J. W. MARKS.

Spring-Equalizers.

No. 158,956. Patented Jan. 19, 1875.

FIG. 1.

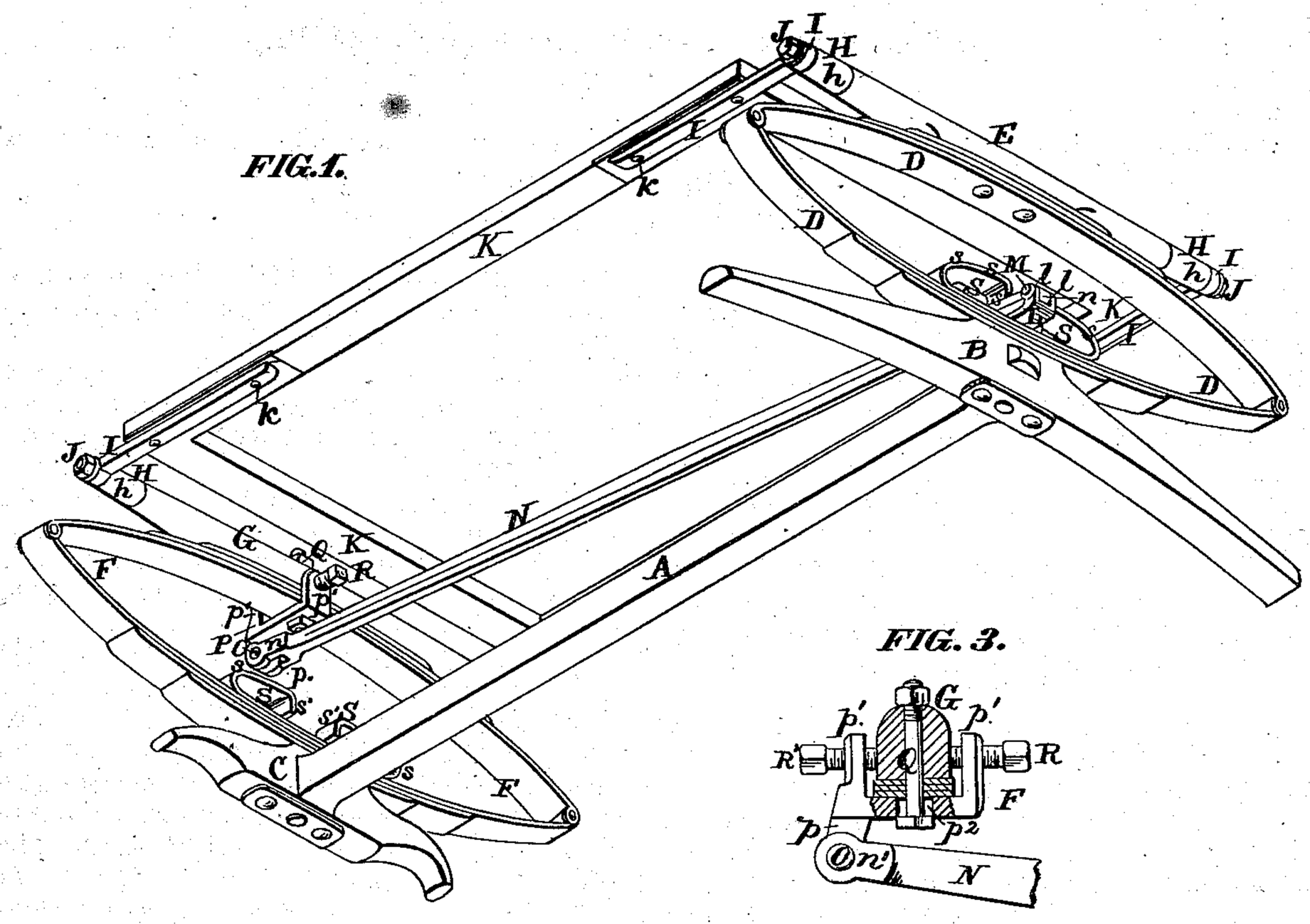


FIG. 3.

FIG. 2.

