

CLASS 267, SPRING DEVICES**SECTION I - CLASS DEFINITION**

This class includes vehicle-springs, elastic extension devices, reciprocating-bed-cushioning devices, and miscellaneous spring structures which are not peculiar to any particular art.

SECTION II - REFERENCES TO OTHER CLASSES**SEE OR SEARCH CLASS:**

- 5, Beds, subclasses 246+ for a spring device disclosed as for a bed, subclasses 655.7+ for a spring containing support for a user's body or part thereof, and subclasses 716+ for a mattress comprising an innerspring core.
- 29, Metal Working, subclasses 896.9+ for a miscellaneous or combined process of manufacturing a spring element made of metal.
- 72, Metal Deforming, appropriate subclasses for a process or apparatus for forming a metal spring wherein the metal is deformed during the process.
- 74, Machine Element or Mechanism, subclass 501.5 for constant tension sustaining devices for flexible cable operators.
- 92, Expansible Chamber Devices, appropriate subclasses. See the SEARCH CLASS note to Class 267 in the class definition of Class 92, for the line between an expansible chamber device for Class 92, and a fluid spring device for Class 267.
- 100, Presses, subclass 265 for reciprocating platen presses having a spring actuator, and not elsewhere provided for.
- 156, Adhesive Bonding and Miscellaneous Chemical Manufacture, appropriate subclasses for a method of making a leaf spring involving the chemical bonding of plural leaves.
- 264, Plastic and Nonmetallic Article Shaping or Treating: Processes, appropriate subclasses for a process of making a nonmetallic spring by shaping.
- 428, Stock Material or Miscellaneous Articles, subclasses 544+ for stock materials, e.g., of indefinite length, which are all metal or have adjacent metal components, especially subclass 591 for such stock material having a feature for affording relative movement between components thereof.

SECTION III - GLOSSARY

The following terms are referenced by some of the definitions of subclasses 2+.

COIL SPRING

an element in the form of a spiral and which exhibits resilient characteristic when distorted from its original shape. May be in the form of a helix, a volute spiral or flat spiral.

HELICAL COIL SPRING

an element in the form of a spiral lying on the surface of a cylinder and which exhibits resilient characteristics when distorted from its original shape.

LEAF SPRING

an element comprising a plate or bar or a plurality of superposed plates or bars and which exhibits resilient characteristics when a portion is deflected transversely of length of the element

SUBCLASSES**1.5 PACKING EXPANDER OR CONSTRICTOR:**

This subclass is indented under the class definition. Structure adapted to bias a packing element in a radial direction.

2 VEHICLE:

This subclass is indented under the class definition. Spring devices under the class definition which includes a spring element to cushion relative movement between parts of a vehicle and which do not involve in their application to such use any substantial modification of the vehicle structure.

- (1) Note. Generally, those patents which have no disclosure for vehicular use have not been cross-referenced to this and indented subclasses.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 113, through 182, appropriate subclass for a spring device of the nonsupport type useful in vehicles, or for supporting

supplementary vehicle equipment (e.g., seat, motor, transmission).

SEE OR SEARCH CLASS:

- 180, Motor Vehicles, appropriate subclasses for motor vehicles in which there is a special relationship between a spring element and parts peculiar to motor-vehicle construction.
- 244, Aeronautics and Astronautics, subclass 104 for spring devices disclosed and claimed in combination with parts peculiar to airplane construction.
- 280, Land Vehicles, subclasses 5.5+ for a general utility land vehicle including an active suspension responsive to a force encountered while the vehicle is in surface traversing motion which usually involves a spring device or element; subclasses 6.15+ for a general utility land vehicle including means, interposed between a vehicle body, chassis, or frame and running gear thereof, for altering height or levelness of the vehicle body, chassis, or frame which may or may not involve a spring device or element; subclass 79 for a general utility wheeled land vehicle provided with springs between the wheel or wheels and the load-support, noting the search notes provided therein; subclasses 124.1+ for a general utility wheeled land vehicle running gear suspension arrangement; or subclasses 275+ or 283+ for a general utility occupant propelled-type land vehicle including yielding framework or running gear which may or may not involve a spring device or element (it is noted that in accordance with the (2) Note of Class 280, subclass 200, motorcycle frames and running gear, without features causing classification in Class 180, Motor Vehicles, are included in these subclasses). Patents classified in this class (Class 267) as originals may include vehicle parts directly related to vehicle suspension (e.g., fluid damper, upper or lower control arm) and vehicle parts which are nominally recited as either a reference or mounting structure for the spring.

- 297, Chairs and Seats, subclasses 195.1+ for springs used in saddle seat construction; subclasses 285+ for springs used in chairs and seats so that a back is resiliently supported; subclass 312 for springs resiliently supporting independently movable sections of a seat bottom.

3 Railway:

This subclass is indented under subclass 2. Spring devices especially adapted for railway rolling-stock and not classified in other subclasses of this class.

SEE OR SEARCH CLASS:

- 213, Railway Draft Appliances, for spring devices in which the sole specific use is disclosed as a railway draft appliance (e.g., a draft or buffing means) or in which the claim is limited to a railway draft appliance.

4 Coil:

This subclass is indented under subclass 3. Device wherein the spring element is a coil-spring.

5 Perambulator:

This subclass is indented under subclass 2. Spring devices especially adapted for children's carriages.

6 Bolster:

This subclass is indented under subclass 2. Spring devices especially adapted for vehicle-bolsters.

7 Leaf:

This subclass is indented under subclass 6. Device wherein the spring element is a leaf-spring.

23 Leaf, coil, and fluid pressure:

This subclass is indented under subclass 259. Device comprising a leaf-spring, a coil-spring, and a fluid-pressure spring are combined in the same structure.

24 Leaf, fluid pressure and liquid:

This subclass is indented under subclass 259. Device comprising a leaf-spring and a fluid-pressure and liquid spring combined in the same structure.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:
64.25, for plural compressible fluid springs combined with a fluid retarder and adapted for use in a vehicle.
- 25 Leaf and torsion:**
This subclass is indented under subclass 259. Device comprising a leaf-spring and a torsion-spring combined in the same structure.
- 26 Torsion coil:**
This subclass is indented under subclass 25. Device wherein the torsion-spring element is of the coil type.
- 27 Leaf-end-connecting:**
This subclass is indented under subclass 26. Device wherein the torsion-coil-spring element forms an end connection for the leaf-spring.
- 28 Leaf and coil:**
This subclass is indented under subclass 259. Device wherein a leaf-spring and a coil-spring are combined in the same structure.
- 29 Leaf-end-connecting:**
This subclass is indented under subclass 28. Device wherein the coil-spring element forms an end connection for the leaf-spring.
- 30 Leaf and rubber type:**
This subclass is indented under subclass 259. Device wherein a leaf-spring and a rubber type spring are combined in the same structure.
- 31 Leaf and fluid pressure:**
This subclass is indented under subclass 259. Device wherein a leaf-spring and a fluid-pressure spring are combined in the same structure.
- 32 Leaf-end-connecting:**
This subclass is indented under subclass 31. Device wherein the fluid- pressure-spring element is interposed between the end of the leaf-spring and a supporting or supported member.
- 33 Coil and rubber type:**
This subclass is indented under subclass 259. Device wherein a coil-spring and a rubber type spring are combined in the same structure.
- 34 Coil and fluid pressure:**
This subclass is indented under subclass 259. Device wherein a coil-spring and a fluid-pressure spring are combined in the same structure.
- 35 Rubber type and fluid pressure:**
This subclass is indented under subclass 259. Device wherein a rubber type spring and a fluid-pressure spring are combined in the same structure.
- 36.1 Leaf:**
This subclass is indented under subclass 2. Spring device wherein the spring element comprises a leaf-spring*.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
158+, for a leaf spring of nonvehicular or generic application.
192+, for a leaf spring stabilizer.
195+, for a leaf spring and retarder (shock absorber).
229+, for a leaf-spring and torque-applying lever.
283, for a multilayer leaf-torsion spring.
- SEE OR SEARCH CLASS:
280, Land Vehicles, subclasses 5.5+ for a general utility land vehicle including an active suspension responsive to a force encountered while the vehicle is in surface traversing motion which may or may not involve a leaf spring device or element; subclasses 6.15+ for a general utility land vehicle including means, interposed between a vehicle body, chassis, or frame and running gear thereof, for altering height or levelness of the vehicle body, chassis, or frame which may or may not involve a leaf spring device or element; subclass 79 for a general utility wheeled land vehicle provided with springs between the wheel or wheels and the load-support, noting the search notes provided therein; subclass 86.5 for a general utility wheeled land vehicle including an auxiliary axle assembly which may or may not have a leaf spring; subclasses 124.1+ for particular running gear construction of a general utility

wheeled land vehicle, especially subclasses 124.11+, 124.131, 124.14, 124.163, 124.165, or 124.171+ for particular running gear constructions which employ a leaf spring; or subclasses 680 or 686 for a general utility wheeled land vehicle tandem axle running gear having a leaf spring.

37.1 And covering:

This subclass is indented under subclass 36.1. Spring device including a casing enclosing the spring element.

37.2 Spiral or elastic covering:

This subclass is indented under subclass 37.1. Spring device including a casing which encloses the spring element and which is formed either from a strip of material coiled about and along the spring element, or from rubber or a material which exhibits similar characteristics.

37.3 Three serially arranged metallic segments:

This subclass is indented under subclass 37.1. Spring device wherein the casing comprises three distinct sections oriented in an end-to-end fashion along the longitudinal axis or the leaf spring.

- (1) Note. Typically, the individual sections are relatively moveable to permit flexure of the casing with the spring.

37.4 Having lubricant reservoir or pad:

This subclass is indented under subclass 37.1. Spring device including a compartment or material adapted to contain a fluid to be applied to relatively moving portions of the device to reduce friction therebetween.

SEE OR SEARCH CLASS:

184, Lubrication, appropriate subclasses for devices of general utility applied externally to leaf-springs for the purpose of supplying them with lubrication and involving no cooperating modification of the spring.

38 Twin, axle interposed:

This subclass is indented under subclass 36.1. Device wherein the axle is disposed between a pair of substantially parallel and opposite leaf-springs.

39 Side bar:

This subclass is indented under subclass 36.1. Device wherein the leaf-spring which support the vehicle-body are secured to side-bars, which extend longitudinally of the body from axle to axle.

40 Longitudinal:

This subclass is indented under subclass 36.1. Device wherein the vehicle-body is supported on leaf-springs which extend longitudinally thereof from axle to axle.

41 Cantilever:

This subclass is indented under subclass 36.1. Device wherein the spring element is connected at one end to the axle and at its other end, and sometimes at an intermediate point also, to the vehicle-body or to a body-supporting spring.

42 Elliptic:

This subclass is indented under subclass 36.1. Device wherein endless or continuous leaf-springs consisting of members having their adjacent ends only connected, integrally or otherwise, and having their intermediate portions free for relative approach or recession, except where the novelty resides in structure. (See definition of subclass 47).

- (1) Note. Those patents which claim only end connecting structure for an elliptic spring have been classified in subclass 261 below.

43 Elliptic and leaf:

This subclass is indented under subclass 36.1. Device wherein leaf-springs comprising two leaf-spring elements secured together and bending in the same or substantially the same plane, one of said elements being of elliptic type.

44 Semielliptic:

This subclass is indented under subclass 36.1. Device comprising leaf-springs of generally straight or semi-elliptic type, except where the novelty resides in structure. (See definition of subclass 47).

45 Semielliptic and leaf:

This subclass is indented under subclass 26. Device in which leaf-springs comprising two leaf-spring elements secured together and bending in substantially the same plane, one of said elements being of semi-elliptic type.

46 End-to-end connected:

This subclass is indented under subclass 45. Device wherein the semi-elliptic and leaf-spring elements are connected end to end.

47 Structure:

This subclass is indented under subclass 36.1. Device limited to the structure of the leaf-spring element, either of the individual leaf or the cooperating structure of the several leaves and parts without relation to their configuration in the bending-plane.

48 Auxiliary tensioning elements:

This subclass is indented under subclass 47. Device wherein the leaf-spring element comprises one or more main leaves and one or more auxiliary leaves having a normal curvature different from that of the main leaves, so that when all of the leaves are secured together to form the spring element the auxiliary leaves in tending to assume their normal curvature exert tension on the main leaves.

49 Antifriction:

This subclass is indented under subclass 47. Device wherein the spring element comprises means for reducing friction between the leaves.

