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H. B. ATKINS.

RUNNING FRAME FOR VEHICLES.

(Application filed Nov. 17, 1899.)

(No Model.)

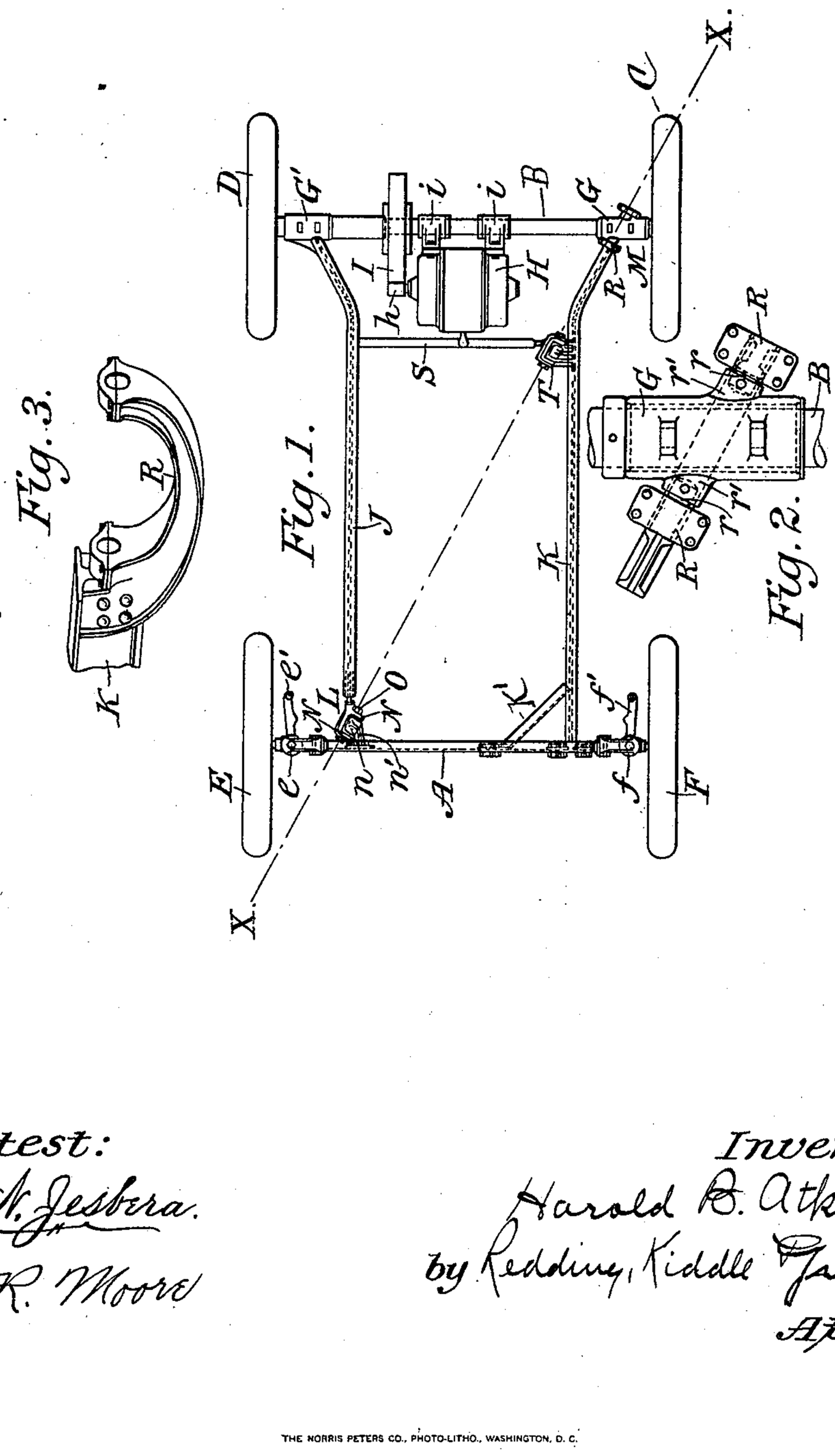

Fig. 1.

Fig. 2.

Fig. 3.

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RUNNING-FRAME FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 666,592, dated January 22, 1901.

Application filed November 17, 1899. Serial No. 737,274. (No model.)

To all whom it may concern:

Be it known that I, HAROLD BEDFORD ATKINS, a citizen of the United States, residing in Roselle, Union county, State of New Jersey, have invented certain new and useful Improvements in Running-Frames for Vehicles, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to improvements in running-gear frames for vehicles having four wheels which run upon the ground.

While the invention may be generally applied, its principal use is in connection with power-driven or other vehicles designed to carry heavy weights or be propelled at high speed, and therefore subjected to great strain.

The construction is preferably of metal in the form of a frame of tubes or flanged bars which are securely connected to form a strong, rigid, and yet flexible support for the load.

