Aug. 15, 1939. E. W. WEBB 2,169,715

STABILIZED TRUCK AND BOLSTER THEREFOR

Filed Sept. 23, 1937 3 Sheets-Sheet 1

Fig. 1.

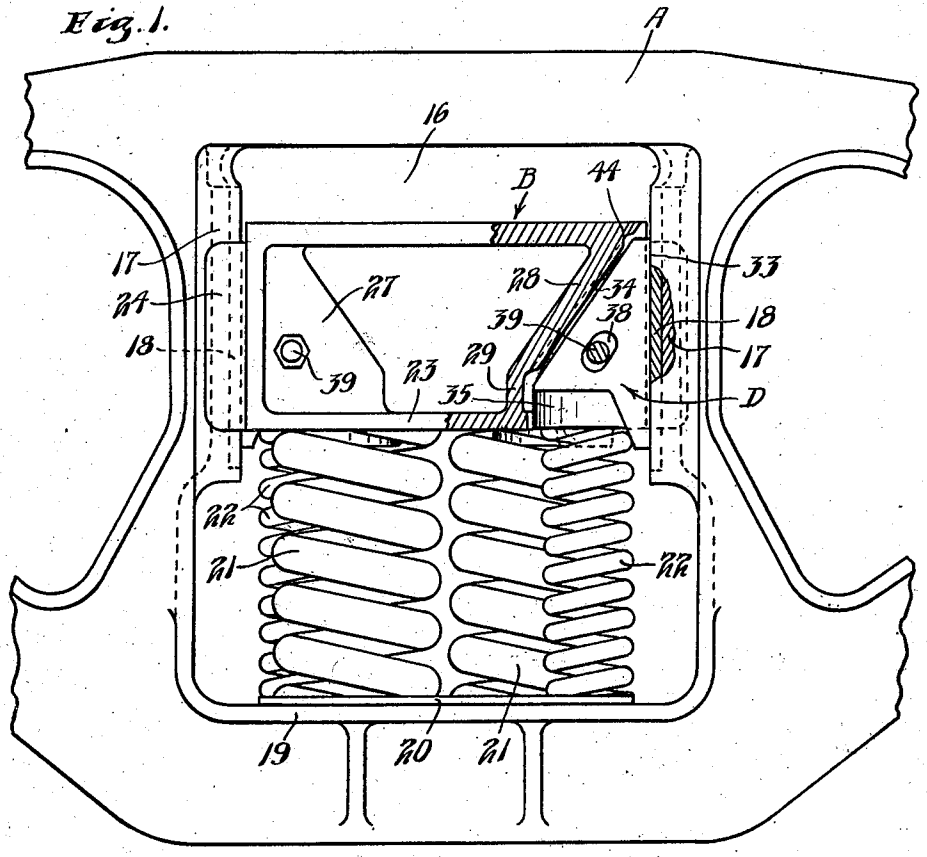


Fig. 2.

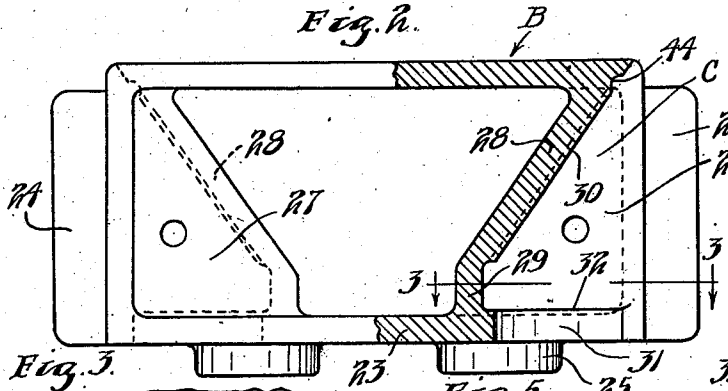


Fig. 4.

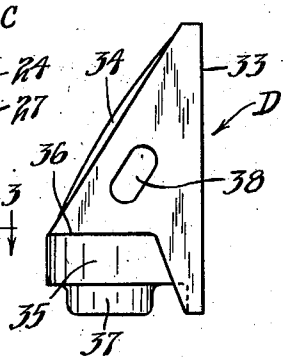


Fig. 3.