50 Lubrication:

This subclass is indented under subclass 47. Device wherein the spring element is structurally modified to provide for lubrication. Includes lubricant--carriers in the form of strips adapted to be interposed between the leaves of the spring element.

51 Broken-spring supports:

This subclass is indented under subclass 36.1. Device which includes emergency devices adapted to be applied to broken leaf-springs to effect a temporary repair, devices permanently associated with leaf-springs and normally idle, but adapted to support the load in case of breakage of the spring, and devices normally performing the function of auxiliary springs,

but which may be employed to repair the main spring in case of breakage.

52 Intermediate supports:

This subclass is indented under subclass 36.1. Device having means for connecting leaf-springs other than cantilever-springs intermediate their ends to parts of the vehicle, together with cooperating leaf modifications.

- (1) Note. An intermediate connection of the leaf spring for the purpose of enabling the axle to rock in its vertical axial plane are not proper for this class (267) but rather will be found in Class 280, Land Vehicles.

SEE OR SEARCH CLASS:

280, Land Vehicles, subclasses 124.1+ for particular running gear construction of a general utility wheeled land vehicle, especially subclasses 124.11+ wherein an axle or axle assembly is pivotally mounted upon the vehicle body, chassis, or frame which may involve a leaf spring, or subclasses 124.175+ for a residual leaf spring suspension including a connection feature; or subclasses 680 or 686 for a general utility wheeled land vehicle tandem axle running gear having a leaf spring.

53 Clips:

This subclass is indented under subclass 36.1. Devices for tying or clamping the individual leaves of leaf-spring elements together, with cooperating leaf modifications.

- (1) Note. Devices of this character which are modified for cooperation with means for connecting the spring intermediate its ends to a part of the vehicle are found in this class, subclass 52.

64.11 Comprising compressible fluid:

This subclass is indented under subclass 2. A spring device including a receptacle having a compartment whose volume can be changed, the compartment including a flowable material which can be compressed as the volume is decreased by the application of an external force and which will expand when the force is removed.

- (1) Note. In a fluid-spring device when the compressible fluid is subjected to compressive force, none of the fluid escapes from the compartment (e.g., to without the device, or from one side to the other of a piston head), so that when the force is removed the compartment returns to its normal volume, due entirely to the expansion of the compressed fluid; whereas in a fluid dashpot the fluid does escape, and hence another force must be applied to the device in order to restore the compartment to its normal volume.
- (2) Note. This subclass and its indents include the combination of a fluid spring and a retarder device (e.g., fluid dashpot).

SEE OR SEARCH THIS CLASS, SUB-CLASS:

- 113+, for the structure of a fluid spring, per se.
217+, for the combination of a mechanical spring device and a retarder device.

SEE OR SEARCH CLASS:

- 188, Brakes, subclasses 297+ for a fluid dashpot, per se.

64.12 Having lockable strut:

This subclass is indented under subclass 64.11. A device wherein a rodlike member is attached to a movable part of the fluid spring and extends to the exterior of the device so that the rodlike member is itself longitudinally movable and including means for fixedly securing the rodlike member in a desired position.

SEE OR SEARCH CLASS:

- 188, Brakes, subclass 300 for a fluid retarder having a lockable strut.

64.13 Including compressible liquid:

This subclass is indented under subclass 64.11. A device wherein the compressible material remains in a liquid state under normal operating conditions.

- (1) Note. Normally, liquids are not compressible; however, this subclass contains liquids possessing specific

chemical natures which render them compressible.

64.14 Including chamber at sub-atmospheric pressure:

This subclass is indented under subclass 64.11. A device also including a second compartment, operatively associated with the first compartment, which is partially or completely evacuated.

- (1) Note. The evacuation may take place either prior to, or during, operation of the device.

64.15 With retarder:

This subclass is indented under subclass 64.11. A device combined with a device which will not independently return to its original condition after application of an external force (e.g., a fluid dashpot), thus retarding the spring's distortion or recovery.

SEE OR SEARCH CLASS:

- 188, Brakes, subclasses 266+ for a retarder, per se.

64.16 Leveling device:

This subclass is indented under subclass 64.15. A device including means operable to maintain the spring's effective "working range" constant regardless of various loading conditions, so the "mean riding height" of the vehicle can be maintained substantially constant.

- (1) Note. "Mean riding height" refers to the distance between sprung and unsprung parts of the vehicle when it is at rest, i.e., at the midpoint of the spring's oscillation, or "working range".

64.17 Self-pumping:

This subclass is indented under subclass 64.16. A device wherein the means to maintain the spring's working range includes a mechanism to generate increased fluid pressure within the device, the mechanism operating in response to oscillation of the device.

64.18 Having metering pin for varying spring rate:

This subclass is indented under subclass 64.16. A device including an orifice through which fluid flows, and a rodlike element projecting

into the orifice to define a flow passage therebetween, wherein the rodlike element is adapted to reciprocate relative to the orifice, thus varying the size of the passage and variably regulating the flow therethrough to change either the rate of deflection or the rate of return of the device.

- (1) Note. Devices in this subclass require that either the reciprocating rodlike element or the orifice be of varying diameter to regulate the flow.

64.19 Having flexible wall:

This subclass is indented under subclass 64.16. A device wherein the compartment is bounded by an enclosure comprising a pliantly deformable material.

64.21 Including rolling lobe between telescoping members:

This subclass is indented under subclass 64.19. A device including a pair of elements, one sliding into an open end of the other, the elements adapted to reciprocate with respect to one another, wherein the pliant material is fixedly attached at its opposite ends to each of the two elements, and excess material is provided which folds upon itself to form an overlapping, saclike portion intermediate the ends.

64.22 Having metering pin for varying spring rate:

This subclass is indented under subclass 64.15. A device including an orifice through which fluid flows, and a rodlike element which projects into the orifice to define a flow passage therebetween, wherein the rodlike element is adapted to reciprocate relative to the orifice, thus varying the size of the passage and variably regulating the flow therethrough to change either the rate of reflection or the rate of return of the device.

- (1) Note. Devices in this subclass require that either the reciprocating rodlike element or the orifice be of varying diameter to regulate the flow.

64.23 Having flexible wall:

This subclass is indented under subclass 64.15. A device wherein the compartment is bounded by an enclosure comprising a pliantly deformable material.

64.24 Including rolling lobe between telescoping members:

This subclass is indented under subclass 64.23. A device including a pair of elements, one sliding into an open end of the other, the elements adapted to reciprocate with respect to one another, wherein the pliant material is fixedly attached at its opposite ends to each of the two elements, and excess material is provided which folds upon itself to form an overlapping, saclike portion intermediate the ends.

64.25 Having plural compressible fluid springs:

This subclass is indented under subclass 64.15. A device including two or more compartments of variable volume, each including a flowable material which can be compressed.

64.26 Having telescoping cylinders:

This subclass is indented under subclass 64.15. A device including two hollow cylinders, each having a closed end; the external diameter of one cylinder being smaller than the internal diameter of the other so that the smaller cylinder can slide into the larger cylinder, wherein the cylinders are adapted to reciprocate relative to each other against the opposition of fluid pressure.

64.27 Having flexible wall:

This subclass is indented under subclass 64.11. A device wherein the compartment is bounded by an enclosure comprising a pliantly deformable material.

64.28 Including means for charging or discharging spring:

This subclass is indented under subclass 64.11. A device wherein means is provided permitting access to its interior by which fluid may be either introduced into, or removed from, the device.

66 Braces:

This subclass is indented under subclass 2. Devices for positively limiting the recovery of the load-springs, whether applied directly to the spring or to the relatively-movable parts of the vehicle, devices for preventing the vehicle-body from swaying backward and forward or from side to side or for yieldingly resisting such swaying action, and devices for guiding

the relatively-moving parts of the spring element.

67 Yielding:

This subclass is indented under subclass 66. Devices wherein the brace is either of resilient material or has a spring associated with it for rendering its action yielding.

68 Sliding:

This subclass is indented under subclass 66. Devices in which there is a sliding connection between the brace and some part of the vehicle.

69 ELASTIC EXTENSION DEVICES:

This subclass is indented under the class definition. Miscellaneous devices of more or less general application which contain one or more elastic elements, so that when said devices are subjected to tension they will be extended and when the tension is removed they will resume their normal length.

- (1) Note. Devices whose construction especially adapts them to withstand both extension and contraction are not included here, but elastic draft-links are included and devices including a novel combination of fastening element and elastic element.

SEE OR SEARCH CLASS:

- 2, Apparel, subclasses 324 and 339, for garment supporters including spring devices.
- 59, Chain, Staple, and Horseshoe Making, subclasses 79.1+ for elastic links intended to be connected end-to-end to like elements to form an elastic chain.
- 114, Ships, subclass 205 for tension relievers combined with a traveler for sail, and subclasses 213+ for tension relievers specific to use on ships.
- 124, Mechanical Guns and Projectors, subclasses 7+ for spring devices actuating projectile throwing arms, and subclasses 16+ for spring devices actuating a plunger or similar device to impel a projectile.
- 242, Winding, Tensioning, or Guiding, subclasses 226 and 251+ for a spring powered fishing reel, and 371+ for a spring powered reel of general use.

- 343, Communications: Radio Wave Antennas, subclass 895 for spiral or helical type antennas.

70 Compression spring:

This subclass is indented under subclass 69. Structure wherein when the device is extended, the elastic medium is compressed in a line at right angles to its cross-section. If the elastic medium contains coils or bends, the compression is substantially at right angles to the plane of any of the coils or bends.

71 Single:

This subclass is indented under subclass 70. Structure wherein the extension device comprises one spring element only.

72 Drawbars inclosed:

This subclass is indented under subclass 71. Structure wherein the single spring element incloses a plurality of draw-bars.

73 Tension spring:

This subclass is indented under subclass 69. Structure wherein when the device is extended, the elastic medium is put under tension in the same direction, as explained in the definition of subclass 70 above.

74 Single:

This subclass is indented under subclass 73. Structure wherein the extension device comprises one spring element only.

75 RECIPROCATING-BED-CUSHIONING DEVICES:

This subclass is indented under the class definition. Cushioning devices arranged to check the momentum of the reciprocating bed of a machine, such as a printing-press, lathe, planing-machine, etc., near the end of its stroke. In some cases the energy stored up in overcoming the momentum of the bed is utilized for starting it in the opposite direction.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 119, 130, for a press cushion fluid spring device and solid material spring device, respectively.

80 SPRING PANEL:

This subclass is indented under the class definition. Device which includes an outline of rigid elongated mounting elements spaced from each other, and either (1) a resilient load supporting surface located on or between and connected to said elements, or (2) a rigid load supporting surface located on or between and connected to said elements by resilient means.

- (1) Note. Although the load supporting surface may be capable of receiving the ultimate load directly, a more common arrangement would include padding and a covering material between the load and the supporting surface.
- (2) Note. The devices classified in this and the indented subclasses are mainly the spring subcombinations of chair and seat cushions.

SEE OR SEARCH CLASS:

- 5, Beds, subclasses 246+ for a bed bottom of springs and subclasses 716+ for a mattress comprising an inner-spring core.
- 160, Flexible or Portable Closure, Partition, or Panel, appropriate subclasses, for flexible or portable panels in general.
- 297, Chairs and Seats, subclasses 452.16+ for a chair or seat having a cushioned bottom or back.

81 Composite springs of diverse material, e.g., metal and non-metal:

This subclass is indented under subclass 80. Device which includes two or more springs differing in the kind of substance which they utilize to effect a spring action (as metal, rubber, air) and acting in concert to support the load.

82 Vented fluid chamber modifies action of metallic spring:

This subclass is indented under subclass 81. Device in which one of the diverse springs is a metallic member and another of the springs comprises a fluid containing compartment having a restricted or valved orifice to regulate the flow of fluid into or out of the compartment, and the flow of fluid through the orifice dampens the movement of the metallic spring.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 217+, for a vehicular-type combined spring and dashpot device in which the dashpot modifies the movement of the spring.

83 Superposed layers; metal and non-metal:

This subclass is indented under subclass 81. Device wherein two or more laminae are disposed one above the other, and adjacent laminae are metallic and nonmetallic, respectively.

SEE OR SEARCH CLASS:

- 428, Stock Material or Miscellaneous Articles, subclasses 416, 418, 432+, 444, 450, and 457+ for a nonstructural stock material product in the form of a composite web or sheet embodying a layer of metal next to a layer of non-metal.

84 Metal layer is compressible coil spring:

This subclass is indented under subclass 83. Device wherein the metal layer comprises spiral springs which receive the load axially of the spiral.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 91+, for spring panels comprising compressible coil springs.

