No. 659,718. Patented Oct. 16, 1900.

D. TRUE.

SPRING GEAR FOR VEHICLES.

(Application filed Jan. 27, 1900.)

(No Model.) 3 Sheets—Sheet 1.

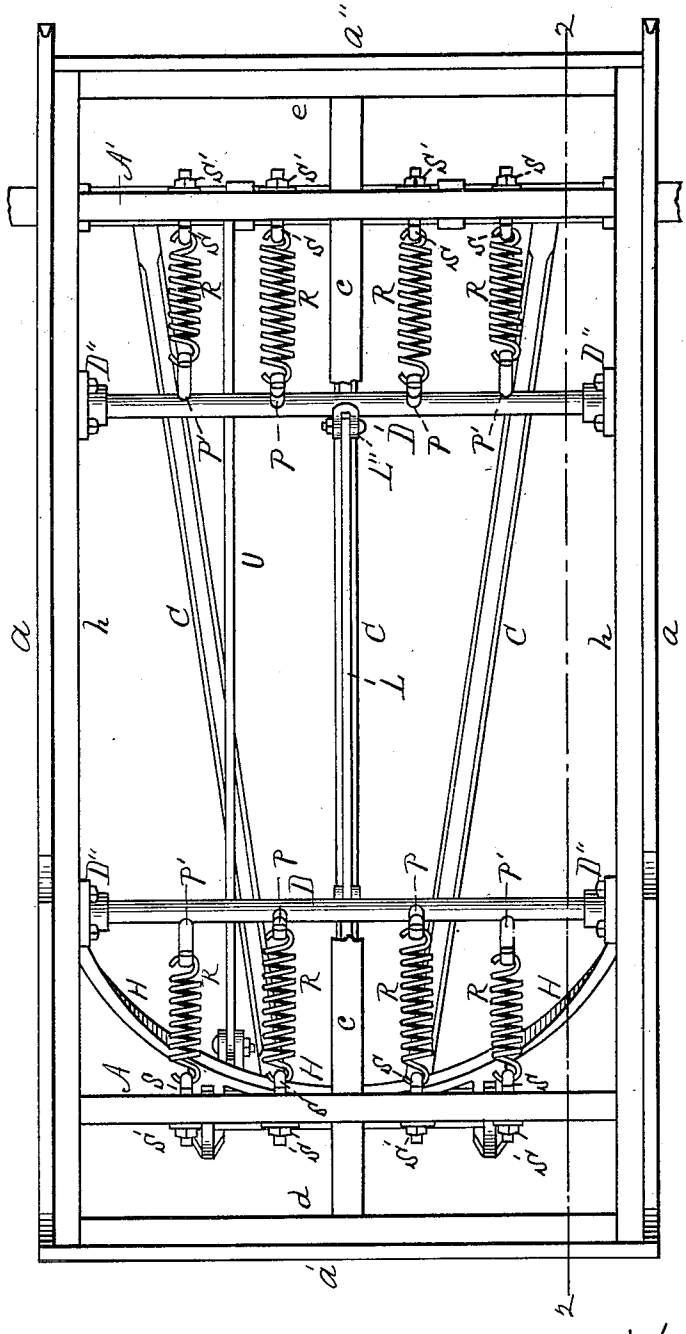


Fig. 1.

WITNESSES

A. A. Bonnay.

E. A. Swett.

INVENTOR

David True,

By his Atty.

