

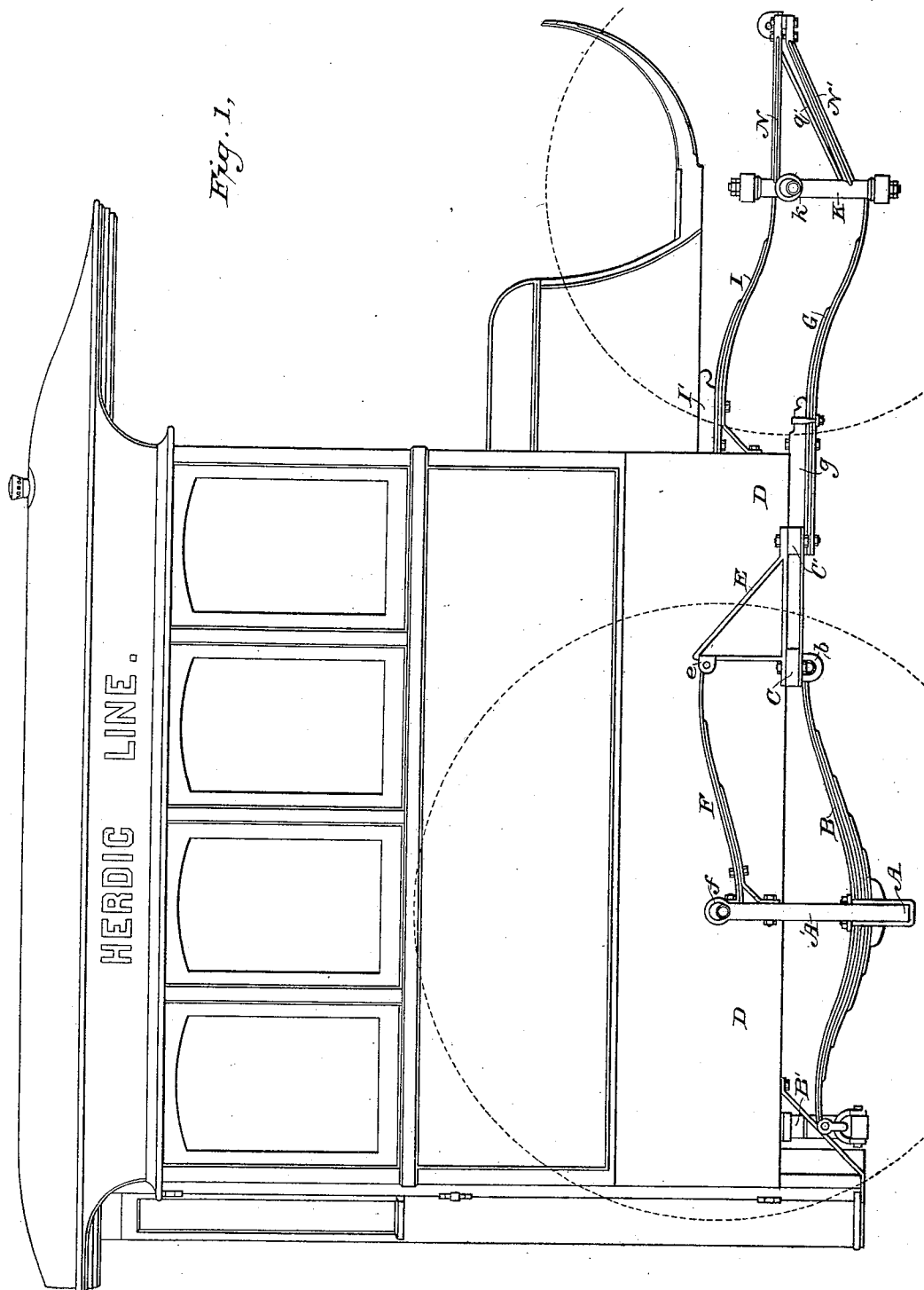
(No Model.)

2 Sheets—Sheet 1.

P. HERDIC.
Vehicle.

No. 242,316.

Patented May 31, 1881.



