

No. 656,483.

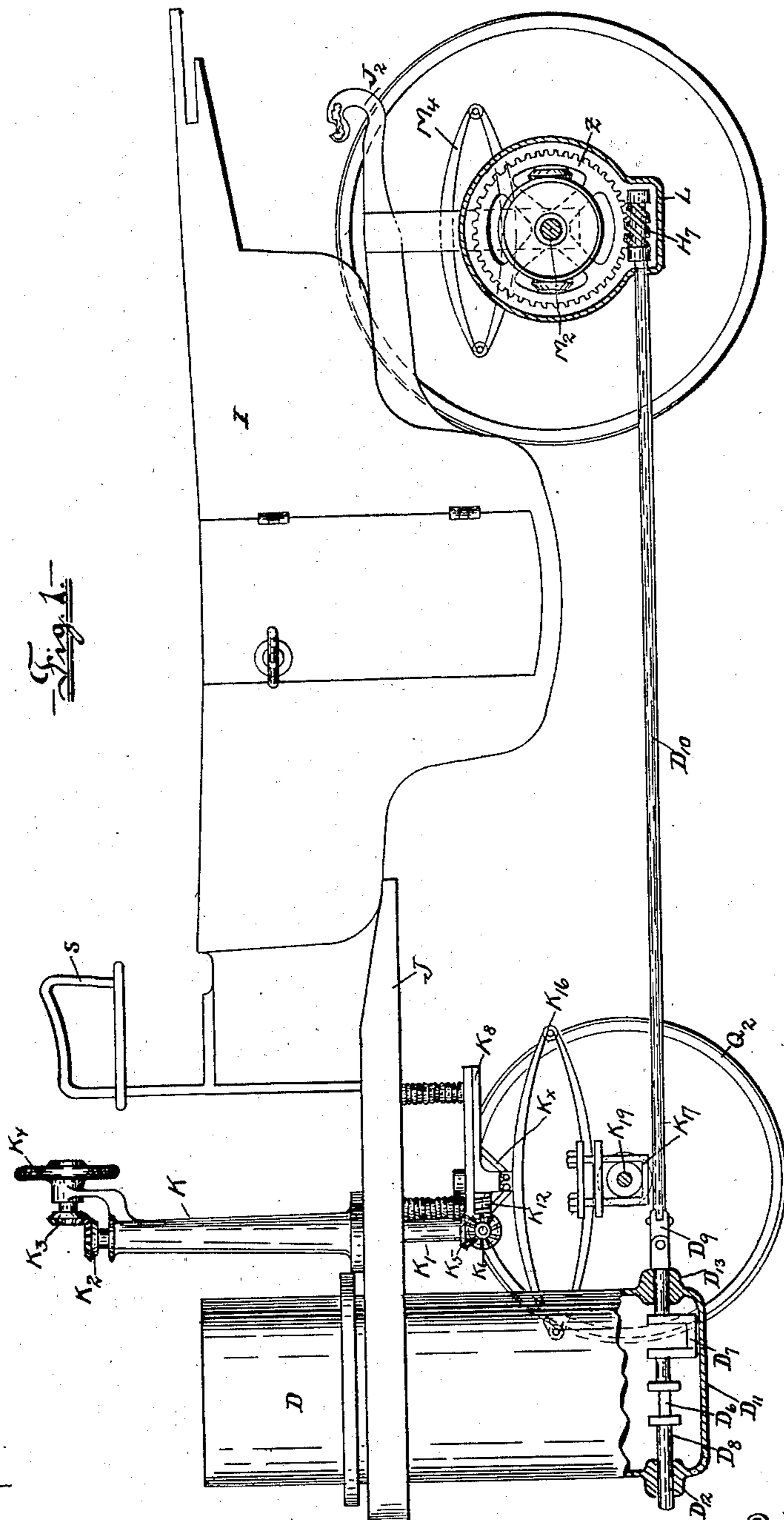
Patented Aug. 21, 1900.

W. SCOTT.
MOTOR VEHICLE.

(Application filed Feb. 25, 1898.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses—

G. E. Bennett

Wm. V. Becken

Inventor

Walter Scott

by his attorney

Aug. M. Peterson

No. 656,483.

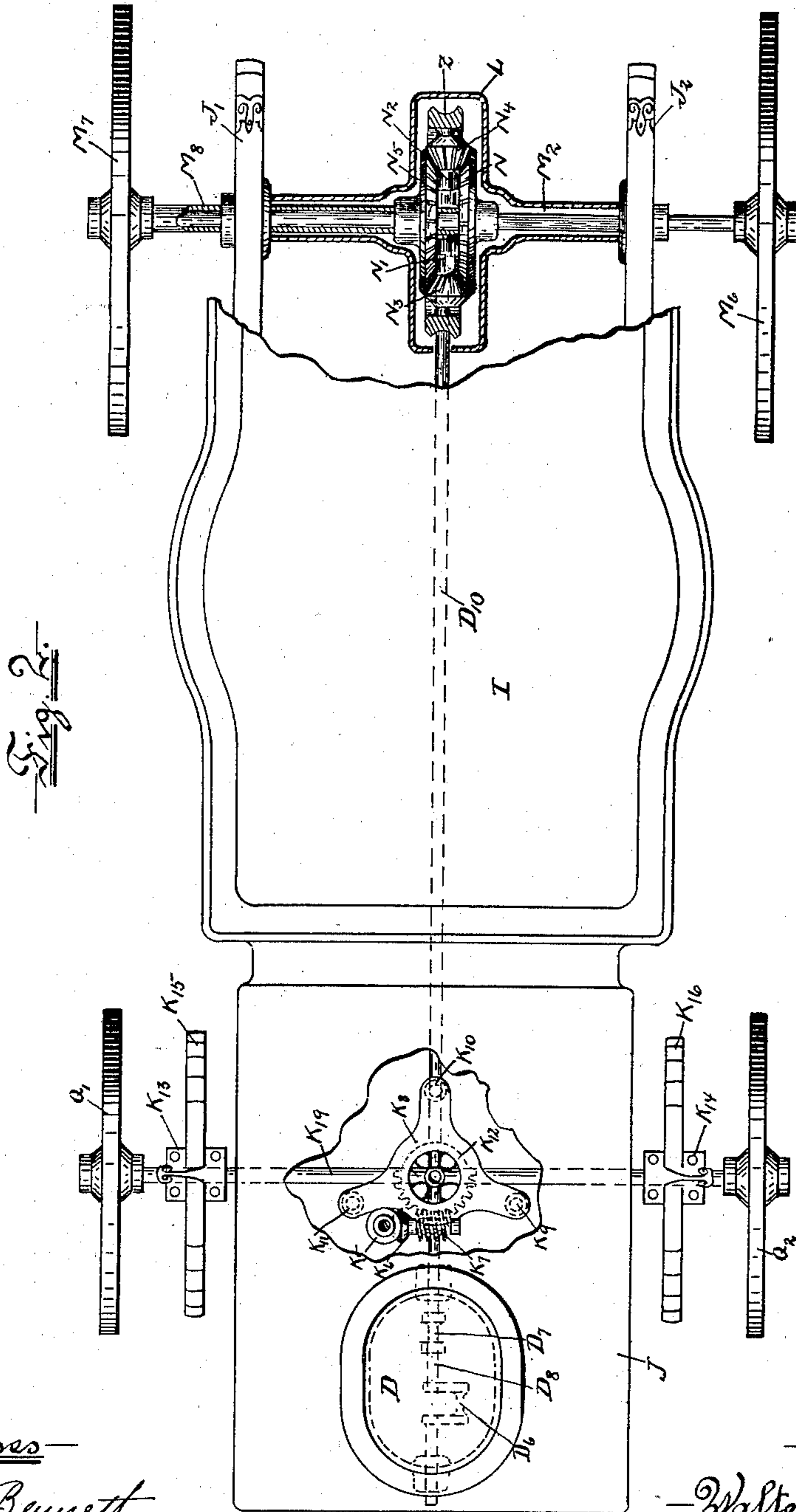
Patented Aug. 21, 1900.

