

No. 678,063.

Patented July 9, 1901.

R. THAYER.
MOTOR VEHICLE.

(Application filed Feb. 9, 1901.)

(No Model.)

3 Sheets—Sheet 1.

FIG. 1.

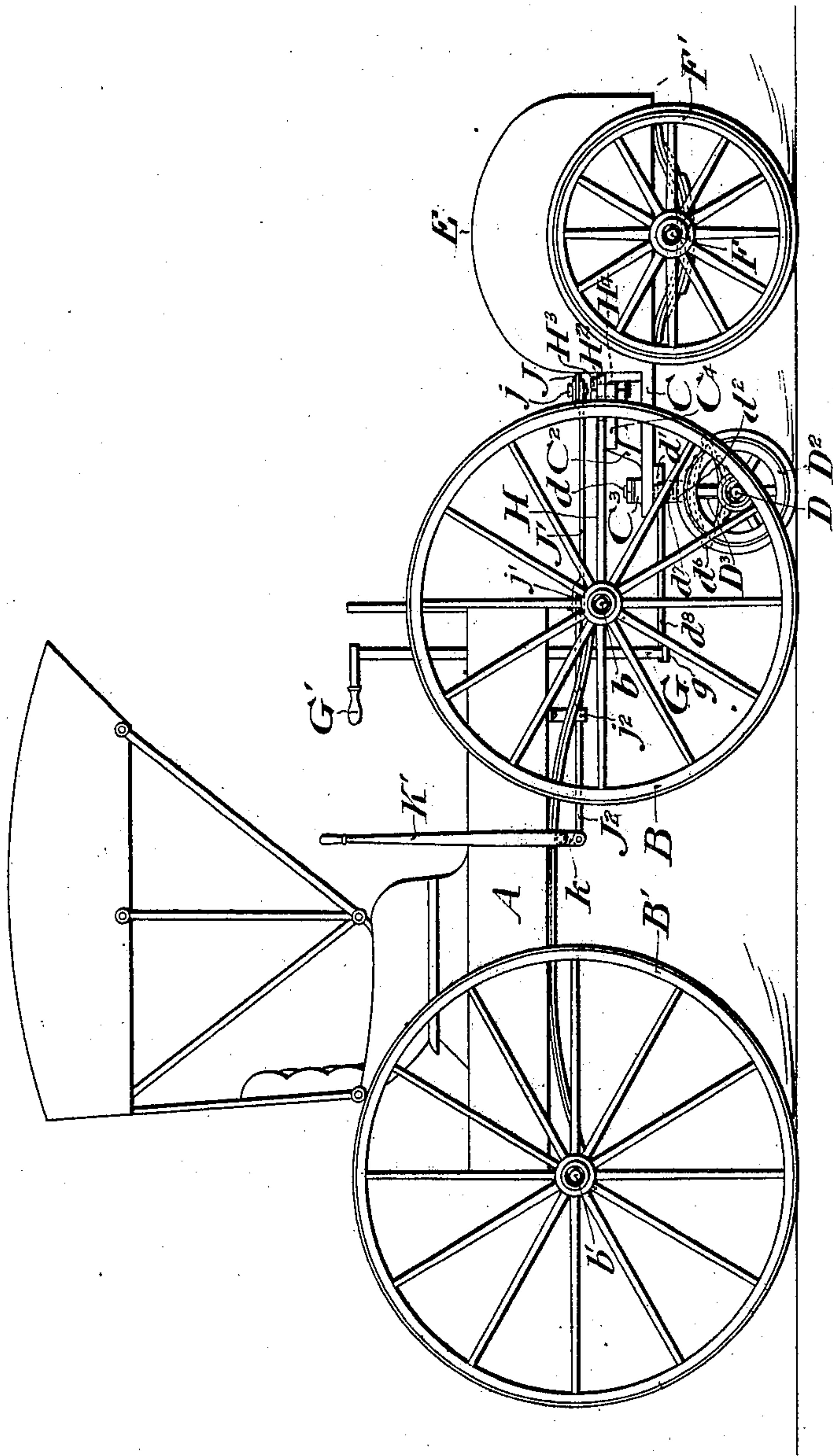


FIG. 2.



