(No Model.) 3 Sheets—Sheet 1.

R. E. OLDS.

MOTOR CARRIAGE.

No. 594,338. Patented Nov. 23, 1897.

Fig. 2

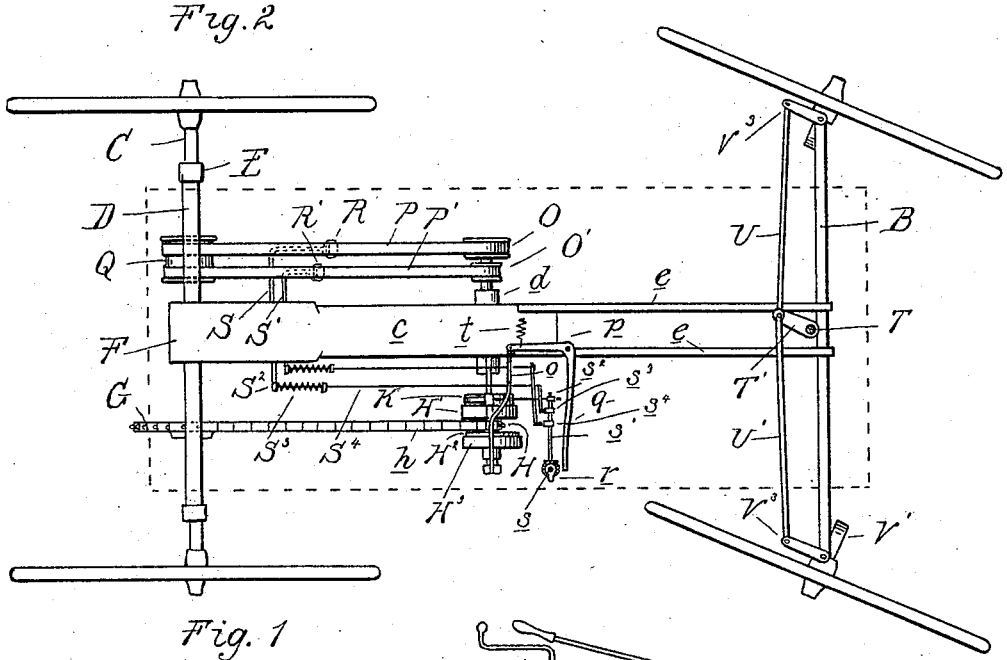
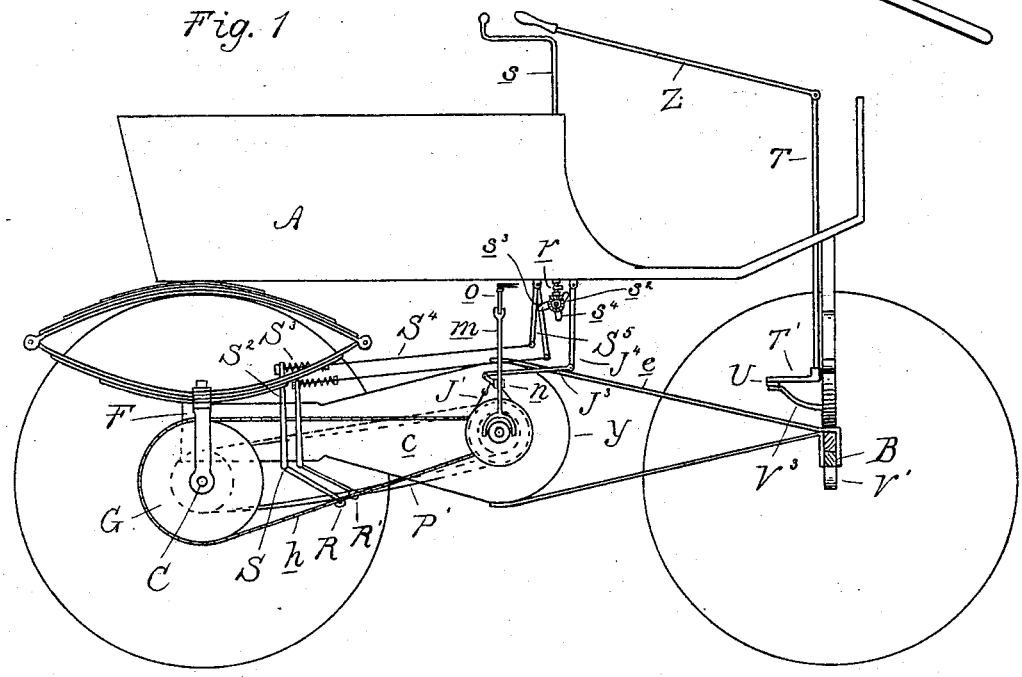


