June 10, 1930. C. J. W. CLASEN 1,763,221

RAILWAY TRUCK

Original Filed April 13, 1925 4 Sheets-Sheet 1

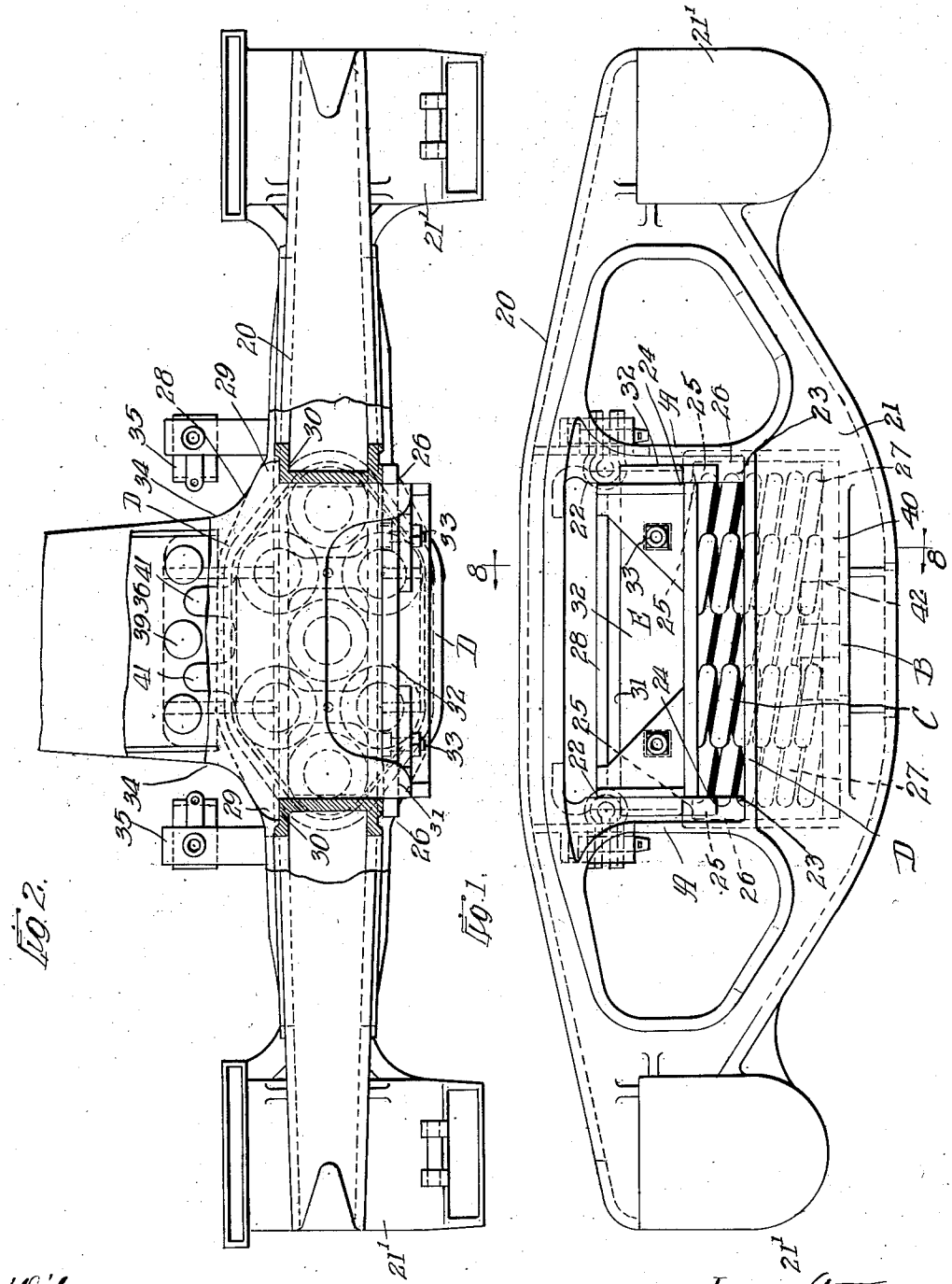


Fig. 2.

Fig. 1.