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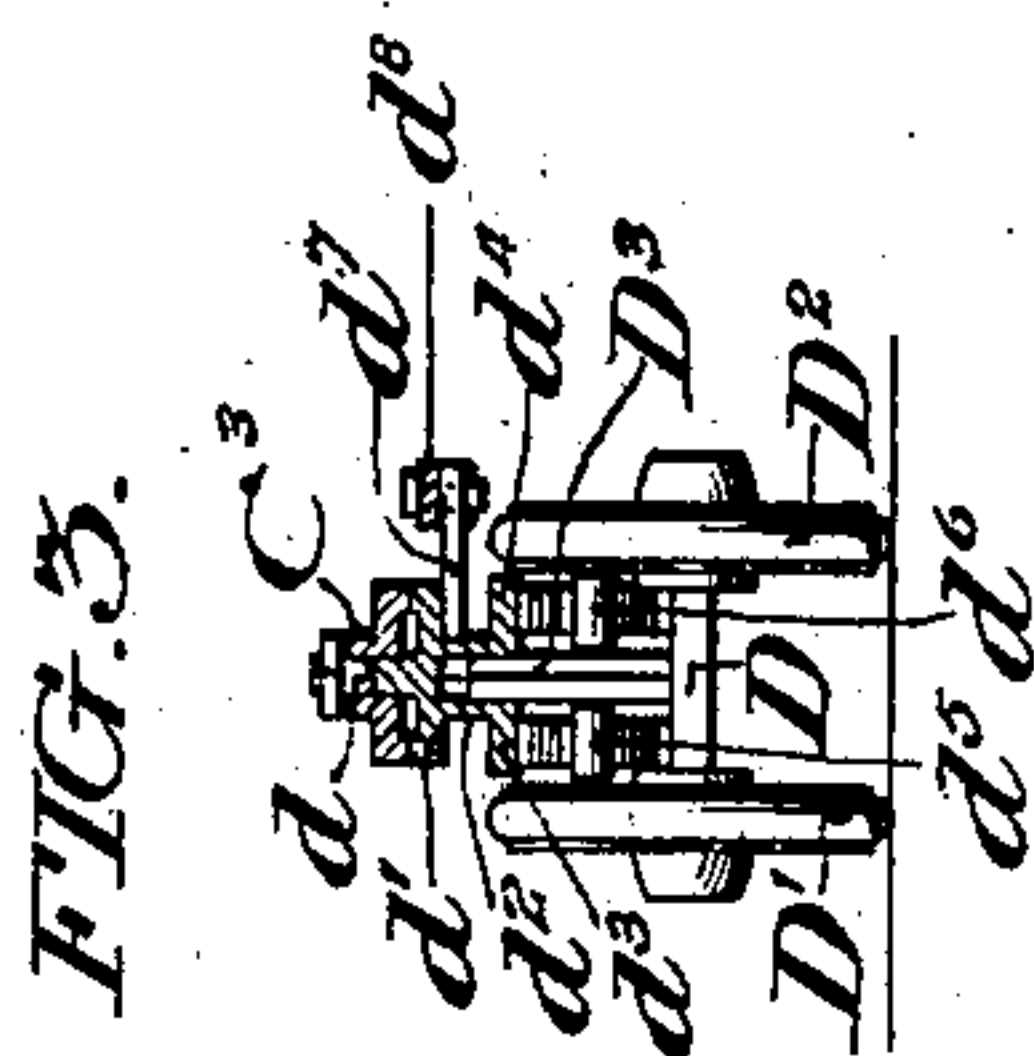
