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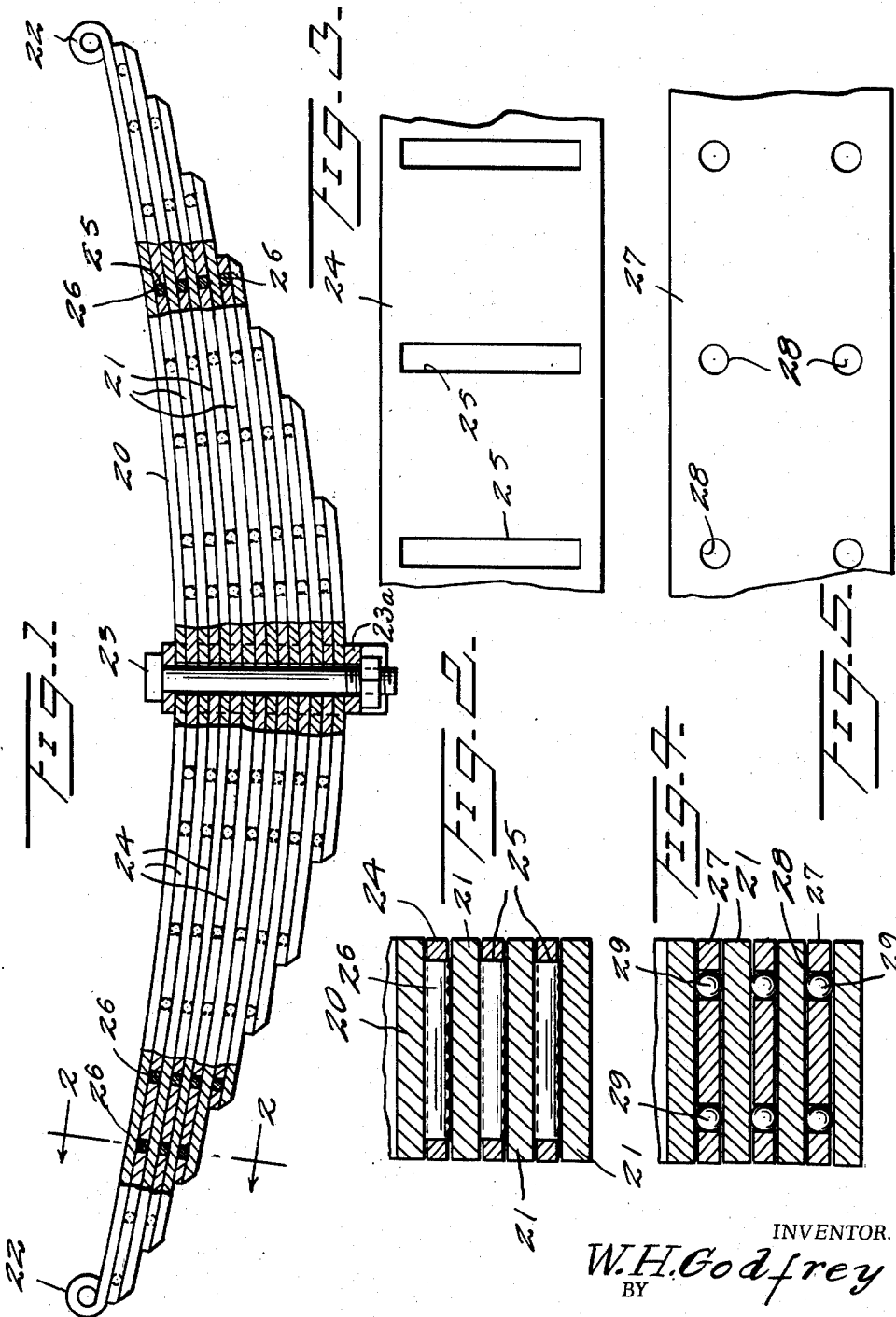
W. H. GODFREY

2,614,832

VEHICLE SPRING

Filed May 16, 1949

4 Sheets-Sheet 1



INVENTOR.