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RAILWAY TRUCK

Original Filed April 13, 1925 4 Sheets-Sheet 2

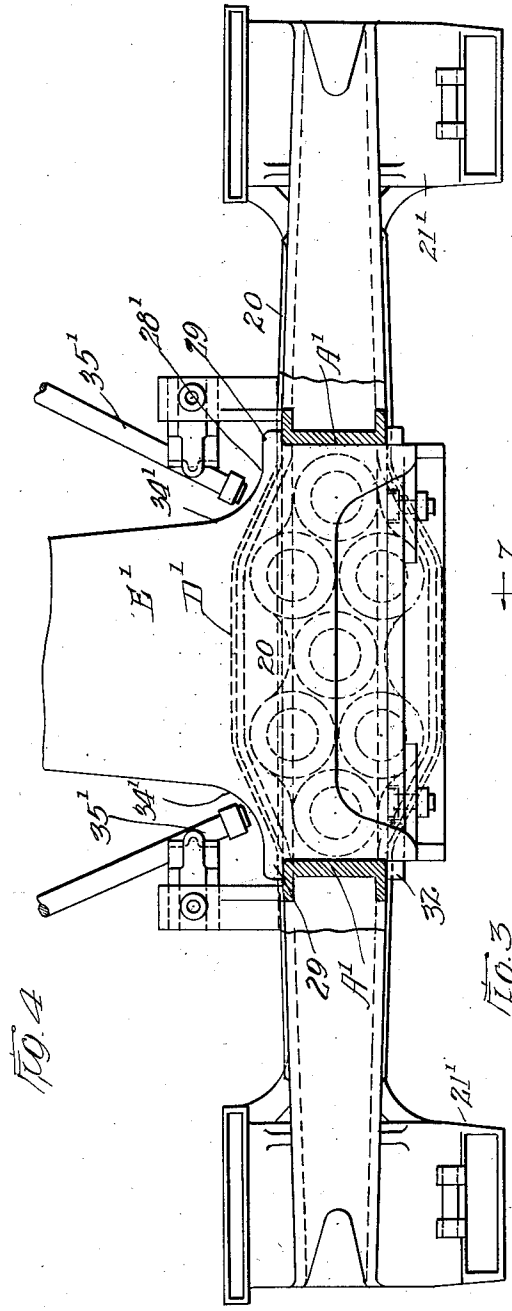


FIG. 4

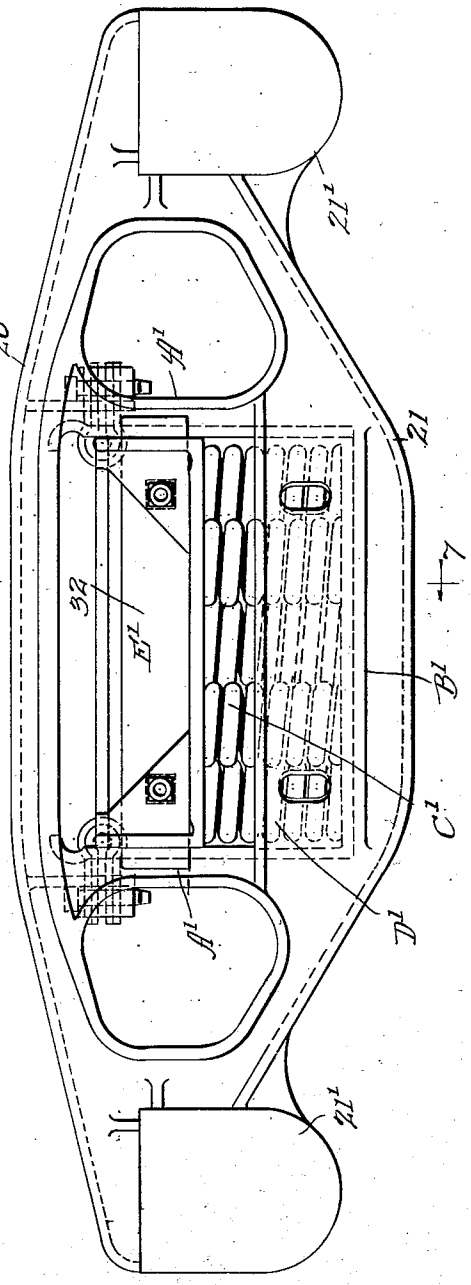


FIG. 3

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RAILWAY TRUCK

Original Filed April 13, 1925 4 Sheets-Sheet 3

Fig. 6.

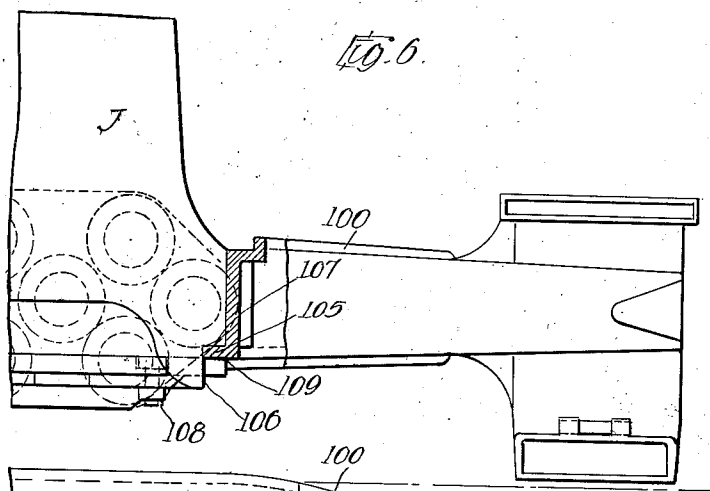


Fig. 5.

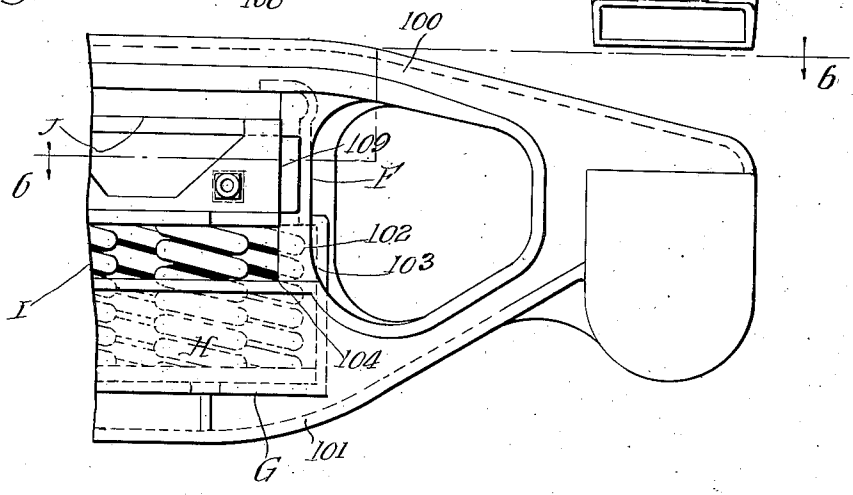
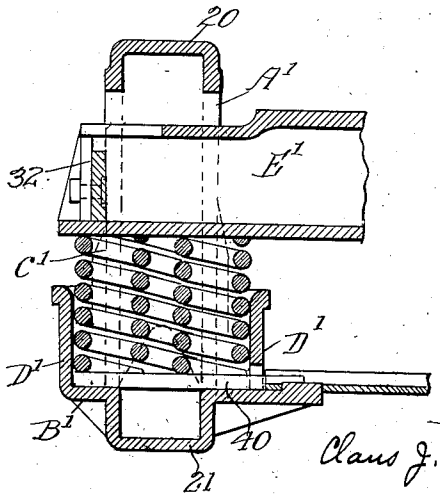


Fig. 7.



