No. 612,026. Patented Oct. 11, 1898.

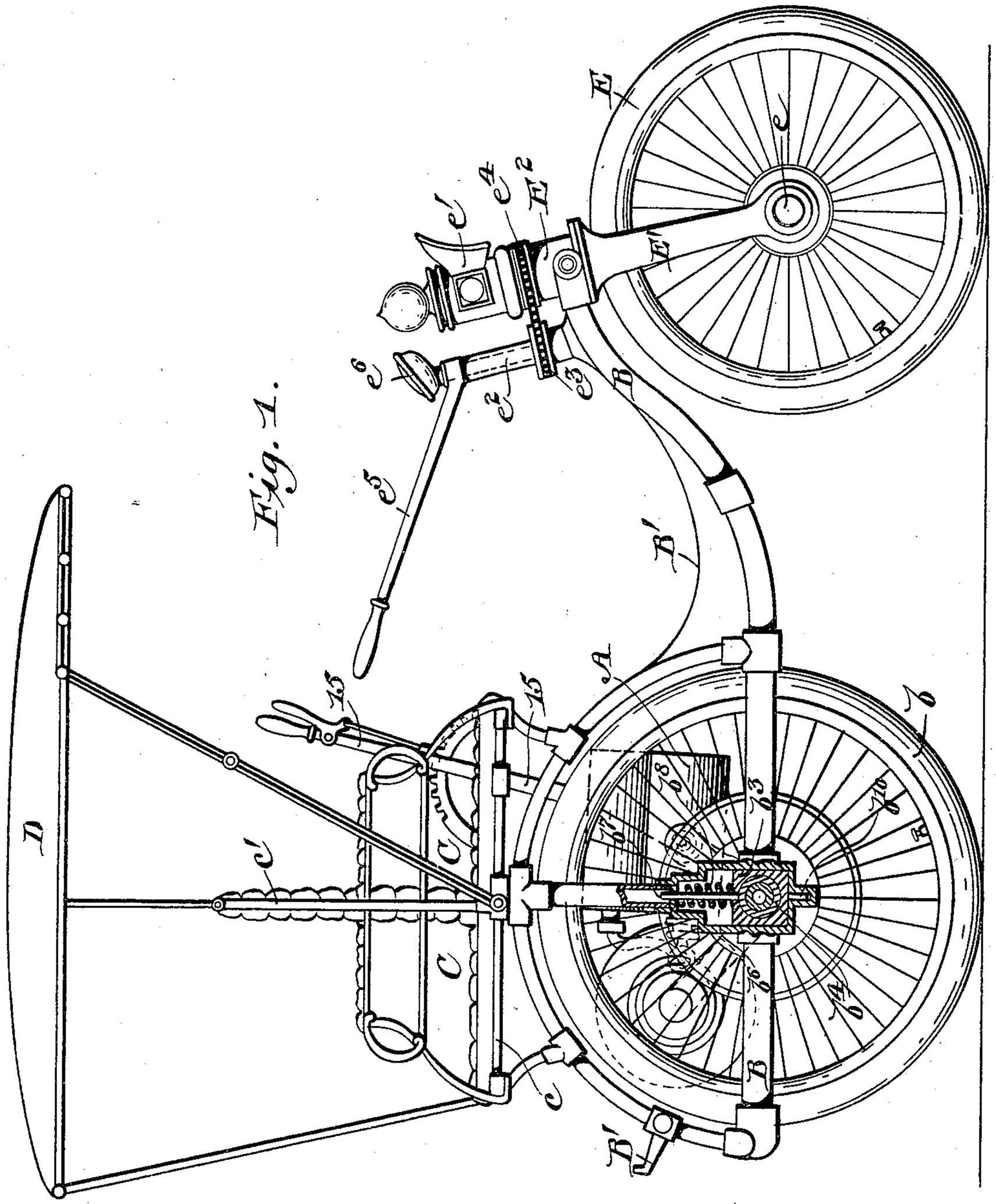
J. W. EISENHUTH.

MOTOR VEHICLE.

(Application filed Dec. 13, 1897.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



WITNESSES

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4 Sheets—Sheet 2.