W. SCOTT.
MOTOR VEHICLE.

(Application filed Feb. 25, 1898.)

(No Model.)

3 Sheets—Sheet 2.



Witnesses—

G. E. Bennett

Arrel V. Deeken

Inventor—

Walter Scott

By his attorney—

Aug. W. A. Macdonald

No. 656,483.

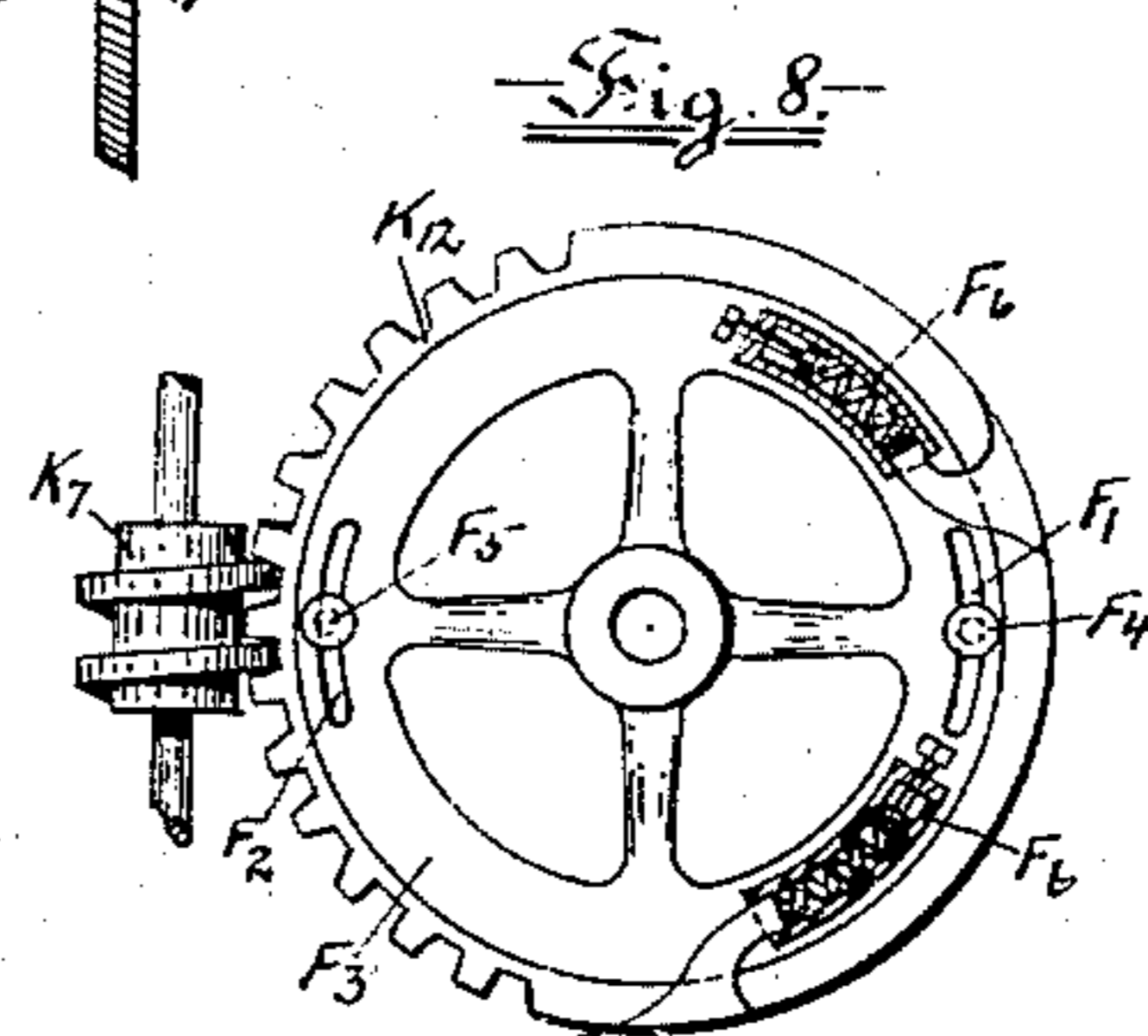
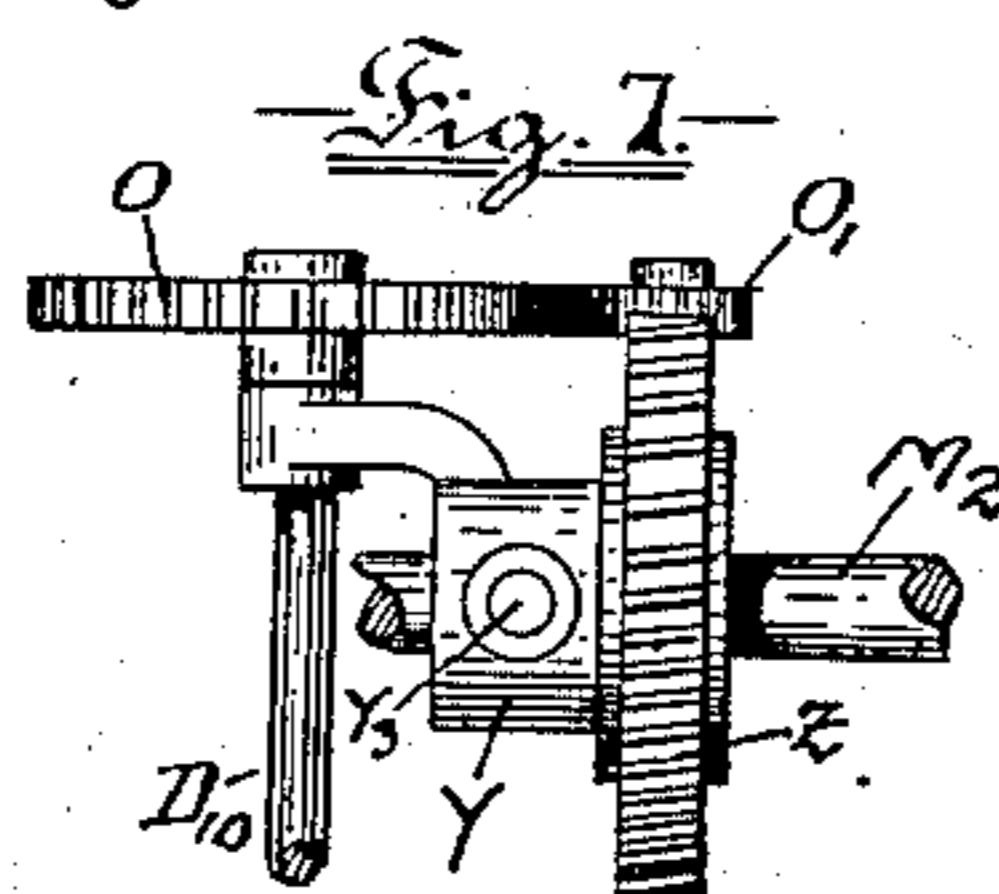
