Dec. 23, 1958 F. B. EASTON 2,865,652

STABILIZER COUPLING FOR AIR CUSHION SUSPENSION

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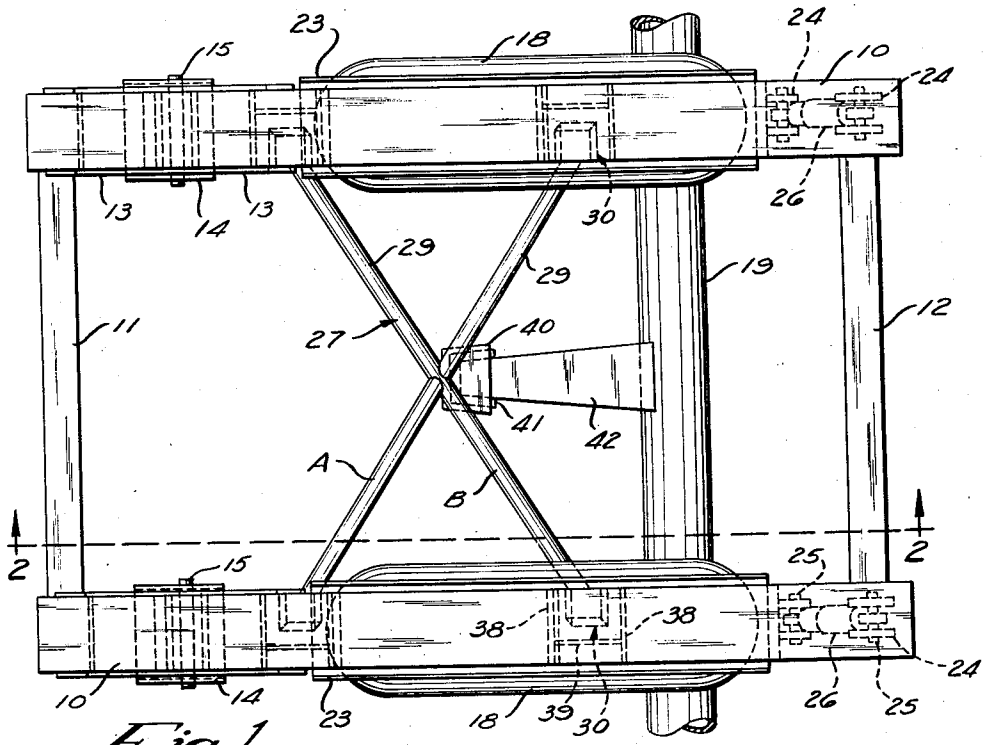


Fig. 1

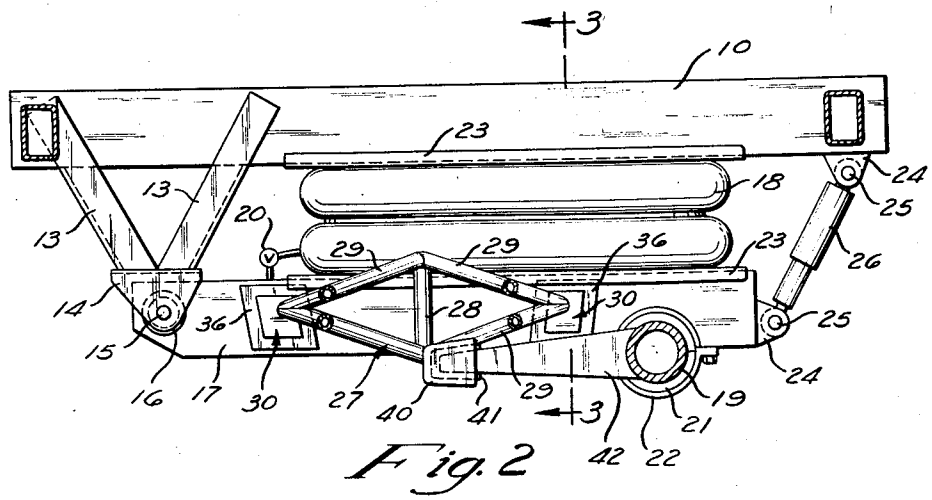


Fig. 2

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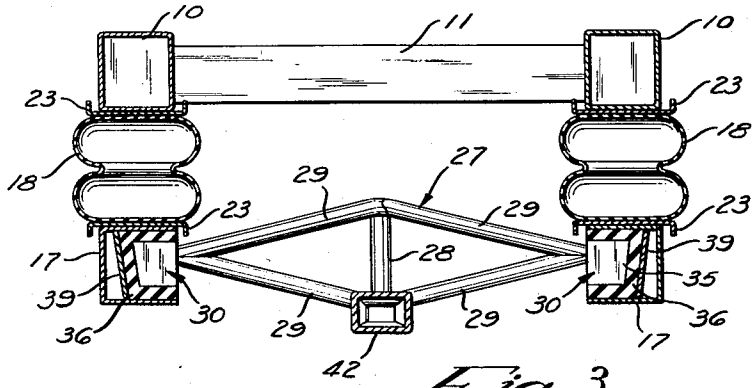
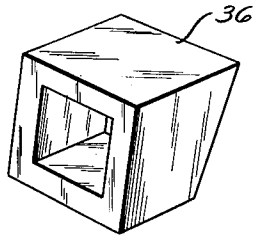