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RAILWAY TRUCK

Original Filed April 13, 1925 4 Sheets-Sheet 4

Fig. 8.

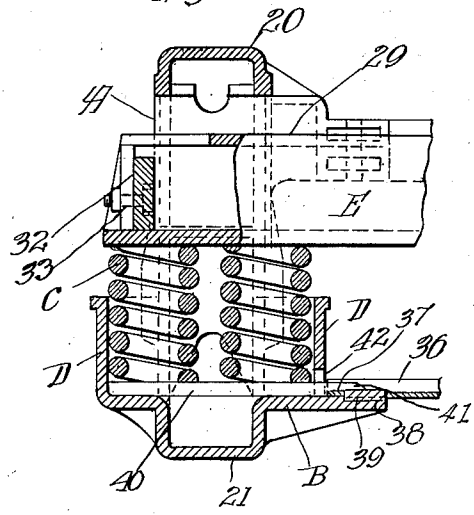


Fig. 9.

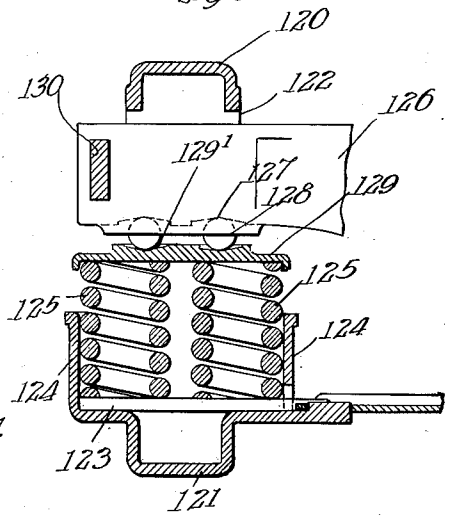


Fig. 10.

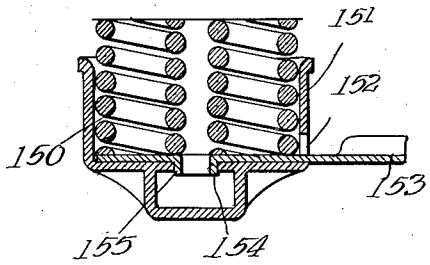


Fig. 11.

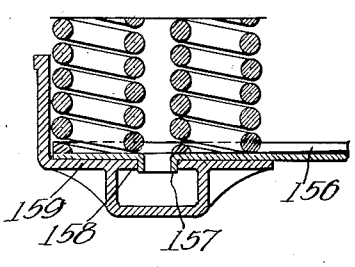
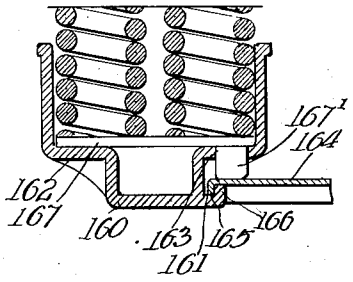


Fig. 12.



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UNITED STATES PATENT OFFICE

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RAILWAY TRUCK

Application filed April 13, 1925, Serial No. 22,595. Renewed November 26, 1929.

This invention relates to railway trucks.

The general object and nature of the present invention is to provide means for increasing the spring capacity of a railway truck of a given size without the necessity for lengthening the wheel base, increasing the depth, or appreciably increasing the weight of the component parts of the truck. In my related applications Serial Nos. 22,594 and 22,597 filed of even date herewith, are disclosed several expedients for increasing the spring capacity of a truck, without increasing its size or weight, and the present invention contemplates broadly the means accomplishing this result in a simple and effective manner.

An object of this invention is to provide a railway truck including side frames, each of which comprises tension and compression members, in conjunction with guide columns which are spaced apart a relatively great distance proportionate to the dimensions of the frame, so as to afford an increased longitudinal area for an increased number of spring units, the guide columns being of a character in which the same are spaced apart substantially equidistantly throughout the extent of the bolster opening, in combination with means for bracing the guide columns and tension member of the side frame.

A further object of my invention is to provide guide columns of this character which have the inner guide faces of their lower portions recessed for the accommodation of additional spring units, affording a spring rest of increased extent to seat a spring cluster including additional units, without the necessity of widening all portions of the guide columns.

Another object of the invention is to provide a particular type of bolster arranged to co-operate with side frames of the character referred to, such bolster having its end portion sufficiently widened to bear uniformly upon all portions of the spring cluster, the body of such bolster within the ends thereof being relatively narrow to provide maximum clearance for the brake beam and hangers ordinarily associated with the side frame.

A further object of the invention is to apply the invention in connection with lateral motion trucks.

Other and further objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawings, Fig. 1 is a side elevation of a truck side frame, showing my invention applied thereto. Fig. 2 is a top plan view of a side frame and a fragment of a bolster, parts of the bolster being broken away to disclose the spring plank arrangement. Fig. 3 is a side elevation of a truck side frame showing a slightly different embodiment of my invention. Fig. 4 is a top plan view of the construction shown in Figure 3, showing a fragment of a bolster in connection therewith. Fig. 5 is a fragmentary side elevation of another slightly different embodiment of the invention. Fig. 6 is a part sectional and part elevational view of the invention substantially on the line 6—6 of Fig. 5. Fig. 7 is a transverse, sectional view of the invention on the line 7—7 of Fig. 3. Fig. 8 is a transverse vertical sectional view of the invention on the line 8—8 of Figure 1. Figure 9 is a transverse sectional view, similar to Fig. 8, showing the application of the invention to a lateral motion truck side frame. Fig. 10 is a transverse, sectional view similar to a portion of Fig. 8, showing a slightly different embodiment of the spring plank arrangement used in connection with my invention. Fig. 11 is another slightly different embodiment of the spring plank arrangement. And Fig. 12 is still another slightly different embodiment of spring plank construction.

