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SPRING-DEFLECTION DEVICE FOR RAILWAY VEHICLES

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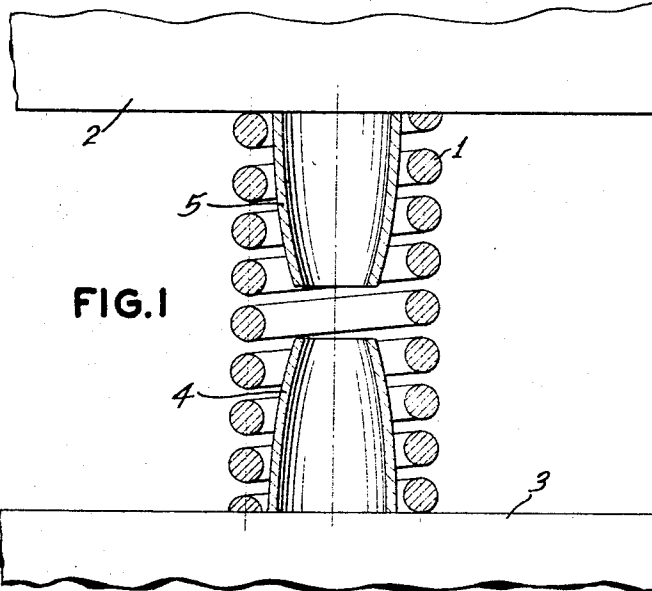


FIG. 1

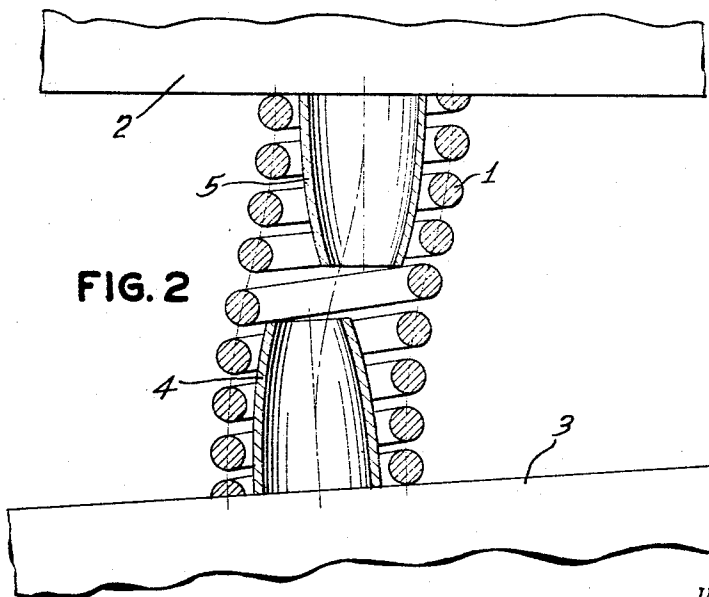


FIG. 2

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SPRING-DEFLECTION DEVICE FOR
RAILWAY VEHICLES

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1 Claim. (Cl. 267—4)

A number of different constructions are known for the spring suspensions of rail vehicles, particularly the spring suspension between a railway truck and a bridge girder supported thereon. In one of these known constructions, the springs of the spring suspension system are mounted between the bridge girder and the railway truck, at some distance from the pivot point or ideal center of rotation of the truck, on the carrier members of the truck frame or on a bracket on the latter. It is also known in railway spring suspensions to mount, within a metallic coil spring, an outwardly cylindrical, H-shaped or double cone-shaped rubber shock absorber the outer diameter of which is approximately equal to or smaller than the inner diameter of the coil spring. It is also known to accommodate the coil springs in two U-shaped cylindrical parts with a clearance so that lateral yielding of the springs is prevented and a predetermined stress is not exceeded.

In such constructions, the bridge girder is supported on the upper end of the springs without any bearing surface. Since the springs in such constructions are positioned at the right-hand and left-hand sides at some distance from the pivot or turning pin of the truck, the end surfaces of these springs are displaced parallel to each other when the truck turns relative to the bridge girder. In order to maintain the elastic forces resulting from the displacement of the springs during turning of the truck as low as possible, the springs must be made with as small a diameter as possible, i.e., with a large ratio of the length of the spring to the diameter thereof. An increase in this ratio also increases the likelihood of the spring to buckle. As a rule, the springs are so designed that they have a margin of safety against buckling under normal operating conditions which is slightly higher than 1. Usually, it is attempted to approximate the value of 1 as closely as possible in order to reduce undesired elastic forces during turning of the railway truck.

The construction of the present invention prevents the buckling of such spring suspensions in railway vehicles even in the event of very great deflections of the spring and/or tilting of one of the two spring ends, i.e., the tilting of the bridge girder or of the railway truck under unusual operating conditions, for example, in the case of derailment of one or several axles of the railway truck.

The invention will be further illustrated by reference to the accompanying drawings in which

FIGURE 1 represents the spring suspension of a railway vehicle under normal operating conditions of the

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spring under load and showing an upper and lower inner guide, and

FIGURE 2 illustrates the same spring suspension shown in FIGURE 1 in the most extreme deflected position between a bridge girder and a railway truck to which the spring is connected.

Referring to the drawings, a coil spring 1 is connected at one end to a railway vehicle bridge girder 2 and at the other end to a railway truck 3. The guides 4 and 5 are mounted within the spring and are secured to the railway truck and the bridge girder, respectively. The guide members 4 and 5 are so mounted that the spring will contact them only in the case of the most extreme operating conditions as shown in FIGURE 2, i.e., during the greatest possible deflection and/or tilting of one of the spring ends, for example, tilting of the railway truck 3. Any buckling of the spring 1 in any side direction is rendered impossible, both during normal and extraordinary operating conditions, as a result of the mounting of the guides 4 and 5.

The guides 4 and 5, which are shown as being of tubular construction in the drawing, have the general shape of truncated cones and may also operate as abutments, with the provision of abutment means on the free ends thereof, whereby the guides also function as a protection for the spring against overloads. The guides also may be of solid construction, if desired.

It will be obvious to those skilled in the art that many modifications may be made within the scope of the present invention without departing from the spirit thereof, and the invention includes all such modifications.

What is claimed is:

A safety device for preventing the buckling of a coil spring mounted between a frame member of a railway vehicle and a railway truck, the spring having a large ratio of length to diameter, which comprises a pair of guide members positioned within the spring and having the general shape of a truncated cone, the sides of the guide members being adapted to contact the spring under extreme operating conditions and the members being of sufficient length to act as abutments under overloads, one of the guide members being secured to the frame and the other to the truck, whereby buckling of the spring is prevented during large deflections thereof.

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