Fig. 1



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MOTOR CARRIAGE.

No. 594,338. Patented Nov. 23, 1897.

Fig. 3

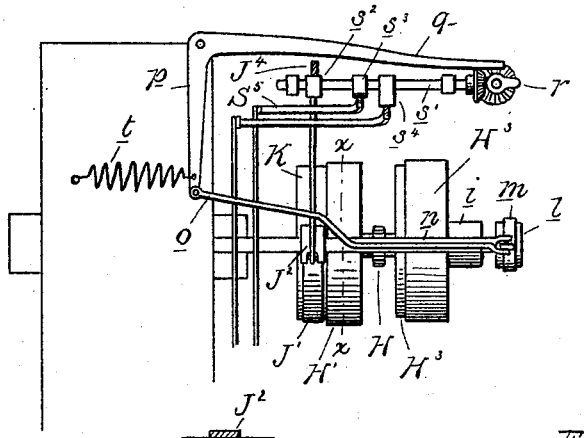


Fig. 4

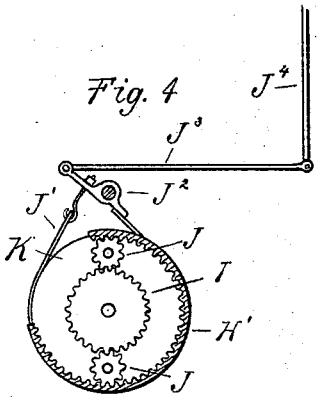


Fig. 6

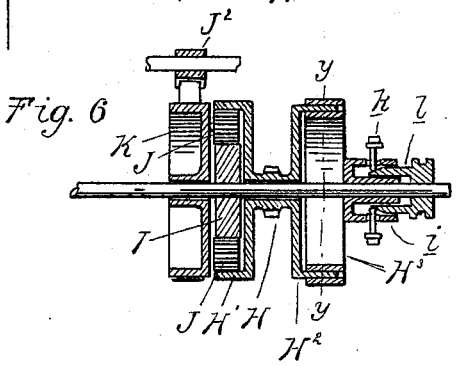


Fig. 7

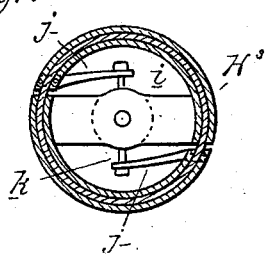


Fig. 9

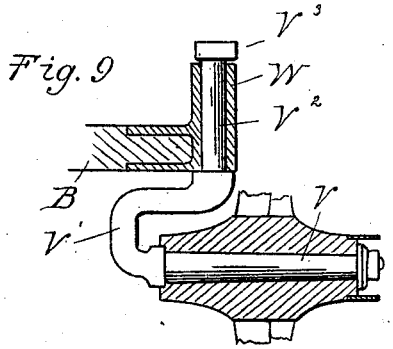
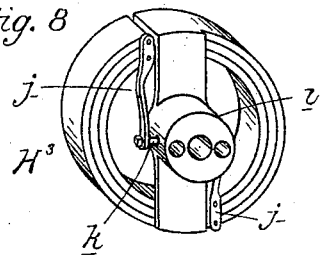


Fig. 8



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R. E. OLDS.

MOTOR CARRIAGE.

No. 594,338. Patented Nov. 23, 1897.