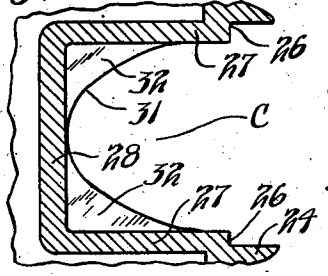
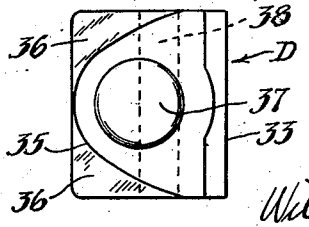


Fig. 5.



INVENTOR
EDWIN W. WEBB.
BY HIS ATTORNEYS.
Williamson & Williamson

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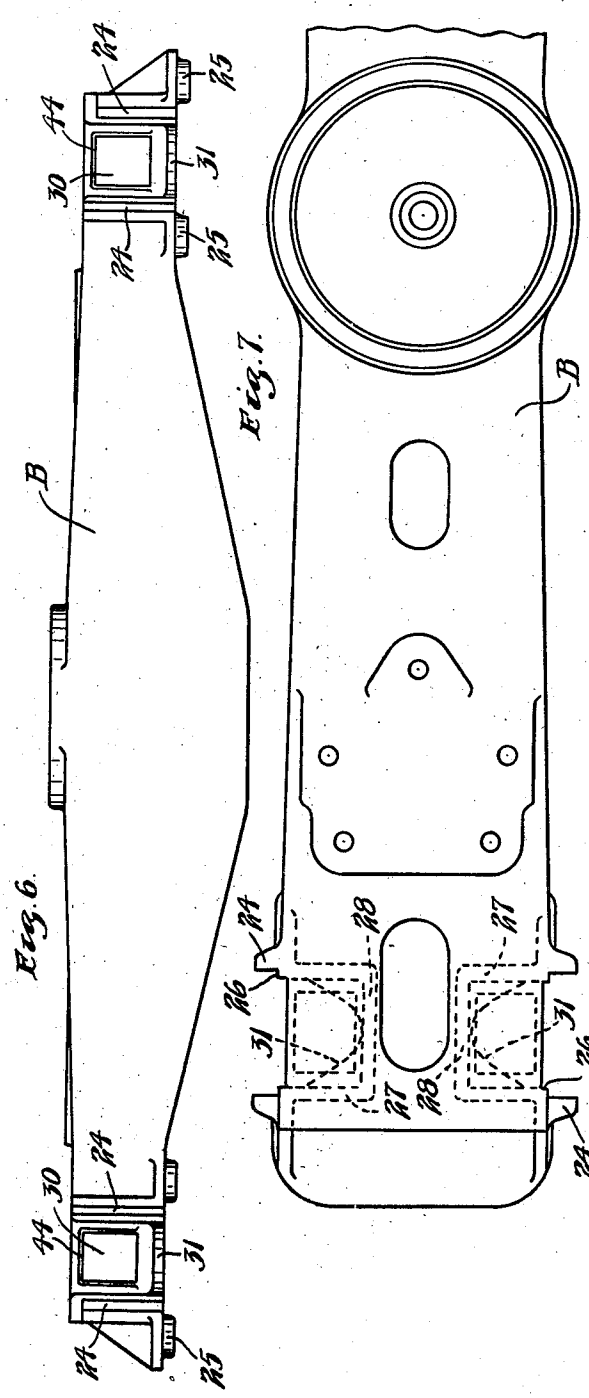
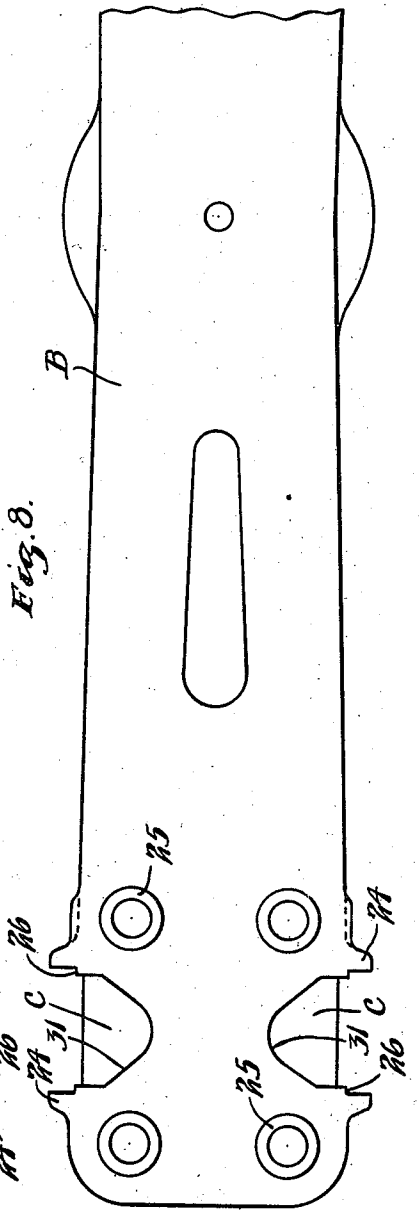
STABILIZED TRUCK AND BOLSTER THEREFOR

