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CUSHIONING DEVICE

Filed July 29, 1931

2 Sheets-Sheet 1

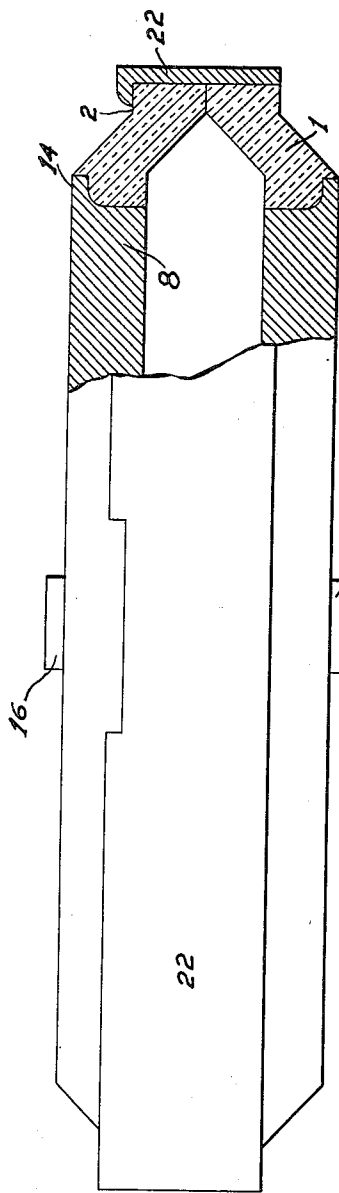


Fig. 1.

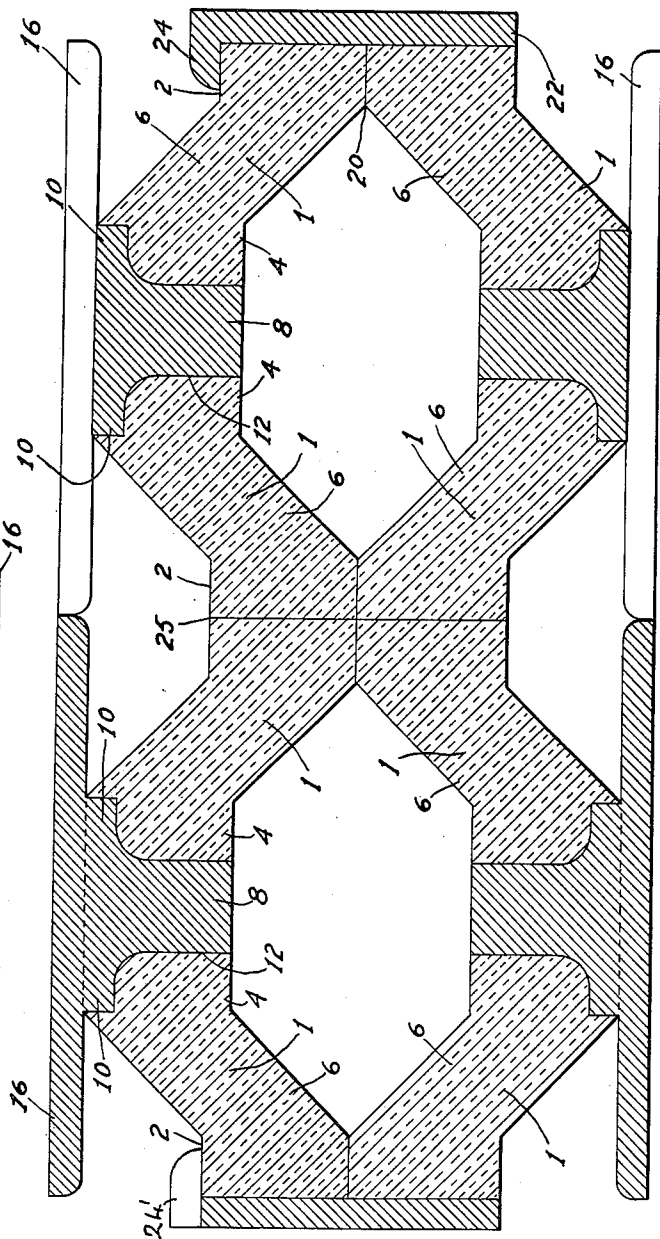


Fig. 2.

