

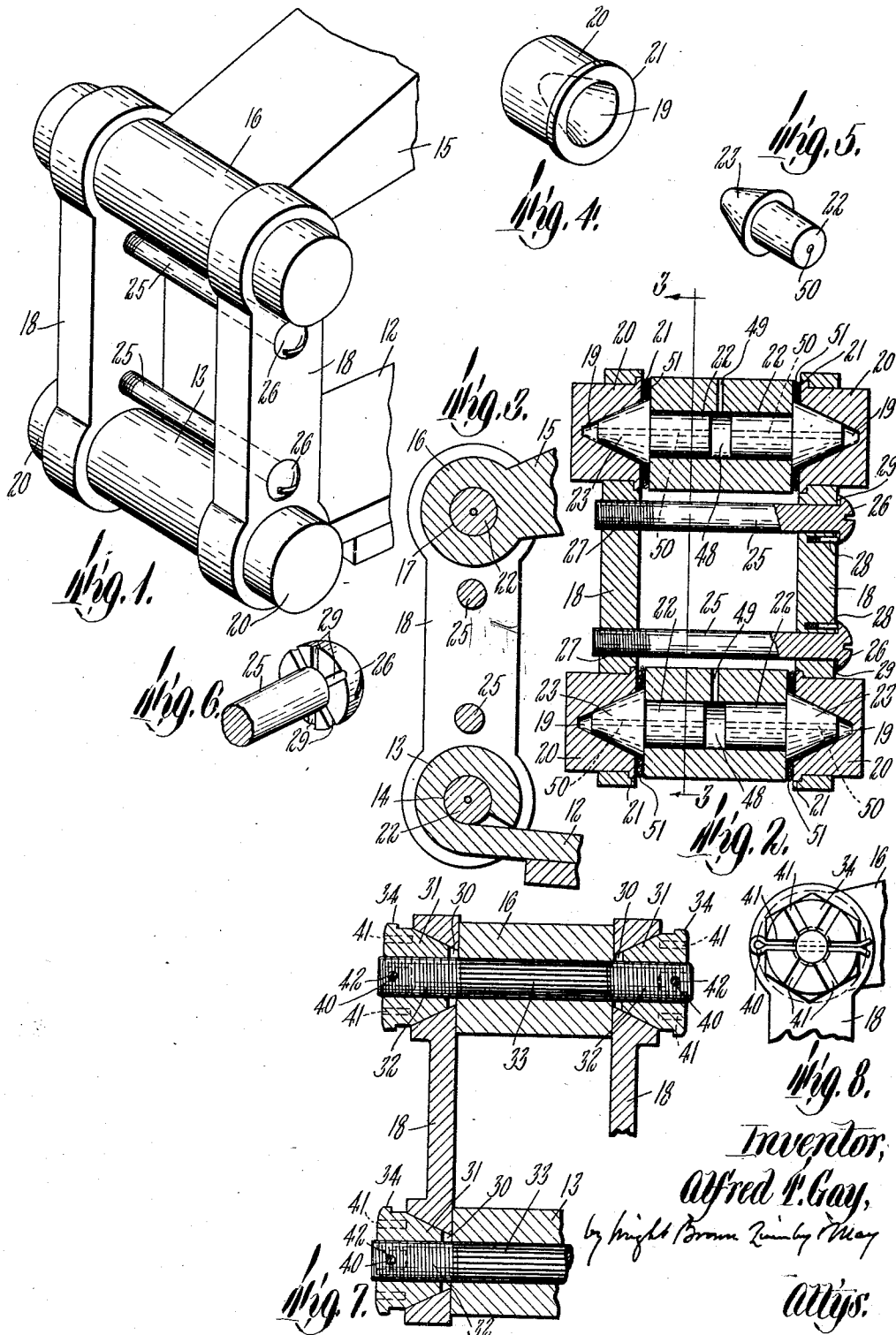
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SPRING SHACKLE

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## UNITED STATES PATENT OFFICE

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## SPRING SHACKLE

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This invention relates to a shackle adapted particularly for use in a motor vehicle to connect the free end portion of a body-supporting spring with a frame member of a spring-supported vehicle body, the shackle including a pair of links pivotally connected with, and extending between the spring and the body member.

The chief object of the invention is to provide a shackle which is adjustable to take up wear of the elements of the pivotal connections securing the ends of the shackle to the spring and frame or body member, and at the same time, prevent rattling contact of said elements with each other.

Other objects will hereinafter appear.

Of the accompanying drawings forming a part of this specification,—

Figure 1 shows in perspective portions of a spring and a body or frame member, and a shackle constituting the preferred embodiment of the invention.

Figure 2 is a sectional view of the same.

Figure 3 is a section on line 3—3 of Figure 2.

Figures 4, 5 and 6 are perspective views of parts shown by Figure 2.

Figure 7 is a fragmentary sectional view, showing a modification.

Figure 8 is a fragmentary end view, showing parts shown by Figure 7.