W. H. Godfrey

BY

Kimmel & Crowell ATTORNEYS

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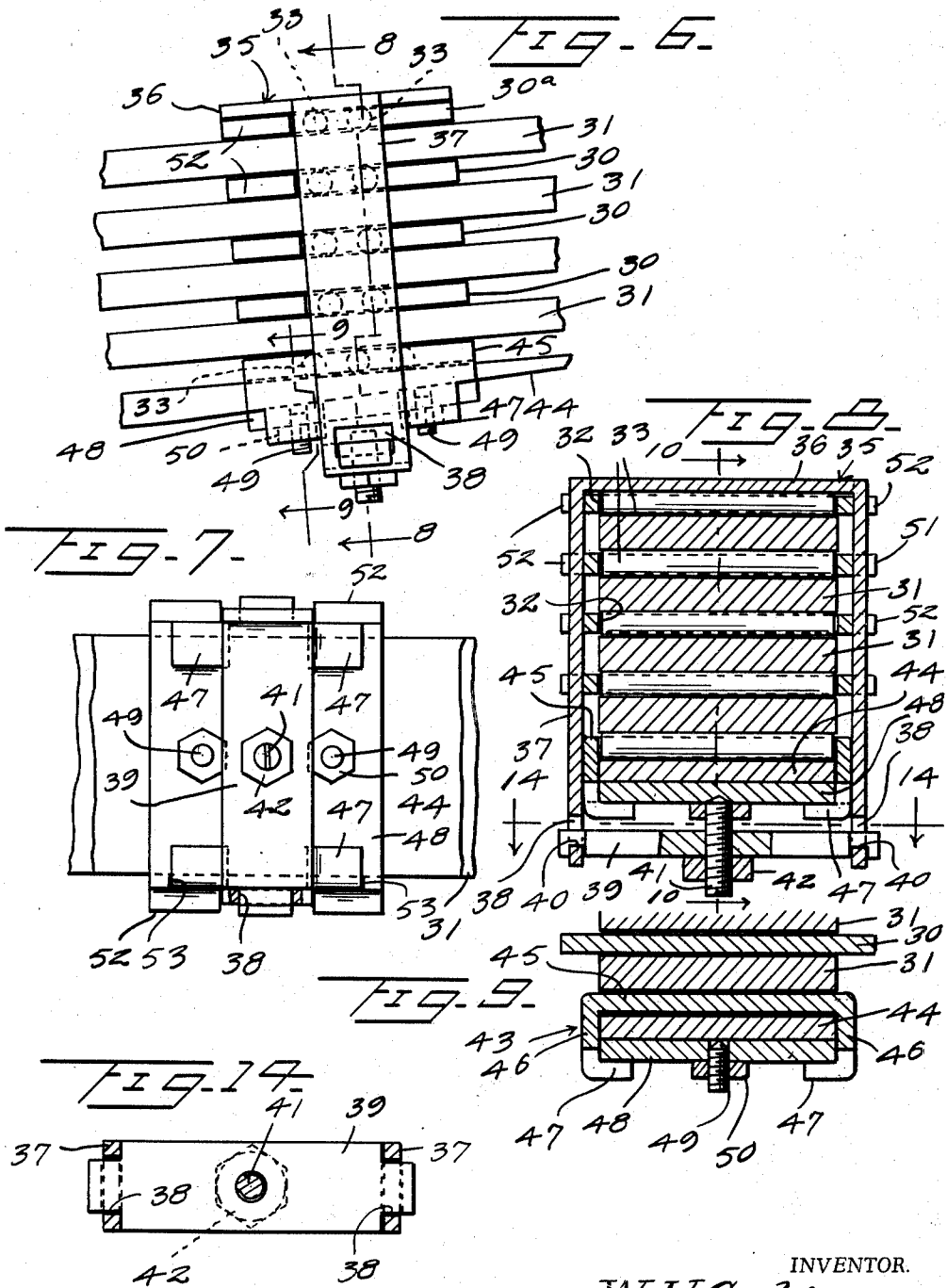
W. H. GODFREY

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INVENTOR.

