

June 30, 1931.

D. F. AINSLIE

1,812,733

DRAWBAR

Filed Aug. 6, 1930

2 Sheets-Sheet 1

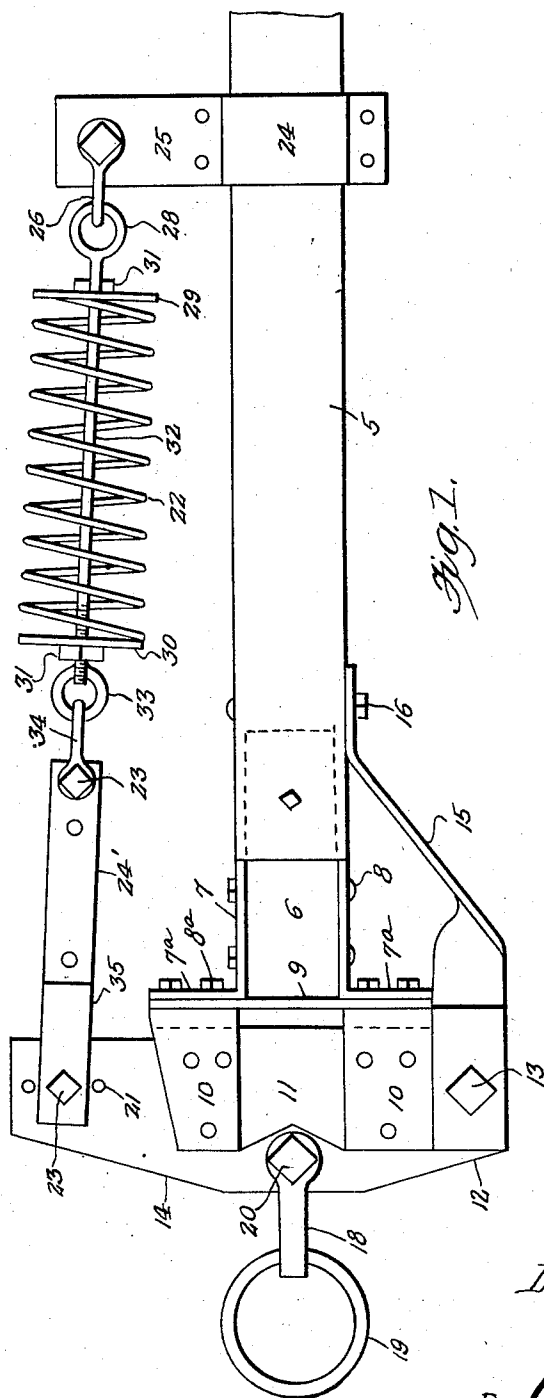


Fig. 1.

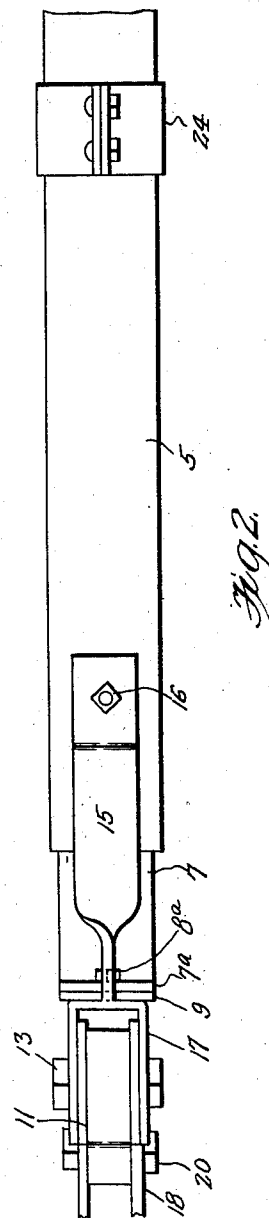


Fig. 2.

