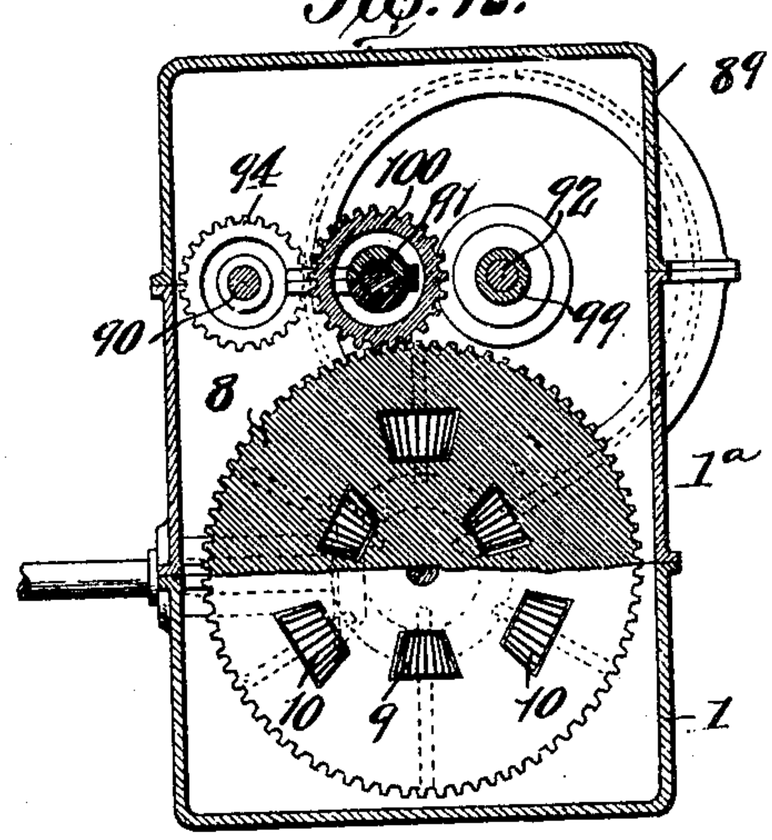
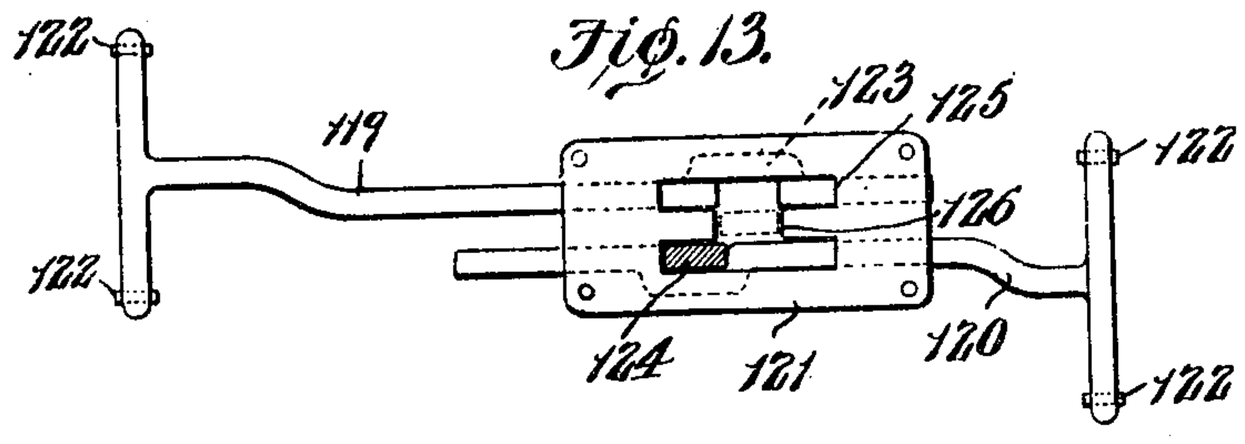


Fig. 13.



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UNITED STATES PATENT OFFICE.

DAVID L. McCLINTOCK, OF KANSAS CITY, MISSOURI.

POWER-TRANSMITTING MECHANISM FOR AUTOMOBILES.

No. 846,754. Specification of Letters Patent. Patented March 12, 1907.

