

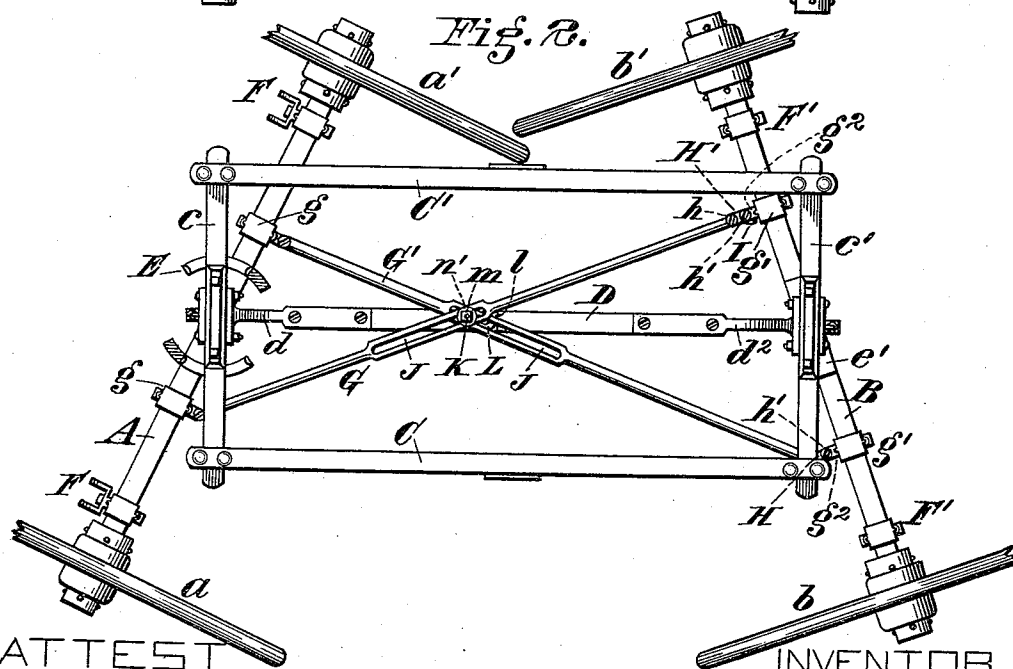
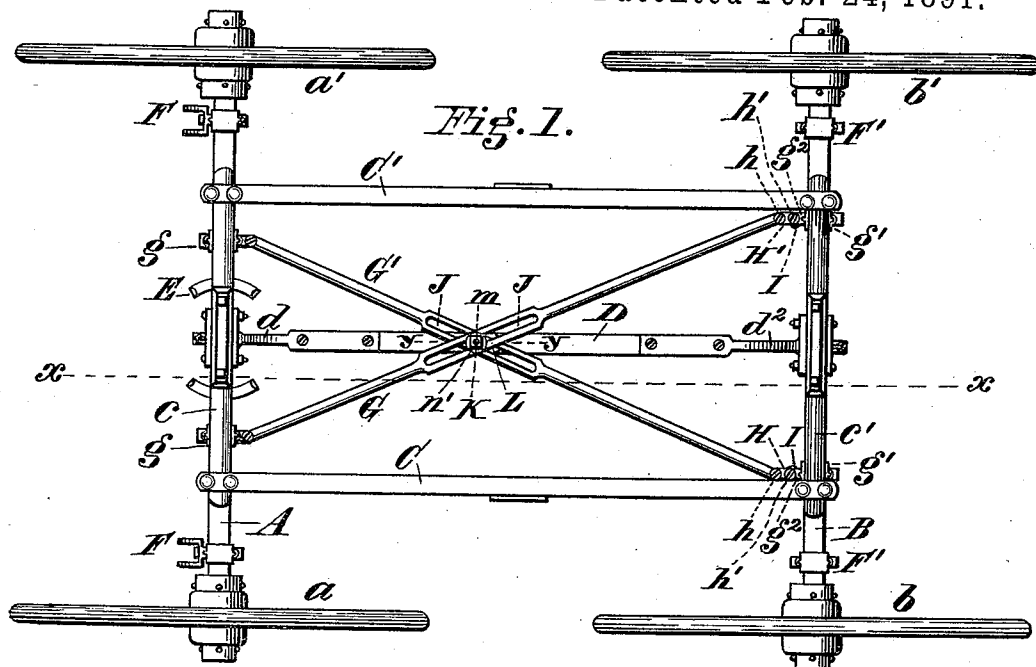
(No Model.)

