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2,117,264

RESILIENT SUPPORT

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Fig. 1

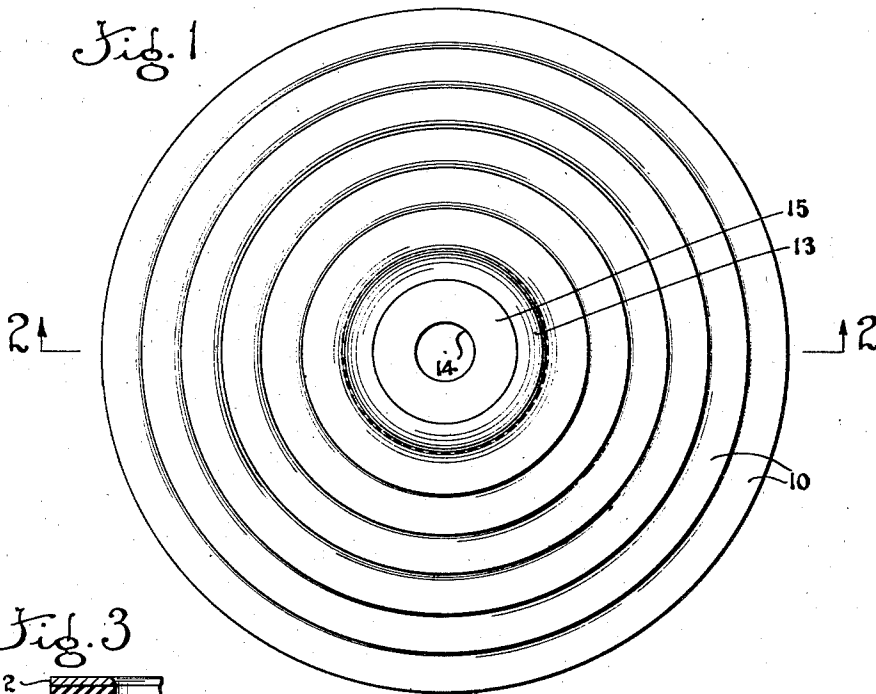


Fig. 3

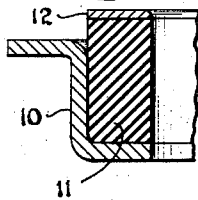


Fig. 2

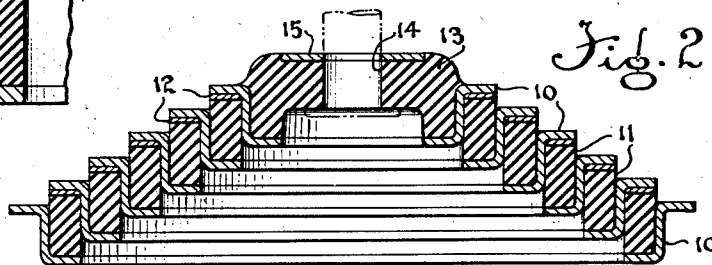


Fig. 5

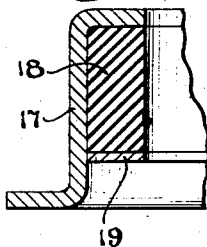
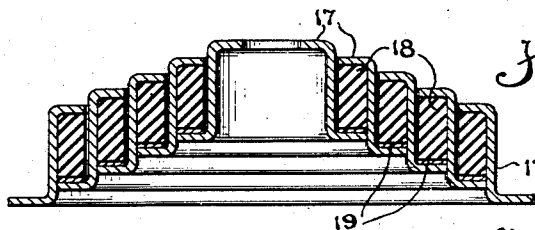


Fig. 4



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RESILIENT SUPPORT

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This invention relates to resilient supports such as may be used in most any situation where it is desired to provide a yielding connection between two relatively movable members.

