G. G. HINSDALE.

YIELDING UNIT.

APPLICATION FILED SEPT. 25, 1918.

1,317,788. Patented Oct. 7, 1919.

Fig. 1.

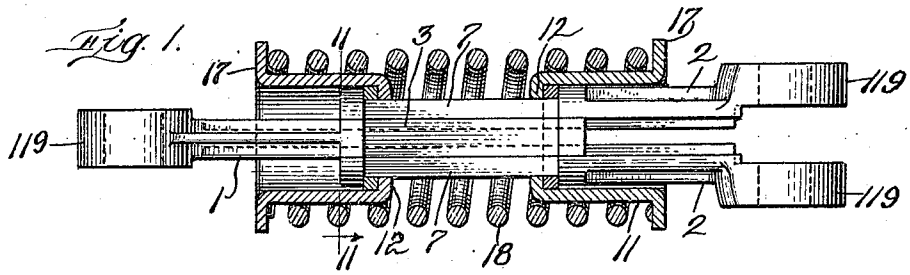
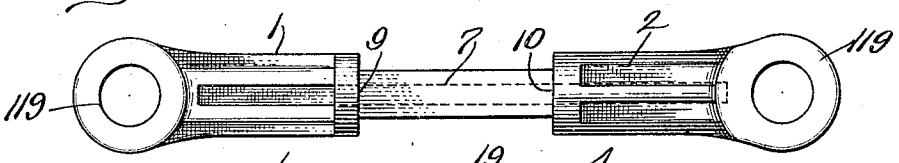


Fig. 2.



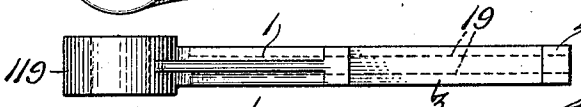


Fig. 3.

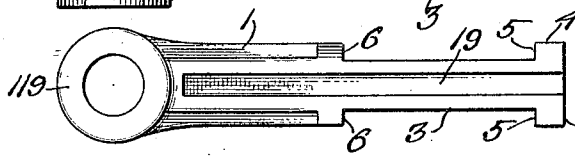


Fig. 4.

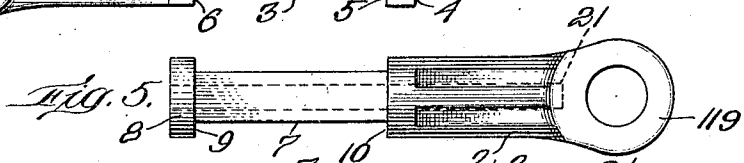


Fig. 5.

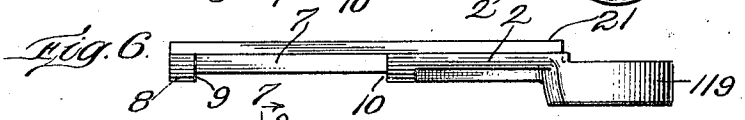


Fig. 6.

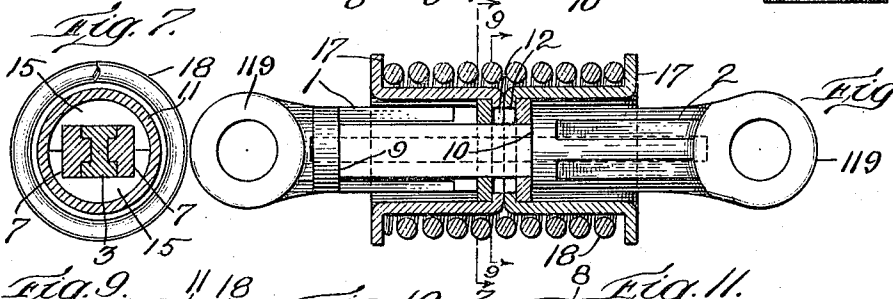


Fig. 7.

Fig. 8.

Fig. 9.

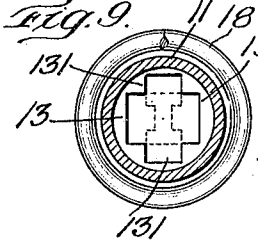


Fig. 10.