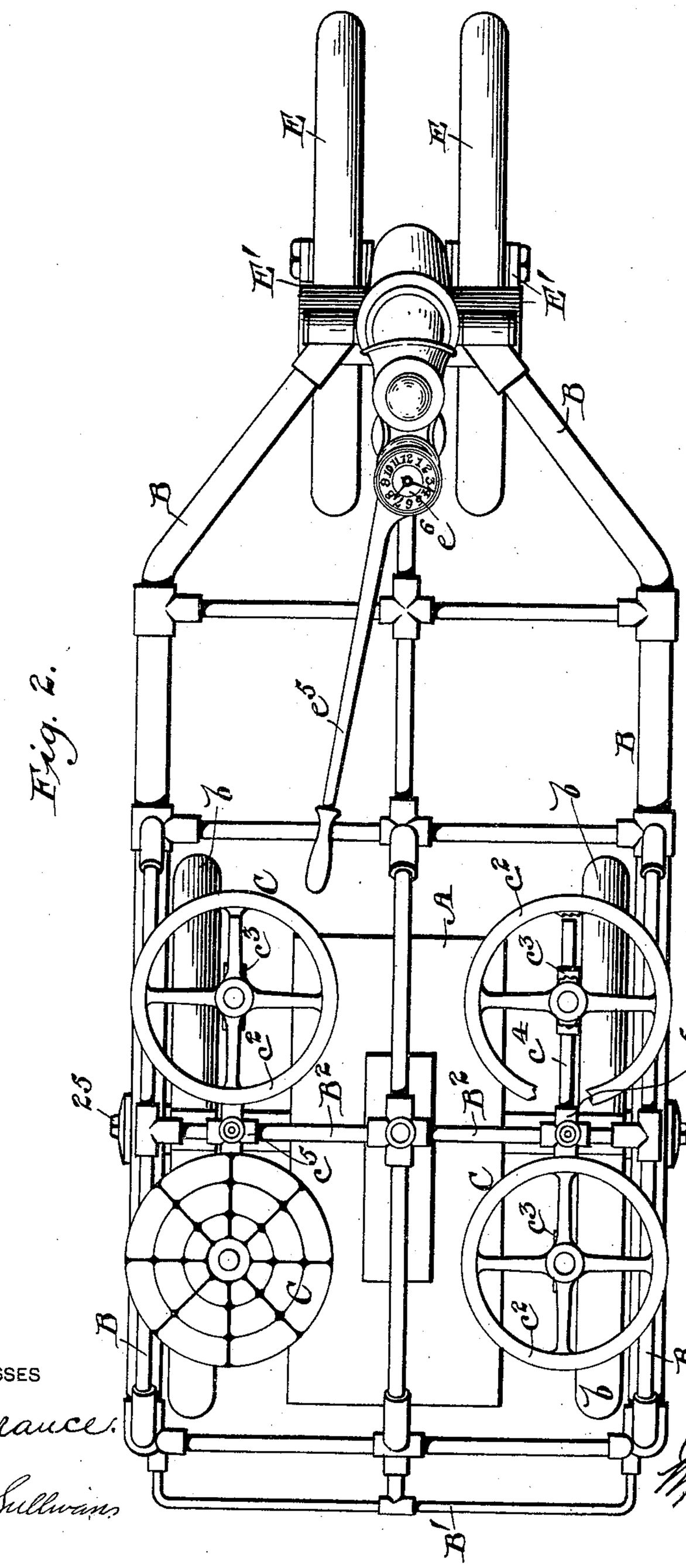

Fig. 2.

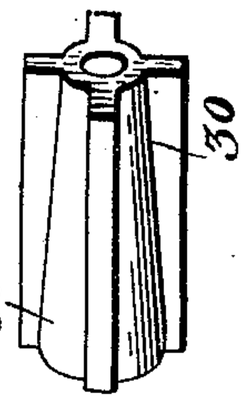

Fig. 10.

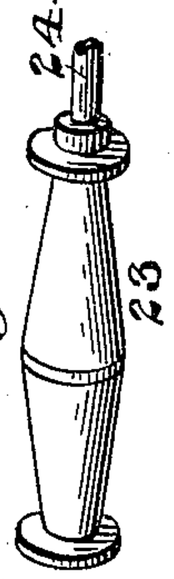

Fig. 9.

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(No Model.) 4 Sheets—Sheet 3.