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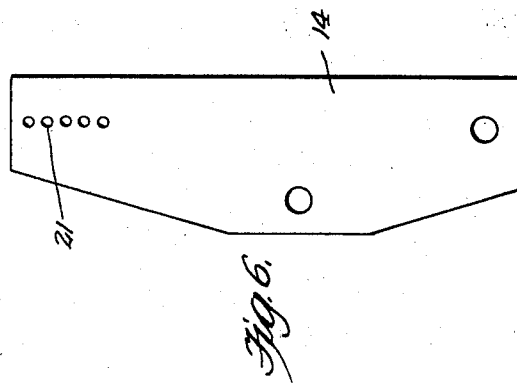
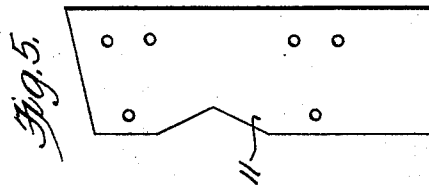
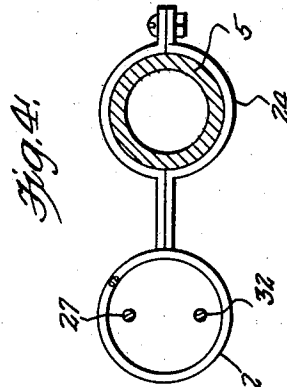
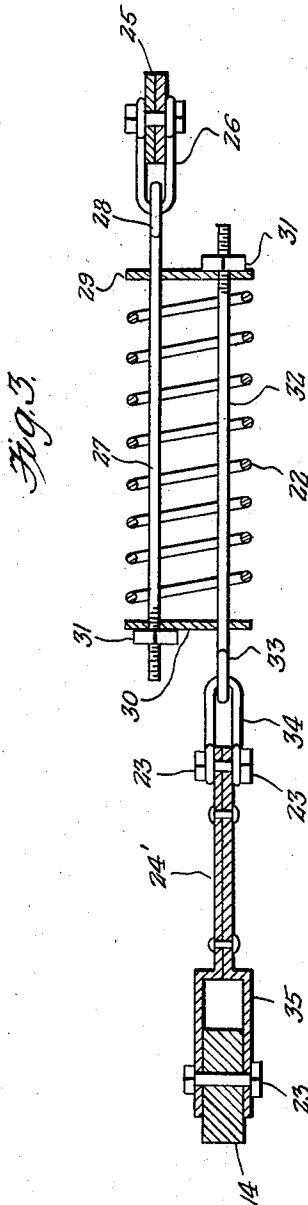
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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DRAWBAR

Application filed August 6, 1930. Serial No. 473,443.

This invention relates generally to draw bars, and particularly to a draw bar used for hitching or coupling heavy vehicles and machinery, such as heavy tractors and road graders, where the shock of starting and stopping, and the shocks incident to striking rocks and other obstructions usually encountered on a road or terrain over which said machinery must be passed, usually resulting in damage or breaking of the draw bar, and which are usually provided with resilient means for preventing said damage resulting from said jars.

It is the particular province of this invention to provide a draw bar simply of new and novel structure, which provides for efficiently reducing and eliminating the dangers of breakage in said draw bar, and the conditions named.

It is an object of this invention to provide a strong and rugged mechanism for constituting resilient means for cushioning the road shocks.

It is also an object of the invention to provide a device of this character adapted to be used with the heaviest kind of vehicles and to effectively couple the same in a resilient shock absorbing manner, without placing the entire stress against said coupling upon the spring members thereof.

It is also an object of the invention to provide a device of the character described, which may be disposed in different vertical planes, according to structure of the drawn vehicle.

It is also an object of the invention to provide a device of the character described which may be of any suitable type and strength, and which may be adjusted to various tensions.

It is also an object of the invention to provide a device of the character described which is capable of drawing all ordinary loads without involving the resilient means incorporated therein, said resilient means adapted to compensate for any overload which may be placed upon the device.

These and other objects, the nature of the invention, its composition, its arrangement and combination of parts will be clear to any

one acquainted with the art to which this invention relates, when consulting the following description and drawings in which:—

Figure 1 is a top plan view of my improved draw bar.

Fig. 2 is a side view thereof from the right of Fig. 1.

Fig. 3 is a longitudinal section through the spring mechanism.

Fig. 4 is a transverse cross section in use of a detail of Fig. 1.

Fig. 5 is a plan view of one of the bearing plates.

Fig. 6 is a plan view of the toggle.

It is to be understood that I do not desire to limit the application of this invention to the particular modification set forth herein and the illustration thereof, and I do not desire to limit the application of this invention to the particular modifications set forth herein and the illustration thereof, and that any change or changes may be made in structure consistent with the spirit and scope of the invention.

Referring in detail to the drawings, it will be seen that the invention comprises a tubular draw bar 5 which is fastened in conventional manner to a draft vehicle and is provided at its free end with an extension 6, close-fitted in the end, in telescoping manner. Secured in position by suitable means to the extension are secured diametrically opposite brackets 7 secured to said extension 6 by bolts 8 arranged therethrough on each side of said extension. The lateral extension 7a and the angle bracket 7 provides for pull and for the reception of bolts 8a to secure said brackets to an elongated rectangular plate 9 which is co-extensive with the areas of the portions of the brackets 7a thereacross.

Fastened to each end of the plate 9 by the bolts 8a and at the other side of the plate from the angle iron 7a are U-shaped members 10 adapted to have secured to their legs on the inner sides thereof plates 11 which extend between opposite coplanar pairs of the legs. An extension on each of said plates 11 beyond one of said U-shaped members provides a mounting 12 for a pivot

bolt 13 journaled therethrough. A toggle bar 14 has one edge pivoted on bolt 13 and is disposed between the legs of the U-shaped members 10, and another plate similar to the plate 11 is secured to the inner surface of the under legs of the U-shaped members 10. The plates 11 form bearing surfaces for the toggle bar 14.