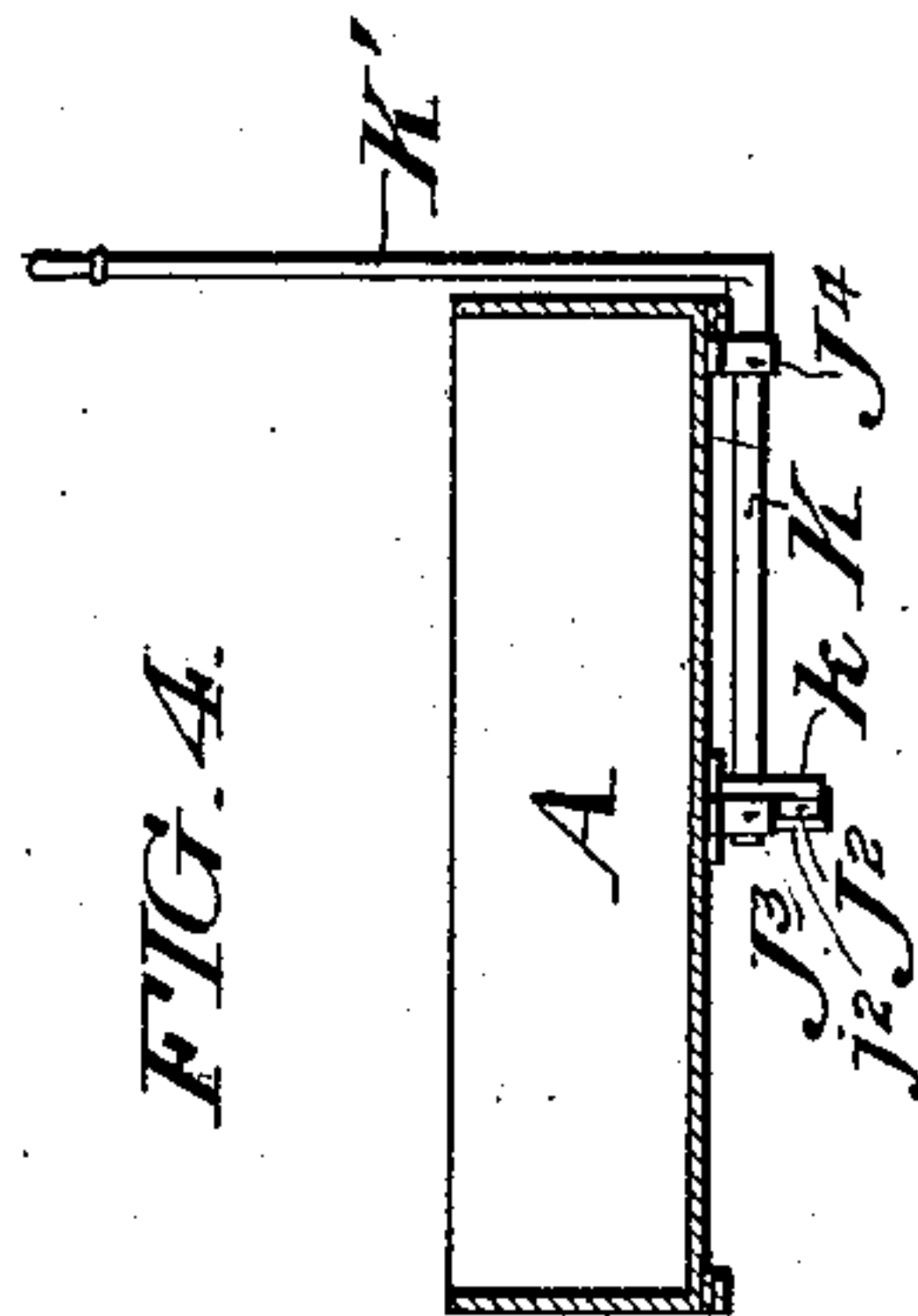
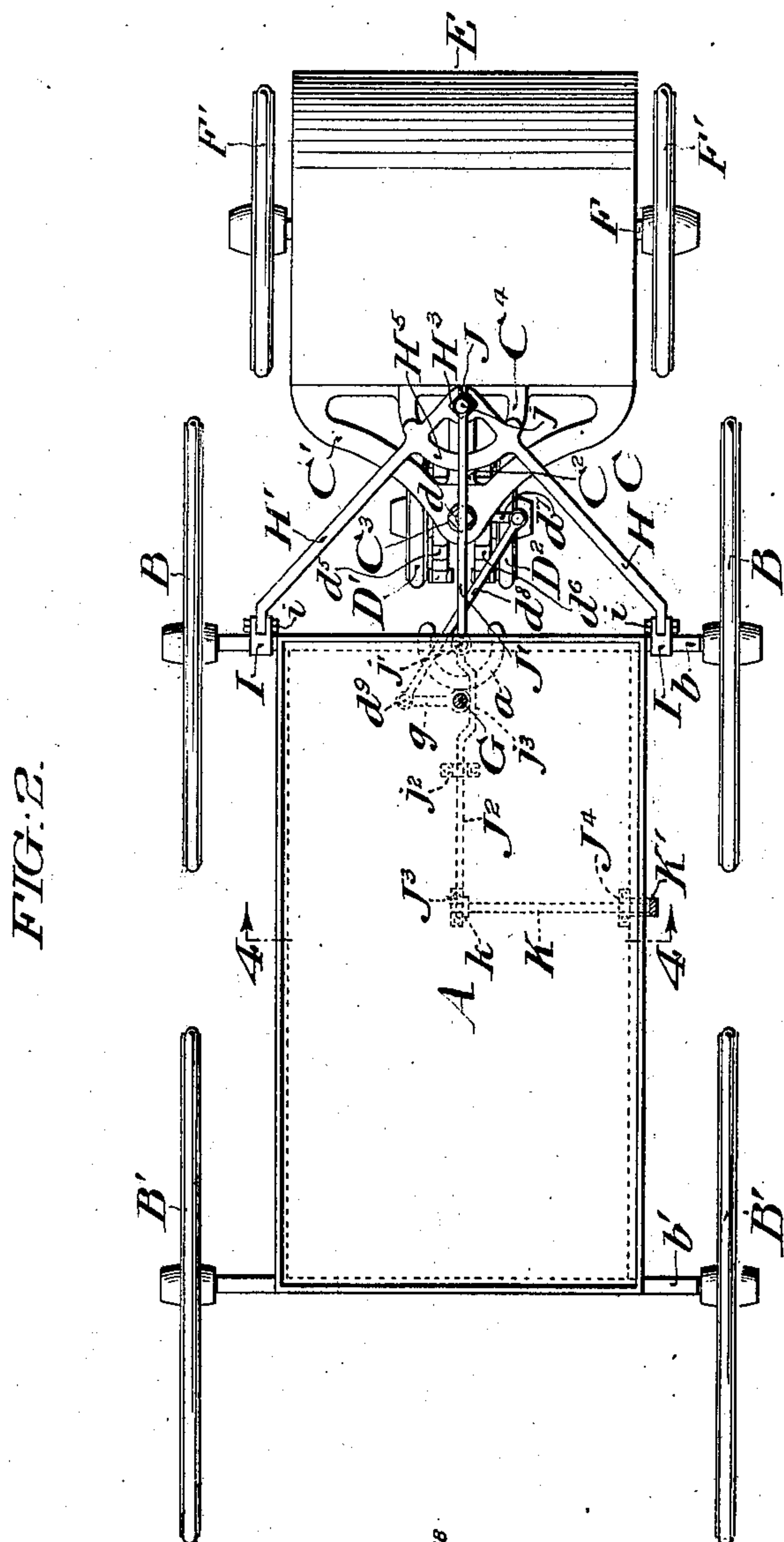
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