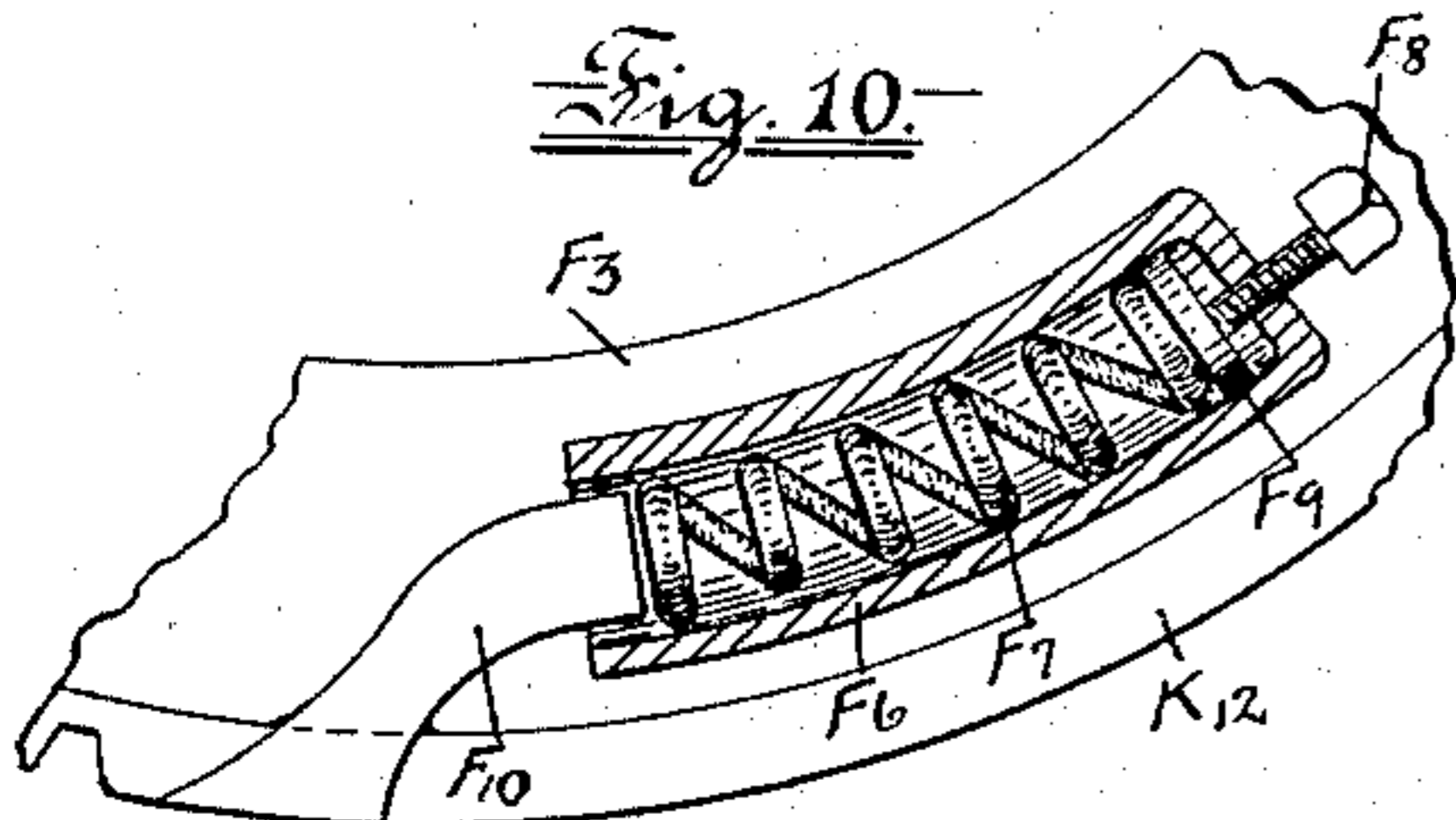
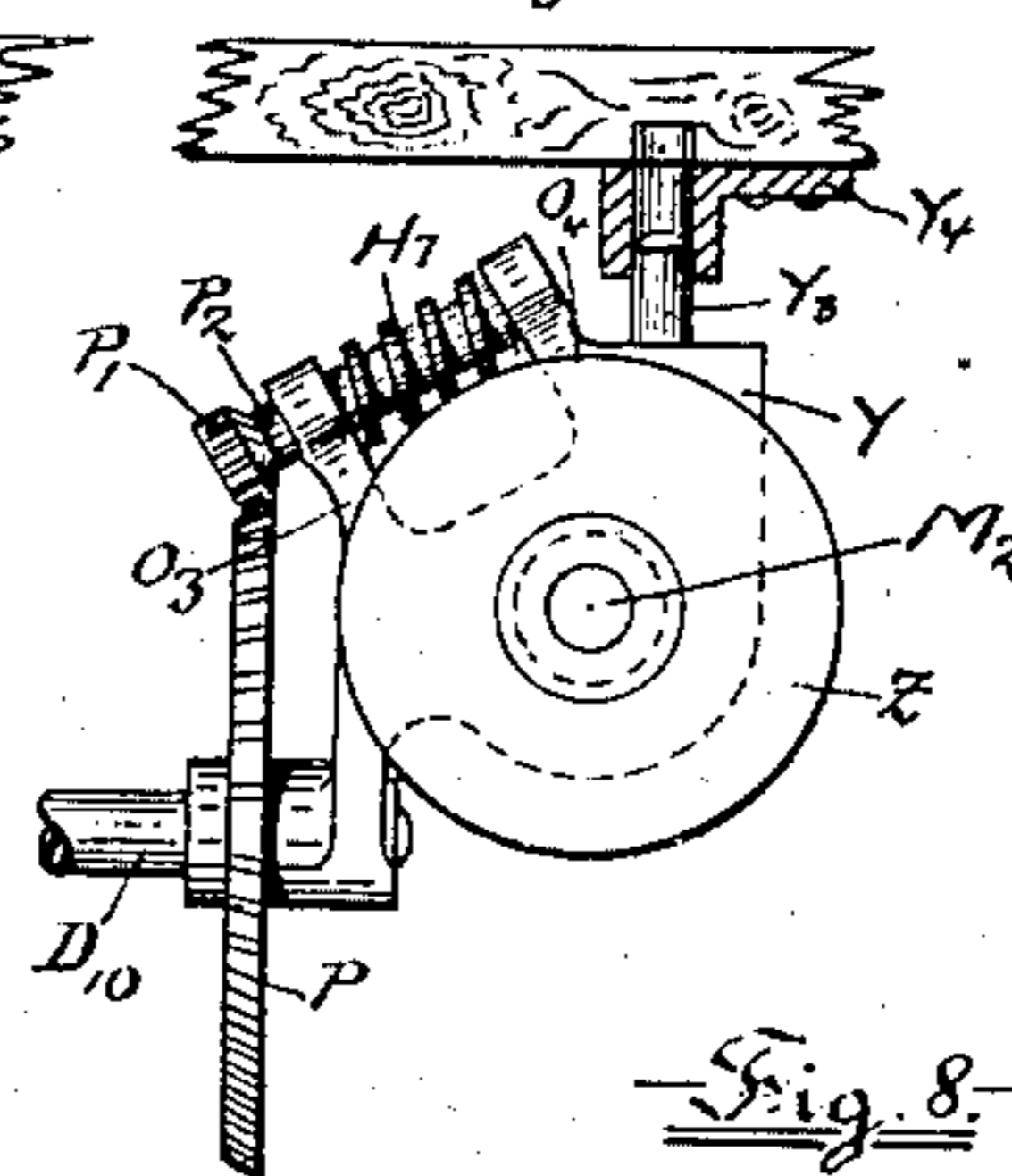
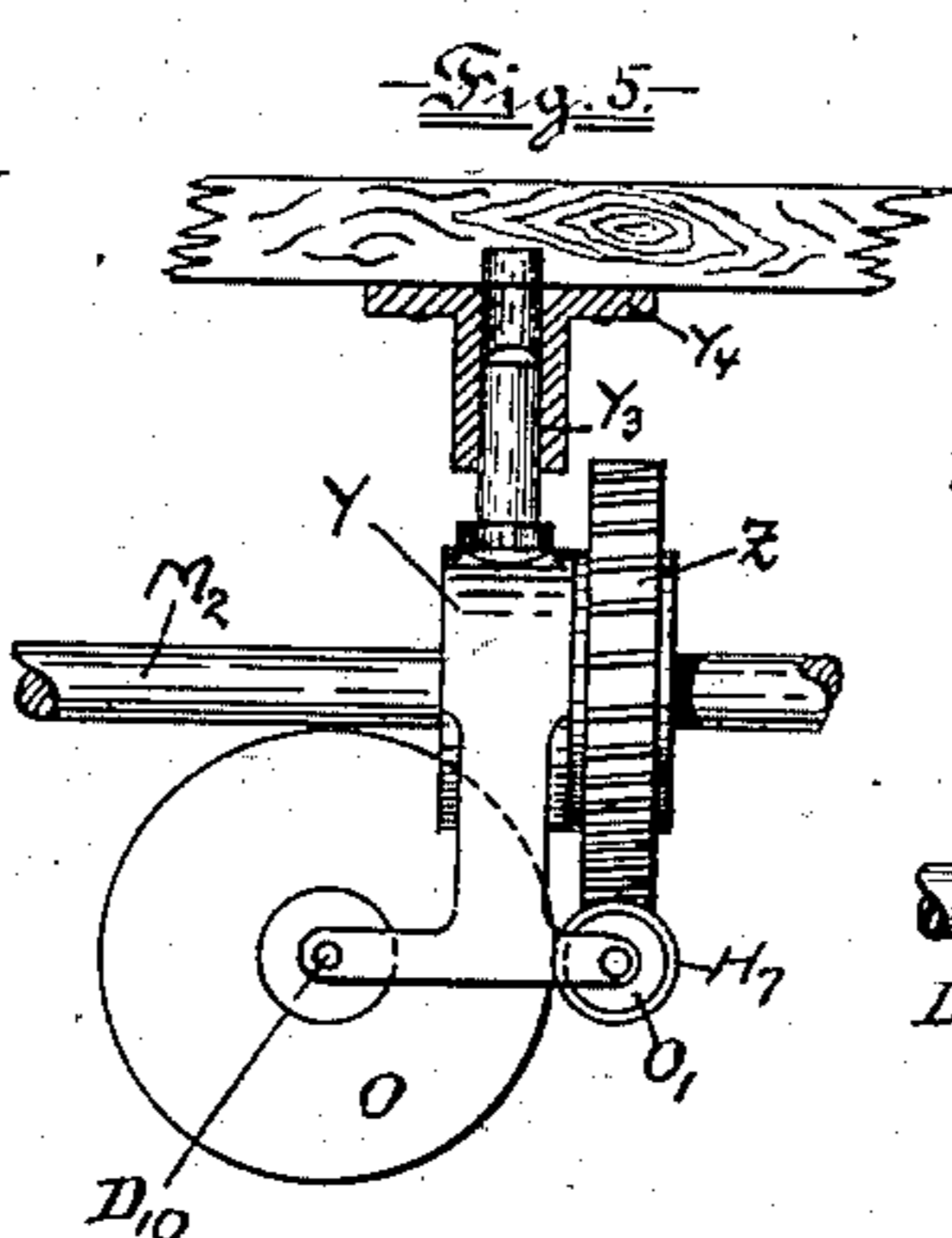
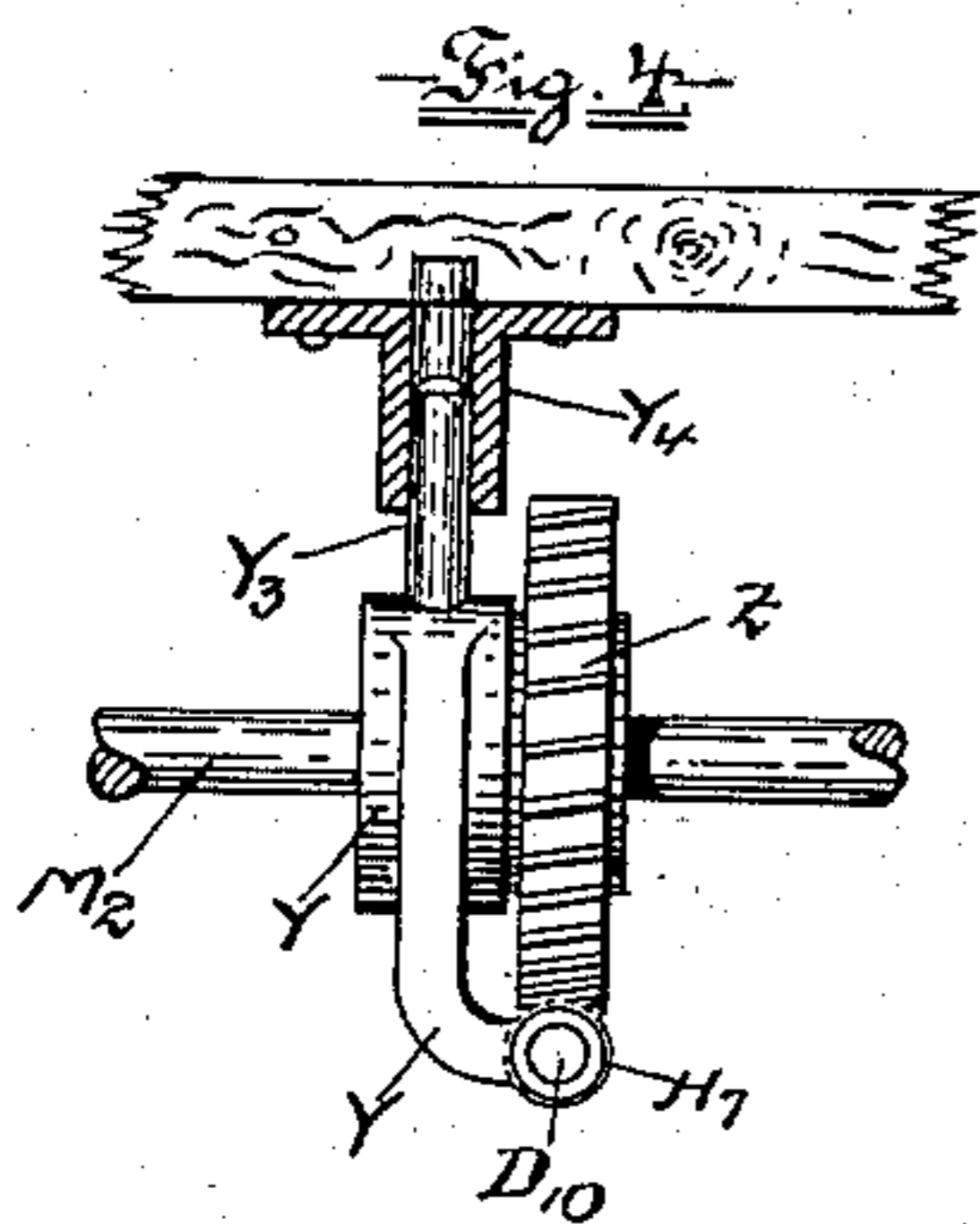