Fig. 3

Fig. 4



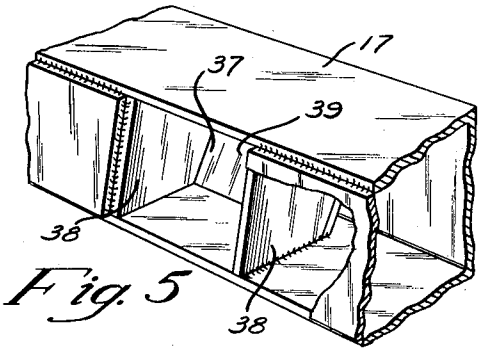


Fig. 5

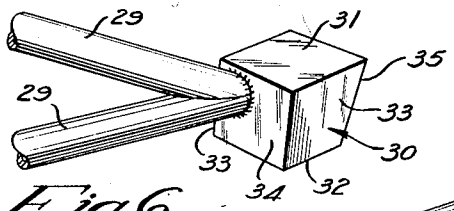


Fig. 6

Fig. 7

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STABILIZER COUPLING FOR AIR CUSHION SUSPENSION

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3 Claims. (Cl. 280—124)

This invention relates broadly to pneumatic spring suspension assemblies and more specifically to improvements in the structure of the undercarriage therefor.

One of the objects of the invention is to provide an air cell supporting structure embodying a pair of parallel bolsters mounted for pivotal movement in a vertical plane responsive the movement of the vehicular axle, and a truss therefore to maintain the bolsters in a common horizontal plane.

Another object of the invention is to provide a yieldable connection between the bolsters and the truss which is designed to afford universal movement but restrain excessive sidewise movement of the bolsters.

Another object of the invention is to provide a truss which is capable of resisting the lateral strains imposed on the air cells consequent to the vertical movement of the wheels on one side of the vehicle and/or side thrusts initiated by sharp turns.

Further objects of the invention reside in the production of an undercarriage of low unsprung weight, a framing structure which will resist axial movement of the bolsters upon application of the brakes, and an undercarriage which is durable of structure, economic of manufacture and efficient of operation.

Other objects and advantages more or less ancillary to the foregoing, and the manner in which all the various objects are realized, will appear in the following description, which considered in connection with the accompanying drawings, sets forth the preferred embodiment of the invention.

Referring to the drawings:

Fig. 1 is a plan view of the undercarriage embodying the invention;

Fig. 2 is a longitudinal section thereof, the section being taken on a plane indicated by the line 2—2 in Fig. 1;

Fig. 3 is a transverse section of the undercarriage, the section being taken on the line 3—3 in Fig. 2;

Fig. 4 is a view in perspective of one of the resilient supporting blocks for the frame truss member;

Fig. 5 is a view in perspective of a fragmentary portion of one of the bolsters illustrating the framing of the portion thereof that provides the opening for one of the truss bearing blocks;

Fig. 6 is a view in perspective of a fragmentary portion of one of the truss members; and

Fig. 7 is a modified form of the strut in the center of the truss member of the assembly.

Referring first to Fig. 1, the undercarriage comprises a rectangular frame embodying a pair of hollow parallel beams **10**, preferably of square transverse section, with front and rear cross members **11** and **12** welded or otherwise affixed to the inner faces thereof. The outer face of the forward end of each beam **10** is provided with a pair of depending convergent arms **13** having a channel iron bracket **14** welded to the lower ends thereof. The depending ears of each bracket are drilled to receive pins **15** having rubber clad bushings **16** thereon for the pivotal support of bolster rails **17** that carry the air cells **18** and

support the vehicle axle **19**. The bolsters are made from fabricated steel plates welded to form hollow prismoidal bodies or surge tanks which are interconnected through valves **20** with the air cells **18**. The axle **19** is mounted in rubber journal bearings **21** seated in recesses in the bolster and secured to the lower faces thereof by bearing caps **22**. The confronting faces of the beams and bolsters support flanged plates **23** having the air cells **18** vulcanized thereto. The rearward ends of the bolsters and the lower faces of the beams are provided with brackets **24** which are drilled to receive pins **25** for the pivotal support of shock absorber assemblies **26** of conventional form.