With the well-known forms of light running-gear principally constructed of wood and more or less loose at the points of connection sufficient elasticity is present to permit such distortion of the frame as will allow all four wheels to rest upon a slightly-uneven surface, whereas with a rigid metallic frame all four wheels would rest upon the surface without internal distortion of the frame members only when the road-bed is substantially flat. My invention is particularly designed to overcome this difficulty; and it consists in constructing the frame in two portions, which are united by a hinge-joint the axis of which is arranged upon a line oblique to the longitudinal and transverse axes of the frame or to the track of a two-track vehicle or extending diagonally through the frame, which permits the frame to fold up or down upon this line to accommodate itself to inequalities of surface. The joints in the oblique or diagonal line are not mere loose connections, but they constitute a hinge-joint between the two parts of the frame—that is to say, the members at those points are connected by some form of joints which have their axes of movement in a line coinciding with the oblique or diagonal line between the two parts of the frame and substantially free from lateral movement.

By my invention the running-frame becomes perfectly rigid in its resistance to horizontal stresses at any corner of the frame or upon the axles. It is not liable to internal distortion of any single member, since the bearings of the hinge-joint may be longitudinally of ample extent and lateral rigidity and while permitting the frame to fold along the oblique or diagonal line to adapt itself to any unevenness of the roadway, at the same time securing a frame of unequaled strength and durability entirely free from "loose" joints, which must necessarily transmit part of the strain in undesired directions.

The invention also includes some preferred features of construction, as will appear, and be hereinafter more particularly referred to in the claims.

In the drawings, Figure 1 is a plan view of a running-gear frame embodying the invention. Fig. 2 is an enlarged detail of one of the bearings of the frame. Fig. 3 is an enlarged detail of the yoke forming part of the bearing shown in Fig. 2.

In the drawings, A and B are the front and rear axles or wheel-carrying members of the running-gear frame, upon which are supported in any desirable manner the wheels C D E F. As indicated, the front wheels E F are steering-wheels rotating upon the usual stub-axles connected to the ends of the axle or member A upon vertical pivots *e f*, and from each of said spindles extends an arm *e' f'* for connection to suitable steering mechanism. The rear axle or member may be rigidly connected with the frame, and the wheels supported upon its extremities may be rotated upon stationary stub-axles, or, as indicated in Fig. 1, the said axle may be rotatably supported in bearings G G', connected with the frame, and the said rear wheels may be driven through said axle B by a motor H, connected by suitable pinion *h* with driving-gear I, secured to the axle, which may also sustain the rear end of the motor H through suitable bear-

ings *i i*, it being understood, however, that the particular construction or arrangement of the motor is not essential.

The front and rear axles or members are connected by reaches J K, extended between them, and they may have any desired section. The front end of the reach on one side, as J, is articulated to the axle or member A by a joint L, shown as a hinge-joint. The other end of the opposite reach may be similarly hinged to the opposite end of the rear axle or member by a joint M, the axes of these joints coinciding with a diagonal line X X, passing from the rear of the frame at one side to the front of the frame at the opposite side. As indicated in Fig. 1, this joint L may comprise a pair of jaws N N, attached to the forward end of the reach J, between which fits a block *n*, which is rigidly secured to a short projection *n'* from the front axle A, and a bolt O passes longitudinally through block *n* and the jaws N N, the axis of the said bolt being on the diagonal line X X, extending from the axis of joint M at or near the opposite rear corner of the frame. Where, as in Fig. 1, a rotating axle is employed, the extremity of the reach K may be curved or connected to a curved piece R to pass under or over the outer journal-bearing of said axle, hinge connection being made therewith through pins *r r*, Fig. 2, extending from the opposite sides of the curved portion of the reach and entering sockets or bearings *r' r'* in the sides of the journal-box G, the axes of the said pins being in line with the axes of the forward hinge on the opposite side. The angle formed by the forward end of the reach K and the adjacent end of the bar A is braced by a brace K', as shown in Fig. 1, to render this section or member of the running-gear frame rigid.

A cross-bar S is shown as rigidly connected at one end to the reach J near its rigid connection at G with the rear axle or member, and the other end of this bar is connected to the opposite reach by a joint T, which may be similar to the main frame-joints, as shown in Fig. 1, resembling hinge L, this joint also having its longitudinal axis in the same diagonal line X X. In Fig. 1 the cross-bar supports the front end of the motor H.

It is obvious that more than one cross-bar may be used, if desired, provided it be connected between the reaches by a joint having its longitudinal axis in line with the other joints by which the frame is connected and rendered flexible.

With this construction the running-gear frame is divided into two generally triangular parts united by joints having their axes of movement arranged in a diagonal line, the wheels C E being near the opposite extremities of the bases of said triangular parts and the wheels D F at the apices thereof. If either of the wheels C E be raised, both triangular parts will be elevated from the one extremity, giving a folding effect, and if either of the wheels D F is lifted one of the triangular parts will be elevated from its apex, having entire freedom of movement upon the hinge-line of its base with only a slight lifting on one end of the other triangular part.