Referring first to the construction illustrated in Figs. 1, 2 and 8, there is shown a side frame of a truck, and in this connection I have deemed it necessary to illustrate the parts on one side of the truck only, it being understood that the other side of the truck will be correspondingly made.

The side frame comprises a compression member 20, a tension member 21, and journal boxes 21′, preferably formed integrally with the side frame.

The invention broadly includes guide columns A—A, of a particular formation, a

spring rest B, a spring cluster C, reinforcing means D and a bolster E.

The bolster guide columns A—A are preferably formed integrally with the compression member 20, and tension member 21, and such bars are spaced apart a relatively great distance proportionate to the dimensions of the side frame to accommodate an increased number of spring units. The major portions 22 of the guide columns A—A are spaced substantially equidistantly throughout their extent, merging as shown at 23 with the reinforcing members D. The lower portions 24 of the guide columns A—A are undercut as indicated at 25 to provide recesses 26 for the reception of the spring units 27 disposed therein, thereby affording room upon the spring rest B for two additional spring units, the remaining spring units of the spring cluster C being grouped as illustrated in Fig. 2 on such spring rest, that is, in two transversely disposed pairs, with a central unit therebetween, the spring rest being arranged to extend laterally of the tension member 21 a suitable distance as shown in Figures 2 and 8 of the drawings.

The reinforcing means D are preferably in the form of rigid integral vertically disposed walls, one of which is arranged on either side of the spring rest B, the walls following the outline of the spring rest and being connected with, and formed integrally with the lower portions of the guide columns A—A, the spring rest B, and the tension member 21. By reason of their disposition as described and shown the walls D operate as combined tension and compression members for bracing the side frame to compensate for the increased length of the spring rest B. It should also be observed that this arrangement affords a safety pocket for the spring units of the spring cluster C to prevent disengagement and loss thereof.

The bolster E has a widened portion 28, shaped substantially similar to, and co-extensive with the enlarged spring cluster C so as to bear uniformly thereon in operative position. Such bolster is of a width which may be inserted endwise between the upper portions of the guide columns A—A so as to slidably fit therebetween, the bolster being provided with lugs 29 adapted to abut the inner sides 30 of the guide columns A—A. The outer end of the bolster E when in position projects beyond the outer faces of the guide columns A—A, and this portion of the bolster is provided with a keyway 31 adapted for the reception of a key 32, such key being held in position by suitable bolts 33, and being arranged to bear upon the outer faces of the guide columns so as to retain the bolster in operative relation with the side frame. Such bolster is reduced in width as indicated at 34 so as to permit ample clearance for the brake beam hanger brackets 35 as shown.

In conjunction with the above described construction, which includes the connecting walls D, enclosing the spring rest B, a novel plank arrangement is desirable, such for instance as constitutes the subject matter of copending application Serial No. 22,594, filed April 13, 1925. A spring plank of this character is illustrated in Fig. 8. In such figure the spring plank is indicated by the numeral 36, and comprises a connecting member extending between the side frames of the truck, only one side of such plank being illustrated, together with the means of connecting the same to the side frame, but it will be understood, of course, that the connections between the opposite frame of the truck will be similar in all respects to those which will be now described. The end 37 of the spring plank is adapted to rest upon a shelf 38 which is formed as an extension of the spring rest B on the inner side of the frame, and such shelf is provided with a plurality of upstanding bosses 39 spaced a suitable distance apart, and the spring plank is provided with apertures adapted to fit over such bosses. Disposed upon the spring rest B, within the enclosing walls D provided by the reinforcing members, is a spring seat 40, such spring seat being provided with fingers or lugs 41 which extend through apertures 42 formed in the inner wall D, such lugs bearing upon the end of the spring plank 36 between the bosses 39, and since the spring seat 40 is held in position by the pressure exerted thereon by the spring cluster C, the spring plank is securely held in position by the lugs 41 of such spring seat.

A slightly different embodiment of the invention is illustrated in Figures 3, 4 and 7, and since this construction is closely analogous to that heretofore described in connection with Figures 1, 2 and 8, similar parts will be designated by the same reference characters used in connection with such figures. In this arrangement the upper portions of the guide columns A′—A′ are spaced apart a slightly greater distance than that contemplated in connection with the construction before described such spacing being for the purpose of obviating the necessity for providing offsets to form the tops of the recesses in the lower portions of the inner faces of the guide columns, so that the spring cluster C′ which is similar in disposition to the spring cluster C, may be disposed entirely between the guide columns A′—A′, the spring rest B′ of course being of the same extent. The reinforcing members D′ are disposed on opposite sides of the spring rest B′ in the same manner as heretofore explained, and the spring plank arrangement is similar in all respects. The bolster E′ however has a portion 28′, which

is wider than the portion 28 of the bolster E, to take care of the increased extent of the spring cluster C′, and to cause the same to fit snugly between the guide faces of the guide columns A′—A′, such bolster being reduced as indicated at 34′ to afford clearance for the brake beam tie rod 35′ as will be readily understood.

Another slightly different embodiment of the invention is illustrated in Figures 5 and 6 of the drawings. This construction is somewhat similar to that shown in Figures 1, 2, and 8, in that the spacing of the guide columns is substantially the same. In this construction the side frame comprises a compression member 100, tension member 101, and guide columns F—F. The frame also includes a spring rest G, reinforcing means H, spring cluster I, and bolster J. The guide columns F—F are spaced apart approximately the same distance as the columns A—A heretofore described, and have their lower portions 102 recessed as indicated at 103 in the same manner as the columns A—A, such recesses being utilized to accommodate an additional spring unit 104 in each of them, the other spring units of the cluster E being arranged accordingly.