WITNESSES

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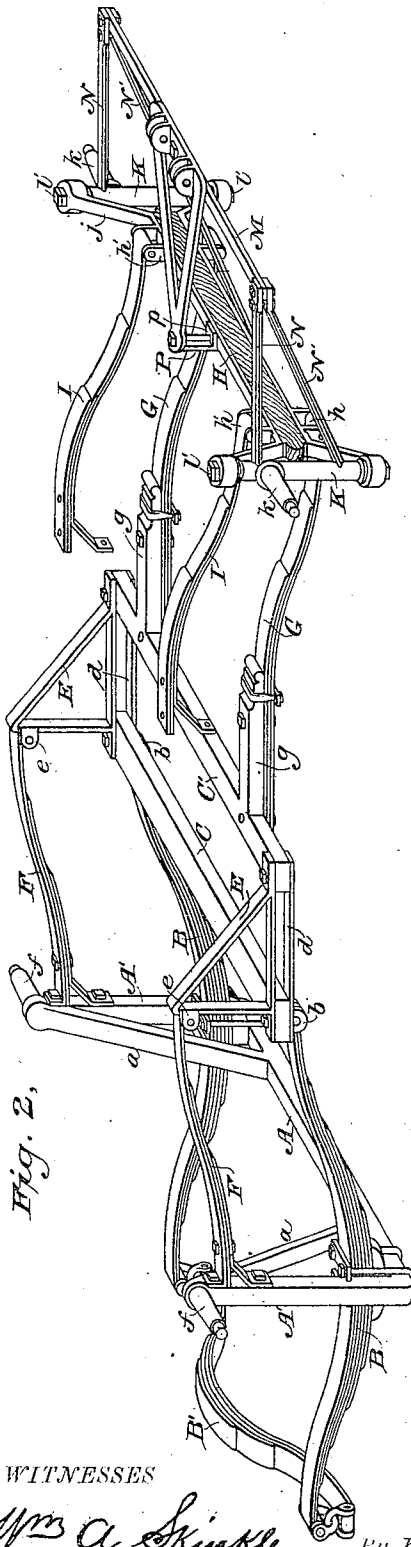
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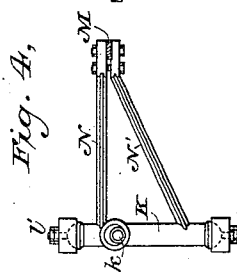
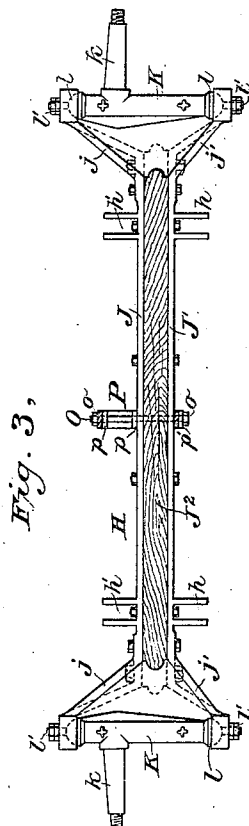
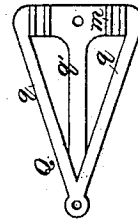
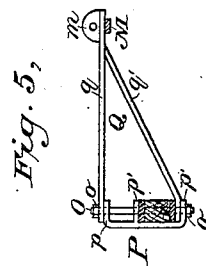
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WITNESSES

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UNITED STATES PATENT OFFICE.

PETER HERDIC, OF PHILADELPHIA, PENNSYLVANIA.

VEHICLE.

SPECIFICATION forming part of Letters Patent No. 242,316, dated May 31, 1881.

Application filed February 19, 1881. (No model.)

To all whom it may concern:

Be it known that I, PETER HERDIC, of the city of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Vehicles, of which the following is a specification.

My invention relates to improvements in vehicles of the class having cranked rear axles, and especially pertains to the connections between the front and rear axles and to the springs by which the body of a vehicle is connected with and supported upon the axles.

In Letters Patent of the United States granted to me April 20, 1880, No. 226,748, is shown a vehicle of the same class, generally considered, as that to which my present invention belongs. In accordance with the invention covered by my said patent a non-turning front axle-tree, provided at its ends with jointed axle-arms or turning stud-axles, is connected with a rear-cranked axle and maintained always parallel therewith by means of a rigid braced reach.

My object now, mainly, is to dispense with the reach proper and to connect the front and rear axles by the vehicle bed or body and supporting and bracing springs, thus maintaining the axles in proper relative positions while avoiding injurious effects incident to the employment of a rigid reach or perch due chiefly to its unavoidable vibration, resulting in constant strains and in the loosening and wear of parts.