Fig. 3

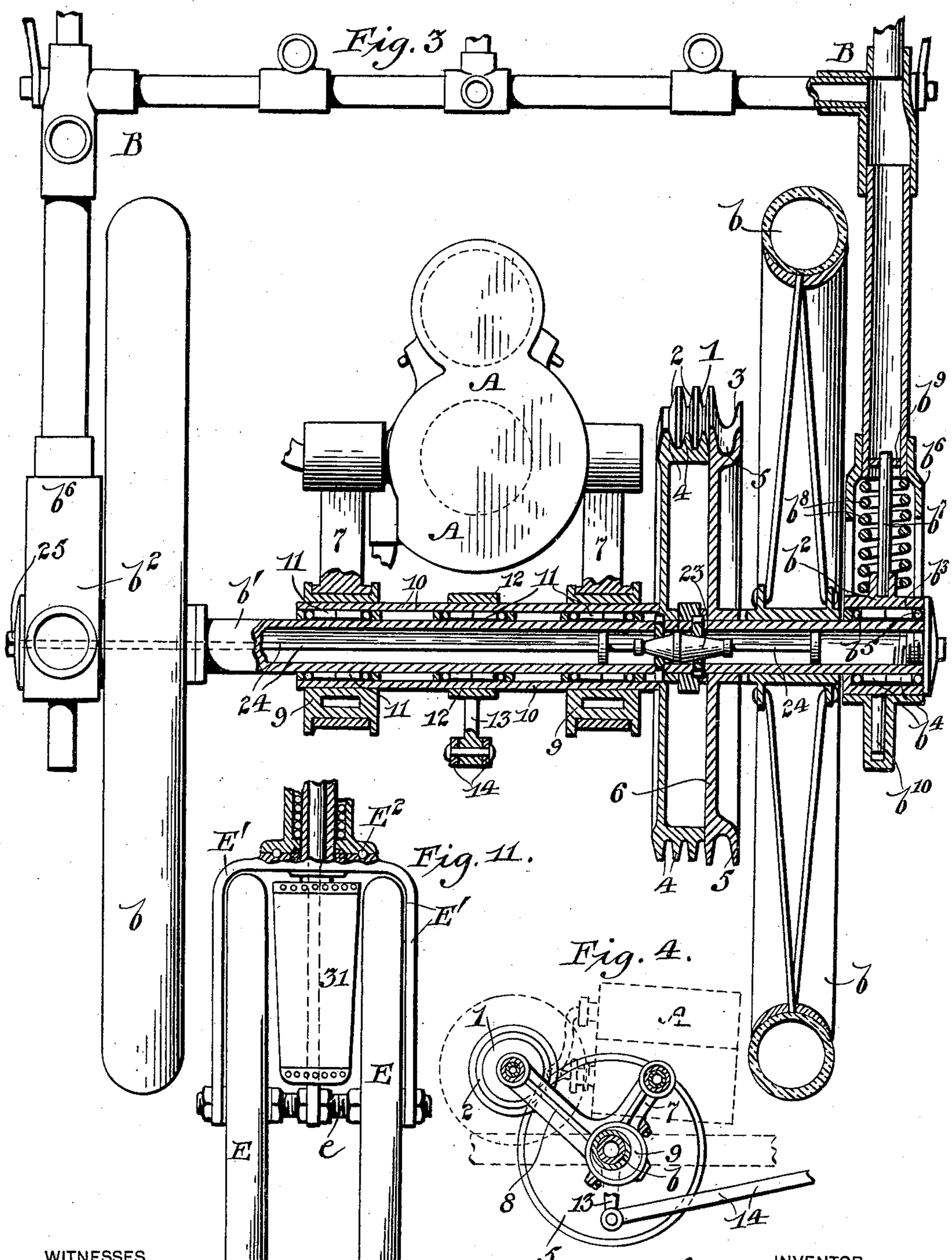

Fig. 11.

Fig. 4.

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(Application filed Dec. 16, 1897.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 6.

