

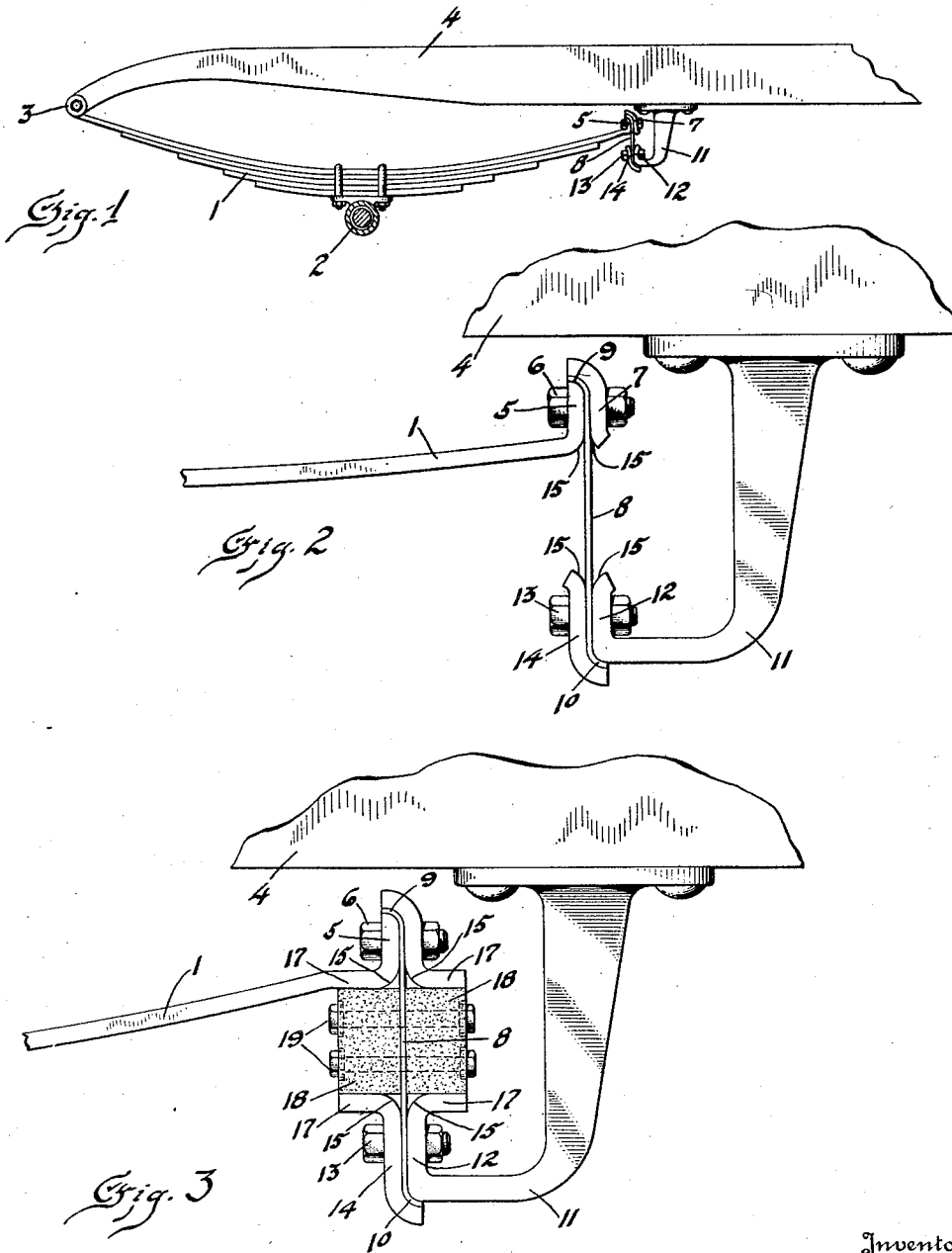
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1,783,394.

STEEL PLATE SPRING SHACKLE

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UNITED STATES PATENT OFFICE

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STEEL-PLATE SPRING SHACKLE

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This invention relates to spring shackles and the like particularly adaptable for use in supporting automobile chassis frames upon the vehicle springs.

5 In automobile construction it is the common practice to employ multiple leaf springs extending longitudinally of the frame, the axle being connected to the spring at a central point, with the frame pivoted to one end of the spring and suspended at the opposite end 10 upon a swinging link. Upon deflection of the spring, the ends tend to move outwardly, swinging the link about its pivots. It is desirable that the swing of the link settle down and return to normal as soon as possible. To this 15 end, the present invention contemplates the substitution for the freely swinging link, of a suspension link that will readily respond to the spring action, but which will restrain periods of swing and tend to maintain itself in proper position. 20

In the drawing, illustrating a preferred embodiment of the invention Figure 1 is a side elevation of a multiple leaf spring and a part 25 of an automobile frame suspended thereon, showing the application of the present invention.

Figure 2 is a fragmentary enlarged elevation of the shackle connection shown in Figure 1 forming the present subject matter. 30

Figure 3 illustrates a modification of Figure 2 construction.

