

No. 647,579.

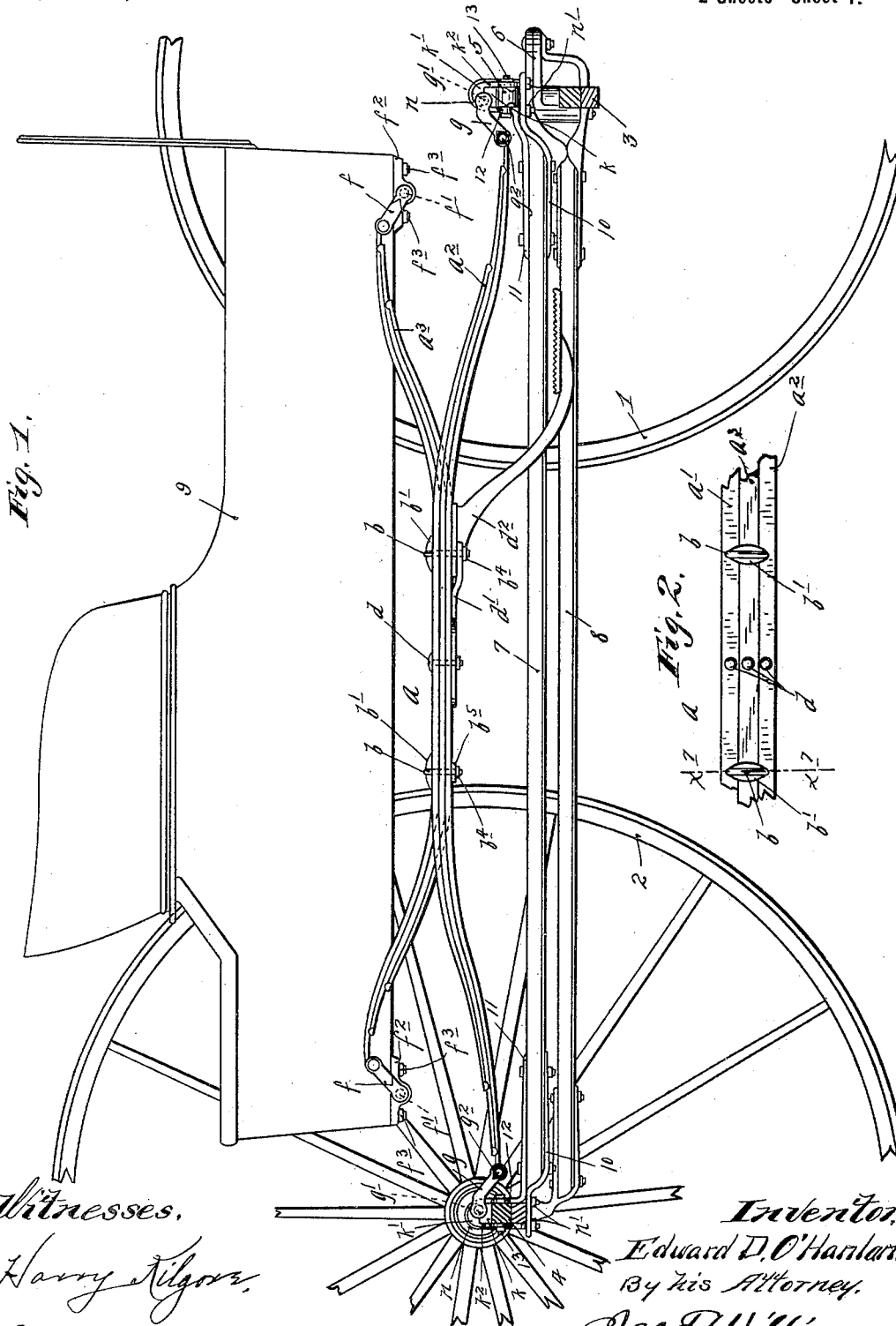
Patented Apr. 17, 1900.