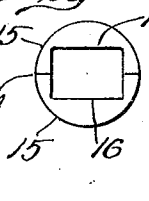
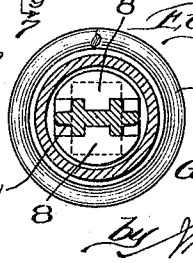


Fig. 11.



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UNITED STATES PATENT OFFICE.

GEORGE G. HINSDALE, OF SOMERVILLE, MASSACHUSETTS.

YIELDING UNIT.

1,317,788. Specification of Letters Patent. Patented Oct. 7, 1919.

Application filed September 25, 1918. Serial No. 255,641.

To all whom it may concern:

Be it known that I, GEORGE G. HINSDALE, a citizen of the United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Yielding Units, of which the following is a specification.

My invention relates to elastic or yielding units such, for example, as that shown and described in my U. S. Letters Patent Number 1,120,714, granted December 15, 1914.

Units of this class are useful in many different situations where it is desired to provide a yielding or elastic connection between two parts or members which is both extensible and contractible lengthwise, but such units are primarily intended and particularly adapted for incorporation in a resilient wheel structure where a plurality thereof is employed to connect the hub section of the wheel with the rim section of the latter so as to yieldingly hold the hub section at the center of the rim section.

The unit of the patent referred to comprises a plurality of slide bars disposed side by side and longitudinally slidable relatively, a coiled spring surrounding and being connected through a pair of abutments with said bars which serves to normally hold them in intermediate positions from which they are movable endwise in either direction against the resistance of the spring when force is applied to the unit in a direction to extend or contract the latter. In the operation of the unit of this patent there was a tendency for the slide bars to cant or swing sidewise relatively, particularly when the unit was condensed or contracted. This canting or relative swinging movement or tendency resulted in the slide bars binding against the abutment members thereby causing injurious wear and improper action of parts.

The main object of my present invention is to improve the construction of units of the character indicated, and particularly to obviate the undesirable feature just pointed out.

In the accompanying drawings:

Figure 1 is an elevation, partly in longitudinal section, of a yielding unit constructed in accordance with my invention.

Fig. 2 is a side elevation of the slide bars of the unit shown in Fig. 1.

Fig. 3 is a plan view of the intermediate slide bar of the unit shown in Fig. 1.

Fig. 4 is a side view of the bar shown in Fig. 3.

Fig. 5 is a side view of one of the outer slide bars of the unit shown in Fig. 1.

Fig. 6 is a plan view of the bar shown in Fig. 5.

Fig. 7 is a section on line 7—7 of Fig. 8.

Fig. 8 is a side elevation, partly in section, showing the unit fully contracted.

Fig. 9 is a section on line 9—9 of Fig. 8.

Fig. 10 shows one of the split washers hereinafter described.

Fig. 11 is a section on line 11—11 of Fig. 1.

My improved unit, as herein shown, comprises a middle or intermediate slide bar and a pair of outer slide bars 2, 2 arranged one at each side of the intermediate bar 1. The intermediate slide bar 1 is made with a shank portion 3 substantially rectangular in cross-section, at the inner end of which is a pair of oppositely disposed lugs 4 which provide a pair of shoulders 5 at the inner end of the shank. At the outer end of the shank portion 3 said intermediate slide bar is made with a pair of oppositely disposed shoulders 6. The inner portion of each outer slide bar is made with a shank portion 7 which is also substantially rectangular in cross-section, said shank portion being made at its inner end with a segmental flange 8 which provides a segmental shoulder 9, and at its outer end with a segmental shoulder 10.

The lengths of the shanks 3 and 7 are the same so that when the three slide bars are assembled side by side as shown in Figs. 1 and 2, the segmental shoulders 10 of the outer bars 2 are in the same transverse plane with the shoulders 5 of the intermediate bar while the segmental shoulders 9 of the outer bars are in the same transverse plane with the shoulders 6 of said intermediate bar.