An angular brace bar 15 is mounted to one side of the tubular bar 5 as shown at 16. It is provided with a U-shaped construction 17 at its free end for supporting the pivot 13 of the toggle bar 14, and the U-shaped member 17 embraces the plate 11 and is secured thereto by the pivot 13 on which the toggle 14 moves. Centrally of the forward edge of the toggle 14 is a pivot 20 which is pivotally secured to the toggle 14 and a U-bar 18 having its bight embracing the toggle and a ring 19 is loosely secured to said U-shaped bar.

The free end of the toggle bar is provided with a plurality of holes 21 for adjustment of the tension of the spring 22 which is secured at the free end of the toggle by a bolt 23 and the other end is secured by a clamp to the bar 5. A clamp collar 24 is provided with a lateral extension 25 and is secured about the shaft 5, and the extension 25 has mounted near its end a pivoted U-shaped member 26, and a rod 27 having a ring 28 on one end. Said rod is thrust through a buffer plate 29 and through the interior of a coiled spring and through another buffer plate 30, in which position it is maintained by an adjusting nut 31. A similar rod 32 having a similar ring 33 loosely placed in another U-shaped member 34 is pivoted by a bolt 23 which is pivoted in a laminated bar 24' and whose other end is bent to form a U-shaped formation as indicated by the numeral 35 which U-shaped formation embraces the toggle 14 which is provided with the bolt holes 21 and the pivot bolt 23 secured the same to the free end of the toggle 14.

It will be seen that the withdrawal of the rings on the rods 32 operates to bring into play the rods 27 and 32 to compress the spring 22 and the free end of the toggle is drawn outwardly. It will be observed that under ordinary conditions, the toggle will not be drawn into extended position hence the spring 22 will not be called upon. However should the draft vehicle encounter obstructions, the spring will come into action and preserve the coupling from damage.

Fig. 4 shows the disposition of the rods 32 and 27 within the spring 22 and gives the detailed view of the attachment of the clamp 24 to the tubular draw bar 5. The exact formation of the plate 11 is shown in Fig. 5, whereas Fig. 6 shows the exact formation of the toggle 14.

It will be observed that the bolt holes 21 in the free end of the toggle provide a certain amount of adjustment for the spring assembly, and the spring itself is adjustable for tension by the nuts 31 on the ends of the rods 32 and 27.

It is obvious that the advantage of this construction over the usual types of resilient means, in which the whole tension of the load is placed upon the resilient means, resulting in an unsatisfactory coupling for very heavy machinery, is that the balanced effect in my invention provides that the resilient means therein shall not come into play except under the extraordinary conditions as mentioned.

It will be obvious that I have provided an improved device of the character described, which is effective, simple, entirely adapted to the purpose for which it is designed. It will also be observed that the simplicity of the structure is such as to provide for cheap manufacture and installation.

Having thus described my invention what I claim as new is:—

1. A draw bar construction of the type described, comprising a hollow tubular bar, a reduced extension telescoped in the outer end of the draft bar, means to secure the extension of said draft bar in said relation, angle brackets secured to the side of said extension, U-shaped members secured to the extensions on said brackets, plates secured to the inner side of the legs of said U-shaped members in lateral extension on said plate, a flat toggle bar adapted for movement between said plates, a pivot through the plates and an end portion of the toggle bar, said toggle bar having a series of bolt holes at its free end, a laterally projecting bracket on said bar, a double acting compressing spring mounted at one end to said laterally extending bracket, and having its further end attached to said free end of the toggle, and a U-shaped member to embrace the free end of the toggle in its bight secured to the other end of the spring, and a bolt through said U-shaped member and through a bolt hole in the free end of the toggle, and a draft ring pivotally mounted centrally of the forward edge of the toggle bar.

2. In combination, a tubular draft bar having one end attachable to a drawn vehicle, an extension in the other end of the bar and fitted therein, and means securing said extension in the said other end of the draft bar, and angle brackets secured to opposite sides of the extension, plates secured across the forward faces of the lateral projections of said brackets; and U-shaped members secured by the portions opposite the bights thereof to said plates, and bearing plates secured to the inner faces of the legs of the U-shaped members, and lateral continuations of said bearing plates on one end

thereof; and a toggle bar disposed between said bearing plates, and a pivot thru said plates and an adjacent end of the toggle bar therebetween; and a pivoted hook, a ring
5 loosely held by said hook, said hook disposed centrally of the forward edge of the toggle bar; and a rearwardly extending bar pivoted in one of a plurality of bolt holes provided in the free end of the toggle bar, a rod
10 loosely coupled to the rear end of said rearward bar, a buffer plate on said rod, a coiled spring surrounding said rod and abutting said buffer plate, and another buffer plate abutting the other end of said spring and
15 maintained on said rod, a nut retaining said other buffer plate in abutment with said spring, and another rod disposed within said spring and through the buffer plates and a loose coupling at the rear end of said rod,
20 and a plate retaining nut on its other end, and a bracket attached to said tubular bar rearwardly of said extension, and means to secure said loose coupling thereto.

In testimony whereof I affix my signature.

DONALD F. AINSLIE.