June 15, 1937. W. C. HEDGCOCK 2,084,028

SPRING PLANKLESS TRUCK

Filed Aug. 15, 1935 3 Sheets-Sheet 1

Fig. 1.

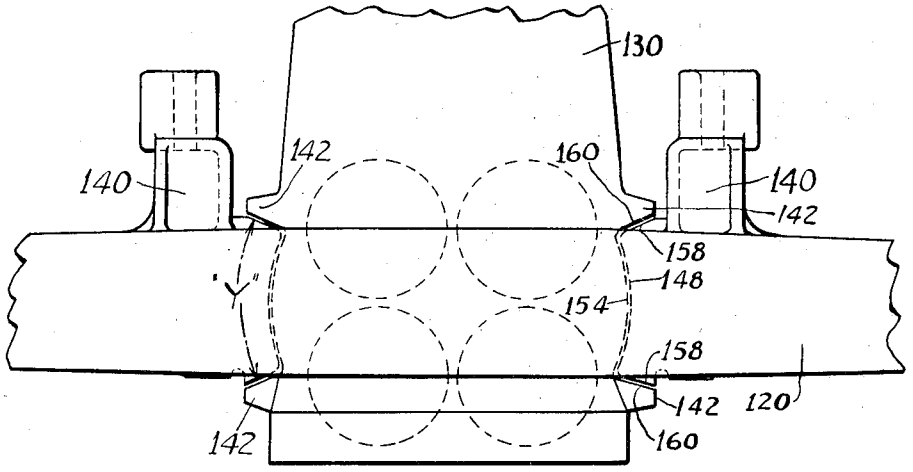
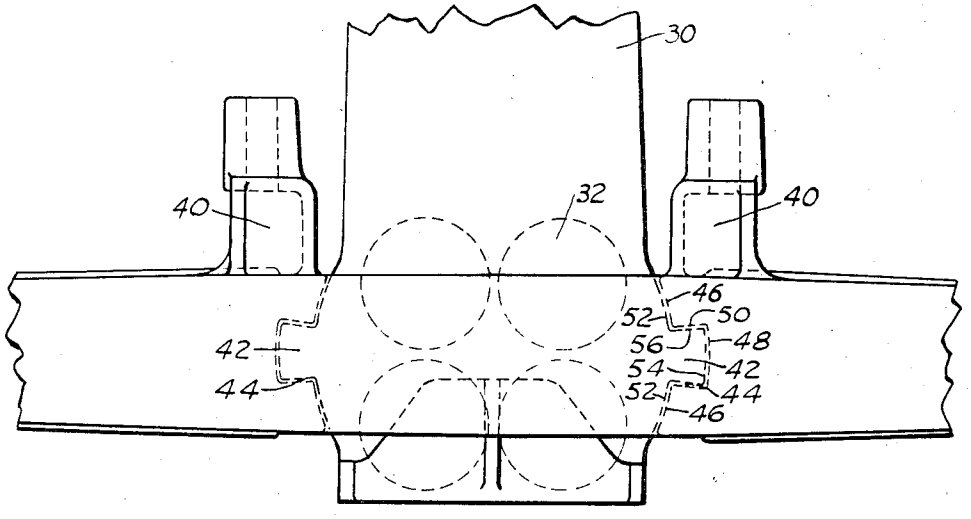


Fig. 2.



INVENTOR.
William C. Hedgcock
BY
Orrin O. B. Garner
ATTORNEYS.

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Fig. 3.