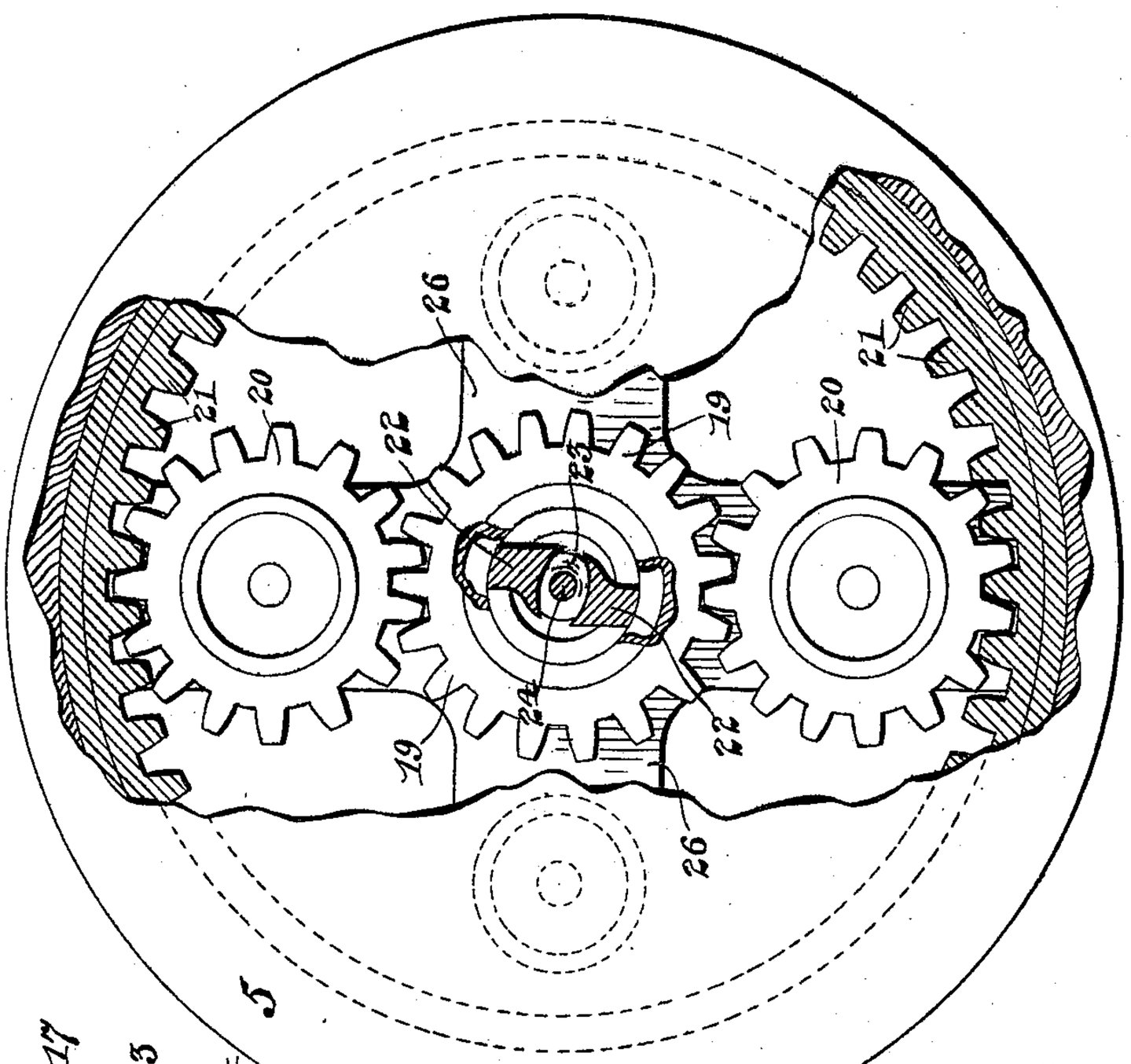

Fig. 7.

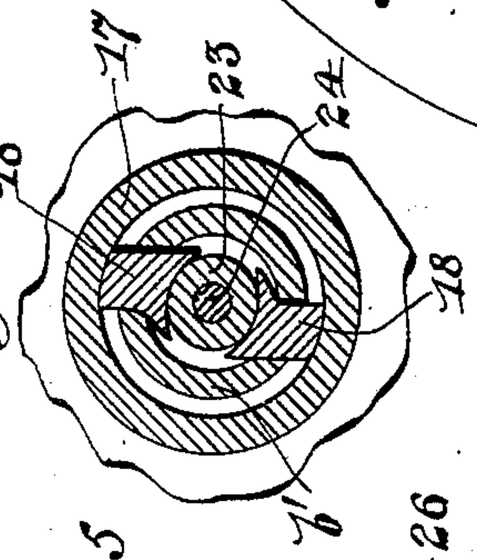

Fig. 8.

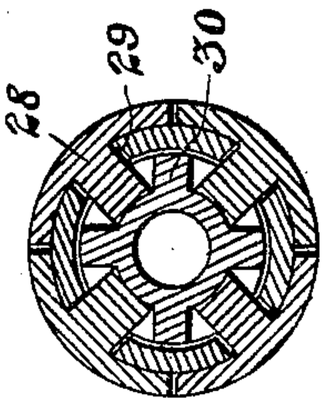

Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN WASHINGTON EISENHUTH, OF NEW YORK, N. Y.

MOTOR-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 612,026, dated October 11, 1898.

