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D. G. ROOS

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SPRING SHACKLE

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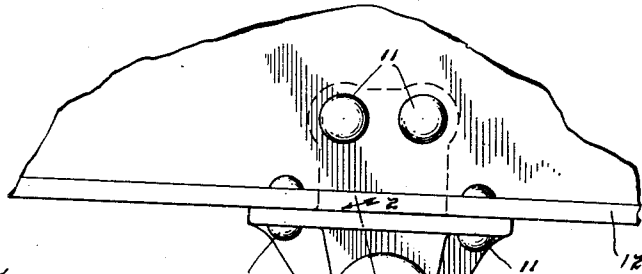


Fig. 1

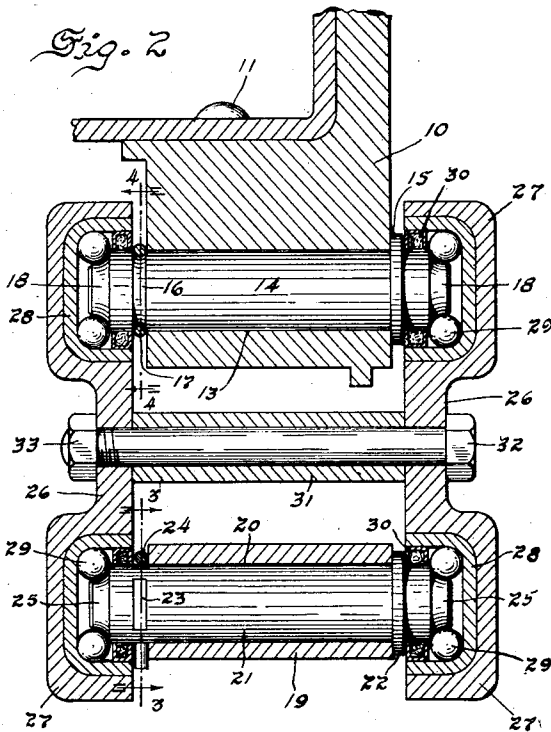


Fig. 2

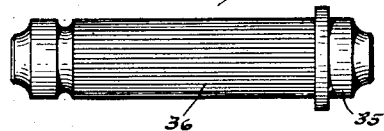


Fig. 5

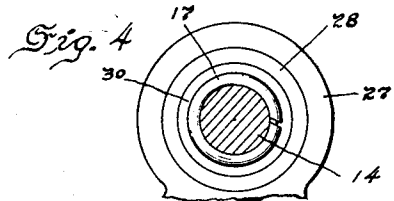


Fig. 4



Fig. 6

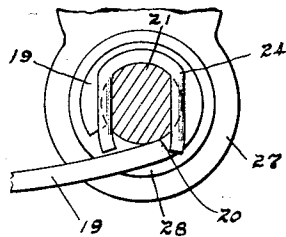


Fig. 3

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## UNITED STATES PATENT OFFICE

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## SPRING SHACKLE

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This invention relates to vehicle springs and particularly to means for shackling the same to the vehicle frame.

It is a common practice in spring shackles of the ball bearing type, to provide a straight shackle pin having bearing surfaces at its ends for the ball bearings which is either pressed into the spring eye or is free to rotate therein, there being no positive means provided to hold the pin against longitudinal movement. After running a considerable number of tests on these conventional constructions, it has been found that the squeaking of the shackle is due to the fact that the pins have moved longitudinally, which allows the shackle links to contact with and rub against the sides of the spring eye and frame spring hanger, hence, it is the principal object of the present invention to provide a vehicle spring shackle with means for holding the same against longitudinal movement to prevent one of the shackle links from engaging the sides of the spring and spring hanger.

Another object is to provide a vehicle spring shackle with a shackle pin having a shoulder thereon at one end abutting against one side of the spring hanger or spring eye and having a circumferential groove at the other end receiving a split circular ring abutting against the other side of the spring eye or spring hanger, to hold the shackle links in spaced relation with the spring and spring hanger.

Another object is to provide a spring shackle of the ball bearing type with a shackle pin having circular grooves at its ends which receive split spring rings that abut against the sides of the spring eye to anchor the pin against longitudinal movement whereby the shackle links are prevented from contacting with the sides of the spring to eliminate squeaking thereof.

These being among the objects of the present invention, the same consists of certain features of construction and combinations of parts to be hereinafter described with reference to the accompanying drawing, and then claimed, having the other and other objects in view.