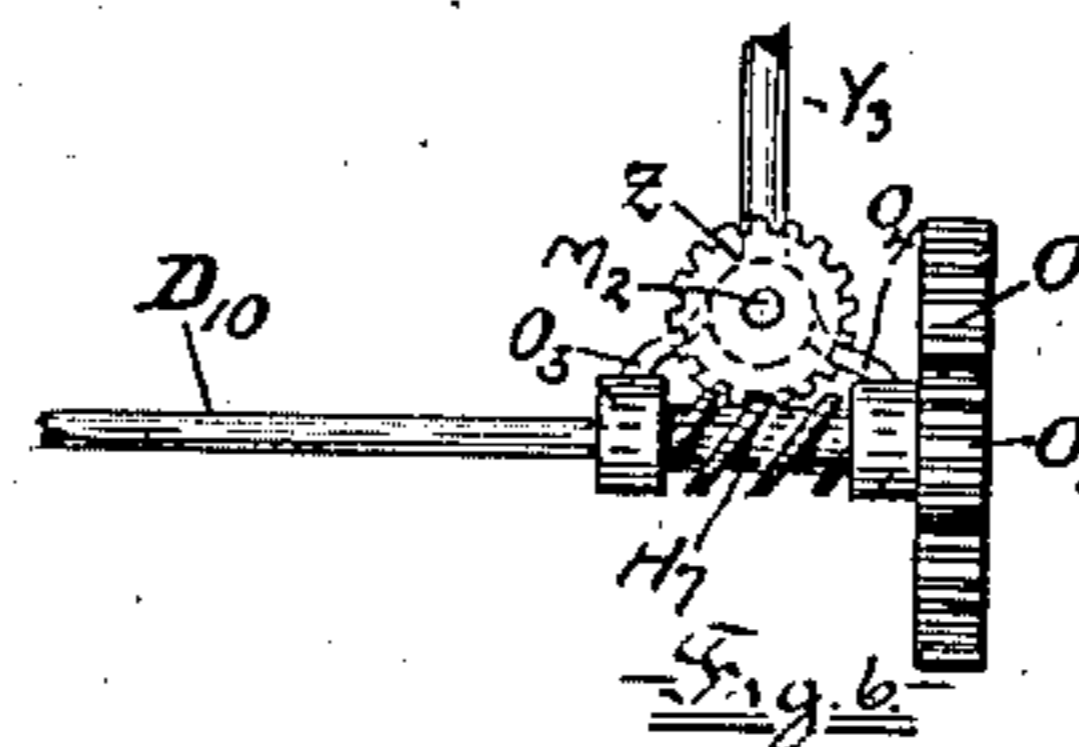
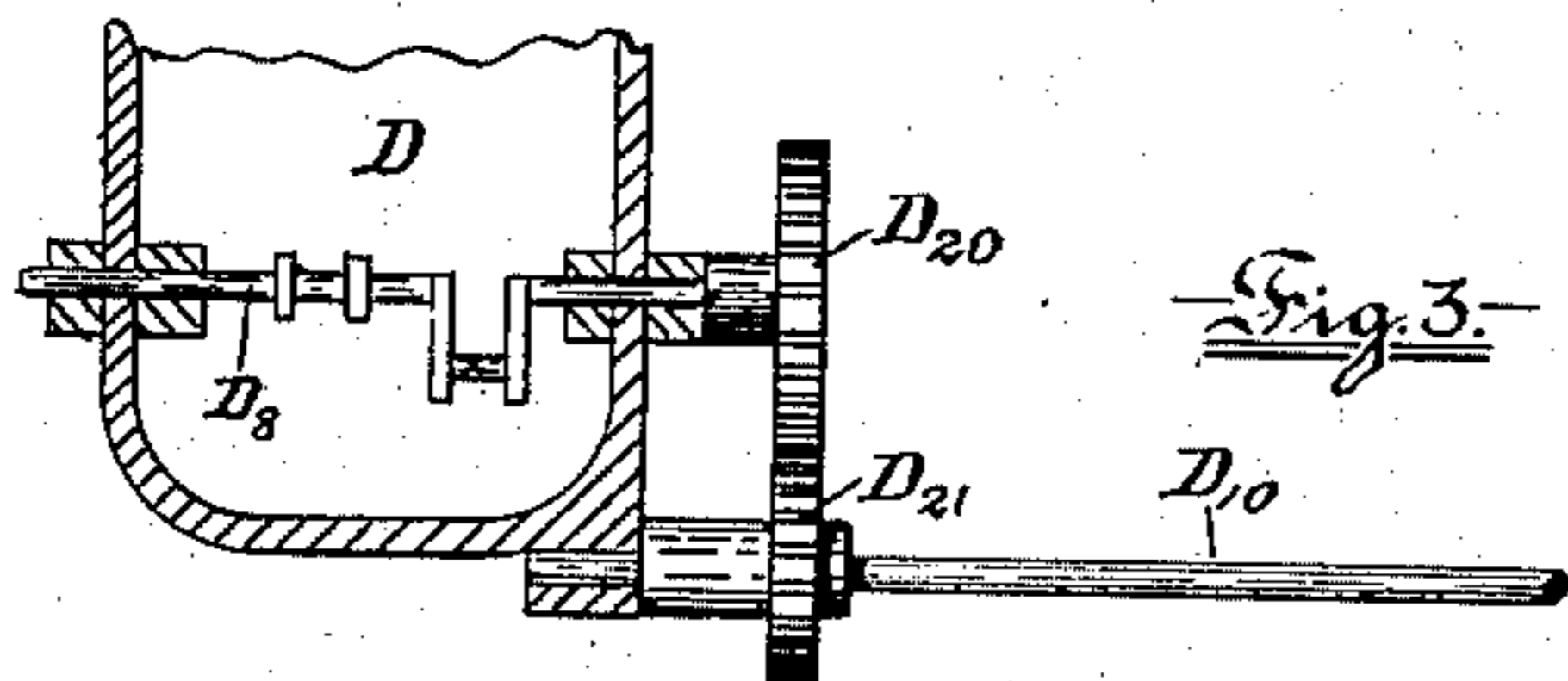
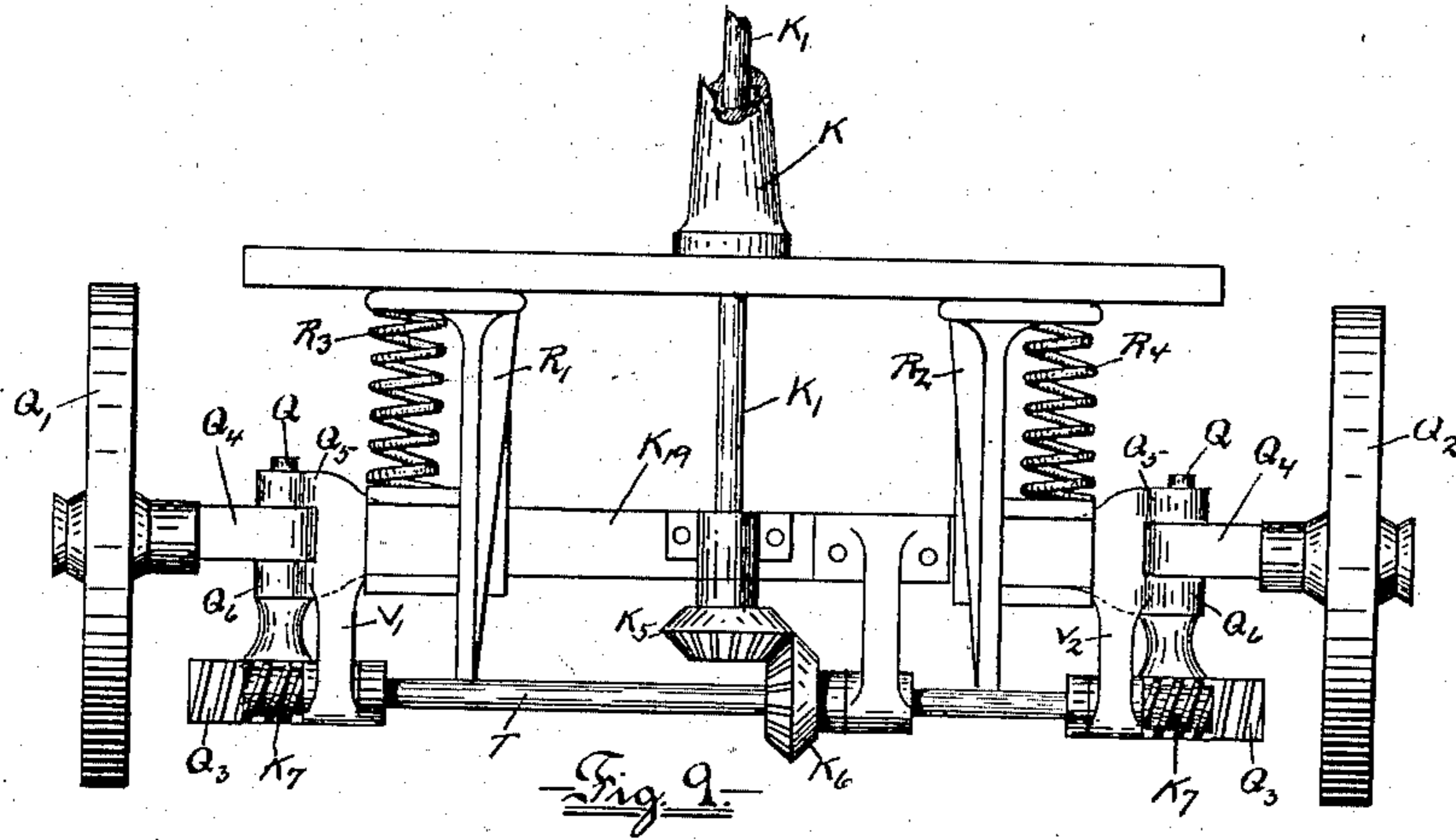
Patented Aug. 21, 1900.