This embodiment of the invention contemplates a modified form of reinforcing means H, and type of bolster and retaining means. In this construction the reinforcing means are in the form of rigid connecting walls disposed at opposite sides of the guide columns and integrally formed therewith and with the spring seat, but instead of the outer reinforcing means terminating at the lower portions of the columns, such means are provided with an extension in the form of an inwardly turned web 105, formed integrally with the outer side of the guide column, only one of such webs being illustrated in the drawings, but it will be understood that a similar web is utilized in connection with the other guide column which is not shown in the same manner. In this arrangement the bolster J is of a somewhat different type than those heretofore described, such bolster having the abutting lugs 29 entirely omitted therefrom, being of a width to fit snugly between the guide faces of the guide columns for sliding movement, the outer end of such bolster being provided with a reduced portion 106 providing a shoulder 107 adapted to abut against the inner side of the web 105. Such reduced end of the bolster is provided with a keyway 108 adapted for the reception of a key 109 which may be secured therein in any suitable manner, the ends of the key 109 being adapted to abut and slide upon the outer surfaces of the web 105, the bolster in this manner being held against endwise movement in both directions, and by this arrangement the brake hanger brackets may be placed more closely to the inner faces of the guide columns, since there are no lugs on the bolster to interfere therewith.

In Figure 9 is illustrated a construction showing my invention applied to the so-called "lateral motion" type of truck. In this arrangement the compression member, tension member and guide columns, may be of the character wherein additional spring capacity is afforded. The compression member is indicated by the numeral 120, the tension member 121, the guide columns 122, the spring rest 123, the reinforcing means 124, and the increased spring cluster 125, it being understood that these parts may be similar to any of those above described except the form disclosing the web 105. The bolster 126 is transversely widened to correspond to the increased spring cluster, and on its under surface is provided with roller contours 127 adapted to accommodate anti-friction rollers 128 which are carried by a roller seat 129 secured upon the tops of the units of the spring cluster 125, such seat being provided with recesses 129′ to retain such rollers. The bolster 126 is therefore permitted lateral motion with respect to the side frame. By reason of the presence of the reinforcing means 124 the bolster is necessarily inserted between the upper portions of the guide columns 122 in the same manner as heretofore described in connection with the bolsters E and E′, and this is permitted by reason of the fact that the bolster is secured after its insertion by the removable key, as heretofore explained, and such a key utilized in this construction is indicated at 130, the key, of course, being attached in a keyway which is located at a point so as to permit the longitudinal or endwise movement of the bolster, at the same time preventing the same from being entirely withdrawn from the side frame.

Figures 10 to 12, inclusive, illustrate various embodiments of spring plank arrangements, any of which may be utilized in connection with the forms of side frames heretofore described, which include the reinforcing means which enclose the spring rest, or partially enclose the same as desired. Referring to Figure 10 the reinforcing or bracing means, which are similar to that before described, the same may be indicated by the numeral 150 as designating the outer brace or tie member, and 151 the inner brace or tie member. In this embodiment of the spring plank arrangement, the inner member 151 is provided with a continuous slot 152 arranged for the insertion of the spring plank 153 which may be of an ordinary type, having a boss 154 adapted for reception in an opening 155 provided therefor in the spring rest, the spring cluster of course being arranged to bear thereon to retain the same in position.

In Figure 11 the inner reinforcing brace

corresponding to 151 in Fig. 10 is entirely omitted to permit the insertion of a spring plank 156 of an ordinary type, such spring plank being provided with a boss 157 arranged to fit within an aperture 158 provided therefor in the spring rest 159, the spring cluster being arranged to be supported upon the spring plank and thereby holding the same in position.

Figure 12 illustrates another slightly different spring plank arrangement which may be used in connection with my invention. In this construction, the lower portion of the tension member 160 is provided with an extension 161 beneath the spring rest 162, the spring rest 162 having an opening therein as indicated at 163 at the inner side of the tension member. The spring plank 164 is provided with a downturned end 165 adapted to fit over the oppositely turned portion 166 formed on the extension 161. Disposed upon the spring rest 162 is a spring seat 167 provided with a downwardly turned lug 167' projecting through the opening 163, and arranged to bear upon the turned end 165 of the spring plank 164 to hold the same in position, it being understood that the spring seat is held in position by the pressure exerted thereon by the spring cluster.

In connection with Figures 1 to 4, inclusive, 7 and 8, it will be observed that I have provided a greatly increased distance between the guide columns in proportion to the dimensions of the frame, and in conjunction with such construction have provided a bolster having the portion which rests upon the spring cluster widened to correspond to the increased extent thereof, such bolster being reduced immediately beyond this portion to provide ample clearance for the brake beam hangers, said bolster being insertible endwise between the upper portions of the columns and having the usual lugs adapted to abut the inner surfaces of the guide columns, the outer end of the bolster being provided with the removable key to engage the outer sides of the guide columns, thus preventing endwise play of the bolster with reference to the side frame, but permitting vertical movement thereof with the bolster springs. In both of these constructions, there is utilized the bracing means D formed integrally with the columns, the spring rest and the tension member, such means D acting as a combined compression and tension member to reinforce the frame to compensate for the increased length of the spring rest.

The construction shown in Figures 5 and 6 includes guide columns spaced apart a relatively great distance in proportion to the dimensions of the frame, in conjunction with the webs 105 formed integrally with the columns and with the reinforcing means H in combination with a widened bolster adapted to be inserted endwise between the guide columns, the reduced portion of such bolster abutting against the inner sides of the webs 105, together with a removable key extending through the reduced end of the bolster and arranged to engage the outer sides of the webs. It will be appreciated that by this arrangement, the lugs usually formed on the inner side of the bolster to abut against the inner guide faces of the columns may be omitted, thereby permitting the hanger brackets to be disposed closely adjacent to the bolster without interference therewith, the webs 105 in the construction described preventing longitudinal motion of the bolster in both directions, while permitting free vertical movement of the bolster with the spring cluster.