2 Sheets—Sheet 1.

E. FUNK.
RUNNING GEAR FOR VEHICLES.

No. 447,109.

Patented Feb. 24, 1891.



ATTEST

Charles E. Hinrichs
Chas. O. Rose

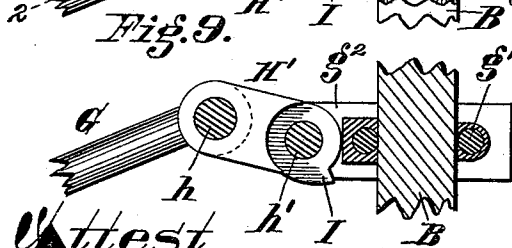
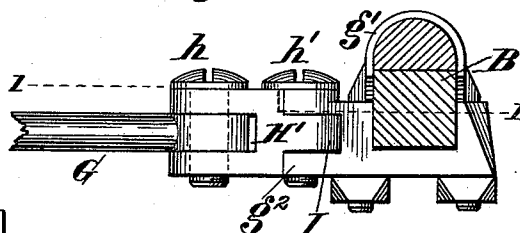
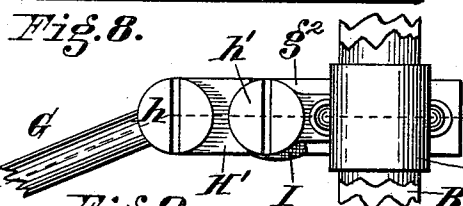
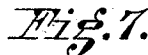
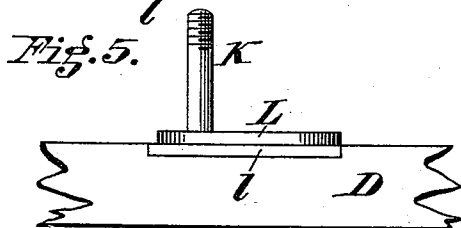
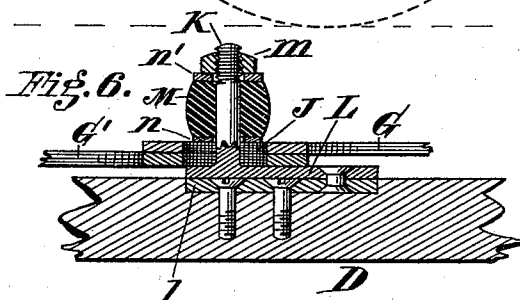
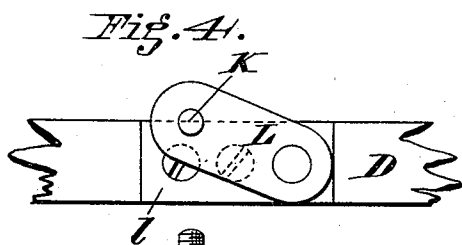
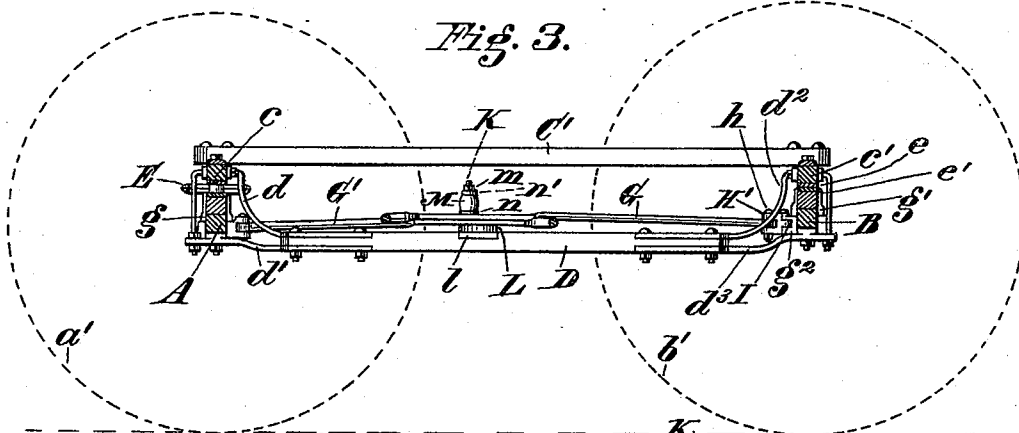
INVENTOR

Edward Funk,
by John E. Jones,
his attorney.