The same reference characters indicate the same parts in all of the figures.

In the drawings, 12 designates the free end portion of a vehicle body-supporting spring having a terminal eye 13, the cylindrical bore of the eye being designated by 14.

15 designates a body or frame member supported by the spring through a shackle embodying the invention, said member having a terminal eye 16, the cylindrical bore of which is designated by 17.

The shackle of my invention comprises two spaced apart links 18, extending from one terminal eye to the other, and provided with enlarged bearing sockets coaxial with the bores of the terminal eyes, and with studs inserted in said bores, and provided with enlarged journal portions fitted to turn in said bearing sockets, said enlarged journal por-

tions and bearing sockets being complementally formed, so that wear of their contacting surfaces may be taken up, and rattling contact of said surfaces with each other may be prevented by relative adjustments of the journal portions and sockets, means being provided in each of the illustrated embodiments of the invention for effecting said relative adjustments.

The bearing sockets in the links are provided by conical recesses 19 formed in bushings 20, having stop shoulders 21, seated on the inner sides of the links 18, said sockets being of decreasing diameter from their inner to their outer ends. The studs are composed of spaced apart sections 22, inserted in the bores 14 and 17, and provided with conical journal portions 23, conforming to, and fitted to turn in the bearing sockets 19.

I embody the means for effecting relative adjustments of the sockets 19 and journal portions 23 in clamping means connecting and adapted to decrease the distance between the links 18, and thus cause the links to force the sockets 19 inwardly relative to the journal portions 23, said means preferably including a bolt 25, having a head 26, bearing on the outer side of one of the links, and a threaded portion 27 engaged with a tapped orifice in the other link, the arrangement being such that rotation of the bolt in one direction decreases the distance between the links. To lock the bolt 25 in various positions to which it may be turned, I provide one of the links with a spring-pressed locking pin 28, adapted to engage either of a series of grooves 29 in the head 26. Two bolts 25 are shown by Figures 1 and 2, but it will be obvious that only one bolt may be provided, if desired.

In the modification shown by Figures 7 and 8, the bearing sockets are provided by conical or tapering orifices 30, formed in, and extending through the links, and increasing in diameter from their inner to their outer ends. The journal portions are conical nuts 31, engaged with the threaded end portions 32 of one piece studs 33, inserted in the bores of the terminal eyes 13 and 16, the studs 33 being preferably externally roughened between the threaded end portions, and tightly

driven into the terminal eyes, so that they cannot rotate therein. The nuts 31 have hexagonal portions 34, adapted to be engaged by a wrench, so that the nuts may be turned inwardly on the stud 33, to take up wear and prevent rattling. The nuts may be locked in different adjusted positions by cotter-pins 40, inserted in radial slots 41 in the outer ends of the nuts and in orifices 42 in the stud 33.

In each embodiment which includes studs formed in sections, the length of the sections is such that their inner ends are spaced apart and form the ends of oil chambers 48, in the bores of the terminal eyes 13 and 16. Oil may be supplied to said chambers through ducts 49, in the terminal eyes, and conducted to the bearing sockets through ducts 50 in the stud sections.

My improved shackle is adapted to be easily installed, removed and replaced, and is adapted to be engaged with the usual terminal eyes 13 and 16, no adaptation of said eyes to the shackle being required.

In the preferred embodiment of the invention shown by Figures 1 to 6, compressible washers 51 are interposed between the ends of the terminal eyes 13 and 16 and the inner ends of the bushings 20 in which the bearing sockets 19 are formed. Said washers are preferably of felt and their function is to exclude dust and dirt from the contacting surfaces of the bearing sockets and journal portions, and to retain a lubricant supplied to said surfaces.

Each of the described embodiments of the invention is characterized by the fact that the bearing sockets and journal portions have true conical surfaces complementary to each other, the contacting portions of said surfaces are therefore elongated and each portion is subjected to uniform wear from end to end, so that conformity of said surface portions to each other is not affected by wear.

I claim:

1. A shackle engageable with the cylindrical bores of terminal eyes on a body-supporting spring and a body member supported thereby, said shackle comprising spaced apart links extending from one terminal eye to the other and provided with bushings engaged with the links and having conical sockets, decreasing in diameter from the inner to the outer sides of the links and coaxial with the bores of the terminal eyes, and studs composed of spaced apart sections inserted in said bores and provided with conical journal portions conforming to, and fitted to turn in said bearing sockets, and clamping means connecting and adapted to decrease the distance between the links, and thereby effect relative adjustments of the journal portions and sockets, to take up wear of their contacting surfaces and prevent rattling contact of said surfaces with each other, said clamping means including a bolt having means at its

opposite ends for simultaneously exerting inward pressure on the links.

2. A shackle as specified by claim 1, comprising also means for locking the bolt in different adjusted positions.

3. A shackle as specified by claim 1, comprising also compressible washers interposed between the ends of the terminal eyes and the said bushings.

In testimony whereof I have affixed my signature.

ALFRED F. GAY.