Fig. 10

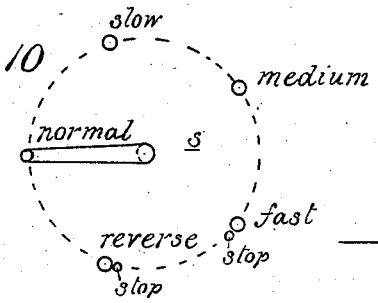
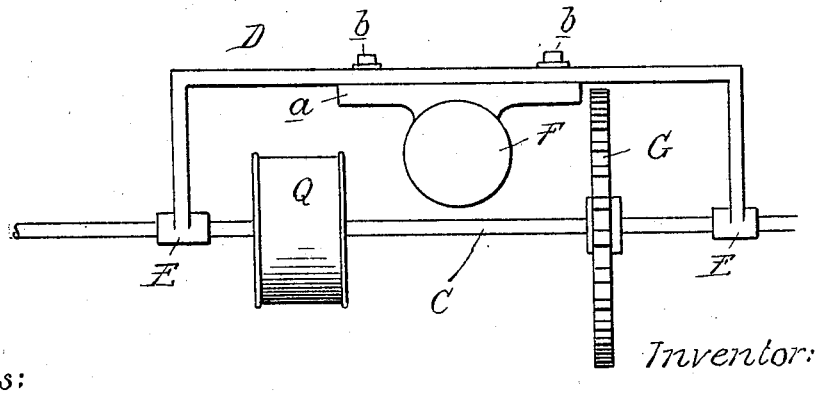


Fig. 11

Fig. 5



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UNITED STATES PATENT OFFICE.

RANSOM E. OLDS, OF LANSING, MICHIGAN.

MOTOR-CARRIAGE.

SPECIFICATION forming part of Letters Patent No. 594,338, dated November 23, 1897.

Application filed September 18, 1896. Serial No. 606,245. (No model.)

To all whom it may concern:

Be it known that I, RANSOM E. OLDS, a citizen of the United States, residing at Lansing, in the county of Ingham and State of Michigan, have invented certain new and useful Improvements in Motor-Carriages, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to that type of motor-carriage in which the motive power is produced by a gasolene-motor; and the object of my invention is to produce a road-vehicle that will meet most of the requirements for the ordinary uses on the road without complicated gear or requiring engine of great power and to avoid all unnecessary weight.

To this end my invention provides for a light and strong frame, of which the engine and the rear shaft of the vehicle are the component members and upon which the body is supported by springs.

It further provides a simple transmission-gear which directly transmits the motion from the engine-shaft, arranged transversely of the carriage, to the rear axle and which provides for three different speed-gears under the easy and prompt control of a single lever, giving the necessary changes of speed required for the different purposes of level roads and hills and for starting and backing, all so arranged that it is not possible to pass from one rate of speed to the other without the wheels being entirely thrown out of gear before a new speed is given, while at the same time motion is transmitted without shock.

My invention also embraces simple steering-gear and other specific improvements of the parts, all as more fully hereinafter described, and shown in the drawings, in which—

Figure 1 is a diagram side elevation of my improved road-vehicle. Fig. 2 is a plan with the body removed. Fig. 3 is an enlarged plan view of Fig. 2. Fig. 4 is a section on line x x in Fig. 3, looking toward the left. Fig. 5 is a rear elevation of the hind axle and frame. Fig. 6 is a vertical cross-section on the line of the engine-shaft. Fig. 7 is a cross-section on line y y, Fig. 6. Fig. 8 is a perspective view of the clutch shown in Fig. 6. Fig. 9 is a vertical section through the stub-shaft of one of the front wheels. Fig. 10 is a diagram of the different positions of the handle on the controlling-staff. Fig. 11 is a rear elevation of engine-shaft and the speed-controlling connections.

A is a body mounted upon springs.

B is the front axle, and C is the rear axle. Both of these axles form part of a strong frame, of which the engine forms the connecting-reach. To this end a yoke D is supported upon antifriction-bearings E on the rear axle, and to this is secured the rear end of the cylinder F, which is formed with a bolster a for securing it by bolts b to the yoke. This cylinder extends forwardly to form a supporting-frame c, in which the engine-shaft G is journaled in boxes d and truss-rods e, secured to the engine-frame, united with the front axle B in a manner to make the engine-frame serve as the reach between the front and rear axles and as a support for the transmission-gear. This transmission-gear comprises a slow-motion chain-gear and two belt drive-gears, one for transmitting a medium and one for a high speed, all of which directly conveys the motion from the engine-shaft to the rear axle.