In accordance with my invention the rear main supporting-springs are clipped or firmly mounted upon the cranked axle close to its upright portions or cranks, and are jointed, respectively, at their front ends, to the opposite ends of a cross bar or plate upon which the vehicle-body rests. Other and lighter or weaker bracing-springs, which may be termed "half-springs," as they are of about half the length of the main supporting-springs, are rigidly connected at their rear ends, respectively, with the respective cranks of the axle, and at or near the tops or upper ends thereof, while at their front ends these tension and thrust or two-way-acting brace-springs connect by joints with the tops of angle-trusses or brackets at points respectively above and about in the vertical planes of the respective jointed front ends

of the main supporting-springs. Instead of bracing-springs, braces consisting of bars jointed at their ends to the trusses and axle-cranks may be employed. A second cross-bar for the body to rest upon is secured in front of and parallel with that one to which the fronts of the supporting-springs are jointed. The trusses or brackets connect these two cross-bars firmly, or, instead of two cross-bars, one broad bar or plate might be employed. A cross-spring connects the rear ends of the two main springs, or instead of this cross-spring a simple bar may have the rear ends of the two main springs jointed to its ends. A supporting-piece on top of the cross-spring serves to connect with the vehicle body or bed at the rear in the usual way. The vehicle-body is supported upon the front axle, and the front axle-tree or axle proper is connected with the body and rear axle by means of four springs or half-springs arranged in pairs, one pair serving as brace-springs, which are located above the other pair, or jointed bar-braces may be substituted for the pair of spring-braces. The lower springs are respectively rigidly connected, at their rear ends, to or near the opposite ends of the before-mentioned front cross-bar, and at their front ends are respectively jointed to the axle-tree near its opposite ends. The upper or bracing springs are jointed to the axle above the jointed connections therewith of the lower springs, and at their rear ends each of these bracing-springs is firmly and rigidly connected with the vehicle-body. The front and the rear bracing-springs are located, respectively, in or about in the respective horizontal planes of the axle-arms or wheel-journals of the front and rear axles, and the draft-strain is thus brought centrally, or nearly so, upon the wheels of the vehicle.

My invention also relates to minor improvements in various parts.

The subject-matter claimed will hereinafter be designated, after first fully describing my improvements in connection with the accompanying drawings, in which are shown those parts of a suitable vehicle—for instance, the "Herdic" coach, represented in my before-referred-to patent, No. 226,748—which are deemed sufficient for illustrating and describing my present invention as preferably applied.

Figure 1 is a side elevation with the wheels

partially shown in dotted lines. Fig. 2 is a view in perspective of the axles, springs, &c., or the running-gear. Fig. 3 is a front elevation, showing the front axle-tree and its independently mounted stud-axles or short-turning axle-arms. Fig. 4 is an elevation of parts shown in Fig. 3, the draft attachment being in part represented. Fig. 5 is a view showing the front axle-tree and the vibrating draft-bar in section with the vibrating strap-bracket or device for attaching the shafts in elevation. Fig. 6 is a plan view of the vibrating strap-bracket for attachment of the shafts.

The rear cranked axle, A, is made of any suitable material, has diagonal struts or braces *a*, for strengthening its upwardly-projecting ends or cranks A' A', and has main supporting-springs B B, mounted upon it near its cranks, and connected by joints at their rear ends with a third or cross spring, B', as in my before-recited patent. The front ends of the springs B B are jointed, respectively, to the opposite ends of a cross-bar, C, to which the vehicle bed or body D is suitably fastened. Lugs *b b*, on the under side of the bar C, serve to joint the springs to this bar. In advance of the bar C there is a second cross-bar, C', to which the body D is to be secured. Obviously a single broad metallic plate or wooden bar might be used instead of the two bars C C', or any suitable provision be made for connecting the body and the springs.

Suitable brackets or angle-trusses E E, firmly secured at their bases to both of the cross-bars C C', serve alone, or, by preference, in connection with braces *d d*, on the under sides of the cross-bars, to hold these bars rigidly in proper relative position or parallel with each other. Each bracket E and its adjacent brace-bar *d* may be made in one piece, the ends of the bracket-base and the ends of the brace-bar joining in loop form to adapt the combined bracket and brace to be slipped on the ends of the cross-bars, to be secured in obvious way.

Suitable braces, in this instance spring-braces or half-springs F F, are respectively jointed at their front ends to or near the tops of the respective brackets E E, and each of these springs F is rigidly secured at its rear end to its respective crank or upright portion A' of the rear axle, near its axle-arm or journal *f*. The jointed connections of the front ends of the brace-springs, with the trusses or angle-brackets, are made by lugs *e e* and pins or bolts.

