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E. H. BLATTNER
RUBBER CUSHIONING UNIT

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FIG. 1

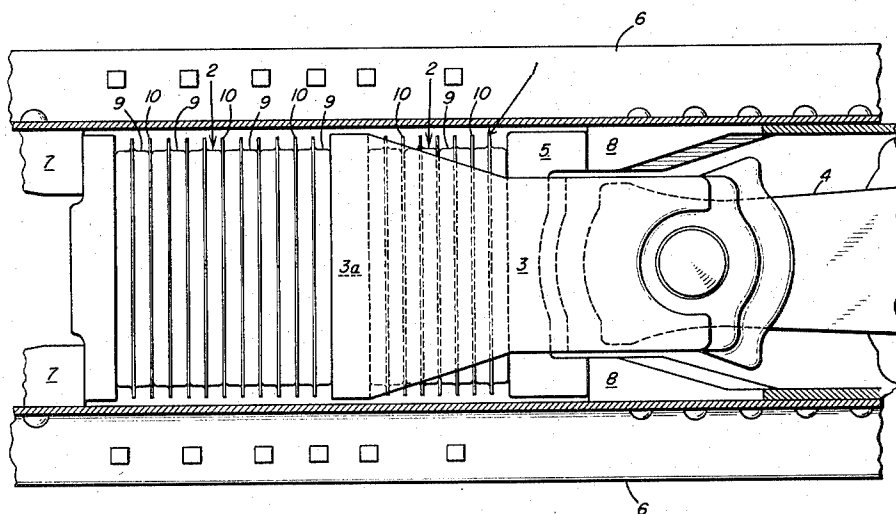


FIG. 2

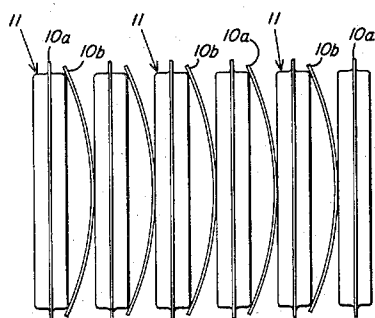
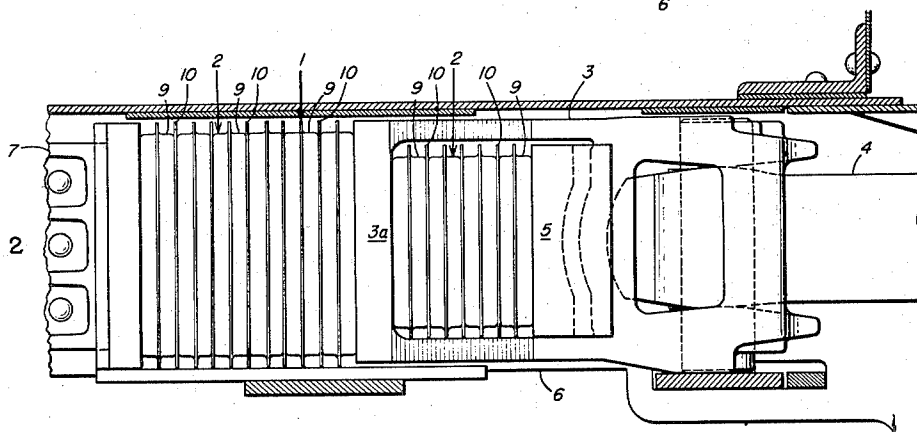


FIG. 3

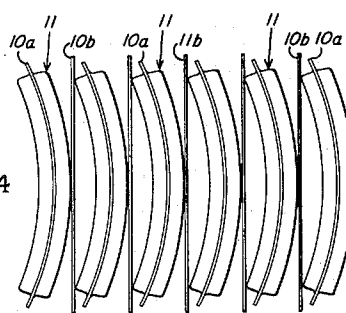


FIG. 4

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RUBBER CUSHIONING UNIT

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4 Claims. (Cl. 213—40)

This invention relates to rubber cushioning units for railway cushioning mechanisms.

Rubber cushioning units such as used in railway vehicles for cushioning the relative movement of two relatively movable members generally are comprised of rubber pads arranged in alternation with flat metal plates, the number and size depending on the forces to be cushioned. In utilizing such units, it is customary to place them under initial compression so as to minimize slack in the subsequent operation of the mechanism. However, a difficulty experienced with such units is that set occurs in the rubber after a certain amount of use, with corresponding reduction in the potential energy of the unit in the neutral or normal position of the mechanism and thus its ability to minimize slack.

The object of the present invention is to provide a rubber cushioning unit for a railway cushioning mechanism which is formed of one or more rubber pads and metal plates arranged in alternation and wherein alternate, certain or all of the metal plates are precurved, whereby the precurved plates, which are under initial compression and substantially flat in the neutral condition of the mechanism, will yieldably resist compression of the cushioning unit and counteract ultimate set of the rubber.

Other objects and advantages of the invention will appear hereinafter in the detailed description, be particularly pointed out in the appended claims, and be illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of a railway cushioning mechanism embodying a preferred form of the cushioning units of the present invention;

Figure 2 is a side elevational view of the mechanism of Figure 1;

Figure 3 is a side elevational view of one of the rubber cushioning units of Figure 1, the unit being shown removed from the mechanism and relieved of compression; and

Figure 4 is a side elevational view of an alternative form of the railway cushioning unit of the present invention, the unit being shown in the same condition as that of Figure 3.