E. D. O'HANLAN.
CARRIAGE SPRING.

(Application filed Dec. 4, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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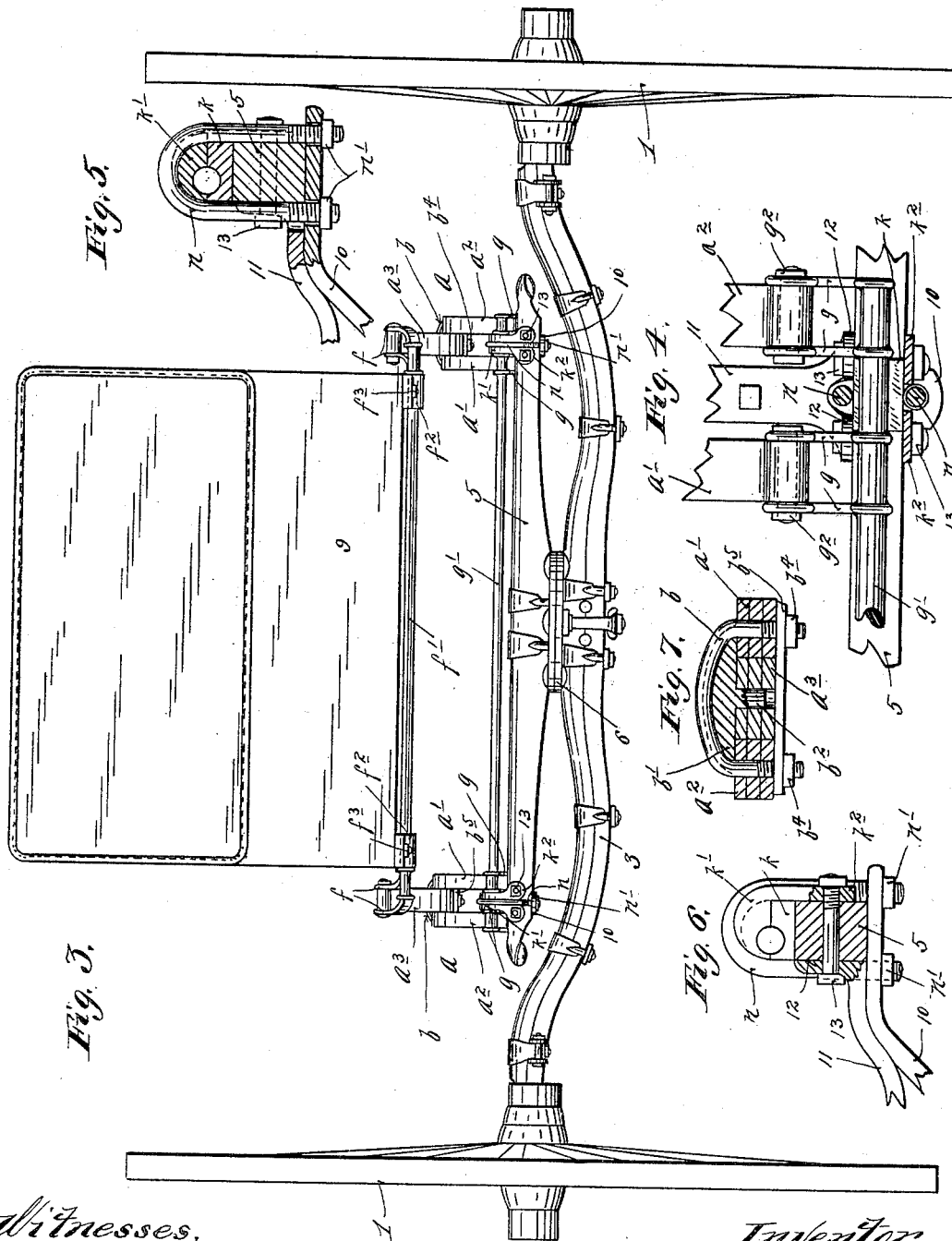
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UNITED STATES PATENT OFFICE.

EDWARD D. O'HANLAN, OF MINNEAPOLIS, MINNESOTA.

CARRIAGE-SPRING.

SPECIFICATION forming part of Letters Patent No. 647,579, dated April 17, 1900.

Application filed December 4, 1899. Serial No. 739,095. (No model.)

To all whom it may concern:

Be it known that I, EDWARD D. O'HANLAN, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Carriage-Springs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to road-vehicles, and has for its especial object to provide improved supporting-springs and equalizing connections for the springs.

To the above ends the invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a view principally in side elevation, but with some parts sectioned and others broken away, showing a road-vehicle with my improved spring devices and equalizing connections applied thereto. Fig. 2 is a plan view showing the central portion of one of the side springs. Fig. 3 is a front elevation of the road-vehicle. Fig. 4 is a detail view, partly in plan and partly in section, showing the end portions of one of the springs and means for connecting the same to the rear axle. Fig. 5 is a detail view, partly in side elevation and partly in vertical section, illustrating the means for attaching the side reach-rods to the so-called "head-block." Fig. 6 is a similar view to Fig. 5, but taken on different lines; and Fig. 7 is a transverse section on the line $x^7 x^7$ of Fig 2.