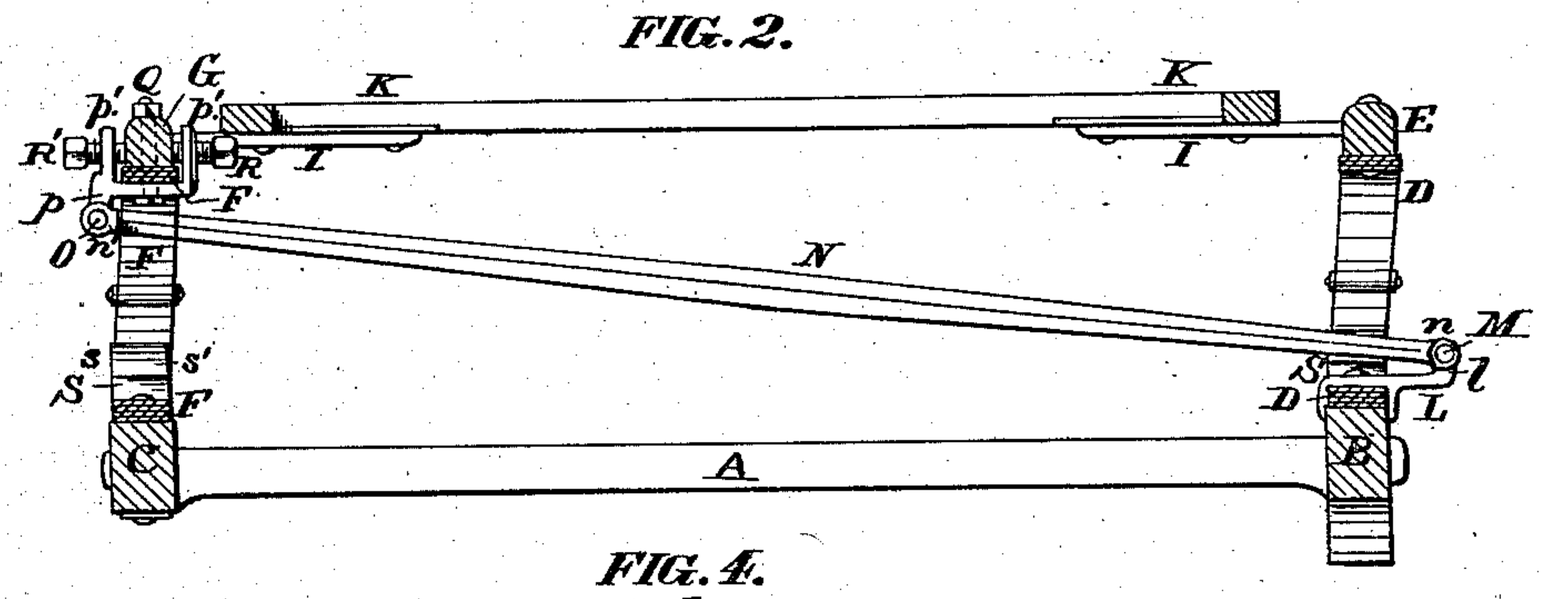
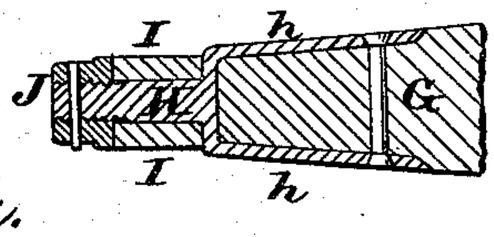


FIG. 4.



ATTEST:

Robert Burns.
Henry Tanner.

INVENTOR:

John W. Marks
By Knight Bros.
Attys.

UNITED STATES PATENT OFFICE.

JOHN W. MARKS, OF SUMNER, ILLINOIS.

IMPROVEMENT IN SPRING-EQUALIZERS.

Specification forming part of Letters Patent No. **158,956**, dated January 19, 1875; application filed November 28, 1874.

To all whom it may concern:

Be it known that I, JOHN W. MARKS, of Sumner, in the county of Lawrence and State of Illinois, have invented a certain new and useful Improvement in Carriages, of which the following is a specification:

My improvement consists in a tie (or push-and-draw) brace which extends from the lower part of the hind spring to the upper part of the forward spring, the said tie-brace having means for adjustment at one end. This is to prevent the straining of the spring and its attachments, and thus to add to the safety and durability of the vehicle.

The second part of my improvement consists in the combination of the tie-brace with spring inclined slightly backward from a vertical position, so that the upper part of the front spring shall not be pushed forward by the tie-brace as the spring is compressed, the spring being in a plane at right angles with the mean position of the brace, so that the upper and lower attachments of the spring are about equidistant from the rear attachment of the brace, which constitutes its point of oscillation.