Referring to the drawing, the vehicle supporting spring 1 is shown as consisting of a 35 number of separate leaves fastened to and carried by the axle 2, at a medial point. The front end of the spring 1, has a fixed pivotal connection 3 with the longitudinal frame member 4. At the opposite or rear end, the 40 spring is provided with an upstanding lip or flange 5, to which is fastened, as by means of screw studs 6, a plate 7, which clamps and holds between such plate 7 and the flange 5, the top of a thin flat metallic spring blade 8. 45 The upper extremity of the blade 8 is angularly curved or bent at 9 around the curved top extremity of the spring flange 5, to which curve, the clamp plate 7 also conforms. Thus this angular extremity or lateral lip or ear 9 50 bears upon the top of the flange, assisting or

supplementing the clamping action of the plate in sustaining the load and prevents withdrawal of the blade from its fastening. The blade extends downwardly in a substantially vertical direction, and its lower extremity 10 is angularly curved around the bottom of a bracket 11, which is bolted or otherwise secured to the longitudinal frame member 4 and depends therefrom. The terminal upstanding flange 12 has fastened thereto by screws 13, the clamp plate 14, to 60 attach the bottom of the blade 8 therebetween in a similar manner and for the same purpose as the upper end of the blade is secured to the spring. 65

Normally, the spring blade is in the unflexed vertical position shown in the drawing. Upon spring deflection, the spring end moves outward or longitudinally in respect to the frame, and the relative movement of its rigid 70 connections causes the blade to be flexed against its inherent tension. Since the blade carries the load or weight of the frame in a vertical plane it may be of light weight thin material. Flat spring steel has been found to be a suitable material from which to construct the blade, as its high tensile strength rigidly 75 supports the load, and obviates side sway. Its inherent tension offers yielding resistance to the relative movement of the spring end 80 in a direction at right angles to its flat surface and vertical plane of suspension.

In order to obviate the danger of sharp edges cutting into the blade, the mouths of the rigid connections, i. e. the bottoms of the 85 spring flange 5 and clamp plate 7, and tops of the bracket flange 12 and clamp plate 14, are flared or curved outwardly as at 15-15', which affords a smooth contact surface for the blade 8, as the intermediate portion is flexed upon the relative movement of the blade attachment points, when the spring end 90 moves outwardly upon spring deflection.

It will thus be seen that the present flexible shackle connection offers no interference to 95 spring deflection, but its inherent tension returns the parts to proper positions, maintaining such positions when the spring is uncompressed, as well as obviating tendency toward periods of swing. 100

In the modified construction shown in Figure 3, a portion of the main leaf spring 1, the bracket flange 12 and clamp plates 7 and 14 are formed with horizontal extensions 17—17 providing seats for a pair of resilient compressible elements 18, such as rubber blocks, one on each side of the spring blade 8. Fastening studs 19 project thru the blocks and blade to anchor the blocks in place. These blocks supplement the spring blade action, being compressed between the horizontal extensions 17 upon spring deflections.

While the parts and arrangement have been described more or less specifically, it is to be understood that the invention is not limited to the exact form shown but such obvious modifications may be made as come within the scope of the appended claims.

I claim:

1. In a road vehicle, the combination with a frame and a spring, of a connection for suspending the frame upon the spring including, a flat metallic spring blade, clamp plates rigidly connecting the ends of the blade to the frame and spring respectively, and angular lips on the blade bearing upon frame and spring to supplement the clamping action of the plates and insure a positive connection.

2. In a road vehicle, the combination with a frame and a spring, of a connection for suspending the frame upon the spring including a flat metallic spring blade formed with angular extremities, clamp plates fixedly securing the opposite ends of the blade to the frame and spring respectively, said angular extremities preventing withdrawal of the blade from the clamp plates and supplementing the function of said clamp plates.

3. In a road vehicle, the combination with a frame and a spring, of a connection for suspending the frame upon the spring including a flat metallic spring blade provided with lateral end portions, adapted to bear respectively upon the frame and spring, and clamp plates conforming in shape to said end portions adapted to firmly secure the opposite ends of the blade to the frame and spring.

4. In a road vehicle, the combination with a frame and a spring, of a connection for suspending the frame upon the spring including a flat metallic spring blade, means to firmly attach the opposite ends of the blade to the frame and spring respectively, the inner extremities of the attachment means being flared outwardly to facilitate distortion of said blade upon deflection of the spring.

5. In a road vehicle the combination with a spring having an end flange and a frame provided with a dependent bracket having an end flange, of a connection suspending the frame upon said spring, including a substantially vertically disposed flat metallic spring blade, clamp plates fixedly attaching the opposite ends of said blade between said

plates and end flanges respectively, integral lips on the blade bearing respectively upon the top of the spring flange and bottom of the bracket flange, said flanges and plates conforming in a shape and enclosing said lips, the inner margins of said flanges and clamp plates being flared outwardly to afford smooth surfaces on which the adjacent surfaces of the blade may freely ride when the intermediate portion of the blade is distorted by the relative movement of the attachment points upon deflection of said spring.

6. In a road vehicle, the combination with a frame and a supporting spring, of an inextensible but flexible connecting link suspending the frame upon the spring, and compressible members carried by the link yieldingly resisting relative movements of the frame and spring.

7. In a road vehicle, the combination of a supporting spring having a vertical end flange, and a frame provided with a dependent bracket having a vertical end flange, of a coupling suspending the frame upon the spring including a flat metallic spring blade, clamp plates fixedly attaching the opposite ends of said blade between said plates and respective vertical end flanges, and a pair of compressible blocks, one on each side of said blade and intermediate the respective attachment points, the inherent tension of the blade and compression of the blocks acting conjointly to resist relative movement of the attachment points.

In testimony whereof I affix my signature.
SAMUEL A. STRANAHAN.

CERTIFICATE OF CORRECTION.

Patent No. 1,783,394.

Granted December 2, 1930, to

SAMUEL A. STRANAHAN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, strike out claim 4, comprising lines 49 to 57 inclusive; same page, lines 58, 78 and 85, for claim numbers "5, 6 and 7" read 4, 5 and 6; and that the said Letters Patent should be read with these corrections that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 13th day of January, A. D. 1931.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.