Application filed December 13, 1897. Serial No. 661,719. (No model.)

To all whom it may concern:

Be it known that I, JOHN WASHINGTON EISENHUTH, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in 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.

My invention relates to improvements in motor-vehicles; and it consists in a motor-carriage provided with a suitable motor for propelling the same and gearing connected with the said motor, whereby the speed of the vehicle may be increased or diminished or whereby the movement of the vehicle may be reversed.

It also consists in certain other novel constructions, combinations, and arrangements of parts, all of which will be hereinafter more fully described and claimed.

In the accompanying drawings, Figure 1 represents a side elevation of a vehicle constructed in accordance with my invention. Fig. 2 represents a top plan view of such a vehicle, but showing a different arrangement of seats. Fig. 3 represents a vertical sectional view through the main axle and gearing for propelling the said vehicle, parts being shown in elevation. Fig. 4 represents a detail view showing the manner of mounting the motor in the carriage, whereby the gearing may be caused to come into engagement or may be disengaged when desired. Fig. 5 represents an enlarged vertical section showing the reversing speed-changing mechanism. Fig. 6 represents an enlarged detail view of the reversing-gear mechanism, parts being broken away to better show the construction. Fig. 7 represents a detail sectional view showing the means for connecting and disconnecting the gears on the main shaft. Fig. 8 is a detail showing a modified form of the same. Figs. 9 and 10 represent detail views of different forms of wedges employed in the gearing on the main shaft of the vehicle; and Fig. 11 represents a front elevation of the guiding-wheels of the vehicle, showing a tank mounted between the said wheels, adapted to carry fuel for the motor which may be used upon the vehicle.

A in the drawings represents any suitable motor; B, a vehicle for carrying the same; C, seats mounted upon the said vehicle, and D a cover therefor.

In illustrating my invention I have shown the motor A mounted upon the vehicle B, preferably having four wheels. The rear wheels $b\ b$ are mounted near the outer ends of the main shaft b' of the vehicle and may be made of any suitable or desirable shape. I preferably use wheels, as shown in the drawings, which are provided with pneumatic tires, which greatly lessen the jar and consequent shocks upon the motor mechanism. Upon the outer ends of the axle of the shaft b' rests the main portion of the frame B. I preferably interpose roller-bearings between the shaft b' and the frame B, as at $b^2\ b^2$. These bearings consist of sleeves or boxes, as b^3, adapted to surround the ends of the shaft b', and rollers, as $b^4\ b^4$, are interposed between the said sleeves and the shaft. I also place balls $b^5\ b^5$ between the ends of the rollers and the confining-collars, which are secured to the shaft for holding them in place. In order that the frame B may rest upon springs, the bearings $b^3\ b^3$ are made to slide in the casings $b^6\ b^6$ and are provided with vertical standards b^7, formed on their upper sides. Coil-springs, as $b^8\ b^8$, surround the standards or stems b^7 and receive the weight of the frame B, the lower end of said springs resting upon the tops of the bearings $b^3\ b^3$. The inner and outer sides of the casing $b^6\ b^6$ are slotted to allow for the movement of the bearings b^3 therein. The upper ends of the standards or stems b^7 pass through guides $b^9\ b^9$, which hold them in the proper vertical position. As a further guide to the movement of said bearings b^3 the stems $b^{10}\ b^{10}$ are secured to the under sides of the bearings b^3 and slide in sockets formed in the bottom of the casings $b^6\ b^6$.

The frame B, in order to be light and yet strong, may be constructed of hollow tubing, similar to the way that cycles in common use are made. The tubing is preferably arched above the rear wheels and the motor A, and upon the upper part of the arch a base c for the seats is mounted. As shown in Fig. 1 of

the drawings, the seats C are preferably two in number, extending laterally of the vehicle, and a central back portion, as c', is formed, which serves as a back-rest for the seats on each side thereof. Suitable foot-rests, as B' B', are mounted upon the frame B for the front and rear seats. The seats C C may be upholstered in any suitable or desired manner and provided with side arms for further comfort. I also contemplate mounting above the seat a cover or top D to protect the occupants of the seats from sun or rain, as the case may be. This cover or top D is preferably constructed of suitable light tubing pivotally attached to the seat-base a, and may be formed with joints, so as to be raised or lowered or otherwise adjusted, as desired. As shown in Fig. 2 of the drawings, the seats may be constructed so as to provide a separate seat for each individual occupying the vehicle. In forming the seats in this way they may be made light and easily adjustable. In this instance the seats C C are preferably formed of circular frame portions c^2 c^2, which may be covered upon their upper surfaces with cushions or pneumatic coverings or other comfortable materials. The central portion of the frames c^2 c^2 are provided with clamp-sockets c^3 c^3, which are adapted to slide upon cross bearing-bars c^4. It will be seen that the seats can be quickly and easily slipped upon the outer free ends of the bearing-bars c^4 c^4 and can be adjusted to any position thereon. The cross bearing-bars c^4 are also provided with sockets, as c^5, which engage a transverse bar, as B^2, of the frame B, and by this connection can be adjusted to any position laterally with respect to the vehicle that may be desired. For summer use this latter form of seat may be employed to great advantage, as it affords a light, adjustable, and very cool support for the occupants of the vehicle.