Filed Sept. 23, 1937 3 Sheets-Sheet 2





INVENTOR.
EDWIN W. WEBB.
BY HIS ATTORNEYS.
Williamson & Williamson

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STABILIZED TRUCK AND BOLSTER THEREFOR

Filed Sept. 23, 1937 3 Sheets-Sheet 3

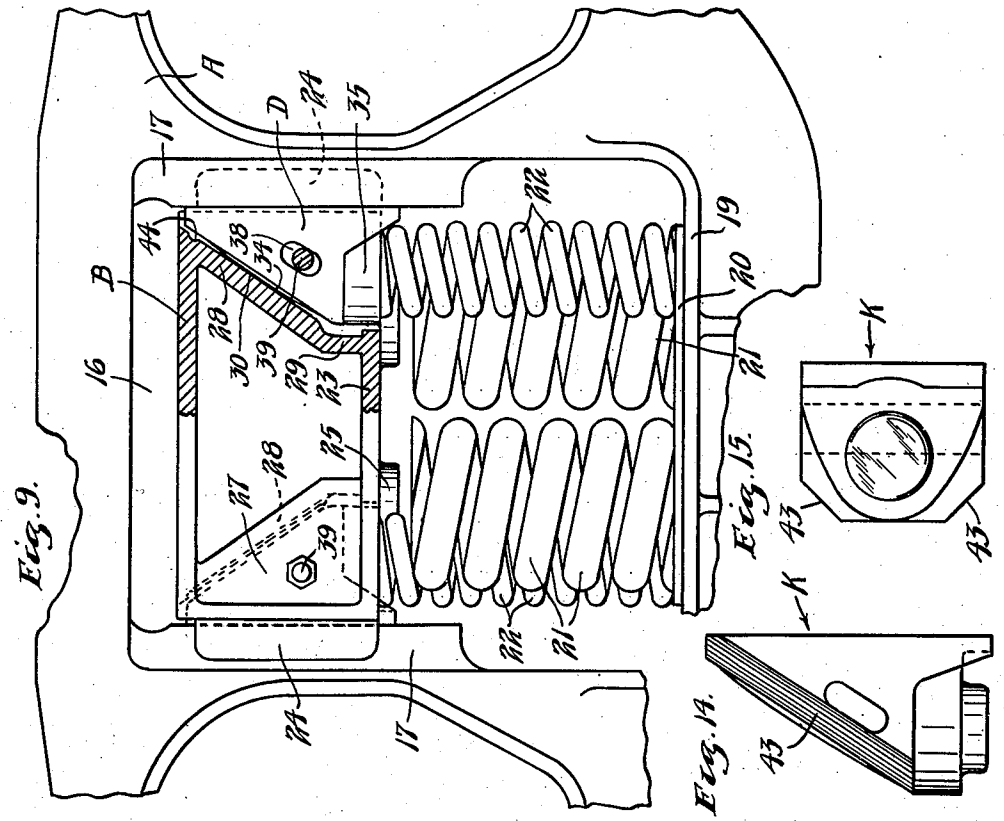

Fig. 9.

Fig. 15.

Fig. 14.

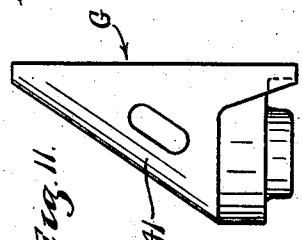

Fig. 11.