Application filed July 19, 1906. Serial No. 326,887.

To all whom it may concern:

Be it known that I, DAVID L. McCLINTOCK, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Power-Transmitting Mechanism for Automobiles, of which the following is a specification.

This invention relates to automobiles of that type in which the power for driving the vehicle is applied to the several road-wheels thereof.

It relates more especially to a power-transmitting mechanism interposed between the engine or other source of power and the driven mechanism, which includes a compensating gear common to all of the road-wheels.

The invention has for one of its objects to provide a compensating gear which is adapted to be associated with the change-speed mechanism, so that both form a unitary construction that can be conveniently mounted on the frame of the vehicle and occupies a minimum of space.

A further object is to improve and simplify mechanisms of this character and improve their construction generally, so that the wheels of the vehicle can be individually driven through flexibly-connected shafts.

Another object of the invention is to employ in connection with compensating gears for driving a plurality of wheels means whereby the mechanism will not be impaired and rendered useless by the breakage of any one or more flexible connections between the gear and the road-wheels.

With these objects in view and others, as will appear as the nature of the invention is better understood, the same comprise various details of construction and combination of parts hereinafter described in connection with the accompanying drawings, and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate certain embodiments of which the invention is capable, Figure 1 is a horizontal longitudinal section of the compensating gear and the connections extending therefrom to the road-wheels, the body of the vehicle not being shown and certain parts being broken away to more clearly illustrate the invention. Fig. 2 is a similar view of a modified construction of the driving mechanism of an automobile. Figs. 3 and 4 are longitudinal sections of modified forms of compensating gears. Fig. 5 is a front view of the steering-pivot shown in Fig. 1. Fig. 6 is a view of a rear axle. Figs. 7 and 8 are detail views of the steering-knuckle construction shown in Fig. 2. Fig. 9 is a longitudinal section of a further modification of the steering-knuckle. Fig. 10 is a transverse section. Fig. 11 is a central horizontal section of the change-speed device. Fig. 12 is a transverse section of the combined change-speed and compensating gear, taken on line 12 12, Fig. 11. Fig. 13 is a detail view showing the selected lever mechanism for actuating the change-speed mechanism.

Corresponding parts in the several figures are indicated throughout by similar characters of reference.

Referring to the drawings, and more particularly to Fig. 1, 1 represents the lower half of the compensating-gear casing, the latter being made in section divisible, preferably, on a horizontal plane. The casing is provided with a plurality of outwardly-extending apertured lugs 2, by which the parts 1 and 1^a of the casing are bolted together. The casing has cast integral therewith or otherwise suitably secured two central diametrically-arranged bearings 3 and two bearings 4 arranged at right angles to the first. The casing is intended in the present illustration to be mounted adjacent the front of the automobile and approximately disposed centrally over the front axle. The bearings 3 have their axes alining and extending transversely of the machine, while the bearings 4 have their axes parallel and extending longitudinally and are located at the rear of the gear-casing. These bearings receive hollow shafts or spindles 5, that are rotatably mounted therein. The laterally-extending shafts are connected to the front road-wheels, whose axle is indicated at 6, while the rearwardly-extending shafts 5 are connected with the rear stub-axles, (indicated at 7.)

Arranged within the casing 1, with its axis concentric with the laterally-extending shafts 5, is the master gear-wheel 8 of the compensating gear, which carries a plurality of pinions 9 and 10, arranged at radially-different distances from the center, and the pinions 9 are preferably radially displaced from the pinions 10, as shown in Fig. 12. Meshing with the pinions 9 and 10, respectively, is a set of two symmetrical miter-gears or wheels 11 and 12, the first being

formed integral or otherwise secured to the laterally-extending shafts 5. The second set of gears carry miter-pinions 13, suitably secured thereto or cast integral therewith, which mesh with miter-gears 14 on the inner ends of the rearwardly-extending shafts 5. By this arrangement all of the shafts 5 may be driven simultaneously at a uniform speed, as when traveling straight ahead, or at different speeds, as when turning a curve.