The bracket-supporting frame, formed by the cross-bars C C', is connected with the front axle-tree or axle proper, H, by springs G G extending from the front portion or bar, C', of the bracket-frame to lugs or ears on the axle-tree, to which the front ends of the springs are jointed. These lugs *h h* are shown as formed with the metallic portion of the axle-tree on its under side and near its ends. Each spring G is rigidly connected at its rear end with the bracket-frame. Two arms, *g g*, rigidly con-

nected with and projecting from the front cross-bar, C', of the bracket-supporting frame, one arm near either end of said cross-bar, is shown as provided for attaching the rear ends of the springs.

Above each spring G is a bracing-spring, I. Each of these springs I I is jointed at its front end to the axle-tree H, while at its rear end it is rigidly attached to the vehicle-body, or it might be both to the vehicle-body and cross-bar C'. By reference to Fig. 1 of the drawings it will be seen that the brace-springs I I connect by bolts at their rear ends with the front of the vehicle-body low down, and with a cross-bar, I', beneath the seat for the driver or in advance of the body proper of the vehicle. The lugs *h' h'* by which the fronts of the bracing-springs I I are pin-jointed to the axle are shown as formed upon the upper metallic portion of the axle-tree. Intermediate the upper and lower metallic portions or bars, J J', there is secured a wooden bar, J². This axle-tree may, however, be composed of any suitable material or materials instead of being constructed exactly as above described. The springs I I, it will be seen, connect with the axle-tree at about the level of the axle arms or journals *k k* for the front wheels.

The axle-arms *k k* are formed with or properly attached to turning-posts K K. These posts, instead of being tubular or sleeve-like, as in my Patent No. 226,748, are, by preference, made solid and provided with rounded or semi-circular top and bottom bosses, *l l*, from which project short threaded studs *l' l'*, and the turning-posts, instead of being supported at their lower ends directly upon the axle-tree or axle proper, are supported at both ends in diagonal struts or braces *j j'*, arranged in pairs and projecting above and below the plane of the axle-tree. These struts are formed by the ends of the metallic bars J J'. At their ends the struts have rounded bearing seats or sockets to receive the bosses on the turning-posts, and the threaded studs *l' l'* of the posts pass through openings made through the tops and bottoms of the strut ends and communicating with the centers of the sockets or seats therein. Nuts upon the threaded ends of the studs *l' l'* serve to hold the parts together.

A vibrating draft-attachment bar, M, is pivoted at its ends to the front ends of the forwardly-projecting braces N N' N N', which are formed with or rigidly attached to the turning-posts K K. A vibrating bracket or forked strap is pivoted to the axle-tree H and to a lugged clip, P, thereon, by a bolt passing through the axle and through the lug *p* at the top of the clip, as well as through the lugs *p' p'*, which embrace the axle and enable the one bolt O and nuts *o o* on its threaded ends to secure the lugged clip in place and pivot the bracket thereto. This bracket Q is provided with three arms or forks, two of them, *q q*, being horizontal and pivoted at their joined rear ends on top of the lugged clip, while the other arm, *q'*, is diagonal, extending back downward-

ly and terminating at its rear end beneath the axle-tree, where it is pivoted between the axle and the bottom lug, *p'*, of the clip P. At front the bracket is bolted to the bar M, and has perforated open lugs or sockets *m m*, into which engaging-lugs of shafts fit loosely and are pivoted, so as to be free to vibrate vertically, by means of one through bolt or pin or two bolts, one for each lug, as will readily be understood. The shafts, it will be seen, are in this way prevented from swaying horizontally except with the movements of the sway-bar M in turning the vehicle, and they may quickly be attached or removed. A tongue provided with lugs to engage the socket-lugs *m m* may be employed instead of shafts when desirable.

Instead of constructing the front axle-tree and its struts precisely as above described, and as in part represented by dotted lines in Fig. 3, the parts may be modified somewhat, as, for instance, by making the struts *j j j' j'* longer and the axle-tree correspondingly shorter, as represented by full lines in said figure. In this way the turning-posts K K may be adjusted in place by springing apart the struts, if it be deemed desirable to so insert them, and the axle-tree and struts may be made wholly of steel or of iron, if preferred. Tubular turning-posts and through-bolts may be employed in connection with the doubly-strutted axle-trees, as will readily be understood by referring to my before-mentioned patent.

Details of construction and arrangement of parts may be modified in various ways without departure from my invention. For instance, the springs may be altered in form, the springs G G be extended back by shanks or arms beneath the cross-bar C and secured to it as well as to the bar C', the cross-bar arms *g g* dispensed with, and the springs I I connected with the truss-frame or cross-bar C' by means of suitable brackets, instead of being fastened at their rear ends in the manner shown.