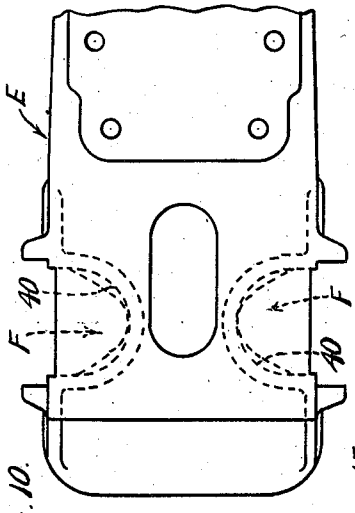

Fig. 10.

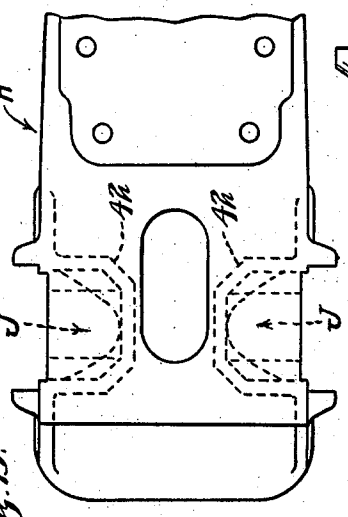

Fig. 13.

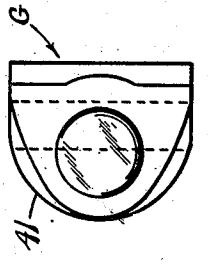

Fig. 12.

INVENTOR.
EDWIN W. WEBB.
BY HIS ATTORNEYS.
Williamson & Williamson

Patented Aug. 15, 1939 2,169,715

UNITED STATES PATENT OFFICE

2,169,715

STABILIZED TRUCK AND BOLSTER THEREFOR

Edwin W. Webb, Chicago, Ill., assignor to Standard Car Truck Company, Chicago, Ill., a corporation of New Jersey

Application September 23, 1937, Serial No. 165,289

5 Claims. (Cl. 105—193)

This invention relates to stabilized car trucks and to truck bolsters used therein. It refers particularly to stabilizing devices of the same general type as those disclosed in my Edwin W. Webb Patent 1,894,386 issued January 17, 1933, entitled "Spring damping truck", my Edwin W. Webb application for patent Serial Number 102,937, filed September 28, 1936, entitled "Stabilizing device for car truck" and my Edwin W. Webb application for patent Serial Number 161,244, filed August 27, 1937, entitled "Stabilized truck".

It is one of the main objects of the present invention to provide an improved bolster structure for use in stabilized car trucks.

It is another object to provide an arrangement of bolster springs and stabilizing springs so constructed and arranged as to prevent the loosening of the stabilizing members and consequent wear thereof rapidly even under conditions that may arise when the bolster lifts slightly from the regular bolster springs.

The objects and advantages of the invention will more fully appear from the following description, made in connection with the accompanying drawings, wherein like reference characters refer to the same or similar parts throughout the various views, and in which,

Fig. 1 is a view in side elevation of a portion of a stabilized car truck embodying the invention, some of the parts being broken away and shown in section to more clearly illustrate the same;

Fig. 2 is a view on an enlarged scale looking toward one end of the bolster shown in Fig. 1, the view being taken in the same manner as in Fig. 1 and part of the bolster being broken away to show other parts in section;

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 2 as indicated by the arrows;

Fig. 4 is a view in side elevation of one of the wedges that is used;

Fig. 5 is a bottom view of the same wedge;

Fig. 6 is a view looking toward one side of the complete bolster as shown in Fig. 1;

Fig. 7 is a view in enlarged scale looking down on a portion of the said bolster;

Fig. 8 is a view in similar scale looking up on the same bolster;

Fig. 9 is a view taken similar to Fig. 1 but showing certain of the movable parts in another position, the height of the bolster and wedges relative to the bolster springs being possibly somewhat exaggerated;

Fig. 10 is a plan view of the end portion of a slightly modified type of bolster;

Figs. 11 and 12 are respectively a view in side elevation and a bottom view of a type of wedge that may be used with the bolster shown in Fig. 10;

Fig. 13 is a view similar to Fig. 10 of another slightly modified type of bolster; and

Figs. 14 and 15 are respectively a view in side elevation and a bottom view of a wedge that may be employed with the bolster shown in Fig. 13.