Referring now in detail to the drawings, in which like reference characters designate like parts, the cushioning mechanism selected as illustrative of the application of the rubber cushioning unit of the present invention to railway cushioning mechanisms is a railway draft gear, that illustrated being of the particular form shown in my copending application, Serial No. 141,332, filed January 30, 1950, now Patent No. 2,720,987.

As will be recognized, the illustrated draft gear 1 is of the selective travel type in which two cushioning units 2 are employed, both acting in buff and only the forward of the units acting in draft. For this purpose, the forward of the units is enclosed in a yoke 3 which is connected to the shank of a coupler 4, the universal connection here shown being typical of installations of an A.A.R. alternate standard Type "F" coupler. In buff,

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longitudinal forces are transmitted from the coupler 4 to the forward of the rubber cushioning units 2 through a front follower 5 and to the rearward of the units through the transverse rear wall 3a of the yoke 3, the resultant force being transmitted to the center sills 6, within which the draft gear is pocketed, through rear stop lugs 7. In draft, the yoke 3 is pulled forward by the coupler and the forward of the units is compressed between the rear wall of the yoke and the front follower 5, the latter reacting against front stop lugs 8 rigid with the center sills 6.

So that longitudinal forces will be yieldably resisted at their inception, it is customary to employ rubber cushioning units of such stress-free longitudinal extent that they will be under initial compression in the neutral or normal condition or position of the cushioning mechanism. Rubber, when subjected continuously to compressive forces ultimately will take a set and this set, in the case of a rubber cushioning unit, will reduce the desired initial compression. To counteract such reduction, the rubber cushioning unit 2 of the present invention, while comprised, as usual, of alternating rubber pads 9 and metal plates 10, employs as some or all of its metal plates, precurved plates. Conveniently made of spring steel and curved or bowed when the cushioning unit is relieved or free of compression, as shown in Figures 3 and 4, such precurved plates are substantially flat in the neutral or normal condition of the draft gear shown in Figures 1 and 2 and, since yieldably resisting the initial compression by which this flatness is obtained, the precurved plates constantly apply force urging the unit to expand longitudinally. This force, in turn, counteracts loss of force in the rubber due to setting and gives to the cushioning mechanism, after set of the rubber has occurred, the desired initial compression in the neutral position of the mechanism.

In some rubber cushioning units the several rubber pads and metal plates are bonded together. In others, only the alternate metal plates are connected to the adjoining or contiguous rubber pads. Both of the illustrated embodiments are of this latter type in which each of the rubber pads 9 is connected to one of the adjoining pads through the intervening 10a of the metal plates 10 and is spaced from the other of the adjoining rubber pads by a spacer or separating plate 10b. The rubber cushioning unit thus is comprised of a plurality of rubber spring elements 11, each made up of a connected pair of the rubber pads 9 and an intervening or center plate 10a and each spaced from the adjoining spring elements by a spacer plate 10b. In lieu of the precurving of all of the metal plates, the embodiment of Figure 3 has only the spacer plates 10b precurved and in that of Figure 4 the precurving is limited to the rubber spring elements 11, including their center plates 10a, the precurving of alternate of the plates generally being sufficient to counteract set of the rubber.

It should be understood that the described and disclosed embodiments are merely exemplary of the invention, and that all modifications are intended to be included which do not depart either from the spirit of the invention or the scope of the appended claims.

Having described my invention, I claim:

1. In a railway cushioning mechanism having a pocket and longitudinally spaced means fixing the length of said pocket in a neutral condition of said mechanism, a rubber cushioning unit seatable in said pocket between said means, said unit comprising alternating rubber means and plate means, said unit when seated in said pocket and in said neutral condition of said mechanism being held under compression by spaced means, said plate means in said condition being substantially flat, and at least certain of

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said plate means being precurved and yieldably resisting said compression.

2. In a railway cushioning mechanism having a pocket and longitudinally spaced means fixing the length of said pocket in a neutral condition of said mechanism, a rubber cushioning unit seatable in said pocket between said means, said unit comprising alternating rubber means and plate means, said unit when seated in said pocket and in said neutral condition of said mechanism being held under compression by spaced means, said plate means in said condition being substantially flat, and certain of said plate means being precurved and yieldably resisting said compression.

3. In a railway cushioning mechanism having a pocket and longitudinally spaced means fixing the length of said pocket in a neutral condition of said mechanism, a rubber cushioning unit seatable in said pocket between said means, said unit comprising alternating rubber means and metal plate means, certain of said plate means being connected to and alternate of said plate means spacing adjoining rubber means, said unit when seated in said pocket and in said neutral condition of said mechanism being held under compression by spaced means, said plate means in said condition being substantially flat, and

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said certain plate means being precurved and yieldably resisting said compression.

4. In a railway cushioning mechanism having a pocket and longitudinally spaced means fixing the length of said pocket in a neutral condition of said mechanism, a rubber cushioning unit seatable in said pocket between said means, said unit comprising alternating rubber means and metal plate means, certain of said plate means being connected to and alternate of said plate means spacing adjoining rubber means, said unit when seated in said pocket and in said neutral condition of said mechanism being held under compression by spaced means, said plate means in said condition being substantially flat, and said alternate plate means being precurved and yieldably resisting said compression.

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