Henry C. Williams

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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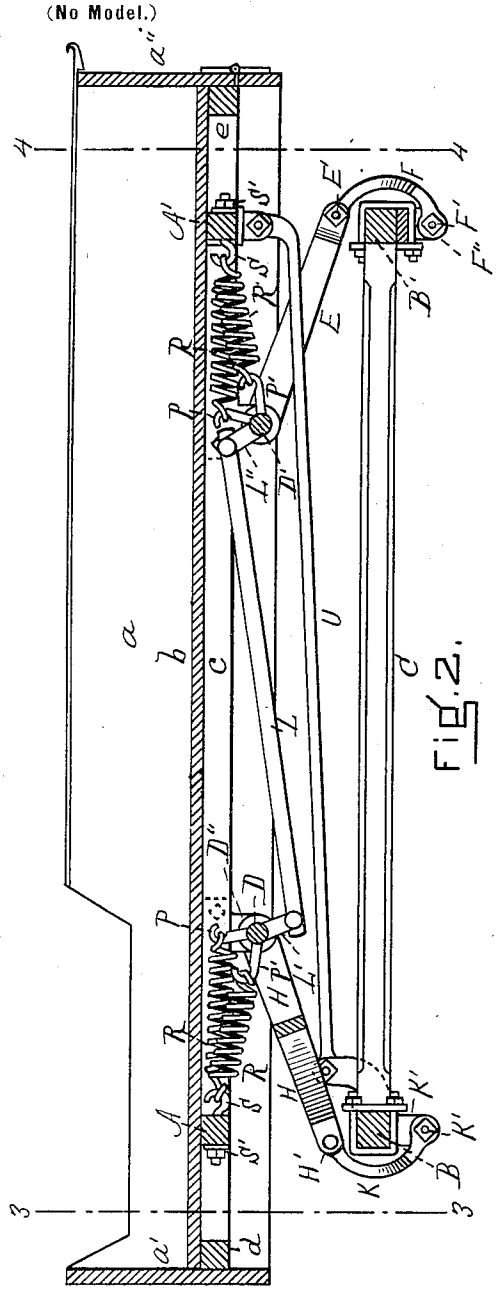


Fig. 2.

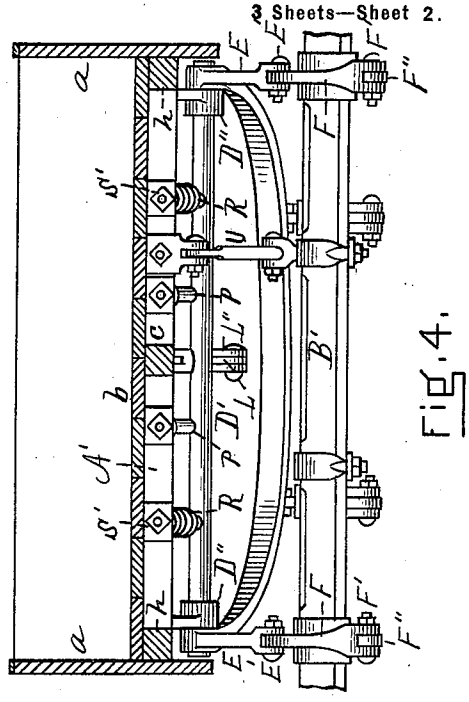


Fig. 4.

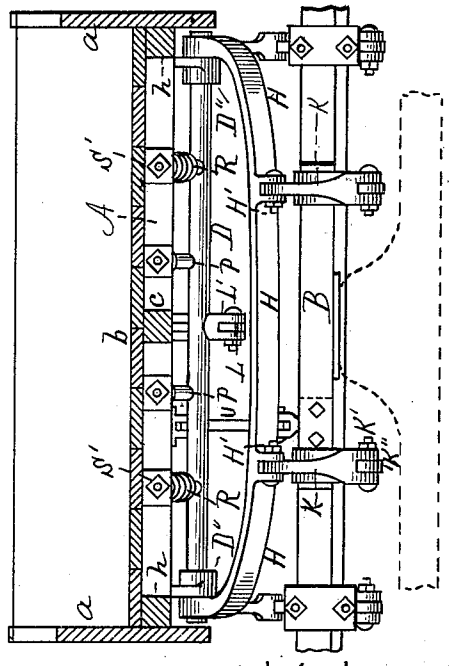


Fig. 3.

WITNESSES

A. A. Bonney.

E. A. Swett.

INVENTOR

David True,

By his Atty.