W. SCOTT.
MOTOR VEHICLE.

(Application filed Feb. 25, 1898.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses
G. E. Bennett
H. V. Deeken

Inventor
Walter Scott
By his attorney
Aug. M. V. Deeken

UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

MOTOR-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 656,483, dated August 21, 1900.

Application filed February 25, 1898. Serial No. 671,579. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT, a citizen of the United States, residing at Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Motor-Vehicles; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention has for its object the improvement of the driving, driven, or running and steering gear of any motor-vehicle. The driving-gear comprises the engine, receiving motion from any desirable motive power, a central rearward-projecting driving-shaft underneath the body of the carriage with different styles of connection between the crank-shaft and said driving-shaft and driving-shaft and the rear axle. The driven or running gear comprises the rear wheels of the vehicle and the different methods of connecting these with the driving-shaft, and the steering-gear comprises all the elements that appertain to guiding the vehicle in any desired direction, said steering-gear located in the front part of the vehicle, so as to be within easy reach of the motorman. From the point where the piston rod or rods act upon the crank or cranks of the crank-shaft, including the driven or running gear, my invention will undergo no change, whatever motive power may be applied. The said motive power, which can be applied to the ordinary cylinder piston or pistons of any kind of rotary or reciprocating engine, may be steam, electricity, petroleum, compressed air, gas, or any combination of these, or any other motive power that may be found desirable, located in the front end of the vehicle and developed there or stored for consumption. The above-stated mechanical means have in this improved construction additionally been made more accessible for repairs or cleansing purposes, the more delicate parts thereof being inclosed.