The application of the invention to the "lateral motion" truck is illustrated in Figure 9, and requires no detailed explanation, since the same features of the constructions previously referred to are utilized in such a truck, it being noted that the removable key associated with the bolster is spaced so as to permit longitudinal movement of such bolster in the ordinary manner.

The spring plank arrangements are especially adaptable to the constructions which have been described, and in connection therewith it will be observed that the arrangement is such as to permit efficient assembly and disassembly of the parts, the same being securely held in position while the trucks are in operation.

While I have herein shown and described what I now consider the preferred manner of carrying out my invention, the same is merely illustrative, and I contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. In a railway truck, the combination with a side frame, including a compression member, a tension member, guide columns, and a spring rest arranged to support a spring assembly thereon the lower portions of said guide columns being provided with recesses for the accommodation of additional spring elements; at the same level as said spring assembly, and a bolster of increased width arranged to bear upon all of the units of said spring cluster.

2. In a railway truck, the combination with a side frame, including a compression member, a tension member and guide columns, the lower portions of said guide columns being provided with recesses for the accommodation of additional spring elements; a bolster of increased width arranged to bear upon all of the units of said spring cluster; and rigid means associated with said side frame to compensate for the increased extent of the side frame parts subject to strain.

3. In a railway truck, the combination with a side frame, including a compression mem-

ber, a tension member and guide columns, the lower portions of said guide columns being provided with recesses for the accommodation of additional spring elements; a bolster of increased width arranged to bear upon all of the units of said spring cluster; and rigid means connecting the lower portions of said guide columns.

4. In a railway truck, the combination with a side frame, including a compression member and a tension member; guide columns spaced apart a relatively great distance proportionate to the side frame; to provide a spring rest; a spring assembly on said spring rest; rigid means connecting the lower portions of said side frame and including portions extending inwardly of said columns at the upper portions thereof; a bolster insertable between the upper portions of said columns; and means in engagement with the inwardly turned portions of said columns to retain the bolster against endwise removal.

5. A side frame for a railway truck, comprising a tension member, compression member and guide columns, all integrally formed, said tension member being provided with a spring rest of an extent longitudinally of the side frame, greater than the effective distance between the guide faces of the columns, said columns being recessed within said guide faces for a portion of the height of the columns to accommodate part of the spring means.

6. In a railway truck, the combination with a side frame, including a compression member, a tension member, guide columns, and a spring rest, all integrally formed, said guide columns being spaced apart a relatively great distance in proportion to the dimensions of the side frame, and the lower portions of said guide columns being provided with inwardly extending recesses; a spring cluster containing the maximum number of spring units of any given size which can be disposed upon said spring rest, certain of said spring units projected into said recesses to afford additional space on said spring rest for the insertion of spring units; rigid means connected to the bottom portions of said guide columns and said spring rest to compensate for the increased longitudinal extent of said spring rest; a bolster having an end portion of a width adapted to fit snugly between said guide columns and disposed between said column guides and bearing upon said spring cluster; and means for confining the end of said bolster to vertical movement, said means including removable elements to permit insertion and withdrawal of said bolster end with respect to said guide columns.

7. In a railway truck, the combination with a side frame including a compression member, a tension member, guide columns and a spring rest, said guide columns being provided with inwardly disposed extensions adjacent the upper ends thereof; a spring assembly on said spring rest; a bolster insertable between said guide columns and having abutments thereon adapted to engage the inwardly turned extensions on said columns to limit movement of said bolster there past; and detachable means associated with said bolster and adapted to bear upon the outer surfaces of said column extensions to limit inward movement of the bolster transversely of the side frame.

8. In a railway truck, the combination with a side frame including a compression member, a tension member, and guide columns for said frame arranged to provide a flat spring rest between the lower ends of said columns, each of said columns having continuously extending vertical side walls and an offset cross wall forming a recess at the lower end of the column; of a spring cluster consisting of a plurality of coil springs arranged substantially in hexagonal form, with the long axis of said cluster coinciding with the longitudinal axis of the side frame, all of said springs being disposed horizontally in the same plane and supported upon said spring rest, the end springs of said cluster being provided with clearance due to provision of the recesses in said guide columns.

9. In a railway truck, the combination with a side frame including guide columns each having continuously extending vertical side walls and an offset cross wall forming a recess at the lower end of the column; of a flat spring rest disposed adjacent the lower ends of said columns; a spring cluster supported by said spring rest and including a plurality of coil springs arranged in substantially hexagonal form with several of the springs disposed along the longitudinal center line of the side frame, the end springs of said cluster being afforded clearance by the recesses in said columns; and a bolster having a flat end bearing on said springs.

10. In a railway truck, the combination with a side frame including a compression member and a tension member; guide columns for said frame each having continuously extending vertical side walls and an offset cross wall forming a recess at the lower end of the column and a flat spring rest extending between the lower ends of the columns; a cluster of coil springs disposed upon said spring rest and including a central group of springs and end springs disposed substantially along the longitudinal center line of the side frame, all of said springs being disposed in a common plane, the end springs of said cluster being afforded clearance by the recesses in the guide columns.

11. In a railway truck, the combination with a side frame including guide columns and a spring rest at the lower ends of said guide columns, each of said guide columns having continuously extending vertical side

walls and an offset cross wall forming a recess at the lower end of the column; of a cluster of springs comprising seven coil springs, three of which extend along the longitudinal center line of the side frame, the outside springs of said three springs being afforded clearance by the recesses in said columns, and the remaining springs being disposed two at one side of the three springs and two at the opposite sides of said three springs and in line with the interstices between said three springs.

