No. 660,327. Patented Oct. 23, 1900.

F. COPELAND.

RUNNING GEAR FOR VEHICLES.

(Application filed Dec. 9, 1899.)

(No Model.) 3 Sheets—Sheet 1.

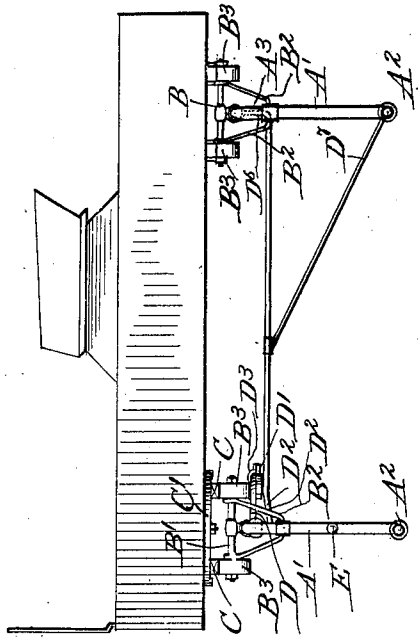

Fig. 1.

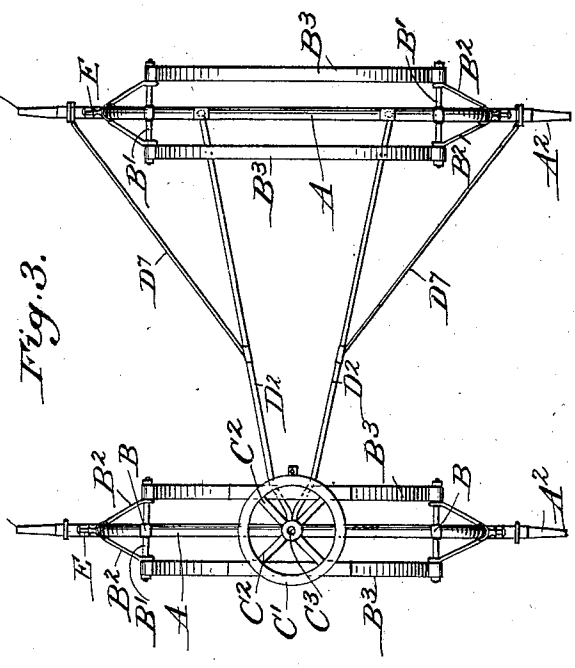

Fig. 3.

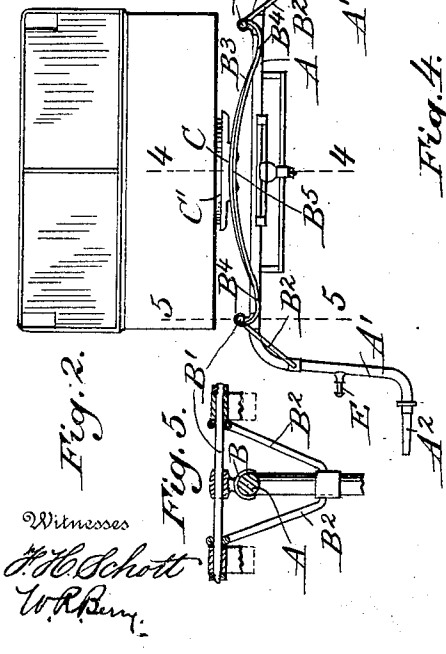

Fig. 2.

Fig. 5.

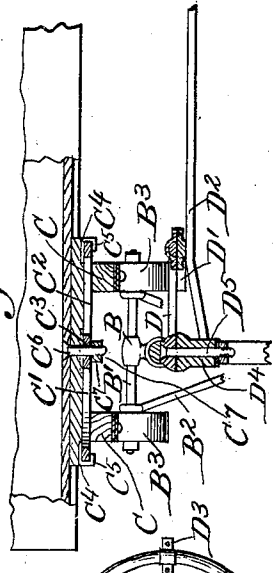

Fig. 4.

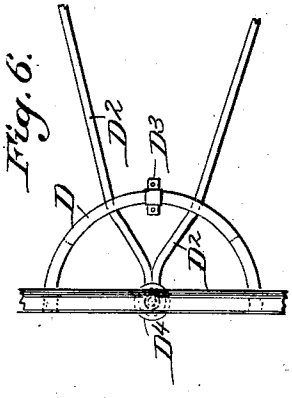

Fig. 6.