85 Multistage springs:

This subclass is indented under subclass 80. Device in which either (1) a plurality of springs are provided, which springs are superposed upon each other so as to be serially effective, or (2) an additional spring contacting support is provided inwardly of the spring's connection to the frame, which support is engageable by the spring during its movement to vary the effective length of the spring.

86 Diverse types of superposed metallic springs:

This subclass is indented under subclass 80. Device in which two or more different types of metal springs (as leaf, coil, zigzag, elliptical, etc.) cooperate to support the load, and the different types are disposed one above the other.

- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 151+, for compound springs, in general.
 259+, for a compound spring especially adapted for vehicle use.
- 87 Sinuous spring loading surface supported by other spring:**
 This subclass is indented under subclass 86. Device wherein the uppermost layer, composed of a series of zigzag springs, is mounted on a layer composed of a different kind of spring.
- 88 Compressible coil spring loading surface supported by other spring:**
 This subclass is indented under subclass 86. Device wherein the uppermost layer, composed of a series of axially loaded compressible spiral springs, is mounted on a layer composed of a different kind of spring.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 84, for spring panels made of diverse materials in which one layer is composed of coil-springs.
 91+, for spring panels composed of coil-springs.
- 89 With means to vary preliminary tension of spring:**
 This subclass is indented under subclass 80. Device in which a means is provided to impose an initial stress upon the spring prior to the reception thereon of the ultimate load, so as to vary the effective resilience.
- 90 With means to dampen vibration of springs, e.g., sound deadening:**
 This subclass is indented under subclass 80. Device which includes a means to absorb or brake the oscillating movements of a spring.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 82, for spring panels in which the spring action is dampened by a dashpot.
 91+, for coil-springs enclosed in nonmetallic covers.
- 91 Spring panel comprises vertically oriented compressible coil springs:**
 This subclass is indented under subclass 80. Device wherein the panel is composed of a series of spiral springs, arranged with the axes of the spirals parallel to each other and aligned in the direction the load is received, and in which the spiral springs are of the type which receive the load in compression.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 166+, for helical coil-spring element, per se.
- SEE OR SEARCH CLASS:
 5, Beds, subclasses 248 and 256 for a bedstead having only coil-springs.
 140, Wireworking, subclass 3 for a method of making a coil-spring mattress.
- 92 Plural superposed coils:**
 This subclass is indented under subclass 91. Device which includes two or more coil-springs or spring panels, one above the other.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 86+, for superposed springs of different types.
- 93 Panel comprises spring of varying capacities:**
 This subclass is indented under subclass 91. Device in which the various springs have different coefficients of resilience (because of differences in size, temper or material).
- 94 With padding protector on spring end:**
 This subclass is indented under subclass 91. Device in which the upper extremities of the springs carry or horizontally disposed, overlying sheet, plate or web to increase the load bearing and contacting area of the springs.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
 86+, for horizontally disposed spring surfaces, overlying vertically oriented coil-springs, which surfaces incidentally increase the load bearing and contacting area of the underlying coil springs to thereby protect padding.

- SEE OR SEARCH CLASS:
5, Beds, subclasses 401+ for pad protectors, per se.
- 95 Loading surface includes component other than coil spring:**
This subclass is indented under subclass 91. Device in which the surface which supports the load includes both a coil-spring and a portion which is not a coil-spring and is not directly supported by a coil spring.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
94, for guards which are interposed between a coil-spring and the padding.
- 96 With resilient side or end, e.g., edge roll:**
This subclass is indented under subclass 91. Device wherein an end of the panel is provided with a spring surface or extension, generally normal to the plane of the loading surface.
- 97 With reinforcement or extension for border wire:**
This subclass is indented under subclass 91. Device in which the periphery of the loading surface of the panel is encompassed by a border wire, and in which an additional wire member is provided parallel to the border wire and attached thereto to strengthen it or enlarge its dimension.
- SEE OR SEARCH CLASS:
5, Beds, subclass 250 for a margin rim having connections for border wires.
- 98 With diagonal surface-to-frame brace:**
This subclass is indented under subclass 91. Device in which a stay is connected to and extends between the load receiving surface and an underlying support on which the springs are mounted.
- 99 Resiliently mounted on frame by tensile springs:**
This subclass is indented under subclass 91. Device in which the coil springs are elastically supported on an underlying support by springs which yield in tension.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
112, for panels resiliently supported from a frame by springs which yield in tension.
- 100 Mounted on frame spanning strips:**
This subclass is indented under subclass 91. Device in which elongated substantially rigid bars extend from one side of the frame to the other and are supported by the frame sides, and wherein the springs are connected and supported by these bars.
- (1) Note. These elongated bars are known in the art as "furniture strips".
- 101 Spring rows supported by row separating stringers:**
This subclass is indented under subclass 91. Device in which the coil springs are arranged in rows and mounted on rods or bars which extend between the rows.
- 102 With cantilevered surface extension, i.e., "soft edge":**
This subclass is indented under subclass 80. Device wherein a portion of the load supporting surface extends outwardly beyond the means which connect the load supporting surface to the underlying frame or mounting elements, which portion is not supported outwardly of its juncture with the said means.
- (1) Note. These devices, when connected to a common border wire, are known in the art as "soft edges", because they yield under load more readily than the main surface.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
85, for superposed springs, serially effective.
- 103 Spring means spacing loading surface vertically from plane of supporting frame:**
This subclass is indented under subclass 80. Device in which the load receiving surface extends generally parallel to the frame and is connected thereto and maintained in a plane separate from the frame by springs.

- (1) Note. The spacing spring means may be integral with and form an extension from the load receiving surface; however, to fall within the confines of this and the indented subclasses, there must be an identifiable portion which yieldingly supports the load receiving surface.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
111+, for load receiving panels secured to supporting frames directly.
- SEE OR SEARCH CLASS:
5, Beds, subclasses 246+ for a bed bottom of springs and subclasses 716+ for a mattress comprising an inner-spring core.
- 104 With supplementary spacing means intermediate ends of surface:**
This subclass is indented under subclass 103. Device wherein additional spacing means are provided, which additional means are connected at one of its ends to the loading surface between its edges, and connected at its other end to the spacing means or to a subjacent support.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
102, for spacing means connected intermediate the edges of a loading surface where the extending edge is not supported.
- 105 Stiffener or bracer for loading surface:**
This subclass is indented under subclass 103. Device wherein a device is connected to spaced portions of the loading surface, so that the resiliency of one of the spaced portions is modified by the transmission and distribution of part of the load to another spaced portion.
- 106 Multiple sections span frame:**
This subclass is indented under subclass 103. Device wherein the elements which constitute the load surface extend less than the full width between the outermost frame elements, and a composite load surface is effected by utilizing two or more elements.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
104, for supplementary spacing means intermediate the ends of a one piece, frame spanning load receiving element.
- 107 By inwardly bowed portion, i.e., "fish-mouth" type:**
This subclass is indented under subclass 103. Device in which the spring spacing means of at least one side of the panel includes a generally U-shaped portion, connected at the ends thereof to the panel and the load supporting surface, respectively, and in which the apex of the U extends inwardly of the panel elements.
- 108 With coiled apex, i.e., "safety pin" type:**
This subclass is indented under subclass 107. Device in which the apex of the V-shaped portion includes a coil spring.
- 109 By outwardly bowed portion:**
This subclass is indented under subclass 103. Device wherein the spring spacing means of at least one side of the panel includes a generally U-shaped portion, connected at the ends thereof to the panel and the load supporting surface, respectively, and in which the apex of the U extends outwardly of the panel elements.
- 110 Panel secured peripherally to supporting frame:**
This subclass is indented under subclass 80. Device wherein the load receiving surface extends generally parallel to the frame and is connected at its outer edges to the frame.
- (1) Note. Included in this subclass (110) are devices wherein the loading surface is bowed upwardly from the frame and wherein a load applied to the loading surface tends to urge the frame members away from each other.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
103+, for devices wherein the loading surface is connected to the frame by spring spacing means and see (1) Note to that subclass for the line.

SEE OR SEARCH CLASS:

5, Beds, subclass 259.1 for connecting clips (plate and wire) for bedsteads, which hold the end of the spring panel in place against the frame; and subclass 260 for a margin rim having connections for border wires.

111 Panel secured to tension frame inwardly:
This subclass is indented under subclass 110. Device wherein the load receiving surface is so mounted on or below the level of the frame that a load applied to the surface tends to urge the frame members inwardly toward each other.

112 Secured by resilient connectors:
This subclass is indented under subclass 111. Device wherein the surface is attached to the frame by elastic devices.

113 FLUID:
This subclass is indented under the class definition. Spring device in which the spring element is a gas or a liquid within an enclosure.

(1) Note. A spring device enclosure substantially filled with solid material is excluded from this subclass, even though the material be fluent, or liquid-saturated or air-saturated.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
64.11+, for a fluid spring device in a vehicle.

114 Time delay:
This subclass is indented under subclass 113. Spring device in which the enclosure is subject to decompression or fluid loss; and means for effecting said decompression or fluid loss to a predetermined extent over a predetermined interval.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
195+, for a vehicle spring combined with means for retarding its distortion or recovery; e.g., fluid dash pot.

115 Draft gear:
This subclass is indented under subclass 113. Spring device for interpositioning between bodies in tow relation with one another to minimize the transfer of forces therebetween resulting from changes in velocity.

imize the transfer of forces therebetween resulting from changes in velocity.

116 Bumper:
This subclass is indented under subclass 113. Spring device attachable either to a fixed, or to an approaching body at a location where it would be positioned between the bodies to minimize collisive impact.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

139+, for a bumper using a solid-material spring device.

117 Cushion for person:
This subclass is indented under subclass 113. Spring device for positioning immediately contiguous to a human body part; e.g., to a chair seat, back rest, mat.

(1) Note. The spring device of this subclass may be separated from direct contact with the human by nothing more than a flexible covering.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
142+, for a spring device for human comfort (e.g., seat cushion), in which a solid-material spring element is used for the cushioning effect.

118 Expansible-contractible chamber device:
This subclass is indented under subclass 113. Spring device in which the enclosure is bounded by structure defining top, bottom and side walls, one of which walls is substantially rigid and another is displaceable, throughout a broad area thereof, to recoverably vary the cubic capacity of the enclosure.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

113, for a fluid spring device enclosure entirely of flexible wall structure; or a fluid spring device flexible wall which is deflected at only a localized point thereof since it has no means for distributing a localized force throughout the wall.

- 119 Press cushion:**
This subclass is indented under subclass 118. Spring device for minimizing the force of impact in the shaping operation apparatus utilizing a high degree of impactive force (e.g., sheet metal drawing apparatus).
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
75, for a reciprocating-bed-cushioning device.
130, for a solid-material (e.g., coil spring) press cushion.
- 120 Vehicle; for non-support or accessory support cushioning:**
This subclass is indented under subclass 118. Spring device for use for cushioning either (a) parts of a vehicle supported by means other than said spring device or (b) structure for only auxiliary or temporarily association with a vehicle (e.g., seat or lading, respectively).
- 121 Compound:**
This subclass is indented under subclass 118. Spring device comprising (a) separate contractible-expansible chambers of which one is piston-modified and the other bellows or diaphragm modified, or (b) one such chamber and solid-material-spring means, other than for a mere piston-impetus purpose.
- 122 Diaphragm or bellows:**
This subclass is indented under subclass 118. Spring device in which the displaceable wall comprises either (a) a separate, bidirectionally flexible wall member connected throughout its periphery to the side walls, or (b) accordion-pleated side wall structure.
- (1) Note. The bidirectionally flexible member may be a septum between, common to, and flexible simultaneously and inversely vary the capacity of, contiguous enclosures.
- 123 For valve or throttle control:**
This subclass is indented under subclass 122. Spring device useful for affecting the operation of either a liquid-flow regulator or means for controlling the air-fuel mixture of an internal combustion engine.
- 124 Piston:**
This subclass is indented under subclass 118. Spring device in which the side wall structure defines a cylinder and the displaceable wall is a rigid member movable along and in substantially sealing proximity to said wall structure interior.
- 125 For use in well drilling or operating:**
This subclass is indented under subclass 124. Spring device useful in an environment including apparatus for either (a) erecting access means to a subterranean supply of liquid or (b) extracting liquid from a subterranean supply.
- 126 System:**
This subclass is indented under subclass 124. Spring device including (a) passage means communicating between opposite sides of the piston for movements of the liquid or gas therebetween or (b) an accumulator or reservoir for the fluid communicating with the piston-provided enclosure.
- (1) Note. Unless separated from the piston chamber by a passage of significant length or substantial construction, a cubic capacity will be recognized only as an extension of a piston chamber and not a separate reservoir or accumulator for this subclass; and see (1) Note in subclass 127.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
124, for a piston-operated fluid spring device provided with vent means to the ambient environment, or with access means for ambient air.
- 127 Trans-piston passage:**
This subclass is indented under subclass 126. Spring device including means through the piston member for movement of liquid or gas to either side of said piston.
- (1) Note. Mere clearance between the piston and the cylinder interior wall structure is not considered passage means for this subclass, even though particularly dimensioned for this purpose.