12. In a railway truck, the combination with a side frame including a compression member and a tension member, guide columns each having continuously extending vertical side walls and an offset cross wall forming a recess at the lower end of the column, and a spring rest at the lower ends of said guide columns, the spring supporting surface of said rest being flat throughout its extent; of a plurality of coil springs supported in a cluster on said spring rest, and all disposed in a common plane, said cluster being arranged to include a substantially hexagonal formation with a central longitudinally extending row of springs, and outer rows of springs, the latter springs being arranged opposite the interstices between the central row of springs, the end springs of the central row being afforded clearance by the recesses in the guide columns; and a bolster engageable with said guide columns and guided thereby, said bolster being provided with a flat bearing surface adapted to bear uniformly upon all of the units of said spring cluster.

13. In a truck, the combination with side frames having a specified wheel base corresponding to general practice, each side frame having a flat spring seat; of guide columns integrally formed with said side frames and spaced apart a distance corresponding to the length of said spring seat, the side walls of each of said columns extending substantially parallel for the full height thereof and the cross wall having an offset forming a recess at the lower end of the column; an increased number of spring units of dimensions and capacity corresponding substantially to those in use on a truck having a wheel base and guide columns as before mentioned, said spring units bearing against each of said spring seats and the end springs being afforded clearance by the recesses of the guide columns; and a bolster removably disposed between the guide columns of each frame, said bolster having side members disposed in engagement with opposed sides of said columns.

14. In a railway car truck, a bolster, side frames each having an upper compression chord, a lower tension chord and spaced columns connecting said chords and forming between them an opening to receive an end of said bolster, each tension chord having a flat horizontal portion extending from the base of one column to the base of the other and widened inwardly of the columns and reinforcing webs on opposite sides of the horizontal portion integral with the columns and horizontal portion, said webs converging from the widened portion to the columns, and a group of bolster supporting springs on said horizontal portion, certain springs of said group arranged along the longitudinal central line of the side frame.

15. In a railway car truck, a bolster, side frames, each having an upper compression chord, a lower tension chord and spaced columns connecting said chords and forming between them an opening to receive an end of said bolster, each tension chord having a flat horizontal portion extending from the base of one column to the base of the other, and integral reinforcing webs extending upwardly at opposite sides of the horizontal portion and converging to the columns, and a group of bolster supporting springs on said horizontal portion, said group of springs comprising a central longitudinal row of springs between said columns, the end-most springs of which occupy the spaces between said converging webs, other springs of said group being positioned on opposite sides of the central row.

16. In a railway car truck, a side frame having an upper compression chord, a tension chord having a central horizontal portion, and inclined end portions joining said central portion with the ends of the compression chord, upright columns extending from the ends of the horizontal portion to the compression chord and forming between them a bolster receiving opening, said horizontal portion having upstanding integral webs converging to the columns from points spaced inwardly from the columns to strengthen the tension chord at the juncture of the horizontal portion with the inclined end portions, the top face of the horizontal portion contiguous to the base of each column providing a space on the longitudinal center line of the frame and between the converging webs for receiving the end spring of a group of bolster supporting springs, said columns having inner faces extending to the horizontal spring supporting portion and inwardly offset upper portions forming bolster guides.

17. In a railway car truck, a side frame having an upper compression chord, a tension chord having a central horizontal portion and inclined end portions joining said central portion with the ends of the compression chord, upright columns extending from the ends of the horizontal portion to the compression chord and forming between them a bolster receiving opening, said horizontal portion being widened intermediate the columns and having upstanding integral webs converging from the widened portion

thereof to the columns and merging into the columns to strengthen the tension chord at the juncture of the horizontal portion with the inclined end portions, the top face of the horizontal portion being flat and extending to the base of the columns between the converging webs to provide spring receiving recesses adjacent the columns, said columns having inner faces extending to the horizontal spring supporting portion and inwardly projecting flanges forming bolster guides.

18. In a railway car truck, a side frame having an upper compression chord, a tension chord having inclined end portions connected to the ends of the compression chord and a horizontal central spring supporting portion, and upright columns joining said chords at the ends of said spring supporting portion, said spring supporting portion being flat from the base of one column to the base of the other and widened intermediate said columns, the juncture of the horizontal portion with the inclined end portions being reinforced by webs at opposite sides of the frame joining the columns above the bases thereof to the widened central spring supporting portion inwardly of the columns.

19. In a railway car truck, a side frame having an upper compression chord, a tension chord having inclined end portions connected to the ends of the compression chord and a horizontal central spring supporting portion, and upright columns joining said chords at the ends of said spring supporting portion, said spring supporting portion being flat from the base of one column to the base of the other and widened intermediate said columns, the juncture of the horizontal portion with the inclined end portions being reinforced by webs at opposite sides of the frame joining the columns above the bases thereof to the widened central spring supporting portion inwardly of the columns, the top face of the horizontal portion contiguous to the base of each column providing a space on the longitudinal center line of the frame and between the converging webs for receiving the end spring of a group of bolster supporting springs.

20. In a railway car truck, a bolster, side frames each having an upper compression chord, a lower tension chord and spaced columns connecting said chords and forming between them an opening to receive an end of said bolster, each tension chord having a flat horizontal portion extending from the base of one column to the base of the other and widened inwardly of the columns and reinforcing webs on opposite sides of the horizintal portion integral with the columns and horizontal portion, said webs converging from the widened portion to the columns, and a group of bolster supporting springs on said horizontal portion, certain springs of said group arranged along the longitudinal central line of the side frame, the top face of the horizontal portion contiguous to the bases of the columns providing spaces on the longitudinal center line of the side frame between the converging webs for receiving the end springs of said group.