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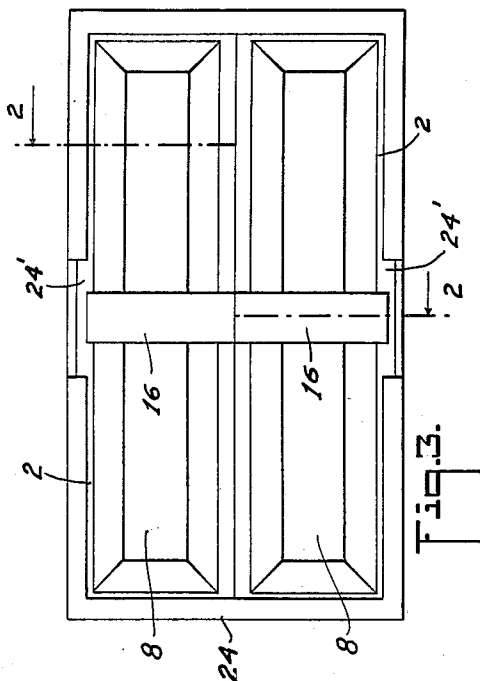
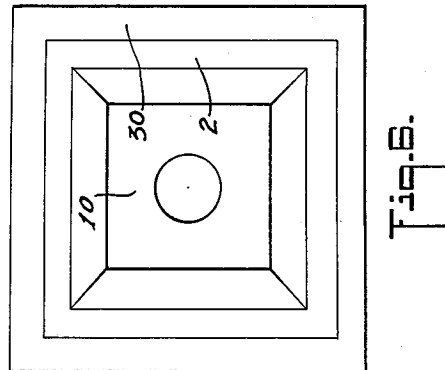
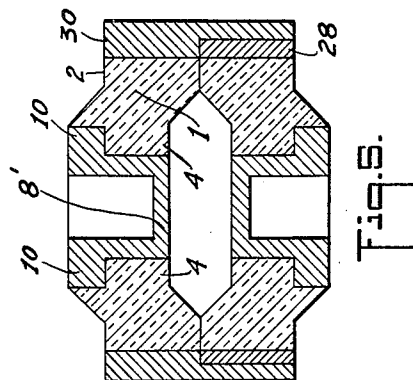
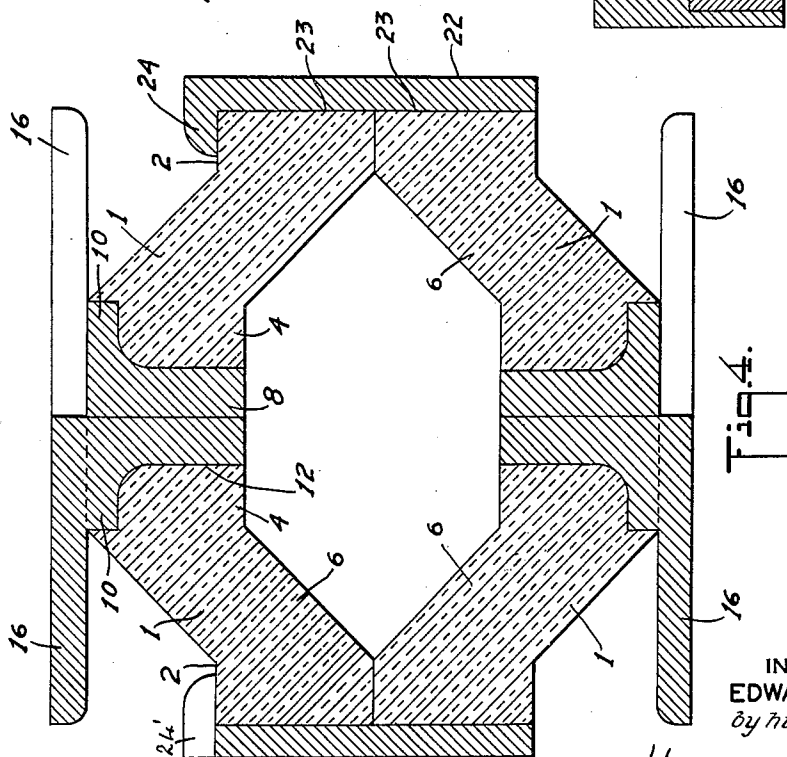
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UNITED STATES PATENT OFFICE

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CUSHIONING DEVICE

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This invention relates to cushioning devices and more particularly to cushioning devices made of elastic or resilient material, as rubber, and it is an object of this invention to provide an improved device of the type described which may be used in place of cushioning devices of other constructions, as metal springs, or as a means for preventing the transmission of vibrations.

In the drawings—

Figure 1 is a view partly in elevation and partly in section of a device constructed in accordance with this invention and designed to replace the usual elliptic springs of four wheel railway passenger car trucks;

Figure 2 is a view showing at the left a central vertical section, and at the right, a vertical section taken intermediate the center and an end of the device, the sections being taken as on line 2—2 of Figure 3;

Figure 3 is a top plan view of the device shown in Figures 1 and 2;

Figure 4 is a view similar to Figure 2 of an arrangement adapted for use in place of the elliptic springs on six wheel trucks;

Figure 5 is a central vertical section of an arrangement designed for use with small generating sets to prevent the transmission of vibrations therefrom; and

Figure 6 is a plan view of Figure 5.