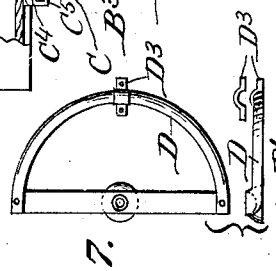

Fig. 7.

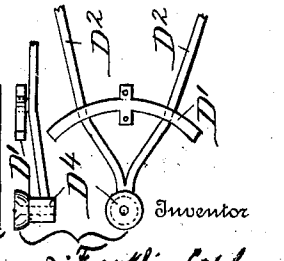

Fig. 8.

Witnesses
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No. 660,327. Patented Oct. 23, 1900.

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(Application filed Dec. 9, 1899.)

(No Model.) 3 Sheets—Sheet 2.

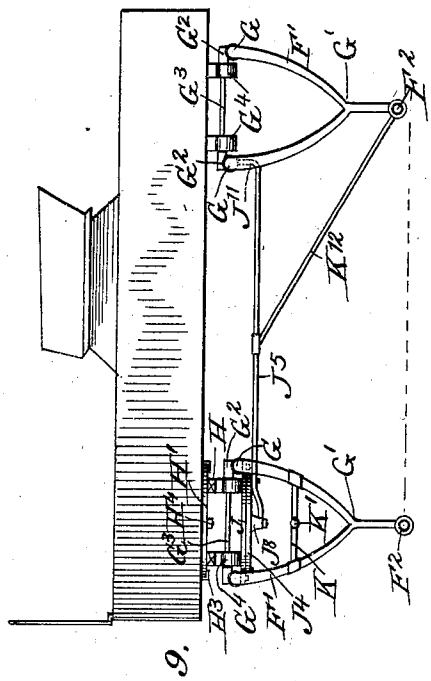

Fig. 9.

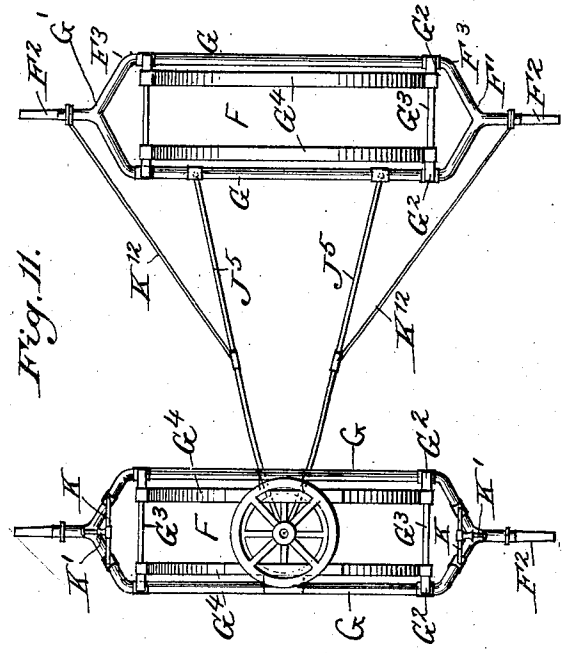

Fig. 11.

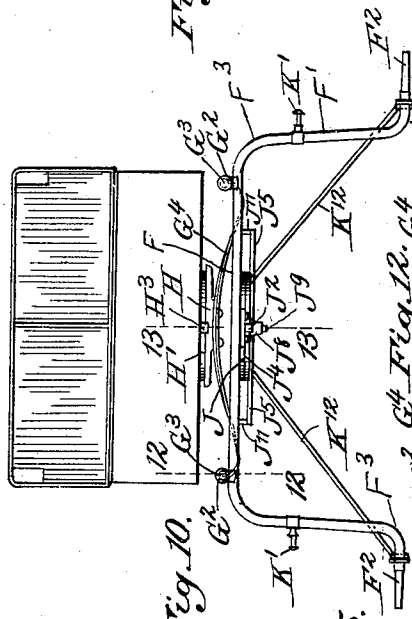

Fig. 10.

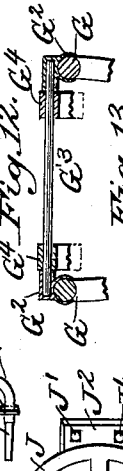

Fig. 12.