The bolsters are transversely braced forward the axle **19** and rearward the front cross member **11** by a truss **27** embodying a vertical central tubular strut **28** and a pair of diagonal arms A and B (Fig. 1). The diagonal arms are formed by tubes **29** welded to the strut, (Fig. 3), and to substantially cubical block **30** at the ends thereof. The upper face **31** is parallel to the base **32**, the opposed sides **33** of the block are also parallel to each other, and the end wall **34** is normal to the upper face, sides and base. The rearward or outer face **35** of the block, however, is inclined downwardly, and the ends of the tubes **29** are welded to the inner face **34** of the block. Each of the blocks **30** is encased, save only the inner face **34** thereof, by a moulded rubber sleeve **36** (Fig. 4) of similar configuration to that of the block, and the sleeves are seated in pockets **37** formed in the bolster rails **17**. The pockets are defined by parallel side partitions **38** and a rearwardly inclined wall **39** which is welded to the top and bottom walls of the bolster and around the periphery of the opening of the pocket as shown in Fig. 5. The walls of rubber sleeve are approximately one inch thick and are snugly engaged, upon assembly, with the blocks **30** and the walls of the pockets **37**.

The yieldable mounting for the truss facilitates slight independent movement of the bolsters relative to each other, but restrain excessive movement of one of the bolsters when the superjacent air cell is flexed by the percussive blows imposed thereon due to irregularities in the road. The truss, moreover, will restrain independent lineal movement of the bolsters and maintain the axle **19** in normal relation thereto. The truss, moreover, will restrain centrifugal thrust on the bolsters when the vehicle negotiates a sharp turn in the road and restrain a tilting action with magnitude of restraint increased by centrifugal thrust.

The strut and tubes **29** have a cubical hollow block **40** welded thereto at the juncture of the parts for the reception of a rubber sleeve **41** of the form illustrated similarly in Fig. 4. The block supports the tang **42** of a bracket welded to the axle. This structure is provided to maintain the axle in tracking relation with the front wheels of the vehicle and restrain axle torque upon application of the vehicular brakes.

In the modified form, illustrated in Fig. 7, the strut **43** is formed with a pair of inner arms C welded thereto, and a pair of outer arms D retained by a stud **44** within the tubular strut. The ends of the strut are provided with washers **45** and **46** for the support of spheroidal rubber blocks **47** to facilitate independent movement of the arms C and D. The blocks **47** are retained in place by nuts **48** on the ends of the stud.

The truss of Fig. 7 is mounted in the bolsters in the same manner as heretofore described and performs the same function thereof but with the added advantage of greater flexibility and cushioning effect.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or con-

fining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

What is claimed is:

1. An undercarriage for a vehicular air cell supporting structure comprising a chassis frame, bolsters pivoted thereon adjacent the forward end thereof, rubber clad pins in the pivotal connection for said bolsters, air cells intermediate said bolsters and said frame, shock absorbers between the rearward ends of said frame and bolsters, a rubber bushing carried by said bolsters, a vehicle axle in said bushing, a truss disposed between said bolsters, cross arms in said truss, rubber sleeves on the ends of said cross arms seated in said bolsters, a bracket welded to said axle, a rubber sleeve on the end thereof, a bearing socket in the center of said truss supporting said rubber sleeve on the bracket, and means on said rubber sleeves to restrain the rotation thereof.

2. An undercarriage for a vehicular air cell supporting structure comprising a chassis frame, bolsters pivoted thereon adjacent the forward end thereof, rubber clad pins in the pivotal connection for said bolsters, air cells intermediate said bolsters and said frame, shock absorbers between the rearward ends of said frame and bolsters, rubber bushings carried by said bolsters, a vehicle axle in said bushing, divergent arms constituting a truss intermediate said bolsters, cubical blocks on the ends of said arms, cubical rubber sleeves thereon, said bolsters having

cubical pockets therein for said sleeves, a bracket affixed to said axle, a cubical cup affixed to said truss, and a cubical rubber sleeve in the outer end of said bracket seated in said cup.

3. An undercarriage for a vehicular air cell supporting structure comprising a pair of hollow parallel beams, brackets depending from the forward ends thereof, bolsters pivotally mounted on said brackets, rubber clad pins in the pivotal mountings for said bolsters, rubber bushings in said bolsters adjacent the rearward ends thereof, a vehicle axle mounted in said bushings, shock absorbers on the rearward ends of said beams and said bolsters, a truss transverse said bolsters, rubber bushings on the ends of said truss mounted in said bolsters, a bracket welded to said axle, a rubber bushing on the outer end thereof, and a socket on said truss supporting the rubber bushing on said bracket.

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