Henry Williams

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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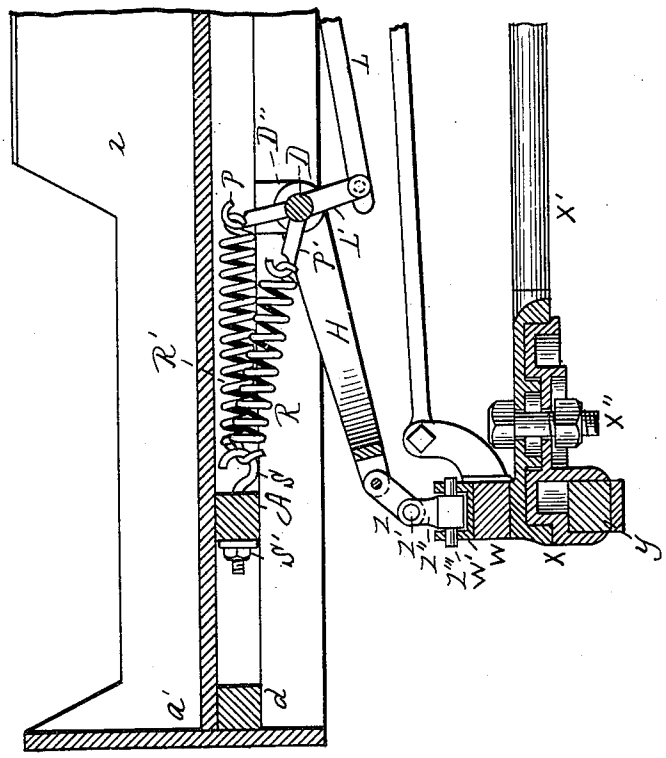


Fig. 5.

WITNESSES
A. N. Bonney.
E. A. Swett.

INVENTOR
David True
By his Atty.
Henry Williams

THE BROWN-PETERS CO., PHOT.-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

DAVID TRUE, OF AMESBURY, MASSACHUSETTS.

SPRING-GEAR FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 659,718, dated October 16, 1900.

Application filed January 27, 1900. Serial No. 3,002. (No model.)

To all whom it may concern:

Be it known that I, DAVID TRUE, a citizen of the United States, residing in Amesbury, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Spring-Gear for Vehicles, of which the following is a specification.

This invention relates to that class of spring-gear for vehicles, and especially for carriages and wagons, in which the movement of the carriage-body with relation to the running-gear is purely a vertical one, the body being caused by the springs to move vertically, remaining always at horizontal planes and all portions of the body moving up and down at the same time.

My invention consists in a certain novel construction and in novel arrangements of parts whereby this is accomplished. "Side slat" or tipping down at one side, corner, or end of the body is prevented, the amount of space between the carriage-body and the axles reduced without danger of striking, the vehicle rendered exceedingly easy to the occupants, and other advantages secured.

The nature of the invention is fully described below and illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a spring-gear embodying my improvement with the sides, front, and end of a carriage-body applied, a portion of the central longitudinal bar being represented as broken out. Fig. 2 is a longitudinal vertical section taken on line 2, Fig. 1, the floor of the body being shown in position. Fig. 3 is a cross vertical section taken on line 3, Fig. 2. Fig. 4 is a cross vertical section taken on line 4, Fig. 2. Fig. 5 is a detail, mostly in longitudinal vertical section, illustrating the application of the invention to a carriage in which a fifth-wheel is employed.

Similar letters of reference indicate corresponding parts.

In Figs. 1 to 4, inclusive, *a* represents the sides, *a'* the front or dashboard, *a''* the back or end-gate of the carriage-body, and *b* is the floor, all constructed as usual.

c represents a longitudinally-arranged mid-bar extending from the front to the rear of the frame, such frame comprising the front bar *d*, rear bar *e*, and side bars *h*.