In the accompanying drawing which illustrates a suitable embodiment of the present invention,

Figure 1 is a side view of a vehicle frame member, showing a spring connected thereto by a spring shackle.

Figure 2 is an enlarged section taken on the line 2—2 of Figure 1 showing two different types of shackle pins incorporated therein.

Figure 3 is a section taken on the line 3—3 of Figure 2 showing the section of the lower pin.

Figure 4 is a section taken on the line 4—4 of Figure 2, showing a section of the upper pin.

Figure 5 is a view of a modified form of pin having a serrated surface.

Figure 6 is a view of a modified pin having two circumferential grooves formed at its ends.

Referring to the accompanying drawing, in which like numerals refer to like parts throughout the several views, the frame spring hanger 10 is formed with a vertical face and a horizontal face which respectively seat against and are secured by rivets 11 to the vertical web and horizontal flange of the frame channel 12 of the vehicle frame. The frame spring hanger 10 extends downwardly below the horizontal flange of the spring hanger 10 and is provided with a horizontally extending opening 13. The upper shackle pin 14 is preferably forced into the opening 13 to hold the same against rotation and is provided with a circumferential flange 15 at one end which abuts against the outer face of the spring hanger 10. The flange 15 gives added strength to the pin 14 by increasing the area subjected to the greatest shearing stress, and many tests have proven that the adding of strength to the pin 14 at the point shown is of material value. A circular groove 16 is formed around the end of the pin 14 which projects past the inner surface of the spring hanger 10, and a split ring 17 preferably of spring material is received therein. The pin 14 is consequently held against longitudinal movement in one direction by the flange 15 at the one end, and is held against longitudinal movement in the

other direction by the split ring 17 seated in the groove 16 at the other end thereof. The intersecting corners of the cylindrical surface and end faces of the pin 14, are filleted to provide curved bearing seats 18.

5 As shown in Figure 3, the end of the vehicle spring 19 is rolled upwardly and rearwardly to form a circular eye 20 which receives the lower shackle pin 21. The pin 21 is formed with a flange 22 similar to the flange 15 on 10 the pin 14 which, when the pin 21 is pressed into the spring eye 20, abuts against the other face of the spring eye 19 for the same purpose as previously described, that is, to in- 15 crease the area subjected to the greatest shear-

at both ends of the pin 37 to hold the same against movement in a longitudinal direc- tion.