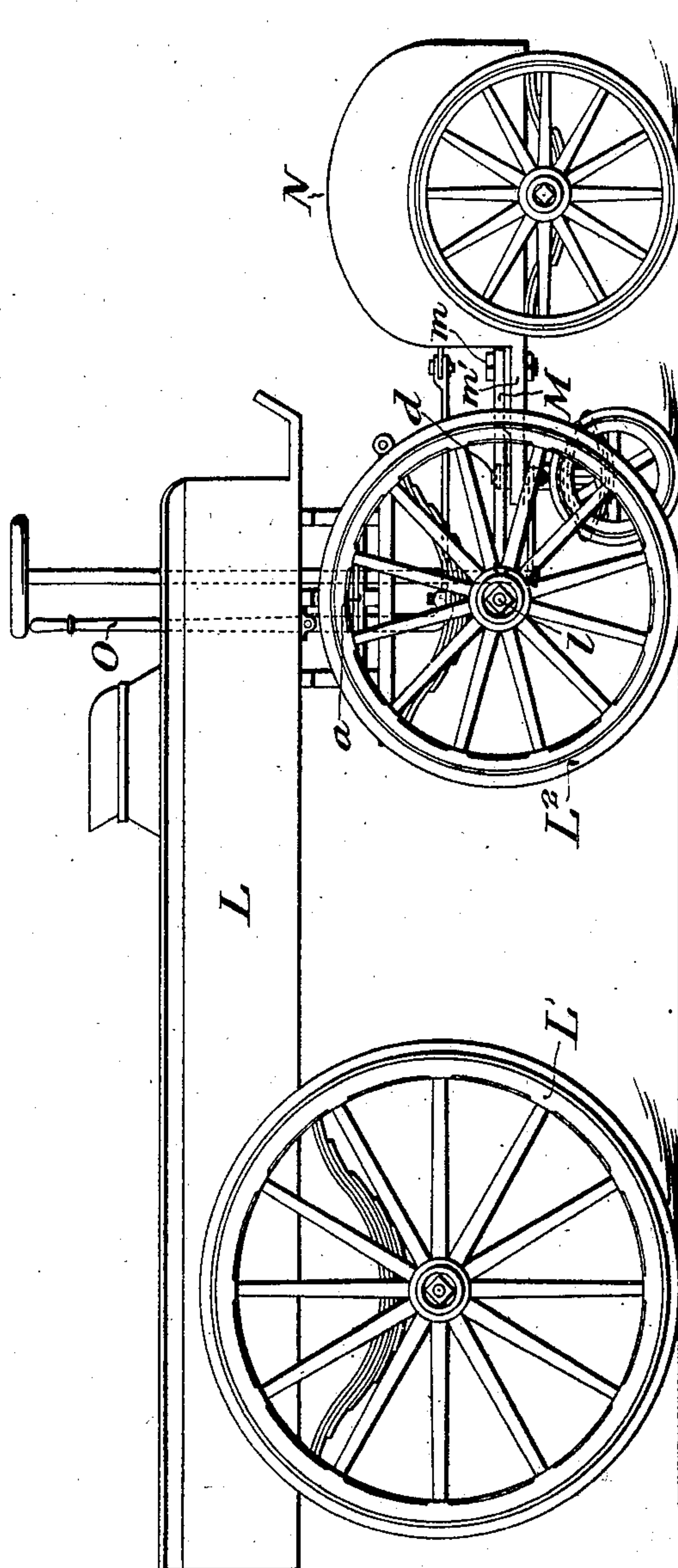
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3 Sheets—Sheet 3.