- 128 Rigid-material-spring impelled:**
This subclass is indented under subclass 124. Spring device in which an impetus for movement of the piston is provided by a separate, solid, resilient member.
- 129 Seal:**
This subclass is indented under subclass 124. Spring device including significant means for eliminating the passage of fluid between the periphery of the piston and the interior cylinder wall structure.
- 130 PRESS CUSHION:**
This subclass is indented under the class definition. Spring device for minimizing the force of impact in the shaping operation of apparatus using a high degree of impactive force (e.g., sheet metal drawing apparatus).

SEE OR SEARCH THIS CLASS, SUB-CLASS:
119, for a fluid-spring press cushion.
- 131 SEAT SUPPORT:**
This subclass is indented under the class definition. Spring device having one end attachable to a base portion of a seat for a human and another end extending therefrom for attachment to the seat portion over said base portion.
- 132 Velocipede or motorcycle:**
This subclass is indented under subclass 131. Spring device in which the seat is part of a human-propelled vehicle or of a motorcycle.
- 133 Flexural:**
This subclass is indented under subclass 131. Spring device which is the sole means for retention of the seat portion above the base portion; and for arcuate, to-and-fro movement of the seat portion about a horizontal axis.
- 134 FRICTION SNUBBER:**
This subclass is indented under the class definition. Spring device in which a portion of a spring element is movable in rubbing contact with a surface of a solid body or through a viscous body; said movement being responsive to the application of a force and impeded by said rubbing contact.
- (1) Note. Movement, for this subclass, may be (and usually is) that of a portion of a spring body as a consequence of the deformation of the body as a whole. The surface for rubbing contact may be that of another, concentric spring body.
- 135 Snubbed coil spring or ring pack:**
This subclass is indented under subclass 134. Spring device in which said portion is the surface portion of a spirally wound body or one of the annuli of a set of plural, concentric (usually longitudinally spaced) annuli.
- 136 RESILIENT SHOCK OR VIBRATION ABSORBER:**
This subclass is indented under the class definition. Spring devices for inhibiting or minimizing the undesirable effect of the force of an unintended blow or undesirable oscillation.

SEE OR SEARCH THIS CLASS, SUB-CLASS:
113+, for a fluid-spring shock absorber.

SEE OR SEARCH CLASS:
180, Motor Vehicles, subclass 300 for a motor vehicle having a specific motor-to-body-frame relationship and wherein is provided yieldable means for minimizing the rocking of the motor about principal supports.
248, Supports, subclasses 560+ for a resilient means which forms part of a support structure. See the note to this class (267) under the definition of subclass 560 for the line between Class 248 and Class 267.
405, Hydraulic and Earth Engineering, subclass 214 for shock-absorbing fenders for marine structures which employ a coil spring.
- 137 Tool movement dampening:**
This subclass is indented under subclass 136. Spring device in which the body constitutes means in moving contact with work to modify the work and in which the spring device minimizes undesirable oscillation incident to said movable contact and work modification.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

125, for a piston-type fluid spring device for dampening the operation of a well drill.

138 Draft gear:

This subclass is indented under subclass 136. Spring device in which the body is one of a pair of vehicle bodies in tow relation with one another and the spring device is interposable between the vehicle bodies to minimize the transfer of forces therebetween resulting from changes in velocity.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

115, for fluid-spring device-type draft gear.

139 Bumper:

This subclass is indented under subclass 136. Spring device in which the body is one of a pair of bodies (e.g., vehicle and dock bodies) likely to undergo collisive impact and the spring device is positionable to minimize the effect of said impact.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

116, for a bumper using a fluid spring device.

SEE OR SEARCH CLASS:

293, Vehicle Fenders, subclasses 135+ for the combination of a bumper and a spring support therefor.

140 Rubber:

This subclass is indented under subclass 139. Spring device in which the spring element comprises a body of elastomeric material; i.e., a product of latex or a synthetic substitute or equivalent of latex.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

153, for a spring device of general utility, including a spring element of rubber; and see the search notes thereof.

SEE OR SEARCH CLASS:

293, Vehicle Fenders, subclass 136 for the combination of a bumper and an elastomeric support therefor.

140.11 Including energy absorbing means or feature (e.g., supplemental vehicle equipment, such as motor mount, seat, etc., including additional fluid or friction energy absorber):

This subclass is indented under subclass 136. Structure wherein a means or feature, distinct from a resilient means, absorbs mechanical energy from a vibrating component, converts such absorbed energy to another form of energy, such as heat and thereby damps the absorbed energy.

(1) Note. A mere spring, acting alone or in concert with others, is not considered an energy absorbing member for this subclass as the energy transferred is not changed in form or dissipated but returned almost in full to the vibrating member.

(2) Note. Spring devices of the supporting type useful to cushion relative movement between vehicle parts and which do not involve substantial modification of the vehicle structure are not found herein and in the indented subclasses, but are found in other subclasses within this class.

(3) Note. Devices in this and the indented subclasses include vehicle engine mounts many of which include hydraulic damping.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

2+, for individual vehicle suspension components.

SEE OR SEARCH CLASS:

180, Motor Vehicles, subclasses 300+ for motor mounts having a specific motor to body frame relationship.

248, Supports, subclasses 562+ for a support including a spring and energy absorbing means. (See line note

under Search Class in Class 248, subclass 560).

140.12 Having concentric coaxial spring between plural confining means for radial force:

This subclass is indented under subclass 140.11. Structure wherein the resilient means is an elastomeric or like spring radially disposed between two approximately concentric rigid tubular members with the energy from the vibrating component being applied not parallel to the central axis of the tubular members and the resilient means.

- (1) Note. Many of the devices included herein and the indented subclass have an inner tube which extends approximately all the way through the outer tube.

140.13 Axial:

This subclass is indented under subclass 140.11. Subject matter wherein the resilient means is an elastomeric or like spring disposed between the vibrating component and a supporting component with the energy from the vibrating component being applied approximately parallel to the central axis of the resilient means.

- (1) Note. Many of the devices found herein and in the indented subclass have the spring located between two members spaced along the central axis of the spring either located as two end members or as an end member and an intermediate member.
- (2) Note. Many of the devices found herein and in the indented subclass have a conically shaped or tapered spring and have one of the end or intermediate members of cup-shape receiving the spring (e.g., cup/bush type).

140.14 With electronic or magnetic control:

This subclass is indented under subclass 140.13. Structure wherein the means or feature for absorbing mechanical energy has its damping effect varied (increased or decreased) by application of electrical energy.

- (1) Note. Included herein are devices which increase or decrease the vibration damping effect by using fluids which undergo

a change in viscosity upon application of electrical energy (i.e., electroviscous fluids) and devices wherein a flow passage between fluid containing chambers is varied in effective cross-section by means responsive to application of electrical or magnetic energy.

140.15 With electronic or magnetic control:

This subclass is indented under subclass 140.11. Structure wherein the means or feature for absorbing mechanical energy has its damping effect (increased or decreased) by application of electrical energy.

- (1) Note. Included herein are devices which increase or decrease the vibration damping effect by using fluids which undergo a change in viscosity upon application of electrical energy (i.e., electroviscous fluids) and devices wherein a flow passage between fluid containing chambers is varied in effective cross-section by means responsive to application of electrical or magnetic energy.

140.2 Variably preloaded:

This subclass is indented under subclass 136. Structure comprising means for varying the loading, e.g., tension, compression, shear, etc., of the resilient element so as to vary its characteristics.

SEE OR SEARCH CLASS:

248, Supports, subclass 575 for a resilient support comprising variably preloaded resilient means.

140.3 Having diverse resilient element:

This subclass is indented under subclass 136. Structure wherein a single spring comprises a plurality of resilient elements, at least one of which is different from another.

140.4 Metallic and nonmetallic:

This subclass is indented under subclass 140.3. Structure comprising metallic and nonmetallic element.

140.5 Diverse resistance to vibration along different axes:

This subclass is indented under subclass 136. Structure wherein the resilient means provides for vibration along at least two distinct transla-

tional and/or rotational axes and wherein the resistance of said resilient means to such vibration along one axis is different from that along at least one other axis.

141 Nonmetallic, resilient element:

This subclass is indented under subclass 136. Structure comprising a nonmetallic, resilient element.

141.1 Plural resilient elements with rigid spacer:

This subclass is indented under subclass 141. Structure comprising a plurality of resilient elements which elements are separated by at least one nonresilient spacer element.

SEE OR SEARCH CLASS:

384, Bearings, appropriate subclasses for a laminated bearing of nonmetallic resilient material separated by a non-resilient spacer.

141.2 Confined between coaxial, vibrating annular members:

This subclass is indented under subclass 141. Structure wherein the resilient element is disposed between two coaxial rigid annular members and at least a part of the resilient element is restrained from radial movement by said members.

141.3 Including radial contact surface, e.g., tapered or shouldered member:

This subclass is indented under subclass 141.2. Structure comprising a radial surface, such as a taper or shoulder, on one of the members which contacts the resilient element.

141.4 Annular flange or collar embedded in resilient element:

This subclass is indented under subclass 141.3. Structure wherein one of the members comprises an annular flange or collar at least one edge of which is surrounded by the resilient element.

141.5 Flanged or collared innermost member:

This subclass is indented under subclass 141.4. Structure wherein the flange or collar is on the member which most closely surrounds the common axis.

141.6 Collapsible wall:

This subclass is indented under subclass 141.3. Structure comprising a three-dimensional free space bounded on at least one side by a resilient element whereby vibration of the members will cause the resilient element to distort and vary the shape and/or volume of the free space.

141.7 Arcuate or tapered contact surface:

This subclass is indented under subclass 141.3. Structure wherein the surface which contacts the resilient element is (a) of arcuate configuration, or (b) inclined with respect to the axis of the annular members.

142 CUSHION FOR HUMAN COMFORT:

This subclass is indented under the class definition. Spring device for positioning to bear the weight of a person, in a position directly to receive the force of said weight; i.e., separated therefrom by no more than a flexible covering.

- (1) Note. This subclass includes spring devices for seat cushions, back rests, resting mats, bed springs, etc.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 117, for an air spring cushion for human comfort.
182, for a seat cushion spring support (e.g., bracket).

143 Compound:

This subclass is indented under subclass 142. Spring device comprising a plurality of spring elements of construction diverse from one another.

- (1) Note. Diversity of construction is recognizable by separate, coordinate classification concerning the element; e.g., coil, torsion, rubber.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 151+, for compound coil springs of general utility; e.g., subclass 152, in which one of the diverse elements is an elastomeric body.

- 144 Zigzag:**
This subclass is indented under subclass 142. Spring device in which the spring element is unitary and undulating in shape.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
165, for a zigzag spring device of general utility.
- 145 Rubber:**
This subclass is indented under subclass 142. Spring device in which the spring element is an elastomeric body; i.e., of latex or a synthetic substitute or equivalent.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
153, for a rubber spring device of general utility; and see the subclass search notes.
- 146 Fibrous pad:**
This subclass is indented under subclass 142. Spring device comprising a cushion body made of nonmetallic filamentary material.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
148+, for a fibrous-body spring device of general utility.
- 147 COMPRESSED WIRE MESH:**
This subclass is indented under the class definition. Spring device in which the spring element comprises an open work fabric of interwoven and densitized, and thereby crinkled, wire.
- SEE OR SEARCH CLASS:
428, Stock Material or Miscellaneous Articles, subclass 605 for a fibrous metal mass.
- 148 FIBROUS:**
This subclass is indented under the class definition. Spring device in which the spring element is a filamentary, nonmetallic element; or a body made of such elements (e.g., rope, mat).
- SEE OR SEARCH CLASS:
428, Stock Material or Miscellaneous Articles, subclass 605 for a fibrous metal mass.
- 149 Glass fiber:**
This subclass is indented under subclass 148. Spring device in which the filamentary element is a vitreous siliceous product.
- 150 CENTERING DEVICE:**
This subclass is indented under the class definition. Spring device connectible to a pivotable body (e.g., aircraft caster wheel) so as to be unstressed when said body is in a normal position and to be put under stress by pivotal movement of said body from said position, whereby said spring device tends to return said body to said normal position.
- 151 COMPOUND:**
This subclass is indented under the class definition. Spring device comprising a plurality of spring elements of construction diverse from one another.
- (1) Note. Diversity of construction is recognized by separate, coordinate classification in this class; e.g., coil, torsion, rubber.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
121, for a compound spring one of the elements of which is a piston-type fluid spring.
143, for a compound spring device in a cushion for human comfort (e.g., seat cushion, rest pad or mat).
259+, for compound vehicle spring construction.
- 152 Rubber:**
This subclass is indented under subclass 151. Spring device in which one of the spring elements is an elastomeric body of latex, or a synthetic substitute or equivalent.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
30, for a leaf-and-rubber type compound vehicle spring.