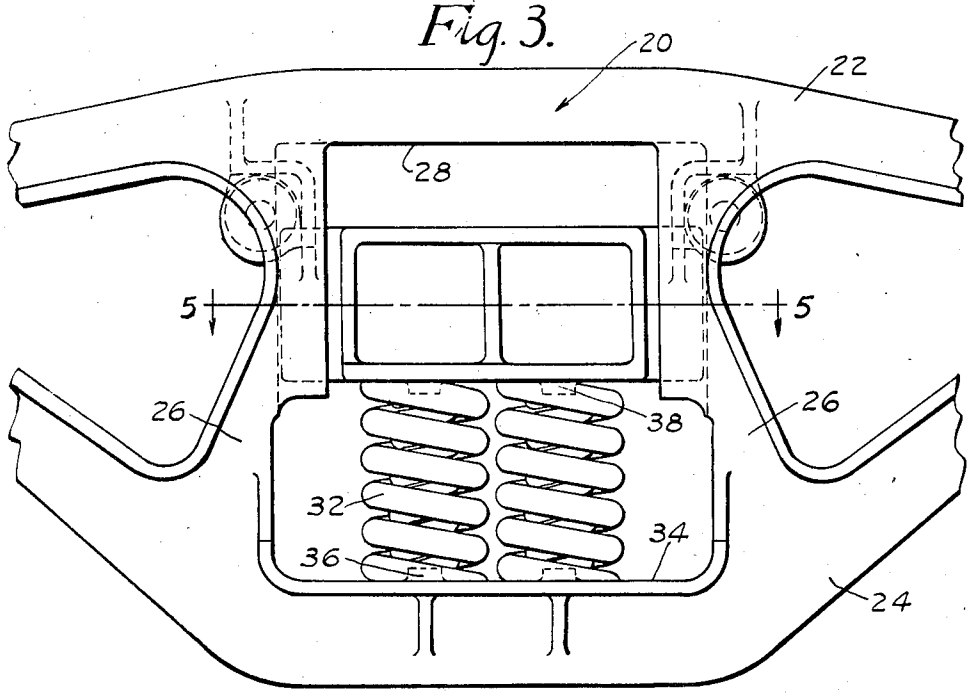
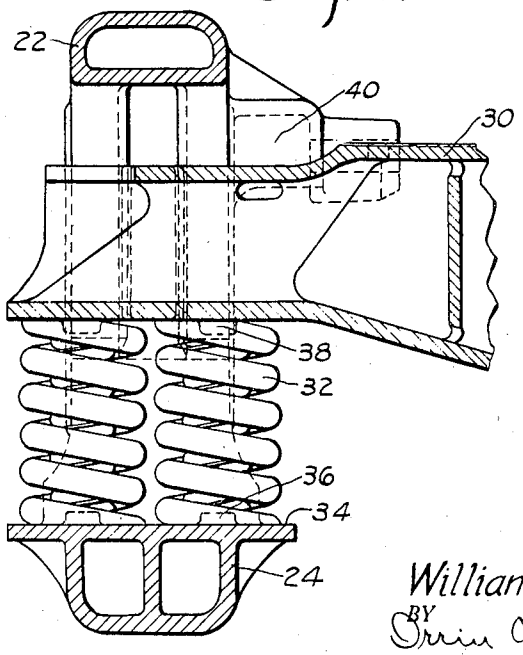


Fig. 4.



INVENTOR.
William C. Hedgcock
BY
Orrin O. B. Garner
ATTORNEYS.

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Fig. 5.

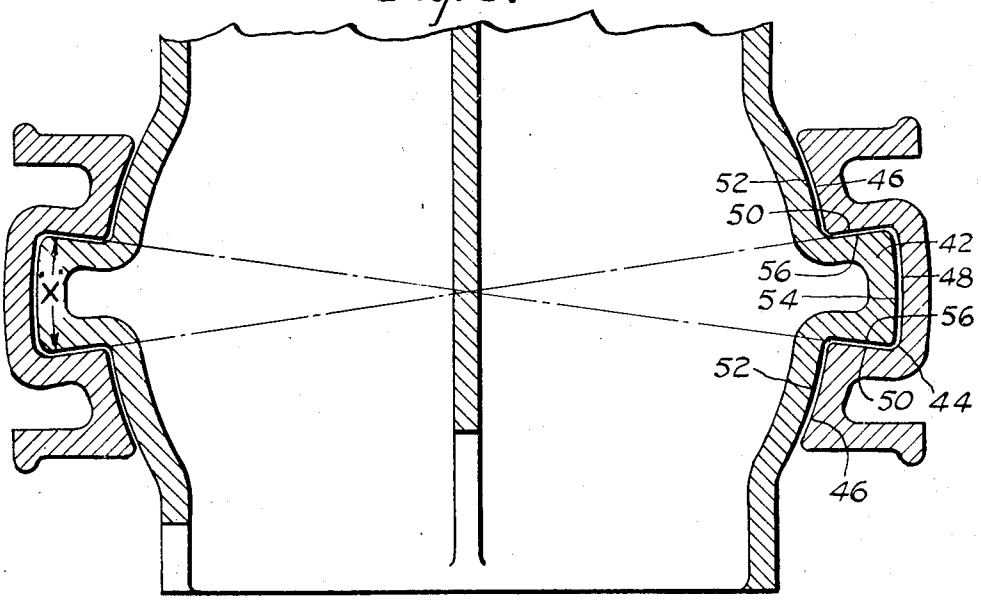
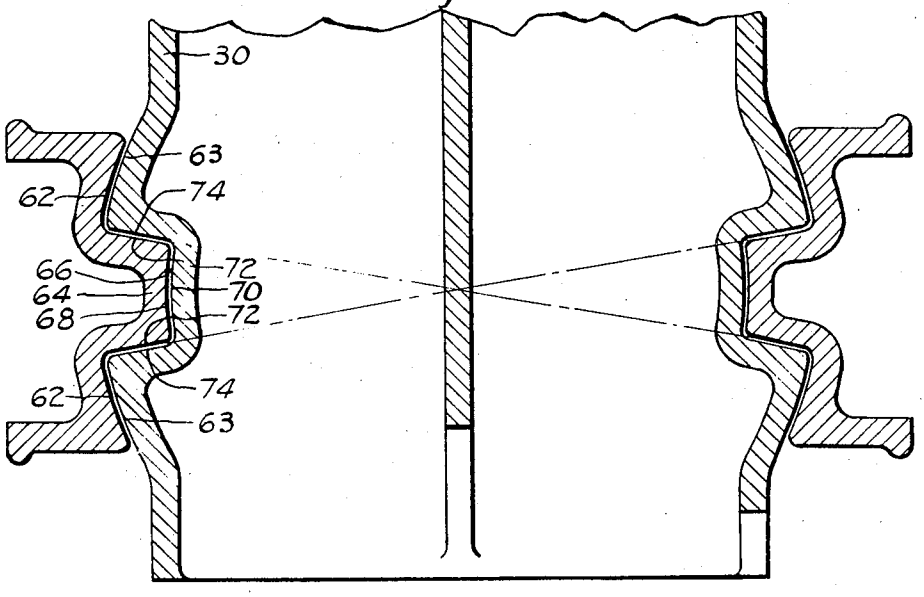