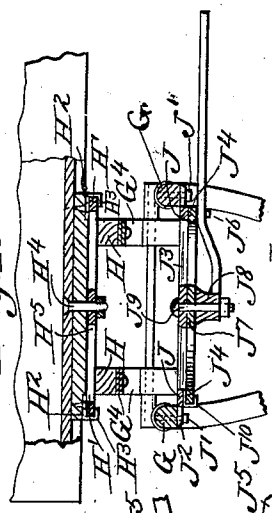

Fig. 13.

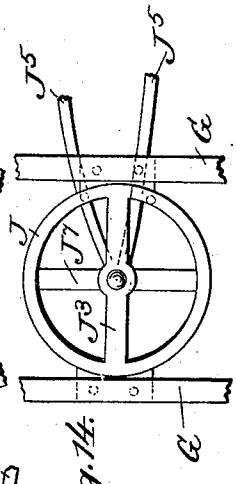

Fig. 14.

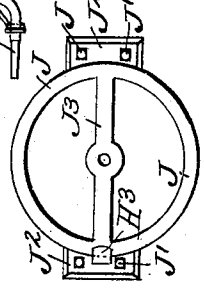

Fig. 15.

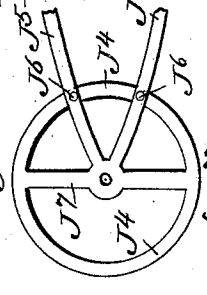

Fig. 16.

Witnesses

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No. 660,327 Patented Oct. 23, 1900.

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RUNNING GEAR FOR VEHICLES.

(Application filed Dec. 9, 1899.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 17.

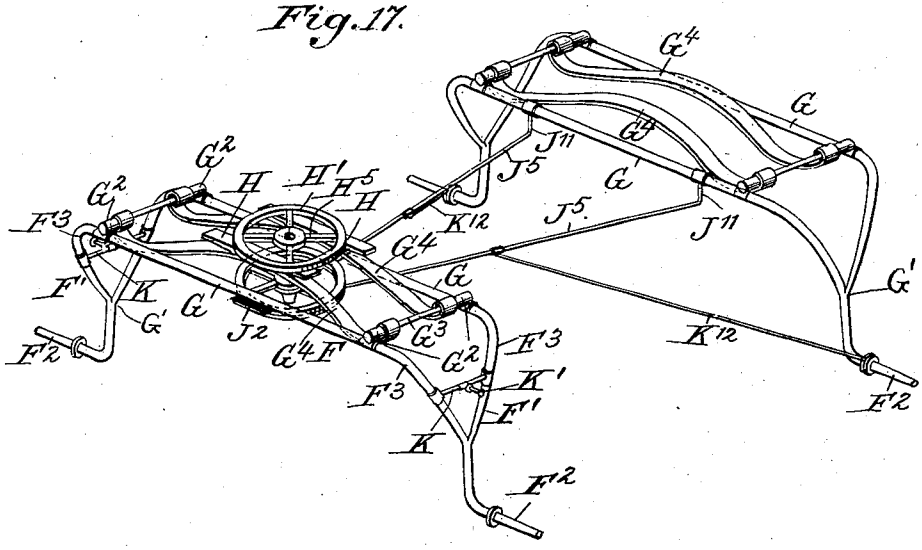
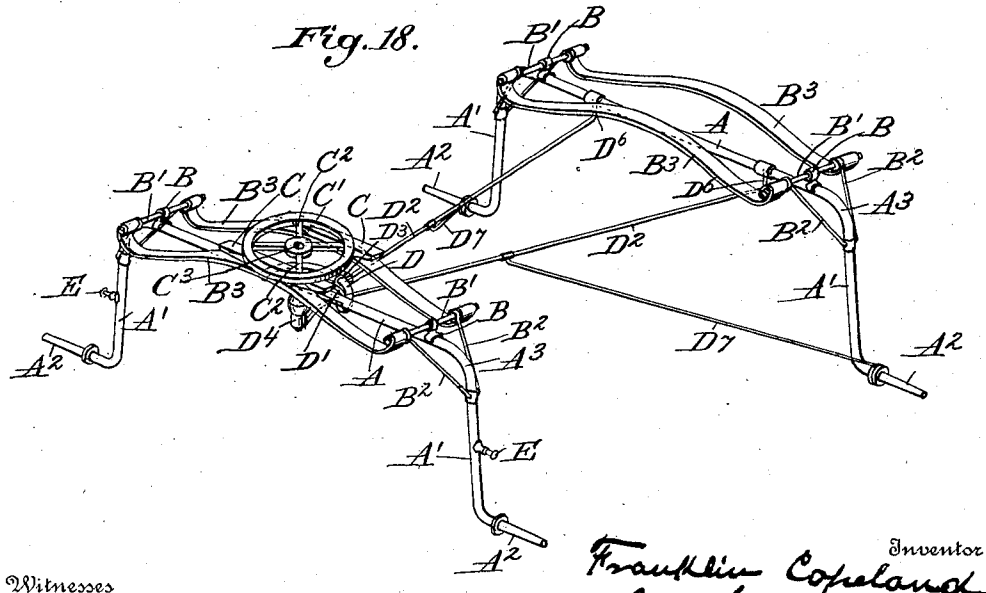