W. H. Godfrey
BY

BY

Kimmel & Crowell ATTORNEYS

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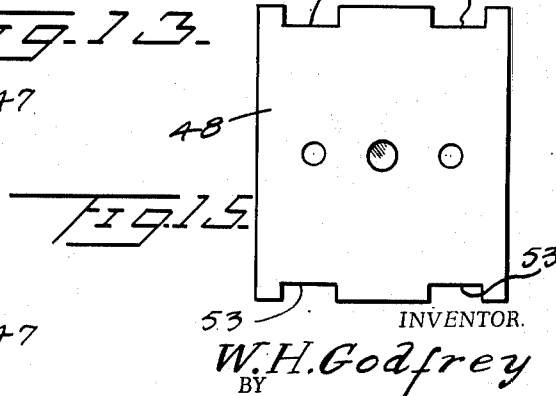
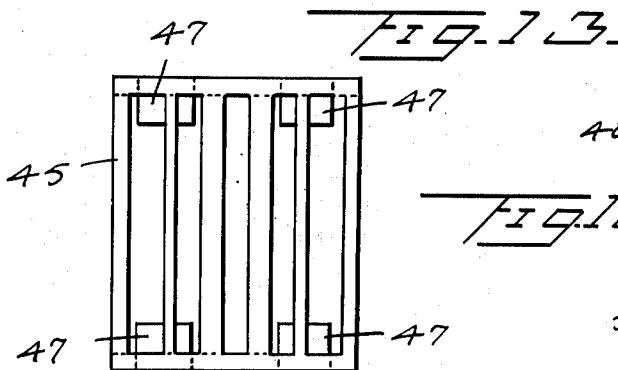
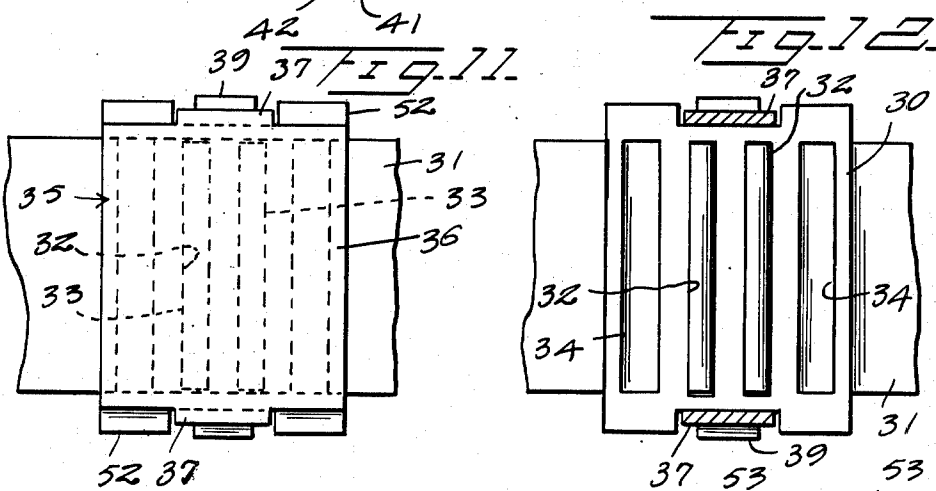
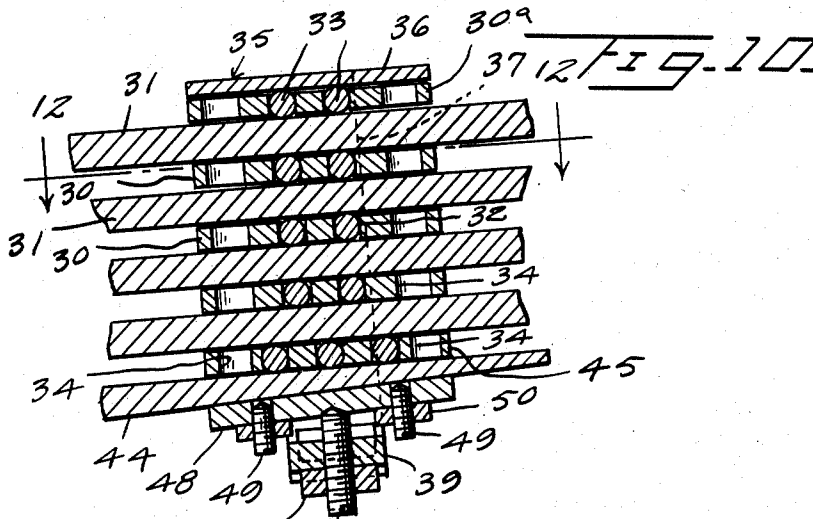
W. H. GODFREY