Fig. 6.



INVENTOR.
William C. Hedgcock
BY
Orrin O. B. Farmer
ATTORNEYS.

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2,084,028

UNITED STATES PATENT OFFICE

2,084,028

SPRING PLANKLESS TRUCK

William C. Hedgcock, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application August 15, 1935, Serial No. 36,269

33 Claims. (Cl. 105—197)

This invention relates to car trucks and more particularly to a type of truck commonly known as a spring plankless truck. This invention is an improvement on the design shown in my Patent No. 1,926,678.

Spring plankless four wheel trucks are a relatively recent innovation. Heretofore it has been customary to use a spring plank connection between the two side frames to align the truck, that is, to maintain the side frames in the proper spacing and to keep them in substantially square relationship.

In the absence of the spring plank with its spacing and squaring functions, the performance of these functions devolves upon the connection between the bolster and the side frame. This connection must have sufficient looseness to permit free vertical movement of the bolster on the truck spring. In view of this looseness in the fit between the bolster and side frame column there has heretofore been developed and used a desirable form of bolster and column guide construction which has included arcuate engaging surfaces on the faces of the columns and radial surfaces on the flanges of the column so as to provide full-face contact between the engaging surfaces of the bolster and the side frame during such misalignment of the side frame with respect to the bolster as occurs within the limitation permitted by the aforesaid looseness.

Figure 1 is illustrative of the construction just referred to. In such a construction the radial faces on the column flanges and on the bolster are relatively widely separated, thus requiring great accuracy in the manufacturing process in order to insure proper fitting and engagement between the parts. In addition, when the radial flanges are so located, that is, projecting outwardly on the bolster on each side of the side frame columns, clearance must be provided between these flanges and the brake hanger brackets on the inner sides of the side frames. This restricts the spacing of the brake hanger brackets to a minimum limitation which is imposed by the width between the radial flanges on the bolster where it engages the respective column guides, and imposes further limitation upon the shortness of the wheel base which may be used in the truck because of the relation which necessarily exists between the brake hanger bracket and the suspended brake to the wheel of the truck.

One of the objects of my invention is to provide a novel form of truck in which the load carrying member, in cooperation with the side frame, holds the truck in square relation.

Another object is to provide a novel form of spring plankless truck in which proper alignment is maintained by co-operative means on the side frame and the associated bolster or other load carrying member.

A still further object of the invention is to provide such a truck of a form which will not impose a limitation upon the shortness of the wheel base which may be used.

A still further object is to provide a spring plankless truck in which the spacing of the brake hanger brackets will not be unduly limited by the form of aligning means used between the load carrying member and the side frame.

A yet further object contemplated by my invention is the provision of a spring plankless truck in which the radial guide means, necessarily provided in such a truck for cooperation between the bolster and the side frame, shall be formed as a single means on each column instead of double means as heretofore used, thereby simplifying the construction and maintaining a proper degree of accuracy.