Referring first to the form of the invention shown in Figs. 1 to 9 inclusive, portions of a car truck are shown including a side frame A having a bolster opening 16. This side frame includes bolster columns 17 recessed to receive wear plates 18 which may be secured to the columns in any suitable manner. The tension member of the side frame A is provided at the bottom of the bolster opening 16 with projecting flanges to form a wide spring seat 19 upon which a lower spring cap 20 rests. Supported upon this spring cap are a group of four heavy bolster springs 21 of standard type, the spacing between the outer pair of these springs and the inner pair of the same being somewhat greater than usual to accommodate a pair of stabilizing springs 22 which are supported upon the spring cap 20. These stabilizing springs 22 are relatively light in comparison to the bolster springs 21 and they are of considerably greater length when not under compression than are the springs 21 and they are so constructed that they may be subjected to further compression after the bolster springs 21 can be compressed no further, i. e., after the bolster springs have been compressed "solid".

For use between the two opposite side frames of the car truck, a bolster B is provided. This bolster is of truss formation, the central part of the bolster being of considerably greater depth than the ends, and the bolster preferably being hollow, the bottom 23 of the bolster forming the tension member of the truss.

While both ends of the bolster B are similarly formed to be received within the bolster openings 16 of the opposite side frames A of the truck, reference will be made chiefly only to one end of the bolster B. Projecting from the opposite sides of the end of the bolster are spaced vertical flanges 24 which work against the sides of the columns 17 to limit lateral movement of the bolster. The end portion of the bolster rests directly upon the four bolster springs 21, the bottom 23 being provided with spring centers 25 to receive the upper ends of the bolster springs.

Between the flanges 24 at each side of the bolster the bolster is slightly inwardly channeled

at 26 and pockets C are formed in the opposite sides of the bolster projecting inwardly from these channeled portions. The sides of these pockets C are formed by vertical webs 27 which project upwardly in spaced parallel relation from the bottom or tension member 23 of the bolster. The backs or inner sides of the pockets C are formed by diagonally inclined webs 28 which extend diagonally downwardly and inwardly from the top side edges of the bolster toward a vertical plane taken longitudinally of the bolster at the central portion thereof. These inclined webs 28 in turn join short vertical webs 29 which run downwardly to the bottom 23 of the bolster. The web 28 of each pocket at its surface facing a column 17 is grooved by the grooves 44 at its sides and top to form a raised inclined surface 30 directly opposite the adjacent wear plate 18. As best shown in Figs. 2, 3, 7 and 8 the bottom or tension member 23 of the bolster underlies the wedge pockets C but notches 31 are cut in the tension member below the pockets C to accommodate the upper ends of the stabilizing springs 22. By notching the tension member 23 below the pockets, rather than completely cutting away the tension member below the pockets, flanges or ribs 32 of substantially triangular shape are formed below the pockets which preserve the strength of the tension member of the bolster as well as acting to prevent the dropping of the wedges in an emergency as will hereinafter be brought out.

Fitting within the pockets C and interposed between the surfaces 30 of the bolster and the wear plates 18 of the columns 17 are stabilizing members in the form of wedges D. Each wedge has an outer vertical surface 33 which works against the adjacent wear plate 18 and it has a diagonally inclined crowned inner surface 34 which bears against and cooperates with the adjacent inclined surface 30 of the bolster B. The inner surface 34 of the wedge is slightly crowned so as to assure proper contact between the vertical surface 33 of the wedge and adjacent wear plate 18 irrespective of slight irregularities in the manufacture of the bolster B and the wedge D and irrespective of slight tilt that may occur between the bolster and the side frame A during operation of the truck. The lower portion 35 of the wedge is shaped to be loosely received within the notch 31 of the bottom or tension member 23 of the bolster and as the notch 31 is preferably approximately parabolic in shape, the lower portion 35 is of similar shape and the width of this lower portion 35 at the inner edge of the wedge is somewhat narrower than the part of the wedge immediately above the lower portion 35 to provide shoulders 36 which overlie the flanges or ribs 32. Spring centers 37 project downwardly at the bottom of the wedges D below the lower portions 35 to receive the upper ends of the stabilizing springs 22.

