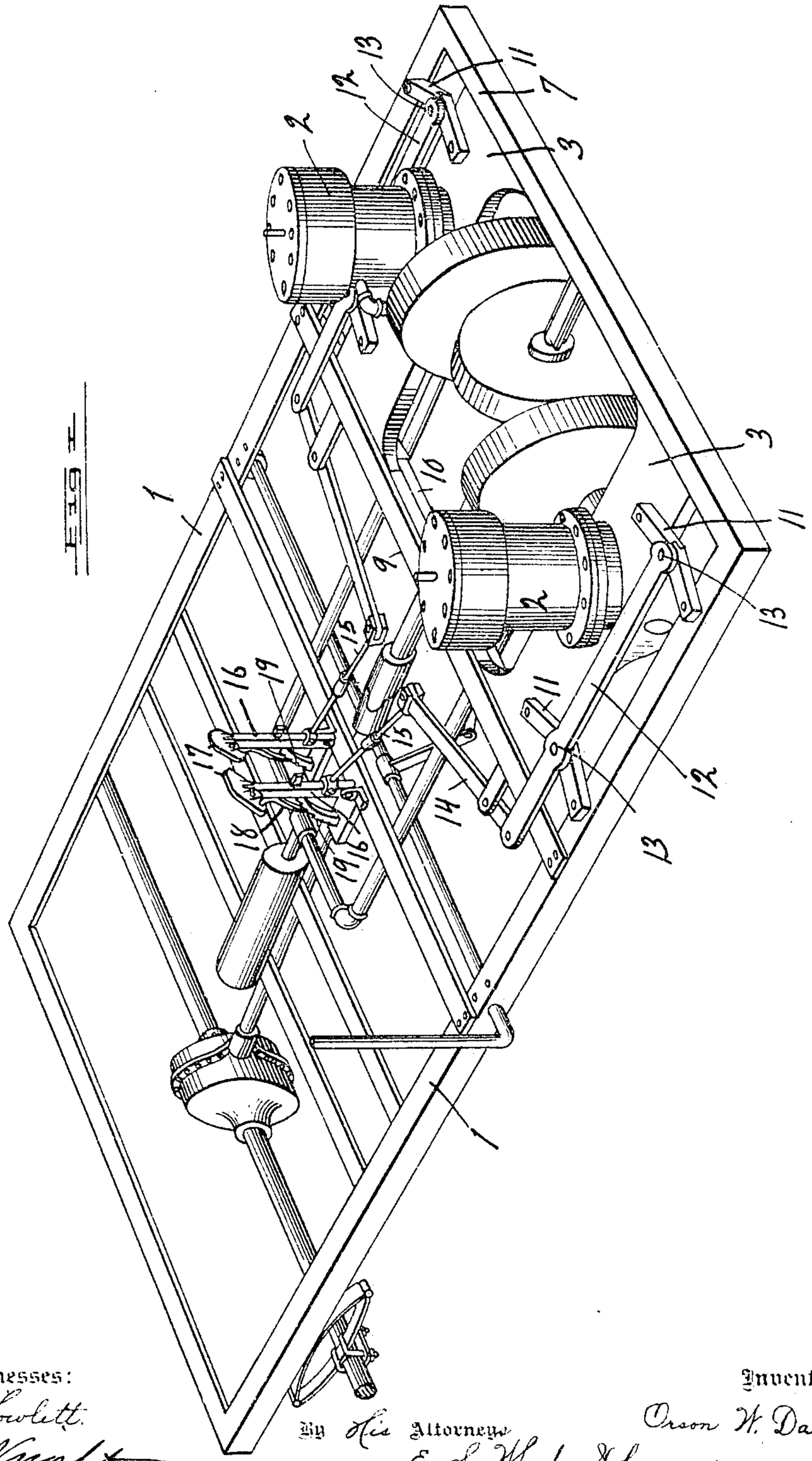
No. 799,147. PATENTED SEPT. 12, 1905.

O. W. DAVIS.

TRANSMISSION GEAR.