A still further object of the invention is to provide a radial guide in such a form that will not impose a limitation upon the spacing of the brake hanger brackets on the side frame, thus making it possible for such brake hanger brackets to be a shorter distance apart and thereby permitting a shortened wheel base.

With these and various other objects in view, my invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings which illustrate embodiments of my invention and wherein like reference characters are used to designate like parts—

Figure 1 is a fragmentary top plan view of a form of truck construction heretofore developed and used and previously referred to in this specification;

Figure 2 is a fragmentary top plan view of a truck construction embodying my invention;

Figure 3 is a fragmentary side elevation of the truck construction shown in Figure 2;

Figure 4 is a transverse fragmentary sectional elevation taken substantially in the plane of the transverse center line of the truck as shown in Figures 2 and 3;

Figure 5 is a fragmentary section taken sub-

stantially on the plane indicated by the line 5—5 of Figure 3; and

Figure 6 is a view corresponding to Figure 5 showing a modified form of the construction embodied in my invention.

Describing my invention more in detail and referring to the structures shown in Figures 2 to 5, inclusive, the side frame 20 may be of the usual truss design having the compression member 22 and the tension member 24 joined by the integrally formed column guides 26 and forming therewith the window opening 28 within which may be received the end of the bolster 30 of substantially box formation. The coil springs 32 are seated upon the spring seat portion 34 of the tension member 24 being position thereon around the up-standing lugs 36 and supporting the bolster being positioned thereunder by the downwardly projecting lugs 38. The side frame is provided with the brake hanger brackets 40 from which may be suspended brakes for cooperation with the associated wheels of the wheel and axle assembly (not shown).

In place of the usual form of cooperation between the column guides on the side frame and the portions of the bolster cooperating therewith, I have provided a novel structure in which a single vertical guiding flange 42 is formed on each side of the bolster to be received in and cooperate with a complementary channel 44 formed in the column guides of the side frame. In this embodiment of my invention the guiding surface on the column guides may consist of the spaced arcuate side portions 46 and the central arcuate portion 48 joined by the vertical plane portions 50. All of these surfaces cooperate with complementary surfaces formed on the bolster, that is, the arcuate surfaces 46 cooperate with the opposed arcuate surfaces 52, the arcuate surface 48 cooperates with the opposed arcuate surface 54 and the plane surfaces 50 cooperate with the opposed plane surfaces 56. It will be observed that the plane surfaces 50 on the column guide and the opposed plane surfaces 56 on the vertical flange 42 of the bolster lie substantially in two planes which intersect each other in a line which lies within the vertical plane bisecting the bolster longitudinally.

I may modify this structure of the flange 42 by making the arcuate surface 54 a plane surface instead, in which case I would also make the opposing surface 48, on the column guide, a plane surface. In the preferred form of my invention, however, these two surfaces will be arcuate and they will be formed from a common center, said center being also common to the arcuate surfaces 46 and 52 formed respectively on the column guides and on the bolster.

In the structure shown in Figure 1, which is the well-known design of spring plankless truck already referred to, it will be observed that the bolster 130 cooperates with the column guides of the side frame 120 by means of the single arcuate surfaces 148 cooperating with opposed complementary arcuate surfaces 154 formed on the bolster; and further, on either side of the said arcuate surfaces by means of the spaced plane surfaces 156 which cooperate with the opposed plane surfaces 160 formed on the guide flanges 142 which are made an integral part of the bolster 130. In this structure it will be observed that the spaced guiding flanges 142, formed on the bolster inwardly of the side frame, are necessarily in close proximity to the brake hanger brackets 140 formed on the side frame. It will be apparent that the provision of these guide flanges on the bolster at these points necessitates a greater distance between the brake hangers 140 at opposite sides of the bolster than would otherwise be the case. Such a structure, therefore, will, of necessity, have a limiting effect upon the length of wheel base, that is, the distance between the centers of the wheels.

In the various forms embodying my invention I have eliminated the outwardly disposed guide flanges 140 and, in their stead, I have provided the single guide flange 42, centrally located with respect to the column guides on the side frame. This improved construction not only makes possible a shorter wheel base when desired, but also eliminates to a large degree the refinements of manufacture which are necessary in order to provide a satisfactory fit between the column guide surfaces on the side frame and the cooperating surfaces on the bolster when the guiding flanges are spaced apart as in the structure shown in Figure 1. It will be apparent that the degree of accuracy required in the manufacture of the side frames and the bolster is much less when the distance between the surfaces which provide the limiting stops in the twisting movement which occurs between the bolster and the associated side frames is the short distance "x" rather than the much longer distance "y". I have thus lessened considerably the cost of manufacture while, at the same time, improving the results which are secured in actual operation of the truck.