The construction and arrangement of the chain-gear are as follows: H is a sprocket-wheel revolving loosely upon the engine-shaft and connected by a chain h with the sprocket-wheel G on the rear axle. The sprocket-wheel H is integrally formed with two flanged heads H′ H², the latter of which forms the loose member of a friction-clutch. H³ is the fast member of this clutch, secured by means of a hub i upon the engine-shaft and provided with a double split ring, between which the flange of the head H² is adapted to be clamped fast. To this end the fast member H³ has secured to the split ends of its rims the toggles j, the inner ends of which extend in proximity to the hub and carry steel pins k, which pass radially into the sides of the hub. This hub is recessed in a manner to receive the wedge-shaped ends of a sliding collar l, which when pushed inside the hub acts upon the steel pins k and forcing them outwardly moves the toggles in a manner to draw the split rims of the member H³ together, and thereby clamp the flange of the loose member H² of the friction-clutch between them.

The sliding collar l engages with the forked end of a lever m, fulcrumed to an arm n from the engine-frame and connected at its upper end to the connecting-rod o. This connecting-rod is secured to one arm of a bell-crank lever p, which is fulcrumed beneath the body of the vehicle and which has a long arm q, extending in proximity to an actuating-cam r on the vertical staff s, which projects up to the body of the carriage in proximity to the operator on the seat and which forms the means for controlling the transmitting mechanism, the arrangement being such that in a prescribed position of the staff s the cam r will move the bell-crank lever in a proper manner by means of the connections described to engage the fast and loose members H^2 H^3 of the friction-clutch to impart motion to the chain-gearing, while normally when the parts q and r are not in engagement a spring t will operate to disengage the members.

The flanged head H′ forms the member of a reversing mechanism. It is provided with an internal gear, and a gear-wheel I of smaller diameter and fast upon the engine-shaft is secured within this head. In the annular space and engaging with the gears of the parts I and H′ are two gear-pinions J, secured diametrically to each other to a flanged head K, loose upon the engine-shaft. Around this flanged head passes a brake-strap J′, connected to a toggle-lever J^2, which works at the end of a connecting-rod J^3. The connecting-rod J^3 works at the end of a vibrating lever J^4, which is pendent from the under side of the body. In close proximity to this lever is journaled beneath the body a small transverse shaft s', which is connected by intermediate miter-gear with the controlling-staff s. Upon this shaft s' is secured a crank-arm s^2, which at a certain position in the revolution of the shaft s' is adapted to strike against the vibrating lever J^4, and thereby vibrate it in a proper manner to apply the brake-strap J′. By this movement the flanged head K, which normally revolves with the head H′, is arrested, and the motion of the engine-shaft will be transmitted through the gear-wheel I and gear-pinions J to the flanged head H′ and sprocket-wheel H in the reverse direction from the motion given when the clutch members H^2 and H^3 are in engagement.