- 33, for a coil-and-rubber type compound vehicle spring.
- 153 RUBBER:**
This subclass is indented under the class definition. Spring device comprising an elastomeric body; i.e., a latex product of a synthetic substitute or equivalent.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 140, for a rubber spring device in shock-absorbing bumper construction.
- 141, for a rubber spring device in a shock absorber of the nonsupport type.
- 145, for a rubber spring device in a cushion for human comfort.
- 292+, for a rubber-type vehicle spring device.
- SEE OR SEARCH CLASS:
- 384, Bearings, subclasses 220+ and 297 for a nonmetallic mounting means, or a sleeve or liner for a plain rotary bearing appropriate subclasses for flexible laminated bearings.
- 403, Joints and Connections, subclass 228 for a composite bushing having an elastomeric component.
- 154 TORSION:**
This subclass is indented under the class definition. Spring device in which the spring element is a unitary member having a portion subject to a deforming force while another portion is retained against movement or is subject to a force which is substantially lesser than or opposite in direction to the first force; which element either (a) includes an unconvoluted portion to which the force is applied as an axial twist, or (b) constitutes a spirally wound body the number of turns of which tend to be changed by the application of the first-mentioned force.
- 155 Coil:**
This subclass is indented under subclass 154. Spring device in which the spring element is in the form of a spirally wound body.
- 156 Volute:**
This subclass is indented under subclass 155. Spring device in which the winding of the body is in the form of a substantially flat spiral.
- 157 Also compressible or expansible:**
This subclass is indented under subclass 155. Spring device which is subject to a compressive or expansive force; as well as said first-mentioned force.
- 158 BENDABLE ALONG FLAT SURFACE (E.G., LEAF SPRING):**
This subclass is indented under the class definition. Spring device in which the spring element is substantially planar through a cross-section thereof whereat bending occurs under a load.
- 159 Snap spring:**
This subclass is indented under subclass 158. Spring device in which the spring element is a unitary member, including a portion under stress resisting movement toward one side of a plane passing through the bending axis, which stress is reversible when said element or portion crosses said plane whereby to continue urging said element or portion away
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 171, for an over-center spring device energized by a coil-spring.
- 160 Flexural support:**
This subclass is indented under subclass 158. Spring device in which the spring element, or a group thereof, constitutes the sole support for a movable load member and the sole connection between said load member and another member fixed to its environment; whereby the direction of (generally, arcuate) movement of said load member is determined by the bending of said element, or group.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- 162, for (1) a spring device including a resilient ring pack and spaced members connected to each of the ends thereof; which members are merely end connection elements of the spring device, rather than load members and (2) the combination of load means, a spring ring pack and rigid rod means extending through the common central aperture of the pack, whereby the control of movement of the load by

- the flexure of the spring device ring elements is negated or, at least, significantly inhibited or modified.
- 178, for a flexural support including a series of coil-springs between a fixed member and a relatively movable support which is the load member.
- 161 Ring or annular spider:**
This subclass is indented under subclass 158. Spring device in which the spring element is annular in general configuration; or is generally circular and includes within the confines of its circle an annularly arranged group of separate, spaced, finger-like formations.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
163, for a spring device element comprising a circular body and a plurality of extensions extending irregularly outwardly (rather than generally annularly and within the confines) thereof, so that neither the device nor the spider-like formation is generally annular.
- 162 Pair or pack:**
This subclass is indented under subclass 161. Spring device in which there are a plurality of superposed and adjacent, annular spring elements or element portions for bending about a common flexural arc.
- 163 Including tang or spider:**
This subclass is indented under subclass 158. Spring device in which the spring element is provided with an elongated separation (e.g., slot) to define either spaced portions extending from an end thereof or finger-like formation within the confines of said element.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
161+, for a bendable spring device element including an annularly arranged spider formation.
- 164 Bow spring or superposed spring elements:**
This subclass is indented under subclass 158. Spring device in which either (a) the spring element is a unitary member bent back upon itself intermediate the ends thereof to present superposed or confronting portions or (b) a group (e.g., pair) of separate, overlapping spring elements is provided; whereby said confronting portions or overlapping elements present a common bending plane or flexural arc.
- 165 Zigzag or plural:**
This subclass is indented under subclass 164. Spring device comprising either (a) the structure of part (b) of the definition of subclass 164 or (b) the unitary spring element bent back upon itself at least twice to provide at least three portions sharing the common bending plane or flexural arc.
- 166 COIL:**
This subclass is indented under the class definition. Spring device in which the spring element is in the form of a helix and is adapted to be extended or compressed in the direction of the helix axis.
- SEE OR SEARCH CLASS:
428, Stock Material or Miscellaneous Articles, subclass 592 for metallic stock of helical configuration or having a helical component.
- 166.1 Conical:**
This subclass is indented under subclass 166. Spring device wherein the turns of the helix lie upon the surface of a cone.
- 167 Circular:**
This subclass is indented under subclass 166. Spring device maintained in the form of an endless loop.
- 168 Plural, one within another:**
This subclass is indented under subclass 166. Spring device including a pair of said elements, one of which surrounds the other directly (i.e., with no structural element intervening therebetween).
- 169 Including internal brace:**
This subclass is indented under subclass 166. Spring device provided with means extending a substantial distance within the confines of the coils for limiting transaxial flexure.
- 170 Including end thrust member:**
This subclass is indented under subclass 166. Spring device including, in the use condition thereof, a member which is (a) separate from

- the spring element, (b) positioned at one end thereof, and (c) movable therewith during said extension or compression.
- 171 Equilibrium or over-center:**
This subclass is indented under subclass 170. Spring device, further including a second end thrust member at the other end of the spring element; and in which the spring element is adapted either (a) to maintain said end thrust members a predetermined distance apart or (b) selectively to maintain one of the members, or the contact point between said one member and the end of the element, at each of a pair or predetermined positions on opposite sides of the helix axis.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
159, for an over-center snap spring of leaf or disc construction.
- 172 Including cam:**
This subclass is indented under subclass 170. Spring device and means having a surface movable along a path intersecting a position of the end thrust member for thrust reaction momentary engagement therewith.
- 173 Including lever:**
This subclass is indented under subclass 170. Spring device in which the end thrust member constitutes, or is associated with, means movable about a fulcrum for a thrust reaction with said spring element.
- 174 For dynamic or work environment:**
This subclass is indented under subclass 170. Spring device wherein said end thrust member, has a movement intended to effect a condition change (e.g., actuate a valve, make or break a circuit), work stroke (e.g., piston movement), or work modification (i.e., tool function).
- 175 Adjustable:**
This subclass is indented under subclass 174. Spring device, including means for selectively varying the spring force of the spring element whereby the character of movement of the member may correspondingly be selectively varied.
- 176 Reset:**
This subclass is indented under subclass 174. Spring device in which the spring element is adapted to resist said movement and to return said member to a starting position.
- 177 Adjustable:**
This subclass is indented under subclass 170. Spring device including means for selectively varying the spring force of the spring element whereby the character of the thrust reaction may be correspondingly varied.
- 178 Support type:**
This subclass is indented under subclass 170. Spring device either (a) for retaining an object against the forces of gravity, or (b) for supplementing the retention against gravity of a cantilever-supported object.
- 179 Particular end connection:**
This subclass is indented under subclass 170. Spring device in which both the spring element and the end thrust member are particularly pre-shaped for the purpose of attachment with one another.
- 180 Irregular:**
This subclass is indented under subclass 166. Spring device in which the spring element is of one-piece construction and (a) includes plural, intervoluted coils; or (b) is out-of-round in cross-section; or (c) in the unstressed condition thereof, includes portions which vary, one from another in (1) helix angle, or (2) distance from a common, central, longitudinal axis, or (3) cross-section.
- 181 FORAMINATED:**
This subclass is indented under the class definition. Spring device in which the spring element is a multiperforate body.
- SEE OR SEARCH THIS CLASS, SUB-CLASS:
147, for a compressed wire mesh spring element.
161+, or 163, for a spring device flat-surfaced element which is slotted to provide bending planes.

182 MISCELLANEOUS:

This subclass is indented under the class definition. Subject matter not classifiable elsewhere.

- (1) Note. This subclass includes supports, per se, (e.g., frame, bracket) for a seat cushion spring device.

183 Parallel depression (e.g., having stabilizer bar):

This subclass is indented under subclass 2. Spring device combined with equalizing means which tends to cause uniform displacement of all points along a substantially horizontal line contained in the vehicle chassis or body.

- (1) Note. The equalizing means typically factions to cause uniform displacement along a lateral axis, or along a longitudinal axis of the vehicle body antiroll.

SEE OR SEARCH CLASS:

280, Land Vehicles, subclasses 5.5+ for a general utility land vehicle including an active suspension responsive to a force encountered while the vehicle is in surface traversing motion which may or may not involve a stabilizer or torsion bar, especially subclass 5.511 involving sway or torsion bar regulation; or subclass 124.107 for a general utility wheeled land vehicle running gear suspension arrangement preventing lateral or sideways tilt of the vehicle body, chassis, or frame through a centrifugal force transmission linkage.

184 Duplex:

This subclass is indented under subclass 183. Spring device wherein the equalizing means acts in two planes, thereby tending to cause uniform displacement of the chassis along both the lateral and longitudinal axis of the vehicle.

185 Single pivot:

This subclass is indented under subclass 184. Spring device wherein all forces applied to the chassis by the equalizing means cause uniform displacement about a single point.

186 Fluid stabilizer:

This subclass is indented under subclass 183. Spring device wherein the equalizing means employs a pressure fluid to cause uniform displacement of the chassis of body.

187 Including torque bar or pump:

This subclass is indented under subclass 186. Spring device wherein the equalizing means further comprises either (a) an elongated member which exhibits resilient characteristics when subjected to axial twist while transmitting equalizing stresses from one point to another on the vehicle, or (b) a discrete apparatus for dynamically increasing the pressure or velocity of the pressure fluid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

188, for a torsion stabilizer, per se.
273, for a vehicle torsion spring or torque bar, per se.

188 Torque bar or tube stabilizer:

This subclass is indented under subclass 183. Spring device wherein the equalizing means includes an elongated member formed of metal or a similar material, and which exhibits resilient characteristics when subject to an axial twist while transmitting equalizing stress for one point to another on the vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

187, for a torsion bar equalizer combined with a fluid-operated equalizer.

189 And elastomeric member:

This subclass is indented under subclass 188. Spring device wherein the equalizing means further comprises a member formed for rubber or a material which exhibits similar characteristics.

SEE OR SEARCH THIS CLASS, SUBCLASS:

259, for torque bar or tube combined with a rubber spring for use on a vehicle other than as an equalizer.

276, for a torque bar or tube-vehicle suspension spring combined with an elastomeric bushing.

190 And coil spring:

This subclass is indented under subclass 188. Spring device including a coil-spring* which is employed either to cushion relative movement between parts of the vehicle, or to supplement the elongated resilient member in transmitting equalizing stresses from one point to another on the vehicle.

191 And retarder:

This subclass is indented under subclass 188. Spring device including nonreacting means (e.g., a dashpot) for opposing and slowing distortion or recovery of a spring element.

- (1) Note. The spring element may serve to cushion relative movement of vehicle parts, or it may serve as an equalizer to ensure parallel depression of the parts.

SEE OR SEARCH THIS CLASS, SUBCLASS:

195+, for a mechanical spring and retarder (e.g., shock absorber), per se.

SEE OR SEARCH CLASS:

188, Brakes, subclass 129 for a frictional shock absorber with no restoring means (spring), and subclasses 266+ for a fluid resistance dashpot or shock absorber, per se.

192 Leaf spring stabilizer:

This subclass is indented under subclass 183. Spring device wherein the equalizing means comprises a leaf-spring*.