Fig. 18.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANKLIN COPELAND, OF NEW YORK, N. Y.

RUNNING-GEAR FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 660,327, dated October 23, 1900.

Application filed December 9, 1899. Serial No. 739,794. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN COPELAND, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Running-Gear for Vehicles, of which the following is a full, clear, and exact description, such as will enable those skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in running-gear for vehicles of that class which are used for light driving.

It has for its object the provision of an axle having a high arch to permit a close hitch without interfering with the movement of the horse and at the same time allows the use of very low wheels of the pneumatic type.

It also has for its object the provision of a spring mechanism for hanging the body to the axle so that the body will be carried at a normal elevation. In the vehicles heretofore constructed with very high arched axles the body has been carried too high by the springs; and, further, it has for its object the provision of a coupling mechanism for reducing the vibration of the arched axles. The high arched axles in ordinary use, in the case of the front axles more particularly, are coupled to the body at the tops of their crowns. Owing to the legs of the axles extending to a considerable distance below their coupling-points, there is considerable vibration; and, furthermore, it has for its object the provision of a mechanism adapted to take the place of the ordinary side-bar and which at the same time will not interfere in any way with the turning of the wheels.

The invention consists in the novel construction, combination, and arrangement of parts, such as will be hereinafter fully described, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the accompanying drawings, in which similar letters of reference designate corresponding parts, Figure 1 is a side elevation of a running-gear embodying the invention with a vehicle-body mounted thereon. Fig. 2 is a front elevation of the same. Fig. 3 is a plan view of the running-gear. Fig. 4 is a sectional view on the line 4 4 of Fig. 2. Fig. 5 is a sectional view on the line 5 5 of Fig. 2. Figs. 6, 7, and 8 are detail views showing parts of the lower fifth-wheel mechanism. Fig. 9 is a side elevation of a modified form of the running-gear with a vehicle-body mounted thereon. Fig. 10 is a front elevation of the same. Fig. 11 is a plan view of the modified form of the running-gear. Fig. 12 is a sectional view on the line 12 12 of Fig. 10. Fig. 13 is a sectional view on the line 13 13 of Fig. 10. Figs. 14, 15, and 16 are detail views showing the several parts of the lower fifth-wheel mechanism in the modified form. Fig. 17 is a perspective view showing the modified form of the running-gear. Fig. 18 is a similar view showing the preferred form of the running-gear.

The preferred form of the invention is shown in Figs. 1 to 8, inclusive, and Fig. 18. This construction will be described first.

The vehicle-body carried by the running-gear may be of any construction suitable in the premises. Both axles of the running-gear have substantially the same construction, so a description of one will suffice for both. The front axle, for example, is arched and consists of the crown A, the rises A′, and the spindles A^2. The crown and the rises are connected by the curved elbows A^3. These several parts may be made integrally or made separately and suitably joined. This construction of the axle gives it a symmetrical appearance and at the same time adapts it to sustain considerable weight. It also adapts the axle to the comparatively low wheels ordinarily used on such vehicles.

On each end of the crown A is secured the support B, carrying the bar B′. Each bar is braced by the rods B^2, connecting its ends with the rise A′. (See Fig. 5.) These bars to a considerable extent serve the same purpose as the ordinary side-bars. Practically the two bars B′ on the same side of the running-gear act as a single bar; but by having two of them, each extending but a short distance, rather than a single one extending the entire distance a much shorter turn of the vehicle can be secured, as the front wheels can be turned farther under the body of the vehicle without cramping. Compensating springs B^3 are attached at their ends to the

bars B′. Near their ends, as at B^4, the springs bend slightly below their points of attachment to the bars. At their middle portions, as at B^5, they project above the crown of the axle. These springs—a pair to each axle—carry an end of the vehicle-body. When depressed, they drop below the crown of the axle, one on each side of the latter, and are limited in their downward movement only by their resiliency and the body contacting with the supports B.