APPLICATION FILED APR. 25, 1904.

4 SHEETS—SHEET 1.



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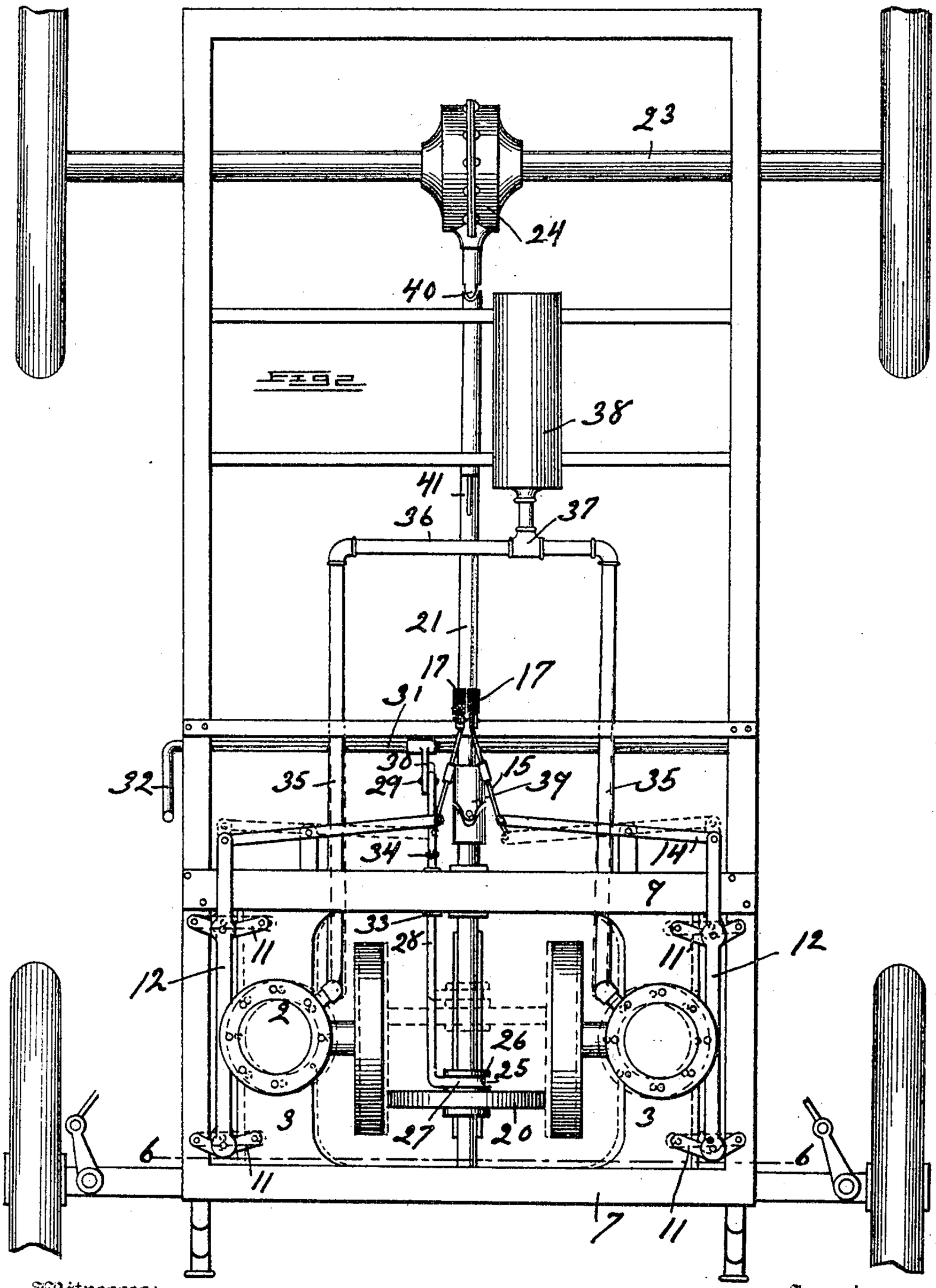
4 SHEETS—SHEET 2.