FIG. 6.



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UNITED STATES PATENT OFFICE.

RUSSELL THAYER, OF PHILADELPHIA, PENNSYLVANIA.

MOTOR-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 678,063, dated July 9, 1901.

Application filed February 9, 1901. Serial No. 46,609. (No model.)

To all whom it may concern:

Be it known that I, RUSSELL THAYER, a citizen of the United States, residing at Chestnut Hill, in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Motor-Vehicles, whereof the following is a specification, reference being had to the accompanying drawings.

10 The purpose of my invention is to permit the ready combination of an ordinary road-vehicle with an independent motor-driven carriage of relatively small size, the organization of the respective parts being such that by the
15 mere detachment of the shafts or tongue of the road-vehicle the motor-carriage may be connected with the front axle of said vehicle and be controlled by a person riding in the vehicle just as a horse could be driven there-
20 from.

I am aware that heretofore it has been proposed to remove the front axle and wheels of a carriage and to substitute for them a tractor-truck placed beneath the front portion of the
25 carriage-body, said truck directly supporting that end of the body. Such an arrangement, however, either necessitates the construction of a special carriage-body adapted to be thus directly supported upon a truck, or else, if an
30 ordinary carriage be used, requires the relatively elaborate operation of removing the front axles and wheels and replacing them by the truck. The mechanical differences between such an arrangement and one embody-
35 ing my present invention will be manifest from the following description; but from the practical standpoint an essential difference is that by the employment of my invention a person may keep in his carriage-house one or more
40 ordinary road-vehicles and may have a mechanical motor therefor which is, so to speak, interchangeable with his horses, since it may be applied to any one of the vehicles with as little expenditure of time and labor as would
45 be required for the harnessing of a horse.