So far the description of the front axle is applicable to the rear one. The other features of the front axle will now be described.

On the tops of the springs B^3 are secured the bolsters C, to which is secured the fifth-wheel C′, provided with the radial cross-pieces C^2. In the jointure of the cross-pieces is the aperture C^3. To the under side of the bottom of the body are secured the wear-plates C^4, (see Fig. 4,) on which the fifth-wheel turns. To hold the fifth-wheel in its proper position on the wear-plates, the latter are provided with projections C^5, which extend beneath the fifth-wheel. A bolt C^6 passes through the bottom of the vehicle-body and the aperature C^8 of the radial cross-pieces and pivots the axle and the body together. A nut C^7 is provided for holding the bolt in place against accidental displacement.

To the crown of the front axle is secured the annular segment D immediately below the fifth-wheel C′ and concentric with the latter. This segment is adapted to move on a second annular segment D′, mounted on the forward end of the perches D^2. To hold the two segments together, a collar D^3 is secured to the segment D′, and through it the segment D moves. (See Figs. 7 and 8.) To the extreme forward ends of the perches D^2 is attached the hub D^4. A bolt D^5 passes through the crown of the axle immediately below the bolt C^6, and the hub D^4 and the axle and perches are thereby pivoted together.

By means of the foregoing construction a double fifth-wheel mechanism is provided, whereby the vibration of the front axle is minimized. Where there is but a single fifth-wheel mechanism or single pivotal point between the axle and the running-gear, the axle oscillates vertically about the pivotal point. This is especially so in this class of vehicles, where the axles have high arches and low wheels. By providing the double fifth-wheel mechanism or double pivotal point one above the other the liability of the axle to oscillate or to vibrate vertically is very much lessened.

To each of the rises of the front axle is secured a foot-rest E to facilitate the getting in and out of the vehicle.

The springs B^3, mounted on the rear axle, are secured to the under side of the body in the usual manner. While the two axles have the same dimensions, yet the crown of the rear axle is nearer the under side of the bottom of the body than the crown of the front axle, and consequently higher above the ground. This is owing to there being no fifth-wheel mechanism interposed between the rear axle and the body. As the rear axle is higher, the customary higher rear wheels can be used. To adapt them to the difference in height between the two axles and at the same time be parallel with the body, the perches D^2 have drops D^6 at their rear ends. The perches are braced by the rods D^7, connecting them with the rises of the rear axle.

In the modification shown in Figs. 9 to 17, inclusive, the construction is substantially the same as that hereinbefore described. The principal difference is that in the modification the axle is bifurcated. In the modified form the axle consists of the crown F, the rises F′, and the spindles F^2. These several parts are connected by the elbows F^3. The crown, rises, and curved elbows are bifurcated and consist of the two members G. In the crown the two members are a considerable distance apart and are substantially parallel. In the rises, however, the two members gradually approach each other and come together, as at G′. At each end of the crown on each member is secured the support G^2. A bar G^9 is mounted at its ends in the supports G^2 at each end of the crown. (See Fig. 12.) This bar extends from one member G to the other and is above the crown. The springs G^4 are attached at their ends to the bars G^3, between the members G, and when depressed they drop between the said members. On the tops of the springs G^4, carried by the front axle, are secured the bolsters H. On the latter is mounted the fifth-wheel H′ and adapted to turn against the wear-plates H^2, secured to the under side of the body. (See Fig. 13.) These plates have lugs H^3 engaging with the fifth-wheel to hold the latter in place. A bolt H^4 passes through the bottom of the body and the cross-bar H^5 of the fifth-wheel and pivots the two together. A fifth-wheel J is secured to the under side of the members G of the crown of the front axle by the screws J′ passing through the flanges J^2 into said members, and it is provided with a cross-piece J^3. This fifth-wheel turns on the annular plate J^4, secured to the perches J^5 by the screws J^6. The annular plate has a cross-piece J^7. A hub J^8 is attached to the ends of the perches. A bolt J^9 passes through the cross-pieces of the fifth-wheel and the annular plate and through the hub and pivots them together. The fifth-wheel and the annular plate are held together by the clips J^{10}, carried by the fifth-wheel and projecting under the annular plate. It is to be observed that the bolt J^9 is immediately below the bolt H^4 and that both fifth-wheel mechanisms are parallel, and thereby the same results are obtained as in the first instance. Between the rises F′ of the front axle are secured the rods K, carrying the steps K′. The springs G^4 of the

rear axle are secured to the under side of the bottom of the body of the vehicle in the usual manner. The perches J^5 have the drops J^{11} and the braces K^{12}.