Fig 2



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4 SHEETS—SHEET 3.

Fig 3.

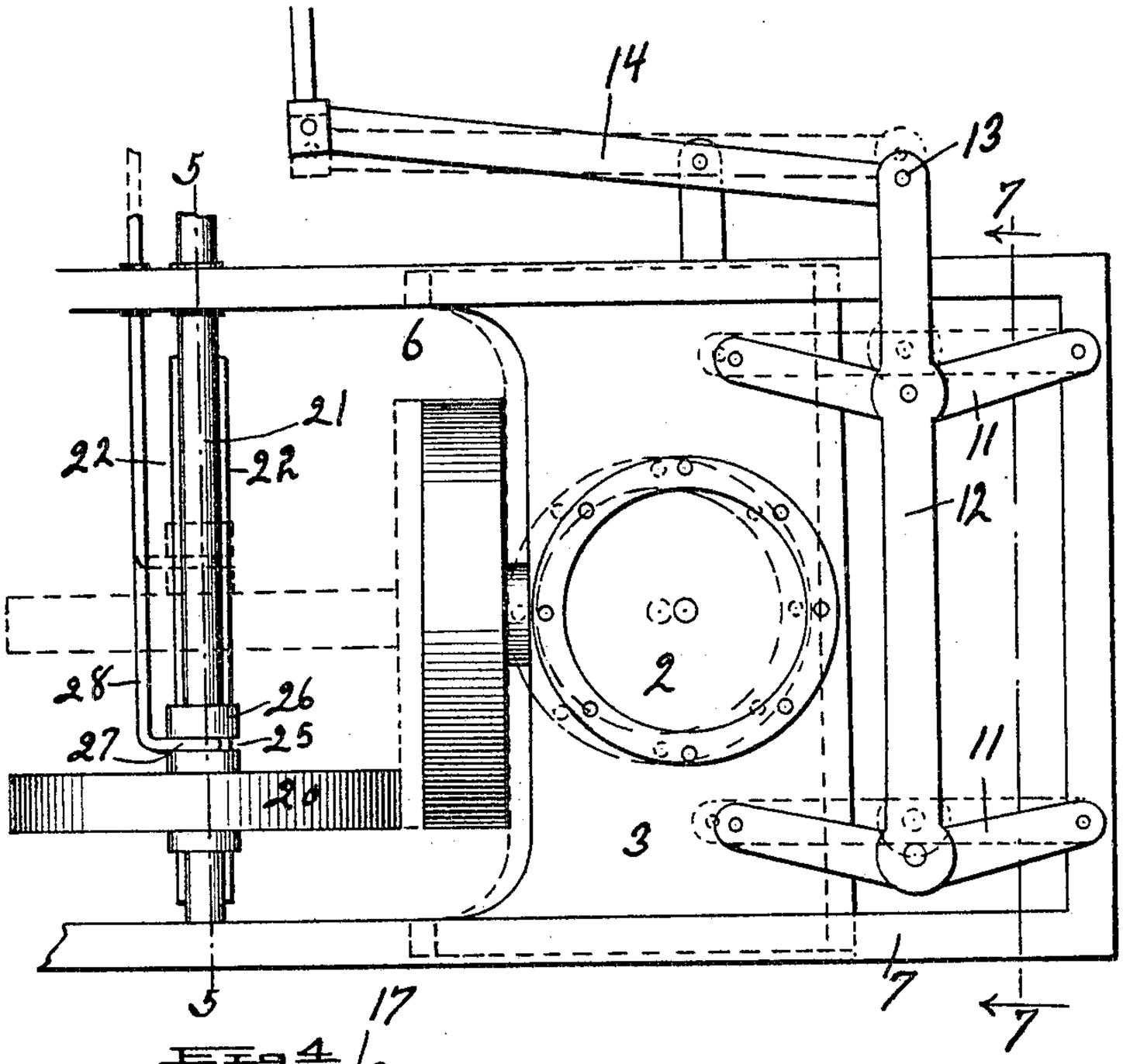


Fig 4

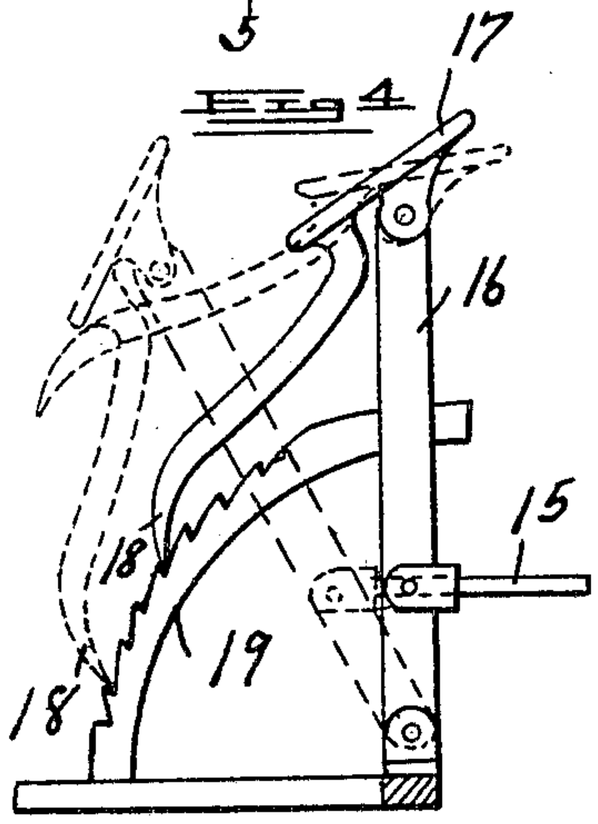