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4 Sheets-Sheet 3



INVENTOR.
W.H. Godfrey
BY

Kimmel & Brownell ATTORNEYS

Oct. 21, 1952

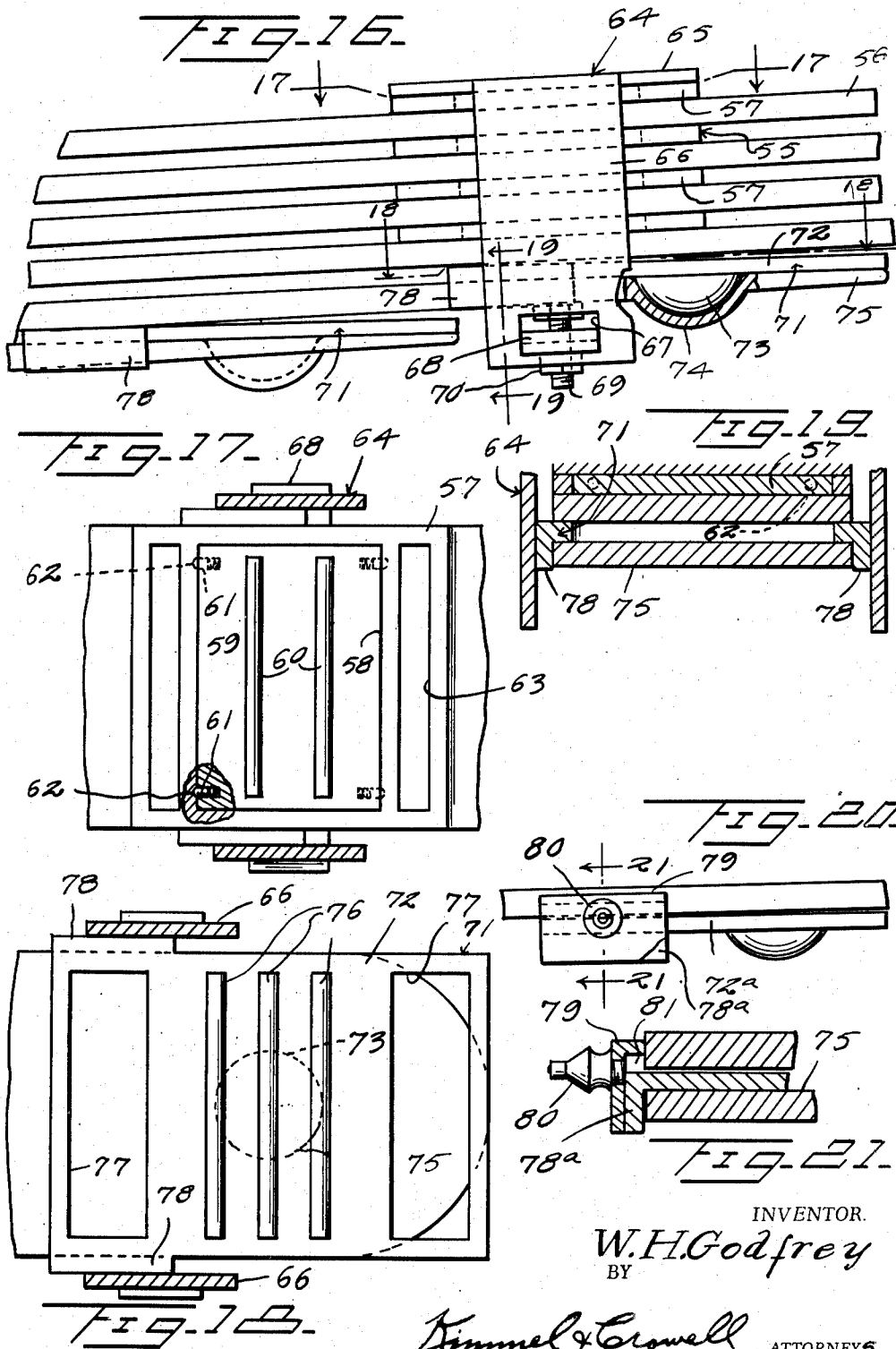
W. H. GODFREY

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VEHICLE SPRING

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4 Sheets-Sheet 4



INVENTOR.