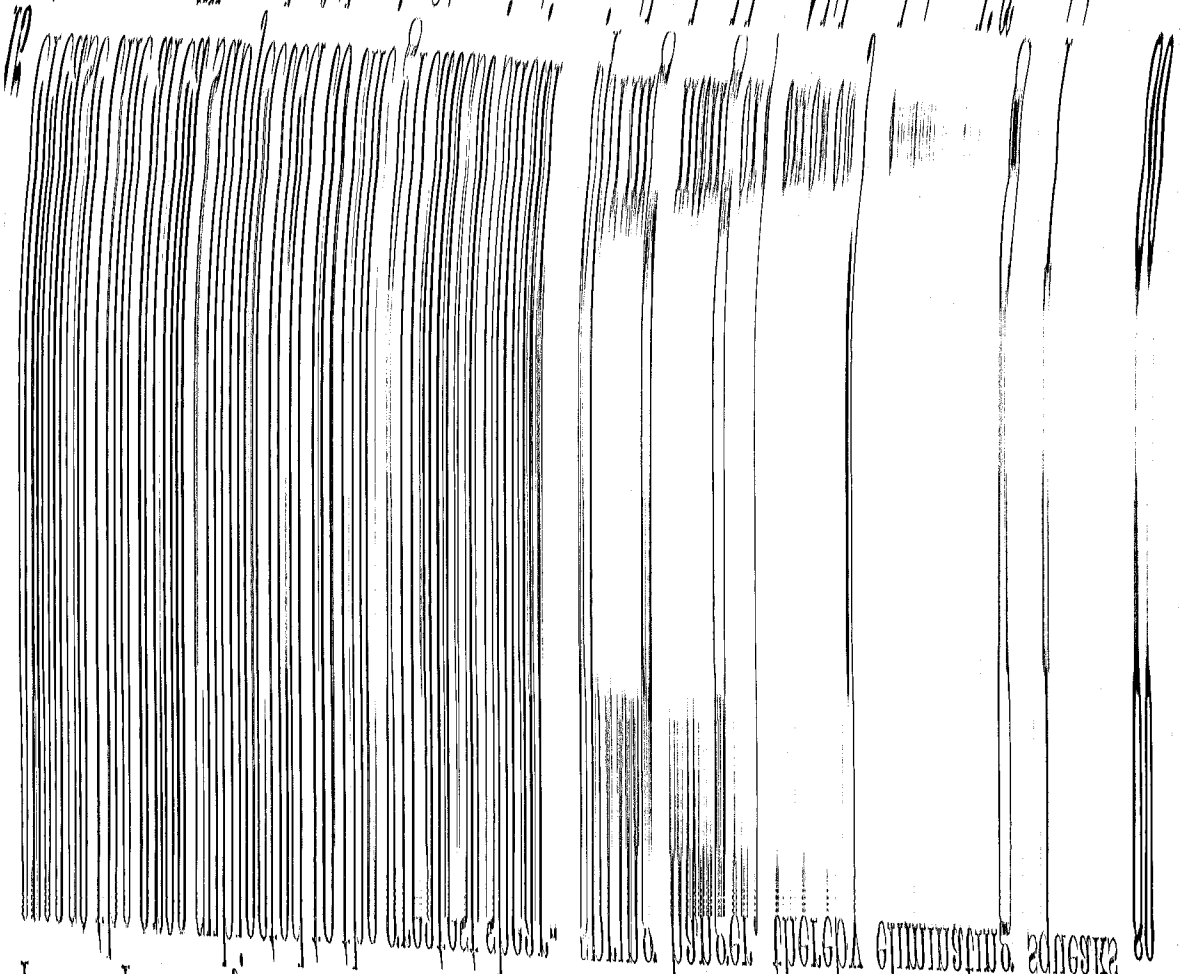
It is believed that the present invention has been sufficiently described so that anyone skilled in the art can readily understand that the preferred form of the spring shackle and the modifications shown in the drawing have certain advantages which are not present in any of the constructions used heretofore. It can be seen that by anchoring a shackle pin against longitudinal movement, the shackle links are prevented from contacting with and rubbing against the sides of the spring and spring hanger, thereby eliminating squeaks

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*ing stress. The end of the pin 21 projecting in the shackle. Although two different types of shackle pins are shown in Figure 3, it is not intended to limit the invention to the specific construction shown.*



*being as previously described, that is, to in- crease the area subjected to the greatest shear- ing stress. The end of the pin 21 projecting in the shackle. Although two different types of shackle pins are shown in Figure 3, it is not intended to limit the invention to the specific construction shown.*

against the adjacent side of said spring and spring hanger respectively, said flanges increasing the areas of said pins subjected to the greatest shearing stresses, means on said pins adjacent the ends opposite said flanges for anchoring said pins against longitudinal movement toward said spring and spring hanger, and a pair of spaced complementary shackle links connecting said pins, said anchored pins restraining said shackle links from engaging said spring and hanger.

4. In a spring shackle, a pair of complementary links connecting the spring and vehicle frame, a pin extending through said spring pivotally connected with said links, an abutment formed on said pin adjacent one end thereof, a groove in said pin adjacent the end opposite said abutment, and a clip seated in said groove, said abutment and clip restraining said pin against transverse movement relative to said spring and frame.

5. In a spring shackle, a pair of complementary links connecting a spring member and vehicle frame member, a pin extending through one of said members pivotally supported in said links, a flange on said pin adjacent one end thereof, a groove in said pin adjacent the end opposite said flange, and a clip seated in said groove, said flange and said clip restraining said pin against longitudinal movement in said member.

6. In a spring shackle, a pair of complementary links connecting the spring and vehicle frame, a pin extending through said spring pivotally connected with said links, means to restrain said pin against rotatable movement relative to said spring and frame, a flange formed on said pin adjacent one end thereof, a groove in said pin adjacent the end opposite said flange, and a clip seated in said groove, said flange and clip restraining said pin against movement transversely of said spring and frame.

7. In a spring shackle, a pair of complementary links connecting a spring member and a vehicle frame member, a pin extending through one of said members and pivotally connected with said links, serrations on said pin to restrain the same against rotational movement in said pin supporting member, an abutment formed on said pin adjacent one end thereof, a groove in said pin adjacent the end opposite said abutment, and a clip seated in said groove, said abutment and clip restraining said pin against movement transversely of said pin supporting member.

Signed by me at South Bend, Indiana, this 7th day of November, 1927.

DELMAR G. ROOS.