This invention relates to bogie trucks for railway and like vehicles and the object of the invention is to provide improved arrangements for supporting the vehicle-carrying bolster of such bogie trucks. It has heretofore been usual to employ for this purpose helical steel springs arranged in nests of four under each end of the bolster, the said springs resting on seats formed thereon in the bogie side frames or on a spring plank carried by the bogie.

A bogie truck embodying the present invention comprises side frames, a bolster, and India-rubber springs carried by said side frames and supporting said bolster. Particularly the invention resides in the combination in a bogie truck of side frames of diamond shape, seats for India-rubber springs on said side frames, a bolster, and India-rubber springs resting on said seats and supporting the ends of said bolster. The diamond shaped side frames of bogie trucks to which the invention especially relates are formed as castings or of pressed steel.

Furthermore the invention is also applicable to passenger vehicle bogie trucks and in such application the bogie truck comprises side frames, cross beams connecting said side frames, a spring plank suspended from said cross beams, a bolster, and India-rubber springs carried by said spring plank and supporting said bolster.

The India-rubber spring employed in carrying out the invention is of squat and stable character and presents ample resistance under heavy loads. It is so designed as to give the desired cushioning effect under the normal load for which it is designed and yet has ample reserve to meet stresses without damage to the spring should the load be increased beyond the normal. The spring is moreover such that the reduction in the length thereof due to compression under load is very small but nevertheless sufficient to give the cushioning or shock absorbing effect required.

An India-rubber spring suitable for the said purpose, comprises a column of India-rubber pads separated from each other by metal plates, each India-rubber pad consisting of a number of India-rubber blocks of considerable area relatively to the thickness thereof and so arranged relatively to each other as to leave free spaces between the blocks to allow of expansion of the India-rubber when the spring is under compression.

Preferably the India-rubber blocks constituting a pad are moulded on to a metal plate that determines the positions of the blocks relatively to each other.

It is also desirable to perforate the metal plate and to connect the India-rubber blocks moulded on to one side of the metal plate to similar India-rubber blocks moulded on to the other side thereof by India-rubber passing through the perforations in the plate.

The spacing of the India-rubber blocks is or may be such that under certain predetermined compression the sides of the India-rubber blocks bear one against the other.

The metal plates separating the India-rubber plates may be formed with ribs that engage the spaces between the India-rubber blocks in order to maintain the several members of the spring in proper position.

If desired the spring may be built up of removable units each comprising a metal plate on both sides of which India-rubber blocks are moulded as before described, the desired number of units to constitute the complete spring being arranged one above the other with metal dividing plates between the several units. These metal dividing plates may be formed with ribs as before described to engage the spaces between the India-rubber blocks.

Alternatively the metal dividing plates may be plain and in order to maintain the several spring units and plates in proper position a number of bolts or pins may be passed through holes formed thereon in the metal plates and India-rubber blocks.

It is also within the invention to form the complete spring as a single unit, that is to say uncured or partly cured India-rubber blocks and metal plates may be placed in proper association in a mould within which the curing or final curing of the rubber is effected thereby firmly uniting the India-rubber to the metal plates. In such case the spaces between the blocks must be such as to enable them to be produced in building up the spring structure in the mould.

Fig. 1 of the accompanying drawing shows in elevation a diamond frame bogie truck the bolster of which is supported by springs according to the present invention.

Fig. 2 shows in side elevation and partly in section on the line II—II of Fig. 4 one of the bolster supporting springs.

Fig. 3 shows in plan one of the metal dividing plates employed in the improved spring, and Fig. 4 shows in plan one of the spring units.

The bogie truck illustrated is of the double truss diamond frame type, the side frames of which are made of pressed steel.

1 indicates the pressed steel side frame, 2 the spring plank connecting the two side frames of...
the truck, and 3 the bolster which is supported on india-rubber springs 4 carried by said spring plank.

The india-rubber spring 4 comprises any desired number of spring units separated from each other by interposed dividing plates 5. In the example illustrated the spring comprises five units each consisting of a metal plate 6 of substantially rectangular shape on both sides of which india-rubber blocks 7 are moulded, the blocks at one side of the plate being connected to the blocks at the other side thereof by india-rubber 7a that extends through perforations formed therefor in the plate. The india-rubber blocks 7 on each side of the plate 6 are four in number and they are of substantially rectangular shape, of the same dimensions as each other, and separated from each other by spaces 8, see Fig. 4, which allow for expansion under compression. The india-rubber blocks 7 are arranged in two rows on the metal plate, two blocks being in each row and the blocks in one row being located directly in line with the blocks in the other row, see Fig. 4. The metal dividing plates 5 are of the same shape and dimensions as the metal plates 6 on to which the india-rubber blocks 7 are moulded and each side of the said metal dividing plates is formed with slightly projecting ribs 9 to engage the spaces 8 between the india-rubber blocks 7 of the adjacent spring units. The india-rubber blocks are of large area relatively to the thickness thereof so that the spring constituted by the assembled units and dividing plates is vertically stable and there is no tendency to cant under load.

In the metal plates 5 and 6 central holes 10 are formed to receive a bolt 11 that serves to connect together the several units constituting the spring. The ends of the spring are seated on recessed end plates 12 that, in like manner to the dividing plates 5, are formed with ribs 9 that engage the spaces 8 between the india-rubber blocks 7.

The improved spring provides an ample area of support for the bolster, has ample capacity for absorption of shock and increases the desired stability of bolster and side frames.

A spring constructed as described consists of a block capable of carrying heavy loads without undue compression and not liable to be damaged under exceptionally heavy loads. There are no parts to fracture under shocks and the cushioning effect for a given movement is greatly superior to that of a nest of helical steel springs designed to bear a corresponding load. As will be understood the invention is not restricted to any particular arrangement or number of india-rubber blocks.

What I claim is:

1. In a railway car truck, diamond-shaped side frames, a spring plank connecting the same, a bolster interposed between the side frames, and spring structures interposed between the spring plank and the bolster, each spring structure including a series of superposed units, each unit comprising flat blocks of india rubber moulded in spaced relation on both sides of a reinforcing plate united by india-rubber passing through perforations in said reinforcing plate, and plates interposed between said units having ribs disposed to occupy the spaces between the rubber blocks.

2. In a railway car truck, diamond-shaped side frames, a spring plank connecting the same, a bolster interposed between the side frames, and spring structures interposed between the spring plank and the bolster, each spring structure including a series of superposed units, each unit comprising a series of flat rectangular blocks of rubber moulded in spaced relation on both sides of a reinforcing plate united by india-rubber passing through perforations in said reinforcing plate, and plates interposed between said units having ribs disposed to occupy the spaces between the rubber blocks.

3. In a railway car truck, diamond-shaped side frames, a spring plank connecting the same, a bolster interposed between the side frames, and spring structures interposed between the spring plank and the bolster, each spring structure including a series of flat rectangular blocks of rubber moulded in spaced relation on both sides of a reinforcing plate, united by india-rubber passing through perforations in said reinforcing plate, plates interposed between said units having ribs disposed to occupy the spaces between the rubber blocks, the reinforcing plates of the units and the plates separating the units being centrally perforated, and a bolt engaging the perforations for retaining the elements of the spring structure in alignment.

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