W.H. Godfrey

BY

Kimmel & Crowell

ATTORNEYS

UNITED STATES PATENT OFFICE

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VEHICLE SPRING

William H. Godfrey, Detroit, Mich.

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2 Claims. (Cl. 267-49)

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This invention relates to vehicle springs.

An object of this invention is to provide in a leaf spring structure of the semi-elliptical type, an anti-friction means between the leaves of the spring so as to facilitate the movement of the spring leaves one relative to the other.

Another object of this invention is to provide an anti-friction means for positioning between the spring leaves which can be mounted on springs at present in use, the anti-friction means being in the form of either rollers or balls.

With the above and other objects in view, my invention consists in the arrangement, combination and details of construction disclosed in the drawings and specification, and then more particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a detail side elevation, partly in section, of a leaf spring structure having anti-friction inserts, constructed according to an embodiment of this invention, mounted between the leaves thereof.

Figure 2 is a sectional view taken on the line 2-2 of Figure 1.

Figure 3 is a fragmentary plan view of the insert.

Figure 4 is a transverse sectional view of a modified form of this invention.

Figure 5 is a fragmentary plan view of the modified form of insert.

Figure 6 is a detail side elevation, partly broken away, of another form of this invention.

Figure 7 is a fragmentary bottom plan of the structure shown in Figure 6.

Figure 8 is a sectional view taken on the line 8-8 of Figure 6.

Figure 9 is a fragmentary sectional view taken on the line 9-9 of Figure 6.

Figure 10 is a sectional view taken on the line 10-10 of Figure 8.

Figure 11 is a top plan view of the structure shown in Figures 6 to 10.

Figure 12 is a fragmentary sectional view taken on the line 12-12 of Figure 10.

Figure 13 is a plan view of the lowermost one of the inserts embodied in Figures 6 to 10 inclusive.

Figure 14 is a sectional view taken on the line 4-4 of Figure 8.

Figure 15 is a bottom plan view of the lower plate used with the structure shown in Figures 6 to 14 inclusive.

Figure 16 is a fragmentary side elevation, partly in section, of another modification of this invention.

Figure 17 is a sectional view taken on the line 17-17 of Figure 16.

Figure 18 is a fragmentary sectional view taken on the line 18-18 of Figure 16.

Figure 19 is a sectional view taken on the line 19-19 of Figure 16.

Figure 20 is a fragmentary side elevation of another modification of this invention.

Figure 21 is a sectional view taken on the line 21-21 of Figure 20.

Referring to the drawings and first to Figures 1, 2 and 3, the numerals 20 and 21 designate generally superposed spring leaves, the leaf 20 being the uppermost leaf formed with eyes 22 at the opposite ends thereof. There may be as many leaves 21 as may be desired and these leaves are secured together by means of a king bolt 23 threadedly engaging through a tie bar 23a.

A plurality of elongated flat inserts 24 are interposed between the spring leaves 21 and each insert 24 is provided with transversely extending and longitudinally spaced apart openings 25. A plurality of anti-friction rollers 26 are loosely mounted in the openings 25 and are of a diameter slightly greater than the thickness of the inserts 24 so that the inserts 24 will merely serve as retainers for the rollers 26 and will not frictionally contact with the confronting sides or faces of the spring leaves 20 and 21.

Referring now to Figures 4 and 5, the retainers 27 which are inserted between the spring leaves 21 are formed with at least a pair of holes 28, and anti-friction balls 29 are loosely mounted in the holes 28. The retainers 24 and 27 are of a length substantially equal to the length of the adjacent spring leaf, whereas in Figures 6 to 15 inclusive the anti-friction retainers are shorter in length than the length of the spring leaf.