The flexible connection between the several shafts 5 and their respective stub-axles comprises two members or rods 15 and 16, united by a universal joint 17 at adjacent ends, and at their opposite ends are respectively slidably mounted in a shaft 5 and connected with the steering-knuckle. The section 15 of each flexible connection is suitably feathered in its respective shaft 5, so that the same is capable of moving longitudinally therein; but it will be rotated with the shaft. This permits of the variation in the distance between the steering-knuckle and compensating gear incident to the rising and falling of the vehicle-body with respect to the wheels. A universal connection 18 is provided between each member 16 and its respective stub-axle, so as to afford sufficient flexibility while the latter is rotated.

Solid or stationary front and rear axles are employed in connection with my improved driving mechanism for automobiles. These are indicated at 21 and 22, respectively, in Figs. 1, 5, and 6, and on which the blocks 23 for supporting the vehicle-springs (not shown) are attached. The front axle 21 is provided with a vertically-extending eye 24 at each end, one being shown in Fig. 5 in which is mounted the vertically-extending pivot 25 of the skein 26. The pivot is connected to the skein by an elbow 27, and the entire member is held in the eye 24 by a collar 29, to which is secured or cast therewith an arm 28. These arms may extend to the front or rear of the axles and are adapted to be connected together by a drag-link and are further connected to the steering-post mechanism in the usual manner. It is obvious that the axle construction shown in Fig. 6 may be used at the front in connection with any approved steering mechanism.

Since the compensating gear is located at a distance in front of the rear axle more or less great, the rear end of the members 15 are supported in separate bearings 30, mounted on a suitable part of the vehicle-frame. These members are capable of sliding longitudinally in the bearings 30, so as to accommodate for the changing distances between the compensating gear and the rear wheels as the vehicle-body rises and falls. The skeins of the rear wheels are preferably cast integral with the axle, thereby forming a strong axle construction. The rear flexible connections are arranged with the members 15 thereof extending in a rearward direction, while the other members 16 extend outwardly at an angle to the first members.

Referring to Fig. 2, a compensating gear is shown which in the main is substantially the same as that already described, and corresponding parts are similarly designated by similar reference-numerals. It differs from the first, however, in having means for connecting the members of each set of gear-wheels 11 and 12 together, so that if any connection between the compensating gear and a wheel should become disabled or broken the compensating gear as a whole would not be rendered useless. This means is described as follows: On each of the laterally-extending shafts 5 is a cog-wheel 31, and arranged in bearings 32 at the front of the gear-casing 1 is a shaft 33, to which are slidably keyed pinions 34, that mesh with the wheels 31. The pinions 34 are provided with sleeves 35, that rest in the bearings 32 and are each provided at the inner end with a peripheral groove 36, in which engages a fork-lever suitably arranged to slide the sleeve and pinion longitudinally on the shaft 33. The normal position of these pinions 34 is shown by dotted lines, and they are held in such position in any desired manner—as, for instance, springs operating on the levers, as will be readily understood. Should either of the connections between the laterally-extending shafts 5 and the front driving-wheels be disabled, it is merely necessary to move the pinions 34 into engagement with the wheels 31, and thereby connect the two shafts together, so that the compensating gear is not affected as far as the remaining driving-wheels are concerned. In order to connect the rearwardly-extending shafts 5 together in a similar emergency, they are each provided with spur-gears 36^a, one of which is adapted to be moved into mesh with the other when it is desired to connect the shafts together. One movable gear 36^a is provided with a sleeve 37, that projects exterior to the casing and is provided with a peripheral groove 38 to receive an operating-lever.

The slidable members 15 of the flexible connections between the compensating gear and the road-wheels are each slidably mounted in its respective shaft 5 by means of anti-friction-balls 39, that are seated in registering longitudinal grooves 40 in the member 15 and shaft 5. This arrangement permits of relative movement with a minimum friction and at the same time forms a key construction for uniting the two parts together.

Instead of having the rear flexible connections extend directly to the compensating gear an intermediate mechanism may be employed. This, as shown in Fig. 2, comprises two miter-gears 41, arranged between the rear ends of the two parallel intermediate shafts 42 and the members 15 of the rear

flexible connections. The shafts 42 are sufficiently long as to extend approximately to the rear axle, so that the flexible connections are disposed transversely of the vehicle-frame. The members 15 and the rear ends of the shafts 42 are mounted in bearings 43, arranged in the dust-proof and lubricant-containing casing 44, that is adapted to be bolted or otherwise suitably secured to the vehicle-frame. The members 15 are mounted in the sleeves 45 of one gear of each of the miters 41 and are slidably keyed therein by balls, as described in connection with the front flexible connections.