The chief objects of the invention are to provide a resilient support of a sectional character whereby various units thereof may be utilized or dispensed with according to the requirements of the situation in which it is used; to provide a resilient support comprising rubber wherein the latter is placed under compression in the direction of the movement of the relatively moving members, yet permitting relatively large amplitude of movement of said members; and to provide a resilient support of the character mentioned at relatively low cost. Other objects will be manifest.

Of the accompanying drawing:

Figure 1 is a plan view of one embodiment of the invention, in its preferred form;

Figure 2 is a diametric section thereof on the line 2—2 of Figure 1;

Figure 3 is a fragmentary sectional detail, on a larger scale, of one of the units of the support;

Figure 4 is a transverse sectional view of another embodiment of the invention; and

Figure 5 is a fragmentary sectional detail, on a larger scale, of one of the units of the structure shown in Figure 4.

Referring to Figures 1 to 3 of the drawing, it will be seen that the improved support comprises a plurality of annular metal members 10, of graduated diameters. In section, each member 10 is of Z-shape with its medial region parallel to its axis, and with its lateral regions arranged as parallel, oppositely directed, radial flanges, of which the bottom flange extends inwardly and the top flange extends outwardly. The dimensions of the respective members 10 are such that the outside diameter of the medial portion of each member is the same as the inside diameter of the inwardly extending flange of the next larger member, and the outside diameter of the outwardly extending flange of each member is the same as the inside diameter of the medial portion of the next larger member.

Mounted upon the inner periphery of each member 10, except the uppermost of said members, is an annular, concentric cushion of resilient rubber 11, which cushion is vulcanized to the inner peripheral face of the intermediate portion of the member 10 and to the adjacent face of its inwardly extending flange, the inside diameter of said cushion being the same as the inside diameter of said flange. The cushion 11

is rectangular in section and extends somewhat above the top of the member 10, the top face of said cushion having an annular metal wear plate 12 vulcanized thereto. The inner periphery of said wear plate may be beveled or rounded, as shown in Figure 3. The arrangement is such that a plurality of the resilient units described may be assembled in telescoped or nested relation, the outwardly extending flange of each member 10 seating upon the wear plate 12 of the next larger unit, and the outer peripheral face of each member 10 fitting flush against the inner peripheral face of the next larger cushion 11.

The smallest of the several units, which is disposed at the top of the assembled structure, has a generally dome-shaped cushion 13 of resilient rubber vulcanized to the inner peripheral surface and inwardly extending flange of its ring 10, said cushion 13 being formed with an axial aperture 14, and having a metal ring or washer 15 inset in and vulcanized to its top face, about the aperture 14. The arrangement is such that one of two relatively movable members may be secured to the dome-shaped cushion of the top unit of the structure, and the bottom unit of the structure suitably secured to the other relatively movable member.

In the operation of the structure, relative movement of the supporting and supported members such as moves them toward each other, moves the outwardly extending flange of each member 10 toward the inwardly extending flange of the next larger member 10, thus exerting axially directed compression upon the intervening cushions 11, deformation of the latter being permitted by reason of the fact that the cushions 11 are of greater height than the medial portions of the members 10 to which they are secured. In the assembled structure the medial portions of the members 10 overlap each other, with the result that relative lateral movement of the supporting and supported members is yieldingly resisted by radial compression of the rubber cushions between said members 10.

The several units of the support are of simple construction, and as many units may be provided for each structure as are necessary for any particular installation.

The embodiment of the invention illustrated in Figures 4 and 5 is shown in position to resist relative movement between two members tending to move said members apart, wherefore the structure may be utilized for cushioning rebound. If the structure were mounted in reverse posi-

tion from that shown, it could be utilized for suspending the supported member.