Of the parts of the vehicle, 1 indicates the front wheels; 2, the rear wheels; 3, the front axle; 4, the rear axle; 5, the head-block; 6, the so-called "fifth-wheel;" 7 8, the reach-bars; 9, the body, and a the side springs as entireties.

The novelty of my invention resides principally in the construction of the side springs a , but other minor novel features will be hereinafter noted. These novel side springs are each made up of three sections a' a^2 a^3 , the members a' and a^2 being spaced apart and ex-

tended parallel, while the spring-section a^3 is reversed or turned upside down, with its central portion placed between the central portions of the other two springs and rigidly secured thereto by suitable devices. The said three springs are in this preferred construction thus tied or rigidly secured at their central portions by a pair of threaded U bolts or yokes b , the prongs of which pass through perforations in the springs a' and a^2 and the bow portion of which clamp and hold in position disks or caps b' , provided with studs or projections b^2 , that are seated within suitable perforations in the spring-section a^3 . At their lower ends the screw-threaded ends of the yokes b are provided with nuts b^4 , that clamp in position short metallic straps b^5 , which are thereby pressed against the under surfaces of the three spring-sections a' a^2 a^3 . In this manner the central portions of the three spring-sections are rigidly but detachably secured together. The said central portions of the three springs may be further secured, if desired, by means of short nutted bolts d , passed therethrough and through a bracket d' , and an ordinary step-bracket d^2 may be secured to the spring by one of the yokes b , heretofore noted, or by any other suitable means.

The ends of the reversed central section a^3 of the side springs are pivotally connected to the free ends of arms f of transversely-extended equalizing rods or bars f' . In this preferred construction each arm f is formed by two prongs, both of which are integrally formed with the corresponding equalizing-rod f' , and solid bearings f^2 are placed upon the said rods in the process of their construction. These bearings f^2 are secured to the under end portions of the vehicle-body 9 by means of screws or bolts f^3 , so that the equalizing-rods f' are passed close to but just under the bottom of the body 9.

The ends of the outer and downwardly-extended spring-sections a' and a^2 are pivotally connected to the free ends of arms g of transversely-extended equalizing-bars g' . The said arms g are also in this preferred construction formed integral with the rods g' and are spaced laterally in pairs adapted to embrace the ends of said spring-sections, which are pivotally connected thereto, as above in-

dictated, by means of bolts g^2 . At their forward ends the springs $a' a^2$ are thus supported from the forward equalizing-rod g' , which in turn is supported from the transverse head-block 5, while at their rear ends said springs are supported from the rear equalizing-rod g' , which in turn is supported from the rear axle. The devices for mounting the equalizing-rods g' in the one case on the head-block 5 and in the other on the rear axle are alike, and the description of the said parts as applied to the said head-block will answer as a description of the same application thereof to the rear axle.

Near each end of the head-block 5 and in line with the side reach-rod 7 the equalizing-rod g' is directly mounted in a split box $k' k'$, the upper section k' of which has a depending lug k^2 , that overlaps the outer surface of the said head-block 5. The reach-bar 7 has projecting strap portions 10 and 11, the former of which passes under the bottom of the head-block 5 and the latter of which has vertical projecting flanges 12, which bear against the inner surface of the said head-block 5. Nutted bolts 13 are passed through the said vertical flanges 12 of the strap 11, through the head-block 5, and through the depending strap portion k^2 of the box-section k' . The lugs 12 and the depending strap portions k^2 are spaced apart far enough to permit a yoke or U-bolt n to be placed over the box-sections $k' k'$, and the head-block 5, with its screw-threaded ends, passes through suitable perforations in the reach-bar straps 10 11. Nuts n' on the screw-threaded ends of said yokes or U-bolts n clamp the ends of the straps 10 tightly against the bottom or under surface of the head-block 5. By this means the parts are rigidly secured together, but may nevertheless be readily separated when occasion demands it.

By the arrangement above described the side reach-rods 7 are positioned directly under the central or intermediate section a^3 of the corresponding side springs, and the end straps of the said reach-bars are applied to the head-block in the one instance and to the rear axle in the other at such points that they directly receive the load strains from the springs, and thus prevent torsional strains from being put upon the said head-block and rear axle. This is an important feature of the construction.