It is preferable to employ the gear mechanism between the compensating gear and the rear wheels when the steering of the vehicle is desired to be accomplished by all of the road-wheels of the latter, as by the construction of steering mechanism about to be described, although it is not absolutely necessary to use the intermediate gear mechanism referred to. To carry out the steering-gear in its modified form, the axles are each constructed of two parallel shafts or members 46, which at their ends are turned upwardly, as shown in Fig. 7, and terminate in vertically-extending eyes 47, through which the pivot 48 extends. The skein 49 of each wheel is provided with two sets of eyes 50, one set engaging the top and bottom surfaces of the eye 47 of one shaft 46 and the other set engaging the eye in a similar manner of the other shaft. The pivots 48 extend through the eyes of the skein and hold the latter on the end of the axle. The pivots 48 are preferably in the form of bolts, and they so fit the shafts 46 and eyes of the skein as to permit of free pivotal movement between them. By this arrangement the wheels can be turned for steering by imparting longitudinal movement to either or both of the shafts 46. For this purpose the shafts 46 at each end adjacent the steering-knuckles are connected by a cross-piece 51 to the eyelets or other devices 52, that are pivoted to the cross-piece. This cross-piece is disposed over the shafts 46 and serves as a means for supporting the spring-carrying block 53 for the vehicle-springs. The block 53 is provided with a central stud 54, that extends through an opening in the cross-piece 51, and is secured by a nut 55, screwed on the thread of the stud. Interposed between adjacent surfaces of the spring-block 53 and the cross-piece 51 are antifriction-rollers 56, as shown in Fig. 8. The cross-pieces are each provided with an outwardly-extending arm 57, that is attached by drag-links 58 to the steering-post mechanism in any desired manner, so that as the steering-post is moved in one direction or the other the shafts 46 of each axle are moved lengthwise in opposite directions, so as to steer the wheels in the desired direction. The flexible connections between the road-wheels and the compensating gear and intermediate gear mechanism at the rear of the vehicle extend transversely in a plane centrally between the shafts 46 of the axles. The flexible connections are united with the stub-axles 20, and these in turn rotate the wheels through the thimbles 59, keyed to the square end of the studs, as indicated at 60, by the key 61, as shown in Fig. 2 and described more in detail in my Patent No. 751,540, of February 9, 1904.

The compensating gears thus far described, it will be observed, are constructed with gear-wheels of the miter type, except the master-gear in Fig. 1, which is a spur-gear, while that in Fig. 2 is suitable for connection with a spur or miter gear on the driving-shaft. The modified constructions (shown in Figs. 3 and 4) comprise compensating gears each made up of spur gear wheels and pinions. Referring to Fig. 3, a master gear-wheel is indicated at 70 and is mounted on a shaft-axle or shaft 71, journaled in the hollow shafts 72 of the set of gear-wheels 73. A second set of gear-wheels 74 are mounted loosely to turn on the hollow shafts 72 and are provided with pinions or spur-gears 74^a, with which the spur-gears 75 mesh. The latter gears are provided with hollow sleeve portions 76, in which are suitably feathered the inner ends of two of the flexible connections leading to the vehicle-wheels. It is to be noted that the sleeves 76 are disposed parallel with the hollow shafts 72. This compensating gear is adapted to be mounted between the ends of the vehicle-frame, and the flexible connections extend longitudinally toward the front and rear from the gear. Intermediate the sets of gear-wheels 73 and 74 and the master-gear are sets of double pinions 77 and 78, respectively connecting the members of each set of gear-wheels 73 and 74.

Referring to Fig. 4, the master-gear is indicated at 79, and the same drives a set of intermediate or idle gear-wheels 80 by the pinions 81. The gear-wheels 80 are each provided with double pinions 82, that mesh with and drive the two sets of symmetrical gear-wheels 83 84. The gear-wheels 83 are provided with hollow shafts 85, which rotatably receive the arbor 86 of the master-wheel and slidably receive the inner end of two of the members 15 of the flexible connections. The idle wheels 80 are rotatably mounted around the hollow shafts 85, while the gears 84 are rotatable on the hubs 87 of the idle gears. The gears 84 are provided with miter-gears 88, whereby the remaining flexible connections are driven, the construction between the gears 88 and the flexible connections being the same as that shown in Fig. 1. With either of the modified forms of compensating gears the wheels can be effectively driven at the different speeds which result when the vehicle is steered in a curved direction, and

power is transmitted effectively to each of the driving-wheels.

