(No Model.)

N. A. PALMER & J. B. F. MORGAN.

VEHICLE RUNNING GEAR.

No. 580,646. Patented Apr. 13, 1897.

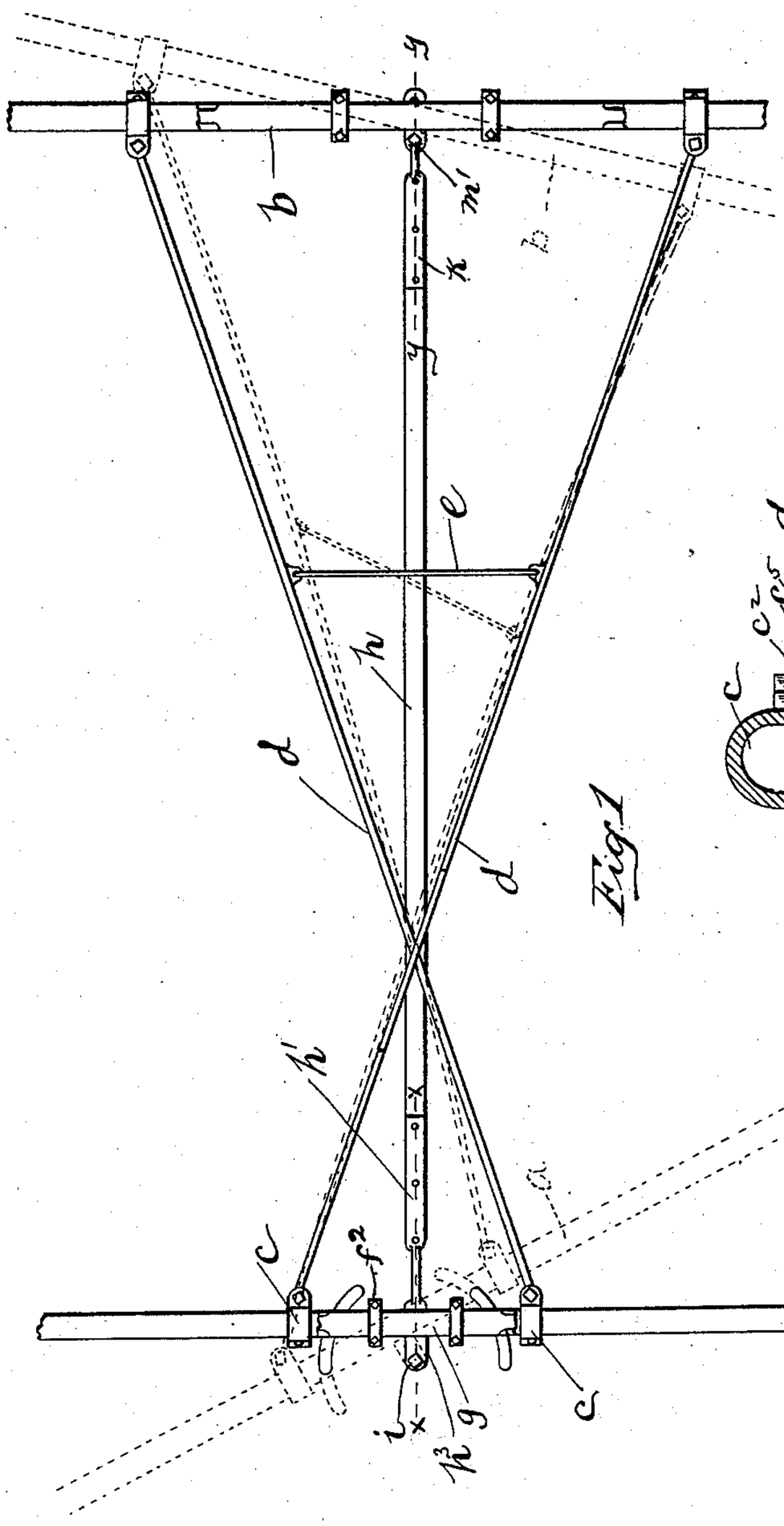

Fig. 1

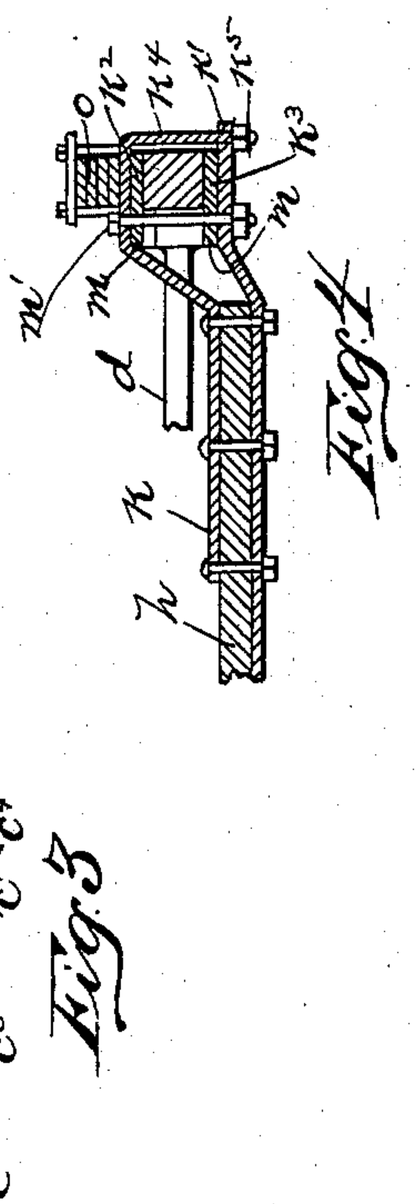