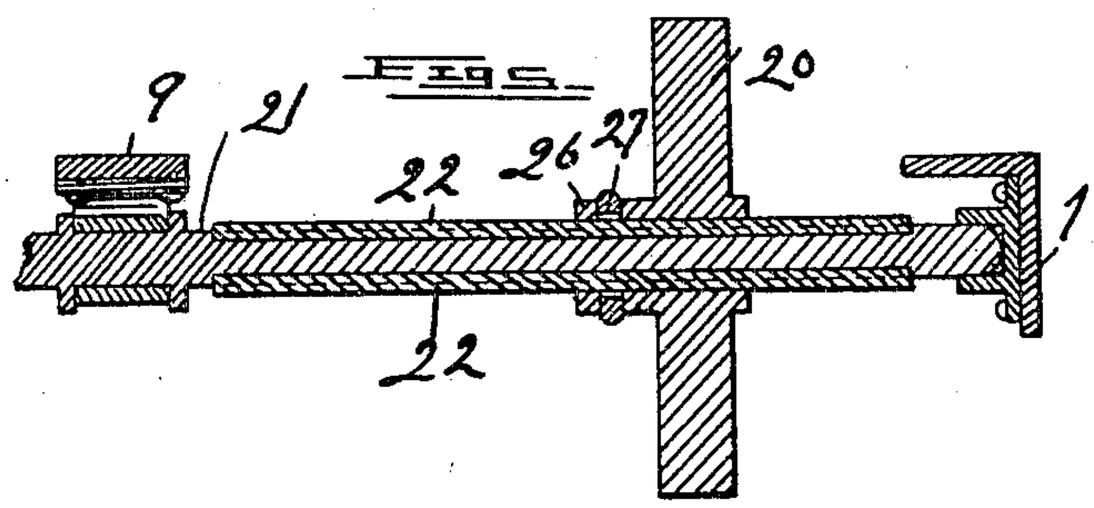


Fig 5.



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TRANSMISSION GEAR.

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4 SHEETS—SHEET 4.

Fig 6.