The change-speed device to be used in connection with the compensating gear may be of any approved design; but I prefer, however, the construction in Fig. 11 and described as follows: 89 designates the casing of a change-speed device. This is preferably the top part of casing 1 and is adapted to cooperate with the latter to form a dust-proof and a lubricant-containing inclosure for both the compensating gear and the change-speed device. The parts may be secured together by bolts that are adapted to pass through the apertured lugs and secure the structure to the vehicle-frame. The change-speed device shown is of the construction for producing three forward speeds and one reverse, although this is not to be understood as an arbitrary arrangement. The device comprises three parallel shafts 90, 91, and 92 and gears 93 and 93^a, 94 and 94^a, respectively, on the shafts 90 and 91 and gears 95 and 95^a, 96 and 96^a on the shafts 91 and 92. The gears 93 and 94 are keyed to the shaft 90, suitably connected with the engine. The gears 94^a and 95^a are keyed, respectively, to shafts 91 and 92. Of the remaining gears, 96 is arranged on and rotates with the sleeve 97, 93^a and 95 on the sleeve 98, and gear 96^a on sleeve 99. The gears 93^a and 95 are formed integral with each other and with the sleeve 98, or they may be otherwise suitably secured together and rotate on sleeve 97. The gear 96 is keyed or otherwise secured to the sleeve 97, and carried by the gear 96 in any suitable manner is a pinion or gear 100, that is arranged to mesh with the master gear-wheel on the compensating gear, as shown in Fig. 12. The shafts 90 and 92 are mounted in bearings 101, provided in the casing, and the shaft 91 is mounted in the bearing 102 at a point intermediate its ends, and the bearing 103 in the casing at the inner end of the shaft.

The various gear connections for producing the different speeds and forward and reverse travel are obtained through the two double-cone clutch devices arranged exterior to the casing 89 on the outer ends of the shafts 91 and 92. Each clutch device comprises a spool-shaped sliding member 104, having a cone at each end, and slidably mounted on the hub or sleeve portion 105 is a block 106, having a peripheral groove in which the forked ends of a push-bar of the controlling mechanism are adapted to engage. The hub or sleeve portion 105 is provided with lugs 107, arranged at diametrically opposite points and to which are pivoted oppositely-arranged dogs 108, the nose of each of which extends inwardly through the slots 109 in the hub portions 105. Coöperating with the tails of the dogs are the antifriction-rollers 110, which by the movement of the sliding blocks 106 actuate the dogs. The left-hand clutch in Fig. 11 produces the first speed in a forward direction and the reverse, while the clutch at the right produces the second and high forward speeds. The noses of the dogs of the left-hand clutch engage in notches 111 in the sleeve 99, and the dogs of the right-hand clutch engage in notches 112 of sleeve 97, the sliding blocks 106 being thus keyed to their respective sleeves. The hollow cone 113 is adapted to be engaged by the double cone for producing the first forward speed, the hollow cone being keyed to the shaft 92. For producing the reverse speed the hollow cone 114 is engaged, and the second and third speeds are produced by the cone of the right-hand clutch engaging, respectively, the hollow cone 115 and 116. By reason of the dogs 108 of each clutch being oppositely disposed one dog is thrown into its operative position by the movement of the sliding block which is arranged to actuate it, while the other dog is moved to an inoperative position by the nose thereof engaging in the notch of the adjacent sleeve, the latter being relatively stationary, while the dogs move with the double cone. As shown in the right-hand clutch, the lower dog is set to hold the parts in the position to produce the second speed, and the upper dog is shown tilted to its elevated position, so as to be moved into its operative position when the sliding block is shifted to the right. The function of the dogs is to positively lock the cones of the clutch in their set position.