In providing guiding means for the vehicles I may use one or more guiding-wheels; but I preferably employ two guiding or steering wheels, as illustrated in Figs. 1, 5, and 6 of the drawings. These wheels E E are preferably mounted in a suitable fork, as E', which has pivotal bearings E^2 in the frame B. The wheels E E are mounted upon a suitable shaft, as e, between the arms of the fork E', and are preferably arranged very much closer together than the rear wheels of the vehicle. This arrangement I find to be very advantageous, for while the wheels are not far enough apart to interfere with the facility with which they may be turned to steer the vehicle, yet they are of sufficient distance apart to prevent the likelihood of the vehicle tipping upon rounding a curve. The head of the fork E' extends above the bearing E^2, and carries upon its upper end a lantern, as e', which is preferably built thereon as a part of the vehicle. To control the movement of the head and fork, I employ an auxiliary head, as e^2, pivotally mounted on the frame B just to the rear of the main head of the vehicle. The auxiliary head e^2 is provided near its lower end with a sprocket-wheel e^3, which is connected by means of a suitable sprocket-chain with a sprocket-wheel e^4, formed upon the head proper of the vehicle. To the upper end of the auxiliary head e^2 is secured a handle, as e^5, which extends in close proximity to the seats of the vehicle and within easy reach of the one who is to guide the same. It will be seen that by operating the handle e^5 the front wheels E E may be kept under perfect control for steering the vehicle. I also contemplate building a clock upon the upper end of the auxiliary head e^2, as at e^6, the said clock being arranged at such an angle as to be easily seen by the occupants of the vehicle. The frame B is curved upwardly at the front end and rests upon the fork E' for its support, being secured to the bearing E^2.

The motor A may be of any desired or suitable construction, and is preferably one which is adapted to revolve a gear-wheel or pinion, as will be now more fully described. Upon the main shaft of the engine a pinion 1 is mounted, which is adapted to be revolved by the operation of the motor. The pinion 1 is provided upon a portion of its periphery with frictional surfaces, as 2, and upon the remainder of its periphery with a cable-groove 3. The frictional surfaces 1 are adapted to be brought into contact with corresponding surfaces 4 upon a gear-wheel and mounted upon the main shaft of the vehicle. A cable is also adapted to connect the groove 3 with a similar groove 5 upon the said gear-wheel 6 on the main shaft of the vehicle. In the lower ends of the arms 7 and 8 of the engine-frame, on each side of the frame, are formed bearings adapted to surround eccentrics 9. These eccentrics are mounted upon a sleeve 10, which surrounds the shaft at b', and roller-bearings, as 11, are interposed between the said sleeve and the said shaft, whereby very little friction is produced between the parts. A collar 12 is secured to the sleeve 10, so as to be rigid thereon, and is provided with an arm 13. The arm 13 is connected by means of a link 14 with a hand-operated lever 15, which extends upwardly in proximity to the seat. By operating the lever 15 the cams or eccentrics 9 can be so turned as to force the gear-wheel 6 away from the pinion 1, so that the frictional surfaces on the two gears will be separated. By carrying this movement far enough the cable connecting the grooves 3 and 5 can be made taut, so that motion will be communicated from the pinion to the gear. This produces a reverse motion in the axle. In order to vary the speed, the eccentrics are operated so as to allow the cable to slip more or less according to the speed desired. So also the frictional surfaces 3 and 4 may be brought firmly together by means of the eccentrics, so as to communicate full speed to the vehicle, or the said surfaces may be separated slightly, so as to permit them to slip a little