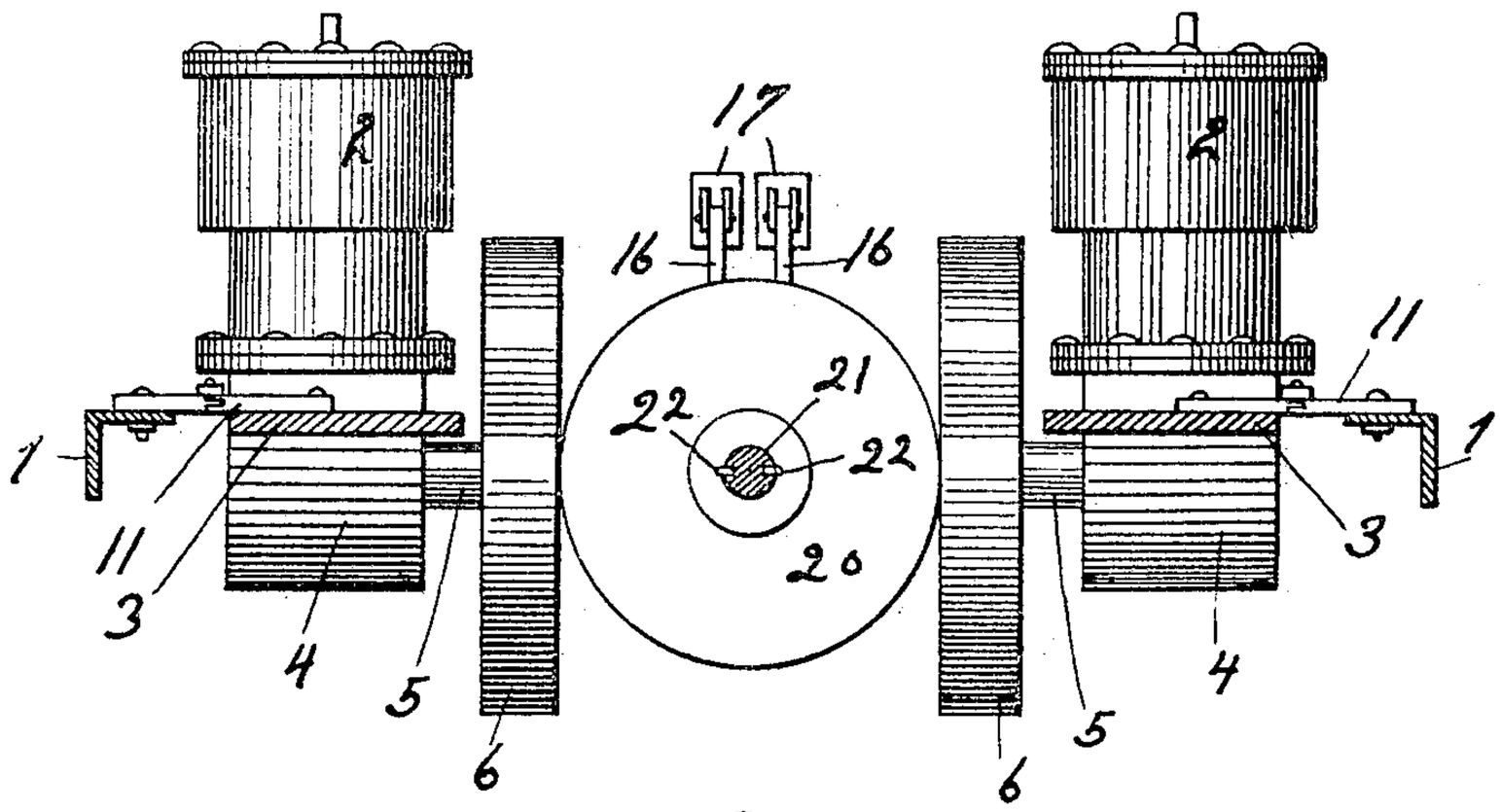


Fig 7.