Like the previously described embodiment of the invention, this embodiment comprises a plurality of telescopically disposed units of graduated sizes, each of the units except one comprising an annular metal member 17, a rubber cushion 18 secured thereto, and a wear plate 19 secured to said cushion. The smallest unit of the structure consists solely of the metal member 17. As is most clearly shown in Figure 5, each member 17 is of Z-shape with a cylindrical medial region parallel to its axis, and with its lateral regions arranged as parallel, oppositely directed radial flanges, of which the bottom flange extends outwardly and the top flange extends inwardly. The dimensions of the respective members 17 are such that the outside diameter of the outwardly extending flange of each member is substantially the same as the inside diameter of the medial portion of the next larger member 17, but the outside diameter of said medial portion is somewhat less than the inside diameter of the inwardly extending flange of the next larger member.

Each rubber cushion 18 is rectangular in section, and is vulcanized solely to the under side of the inwardly extending flange of a member 17, the inner periphery of the cushion being flush with the inner periphery of said flange. Furthermore, the height of the cushion 18 is somewhat less than the height of the medial, cylindrical portion of the member 17. The annular metal wear plate is vulcanized to the bottom face of the cushion 18. The several units of the structure are assembled in telescoped or nested relation with the outwardly directed flange of each member 17 bearing against the wear plate 19 of the next larger unit. The assembled structure is mounted between two relatively movable members, the movement of which the structure is designed to cushion, the largest member 17 being secured to one of said relatively movable members and the smallest member 17 being secured to the other.

The arrangement is such that movement of the relatively movable members tending to move them apart moves the members 17 axially so that the outwardly extending flange of each of said members approaches the inwardly extending flange of the next larger member with the result that compressive force is exerted upon the intervening rubber cushions 18, the latter thereby being deformed and yieldingly resisting the compressing force. Deformation of the cushions 18 is permitted by reason of the space between the inner periphery of each cushion 18 and the outer periphery of the medial portion of the adjacent member 17. It will be observed, however, that this embodiment of the invention is not as well adapted to resist relative lateral movement of the relatively movable members as is the previously described embodiment.

Other modification may be resorted to without

departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. A resilient support comprising a plurality of concentric, telescopically arranged, metal rings of graduated diameters, each of said rings consisting of a cylindrical medial portion formed on one lateral margin with an outwardly extending radial flange and on its other margin with an inwardly extending radial flange, the inwardly extending flange of one ring being axially aligned with the outwardly extending flange of the next smaller ring in the assembled structure, and resilient rubber cushions between the aligned flanges of adjacent rings, each of said cushions being bonded solely to one ring.

2. A resilient support comprising a plurality of concentric, telescopically arranged, metal rings of graduated diameters, each of said rings consisting of a cylindrical medial portion formed on one lateral margin with an outwardly extending radial flange and on its other margin with an inwardly extending radial flange, the inwardly extending flange of one ring being aligned with the outwardly extending flange of the next smaller ring, in an axial direction, in the assembled structure, and resilient rubber cushions of greater axial height than the medial portion of the respective rings disposed between the aligned flanges of adjacent rings, each of said cushions being bonded to a single metal ring, on the inner periphery thereof.

3. A combination as defined in claim 2 including wear plates vulcanized to the respective cushions for engagement with the adjacent rings in the assembled structure.

4. A combination as defined in claim 2 including a dome-shaped cushion of resilient rubber vulcanized to the inner periphery of the smallest metal ring of the structure.

5. A resilient support comprising a plurality of separable, concentrically arranged units, each unit being formed with a cylindrical metal member having a medial portion and oppositely extending radial marginal flanges and a cylindrical resilient rubber cushion bonded to said medial portion and one of said flanges, said units progressively graduating in size so that the number of units utilized in the support may be varied as desired.

6. A resilient support comprising a plurality of concentric, telescopically arranged, metal rings of graduated diameters, each of said rings consisting of a cylindrical medial portion formed with oppositely extending, parallel marginal flanges, one flange of each ring being aligned with the oppositely extending flange of the adjacent ring, and resilient, annular rubber cushions between aligned flanges of adjacent rings vulcanized solely to a flange of a single ring, said cushions being of lesser axial height than the medial portions of the rings, and being spaced from the medial wall of at least one ring to permit deformation of the cushion under compressive load.

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