193 Leaf spring acting between pivoted links:

This subclass is indented under subclass 192. Spring device wherein portions of the leaf-spring* which are deflected relatively to each other are each connected to the vehicle by an intermediate element which turns about an attached pin or equivalent structure.

194 Plural nontorsion coil springs:

This subclass is indented under subclass 183. Spring device wherein the equalizing means includes two discrete coil-springs* adapted to be extended and compressed in the direction of their central axes.

195 Mechanical spring and nonresilient retarder (e.g., shock absorber):

This subclass is indented under subclass 2. Spring device including a nonfluid (mechanical) spring element for cushioning relative movement between the vehicle parts combined with nonreacting means for opposing and slowing the distortion or recovery of the spring element.

- (1) Note. This subclass and its indents include shock absorber which are combined with a nonfluid spring element for returning the vehicle parts connected by the shock absorbers to a neutral position after they have been displaced therefrom.

SEE OR SEARCH THIS CLASS, SUBCLASS:

64.15+, for a fluid spring combined with a motion retarder (shock absorber).

SEE OR SEARCH CLASS:

105, Railway Rolling Stock, subclasses 197.05+ for a snubber combined with railway truck structure.

188, Brakes, subclasses 266+ for an internal resistance motion retarder, wherein energy absorbed during displacement of the parts out of normal position is not returned to restore the parts to normal position.

196 Friction (e.g., "snubber"):

This subclass is indented under subclass 195. Spring device wherein the retarder comprises two friction surfaces which are caused to rub against each other to slow the distortion or recovery of the spring element.

SEE OR SEARCH THIS CLASS, SUBCLASS:

134+, for a friction snubber which is not peculiarly adapted for use on a vehicle.

SEE OR SEARCH CLASS:

188, Brakes, subclasses 129+ for a vehicle friction shock absorber, per se, having a spring biased friction surface, but in which there is no distortion of the

- spring as the parts move relative to each other.
- 213, Railway Draft Appliances, subclasses 22+ for a cushioned railway draft appliance employing a spring and friction surfaces, and subclasses 220+ for a car end bumper or buffer, per se.
- 197 Including flexible strap connector:**
This subclass is indented under subclass 196. Spring device including an elongated flaccid element connected to or forming part of the retarder, and having one end connected to one of the sprung vehicle parts, whereby relative motion of the vehicle parts away from each other is accommodated through the flaccid element, and the spring element subsequently draws the vehicle parts toward one another through the flaccid element.
- SEE OR SEARCH CLASS:
188, Brakes, subclass 65.1 for a brake which operates on a strand such as a rope, band, etc.
- 198 Strap forms friction element:**
This subclass is indented under subclass 197. Spring device wherein one of the two surfaces which are caused to rub against each other is on the elongated flaccid element.
- (1) Note. The surfaces must be that of a flaccid element and not of a separate brake shoe attached to the flaccid element.
- 199 Flat spiral spring:**
This subclass is indented under subclass 197. Spring device wherein the spring element comprises a coil of at least one complete turn about an axis and wherein all turns lie in a single plane.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
198, for a device in which the friction occurs between the spiral spring element and the flaccid element.
- 200 Having lubricating feature:**
This subclass is indented under subclass 196. Spring device including a friction reducing fluid, or means to store or facilitate the application of the friction reducing fluid.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
37.4, for leaf-spring covering provided with a lubricant reservoir or pad.
268, for end connection for a vehicle leaf-spring provided with means to apply or pass a lubricant.
- 201 Elastomeric spring or friction element:**
This subclass is indented under subclass 196. Spring device an element formed of rubber or a material exhibiting similar characteristics and which serves either (a) as the spring element, (b) a friction surface, or (c) as a means for biasing the friction surfaces against each other.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
292, for a rubber spring element, per se, which is peculiarly adapted for use on a vehicle.
- 202 And helical coil spring:**
This subclass is indented under subclass 201. Spring device including a helical coil-spring element which acts between the parts of the vehicle.
- (1) Note. Those devices having coil-springs which bias friction elements only are excluded.
- 203 Plural coil springs:**
This subclass is indented under subclass 202. Spring device including a second discrete helical coil-spring* element which acts between the parts of the vehicle.
- 204 Friction surface on helical spring:**
This subclass is indented under subclass 196. Spring device wherein one of the surfaces which rub against each other is located on a helical coil-spring*.

- 205 Including cam or wedge friction element or actuator therefor:**
This subclass is indented under subclass 196. Spring device including two members or portions having contacting relatively moving surfaces, wherein at least one of the surfaces is sloped or curved to force the friction surfaces against each other.
- (1) Note. The cam or wedge surface may also serve as the "friction surfaces".
- SEE OR SEARCH THIS CLASS, SUBCLASS:
201+, for a retarder which employs a cam or wedge for compressing an elastomeric friction element.
- SEE OR SEARCH CLASS:
213, Railway Draft Appliances, subclasses 32+ for similar devices which are peculiar to railway use.
- 206 Helical cam surface:**
This subclass is indented under subclass 205. Spring device wherein the sloped or curved surface defines or is formed upon a helix.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
204, for retarding devices where a helical spring serves as one of the friction surfaces.
- 207 Plural axially spaced expandable friction rings:**
This subclass is indented under subclass 205. Spring device having a central axis along which parts or the device connected to the sprung vehicle portions are caused to move, wherein a plurality or discrete expandable annular members, each carrying a friction surface on its peripheral face, are located at different points along the axis.
- 208 Including relatively rotating friction surfaces (e.g., drum type):**
This subclass is indented under subclass 205. Spring device wherein one of the rubbing surfaces is caused to revolve or swing in contact with the other surface.
- SEE OR SEARCH CLASS:
213, Railway Draft Appliances, subclass 28 for similar devices peculiar to railway use.
- 209 Including helical coil spring:**
This subclass is indented under subclass 205. Spring device including a helical coil-spring* which serves either as the spring element for cushioning the relatively moving parts of the vehicle or for biasing the friction, wedge or cam surfaces toward or away from one another.
- 210 Transversely oriented coil for biasing friction surfaces:**
This subclass is indented under subclass 209. Spring device wherein the helical coil-spring* serves to resiliently urge the friction surfaces toward or away from one another, and the central axis of the spring is oriented at an angle to the vertical when the device is mounted on the vehicle.
- 211 Plural laterally spaced coils (e.g., spring group):**
This subclass is indented under subclass 209. Spring device including a second helical coil-spring*, wherein a substantial part of one of the helical coil-spring*, wherein the axes of the two springs are spaced from each other.
- 212 Nested coil springs:**
This subclass is indented under subclass 209. Spring device including a second helical coil-spring*, wherein a substantial part of one of the helical springs occupies the area within the other helical spring.
- 213 Inside friction shell:**
This subclass is indented under subclass 212. Spring device wherein a substantial portion of each helical spring lies within a hollow member on which is located one of the frictions surfaces.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
204, for similar devices in which the spring rubs against the surface of the shell to provide the snubbing action.

214 Friction surface formed on or biased by additional spring:

This subclass is indented under subclass 196. Spring device including a second element which exhibits resilient characteristics and which tends to force the friction surface into or out of contact with each other.

- (1) Note. Devices having a spring which serves to bias the vehicle parts and the friction elements are not classified here on that basis.
- (2) Note. The friction surface may be on the spring itself, but see this class, subclass 204 for those devices which employ a friction surface formed on a helical spring.

215 Relatively rotating friction surfaces (e.g., drum type):

This subclass is indented under subclass 214. Spring device wherein one of the rubbing surfaces is caused to revolve or swing while in contact with the other surface.

216 Coil spring for biasing vehicle parts and friction surfaces:

This subclass is indented under subclass 196. Spring device wherein the spring element which serves to cushion relative movement between the parts of the vehicle comprises a coil-spring* which also tend to force the rubbing surfaces toward or away from each other.

217 Fluid retarder:

This subclass is indented under subclass 195. Spring device wherein the viscosity of a liquid or gas is employed for opposing and slowing the distortion or recovery of the spring element.

SEE OR SEARCH CLASS:

- 16, Miscellaneous Hardware (e.g., Bushing, Carpet Fastener, Caster, Door Closer, Panel Hanger, Attachable or Adjunct Handle, Hinge, Window Sash Balance, etc.), subclasses 51+ and 66+ for a fluid check and spring system for use with a closure (e.g., door).
- 105, Railway Rolling Stock, subclass 197.05 for a hydraulically-dampened spring bolster for a railway truck.

188, Brakes, subclasses 266+ for a fluid retarder with no claimed spring element.

280, Land Vehicles, subclasses 124.1+ for a general utility wheeled land vehicle running gear suspension arrangement, especially subclasses 124.145+ or 124.154+ wherein a wheel is separately supported upon an individual stub axle including a vertically extending strut which may or may not include a fluid damper or retarder.

218 With separate pump or adjustment for spring loading:

This subclass is indented under subclass 217. Spring device including either (a) Discrete means in addition to the fluid retarder for raising, transferring or compressing the liquid or gas, or (b) means by which the spring force exerted on the vehicle parts at a particular relative position of the parts may be varied.

219 Elastomeric spring:

This subclass is indented under subclass 217. Spring device wherein the spring element is formed of rubber or a material which exhibits similar characteristics.

SEE OR SEARCH THIS CLASS, SUBCLASS:

35, for a fluid spring combined with an elastomeric spring.

220 Mounted at end of retarder:

This subclass is indented under subclass 219. Spring device wherein the rubber or rubber-like spring element is attached at or immediately adjacent to a terminal portion of the retarder.

- (1) Note. The rubber or rubber-like bushing is normally located at the point or attachment to the vehicle.

221 Helical coil spring:

This subclass is indented under subclass 217. Spring device wherein the spring element is a helical coil-spring*.

SEE OR SEARCH THIS CLASS, SUBCLASS:

34, for a fluid spring combined with a helical coil-spring.

222 Quadrilateral suspension:

This subclass is indented under subclass 221. Spring device including four links pivoted together to form a four-sided polygon, wherein the relatively moving parts of the vehicle are connected to or serve as separate links, whereby relative movement between the vehicle parts cause the shape of the polygon to change.

- (1) Note. Typically, the links comprise the upper and lower control arms, the wheel axle support, and the vehicle chassis, and the arrangement is applied to separate wheels as an "independent suspension" system.

223 And rocking actuator arm or rotary fluid displacement member:

This subclass is indented under subclass 221. Spring device wherein the retarder includes either (a) a pivoted lever which is caused to pivot upon relative motion between the vehicle parts to effect operation of the retarder, or (b) a rotatably mounted member having a surface thereon which displaces or moves through the retarding fluid to effect the opposing and retarding action.

SEE OR SEARCH CLASS:

- 188, Brakes, subclasses 266+ for a fluid dashpot, per se, particularly subclasses 306+ for those having an arcuately oscillating thrust member.

224 Plural mechanical spring for biasing vehicle parts:

This subclass is indented under subclass 223. Spring device including a second discrete non-fluid spring element which cushions relative movement between the vehicle parts.

225 Plural mechanical springs for biasing vehicle parts:

This subclass is indented under subclass 221. Spring device including a second discrete non-fluid spring element which cushions relative movement between the vehicle parts.

226 Spring within coaxial fluid chamber:

This subclass is indented under subclass 221. Spring device including an enclosure for containing the liquid or gas, wherein a substantial

portion of the helical coil-spring* element is located within the enclosure, and the central longitudinal axis of the enclosure coincides with the central axis of the spring helix.

227 Leaf spring:

This subclass is indented under subclass 217. Spring device wherein the spring element is a leaf-spring*.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 31+, for a fluid spring combined with a leaf-spring.

228 Lever and nontorsion spring:

This subclass is indented under subclass 2. Spring device including a discrete swingably mounted, force multiplying link through which stress is applied to a spring element to compress, expand or laterally deflect a portion of the spring element.

- (1) Note. Devices in which the link forms an essential part of the spring element are excluded.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 195+, for a spring connected through a lever to a shock absorber, especially subclasses 201+, 219, and 221+.