Referring to Figures 6 to 15 inclusive, anti-friction retainers 30 are inserted between superposed spring leaves 31, and an upper retainer 30a is disposed on the upper side of the upper one of the spring leaves 31. Each retainer 30 is formed with a pair of transversely extending openings 32 within which rollers 33 are adapted to loosely engage, and each retainer 30 is also formed outwardly of the openings 32 with lubricant holding openings 34. The retainers 30 and 30a are held in applied position by means of a substantially U-shaped shackle generally designated as 35, and which includes an upper plate 36 and a pair of right angularly and downwardly projecting arms or bars 37.

The bars or arms 37 adjacent the lower ends thereof are formed with openings 38 through

which the rollers 33 are adapted to loosely engage, and each retainer 30 is also formed outwardly of the openings 32 with lubricant holding openings 34. The retainers 30 and 30a are held in applied position by means of a substantially U-shaped shackle generally designated as 35, and which includes an upper plate 36 and a pair of right angularly and downwardly projecting arms or bars 37.

The bars or arms 37 adjacent the lower ends thereof are formed with openings 38 through

which the rollers 33 are adapted to loosely engage, and each retainer 30 is also formed outwardly of the openings 32 with lubricant holding openings 34. The retainers 30 and 30a are held in applied position by means of a substantially U-shaped shackle generally designated as 35, and which includes an upper plate 36 and a pair of right angularly and downwardly projecting arms or bars 37.

The bars or arms 37 adjacent the lower ends thereof are formed with openings 38 through

which the rollers 33 are adapted to loosely engage, and each retainer 30 is also formed outwardly of the openings 32 with lubricant holding openings 34. The retainers 30 and 30a are held in applied position by means of a substantially U-shaped shackle generally designated as 35, and which includes an upper plate 36 and a pair of right angularly and downwardly projecting arms or bars 37.

The bars or arms 37 adjacent the lower ends thereof are formed with openings 38 through

which the rollers 33 are adapted to loosely engage, and each retainer 30 is also formed outwardly of the openings 32 with lubricant holding openings 34. The retainers 30 and 30a are held in applied position by means of a substantially U-shaped shackle generally designated as 35, and which includes an upper plate 36 and a pair of right angularly and downwardly projecting arms or bars 37.

The bars or arms 37 adjacent the lower ends thereof are formed with openings 38 through

which the rollers 33 are adapted to loosely engage, and each retainer 30 is also formed outwardly of the openings 32 with lubricant holding openings 34. The retainers 30 and 30a are held in applied position by means of a substantially U-shaped shackle generally designated as 35, and which includes an upper plate 36 and a pair of right angularly and downwardly projecting arms or bars 37.

The bars or arms 37 adjacent the lower ends thereof are formed with openings 38 through

which the rollers 33 are adapted to loosely engage, and each retainer 30 is also formed outwardly of the openings 32 with lubricant holding openings 34. The retainers 30 and 30a are held in applied position by means of a substantially U-shaped shackle generally designated as 35, and which includes an upper plate 36 and a pair of right angularly and downwardly projecting arms or bars 37.

The bars or arms 37 adjacent the lower ends thereof are formed with openings 38 through

which the rollers 33 are adapted to loosely engage, and each retainer 30 is also formed outwardly of the openings 32 with lubricant holding openings 34. The retainers 30 and 30a are held in applied position by means of a substantially U-shaped shackle generally designated as 35, and which includes an upper plate 36 and a pair of right angularly and downwardly projecting arms or bars 37.

The bars or arms 37 adjacent the lower ends thereof are formed with openings 38 through

which a pressure bar 39 is adapted to be extended. The pressure bar 39 is formed adjacent the opposite ends thereof with notches 40 within which the bar 37 is adapted to be received, and the pressure bar 39 is held in pressure applying position by means of a set screw 41 which is threaded through the bar 39 and locked by means of a lock nut 42.

A lower insert or retainer generally designated as 43 is interposed between the lower one of the spring leaves 44 and the next adjacent leaf 31. The insert or retainer 43 includes a slotted plate 45 interposed between the spring leaves 44 and 31 and the opposite ends of the retainer plate 45 are formed with right angular extensions 46 terminating in inwardly bent lugs 47 which project beneath a lower plate 48.