E. FUNK.
RUNNING GEAR FOR VEHICLES.

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UNITED STATES PATENT OFFICE.

EDWARD FUNK, OF CINCINNATI, OHIO.

RUNNING-GEAR FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 447,109, dated February 24, 1891.

Application filed November 24, 1890. Serial No. 372,411. (No model.)

To all whom it may concern:

Be it known that I, EDWARD FUNK, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Running-Gears for Vehicles, of which the following is a specification.

My invention relates to that class of running-gears known as "double-swinging" or "double-oscillating" gears, or that in which both the front and hind gears swing or oscillate horizontally, whereby an exceedingly short turn of a vehicle with a low-down body may be accomplished and other material advantages attained; and my invention consists, first, in the provision in connection with the fore and hind oscillating gears, of a pair of diagonally-arranged rods or stays, one crossing the other at a point slightly in advance of the center of the usual perch or reach, and both pivotally connected at their opposite ends to the axles of said fore and hind gears, the said rods being slotted longitudinally intermediate their said ends, an upright crank-pin or eccentric pivotally mounted on said perch intermediate its ends and engaging the slots in said rods, and an elastic cushion surmounted by a fastening and regulating nut on said crank-pin, whereby the said rods or stays are adapted to connect said oscillating fore and hind gears, so that they shall move in unison on their king-bolts, and all rattle or noise incident to the use of said cross-stays obviated; and my invention further consists in the provision, in connection with the fore and hind swinging gears and a pair of crossed rods or stays connecting them so that they shall move or oscillate on their king-bolts in unison, of a link or knuckle-joint at one end of each of said rods, said rods being pivotally connected at both ends to the axles of said fore and hind gears, and said links or knuckle-joints being provided at one of their ends for connection with the adjacent axle, whereby a take-up for any lost motion or strain is supplied, all of which will be fully hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan of my invention, the parts being shown in their normal position; Fig. 2, a similar view with the parts shown in the several

positions they assume when the fore and hind gears are swung to guide the vehicle to the right; Fig. 3, a longitudinal sectional elevation on line $x x$ of Fig. 1, showing the wheels in dotted lines; Fig. 4, a half-size plan view of the crank-pin or eccentric device mounted on the perch, which latter is shown broken off. Fig. 5, a longitudinal elevation of Fig. 4; Fig. 6, a central longitudinal section on line $y y$ of Fig. 1, showing the anti-rattling connection for the stays or rods at their slotted centers; Fig. 7, a half-size longitudinal elevation of one of the link or take-up connections for the stays or rods, showing the axle in cross-section and the stay broken off; Fig. 8, a plan view of Fig. 7; Fig. 9, a sectional plan on line 1 1 of Fig. 7, but with the link and stay in the respective positions they assume when in full operation for the shortest turn possible of my device; and Fig. 10, a longitudinal section on line 2 2 of Fig. 8, to show the link connection distinctly.

A represents the fore axle, and B the rear or hind axle of a vehicle, both being mounted upon wheels $a a'$ and $b b'$, respectively, to form the usual fore and hind gears.

C C' represent the longitudinal bars of an ordinary side-bar frame, and $c c'$ the fore and rear transverse connecting-bolsters thereof.

D represents the coupling-pole or perch, connected, as customary, by means of the upper and lower straps $d d'$ and $d^2 d^3$ at its fore and rear ends, respectively, with said fore and rear axles and bolsters.

E represents the customary fifth-wheel intermediate the fore axle and bolster, and $e e'$ is a pair of bolster-plates, one being on the under side of the hind bolster and the other on the upper face of the hind axle, for enabling the said hind axle to oscillate on its king-bolt and obviate the necessity of another fifth-wheel, except in extreme cases of very large and heavy wagons.

F F are the usual axle-clips of the thill-coupling on the fore axle, and F' F' the clips on the hind axle adjacent the inner ends of the wheel-hubs.

G G' represent two diagonally-arranged rods or stays, one crossing the other at or about the center of the perch and pivotally connected at their opposite ends to the fore and hind axles.

$g g$ represent clips on the fore axle, and g' clips on the hind axle, forming parts of the pivotal connections for said crossed rods, those $g g$ on the fore axle being arranged at a less distance apart than those $g' g'$ on the hind axle, so that the respective fore wheels shall pass the respective hind wheels without colliding, as shown in connection with the wheels a' and b' in Fig. 2, in making as short a turn as possible with my device, and thereby obviate the use of a long perch, which is such a desirable feature in the manufacture of vehicles, and particularly side-bar buggies.