SEE OR SEARCH CLASS:

- 280, Land Vehicles, subclasses 5.5+ for a general utility land vehicle including an active suspension responsive to a force encountered while the vehicle is in surface traversing motion which may or may not involve a lever acting upon a spring device or element; subclasses 6.15+ for a general utility land vehicle including means, interposed between a vehicle body, chassis, or frame and running gear thereof, for altering height or levelness of the vehicle body, chassis, or frame which may or may not involve a lever acting upon a spring device or element; subclass 79 for a general utility wheeled land vehicle provided with springs between the wheel or wheels and the load-support, noting the search notes provided therein; subclasses 124.1+

for a general utility wheeled land vehicle running gear suspension arrangement; or subclasses 275+ or 283+ for a general utility occupant propelled-type wheeled land vehicle including yielding framework or running gear which may or may not involve a spring device or element (it is noted that in accordance with the (2) Note of Class 280, subclass 200, motorcycle frames and running gear, without features causing classification in Class 180, Motor Vehicles, are included in these subclasses). Patents classified in this class (Class 267) as originals may include vehicle parts directly related to vehicle suspension (e.g., fluid damper, upper or lower control arm) and vehicle parts which are nominally recited as either a reference or mounting structure for the spring.

229 Leaf spring:

This subclass is indented under subclass 228. Spring device including a spring element in the form of a leaf-spring* for cushioning relative movement of the vehicle parts.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 271, for an end connection in the form of a shackle for a vehicle leaf-spring.
283, for a multilayer leaf torsion spring.

230 Quadrilateral suspension:

This subclass is indented under subclass 229. Spring device including four rigid links pivoted together to form a four-sided polygon, wherein the relatively moving parts of the vehicle are connected to different links, and one link serves as the "lever" connected to the spring element, whereby relative movement between the vehicle parts causes the shape of the polygon to change.

- (1) Note. Typically, the links comprise the upper and lower control arms, the wheel axial support, and the vehicle chassis, and the arrangement is applied to separate wheels as an "independent suspension".

231 And coil spring:

This subclass is indented under subclass 229. Spring device further including a second spring element in the form of a coil-spring* for cushioning relative movement of the vehicle parts.

- (1) Note. The lever may act upon either the leaf-spring or the coil-spring, or both.

232 And roller:

This subclass is indented under subclass 231. Spring device including a generally round rotatable element which is caused to roll along the surface of the leaf spring or an adjacent member as the vehicle parts move relatively and the leaf spring is deflected.

233 And "overload" bumper:

This subclass is indented under subclass 231. Spring device including a member or portion which limits relative movement of the vehicle parts by striking another member or portion.

234 Including adjustment for spring loading:

This subclass is indented under subclass 231. Spring device including means by which the force exerted by an spring element on the vehicle parts at a particular relative position of the parts may be selectively varied.

235 Adjusting screw coaxial with coil spring:

This subclass is indented under subclass 234. Spring device wherein the means to selectively vary the spring force includes and elongated helically ribbed element rotatable about its longitudinal axis, which coincides with the central axis of the coil-spring* element.

236 Plural coils between vertically spaced leaf springs:

This subclass is indented under subclass 231. Spring device including a second leaf-spring* located above the first leaf-spring* with respect to the vehicle, wherein two discrete coil-springs* are located between the two leaf-springs.

- (1) Note. Elliptical and semielliptical leaf-spring* arrangements are considered to be "vertically spaced".

- 237 Plural coaxial coils:**
This subclass is indented under subclass 231. Spring device including a second coil-spring* for cushioning relative movement of the vehicle parts, wherein the central axes of the two coils coincide.
- 238 Nested coils:**
This subclass is indented under subclass 237. Spring device wherein the coil-springs* are coaxial and a substantial portion of one spring is located within the other spring.
- 239 Having leaf-end-connecting lever:**
This subclass is indented under subclass 321. Spring device wherein the discrete link connects the end of the leaf-spring* to the vehicle, or to another spring element which is in turn connected to the vehicle.
- (1) Note. A mere shackle connecting a leaf-spring* with the vehicle or another leaf-spring is not considered to be a "lever" for purposes of classification in this subclass.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
271, for a leaf-spring combined with shackle for connecting it to the vehicle.
- 240 Coil spring between lever and vehicle part:**
This subclass is indented under subclass 239. Spring device wherein one end of the coil-spring* engages the discrete link or structure rigidly connected thereto, and the other end engages one of the sprung vehicle parts or structure rigidly connected thereto.
- (1) Note. A coil-spring* which is connected to the leaf-spring* at or immediately adjacent to the leaf spring's point of attachment to a vehicle part is considered to "engage one of the sprung vehicle parts".
- 241 And fluid pressure spring:**
This subclass is indented under subclass 229. Spring device including, in addition to the leaf-spring*, and apparatus which utilizes a fluid medium to provide a resilient cushion between the relatively moveable vehicle parts.
- 242 Including adjustment for spring loading:**
This subclass is indented under subclass 229. Spring device including means by which the spring force exerted on the vehicle parts at a particular relative position of the parts may be selectively varied.
- 243 And roller or bearing to accommodate deflection of spring:**
This subclass is indented under subclass 229. Spring device including structure which permits rolling or sliding contact between the leaf-spring* element, or adjacent vehicle structure.
- 244 Vertically spaced leaf springs (e.g., elliptic):**
This subclass is indented under subclass 229. Spring device including a second discrete leaf-spring* spaced above the first leaf-spring* with respect to the vehicle.
- (1) Note. One spring must be located above or below the other spring when the device is unstressed or in equilibrium.
- 245 Having serially pivoted levers at end of spring:**
This subclass is indented under subclass 229. Spring device wherein the discrete link is pivotally connected to the spring element, and a second discrete link is pivotally connected to the first link and additionally to one of the sprung vehicle parts.
- 246 Transverse leaf spring:**
This subclass is indented under subclass 229. Spring device wherein the longitudinal axis of the leaf-spring* is oriented laterally with respect to the vehicle chassis.
- 247 Center acting or resiliently biased lever:**
This subclass is indented under subclass 229. Spring device wherein either (a) the discrete link acts through a point along the length of the leaf-spring which is closer to its longitudinal center than an end thereof, or (b) the discrete link or a separate element is formed of an elastically deformable material to bias the link against the leaf-spring*.
- 248 Coil spring:**
This subclass is indented under subclass 228. Spring Device wherein the spring element comprises a coil-spring*.

249 Enclosed spring:

This subclass is indented under subclass 248. Device including a housing which surrounds the spring element.

- (1) Note. The “housing” may comprise one or more members which collectively enclose the spring, and may serve some additional purpose in addition to merely enclosing the spring.

250 Plural coaxial coils in enclosure:

This subclass is indented under subclass 249. Spring device wherein a second coil-spring* is located within the housing, and the longitudinal axes of the coils coincide.

251 Plural nontorsion coil springs:

This subclass is indented under subclass 248. Spring device including a second coil-spring* element for cushioning relative movement of the vehicle parts, wherein each of the coil-spring elements is deflected axially upon relative movement of the vehicle parts.

252 Coaxial:

This subclass is indented under subclass 251. Spring device wherein the two coil-spring* elements have the same longitudinal axis.

253 Differentially deflected by lever:

This subclass is indented under subclass 251. Spring device wherein the discrete link causes simultaneous deflection of both coil-spring* elements in unequal amounts for a given displacement of said link.

254 Quadrilateral suspension:

This subclass is indented under subclass 248. Spring device including four rigid links pivoted together to form a four-sided polygon, wherein the relatively moving parts of the vehicle are connected to different links and one link serves as the “lever” connected to the spring element, whereby relative movement between the vehicle parts causes the shape of the polygon to change.

- (1) Note. Typically, the links comprise the upper and lower control arms, the wheel axle support, and the vehicle chassis, and the arrangement is applied between a

vehicle wheel and chassis as an “independent suspension”.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 222, for a quadrilateral vehicle suspension which includes a shock absorber and coil-springs.

255 Including adjustment for spring loading:

This subclass is indented under subclass 248. Spring device including means by which the spring force exerted on the vehicle parts at a particular relative position of the parts may be varied.

256 Fluid spring:

This subclass is indented under subclass 228. Spring device which utilizes a compressible fluid to resiliently cushion the vehicle parts, wherein the discrete link is employed to transmit relative motion of the vehicle parts to a surface bearing against the fluid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 64.11+, for other fluid springs adapted for use in vehicles.

SEE OR SEARCH CLASS:

- 280, Land Vehicles, subclasses 5.5+ for a general utility land vehicle including an active suspension responsive to a force encountered while the vehicle is in surface traversing motion which may or may not involve a fluid spring device or element; subclasses 6.15+ for a general utility land vehicle including means, interposed between a vehicle body, chassis, or frame and running gear thereof, for altering height or levelness of the vehicle body, chassis, or frame which may or may not involve a fluid spring device or element; subclass 79 for a general utility wheeled land vehicle provided with springs between the wheel or wheels and the load-support, noting the search notes provided therein; subclasses 124.1+ for a general utility wheeled land vehicle running gear suspension arrangement which may or may not involve a fluid spring device or element, especially subclasses

124.157+ which are directed to a residual fluid suspension (in accordance with industry and mechanical engineering convention, a fluid shock absorber, per se, is not deemed a fluid suspension device for subclasses 124.157+ since it does not normally support any weight but merely retards the extent of motion provided by a spring device attempting to distort or return to its undeflected condition); or subclasses 275+ or 283+ for a general utility occupant propelled-type wheeled land vehicle including yielding framework or running gear which may or may not involve a fluid spring device or element (it is noted that in accordance with the (2) Note of Class 280, subclass 200, motorcycle frames and running gear, without features causing classification in Class 180, Motor Vehicles, are included in these subclasses). Patents classified in this class (Class 267) as originals may include vehicle parts directly related to vehicle suspension (e.g., fluid damper, upper or lower control arm) and vehicle parts which are nominally recited as either a reference or mounting structure for the spring.

257 Elastomeric spring:

This subclass is indented under subclass 228. Spring device wherein the spring element is formed of rubber or a material which exhibits similar characteristics.

SEE OR SEARCH CLASS:

248, Supports, subclasses 560+ for a resilient support, and see the subclass 560 definition or a statement of the line.

258 Annular or spherical:

This subclass is indented under subclass 257. Spring device wherein the spring element is either in the form of a cylindrical ring or a sphere.

259 Compound:

This subclass is indented under subclass 2. Spring device having individual diverse spring elements each of which serves to cushion relative movement between parts of the vehicle.

- (1) Note. The original basis of classification in this and indented subclasses was by total disclosure rather than by claimed disclosure; i.e., if a claimed spring element was specifically intended to be used in combination with a leaf-spring, the leaf-spring is considered to be part of the device for classification purposes, even though not actually claimed.
- (2) Note. An elastomeric or rubber bushing employed to mount a spring element in most cases is not considered to be an "individual" spring element itself, particularly where its cushioning effect is negligible when compared with the spring element itself. However, where the disclosure clearly indicates or implies a cushioning effect upon the vehicle parts, an elastomeric or rubber element has been considered to be a separate spring element proper for classification in these subclasses. Analogously, a torsion tube assembly comprising a steel torsion rod with a surrounding elastomeric or rubber sleeve to cushion the vehicle parts is not considered to be diverse spring elements for classification in these subclasses, but rather has been deemed an individual torsion spring proper for this class (267), subclasses 273+, provided later in the class schedule.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 121, for a compound spring, one element of which is a piston-type fluid spring.
- 143, for a compound spring employed in a cushion for human comfort (e.g., seat cushion).
- 151+, for a compound spring of general utility.

SEE OR SEARCH CLASS:

- 280, Land Vehicles, subclasses 124.1+ for a general utility wheeled land vehicle running gear suspension arrangement which may or may not involve plural spring devices or elements, especially subclasses 124.162+ which are directed to a residual fluid suspension combined with a mechanical spring device or element or subclass 124.165

which is directed to a combination of plural, diverse mechanical spring devices or elements; or subclasses 275+ or 283+ for a general utility occupant propelled-type wheeled land vehicle including yielding framework or running gear which may or may not involve plural spring devices or elements (it is noted that in accordance with the (2) Note of Class 280, subclass 200, motorcycle frames and running gear, without features causing classification in Class 180, Motor Vehicles, are included in these subclasses).

260 Having specific end connection:

This subclass is indented under subclass 36.1. Spring device wherein significance is attributed to the particular structure used to attach and end of the leaf spring to part of the vehicle.

(1) Note. Cantilever springs are excluded.

SEE OR SEARCH THIS CLASS, SUBCLASS:

30, for a leaf-spring combined with an elastomeric spring which is disclosed as having a cushioning effect upon the vehicle parts.

229+, for a leaf-spring having and end connection in the form of a lever for applying stress to the spring.

SEE OR SEARCH CLASS:

403, Joint and Connections, appropriate subclasses for a connection between the end of a spring and another member and including only as much of the spring as is necessary to effect the connection.

428, Stock Material or Miscellaneous Articles, subclass 582 for a metallic intermediate article or blank which is provided with an outward flange.