A pair of set screws 49 are threaded through the plate 48 and are adapted to bear against the lower leaf 44 and are locked by means of lock nuts 50. The opposite ends of the retainers 30 and 30a are notched as indicated at 51 and 52 respectively so that the retainers 30 and 30a will be held against movement lengthwise of the spring leaves 31. In like manner the lower plate 48 is formed with a pair of notches 53 in the opposite sides thereof, within which the lugs 47 are adapted to partially engage so that the lower plate 48 will be held against endwise movement.

With a spring assembly as hereinbefore described, the spring leaves may more readily flex one relative to the other without undue friction, thereby providing a more resilient mounting for a vehicle body and providing a means to more readily cushion the vehicle against shocks.

Referring now to Figures 16 to 18 inclusive, there is disclosed another modification of this invention wherein a plurality of roller retainer plates generally designated as 55 are interposed between the spring leaves 56. The retainers 55 include a substantially rectangular plate 57 formed with an opening 58 within which a second removable plate 59 is mounted. The plate 59 has disposed thereacross a pair of anti-friction members 60 in the form of rollers, and the plate 59 has extending from the opposite ends thereof a pair of spring-pressed pins 61 engageable in sockets 62 carried by the plate 57 at the ends of the opening 58.

The plate 57 is also provided with outer openings 63 within which grease or grease retaining felts are adapted to be positioned. The several retainers 55 are held against lateral movement by means of an inverted U-shaped clamp generally designated as 64. The clamp 64 includes an upper plate 65 and a pair of depending side arms 66 engageable on the opposite edges of retainers 55. The arms 66 are formed adjacent the lower ends thereof with openings 67 within which a tie-bar 68, similar to tie-bar 39 is adapted to engage, and the tie-bar 68 is tightly secured by means of a bolt 69 locked by a lock nut 70.

A lower retainer generally designated as 71 is disposed at the lower side of the spring and engages an adjacent spring leaf end. The retainer 71 includes a plate 72 which is formed with a button 73 engageable in the upper concave side of an offset member 74 which is carried by the leaf end 75. The plate 72 has disposed there-

across three anti-friction members 76 in the form of rollers, and the plate 72 is also formed adjacent the opposite ends thereof with lubricant retaining openings 77. The plate 72 is provided with a pair of depending wings 78 adjacent the inner end portions of the plate so as to hold the plate 72 against lateral movement with respect to the spring leaf end 75.

Referring now to Figures 20 and 21, the retainer 72a has secured to the wings 78a an angle-shaped member 79 through the vertical side of which a lubricant fitting 80 is extended so that the lubricant can be forced into the space 81 adjacent the outer edge of a spring leaf.

As shown in Figure 16, at each end of a spring leaf there may be disposed a roller retainer member 71 which may be positioned between adjacent clamping members 64. The retainers 71 will be held against endwise and lateral movement by means of the button 73 and the depending wings 78.

I do not mean to confine myself to the exact details of construction herein disclosed, but claim all variations falling within the purview of the appended claims.

What I claim is:

1. A spring structure comprising a plurality of superposed leaf members, notched retainers between adjacent leaf members, a U-shaped shackle positioned above the uppermost of said retainers and formed with a pair of downwardly projecting legs, the lowermost of said retainers being formed with pairs of downwardly projecting arms, a lower retainer plate having outer notches in which said arms engage, inwardly projecting lugs carried by said arms engaging beneath said plate, pressure screws threaded through said plate compressing said leaf members, a pressure bar below said retainer plate, means securing the ends of said bar to said legs, and a pressure screw threaded through said bar engaging said lower retainer plate to compress said leaf members.

2. A spring structure comprising a plurality of superposed leaf members, notched retainers between adjacent leaf members, the lowermost of said retainers being formed with pairs of downwardly projecting arms, a lower retainer plate having outer notches in which said arms engage, inwardly projecting lugs carried by said arms engaging in the notches of said lower retainer plate and engaging beneath said plate below said leaf members, and pressure screws threaded through said plate bearing against said leaf members.

WILLIAM H. GODFREY.

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