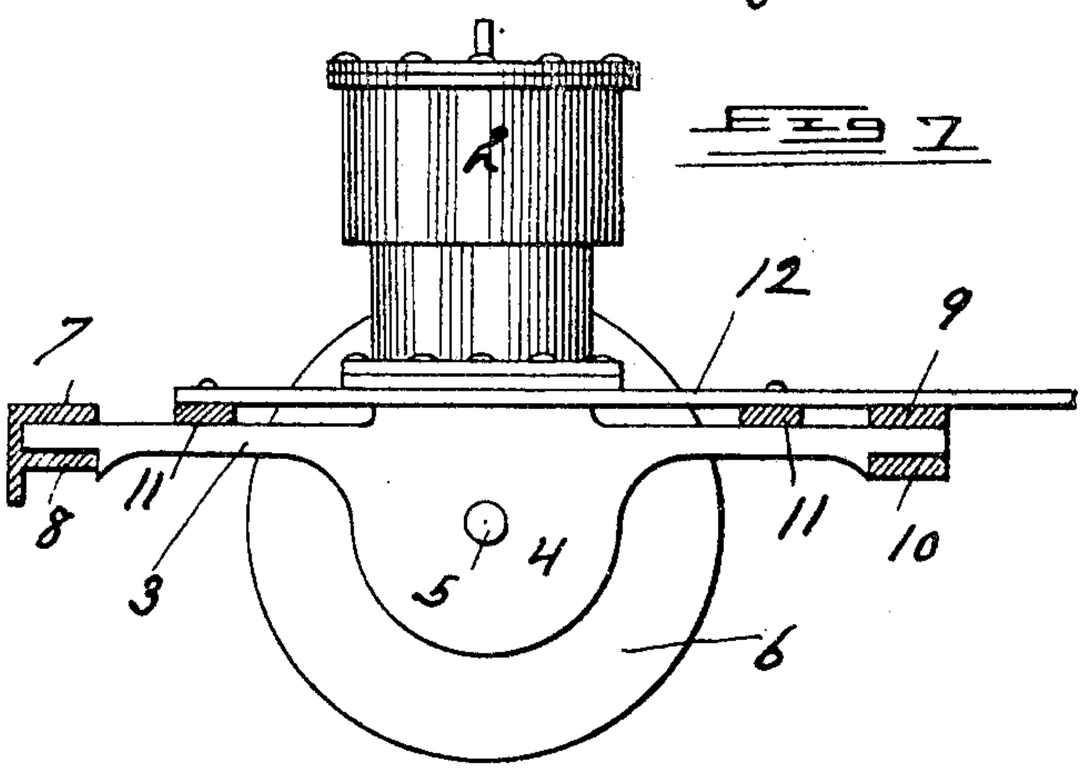
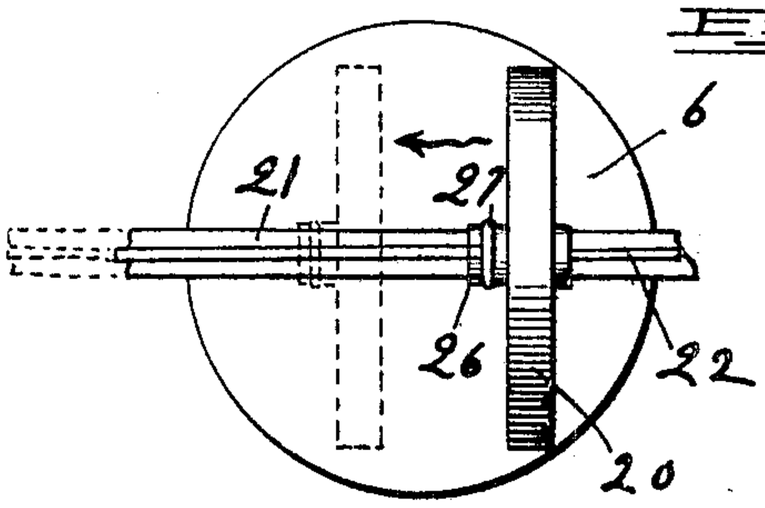


Fig 8.



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UNITED STATES PATENT OFFICE.

ORSON W. DAVIS, OF ADRIAN, MICHIGAN.