Surrounding the shanks 3 and 7 of the assembled bars, and slidable longitudinally thereon, are two tubular abutment members 11, 11, each made at its inner end with an inwardly projecting flange or wall 12 formed with a pair of oppositely disposed rectangular notches 13, Fig. 13, receiving the shanks 7 of the two outer bars 2, and with a pair of oppositely disposed notches 131 for use in assembling the parts. Each abutment member 11 contains a split washer 14, Fig. 10, seated against one side of the wall or flange 12. Each split washer is made up of two separate half sections 15 formed with rectangular notches 16 snugly fitting

the shanks 3 and 7 but freely slidable thereon. At the outer end of each tubular abutment 11 in an outwardly projecting flange 17, and between the flanges 17 of the two abutments 11 is arranged a coiled spring 18 whose opposite ends are occupied by said abutments so that the spring is held out of engagement with the relatively movable shanks 3 and 7.

The outer ends of the slide bars may be provided with eyes 19 by means of which they are pivotally connected with their respective members or parts, the intermediate bar 1 being connected with one of said members or parts and the two outer bars 2, 2 with the other member or part. In the case of a resilient wheel one of these members or parts would be the rim section of the wheel and the other would be the hub section thereof.

When the slide bars 1 and 2 are forced together into, or toward, the condition shown in Fig. 8, the spring 18 tends to twist or cant the abutment members 11 and, acting through the latter, to swing or cant the bars 1 and 2 relatively in a direction parallel with the planes of the joints between said bars. To prevent such relative swinging displacement of the slide bars which has heretofore caused binding and undue wear of the parts, I make the intermediate bar 1 with two longitudinal grooves 20, one at each side thereof, into which fit tongues 21 provided upon the inner sides of the outer slide bars 2. In this way the several bars are all splined or keyed together so as to mutually hold each other against being swung or canted sidewise in the manner referred to, and at the same time said bars are free to slide longitudinally in either direction under the influence of the load borne by the unit.

As heretofore, the shoulders 5 and 9 act through the split washers 14 and tubular abutments 11 to compress the spring 18 when the bars 1 and 2 are pulled outwardly while the shoulders 6 and 10 act through said washers and abutments to also compress said spring 18 when the bars 1 and 2 are forced inwardly.

What I claim is:

1. A yielding unit of the character described comprising overlapping relatively and longitudinally slidable members; a pair of abutment members slidably connected with said slidable members; a spring acting in opposite directions upon said abutment members, and means for holding said slidable members parallel independently of said abutment members.

2. A yielding unit of the character described comprising overlapping relatively and longitudinally slidable members; a pair of abutment members slidably connected with said relatively slidable members; a spring acting in opposite directions upon said abutment members, and means independent of said abutment members for preventing relative lateral swinging movement of said slidable members in a direction parallel with the plane of the joint between them.

3. A yielding unit of the character described comprising overlapping relatively and longitudinally slidable members; a pair of abutment members slidably connected with said relatively slidable members; a spring acting in opposite directions upon said abutment members, and means interlocking said relatively slidable members so as to hold them against relative lateral swinging movement in a direction parallel with the plane of the joint between them.

4. A yielding unit of the character described comprising overlapping relatively and longitudinally slidable members; a pair of abutment members slidably connected with said relatively slidable members; a spring acting in opposite directions upon said abutment members, and means interlocking said relatively slidable members throughout the length of their overlapping portions so as to hold them against relative lateral swinging movement.

5. A yielding unit of the character described comprising overlapping relatively and longitudinally slidable members; a pair of abutment members slidably connected with said relatively slidable members; a spring acting in opposite directions upon said abutment members, and a spline connection between said relatively slidable members for holding them against relative lateral swinging movement.

6. A yielding unit of the character described comprising overlapping relatively and longitudinally slidable members; a pair of abutment members slidably connected with said relatively slidable members; and a spring acting in opposite directions upon said abutment members, one of said relatively slidable members being made with a longitudinal tongue and the other of said members being made with a longitudinal groove occupied by said longitudinal tongue whereby said two members are held in parallel relationship independently of said abutment members.

In testimony whereof I have affixed my signature.

GEORGE G. HINSDALE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."