The belt transmission is located upon the opposite end of the engine-shaft, which carries two pulleys O O′ of different sizes, connected by belts P P′ with the drum-pulley Q, common to both belts and fast upon the rear axle. This belt transmission is thrown in and out of gear under control of the staff s by means of belt-tighteners R R′, which are carried by rock-arms on separate rock-shafts S S′, which are journaled transversely in suitable bearings to the engine-frame. The rock-shaft S has a rock-arm S^2, which engages with the push-rod S^4 through the medium of a compression-spring S^3. The push-rod S^4 is carried by the lower end of a vibrating lever S^5, which is pendent from beneath the body and is adapted to be actuated by a crank-arm s^3 on the shaft s', all so arranged that if the brake-staff s is brought into a certain position it will apply the belt-tightener, by means of the described connection, to the belt P, and thereby communicate motion, through the belt P, to the rear axle. The belt-tightener R′ is controlled by similar actuating connection, there being an additional cam s^4 upon the shaft s'. The transmitting-gear, with all its variable-speed changes, is thus entirely controlled by the operator turning the handle of the staff s in one of four different positions distant from each other a fraction of the periphery of a circle. Thus in the normal position of the handle, as in Fig. 1, the engine-shaft is entirely disconnected from the drive-gear, and while the engine may be running at its usual speed the carriage will have no motion. Turning from this position to the left the operator first throws in cam s^3 into operative position, which actuates the reversing-gear and moves the carriage in a backward direction, or by turning from this position to the right the operator first throws in the cam r, which throws on the chain-gear, giving slow forward speed with sufficient power to climb hills and start the carriage. The operator by turning it farther from this position to the right throws off the chain-gear and then turns the cam s^2 into operative position to throw on the cam s^3 and tighten the belt P′, which conveys medium fast motion to the rear axle. By a further turn to the right he first throws off this belt and then throws on the fast motion by tightening the belt P by bringing the cam s^4 into operative position. This last position is contiguous to the normal position by turning the handle in the reverse direction.

The small shaft s', being connected by miter-gear to the staff s, forms merely a continuation of the staff, but in being secured horizontally onto the body it utilizes to better advantage the space beneath the carriage for the disposal of the intermediate connection between the transmission-gear and the controlling-staff, and at the same time the construction is such that the relative position of the parts is not affected by the swaying or up-and-down motion of the body, thereby permitting the use of light and easy-riding springs. It will also be observed that the cams r, s^2, s^3, and s^4 contact, when in operative positions, against vertical faces, or nearly so, and thus the operation of the transmission-gear can produce no reaction against the body, and thus its elasticity is maintained at all times.

The steering-gear is controlled by a vertical staff T in front of the driver's seat. This staff passes down through the body, provided at its lower end with an arm T′, to which are secured the inner ends of two connecting-rods U U′, which extend laterally toward the front wheels. These front wheels are car-

ried upon stub-axles V, the inner ends of which are formed with a gooseneck V′, terminating in a vertical upwardly-extending pivot-pin V^2, which engages into a vertical bearing W, formed in the front axle B. To the upper end of each pivot-pin is secured an arm V^3, to which the outer end of the connecting-rod is secured. The upper end of the staff T is provided with a pivoted handle Z for the convenience of the driver, and by means of this handle the driver has a firm and sufficient control over the front wheels to guide the vehicle.

I preferably use a body which affords convenient room underneath the seat to store away therein the electric igniter for the engine, the latter being of any preferred known construction of the type in which the speed is controlled by an automatic governor, so that after starting the engine by hand when the vehicle is first started it is kept running during all the contingencies of travel.

The forward extension of the engine-frame is also further utilized to form a complete tight casing by means of a removable iron casing Y, secured between the supporting-frame *c*. This casing keeps out the dust and dirt and may be partly filled with oil to lubricate the crank-shaft and its connection with the piston-rod.

What I claim as my invention is—

1. In a motor-carriage, a supporting-frame comprising the front and rear axle, a yoke extending above the rear axle and in which the latter is journaled, in end bearings, and a reach rigidly connecting said yoke with the front axle and composed of the engine-frame having its rear end bolted to said yoke and its forward end extending beyond the engine-shaft and united with the front axle by truss-rods, substantially as described.

2. In a motor-carriage, the combination of a spring-supported body, a supporting-frame of which the engine-frame constitutes a central rigid reach connecting the front axle with a yoke carrying the rear axle, an engine-shaft journaled in the engine-frame and extending to opposite sides thereof, a chain-gear between one end of the engine-shaft and the rear axle, a medium and fast belt-drive connecting the opposite end of the engine-shaft, controlling devices and front wheels supported on stub-axles having vertical pivot-bearings in the ends of the front axle and steering connection therefor.

3. In a motor-carriage, a supporting-frame in which the engine-frame forms a component part of a central reach rigidly connecting the front axle with the rear axle through the medium of a yoke provided with end bearings in which the rear axle is journaled, and variable transmission-gear from the engine to said rear axle.