It will be seen that the clips $g g$ and $g' g'$, respectively, may be very readily brought closer together or set a greater distance apart than shown, to provide for a greater or less length of reach, as desired, thus enabling a very fine adjustment of the stays or rods $G G'$, in connection with the fore and hind gears, for different lengths of body, as well as reach.

$H H'$ represent links forming knuckle-joints between the rear ends of the cross-stays $G G'$ and the clips $g' g'$, and $h h$ are suitable screws or bolts whose shanks pass through openings in said rear ends of the cross-stays and the fore ends of said links for pivotally connecting said stays with the links, the rear ends of said links being pivotally connected with the forked inner ends g^2 of the ties of said clips g' by means of similar screws or bolts h' , as clearly shown in Fig. 10. I prefer to use these links $H H'$ to connect the rear ends of the cross-stays with the hind axle for the reason that a take-up device is provided, whereby any and all lost motion is obviated and no strain or bending consequent upon such lost motion is present or possible.

I represents a lug or wing projecting from the periphery of the rear swinging end of each of the links $H H'$, as clearly shown in Figs. 8 and 9, and on the side thereof, facing inwardly or toward the center of the running-gear, and designed to abut the inner end or corner of the clip-tie, when the stays are in their normal positions or in the act of drawing or pulling forward one end of the hind axle, thus forming a stop to properly limit the inward pivotal motion of said links.

The cross stays or rods $G G'$ are preferably provided with slots J intermediate their respective ends to accommodate an upright crank-pin or eccentric K , mounted on the perch slightly forward of its center. This pin K projects upwardly from a swinging plate L , the latter being pivotally connected at one end to a friction-plate l on the said perch.

M represents a rubber cushion or spring on the crank-pin K immediately above said slotted cross-stays, and m is a regulating and fastening nut on said crank-pin. Suitable washers n and n' are placed on the crank-pin intermediate the cushion and stays and the cushion and fastening-nut, respectively, as clearly shown in Fig. 6. The said crank-pin and cushion form a device for the prevention

of rattling or, in other words, an "anti-rattler" for said cross-stays, whereby all needless vibrations and resultant noises of said stays are entirely avoided and the stays permitted to freely and properly reciprocate or slide in either direction for the desired swinging or turning of the fore and rear gears.

It is obvious that in very light vehicles to be used on very smooth and even pavements or roads, but a single one of my diagonally-arranged stays or rods connecting one side or end of the fore axle with the opposite side or end of the hind axle could be used and the double oscillation result, but certainly not so well, nor would it be as practicable as where two crossed ones are used in vehicles intended for service over all kinds of roadways, both rough and otherwise.

I claim—

1. In a double swinging or oscillating running-gear for vehicles, the combination, with the fore and hind swinging gears, of a pair of diagonally arranged and crossed rods or stays having pivotal connections at their opposite ends with the said fore and hind gears and longitudinal slots at their centers, an upright crank-pin or eccentric pivotally mounted on the perch intermediate its ends and engaging the slots in said crossed stays, and an elastic cushion surmounted by a fastening and regulating nut on said crank-pin immediately above and in intimate contact with said stays, the whole being adapted to operate so that said stays shall connect said oscillating gears and cause them to move or swing in unison in the desired direction and all rattle or noise incident to their use obviated, substantially as herein set forth.

2. In a double swinging or oscillating running-gear for vehicles, the combination, with the fore and hind swinging gears and a pair of crossed stays or rods connecting them, so that they shall move or oscillate on their king-bolts in unison, of a link or knuckle-joint at one end of each of said rods, said rods being pivotally connected at both ends to laterally-adjustable clips on said front and hind gears, and said links being provided at one of their ends for connecting the adjacent gear, whereby a take-up device for any lost motion or strain is supplied and provision made for a greater or less length of reach, substantially as and for the purpose herein set forth.

3. The combination, with the diagonally-arranged connecting stay or stays and the clip tie or ties, of a link or knuckle having a lip or wing adapted to engage said clip tie or ties and form a stop for the inward movement of said link, substantially as and for the purpose herein set forth.

In testimony of which invention I have hereunto set my hand.

EDWARD FUNK.

Witnesses:

JOHN E. JONES,
J. J. CORDESMAN.