When suitable bar or rod braces are employed in lieu of the springs F F and I I, such braces would be jointed in place at both ends, and would, as will readily be understood, occupy the same or substantially the same positions in which the preferably-employed spring braces are shown by the drawings. Whether springs or bars are employed the braces have the same functions to perform.

I do not broadly claim spring-reaches or yielding or self-compensating connections between the front and rear axles of vehicles; neither do I broadly claim bracing cranked axles, for I am aware that one-way flexible braces, such as cords or straps extending from the axle-cranks forward to the vehicle-body, have been employed. Such braces are unlike mine, which, instead of acting merely as tensional braces, are both tensional and thrusting braces.

I claim as of my own invention—

1. The combination of the cranked axle, the main supporting-springs secured thereto, and the two-way acting or tensional and thrusting

braces located above said springs and having connection with the axle-cranks and the vehicle-body, substantially as and for the purpose hereinbefore set forth.

2. The combination of the cranked axle, main supporting-springs rigidly secured thereto, and two-way-acting bracing-springs located above said supporting-springs, and rigidly connected at their rear ends with the axle-cranks, substantially as and for the purpose hereinbefore set forth.

3. The combination, substantially as hereinbefore set forth, of the vehicle bed or body, trusses or brackets having rigid connection therewith, the cranked axle, the main supporting-springs secured to said axle and having jointed connection at their front ends with the vehicle-body, and the braces or bracing-springs connected with the axle-cranks located above the main supporting-springs, and having jointed connection at their front ends with the vehicle-body through or by way of the said trusses or brackets, for the purpose described.

4. The combination of the cranked axle, the main supporting-springs, the trusses or brackets, the frame or cross-bars to which these brackets are secured and with which frame said springs are jointed at their front ends, and the bracing-springs rigidly connected at their rear ends with the axle-cranks and jointed at their front ends to the brackets or trusses, substantially as and for the purpose hereinbefore set forth.

5. The combination, substantially as hereinbefore set forth, of the vehicle bed or body, trusses or brackets having rigid connection therewith, the cranked rear axle, the main supporting-springs secured to said axle and having jointed connection at their front ends with the vehicle-body, the braces or bracing-springs connected with the axle-cranks located above the main supporting-springs and having jointed connection at their front ends with the vehicle-body through or by way of the trusses or brackets, the non turning front axle-tree or axle proper, the front supporting-springs jointed to the axle-tree and having rigid connection at their rear ends with the vehicle-body, and the front braces or bracing-springs having connection with the vehicle-body, located above the front supporting-springs and having jointed connection at their front ends with the axle-tree, for the purpose described.

6. The combination of the non-turning front axle-tree or axle proper, the turning-posts provided with axle-arms, the front supporting-springs jointed to the axle-tree, the front bracing-springs also jointed to the axle-tree, and the vehicle-body with which all of said springs have rigid connection at their rear ends, substantially as and for the purpose hereinbefore set forth.

7. The running-gear, substantially as hereinbefore set forth, consisting of the combination of the rear cranked axle, the rear supporting and bracing springs, the bracket-frame or cross-bars, the brackets or trusses thereon,

with which frame and brackets the front ends of said supporting and bracing springs are respectively jointed, the non-turning front axle-tree or axle proper, the supporting and bracing
5 springs jointed to said axle-tree at their front ends, and at their rear ends respectively connected firmly with the bracket frame or cross-bars and adapted, as described, for rigid connection with the vehicle-body.

- 10 8. The combination of the axle-tree or axle-proper having the pairs of struts or braces at its ends provided with bearing seats or sockets, and the axle-arm carrying turning-posts formed with the rounded or semicircular bosses, at
15 both ends fitted in the strut-sockets and secured in place, substantially as described.

9. The axle-arm, carrying turning-post provided with the bosses and the threaded studs at both ends, as and for the purpose described.

- 20 10. The vibrating bracket Q, having the arms or forks $q q q'$ and perforated lugs or sockets $m m$, as and for the purpose described.

11. The combination of the vibrating draft-bar, the forked bracket Q, connected therewith, the lugged clip P, and the bolt O, by
25 which to connect the bracket and clip to the axle-tree, substantially as and for the purpose described.

12. The combination of the non-turning axle-tree or axle proper, its pairs of struts or braces,
30 the axle-arm carrying turning-posts, the vibrating draft-bar, the turning-post braces with which said bar is jointed at its ends, the vibrating bracket, and the lugged clip by which
35 to pivot the bracket to the axle-tree, substantially as hereinbefore set forth.

In testimony whereof I have hereunto subscribed my name.

P. HERDIC.

Witnesses:

WM. J. PEYTON,

CHAS. E. UPPERMAN.