Fig. 4

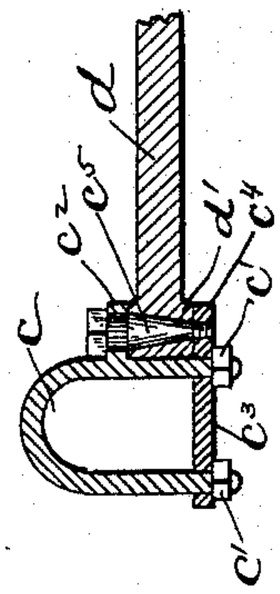

Fig. 3

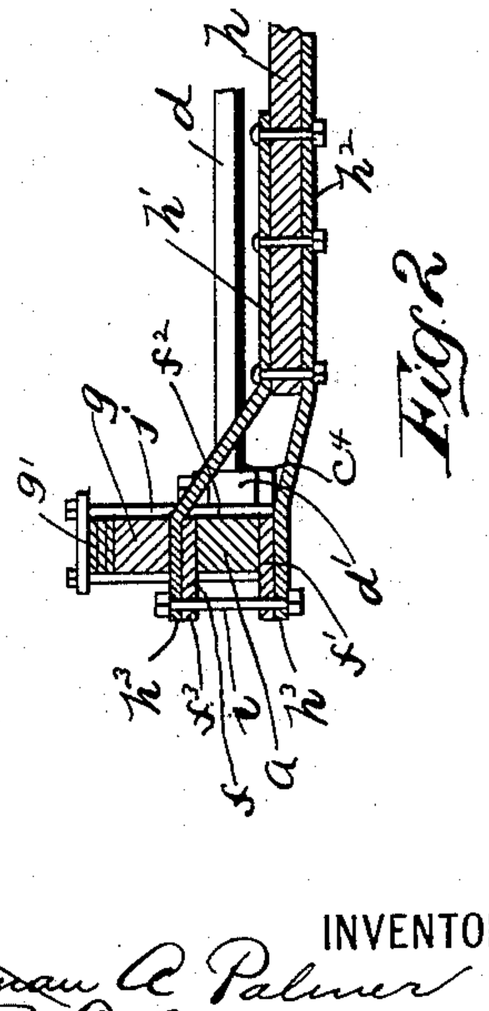

Fig. 2

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VEHICLE RUNNING-GEAR.