In my description I will refer to the accompanying drawings, wherein like letters of ref-

erence indicate corresponding parts in the different views, and in which—

Figure 1 shows a side view of a vehicle; Fig. 2, a top view of Fig. 1; Fig. 3, a broken detail view of another connection between the crank-shaft and driving-shaft and another view of the connection shown in Figs. 5 and 7 between the driving-shaft and the rear axle; Fig. 4, an end view of a worm and worm-gear connection between the rear axle and the driving-shaft; Figs. 5 and 6, modifications of the same connection; Fig. 7, a top view of Fig. 5; Fig. 8, a detail view of the spring and lever attached to the pivoted-gearing connection shown in Fig. 1 between the steering-gear and the front wheels; Fig. 9, a front end view of the truck of a vehicle, showing a modification of the steering-gear shown in Figs. 1 and 2, and Fig. 10 a detail view of the spring-and-lever attachment shown in Fig. 8.

The gearing revolving the wheels and the steering apparatus are attached to the carriage in the following manner: The vehicle body proper, I, has a front platform J and in the rear a pair of arms J' and J². This platform has the appliances for generating the motive power mounted on it, besides the manipulating part of the steering apparatus, consisting of a standard K, through which runs a rod K', having at the upper end a miter-gear K², meshing with a companion gear K³, supported in a bracket, which is part of standard K, to which is finally attached a hand-wheel K⁴. At the nether end of rod K' is similarly attached one of a pair of miter-gears, K⁵, the other, K⁶, being secured firmly to a worm K⁷, supported in a pair of arms that form part of bracket K⁸, supporting the front of the vehicle at three points K⁹, K¹⁰, and K¹¹. The worm K⁷ gears into a worm-wheel K¹², the gear cut only on a semicircular segment thereof. The worm-wheel is part of a circular plate or disk having four arms K^x, suitably mounted on the horizontal and lateral extending arms K¹³ and K¹⁴, resting on and secured to their respective carriage-springs K¹⁵ and K¹⁶, which again rest on and are suitably attached to the journals K¹⁷ and K¹⁸, in which journals the axle K¹⁹ is supported, having the front wheels Q' and Q² revolving thereon.

The driving-gearing is located and con-

nected as follows: Suitably supported in an engine D is a crank-shaft D⁸, having cranks D⁶ and D⁷. This is, by the universal coupling D⁹, connected with the driving-shaft D¹⁰. A modification of this connection between the crank-shaft and the driving-shaft is shown in Fig. 3, where the end of shaft D¹⁰ is supported in the engine-shell and connected with the crank-shaft by spur-gears D²⁰ and D²¹. Said shaft D⁸ is supported in the engine-shell D¹¹ in hubs D¹² and D¹³, and the extension thereof or the driving-shaft D¹⁰ is supported in the other end in the casing L, which incloses the part of the running or driven gearing attached to the rear wheels of the vehicle. The said extension-shaft D¹⁰ has secured to it a worm H⁷, meshing with a worm-wheel Z, which is secured to the rear axle M², journaled in the customary boxes, said boxes having interposed between them and the rear supporting-arms J¹ and J² of the carriage springs M⁴ and M⁵, all of which journal-boxes, springs, and rear carriage-arms are secured together in a fitting mechanical manner. Secured firmly to the shaft M² is one of the rear wheels M⁶, while the other rear wheel M⁷ is formed with a sleeve M⁸, that fits around the shaft M², M⁸ having the fourth cog-wheel N⁵ of a compensating gear, consisting of the two pinions N³ and N⁴, pivoted in the hubs N¹ and N² on the cog-wheel N, which is firmly secured to the shaft M². The worm-wheel Z is fittingly secured to the shaft M² and, as will be seen in Fig. 2, lies around the compensating gear and can either be attached directly to the shaft M² or be cast in one with the part of the compensating gear formed by N, N³, and N⁴. The operative motion of this rear part of the driven gearing will consequently be seen to be the following: the driving-shaft D¹⁰ being given the necessary revolving motion by its connection with the motive power and the intermediate elements, will through the worm H⁷ transmit its revolutions to the worm-wheel Z, which was the desired object. As a review of the operative motion of my vehicle from the point where the power is applied, it will thus be seen that the motive power will transmit motion to the cranks D⁶ and D⁷, which will finally transmit power to the driving-gearing.

The steering apparatus is operated, as follows: The motorman from his seat S manipulates the hand-wheel K⁴, which, having firmly attached to it the miter-gear K³, meshing with a companion gear K², secured at one end of the rod K¹ at the top of the standard K, will thus transfer motion to the miter-gear K⁵, attached to the other end of the rod K¹. Gearing into this is a companion gear K⁶, secured firmly to a pin having the worm K⁷ attached to it, said pin supported in bracket-arms forming part of the disk K⁸, which is an immovable part with the under part of the carriage, formed by the carriage-arms K¹³ and K¹⁴, springs, boxes K¹⁷ and K¹⁸, containing the axle K¹⁹, and wheels revolving at the end of

said axle. A disk K⁸, with a segment of a worm-wheel attached, gears into the worm K⁷, supported, as aforesaid, in a bracket forming part of the disk K⁸, so that it will be apparent that a right or left motion of ninety degrees can be given to the axle having wheels revolving thereon, which was the object I had in view.

In Fig. 8 I have illustrated a modification of the worm-gear K¹² and its connection with the disk K⁸, as follows: The worm-gear K¹² is constructed as running loose around the disk F³ to the extent of the length of the slots F¹ and F², cut in said disk, which disk rests on top of the disk K⁸ and has connection therewith by means of the two bolts F⁴ and F⁵, fastened in K⁸ and protruding through the slots F¹ and F². Secured on disk F³ are, further, a shell F⁶, (see Fig. 10,) having an open and closed end, a coiled spring F⁷, lying inside of it, a set-screw F⁸, attached in the closed end and having a plate F⁹ at the end inclosed in the shell resting against one end of the spring F⁷. The other end of the spring F⁷ bears against a lug F¹⁰, cast on or otherwise attached to worm-gear K¹². It will now be seen that the above-described construction is an elastic take-up motion for any sudden jerks in the gearing caused by the wheels meeting obstructions which might occasion breaks. Another take-up motion can be placed on the opposite side to take up the opposite motion. The steering motion, being transferred through the worm K⁷ to the worm-gear K¹², is transmitted to the disk K⁸ by lug F¹⁰, acting on the spring F⁷, located in the shell F⁶, which shell forms part of the circular disk F³, lying inside of the worm-gear K¹², which disk is attached to the underneath-lying disk K⁸ by the bolts F⁴ and F⁵, attached to disk K⁸, moving in the slots F¹ and F² in disk F³, thus causing an easy elastic movement between the steering-gear and the front wheels.

Referring to the modifications for connecting the wheel-axle M² with the driving-shaft D¹⁰, the illustration in Fig. 4 shows the driving-shaft having the worm H⁷ secured to it, said worm supported in the arms Y¹ and Y² of a bush Y, which bush itself runs loose on the axle M², and to prevent the friction from carrying it around with the said axle it is furnished with a pin Y³ and is vertically adjustable up and down in support Y⁴, attached to the under side of the truck-body, the worm H⁷ gearing into worm-wheel Z, thus revolving M². In Figs. 3, 5, and 7 the motion from the driving-shaft D¹⁰ is transmitted by means of the spur-gear O, attached thereto, meshing with its pinion O¹, said pinion attached to a pin carrying also the worm H⁷, supported in the arms O³ and O⁴ and forming part of a bush lying, as in the instance of bush Y, around the axle M² and moving loose on the same, bush Y also having a pin Y³, secured in a support Y⁴, attached to the truck-body, and finally the worm H⁷ gears into the worm-wheel Z on the driven axle M².