Referring to the drawings which accompany the specification, Figure 1 is a side elevation of an ordinary one-seat wagon or buggy having a motor-carriage connected therewith in
50 accordance with my invention. Fig. 2 is a top or plan view thereof, certain portions adjacent to the carriage-body being indicated in hori-

zontal section. Fig. 3 is a detail view of the steering-wheels for the motor-carriage, showing in vertical section their pivotal connec- 55
tions with the carriage. Fig. 4 is a transverse section through the bottom of the carriage-body on the line 4 4 of Fig. 2, showing the position of certain portions of the motor-controlling mechanism. Fig. 5 is a side view of por- 60
tions of the motor-controlling device. Fig. 6 is a view in side elevation of an ordinary express-wagon having my invention applied thereto.

Referring to the type of organization shown 65
in Figs. 1, 2, 3, and 4, the wagon-body is represented at A and is supported at its front end in the usual way by means of a "fifth-wheel" a , mounted upon the front axle b , having
70 wheels B, the rear end of the carriage-body being supported upon the rear axle b' , having wheels B'. The motor-carriage is indicated conventionally at E and is shown as provided with a main driving-shaft F, to which in this
75 instance the driving-wheels F' are rigidly attached. Any other form of driving mechanism may, however, be substituted for that shown.

The motor of course may be of any preferred type, and as my invention has no re- 80
lation to the internal construction thereof I do not deem it necessary to advert to any details beyond the fact that the motor mechanism is controllable by the longitudinal shifting of a bar whose general construction will 85
be hereinafter described.

At the rear end of the motor-carriage E is a trail, comprising two converging arms C C' and an intermediate arm C², connected with the body of the motor-carriage E at a higher 90
level than the arms C C' and curved downwardly, so as to unite with said arms at their point of convergence. A vertical socket or bearing C³ (see Fig. 3) is provided at said point of convergence, (which is the rear end 95
of the trail,) and within said socket a vertical pivot-stem d is rotatably mounted. Said pivot-stem d projects upwardly from a bearing-plate d' , whose upper face corresponds to the proximate face on the under side of the 100
trail, so as to afford an extended bearing-surface for the parts thus rotatively connected. A socket d^2 projects downward from the center of the bearing-plate d' , the cavity of said

socket being of angular cross-section, and at the lower end of the socket d^2 are two lateral extensions $d^3 d^4$, beneath which, respectively, are springs $d^5 d^6$. Said springs are supported
 5 upon the axle D, which carries a pair of steering-wheels $D' D^2$, rotatively mounted thereon. At the longitudinal center of said axle is rigidly mounted an upwardly-projecting stem D^3 , whose angular cross-section conforms to
 10 that of the cavity of the socket d^2 of the bearing-plate d' , so that said stem will engage rotatively with said bearing-plate, but will be capable of free longitudinal movement in a vertical direction. A lateral lever-arm d^7 is
 15 rigidly attached to the bearing-plate d' , said lever-arm being pivotally connected at its outer extremity with a link d^8 , which runs rearwardly to a point beneath the carriage-body and is there pivoted at d^9 to a horizontal lever-arm g , rigidly attached to a vertical
 20 shaft G. This shaft is rotatably mounted in a bearing passing through the floor of the carriage-body and is provided at its upper end with a handle G' . By turning this handle G'
 25 in either direction the bearing-plate d' will be rotated in one direction or the other in a horizontal plane and by said rotation the axle D (which may be termed the "steering-axle") will be turned in one direction or the other,
 30 so that the wheels $D' D^2$ will operate to steer the motor-carriage. The controlling mechanism of the steering-axle, it will be noted, is of such a character as to not only permit the shifting of the steering-axle, but also to
 35 accommodate itself to the position of the trail when the motor-carriage is turned with relation to the carriage-body.