As shown in the drawings, a cushioning device constructed in accordance with this invention comprises a plurality of substantially rectangular elements or members 1 formed of an elastic or resilient material, preferably rubber or a rubber compound and having their edge portions 2 and their center portions 4 offset from each other and joined by portions 6 angularly disposed with respect to both the center and edge portions. The members 1 will be proportioned according to the use for which they are intended and the load to be sustained and they will be assembled in units of a pair of oppositely arranged members 1 but, when desired, groups of two or more units may be assembled together as shown in Figures 1 to 3.

In Figures 1 to 4 the members 1 are of greater length than width and are formed with a substantially rectangular slot extend-

ing lengthwise of the center portion in which is fitted a member 8 which serves as a wear member or attaching means and through which connection is established between the cushioning device and its support or load. The member 8 shown comprises substantially a T-member having its flanges 10 of less thickness and projection than its web 12 and it is cut away at its ends to form flanges 14, corresponding to the flanges 10 which extend across the ends of the member 8. The center portions of the members 1 are cut away adjacent the slots to form recesses which receive the flanges 10 and 14 of the members 8 so that the upper surfaces of the members 8 lie flush with the upper surfaces of the members 1. The members 1 are shaped at the slot to the contour of the members 8 and fit the same closely. At their centers the members 8 are formed with transversely extending portions 16 which project above the upper surfaces of the members 8 and extend the full width of the members 1 and which, in Figures 1 to 4, are designed to fit the grooves in the spring supports and spring caps which receive the spring bands on the elliptical springs now in common use.

The members 1 with the members 8 in place therein are arranged in units of two oppositely disposed members 1 having their edge portions engaging as at 20 and their offset center portions spaced apart. Where but a single unit is assembled, as in Fig. 4, a frame 22 is placed about the unit contacting with the members 1, as at 23 and having a small inwardly projecting flange 24 which rests upon the edge portion 2 of the upper member 1 and holds the frame 22 in place. If desired, both the members 8 and the frame 22 may be secured to the members 1 by cementing or vulcanizing. Where more than a single unit is to be placed in one assembly the units are arranged as shown in Figs. 2 and 3 with the adjacent side faces of the units contacting as at 25 and a frame 22 with a flange 24 is placed about the complete assembly. The flange 24 is cut away in the region of the transverse portion 16, as at 24', in order to permit of the full movement of the members 8.

In the modification shown in Figures 5 and 6, the resilient members 1 have their center portions 4 offset from the edge portions 2 and formed with rectangular openings to receive attaching members 8', which, in this case are bolt sockets. The members 8' have flanges 10 which fit recesses formed in the center portions of the members 1. In assembling the two members 1 to form a unit, one of the members 1 is placed in a frame 28 while the other member 1 is placed in a frame 30 which is of sufficient depth to receive both members 1 and is cut away to receive the other member 1 and its frame 28. In this construction, as in the other, the members 1 may be secured to the members 8' and the frames 28 and 30 by cementing or vulcanizing, if desired.

In each of the constructions shown it will be noted that there is no pressure tending to force the members 1 from the surrounding frames, that the flanges 10 on the members 8 and 8' form shoulders which prevent these members being forced out of the members 1, that any increase in pressure resulting from the compression of the members 1 as the members 8 or 8' are forced toward each other increases the resistance by the members 1 to the forcing of the members 8 and 8' through the openings in the members 1 and that the members 8 and 8' will act as stops when the members 1 are fully collapsed. It will also be noted that there is available for the connecting portions 6 of each member 1 when fully collapsed a cross sectional area of the same extent as when the member 1 is in its unloaded position so that the direct compression on the connecting portions 6 and the consequent pressure on the frames 22 is not excessive. The arrangement also provides a yielding resistance to movement of the members 8 and 8' in any direction in a horizontal plane which is of particular importance in limiting side sway in railway cars and preventing lateral motion of the objects supported when the device is used as a support or foundation.

I claim—

1. A rubber cushioning device for sustaining a load by the resistance of the rubber to deformation, having a center portion of any given thickness which in transverse section remains rectangular under varying loads, a connecting deformable portion which is angularly disposed with respect to the center portion and which under varying loads is in transverse section always a parallelogram and at maximum deformation approaches a rectangle, an offset outer portion of the same thickness as the center portion and which in transverse section remains rectangular under varying loads, a frame which encases the entire outer surface of the outer portion for resisting lateral deformation, the entire device under maximum deformation being sub-

stantially in the same plane and rectangular in any transverse section.

2. A rubber cushioning device for sustaining a load by the resistance of the rubber to deformation, having a rectangular center portion of any given thickness which in transverse section remains rectangular under varying loads, a connecting deformable portion which is angularly disposed with respect to the center portion and which under varying loads is in transverse section always a parallelogram and at maximum deformation approaches a rectangle, a rectangular offset outer portion of the same thickness as the center portion and which in transverse section remains rectangular under varying loads, a frame which encases the entire outer surface of the outer portion for resisting lateral deformation, the entire device under maximum deformation being substantially in the same plane and rectangular in any transverse section.

In testimony whereof I have signed my name to this specification.

EDWARD S. AVERY.