TRANSMISSION-GEAR.

No. 799,147. Specification of Letters Patent. Patented Sept. 12, 1905.

Application filed April 25, 1904. Serial No. 204,900.

To all whom it may concern:

Be it known that I, ORSON W. DAVIS, a citizen of the United States, residing at Adrian, in the county of Lenawee, State of Michigan, have invented certain new and useful Improvements in Transmission-Gears; and I do 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 the figures of reference marked thereon, which form a part of this specification.

This invention relates to a differential-speed-transmission gear for motor-vehicles; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The object of the invention is to provide means for enabling a movable friction-disk to be connected directly with the face of the fly-wheel of the engine or engines in a manner to transmit the motion therefrom to the driving-shaft, said friction-disk being movable transversely of the face of the fly-wheel, but held against lateral movement either on or with its shaft, while the engines are mounted upon movable carriages, whereby they may be moved to bring their fly-wheels either singly or concurrently into operative relation with said friction-disk.

The above object is attained by the structure illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the frame of the motor-car carrying my improved driving mechanism. Fig. 2 is a plan view of the frame and running-gear, parts being broken away. Fig. 3 is an enlarged plan view of one of the engines and the friction driving-disk, showing the mechanism for moving the engine-carriage to bring the fly-wheel into operative relation with said disk. Fig. 4 is an enlarged elevation of the ratchets for locking the driving mechanism. Fig. 5 is a sectional view on line 5 5 of Fig. 3. Fig. 6 is a sectional view on line 6 6 of Fig. 2. Fig. 7 is a sectional view on line 7 7 of Fig. 3. Fig. 8 is a fragmentary view in elevation of the friction-disk and its shaft and the fly-wheel of one of the engines.

Referring to the characters of reference, 1 designates the frame, which is formed, preferably, of angle-iron and which carries the driving mechanism. The motive power is supplied by two gasolene-engines 2, which are mounted upon carriages 3, that are supported at their opposite ends to slide in ways in the frame and which carry the crank-cases 4 of the engines, in which are journaled the crank-shafts 5. Upon the inner ends of the crank-shafts are the fly-wheels 6. The ways in which the engine-carriages move are formed by the superimposed bars 7 and 8 at the forward ends of the carriages (see Fig. 7) and the superimposed bars 9 and 10 at the rear ends thereof. The engine-carriages are actuated in the ways by means of the toggle-levers 11, which are pivoted to said carriages and to the side bars of the frame and are connected by the bars 12, which are pivoted at 13 to the joints of said toggle-levers, the rear ends of said bars being pivoted to the levers 14, which are fulcrumed to the frame and have pivoted to their inner ends the adjustable rods 15, which lead to and are jointedly connected with the standards 16 of the pedals 17, said pedals being pivoted to their respective standards and having depending therefrom a dog 18, adapted to engage with a ratchet 19, whereby said pedals may be locked when desired. By a pressure upon both of said pedals both sets of toggle-levers will be actuated to move the carriages of the engines in their ways and bring the faces of the fly-wheels 6 into engagement with the periphery of the friction-disk 20, interposed between said fly-wheels and splined to the driving-shaft 21 by means of the keys 22. The fly-wheels of the engines are driven in opposite directions, so that when brought into contact with the periphery of the friction-disk 20 said disk is caused to revolve, imparting a rotation to the shaft 21 and turning the rear axle 23 through the common driving-gear (not shown) within the case 24, the movement of the engine-carriages to accomplish this purpose being illustrated by dotted lines in Fig. 2. A movement of the friction-disk 20 upon its shaft 21 toward or from the center of the fly-wheels of the engine will regulate the speed of the car as desired. When the friction-disk 20 is engaging the faces of the fly-wheels close to their center, the driving-shaft will be turned slowly, but the engines will have great power over the traction-wheels—an arrangement of material advantage for the purpose of hill-climbing or when encountering sandy roads. As the disk 20 is gradully moved outwardly from the center of the fly-wheels the speed of the car will be correspondingly increased, as will be well understood. To facilitate the