In Fig. 6 the driving-shaft D^{10} has a bevel-gear P attached to it, meshing with a bevel-pinion P' , secured to a pin P^2 , carrying the worm H^7 , said pin supported in the arms O^3 and O^4 , forming part of the bush Y , loosely secured to the axle M^2 , having a pin Y^3 , steadying it in a support Y^4 , which support is attached to the truck-body as in the former instances, the connection being closed by worm H^7 , gearing into worm-wheel Z , attached to shaft M^2 .

A modification of the steering apparatus shown in Fig. 1 is illustrated in Fig. 9. The wheels Q' and Q^2 are in this instance swiveled at the pivots Q . Looking at the construction of one of these wheels, one description sufficing for both, it will be seen that the pivot Q has at its lower extremity a worm-wheel Q^3 , firmly secured. The pivot Q itself is either a substantial part of or firmly secured to the axle-pin Q^4 , the wheel Q' , its axle-pin Q^4 , the pivot Q , and the worm-wheel Q^3 consequently forming a unitary element. The said pin Q is movable in two arms Q^5 and Q^6 , forming part of the axle K^{19} . The axle K^{19} , having boxes R' and R^2 , inclosing springs R^3 and R^4 , supports the front body of the truck. Gearing into the worm-wheel Q^3 is a worm K^7 , and, speaking about both worm-wheels, a worm for each wheel. Said worms K^7 are mounted on a shaft T , which shaft is supported in arms V' and V^2 , forming part of the axle K^{19} . Said shaft T has, furthermore, one of a pair of miter-gears K^6 attached to it, the other miter-gear K^5 being secured to the end of a perpendicular rod K' , which passes through and is supported at the top by a standard K , which rod K' has a hand-wheel secured to its upper end for manipulation by the motorman. It will consequently readily be seen that when the motorman turns the hand-wheel either to the right or left side the rod K' , having the miter-gear K^5 firmly secured thereto, will actuate the companion miter-gear K^6 , secured to the shaft T , and shaft T , having the worms K^7 attached, gearing into their respective worm-wheels, forming part of a unitary element with the wheels Q' and Q^2 , will turn these in either a right or left hand direction. It may be added that the spring device or take-up motion (illustrated in Figs. 8 and 10 and described before) can be applied in the same manner to the worm-gears described in this construction, in which case one spring may be furnished for each segment, and it will be readily understood that it is not necessary for the hollow axle M^8 to be constructed hollow, but that it can be constructed like M^2 and the ends terminating adjacent to each other and supported by suitable bearings. Further, the worm-wheel Z could rotate on a separate bearing other than the axle.

As the operative motion of each division has been explained and the coöperative union between the above-described elements has

unavoidably formed part of the description, no résumé of the same would seem necessary; but

What I claim as my invention, and desire to secure protection for by Letters Patent of the United States, is—

1. The combination in a motor-vehicle, having its rear-end springs seated on an axle, of an engine and operating-levers at its front end, a driving-shaft reaching to and engaging with the rear axle by means of worm and worm-wheel, a frame to support the same connected with the axle-frames holding the axle in position laterally and allowing it to move perpendicularly in relation to the body substantially as described.

2. The combination in a motor-vehicle of a fifth-wheel having a worm-gear segment thereon, a loose disk sliding inside of said worm-gear, bolts secured to the fifth-wheel moving in grooves located in the loose disk, a spring device attached to said loose disk acting in combination with the worm-gear, substantially as described.

3. The combination of a vehicle with its body mounted on springs, a motor in the front end of the body, a driving-shaft extending below the body connecting the motor and the axle of the rear wheels, a crank-shaft supported in the engine-shell, spur-gears intermeshing between said crank-shaft and the driving-shaft, a worm and worm-gear intermediate between the driving-shaft and the rear axle, substantially as described.

4. The combination in a motor-driven vehicle of a body mounted on springs, a motor and steering-gear in front, a driving-shaft extending backward to engage and drive the rear axle, a fixed wheel attached to one end of the axle, a wheel having a sleeve inclosing the axle, a compensating gear operating intermediate the sleeve and axle, a worm-gear rotating on the axle located around the compensating gear meshing with the worm on the driving-shaft, substantially as described.

5. The combination in a motor-driven vehicle of a body mounted on springs, a motor and steering-gear in front, a shaft extending backward to engage and drive the rear axle, a fixed wheel on one end of the axle, a wheel having a sleeve inclosing the axle, a worm-gear circumventing the compensating gear driven by a worm, a frame for said gearing on the axle connected with the body to prevent its rotation, substantially as described.

6. The combination of a motor-driven vehicle having the motor on its front end and its rear end mounted on springs, a shaft with a yielding joint extending backward to the rear axle and driving same by means of gearing, a frame for said gearing attached to the axle and its journal-boxes on their sides and moving perpendicularly with it but not rotating, substantially as described.

7. The combination in a motor-driven vehicle of a body mounted on springs of the rear

axle, guides to allow of the vertical motion of the axle, drive-wheels on the axle, a worm-wheel on the axle, a worm-drive connecting with the worm-wheel mounted on a frame on the axle, a pin on said frame coacting with a socket on the body, substantially as described.

8. The combination in a motor-driven vehicle of a steering apparatus having swiveled wheels, each swiveling portion having a segment of gear attached, and both segments turned by worms engaging therewith to turn the wheels in one direction, substantially as described.

9. The combination in a motor-driven vehicle of two swiveling wheels with their axles, a segment on each axle, a worm for each segment mounted on a shaft, an upright shaft and gearing connecting the shafts, and a hand-wheel or crank; substantially as described.

10. The combination in a motor-driven vehicle of two swiveled wheels, a gear-segment mounted on the swiveling portion of each axle, a shaft and worm connecting said segments, an upright shaft and connecting-gears and a hand-wheel moving its front edge in

the direction it is desired to turn the vehicle, substantially as described.

11. In the combination of the driving-shaft with the revoluble axle of a motor-driven vehicle, a bush supported loosely on the axle having arms supporting the gearing for transmitting motion from the driving-shaft to the driven shaft, a pin projecting from said bush, a socket attached to the body of the vehicle containing said pin substantially as described.

12. A combination in a vehicle, whose direction is guided by its front wheels, a suitable hand wheel or lever for steering the vehicle, gearing for connecting such steering-wheel and the axle of the front wheels, and a compensating spring or springs connected with said gearing and located between the steering-wheel and the axle of the running-wheels.

In testimony that I claim the foregoing I have hereunto set my hand this 10th of February, A. D. 1898.

WALTER SCOTT.

Witnesses:

AXEL V. BECKEN,
AUGUST M. TRESCHOW.