In order to tie the wedges D to the bolster B for ease of assembly of the bolster and wedges in the car truck, the wedges are provided with slanting elongated cross apertures 38 and nutted bolts 39 extending crosswise between the opposite webs 27 of the pockets C pass loosely through these apertures 38. The slant of the apertures 38 is generally similar to the slant of the inclined surfaces 30 of the bolster to permit of limited up and down movement of the wedges D relative to the carrying bolts 39.

When the truck is assembled, the two ends of the bolster B together with the pairs of wedges D carried by the ends, will be received within the bolster openings 16 of the side frames and the bolster springs 21 will support the bolster ends directly while the stabilizing springs 22 will support the stabilizing members or wedges D. Up and down movement of a bolster end with its wedges D can, of course, take place relative to the neighboring side frame A and the wear plates 18 of the columns 17 thereof. Most of the bolster load will be taken by the heavy bolster springs 21. As downward movement of the bolster end takes place the inclined surfaces 30 bearing against the surfaces 34 of the wedges will cause the wedges to be moved into slightly tighter wedging relation between the surfaces 30 and the wear plates 18 and the vertical surfaces 33 of the wedges working against the wear plates 18 will produce a slight frictional resistance to the vertical movement of the bolster. This frictional resistance is sufficient to prevent the bolster springs 21 from compressing and expanding in their free vibration period. In other words, the resistance of the stabilizing springs 22 to further compression as the bolster moves downwardly and the wedges D move therewith, causes the wedges to offer slight frictional resistance to the movement of the bolster by reason of the frictional contact of the vertical surfaces of the wedges with the wear plates 18. The slight drag or frictional resistance offered to the free movement of the bolster is sufficient to prevent cumulative harmonic action of the bolster springs 21 at certain speeds of travel of the truck as the truck passes over rail joints. The truck is thus stabilized so that it rides smoothly at all speeds.

If the stabilizing wedges D become loose at any time in the pockets C, there is likelihood of rapid wear of the vertical surfaces 33 and the wear plates 18. Provision is made in the present truck to maintain the wedges D tightly in contact with the wear plates 18 and inclined surfaces 30 of the bolster at all times. For this purpose the stabilizing springs 22 are at all times kept under some compression as more or less diagrammatically illustrated in Fig. 9. The length of the stabilizing springs 22 between the cap plate 20 and the spring contacting portions of the wedges D is such relative to the length of the bolster springs 21 between the spring cap plate 20 and the bottom of the bolster B that in case the bolster should raise slightly from the bolster springs 21, so that the bolster springs are under no compression, the stabilizing springs 22 will still remain under some compression to hold the wedges D tightly in position. In the particular embodiment shown, the stabilizing springs 22 when under no compression, are of considerably greater length than are the bolster springs 21 when under no compression. This would always be the case if the lower ends of the two different types of springs were supported at the same level and if, as shown, the bottom of the bolster stood at approximately the same level as the spring contacting portions of the wedges D. It is not essential, however, that the bolster springs 21 and the stabilizing springs 22 be supported at their lower ends at the same level, nor is it essential that the bottom surface of the bolster lie at approximately the same level as the stabilizing spring contacting surfaces of the wedges. It is highly important, however, to the operation of the truck that the stabilizing springs 22 be always maintained under compression irrespective of whether or not the bolster springs 21 are under compres-

sion. Cars are often run having flat spots on the wheels, thus subjecting the truck to constant jolting. If the wedges D were loose at any time during the normal operation of the truck and the up and down movement of the bolster, the play between the wedges D and the wear plates 18 and the inclined surfaces 30 of the bolster would quickly wear the parts. With the arrangement provided where the wedges are always maintained in tight engagement, appreciable wear of the parts under continued service cannot take place. Attention is also called to the fact that the coils of the stabilizing springs 22 are so spaced and arranged relative to the coils and spacing of the bolster springs 21 that the stabilizing springs 22 cannot go "solid" before the bolster springs 21 go "solid". Therefore, on extreme downward movement of the bolster relative to the side frame, it is impossible for the stabilizing springs 22 to take the entire load of the bolster or any very substantial part thereof. This is highly important inasmuch as the parts 18 and 33 will quickly wear away if too much frictional resistance is offered by these parts to the vertical movement of the bolster. The springs 22 are made quite light relative to the bolster springs 21 for this same general purpose.