with relation to each other to diminish the speed as may be desired. It will thus be apparent that by bringing the gears nearer together or farther apart or at an intermediate point the speed may be slackened or increased or the vehicle may be permitted to stop altogether. The gear 6 is so constructed as to be capable of adjustment for different speeds. The frictional portion 4 of this gear is preferably made so as to move independently of the grooved portion 5. As shown in Fig. 7 of the drawings, the portion 5 is keyed to the shaft *b'*, as at 16, so that the said grooved portion will turn with the shaft of the vehicle. The portion 4 of the gear 6 is preferably provided with a sleeve 17, which is loosely mounted upon the shaft *b'*. Friction dogs or pawls 18, mounted in the shaft *b'*, are adapted to be forced into engagement with the said sleeve 17 to secure the frictional portion 4 of the gear 6 upon the said shaft when desired. Between the portions 4 and 5 of the gear 6 is mounted another gearing consisting of a central pinion, as 19, which is loosely mounted upon the shaft *b'* and intermediate gears 20, which mesh with the said gear 19 and connect the same with an internal gear 21, formed on the inner surface of the frictional portion 4 of the gear 6. Pawls 22, mounted in the shaft *b'*, are adapted to be forced outwardly to engage the pinion 19 when it is desired to operate the vehicle through the medium of the said gearing.

In order to operate the pawls 18 and 22, I provide a sliding wedge, as 23, which is secured upon a rod 24, arranged centrally of the shaft *b'* and provided with an adjusting-nut, as 25, Fig. 3, upon its outer end, by which the said rod and wedge may be adjusted back and forth. If preferred, the said rod 24 might be arranged to be operated by means of a suitable lever. The wedge 23 is preferably circular and tapering longitudinally in both directions, so that when it is drawn one way it will be moved from between the pawls 18 to release their hold upon the sleeve 17 and be forced between the pawls 22, so that the friction-gear will operate the shaft *b'* through the medium of the gears 21, 20, and 19. When the wedge 23 is forced in the opposite direction, the pawls 22 will be released and the pawls 18 will be forced into frictional contact with the sleeve 17 and the shaft will be turned directly by the friction-gear 4. Gears 20 are mounted upon a plate 26 and have a bearing upon hollow studs 27, formed upon the said plate. These hollow studs form oil-wells or grease-cups, which supply lubrication to the gearing constantly. It will be seen from this description that by adjusting the rod 24 the speed of the vehicle may be regulated so as to be increased or diminished, as desired. If preferred, the sleeve 17 may be keyed upon the shaft *b'* and the friction-pawls may be applied to the grooved gear 5 instead of the friction-gear 4.

As seen in Fig. 8 of the drawings, the form of the friction-pawls may be varied without departing from the spirit of my invention. In this detail the friction-pawls 28 are formed of segmental pieces provided with pins which extend through openings 29 in the shaft *b'*. These pins are adapted to be forced outwardly by means of a wedge 30, adapted to engage the pins of the pawls 28.

Among other motors suitable for such a vehicle I contemplate using a gasolene or compressed-gas motor, and when using such a motor I find it advantageous to construct a tank between the front steering-wheels E E, as shown at 31 in Fig. 11 of the drawings. This tank is adapted to rest upon the axle of the wheels E E and may be connected through the hollow tubing of the frame with the motor in any suitable manner. Outside flexible connections of any desired kind may also be used in connecting this tank with the motor. This forms a very desirable construction and convenient means for mounting a gasolene-tank.

It will also be noticed that I have produced a vehicle which can be run at various speeds at the will of those who are riding in the vehicle, and be started, stopped, or reversed at any desired moment.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a motor-vehicle, the combination with a suitable motor, of frictional gearing adapted to be operated by the said motor, a frame mounted upon the main shaft of the vehicle for carrying the said motor and friction-gearing, friction-gearing upon the main shaft of the said vehicle adapted to be operated by the said friction-gearing on the motor-frame, and eccentrics supporting the motor-frame upon the main shaft whereby the said frame may be so moved as to bring the friction-gears closer together or farther apart, according to the speed desired in the running of the vehicle, substantially as described.

2. In a motor-vehicle, the combination with a suitable frame, of a motor mounted thereon, a friction-pinion adapted to be operated by the said motor having upon a portion of its periphery frictional engaging surfaces and upon a remainder of its periphery a groove for receiving a cable, a gear-wheel mounted upon the main shaft of the vehicle having frictional engaging surfaces and a groove upon its periphery to correspond to the frictional surface and groove upon the said pinion, eccentrics interposed between the said motor and the said main shaft of the vehicle and means for operating the said eccentrics whereby the said motor and the pinion operated thereby are adapted to be drawn closer together or placed at a distance from the main shaft and gear thereon, substantially as described.