21. In a railway car truck, a bolster, side frames each having an upper compression chord, a lower tension chord and spaced vertical columns connecting said chord and forming between them an opening to receive an end of said bolster, said tension chord comprising inclined side portions merging into a central portion having on its upper surface a flat horizontal seat extending on its longitudinal center line uninterruptedly from the base of one column to the base of the other, and widened between the columns to extend outwardly on each side beyond the side face planes of the tension chord, and reinforcing web portions on the horizontal seat and each extending from the edge thereof upwardly and inwardly to the adjacent face of the proximate column; the base of each column and the inner end of the associated inclined portion of the tension chord and the contiguous webs on opposite sides of the associated column merging together within the same region; each pair of webs with the associated column and the contiguous base portion of the flat horizontal seat furnishing a partially enclosed recess at the base of the column for the reception of the end spring of a group of springs arranged along the longitudinal central line of the side frame.

22. In a railway car truck, a bolster, side frames each having an upper compression chord, a lower tension chord and spaced columns connecting said chords, and forming between them an opening to receive an end of said bolster, each tension chord having a flat horizontal portion extending from the base of one column to the base of the other and widened inwardly of the columns and reinforcing webs on opposite sides of the horizontal portion integral with the columns and horizontal portion, said webs converging from the widened portion to the columns, a transverse member extending across the space between said side frames and interlocking therewith, a group of bolster supporting springs beneath each end of said bolster and holding said transverse member in place, roller seats interposed between the upper end of each of said spring groups and the bolster, and bearing rollers between said seats and bolster.

23. In a railway car truck, a bolster, side frames, each having an upper compression chord, a lower tension chord and spaced columns connecting the chords and forming between them an opening to receive an end of the bolster, each tension chord having a flat horizontal portion extending from the base of one column to the base of the other, said

horizontal portion having upstanding integral reinforcing webs converging to and merging into the columns, a group of bolster supporting springs on said horizontal portion, certain springs of said group occupying the spaces adjacent the column between said converging webs, a roller seat interposed between the upper ends of said springs and the bolster, and bearing rollers interposed between the seat and bolster.

24. In a car truck, the combination of a side frame comprising tension and compression members, spring seating means supported by the tension member, a bolster, springs between the bolster and spring seating means, and columns defining a bolster opening and extending from the tension member to the compression member of the side frame, said columns being recessed from said spring seating means upwardly and partially housing certain of said springs.

25. In a car truck, the combination of a side frame, comprising tension and compression members, columns defining a bolster opening and extending from the tension member to the compression member of the side frame, said columns having vertically disposed recesses in substantially the longitudinal center line of the side frame and between the vertical sides of the columns, spring seating means extending into said recesses at the lower ends thereof and providing a horizontal support for the springs in a given plane, a group of springs supported on said spring seating means with its greatest length in the longitudinal center line of the side frame and with the end springs positioned within the recesses of said columns, and a bolster positioned in said bolster opening and supported by all of said springs in the group.

26. In a car truck, the combination of a side frame, comprising tension and compression members, columns defining a bolster opening and extending from the tension member to the compression member of the side frame, said columns having an inwardly extending portion at their lower ends on each side of the longitudinal center of the side frame and forming recesses between said portions, horizontal spring seating means merging with said inwardly extending portions at the lower ends of the columns and forming the bottom walls of said recesses, a group of springs arranged on said seating means in a horizontal plane with its greatest length in the longitudinal center of said frame and with its end springs positioned in said recesses, and a bolster positioned in said bolster opening and supported by all of said springs.

27. In a car truck, the combination of a side frame comprising a compression member and a tension member having oblique portions, recessed columns connecting said compression and tension members and defining a bolster opening, a bolster, spring supporting means between said columns at the lower ends thereof, extending into the recesses in said columns, and a group of springs between said spring supporting means and said bolster and arranged on said spring supporting means in the same horizontal plane, with the end springs of said group partially housed in the recesses of said columns.

28. In a car truck, the combination of a side frame comprising compression and tension members, columns connecting said compression and tension members and defining a bolster opening, the lower portion of each of said columns having a contour defined by a channeled cross section forming vertically disposed recesses for partially housing the end springs of a group of vertically disposed springs, spring seating means extending into said recesses at the lower ends thereof and arranged to support said group of springs in the same horizontal plane, and a bolster entering said bolster opening between the upper portions of the columns and supported on said group of springs.

29. A truck structure comprising a side frame having in combination, spaced bolster columns of channel shape in cross section with their open sides facing each other and having a connecting portion at their lower ends having a substantially horizontal top surface, a plurality of bolster supporting springs supported by said surface, the springs adjacent said columns being disposed at one side throughout their length in the channels of said columns.

30. In a railway truck, the combination with a side frame including a compression member and a tension member; guide columns for said frame arranged to provide a spring rest therebetween of increased extent proportionate to the side frame; a spring assembly containing the maximum number of spring units of any given size which can be disposed on said spring rest, said spring rest being flat throughout its extent, and adapted to accommodate said spring units in a common horizontal plane; a bolster cooperating with said side frame and having a flat undersurface substantially co-extensive with the area of the spring assembly and adapted to bear against the same, said bolster being insertible endwise between said guide columns and the side walls of said bolster being directly engageable with the guide faces of the said guide columns; means associated with said bolster for engagement with said guide columns to confine the bolster end to vertical movement, said means being detachable without destructive effect to permit longitudinal withdrawal of the bolster end from said side frame; and reinforcing means integrally formed with said spring rest and extending upwardly therefrom to reinforce the frame and compensate for weakness developed due

to the greater longitudinal extent of said spring rest, said reinforcing means being integrally formed with the lower portions of said guide columns and said tension member.

In witness that I claim the foregoing I have hereunto subscribed my name this 7th day of April 1925.

CLAUS J. W. CLASEN.