In case of breakage of one of the stabilizing springs 22 the bolt 39 passing through the opening 38 in the wedge D above the spring will normally support the wedge to prevent it from dropping. In case these bolts 39 are not used or in case they have become removed, it is still impossible for the wedge D to drop downwardly inasmuch as the shoulders 36 are bound to strike and to be caught by the flanges or ribs 32 of the bolster. Thus if for any reason the stabilizing springs should break, the truck can be used without the stabilizing feature in the manner of an ordinary truck until repairs can be made.

The short vertical web 29 in the bolster is used between the bottom or tension member 23 of the bolster and the inclined web 28 for two purposes. It greatly strengthens the bolster over a construction which might be employed with the inclined web 28 running all the way down to the tension member 23 and at the time the bolster is cast it permits the inclined web 28 to give outwardly somewhat as the bolster cools rather than to produce a straight stress which might result in shrinkage cracks.

By equipping the face of the inclined web 28 of the bolster with the side and top grooves 29, so as to produce the raised inclined surface 30, this surface is self-cleaning and no difficulty is involved in fitting the inclined surface 34 of the wedge D against this surface.

Referring now to the form of bolster and stabilizing wedge shown in Figs. 10, 11 and 12, there is illustrated the end of a bolster E having wedge pockets F therein, the walls 40 of which pockets are of inclined concave shape and preferably partially circular in horizontal cross section to receive the similarly shaped surfaces 41 of wedges G which correspond in other particulars to the wedges D. This is an alternative form of bolster and wedge construction that can be employed.

Referring now to Figs. 13, 14, and 15, a slightly different type of bolster H is shown having pockets J of the same construction as the pockets C previously described with the exception that diagonal inclined webs 42 are employed between the side webs of the pockets and the back webs thereof. To fit the pockets J stabilizing wedges K are employed having inclined surfaces 43 shaped after the surfaces of the pockets. This is another alternative form of bolster and wedge construction that can be employed.

It will be seen that a highly efficient stabilized truck and bolster for use in stabilized trucks has been provided. Trucks embodying the invention have been successfully used by the railroads in actual practice.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of the present invention which, generally stated, consists in the matter shown and described and set forth in the appended claims.

What is claimed is:

1. A bolster for stabilized trucks having a deep center portion and a shallow end portion, a spring bearing surface on the bottom of the end portion, a wedge receiving pocket on each side of each end portion above the bottom of the bolster, said bottom being notched inwardly from the side edges thereof immediately below and in line with each pocket sufficient to allow clearance for a stabilizing spring, the notched portion forming a shelf to prevent the dropping of stabilizing wedges while reinforcing the lower edges of the bolster below the pockets.

2. A truck bolster for stabilized trucks having an end provided with side wedge receiving pockets, said pockets being inwardly defined by inner inclined walls extending downwardly and inwardly and short vertical walls joining the lower edges of said inclined walls, said bolster having inwardly notched webs at its bottom forming shelves below said pockets.

3. In a stabilized car truck, a bolster having an end provided with pockets in its sides and stabilizing wedges received within said pockets, said bolster below said pockets and in line therewith having laterally notched means to prevent said stabilizing wedges from being dropped downwardly completely out of said pockets.

4. In a car truck, a side frame having a lateral bolster opening therein and having columns adjacent said bolster opening, a bolster received within said bolster opening, bolster springs supporting said bolster from said side frame, wedges interposed between the sides of said bolster and said columns, said wedges having integral bolster contacting surfaces of rounded contour for rolling contact with the sides of said bolster and stabilizing springs of materially less capacity than said bolster springs supporting said wedges on said side frame.

5. In a car truck, a side frame having a lateral bolster opening therein and having columns adjacent said bolster opening, a bolster received within said bolster opening and having recesses in its sides with inner surfaces facing said columns, a wedge received within each recess and interposed between said inner surfaces of the bolster and the adjacent column, said wedges having integral rounded surfaces engaging said bolster inner surfaces for rolling contact and springs supporting said wedges on said side frame.

EDWIN W. WEBB.