3. In a motor-vehicle, the combination with

a suitable motor mounted thereon, of a pinion actuated by the said motor, a gear mounted upon the main shaft of the vehicle adapted to be engaged and operated by the said pinion, said gear comprising a frictional portion and a cable-groove-engaging portion, the said frictional portion being adapted to operate the shaft either directly or indirectly through the interposed gearing, the construction being such that the operation of the main shaft may be accomplished at a greater or less speed as desired substantially as described.

4. In a motor-vehicle, the combination with a suitable frame, of a motor mounted thereon, a pinion operated by the said motor, a gear-wheel upon the main shaft of the vehicle adapted to be operated by the said pinion, said gear-wheel comprising a cable-engaging portion and a frictional engaging portion, gears for communicating movement to the shaft of the vehicle from the frictional portion, pawls for connecting said gearing with the said shaft and pawls for connecting the said friction-wheels with the shaft, wedges for bringing the said pawls into frictional contact with the said gearing and said friction-gear, the construction being such that upon the movement of the wedges longitudinally with respect to the shaft, the speed of the vehicle may be changed substantially as described.

5. In a motor-vehicle, the combination with a suitable motor, of a pinion mounted thereon, a gear-wheel on the main shaft of the vehicle adapted to be operated by the said pinion, said gear comprising a cable-groove-engaging portion and a frictional engaging portion, an intermediate plate between the two portions of the gear-wheel, pinions mounted upon the said plate, and a pinion loosely mounted upon said shaft between the two portions of the said gear-wheel, pawls adapted to lock the said pinion upon the shaft and pawls adapted to lock the frictional portion of the gear, a double wedge mounted upon a rod interiorly of the said main shaft and means for moving the rod longitudinally with respect to the said shaft whereby the gear-wheel is caused to rotate the said shaft either directly from the frictional portion of the gear-wheel or indirectly through the said internal gears and pinion, substantially as described.

6. In a motor-vehicle, the combination with a suitable frame, of a motor mounted thereon, bearing-boxes adapted to engage and rest upon the outer ends of the main shaft of the vehicle, roller-bearings interposed between said boxes and said shaft, guide-slots in the frame adapted to allow of vertical movement of the boxes with respect to the frame, springs interposed between the said journal-boxes and the frame for supporting the latter, and guide-rods arranged centrally of the said springs and engaging guides formed interiorly of the frame for further guiding the said bearing-boxes, substantially as described.

7. In a motor-vehicle, the combination with a suitable frame, of a motor mounted thereon, bearing-boxes interposed between the said frame and the ends of the main shaft, roller-bearings interposed between the said boxes and the shaft, stems upon the said bearing-boxes adapted to engage guides in the frame whereby the movement of the boxes with respect to the frame is guided and springs interposed between the said bearing-boxes and the said frame for supporting the weight of the frame, substantially as described.

8. In a vehicle, the combination with a suitable frame, of guiding-wheels for steering the vehicle, a fork for holding said wheels in place, a fuel-tank mounted between the said wheels for supplying the engine with suitable fuel and means connecting the engine with the said tank, substantially as described.

9. In a vehicle, the combination with a suitable frame, of transversely-extending supporting-bars, longitudinally-extending supporting-bars adjustably mounted upon the said transverse bars, and adjustable seats mounted upon the said longitudinal bars and adjustably secured thereto, the construction being such that the seats may be adjusted laterally and longitudinally with respect to the frame of the vehicle, substantially as described.

10. In a vehicle, the combination with a suitable frame, of an arched portion formed thereon above the rear wheels of the vehicle, a central transverse bar mounted upon the said arch, T-shaped cross-heads adjustably secured to the said transverse bar, longitudinally-extending bars mounted in the said T-heads, and adjustable seats secured upon said longitudinal bars, the construction being such that the seats may be adjusted longitudinally or transversely of the frame of the vehicle, substantially as described.

11. In a motor-vehicle, the combination with a suitable motor, of a frame for supporting the said motor, eccentrics interposed between the said frame and the shaft of the vehicle, friction-gearing upon the shaft of the vehicle and friction-gearing upon the said motor-frame, and means for connecting the said latter gearing with the motor for receiving motion therefrom, the construction of the eccentrics being such that the friction-gearing operated by the motor may be brought into contact with the gearing upon the shaft or separated therefrom to regulate the movement of the vehicle, substantially as described.

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

JOHN WASHINGTON EISENHUTH.

Witnesses:
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JAMES J. MURPHY.