The triple arrangement of the sections of the side springs gives several important results. It gives a more extended lateral base of support for the springs on the equalizing-bars or on the running-gear directly if equalizing-bars are not employed, and thus gives greater lateral stability to the carriage-body, and consequently reduces the side swing or rolling motion of the said body. Again, as the upwardly and downwardly extended sections of the springs overlap or clear each other at their active ends or sections the springs are given greater resilience.

By reference particularly to Fig. 3 it will be noted that the parallel spring-sections a' a^2 are somewhat narrower than the central section a^3 . In designing these springs the sections are so proportioned that the two sections a' a^2 , working together, will have about the same strength and resilience as will the single spring a^3 , this of course being done in order to obtain the maximum efficiency from the composite spring as an entirety.

It will be further understood that the object in placing the laterally-spaced spring-sections a' a^2 at the bottom rather than at the top of the composite spring is to increase the base of resistance and lateral stability of the spring, and also by applying the torsional strains to the equalizing-rods g' at two points rather than at one, to thereby increase the efficiency of the equalizing-rods, with the result that the body of the carriage will be carried more nearly level, even with the load placed all at one side of the body. Furthermore, with the specific arrangement described, wherein the connections between the equalizing-rods g' and the cooperating springs $a' a^2$ are made on opposite sides of the bearings for that particular end of the said rod g' , the said rods are relieved from strains tending either to sag or to raise their central portions.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. A vehicle-spring of the character described, made up of three sections, secured side by side at their central portions, substantially as described.

2. A vehicle-spring of the character described, made up of the sections a' a^2 a^3 and secured side by side at their central portions, with the free ends of the central spring a^3 extended upward, and the free ends of the outside springs a' and a^2 extended downward, to increase the lateral base of support of the composite spring, substantially as described.

3. The combination with the running-gear and body of a vehicle, of side springs supporting the body from said running-gear, said side springs comprising each the three spring-sections a' a^2 a^3 connected side by side at their intermediate portions, equalizing-bars connecting the free ends of the intermediate spring-section a^3 to the carriage-body, and equalizing-bars connecting the ends of the spring-sections a' a^2 to said running-gear, substantially as described.

4. A spring of the character described, comprising the three spring-sections a' a^2 a^3 , the yokes or U-bolts b passed through and tying together the spring-sections a' and a^2 , the clips or disks b' held by said yokes b and provided with projections b^2 , engaging seats in the spring-section a^3 , the straps b^5 , and the nuts b^4 on the screw-threaded ends of said yokes b , said straps being clamped against the under surfaces of the said three spring-sections, substantially as described.

5. In a vehicle the combination with the

running-gear and body portion thereof of side springs supporting the body from said running-gear, each spring comprising the three sections a' a^2 a^3 , and side reach-rods connecting the rear axle and the head-block of the running-gear, said reach-bars being extended in the same vertical planes as the corresponding intermediate spring-sections a^3 , substantially as described.

6. The combination with a running-gear and body of a road-vehicle, of side springs connected by equalizing-rods to said body and said running-gear, and reach-bars extending from the rear axle to the head-block of said running-gear and directly and rigidly secured to and connecting the bearings or supports for the lower equalizing-rods, whereby the torsional strains are directly received by said reach-bars, substantially as described.

7. The combination with the running-gear and body of a vehicle, of the side springs made up of the sections a' a^2 a^3 , the equalizing-rods f f' connecting the spring-sections a^3 to said body, and with the equalizing-rods g g' , mounted in bearings, in the one instance on the head-block and in the other on the rear axle, the arms g of said equalizing-rods being spaced

apart to embrace the ends of the spring-sections a' and a^2 and to form intermediate bearing-surfaces for bearing-boxes, by means of which they are mounted on the said head-block and rear axle, substantially as described.

8. The combination with the composite side springs made up of sections a' a^2 a^3 of the equalizing-rods g g' , the arms g of which are spaced apart laterally and connected to the springs a' a^2 as described, the split boxes k k' , the latter having a pair of depending lugs k^2 secured by bolts or otherwise to the head-block or rear axle, as the case may be, and the screw-threaded yokes n embracing said box-sections and the said head-block or rear axle, nuts on the screw-threaded ends of said yoke, and a reach-rod, having straps through which said yoke is passed, the said yokes holding said straps in position, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD D. O'HANLAN.

Witnesses:

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F. D. MERCHANT.