When it is desired to reverse the direction of travel, the left-hand cone member 104 is shifted to the right, thereby locking the cone 114, so that motion will be transmitted successively through the following members: gears 94 and 117, sleeve 118, to which the latter gear is keyed, cones 114 and 104, sleeve 99, gears 96^a and 96 to the spur-gear 100, meshing with the master gear-wheel of the compensating gear. When the cone of the left clutch is shifted to the left for obtaining the first forward speed, the driving connections are as follows: shaft 90, gears 93 and 93^a and 95 and 95^a, shaft 92, cones 113 and 104, sleeve 99, and gears 96^a and 96, the latter driving the master gear-wheel through the spur-gear 100. The right-hand clutch is in the position for producing the second speed, and power is transmitted successively through shaft 90, gears 93 and 93^a, sleeve 98, hollow cone 115, cone 104, sleeve 97 to the spur-gear 100, secured to said latter sleeve. The right-hand cone is moved to the right when the high speed is desired, the power being transmitted successively through the shaft 90, gears 94 and 94^a, shaft 91, cones 116 and 104, sleeve 97 to the spur-gear 100. The clutches may be operated by any approved mechanism; but by preference I employ the selected system of control. This comprises push-rods 119 and 120, Fig. 13, that are slidably mounted in the plate 121,

which is suitably placed on the vehicle-frame or other part adjacent the change-speed device. The outer end of each push-rod is forked and carries at the terminal of each fork an antifriction-roller 122, that fits in the peripheral groove of the sliding block 106 of a clutch. Each push-rod is notched or offset, as indicated at 123, so as to receive the controlling-lever 124. The plate 122 is provided with an H-shaped slot, in which the lever is adapted to move. The lever is so mounted that it is capable of being shifted from one of the legs 125 of the slot to the other, so as to engage with either one of the notches 123 of the push-rods. When the lever is in engagement with either one of the push-rods, it is capable of actuating the latter in either direction for producing the clutch connections desired. When the lever is in the position midway of the legs 125, as shown by dotted lines, it is locked by the projections 126. This corresponds to the position of the parts when the engine is running idly and none of the clutch connections are made.

In Figs. 9 and 10 a further modified construction is shown for transmitting power for driving the vehicle by the steering-wheels. Power is transmitted from the compensating gear by the shaft 127, mounted in the tubular axle 128. The shaft 127 is connected with the wheel through a universal joint 129, one element of the latter being arranged on the spindle 130, mounted in the skein 131. The universal joint comprises two jaws or forks 132 on the adjacent ends of the shaft 127 and spindle 130, and these forks engage in two right-angularly-disposed peripheral grooves in the sphere 133. The skein 131 is enlarged at its inner end to form a chamber, into which the upper end of the tubular axle or sleeve 128 extends. These two parts are pivoted together by the pivot-bolts 134, arranged at diametrically opposite points, so that the skein, and hence the wheel, can be turned on a vertical axis. The shaft 127 and spindle 130 are both provided with shoulders 135, between which and the sleeve 128 and skein 131 are antifriction-balls to take up the thrust and reduce friction. On the shouldered or enlarged portion of the spindle are provided gear-teeth 136, with which mesh pinions 137, journaled on the skein 131 in the chamber thereof. These pinions mesh with an internal gear 138 on the wheel-thimble 139, fitted in the hub of the wheel. By this arrangement rotation is imparted to the wheel from the shaft 127 through the universal joint, gear 136 on the spindle 130, and pinions 137 and internal gear of the wheel. The spindle 130 is threaded at its outer end to receive a nut 140, that screws down upon the end of the skein and holds the spindle in place in the latter. Arranged over the end of the skein and screwed on the threads 141 thereof is a cap-nut 142, that holds the thimble and wheel in position. Extending from the inner end of the skein in a direction more or less transversely to the axis thereof is an arm 143, by which the wheel is connected to the steering mechanism of the vehicle in the usual manner. By this arrangement the steering-wheels may be tilted to one angle or another, while at the same time the power is being transmitted to them for driving the vehicle. 143′ designates a dust-excluding plate.

I have described the principle of operation of the invention, together with several embodiments of which the invention is capable; but I desire to have it understood that the apparatus shown is merely illustrative and that various minor changes may be made without sacrificing any of the advantages of the invention.

What is claimed is—

1. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, a compensating mechanism, and flexible driving connections extending between the mechanism and each element which include universal joints.

2. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, a flexible driving connection for each element, a gear feathered to each of said connections, and a common means for driving the gears and permitting the same to rotate at different speeds.

3. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, a gear-casing, bearings therein corresponding in number to said elements, flexible connections between each element and bearings, a gear slidably connected with each of the connections, and a master-gear for driving the other gears.

4. In a power-transmitting mechanism for motor-vehicles, the combination of driven elements, flexible driving connections therefor each composed of relatively longitudinally movable parts, a compensating mechanism between the connections which is directly connected to certain of the latter, and miter-gears between the remaining connections and the compensating mechanism.

5. In a power-transmitting mechanism for motor-vehicles, the combination of two sets of driven elements, driving connections for the several elements each composed of two relatively longitudinally movable parts, a compensating mechanism connected directly with the driving connections of one set of elements, and miter-gears between the compensating mechanism and the driving connections of the other set of elements.

6. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, independent driving connections flexibly connected with the

elements, a compensating mechanism arranged axially in line with certain of the said connections, and driving means between the remaining connections and the compensating mechanism.

7. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, independent driving connections for the elements each composed of telescoping members, and a compensating mechanism common to the said connections, the same comprising independent sets of gears, a master-gear, and pinions intermediate the master-gear and the sets of gears.

8. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, independent driving connections for the elements, and a compensating mechanism common to the said connections, the same comprising a set of gears slidably mounted with respect to certain of the connections, a second set of gears, a master-gear for driving the said sets, and driving means between the second set of gears and the remaining connections.

9. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, independent driving connections for the elements, and a compensating mechanism common to the said connections, the same comprising a set of gears united with two connections with their axes alining therewith, a second set of gears surrounding the first, a master-gear common to both of said sets, and means for operatively uniting the second set of gears with the remaining connections.

10. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, independent driving connections for the elements, and a compensating mechanism common to the said connections, the same comprising a set of two gears each having a hollow shaft in which one of the driving connections is slidably mounted, a second set of gears rotatably mounted on the first set, a common means for driving the sets of gears independently, and a gearing between each of the gears of the second set and the remaining driving connections.

11. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, independent driving connections for the elements, and a compensating mechanism common to the said connections, the same comprising a master-wheel, an arbor therefor, a set of gears in which the arbor is mounted and with which two of said driving connections are united, and means independent of the said gears for driving the remaining connections from the master-wheel.

12. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, independent driving connections for the elements, and a compensating mechanism common to the said connections, the same comprising a master-wheel, an arbor therefor, gears arranged on opposite sides of the master-wheel which are provided with hollow shaft portions for receiving the ends of the arbor and the ends of two of the driving connections, a second set of gears mounted to rotate independently on the shaft portions of the first gears, and pinions between each of the sets of gears and master-wheel.

13. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, independent driving connections for the elements, and a compensating mechanism common to the said connections, the same comprising a casing, bearings thereon, a master-wheel in the casing, an arbor therefor, a set of gears arranged at opposite sides of the master-wheel which are provided with hollow shaft portions that rest in two of the bearings and receive the arbor and two of said driving connections, a second set of gears mounted on the shaft portions of the first set, pinions between the master-gear and each of said sets of gears, shafts in the other bearings of the casing, and a gearing between each of said latter shafts and the second set of gears.

14. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, independent driving connections for the elements, and a compensating mechanism common to the said connections, the same comprising a master-wheel, gears arranged on opposite sides of the master-wheel which are provided with shaft portions connected with certain of the driving connections, idler-gears disposed concentrically with and on opposite sides of the master-wheel with the first set of gears between them and the latter, pinions between the master-wheel and the idler-gears, a second set of gears arranged concentrically with the master-wheel and located outside of the idler-gears, and pinions carried by the idler-gears which mesh with one of both sets of gears.

15. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, independent driving connections for the elements, and a compensating mechanism common to the said connections, the same comprising a master-wheel, an arbor therefor, gears arranged on the opposite sides of the master-wheel which are provided with hollow shaft portions for receiving the arbor and two of the driving connections, an idler-gear mounted on each of said shaft portions, a second set of gears also mounted on the shaft portions, pinions carried by the master-gear for driving the idler-gears, pinions carried by the idler-

gears that connect the gears of one set with those of the other set, and a gearing between each of the gears of the second set and the remaining driving connections.