261 For elliptic spring:

This subclass is indented under subclass 260. Spring device wherein the spring element comprises two distinct bowed leaf-springs* joined together at each end to form an ellipse.

262 Sliding:

This subclass is indented under subclass 260. Spring device wherein the connecting structure constrains the end of the spring element to relative transnational motion with respect to the connecting structure or the vehicle part to which it is connected.

SEE OR SEARCH THIS CLASS, SUBCLASS:

243, for a lever-actuated leaf-spring and a bearing or roller to accommodate deflection of the spring element.

SEE OR SEARCH CLASS:

16, Miscellaneous Hardware (e.g., Bushing, Carpet Fastener, Caster, Door Closer, Panel Hanger, Attachable or Adjunct Handle, Hinge, Window Sash Balance, etc.), subclasses 362+ for a hinge which allows relative translation of the hinged member.

263 Including spring for biasing pivotal connection:

This subclass is indented under subclass 260. Spring device wherein the connection structure swingably connects the leaf-spring to the vehicle, and a resilient element in addition to the connecting structures is provided and acts between the end of the leaf-spring and the connecting structure of vehicle part.

SEE OR SEARCH THIS CLASS, SUBCLASS:

259+, for an end connection in the form of a diverse-type spring.

264 Including threaded or grooved bearing surface:

This subclass is indented under subclass 260. Spring device wherein the connecting structure includes a first apertured element in which pivots a second element, wherein the apertured element and the exterior of the second element are provided with cooperating threads or otherwise grooved or ridged surfaces to restrict relative sliding movement between the two elements.

265 Including spring position adjustment or geared connection:

This subclass is indented under subclass 260. Spring device where in the connecting structure includes either (a) means to selectively fix the leaf-spring* in any one of a plurality of relative position with respect to the part of the vehicle to which it is connected, or (b) a first rotary member having teeth which mesh with teeth formed on a second relatively movable member, whereby relative motion between the leaf-spring* and vehicle part causes relative movement between the toothed members.

266 Universal joint:

Spring device under subclass wherein the connecting structure permits relative pivotal movement between the leaf-spring* and the vehicle part to which it is connected, wherein the pivotal movement occurs about two orthogonal axes.

SEE OR SEARCH CLASS:

- 16, Miscellaneous Hardware (e.g., Bushing, Carpet Fastener, Caster, Door Closer, Panel Hanger, Attachable or Adjunct Handle, Hinge, Window Sash Balance, etc.), subclasses 366+ for a hinge which permits movement of hinged members about plural axes.
- 403, Joints and Connections, subclasses 52+ for articulation axes.

267 Having rolling antifriction elements (e.g., ball bearing):

This subclass is indented under subclass 260. Spring device wherein the connecting structure includes a plurality of discrete elements having a circular cross section and located between relatively moving surfaces to eliminate friction between the surfaces.

SEE OR SEARCH CLASS:

- 384, Bearings, appropriate subclasses for an antifriction bearing (e.g., ball or roller bearing) and nominally claimed spring and vehicle structure.

268 Having lubrication feature:

This subclass is indented under subclass 260. Spring device including means at the end connection to store or facilitate the application of a friction reducing fluid.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 37.4, for a vehicle leaf-spring covering having a lubricant reservoir or pad.

269 Including elastomeric material:

This subclass is indented under subclass 260. Spring device including a portion formed of rubber or a material which exhibits similar characteristics.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 30, for a leaf-spring combined with a rubber spring which is employed to cushion the parts of the vehicle. The patents classified in this subclass generally disclose a bushing whose cushioning effect on the vehicle parts is negligible compared with that of the leaf-spring (i.e., the bushing is intended to impart "give" to leaf spring end about an axis).

SEE OR SEARCH CLASS:

- 384, Bearings, subclasses 220+ and 297 for nonmetallic sleeves on liners for supporting the ends of an oscillating rotary shaft.

270 Including tapered bushing or inner and outer sleeve for cylindrical bushing:

This subclass is indented under subclass 269. Spring device wherein the connecting structure allows pivotal movement and includes either a hollow conical or tubular elastomeric element, the latter having contiguous relatively rigid tubular elements along its inside and outside surfaces.

271 Including shackle pivoted to spring and to vehicle:

This subclass is indented under subclass 260. Spring device wherein the connecting structure includes a rigid link having one end swingably connected to the end of the leaf-spring, and the other end swingably connected to the part of vehicle.

SEE OR SEARCH THIS CLASS, SUBCLASS:

- 229+, for a leaf-spring which is deflected by a lever.

272 Flat spiral:

This subclass is indented under subclass 2. Spring device which includes a coil-spring* element, all turns of which lie in the same plane.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

199, for a vehicle suspension employing a flat spiral spring to both resiliently cushion and dampen motion between the vehicle parts.

273 Torsion:

This subclass is indented under subclass 2. Spring device wherein the spring element is subjected to a twisting force about its central axis when the vehicle parts are relatively displaced, and undergoing a resultant elastic deformation about said axis.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

154+, for a torsion spring or general utility.
188+, for a vehicle torque bar or tube-type stabilizer.

SEE OR SEARCH CLASS:

280, Land Vehicles, subclasses 5.5+ for a general utility land vehicle including an active suspension responsive to a force encountered while the vehicle is in surface traversing motion which may or may not involve a torsion spring device or element; subclasses 6.15+ for a general utility land vehicle including means, interposed between a vehicle body, chassis, or frame and running gear thereof, for altering height or levelness of the vehicle body, chassis, or frame which may or may not involve a torsion spring device or element; subclass 79 for a general utility wheeled land vehicle provided with springs between the wheel or wheels and the load-support, noting the search notes provided therein; or subclasses 124.1+ for a general utility wheeled land vehicle running gear suspension arrangement which may or may not involve a torsion spring device or element, especially subclass 124.107 which is

directed to an antiroll or antisway suspension including a sway or torsion bar, subclasses 124.116, 124.13, 124.137, 124.149, or 124.152 for a particular suspension arrangement which includes a torsion rod stabilizer, or subclasses 124.166+ for a torsion spring suspension arrangement, per se.

464, Rotary Shafts, Gudgeons, Housings, and Flexible Couplings for Rotary Shafts, subclass 97 for a coaxial torsion bar coupling for a rotary shaft.

274 Quadrilateral suspension:

This subclass is indented under subclass 273. Spring device including four rigid links pivoted together to form a four-sided polygon, wherein the relatively moving parts of the vehicle are connected to or serve as separate links, whereby relative movement between the vehicle parts causes the shape of the polygon to change.

(1) Note. Typically, the links comprise the upper and lower control arms, the wheel axle support, and the vehicle chassis, and the arrangement is applied to separate wheels as an "independent suspension" system.

275 Helical torsion coil:

This subclass is indented under subclass 273. Spring device wherein the spring element is in the form of a spiral lying in the surface of a cylinder, and is subjected to a twisting force about the axis of the cylinder to cushion the relatively moving vehicle parts.

276 And separate elastomeric member (e.g., bushing):

This subclass is indented under subclass 273. Spring device including a member formed of rubber or a device which exhibits similar characteristics, and which contributes at most an insignificant cushioning effect upon the vehicle parts.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

259+, for a torsion spring combined with an elastomeric spring, each of which has a significant cushioning effect upon the vehicle parts.

- 277 And adjustment for varying spring loading:**
This subclass is indented under subclass 273. Spring device including means by which the spring force exerted on the vehicle parts at a particular relative position of the parts may be varied.
- 278 Screw threaded adjustment:**
This subclass is indented under subclass 277. Spring device wherein the means for varying the spring loading comprises two contacting elements, one having a helically ribbed surface which engages cooperating structure on the other element, whereby relative rotation between the two elements causes a corresponding change in spring loading.
- 279 Elastomeric torsion spring:**
This subclass is indented under subclass 273. Spring device wherein the spring element is formed of rubber or a material which exhibits similar characteristics.
- SEE OR SEARCH CLASS:
384, Bearings, subclasses 220+ and 297 for a nonmetallic sleeve or liner for a rotary plain bearing.
464, Rotary Shafts, Gudgeons, Housings, and Flexible Couplings for Rotary Shafts, appropriate subclasses for a nonmetallic torsion spring coupling or housing for a rotary shaft.
- 280 Plural axially spaced elastomeric elements:**
This subclass is indented under subclass 279. Spring device including a second discrete torsion spring element formed of rubber or a material which exhibits similar characteristics and which also serves to cushion relative movement between the vehicle parts, wherein the two spring elements are spaced apart along the torsion axis.
- 281 And attached inner and outer metallic sleeves:**
This subclass is indented under subclass 279. Spring device including an inner and an outer ring, each formed of metal and fastened to the spring element in such a manner that the spring element occupies an annular space defined between the two rings.
- 282 Plural concentric elastomeric rings:**
This subclass is indented under subclass 281. Spring device including a second discrete annular torsion spring element which is formed of rubber or a material which exhibits similar characteristics, wherein the central axes of the two spring elements coincide, and one spring element is located within the other.
- 283 Multilayer leaf:**
This subclass is indented under subclass 273. Spring device wherein the spring element comprises a plurality of contiguous, superposed plates or bars which are subjected to a twisting force about their length.
- 284 And housing enclosing spring:**
This subclass is indented under subclass 273. Spring device including a casing which substantially surrounds the spring element.
- 285 Plural torsion spring:**
This subclass is indented under subclass 273. Spring device including a second spring element which is subjected to a twisting force about its central axis when the vehicle parts are relatively displaced, and undergoes a resultant elastic deformation about that axis.
- (1) Note. Patents claiming only one torsion spring and showing an identical spring arrangement on another axle or vehicle portion have not been included in this subclass.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
259+, for a torsion spring used in combination with a different-type spring.
- 286 Coil:**
This subclass is indented under subclass 2. Spring device wherein the spring element comprises a *coil-spring.
- (1) Note. Patents having claims to the spring element structure, per se, (e.g., cross section, composition) have been classified in subclasses 166+ even if a generic disclosure includes vehicle use.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

166+, for coil-spring element structure, per se.

287 Having stiffener:

This subclass is indented under subclass 286. Spring device including a device attached between the coils of the spring element to increase the spring constant of the spring element.

(1) Note. An additional coil-spring is not considered to be a "stiffener" as defined above.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

290, for a first coil-spring element having a second nested coil spring element which serves to increase the spring constant of the overall device.

288 Conical:

This subclass is indented under subclass 286. Spring device wherein the turns of the coil-spring* lie on the surface of a cone.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

166.1, for a conical coil-spring which is not specifically adapted for vehicle use.

231+, for a vehicle spring device comprising a conical coil-spring, a leaf-spring, and a lever through which stress is applied to the leaf spring.

289 Plural coils:

This subclass is indented under subclass 286. Spring device including a second coil-spring* element for cushioning movement between the vehicle parts.

290 Nested:

This subclass is indented under subclass 289. Spring device wherein a substantial part of one of the spring element lies within the other spring element.

291 Having guide rods extending through coils:

This subclass is indented under subclass 289. Spring device wherein each of two coil-spring elements have a rigid bar or tube located inside

and oriented along or parallel to the central axis of the coil, and which slidingly engages cooperating structure attached to the other end of the coil as the spring elements are compressed.

292 Elastomeric:

This subclass is indented under subclass 2. Spring device wherein the spring element which cushions relative movement between the vehicle parts is formed or rubber or a material which exhibits similar characteristics.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

153, for an elastomeric spring of general utility.

183, for an elastomeric stabilizer.

259+, for a compound spring including an elastomeric spring.

275+, for an elastomeric spring and lever actuator.

279+, for an elastomeric torsion spring.

SEE OR SEARCH CLASS:

384, Bearings, subclasses 220+ for a non-metallic resilient mounting for a plain rotary bearing, and subclass 297 for a nonmetallic sleeve or liner for a plain rotary bearing.

293 Including central guide rod or tube through spring:

This subclass is indented under subclass 292. Spring device wherein the elastomeric spring element is provided with a central opening through which an elongated bar or cylinder extends, wherein the bar or cylinder is caused to slide along cooperating structure during relative displacement of the vehicle parts, thereby restricting movement of portions of the spring device to the along the longitudinal axis of the bar or cylinder.

SEE OR SEARCH THIS CLASS, SUB-CLASS:

201+, for a similar device which includes a friction retarder.

219+, for a similar device which includes a fluid retarder.

294 Having rigid spacer plate between plural elastomeric segments:

This subclass is indented under subclass 292. Spring device wherein the spring element includes a relatively thin planar member formed of a substantially nonresilient material and attached between two adjacent elastomeric portions.

END