The third part of my improvement consists in the combination, with the tie-brace, of spring bumpers or stops, which prevent the upper and lower parts of the springs from bumping together or striking the tie-brace which passes between them. Each bumper-spring is attached to the top of the lower part of the carriage-spring, and consists of a single plate having its ends curved over inward and downward, so as to present a rounded surface for the impingement of the upper part of the main spring. The ends of the bumper-springs extend downward vertically, and, in case of a very severe bump, may be forced down until they rest upon the main part of the plate and impart to the bumper an almost unyielding character.

Figure 1 is an under perspective view of my improvement. Fig. 2 is a longitudinal section. Fig. 3 is an enlarged section transversely through the middle of the fore spring and spring-bar, showing the attachment of the front end of the tie-brace. Fig. 4 is an axial section through the end of a spring-bar, showing the connection therewith of the sling-iron or body-loop.

A is the reach. B is the hind stock and C the fore stock. D is the hind spring, and E its spring-bar. F is the fore spring, and G its spring-bar. At the ends of the spring-bars are axially-extending studs or pins H, forming the pivotal attachments for the sling-irons or body-loops I.

These pivot-studs may be cast in one piece with the socket-ferrules *h* upon the ends of the spring-bars, or may consist of a separate pin driven axially through the end of the ferrule and into the spring-bar.

The described pivotal connection of the sling-irons with the spring-bars admits of the irons turning freely on the pivots H, so that the movements of the carriage-body upon the springs does not tend to strain the connection, as is the case with the ordinary construction, where a vertical bolt passes through both sling-iron and spring-bar, thus forming a rigid connection, which is necessarily strained, and becomes loose in the irregular movements of the body upon the springs.

The sling-irons may be held on the pivots H by a nut or collar, J, on the end of the stud, secured by a diametric pin, as shown. The sling-iron may be attached to the body K in the usual manner by bolts or rivets *k*.

L is a bracket secured to the top of the lower part of the hind spring, and having ears *l l*, through which passes a pin, M, running through the eye *n* at the rear end of the push-and-draw or tie brace N. This brace extends preferably from the rear of the hind spring at bottom to the front of the fore spring at top, so that the brace shall have as great a length as possible, to cause the arc in which the fore end of the tie-brace moves to approximate, as nearly as feasible, to a straight line, so as to avoid the straining of the springs or their attachments.

It is hardly necessary to call attention to the fact that a brace much shorter than that proposed would not fulfill the purpose intended, for the reason that the movement of the upper part of the spring (in the compression and expansion of the spring) is nearly in a straight line, and any connection confined to travel in an arc of a circle of small radius would cramp and strain the movements to such an extent as to render the vehicle very uneasy in use, and also tear loose the attachments of the

spring, thus not only failing to accomplish the purposes of said brace, but lessening in place of increasing the durability.

The fore end of the tie-brace N has an ear, n' n', through which passes a pivot-pin, O, passing also through the lug p of the bracket P secured to the upper part of the fore spring and spring-bar F G. The bracket P is secured by a vertical bolt, Q, passing through a longitudinal slot, p^2, in the bracket, to allow the bracket longitudinal adjustment upon the said bolt. The bracket P has upon its upper side lugs p^1, through which pass set-screws R R′, bearing respectively against the front and rear sides of the spring-bar G. By means of these set-screws the bracket P may be longitudinally adjusted when the bolt Q has been loosened. S S are stop-springs placed on top of the lower parts of the springs D and F. These springs have over-curved portions s s and vertically-descending ends s' s', which, under the effect of a heavy blow from the top part of the spring, (D or F,) may be forced down so as to impinge against the top of the central part of the stop-spring, and thus form a nearly-rigid abutment to prevent the further collapse of the spring D or F. Between the ends s' s' is a space for the passage of the tie-brace, the said brace being protected from the blow of the upper part of the springs D and F by the said stop-springs.

It will be observed that the brace N is so formed as to resist both tensional and compressive strain.

I am aware that the front and rear springs have been connected or tied by means of a rod before. This, therefore, I do not claim broadly; but

What I claim as new and of my invention is—

1. The push-and-draw brace N, extending from the lower part of the rear spring to the upper part of the fore spring, and having at the forward end adjustable connection P Q R R′, all combined substantially as and for the purposes set forth.

2. The combination of brace N, attached to the carriage at the lower part of the hind spring, and the upper part of the fore spring, and the backwardly-inclined springs D F, all combined substantially as and for the purpose set forth.

3. The combination of springs D and F, push-and-draw brace N, and abutment or stop springs S, all substantially as and for the purposes set forth.

JOHN W. MARKS.

Witnesses:
CALEB HOOPES,
THOS. F. HOOPES.