The vertical shaft G is detachably connected and mounted, so as to be readily removable from the carriage-body, in order that
 40 when the vehicle is to be used with a horse the shaft and handle should not be in the way of the occupant.

The motor-carriage is connected to the vehicle in the instance shown by means of a
 45 pair of arms $H H'$, arranged at a suitable angle, as indicated, and provided at their point of union with an eye H^2 , through which passes a vertical bolt H^3 , mounted in a socket
 50 H^4 upon the central arm C^2 of the trail. At a short radial distance from the point of union of the arms a sector H^5 extends between them, said sector resting upon a semicircular bearing-plate C^4 , which is supported upon
 55 the trail, so as to form a fifth-wheel bearing around the pivotal connection formed by the bolt H^3 . The arms $H H'$ are provided at their rear extremities with eyes, whose openings are in a horizontal direction, and the proportions
 60 of the parts are such as to permit the ends of the arms to be readily connected with the front axle b of the vehicle by direct insertion between the shaft-lugs I, whose bolts i pass through said eyes. The purpose of this
 65 method of construction is of course to permit said arms to be applied in place of the shafts or tongue of an ordinary vehicle; but, if de-

sired, the arms may be differently proportioned and otherwise attached to said front axle. In the instance shown a pair of such arms is employed; but obviously these may be considered as a single member or element, and hence I shall use the comprehensive term "draw-bar" to indicate the part or parts
 75 whereby the front axle of the vehicle is connected to the motor-carriage.

Control of the motor mechanism is effected by the longitudinal movement of a bar J, which extends into the rear of the motor-carriage at or near the center thereof. Said bar
 80 is pivotally attached at j to a link J' , whose opposite extremity is pivotally attached at j' to a bar J^2 , running rearwardly through the guide-bracket j^2 beneath the carriage-body to a point beneath the hanger J^3 , the portion of
 85 the bar adjacent to the vertical shaft G being formed with a lateral offset, as shown at j^3 , in order to avoid interference. The end of said bar J^2 is connected (see Fig. 4) to a short lever k , rigidly attached to a rock-shaft
 90 K, mounted in the hangers $J^3 J^4$ and extending out beyond the side of the carriage-body, where it is provided with a shifting lever K' , conveniently placed to be operable from the seat of the vehicle. By throwing said lever
 95 K' in one direction or the other the motor may be started, stopped, or reversed, as is well understood.

In Fig. 6 I have illustrated the embodiment of my improvement in connection with an
 100 ordinary express or delivery wagon. In said drawing, L represents the body of the wagon, L' the rear wheel, and L^2 the front wheel thereof. The front axle l is pivotally connected with the body in the usual manner, and to
 105 said axle are attached the two members of the draw-bar M, which is pivoted at m to the trail m' of the motor-carriage N. In the instance shown the central portion of the trail is raised but little above the side arms there-
 110 of. The arrangement of the steering and motor-controlling devices is substantially similar to that heretofore specified, and therefore repeated description of those parts is not
 115 deemed essential. The shifting lever O for the motor-controlling device may, however, be conveniently brought up through a slot in the floor of the wagon-body, as indicated, and the other parts should of course be proportioned in accordance with the differences in
 120 the dimensions of the running-gear in a wagon of this character.

It is not deemed necessary to describe the actual operation of the foregoing devices beyond the statement that in the steering of the
 125 vehicle the steering-wheels primarily and directly control the movement of the motor-carriage in one direction or the other and that as said carriage turns (which it can do easily by reason of its pivotal connection with the draw-
 130 bar) it will turn the front axle of the vehicle, the tendency of the parts being to "track" without scraping or undue lateral friction.

It will be observed that there are two main

pivotal points and what may be termed a "subsidiary" pivotal point in the combined structure. The main pivotal points are situated, respectively, at the fifth-wheel a of the carriage-body and at the fifth-wheel where the draw-bar is connected to the motor-carriage. The subsidiary pivotal point is situated at the stem d or vertical axis, upon which the steering-axle is turned in a horizontal plane. The purpose of providing these pivotal points is to permit the proper cooperation of the steering apparatus without undue lateral friction or resistance and the ready control of direction from the body of the vehicle. In the organization shown the subsidiary point is located away from both of the other two; but this is merely a matter of convenient structural arrangement, since, theoretically, the subsidiary pivotal point might coincide in the location of its axis with either one of the other two, provided independence of action is preserved.