movement of the friction-disk 20, a channel 25 is formed in the hub 26 thereof, which is embraced by a spanner 27 on the end of the rod 28, which extends rearwardly and is pivoted at 29 to the arm 30, made fast to the rock-shaft 31, supported in the frame and carrying the upwardly-extending operative lever 32, which is located convenient to the hand of the operator. By a manipulation of said lever the rod 28 may be reciprocated to slide the friction-disk 20 upon the shaft 21 to vary the speed of the car or reverse the motion thereof, as required. Said rod slides through a sleeve 33 and is provided with a joint 34 therein to accommodate the sweep of the arm 30.

Because of the fact that the pedals 17 and their connecting-levers may be operated independently the engines may be used singly or together, as desired. This arrangement is especially advantageous where an accident happens to one of the engines to disable it, in which case said engine may be cut out and its carriage moved to free its fly-wheel from the friction-disk, when the car may be driven wholly from the other engine. Another advantage in the opposed engines resides in the fact that when starting but one engine need be cranked, and after the car is under motion the other engine may be moved so as to bring its fly-wheels into engagement with the disk 20, causing the rotation of said disk to start said engine, when by closing the switch of its sparker its power may also be applied to the friction-disk for the propulsion of the car. The effect of bringing the fly-wheels of the engines into engagement with the rotary disk when said engines are running is practically to couple said engines through the drive-shaft and synchronize them, whereby the equation of their combined force is exerted upon said shaft.

Connected with each of the engine-cylinders is an exhaust-pipe 35, which extends rearwardly to a cross-pipe 36, that is connected, through the T-coupling 37, with a suitable muffler 38. There is spring enough in the pipes 35 to allow of the necessary movement of the engines in carrying their fly-wheels into frictional contact with the disk 20; but, if desired, a short section of hose may be inserted in said pipes to more freely permit of the movement of the engine.

The drive-shaft is provided with the usual universal couplings 39 and 40 and with the telescopic joint 41.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a motor-vehicle, of a frame, an engine movably mounted in said frame, a friction-wheel on the shaft of said engine, a drive-shaft having connection with the rear axle, a friction-disk mounted to slide upon said shaft and to rotate therewith, said disk being adapted to impart motion to the shaft when the friction-wheel of the engine is brought into contact therewith.

2. In a motor-vehicle, the combination with a suitable frame, of two opposed engines mounted in said frame, a friction-wheel on the shaft of each engine, and said wheels standing in opposed relation, a drive-shaft, a friction-disk mounted to rotate with said shaft and to slide thereon, said disk being interposed between said friction-wheels and means for moving said friction-wheels to carry their opposed faces into contact with said interposed friction-disk.

3. In a motor-vehicle, the combination of a suitable frame, of opposed engines mounted in the frame to slide toward and from each other, a friction-wheel on the shaft of each engine, a drive-shaft, a friction-disk on the drive-shaft mounted to slide thereon and to rotate therewith, and means for moving said engines independently to bring the friction-wheel of each or both of them into contact with said friction-disk.

4. In a motor-vehicle, the combination with a frame, of two opposed engines mounted in said frame, a friction-wheel on the shaft of each engine, a drive-shaft standing at right angles to the engine-shafts, a friction-disk mounted on the drive-shaft to slide thereon and rotate therewith, means for carrying the friction-wheels of the engine singly or concurrently into contact with said friction-disk, and means for moving said disk upon the drive-shaft.

5. In a motor-vehicle, the combination with a frame, of two opposed engines mounted on carriages adapted to slide in said frame, a friction-wheel on the shaft of each engine, a drive-shaft, a friction-disk on the drive-shaft adapted to slide thereon and interposed between the friction-wheels of the engines, an independent set of levers for sliding the engine-carriages to carry the friction-wheels of the engines concurrently singly into contact with said friction-disk, and means for shifting said disk transversely of the face of said friction-wheels.

In testimony whereof I sign this specification in the presence of two witnesses.

ORSON W. DAVIS.

Witnesses:
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