SPECIFICATION forming part of Letters Patent No. 580,646, dated April 13, 1897.

Application filed October 21, 1895. Serial No. 566,326. (No model.)

To all whom it may concern:

Be it known that we, NORMAN A. PALMER and JAMES B. F. MORGAN, citizens of the United States, residing at Clarksburg, in the county of Ross and State of Ohio, have invented a certain new and useful Improvement in Vehicle-Gears, of which the following is a specification.

Our invention relates to the improvement of vehicle-gears of that class in which crossed draft-rods are employed between the axles, and has particular relation to the improvement of the construction set forth in a former patent, No. 546,430, dated September 17, 1895, granted to Norman A. Palmer, one of the herein-named applicants.

The objects of our present invention are to combine with a vehicle-gear in which a reach is employed improved means for compensating for the shortening and lengthening of the distances between the points of connection of the crossed-draft-rod ends and to produce other improvements in the construction and arrangement of parts of our device, which will be more fully set forth hereinafter. These objects we accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of our improved gear, showing in dotted lines different positions of the axles and connecting parts. Fig. 2 is an enlarged sectional view on line $x\ x$ of Fig. 1. Fig. 3 is a detail sectional view of the clip which we employ, and Fig. 4 is an enlarged sectional view on line $y\ y$ of Fig. 1.

Similar letters refer to similar parts throughout the several views.

a represents the front and b the rear axle of our improved gear. At a point on each side of the center of the length of the front and rear axles each of said axles is embraced by a clip c, said clip consisting of the inverted-U-shaped body shown, the vertical arms of the latter being threaded in their lower end portions to receive nuts c'. The upper portion of each of these clips is provided on its inner side with a short projecting clip-arm c^2. The lower end of the clip is closed by a horizontal clip-tie c^3, the latter having openings to receive the threaded ends of the vertical arms of the clip and being adapted to be retained against the under side of the axle by means of said nuts c'. This bottom clip-tie c^3 is provided with an inner end extension, which projects beneath and parallel with the clip lug or arm c^2, as indicated at c^4, said extension having a screw-threaded opening therethrough.

d represents the crossed draft-rods of our improved gear, the forward ends of which are connected with the forward clips c, and the rear ends of which are connected with the rear clips, said draft-rods being crossed in front of the centers of their lengths, as shown. Each end of each of the cross-bars d terminates in a vertical eyepiece or barrel d', which fits between the clip-lug c^2 and clip-bar extension c^4, and is adapted to receive a pivot-bolt c^5, which passes through said lug and screws into the bar extension.

As shown more clearly in Fig. 3 of the drawings, the opening c^5 through the eyepiece d' is tapering, and that portion of the pin or bolt c^5 which passes therethrough, as described, is of corresponding tapering shape. The rear halves of the draft-rods are preferably connected by a transverse tension-rod e, as set forth in said former patent. The upper and lower sides of the central portion of the front axle a are provided, respectively, with horizontal plates f and f', the latter being connected on opposite sides of the centers of their lengths with suitable clips f^2. These upper and lower plates f and f' are provided on their forward sides with forwardly-projecting tongues or extensions f^3.

g represents the front bolster, to the upper side of which may be connected the front vehicle-spring g' in the usual manner.

h represents the reach-body, which connects the central portion of the front and rear axles in the manner hereinafter described. The forward end portion of the reach h has secured to its upper and lower sides bars or plate-arms h' and h^2, which, extending beyond the forward end of the reach in slightly diverging directions, have their outer or forward portions embracing the upper and lower sides of the axle-plates f and f'. These bars h' and h^2 are, as prescribed for the plates f and f', provided with tongue extensions h^3, corresponding with the plate extensions f^3. The outer portions of these tongue extensions h^3 and f^3 are connected by a king or pivot