A and A' represent, respectively, cross-bars extending across the frame beneath the floor near the front and rear ends of the vehicle and substantially over the front and rear axles. The rear axle is lettered B' and the front axle is not shown, but is under the bar B, to which it is pivotally connected in the ordinary manner. (See dotted lines in Fig. 3.) The rear axle B' and front bar B are connected by the bars C.

D D' are rods supported in suitable boxes D'', sustained by the side bars *h*, said rods being nearer the center of the frame than the axles. Rigid on the ends of the rear rod D' are rearwardly-extending arms E, whose lower ends are pivotally connected at E' with shackles F, which curve around the rear side of the rear axle and are hinged at F' to ears F'', secured to the under sides of the axle B'. Rigid on the ends of the front rod D is a bow-shaped frame H, which extends forward from said rod and has pivotally secured to it at H' the upper ends of the shackle K, curving around the forward end of the bar B, and with the lower ends hinged at K' to ears K'', secured to the under side of the bar B. The operation of the frame H and shackles K is substantially the same as that of the bars E and shackles F. The rods D and D' are connected by a bar L, whose opposite ends are pivotally secured to projections L' and L'', extending, respectively, downward and upward from said rods D and D', whereby reverse rotation is communicated from one to the other.

P P' are hooks secured to the rods D and D' and extending radially therefrom. For reasons below mentioned these hooks are not all set at the same radial line. In the drawings some are on one radial line and some on another. I propose, however, to set them on different radii, if it seems advisable. The number of radii and variety thereof may vary according to circumstances. These radially-arranged hooks are connected by springs R with the cross-bar A A', the connections consisting of adjustable screw-hooks S, secured by nuts S'. The springs may be equal in thickness and strength or not, as desired, and their tension may be regulated by the screw-hooks.

U is a guy-rod or stay-rod pivotally se-

cured at its ends centrally to the cross-bar A′ and the front bar B.

When a person steps into a carriage embodying this invention, the entire carriage-body is depressed vertically, so that the planes of depression are parallel, thus avoiding pulling down one side or one corner, or what is termed "side slat." The only springs are the springs R, (illustrated in the drawings,) which may be as numerous as desired. These springs may be set at different tensions, as above mentioned, and the hooks P P′ may be set at different radii, so that as the carriage is being loaded a part only of the springs may be brought into action when the first occupant enters the carriage and more of them or less of them when the second or third person enters the carriage. Thus the springs are used according to the need of them, and a single spring-gear is adapted for a greater range of loads than is the case with ordinary springs, in which a spring adapted for a heavy weight or to sustain a load of four persons is too stiff for comfort when the carriage is lightly loaded. The guy-rod limits the longitudinal movement of the carriage-body and prevents longitudinal shake or slat. As will readily be understood, the depression of the frame by the application of weight to it forces the shackles F K outward and swings the outer ends of the bars E and bow H toward a horizontal position, thus rotating the rods D D′ inward or toward each other and stretching the springs. Supposing the springs to be of equal length and thickness and their rear connections on lines parallel with the bars A A′, the springs whose inner ends are attached to the hooks P would be the first to be affected when a load enters the carriage and after this the springs P′ would resist the load. Hence it is clear that the spring-resistance may be successive or the bulk of its resistance may be successive. The adjusting of the gear to the use of particular individuals is done by selection of springs and by adjusting the screw-hooks.

It is evident that inasmuch as the plane of the frame *c d e* and of the frame represented by the bars B C and axle B′ are always equal and that it is hence impossible when one wheel passes over a stone that any portion of one of said frames may be forced nearer the other than any other portion said frames may be set nearer together than is ordinarily the case, or, in other words, the carriage-body may be set lower and nearer the axles.