16. In a power-transmitting mechanism for motor-vehicles, the combination of a pair of driven elements, a compensating mechanism, a driving connection between the mechanism and each element, and means for transmitting power from the mechanism to one of the elements in case the driving connection for the other element becomes inoperative.

17. In a power-transmitting mechanism for motor-vehicles, the combination of a pair of driven elements, a compensating device comprising differentially-actuated gears, a shaft, gears connected with the first-mentioned gears, and pinions on the shaft adapted to be thrown into mesh with the latter gears.

18. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, a compensating mechanism common to all the elements, a driving connection between the mechanism and each element, and an emergency device for connecting two of said driving connections together in case either one should become inoperative.

19. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of sets of driven elements, a compensating mechanism common to the same which is adapted to be mounted on the frame of the vehicle, flexible driving connections extending directly from the mechanism to one set of the elements, flexible connections extending to the other set of elements, and bearings for the latter connections which are adapted to be mounted on the frame of the vehicle intermediate the compensating mechanism and the second set of elements.

20. In a power-transmitting mechanism for motor-vehicles, the combination of two sets of driven elements, a compensating mechanism common to the same which is adapted to be mounted on the frame of the vehicle, a flexible connection between the mechanism and one set of elements, independent driving connections leading from the compensating mechanism to the second set of elements, bearings for the latter connections which are adapted to be mounted on the frame of the vehicle, and universal joints included in the latter connections.

21. In a power-transmitting mechanism for motor-vehicles, the combination of front and rear sets of driven elements, a compensating mechanism common to the same which is adapted to be located on the front portion of the vehicle-frame, flexible connections between the compensating mechanism and the front set of elements, shafts extending rearwardly from the compensating mechanism for transmitting power to the rear set of elements, flexible connections for the rear set of elements, and gearings between each of the shafts and the flexible connections, which are adapted to be mounted on the rear portion of the vehicle-frame.

22. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, a compensating mechanism therefor which is adapted to be mounted on one end of the vehicle-frame, a flexible connection extending directly from the mechanism to one of the elements for driving the latter, a shaft extending longitudinally of the vehicle from the compensating mechanism, a gearing at the opposite end of the shaft from the compensating mechanism, and a flexible driving connection between said gearing and the element adjacent thereto.

23. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, a compensating mechanism, independent driving connections between the elements and mechanism, an emergency device for the mechanism, a change-speed device, and a casing common to the mechanism and device.

24. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, a compensating mechanism adapted to be mounted on the frame of the vehicle, independent driving connections between the elements and mechanism which include universal joints, a change-speed device having one of its gears in mesh with the compensating mechanism, clutches for controlling the change-speed device, and means for controlling the clutches.

25. In a power-transmitting mechanism for motor-vehicles, the combination of a plurality of driven elements, a compensating mechanism adapted to be mounted on the frame of the vehicle, independent driving connections between the elements and mechanism which include universal joints, a change-speed device having one of its gears in mesh with the compensating mechanism, clutches for controlling the change-speed device, and a controlling-lever arranged in cooperative relation with the change-speed device for actuating the clutches.

26. In a power-transmitting mechanism, the combination of a plurality of rotatable driven elements capable of rotating at different speeds, a supporting structure, a hinge-joint between each element and the said structure, a compensating mechanism, and a driving connection between the mechanism and each element, said connection including a gearing at the adjacent hinge-joint through which motion is transmitted to the element.

27. In a power-transmitting mechanism, the combination of a hollow rotatable driven element, a driving element, a support on which the latter element is rotatably mount-

ed, a member on which the driven element is rotatably mounted, a hinged connection between the member and support, a spindle in the member, a universal joint between the spindle and driving element having its center of motion coinciding with the hinged connection, and a gearing between the spindle and the driven element.

28. In a power-transmitting mechanism, the combination of a hollow rotatable driven element, a driving element, a support on which the latter element is rotatably mounted, a member on which the driven element is rotatably mounted, a hinged connection between the member and support, a spindle in the member a universal joint between the spindle and driving element having its center of motion coinciding with the hinged connection, a spur-gear on the spindle, an internal gear on the driven element, and a pinion meshing with the gears.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

DAVID L. McCLINTOCK.

Witnesses:

HULDAH A. STEELE,

FRED ELLIOTT.