Other modifications of the invention are apparent. For instance, the axles are well adapted to be used in the construction of two-wheeled vehicles.

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

1. In a running-gear for vehicles, an arched axle having its crown projecting upwardly and provided with elongated rises, a spring attached to the crown of said axle and normally projecting above the same, and a body secured to said spring.

2. In a running-gear for vehicles, an arched axle having its crown projecting upwardly and provided with elongated rises, side-bars mounted on the crown of said axle at its opposite ends, a spring attached to said side-bars and normally projecting above the crown of the axle, and a body secured to said spring.

3. In a running-gear for vehicles, an arched axle having its crown projecting upwardly and provided with elongated rises, supports secured on said axle near the ends of its crown and projecting upwardly from the same, side-bars carried by said supports above the crown of the axle, a spring secured at its ends to said side-bars and normally projecting above the crown of said axle, and a body secured to said spring.

4. In a running-gear for vehicles, an arched axle having its crown projecting upwardly and provided with elongated rises, a spring attached to said axle and normally projecting above the crown of the same, a body, and a fifth-wheel mechanism interposed between said spring and said body.

5. In a running-gear for vehicles, arched front and rear axles having their crowns projecting upwardly and provided with elongated rises, springs attached to said axles and normally projecting above the crowns of the same, a body mounted on said springs, a fifth-wheel mechanism interposed between said body and the spring secured to the front axle, perches extending from the rear axle to the front axle, and a second fifth-wheel mechanism connecting the front end of said perches with the crown of the front axle.

6. In a running-gear for vehicles, arched front and rear axles having their crowns projecting upwardly and provided with elongated rises, supports projecting upwardly from each axle near the ends of the crown, side-bars carried by said supports, springs connected at their ends to said side-bars and normally projecting above the crowns of the axles, a body mounted on said springs, a fifth-wheel mechanism interposed between said body and the spring secured to the front axle, perches extending from the rear axle to the front axle, and a second fifth-wheel mechanism connecting the front end of said perches with the crown of the front axle.

7. In a running-gear for vehicles, an arched axle having its crown projecting upwardly and provided with elongated rises, supports secured on said axle near the ends of its crown and projecting upwardly from the same, side-bars carried by said supports above the crown of said axle, a spring secured at its ends to said side-bars and normally projecting above said crown, a body, and a fifth-wheel mechanism interposed between said body and said spring.

8. In a running-gear for vehicles, an arched axle having a bifurcated crown, a spring hung between the members of the bifurcation, and a body attached to said spring.

9. In a running-gear for vehicles, an arched axle having a bifurcated crown, side-bars secured between the members of the bifurcation, a spring carried by said side-bars, and a body attached to said spring.

10. In a running-gear for vehicles, an arched front axle having a bifurcated crown, a spring hung between the members of the bifurcation, a rear axle, a spring mounted on said rear axle, a body carried by said springs, a fifth-wheel mechanism interposed between said spring carried by the front axle and the body, a cross-piece secured between the members of the bifurcation of the crown, and perches connected with said rear axle and pivoted to said cross-pieces directly beneath the pivotal point in said fifth-wheel mechanism.

11. In a running-gear for vehicles, an arched front axle having a bifurcated crown, side-bars attached at their ends to the members of the bifurcation of said crown, a spring carried by said side-bars, a cross-piece secured between the members of the bifurcation of said crown, a rear axle, a spring carried by said rear axle, a body mounted on said springs, a fifth-wheel mechanism interposed between said body and the spring carried by the front axle, and perches connected with said rear axle and pivoted to said cross-piece directly beneath the pivotal point in said fifth-wheel mechanism.

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

FRANKLIN COPELAND.

Witnesses:
THOS. B. ROBERTSON,
FREDK. HOUSCHILD.