From the foregoing it will be apparent that I claim special advantages from the use of joints having their axes arranged on a line oblique to the longitudinal and transverse axes of the frame or to the track of a two-track vehicle or extending diagonally through the frame, inasmuch as such joints may be free from lateral or endwise movement and overcome the tendency to movement in other than the desired direction, thereby providing for those conditions which exist when the wheels are resting upon an uneven surface. Moreover, such joints can be so strongly constructed as to afford lateral support also to the frame, rendering it perfectly rigid in its resistance to horizontal stresses in passing over uneven ground. In fact, a frame so constructed may be sufficiently rigid to withstand the strain of rough usage without the addition of corner-braces or cross members, and this result is due to the use of my invention, for which I claim the greatest practical advantages, particularly over the various forms of universal or loose jointed frames heretofore proposed. It will be seen not only that the slightest distortion of the road-bed will be perfectly accommodated by the hinged frame, but that the frame so constructed will accommodate any distortion of the road-bed, whether great or small, while at the same time it resists all horizontal strains to which it may be subjected due to the roughness of the road-bed and other causes.

It will be evident in view of the foregoing that the joints need not be at the axles and that other minor changes and modifications may be made in the construction without departure from the invention.

Having described my invention, what I claim is—

1. A vehicle running-frame including transverse or wheel-carrying members and comprising parts hinged together, the axes of the hinge being arranged oblique to the transverse member.

2. A vehicle running-frame comprising parts hinged together, each part including a transverse axle member and a longitudinal or reach member, and hinges intermediate of the axle members with their axes arranged oblique thereto.

3. A running-frame for wheeled vehicles comprising parts hinged together with the axes of the joints between the parts on a diagonal line oblique to the longitudinal and transverse axes of the frame.

4. A vehicle running-frame consisting of parts hinged together, each part comprising an axle or transverse member and a longitudinal member, the axis of the hinge being obliquely disposed with relation to the frame.

5. A running-frame for vehicles comprising parts hinged together with the axes of

the joint oblique to the track or line of travel of the vehicle.

6. A road-vehicle running-frame consisting of two parts, each of said parts being composed of an axle or transverse member and a longitudinal member, the two parts being hinged together with their axis extending diagonally of the running-frame.

7. A running-gear frame for vehicles, comprising two axles or bars, and side bars connecting them, said frame having joints on the same oblique axial line, and a brace rigidly connecting the bars about one of the angles of the frame; substantially as described.

8. A running-frame for wheeled vehicles, comprising parts hinged together with the axes of the joints between the parts on a diagonal line oblique to the longitudinal and transverse axes of the frame, in combination with a weight-supporting member connected to both of said parts, the connection with one of said parts including a free or swinging joint to permit the hinging of the frame; substantially as described.

9. A frame for vehicles comprising front and rear transverse wheel-carrying members, two longitudinal members or reaches, a joint between the front end of one reach and the front axle or member, and between the rear end of the other reach and the rear axle or member, the axes of the joints being in a diagonal line.

10. A frame for vehicles having a front-wheel-carrying axle or member, a rear-wheel-carrying axle or member, a reach on one side rigidly attached to the rear axle or member and joined to the front axle by a hinge, a similar reach on the opposite side rigidly connected to the front axle or member and joined to the rear axle by a hinge, the axes of the frame-hinges being in the same diagonal line.

11. A frame for vehicles comprising front and rear transverse members, two longitudinal members or reaches, a joint between the front end of one reach and the forward transverse member, and a joint between the rear end of the other reach and the rear transverse member, the axes of the joints being in the same diagonal line, and a transverse bar or support connected rigidly at one end with one of the reaches and by a joint to the opposite reach, the axis of said last-named joint being in the same diagonal line as the main frame-joints.

12. A frame for vehicles having a front-wheel-carrying member, a rear-wheel-carrying member, a reach on one side rigidly attached to the rear member and joined to the front member by a hinge, a similar reach on the opposite side rigidly connected to the front member and joined to the rear member by a similar hinge, the longitudinal axes of the frame-hinges being in the same diagonal line, and a transverse weight-supporting bar connected at one end near the rear, unhinged end of one of the reaches and a hinge connection between the other end of said bar and the opposite reach, the hinge between the reach and the bar having its axis in the same diagonal line as the main frame-hinges.

13. A frame for vehicles comprising a rotating wheel-carrying axle, a non-rotating wheel-carrying axle, a reach upon one side connected with the non-rotating axle by a hinge-joint and rigidly connected with a bearing upon the rotating axle, a similar reach upon the other side rigidly connected at the one end with the non-rotating axle and connected by a hinge-joint at its other end with an opposite bearing of the rotating axle, the hinges between the reaches and the axles having their axes upon a diagonal line.

This specification signed and witnessed this 14th day of November, A. D. 1899.

HAROLD B. ATKINS.

In presence of—
PETER P. SHERRY,
W. B. GREELEY.