bolt *i*. The bolster *g* is united with the upper side of the plate-arm *h'* by means of a suitable clip *j*. The rear end portion of the reach *h* is, as prescribed for said forward end portion, provided with upper and lower plate-arms, which are indicated at *k* and *k'*. The rearwardly-projecting extensions of these plate-arms embrace top and bottom plates k^2 and k^3 of the rear axle. The upper plate-arm terminates in a downwardly-extending portion k^4 on the outer side of the rear axle, said portion k^4 terminating in a threaded lower end which passes through a short rear extension of the lower plate *k'*, said threaded termination being adapted to receive a nut k^5. The top and bottom plates k^2 and k^3 of the rear axle are provided with forwardly-extending tongue or lip portions *m*, which are adapted to receive a bolt *m'*, which also passes through the plate-arms *k* and *k'*. *o* represents the rear spring, which may be supported upon the upper plate-arm *k*.

As is usual in this class of vehicle-gears, the turning of the forward axle also results in a turning of the rear axle, the wheels on one side of the vehicle thus being made to move away from each other, while the wheels of the remaining side are turned inward toward each other. This movement of the axles, as is well known, results in the clips with which the ends of the draft-rods are connected being carried or moved by said axles in the arcs of circles, and as the movement thus produced causes the points of connection of the opposite ends of each of the draft-rods to approach more nearly horizontal alinement the distance between the front and rear connecting-points of each of the draft-rods is shortened, and a tendency of the draft-rod to bind results therefrom. In the former patent referred to this difficulty was partially obviated by the employment of slotted connections between the draft-rods and the axle-clips. In our present invention, however, it will be observed that the slotting of these clips or ends of the draft-rods is obviated by placing the pivot-point of the forward axle in front of the center thereof. By this arrangement of parts it is obvious that when the axles are turned in the manner, for instance, as indicated in dotted lines in the drawings there will be sufficient outward or lateral movement of the points of connection of the rods with the front axle to compensate for the shortening in distances above described. In other words, by the outward movement of the connecting-points above mentioned an increased forward as well as lateral movement is imparted to the front end of the draft-rod, thereby preventing the change of relation between the pivotal point of said draft-rod on the front axle and the pivotal point of the same on the rear axle, so that the distance between corresponding pivotal points remains the same in any or all positions of the axles. By said operation the tendency to bind above referred to is wholly obviated.

Owing to the fact that the bolt c^5 and its bearing in the eye *d'* is of the conical form described, it is evident that said eye *d'* when it becomes worn cannot lift or move upward on the bolt until it is sprung inward and meets the resistance of the tension-bar *e*. In this manner the undesirable rattling of said parts is entirely obviated.

We are aware that vehicle-gears have been constructed heretofore wherein the pivot-point of the axle has been arranged in front of the body of the axle, but these devices differ from ours in the combinations hereinafter set forth.

Having now fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a vehicle-gear the combination with the front and rear axles and crossed draft-bars jointedly connecting the same, of a reach extending between said axles, the forward end of said reach being pivotally connected with the forward axle in front of the latter and the rear end of said reach being pivotally connected with the rear axle, substantially as and for the purpose specified.

2. In a vehicle-gear the combination with the front and rear axles, inverted substantially **U**-shaped clip-bodies embracing said axles on opposite sides of their centers, a lug c^2 projecting from the upper portions of each of said clips and a clip-bar c^3 detachably connecting the lower ends of the clip-body, said clip-bar being provided with an extension c^4, of crossed draft-rods the ends of which are journaled as described between said clip-lugs c^2 and clip-bar extensions c^4, substantially as and for the purpose specified.

3. In a vehicle-gear the combination with the axles and a reach extending between said axles, the ends of said reach being pivotally connected with the axles in front of their centers, of crossed draft-rods the ends of which are jointedly connected with said axles and a tension-rod *e* connecting said crossed draft-rods, substantially as and for the purpose specified.

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JAMES B. F. MORGAN.

In presence of—
A. L. PHELPS,
C. C. SHEPHERD.