Having thus described my invention, I desire it to be understood that I do not claim, broadly, the combination of a motor-carriage with a vehicle. On the other hand, I also desire to state that while I have described and shown what I believe to be the most convenient structural organization adapted to embody my invention I do not limit myself to the precise details shown, and I therefore use the term "draw-bar" as comprehending, broadly, any rigid member adapted to connect the motor-carriage with the front axle of the vehicle and the term "steering-axle" as comprehending, broadly, any bearing for the wheel or wheels whereby the motor-carriage is steered. So, also, under the term "controlling member," whether used in connection with the steering-wheels or motor mechanism, I desire to comprehend any device whereby the essential movements of the parts may be effected.

I claim—

1. The combination of a vehicle-body; a rear axle, a front axle pivotally connected with said body; wheels for said axles respectively; a motor-driven carriage; a rearwardly-projecting trail connected with said motor-carriage; a steering axle and wheel carried by said trail and pivoted to turn in a horizontal plane; a draw-bar; means for attaching said draw-bar to the front axle of the vehicle; a pivotal connection between said draw-bar and said motor-carriage; a controlling member for said steering-axle; and a controlling member for the motor mechanism; said controlling members respectively being operable from the carriage-body, substantially as described.

2. The combination of a vehicle-body; a rear axle; a front axle pivotally connected with said body; wheels for said axles respectively; a motor-driven carriage; a steering axle and wheel for said motor-carriage; a pivotal connection between said motor-carriage and said steering-axle, whereby said axle is permitted to rotate in a horizontal

plane independently of said motor-carriage; a controlling member operable from the vehicle-body for shifting said steering-axle in a horizontal plane; a draw-bar; means for attaching said draw-bar to the front axle of the vehicle; a pivotal connection between said draw-bar and said motor-carriage whereby said bar is permitted to turn relatively to said carriage in a horizontal plane, said pivotal connection of the draw-bar being independent of the pivotal connection for the steering-wheel; and a controlling member operative upon the motor mechanism and operable from the vehicle-body, substantially as described.

3. The combination of a vehicle-body; a rear axle; a front axle pivotally connected with said body; wheels for said axles respectively; a motor-driven carriage; a trail projecting rearwardly from said motor-carriage and comprising two exterior converging arms and an intermediate arm; a vertical bearing mounted at the rear end of the trail; a vertical pivot-stem rotatably mounted in said bearing; a steering-axle connected at its central portion with said stem; a pair of steering-wheels carried by said axle; a controlling member operable from the vehicle-body and connected with said stem, whereby said steering-axle may be turned in a horizontal plane; a draw-bar; means for attaching said draw-bar to the front axle of the vehicle; a pivotal connection, such as a fifth-wheel, between said draw-bar and said motor-carriage; and a controlling member operable from the vehicle-body and operative upon the motor mechanism, substantially as set forth.

4. The combination of a vehicle-body; a rear axle; a front axle pivotally connected with said body; wheels for said axles respectively; a motor-driven carriage; a trail projecting rearwardly from said motor-carriage; a vertical bearing mounted at the rear end of the trail; a hollow vertical pivot-stem rotatably mounted in said bearing, the cavity of said stem being of angular cross-section; a steering-axle; a pair of steering-wheels; a vertical stem connected with the central portion of said steering-axle and having a cross-section conforming to that of the cavity of the pivot-stem; a transverse supporting-bar mounted upon said pivot-stem; springs interposed between said supporting-bar and said steering-axle; a controlling member operable from the vehicle-body, whereby said pivot-stem may be turned upon a vertical axis; a draw-bar; means for attaching said draw-bar to the front axle of the vehicle; a pivotal connection, such as a fifth-wheel, between said draw-bar and said motor-carriage; and a controlling member operable from the vehicle-body and operative upon the motor mechanism, substantially as described.

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Witnesses:

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