In Fig. 5 the frame H and guy-rod U are connected with the raised portion W of a fifth-wheel X on the front axle Y. The mode of connecting the guy-rod is exactly the same as indicated in the first four figures in the drawings. The frame H, however, is connected to the upper side of the fifth-wheel by means of the vertically-swinging link Z, pivotally connected at its upper end with the frame H and at its lower end at Z′ with the arm Z″, swinging on the trunnion Z‴, having bearings in the upper portion W′ of the raised portion W. Thus provision is made for longitudinal and lateral swing. X′ is a bar extending rearward to the rear axle, and X″ is the king-bolt.

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

1. In a spring-gear for vehicles, a frame above the axles for supporting the carriage-body; a pair of rods or shafts supported by and having their bearings in said frame; mechanism connecting said rods or shafts whereby the rotation of one imparts reverse rotation to the other; springs extending from said rods or shafts to said frame; the stationary portion of the running-gear comprising the rear axle, the portion over and supported by the front axle, and the connections between said portion and the rear axle; and arms rigid on said rods or shafts and pivotally connected at their lower ends with the stationary portion of the running-gear, substantially as and for the purpose set forth.

2. In a spring-gear for vehicles, a frame above the axles for supporting the carriage-body; a pair of rods or shafts supported by and having their bearings in said frame; mechanism connecting said rods or shafts whereby the rotation of one imparts reverse rotation to the other; springs extending from said rods or shafts to said frame; the stationary portion of the running-gear comprising the rear axle, the portion over and supported by the front axle and the connections between said portion and the rear axle; and jointed arms rigidly secured at their upper ends to the rods or shafts and pivotally secured at their lower ends to the stationary portion of the running-gear, substantially as described.

3. In a spring-gear for vehicles, a frame above the axles for supporting the carriage-body; a pair of rods or shafts supported by and having their bearings in said frame; mechanism connecting said rods or shafts whereby the rotation of one imparts reverse rotation to the other; springs extending from said rods or shafts to said frame; the stationary portion of the running-gear comprising the rear axle, the portion over and supported by the front axle and the connections between said portion and the rear axle; the arms E rigidly secured at their upper ends to the rear rod or shaft; and the curved shackles F pivotally secured at their opposite ends to the rear axle and to the lower ends of said arms, substantially as set forth.

4. In a spring-gear for vehicles, a frame above the axles for supporting the carriage-body; a pair of rods or shafts supported by and having their bearings in said frame; mechanism connecting said rods or shafts whereby the rotation of one imparts reverse rotation to the other; springs extending from

said rods or shafts to said frame; the stationary portion of the running-gear comprising the rear axle, the portion over and supported by the front axle and the connections between said portion and the rear axle; the bow-shaped frame H rigidly secured at its ends to the front rod or shaft; and the curved shackles K pivotally connected at their opposite ends to the bow-shaped frame and to the bar supported by the front axle, substantially as described.

5. In a spring-gear for vehicles, a frame above the axles for supporting the carriage-body; the shafts or rods D, D′ supported in bearings in the frame; mechanism connecting said rods or shafts whereby reverse rotation toward each other is communicated from one to the other; hooks P extending substantially radially from said rods or shafts; springs extending from said hooks to the frame; the rear axle B′; the portion of the running-gear supported by the front axle; and jointed arms pivotally connected at their opposite ends with the rods or shafts D, D′ and the axle B′ and portion supported by the front axle, substantially as set forth.

6. In a spring-gear of the character described, the frame above the axles for supporting the carriage-body; the rods or shafts D, D′ supported and having their bearings in the frame; a plurality of hooks or engaging projections P, P′ extending from said rods on such lines as to prevent the outer ends of said hooks from projecting below the rods; springs connecting said hooks with the frame; the frame for the running-gear; and mechanism intermediate with the running-gear frame and the frame supporting the body for rotating the shafts or rods D, D′ inwardly or toward each other when the carriage-body is depressed; whereby as the hooks P, P′ are swung down no portion of either of said hooks or springs is moved below the under side of the shafts D, D′, substantially as described.

DAVID TRUE.

Witnesses:
HENRY W. WILLIAMS,
A. N. BONNEY.