4. In a motor-carriage, a supporting-frame in which the engine-frame forms a component part of a central reach rigidly connecting the front axle with the rear axle through the medium of a yoke provided with end bearings in which the rear axle is journaled, an engine-shaft supported in the engine-frame and extending on opposite sides thereof, a chain transmission-gear connecting one end of said shaft to the rear axle, and two variable belt-drives connecting the other end of the shaft to the rear axle.

5. In a motor-carriage, a supporting-frame in which the engine-frame forms a component part of a central reach rigidly connecting the frame with the rear axle through the medium of a yoke provided with end bearings in which the rear axle is journaled, an engine-shaft supported in the engine-frame on opposite sides thereof and variable transmission-gear connecting the opposite ends of the engine-shaft with the rear axle and a single controlling device.

6. In a motor-carriage a supporting-frame in which the engine-frame forms a component part of a central reach rigidly connecting the front axle with the rear axle through the medium of a yoke provided with end bearings in which the rear axle is journaled, an engine-shaft journaled in the engine-frame and extending to opposite sides thereof, a chain transmission-gear connecting one end of said engine-shaft with the rear axle and provided with a reversing-clutch, variable belt-drive connection connecting the other end of the engine-shaft with the rear axle and a single controlling-shaft for the transmission-gear.

7. In a motor-carriage, a supporting-frame of which the engine-frame forms a component part of a central reach rigidly connecting the front axle with the rear axle through the medium of a yoke supported by end bearings upon the rear axle, an engine-shaft supported in the engine-frame and extending transversely on opposite sides thereof, a chain transmission-gear from one end of the engine-shaft to the rear axle and comprising a sprocket-wheel loose upon the engine-shaft and formed with two flanged heads, one of which forms the loose member, of a friction-clutch for imparting forward motion to the rear axle, and the other forming the member of a reversing-clutch for imparting motion in the reverse direction to the rear shaft.

8. In a motor-carriage, a supporting-frame of which the engine-frame forms a component part of a central reach rigidly connecting the front axle with the rear axle through the medium of a yoke supported by end bearings upon the rear axle, an engine-shaft supported in the engine-frame, a chain transmission-gear from one end of the engine-shaft to the rear axle and comprising a sprocket-wheel loose upon the engine-shaft and formed with two flanged heads, each of which forms a member of a friction-clutch, one for transmitting motion in one direction and one for transmitting motion in the other direction.

9. In a four-wheeled motor-carriage the combination with the engine-shaft supported

in fixed parallel relation with the rear drive-axle, of a chain drive-gear connecting said engine-shaft with the rear axle and comprising a loose sprocket-wheel on the engine-shaft provided with two flanged heads H′ H², the head H³ forming the fast member of a friction-clutch for imparting motion in one direction and the reversing friction-clutch composed of the loose head K provided with a brake-strap operated by the controlling-staff, the pinions J carried by said head, and the gear I, all arranged to operate as described.

10. In a four-wheeled motor-carriage the combination with the engine-shaft supported in fixed parallel relation with the rear drive-axle, of a chain drive-gear connecting said engine-shaft with the rear axle and comprising a loose sprocket-wheel on the engine-shaft provided with two flanged heads H′ H², one of which forms the member of a friction-clutch for imparting motion in one direction and the other of which forms the member of a friction-clutch for imparting motion in the other direction, and the controlling-staff *s s′* having the actuating-cams *r s²* for throwing said clutches in or out of gear.

11. In a four-wheeled motor-carriage, the combination with the engine-shaft supported in fixed parallel relation with the rear drive-axle, of a chain-gear operated by intermediate friction-clutches on the engine-shaft for imparting motion in opposite directions and two drive-belt chain connections operated by belt-tighteners of the controlling-staff *s s′*, the cams *r s² s³ s⁴* on said shaft, and actuating-gear connection for operating the friction-clutches and belt-tighteners by turning the staff in various prescribed positions, substantially as described.

12. In a four-wheeled motor-carriage, the combination with front axle fast with the frame of the stub-axles formed with the goose-neck and vertical pivot-pins engaging in vertical bearings in the end of the front axle and steering connection with said axles.

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

RANSOM E. OLDS.

Witnesses:
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CHARLES F. HAMMOND.