In Figure 6 I show another embodiment of my invention. In this construction the column guides have the spaced arcuate surfaces 62, which cooperate with the spaced arcuate surfaces 63, formed on the bolster. Between the spaced arcuate surfaces 62 and the column guides I have provided the vertical flange 64 which cooperates with a complementary channel 66 formed on the bolster. In this case the flange 64 is provided with the arcuate surface 68, concave outwardly, which cooperates with the opposed complementary arcuate surface 70, outwardly convex, formed on the bolster. Between spaced arcuate surfaces 62 and 68 on the column guides, I have provided the plane surfaces 72 which cooperate with the opposed plane surfaces 74 formed on the bolster between the arcuate surfaces on the bolster as already described.

In this construction the plane surfaces 72 and 74 lie substantially in two planes which intersect in a line within the vertical plane which bisects the bolster longitudinally, similar to the construction disclosed in Figure 5. It will be apparent also that the diagonally opposed plane surfaces 72 and 74 on opposite column guides and on opposite sides of the bolster respectively lie substantially in a single plane and that the two planes thus defined intersect on the line just mentioned lying within the vertical plane which bisects the bolster longitudinally.

It will be apparent that in my improved construction I have considerably simplified the form of cooperation between the column guides of the side frame and the associated bolster in a spring plankless truck. I have provided a structure which is considerably cheaper to manufacture in that it eliminates to a degree the great accuracy otherwise required in order to insure proper fitting between parts which must necessarily be in alignment. Moreover, instead of providing a pair of guiding flanges on the bolster, I have provided a single flange which may be located either on the bolster or on the side frame, resulting in

considerable simplification; moreover, by the elimination of the guiding flanges on the bolster, inwardly of the side frame, I have made it possible to locate the brake hanger brackets in closer proximity to the sides of the bolster thus bringing closer together the brake hanger brackets at opposite sides of the truck and making possible a much shorter wheel base than would otherwise be the case.

It is to be understood that I do not wish to be limited by the exact embodiments of the device shown, which are merely by way of illustration and not limitation, as various and other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a truck the combination of a side frame including tension and compression members and spaced column guides integrally connecting said members and forming a bolster opening, a bolster extending into said opening, said bolster and column guides having cooperating sliding surfaces, each of said surfaces comprising spaced arcuate portions and a centrally located guide flange on said bolster received in a complementary slot formed on one of said column guides, said flange having two faces whose respective planes intersect in the vertical plane which bisects the bolster longitudinally.

2. In a truck the combination of a side frame including tension and compression members and spaced column guide means integrally connecting said members and forming a window, load carrying means extending into said window, said guide means and load carrying means having cooperating sliding surfaces, said surfaces comprising spaced arcuate portions, and three-wall vertical flanges formed on one of said means intermediate said arcuate portions, each of said flanges having two plane faces joined by an arcuate face.

3. In a truck the combination of a side frame including tension and compression members and spaced column guide means integrally connecting said members and forming a window, load carrying means extending into said window, said guide means and load carrying means having cooperating sliding surfaces, each of said surfaces comprising spaced arcuate portions and a centrally located three-wall vertical flange on one of said means cooperating with a complementary channel formed on the other of said means, said flange comprising spaced plane faces joined by an arcuate face.

4. A load carrying member having column guide cooperating surfaces, said surfaces comprising spaced arcuate portions, and vertical plane faces joining said spaced arcuate portions, said plane faces on each of said surfaces lying in planes which intersect in the vertical plane bisecting the load carrying member longitudinally.

5. In a truck the combination of a side frame member and a load carrying member, said members having cooperating column guide surfaces, said surfaces including spaced arcuate portions joined by spaced plane portions, the plane portions of each said surfaces lying substantially in planes intersecting in the vertical longitudinal center plane of said load carrying member.

6. In a truck the combination of a side frame member and a load carrying member, said members having cooperating column guide surfaces, said surfaces including spaced arcuate portions joined by intervening plane portions, the plane portions on said side frame member having sliding cooperation with the plane portions on said load carrying member, all of said plane surfaces being substantially defined by two planes intersecting in the vertical longitudinal center plane of said load carrying member.

7. In a truck, the combination of a side frame member and a load carrying member, said members having spaced arcuate column guide portions, one of said members having a three-wall vertical flange intermediate said arcuate portions and the other of said members having a channel for reception of said flange, said channel being defined by spaced vertical plane surfaces joined by an arcuate surface.

8. In a truck, the combination of a side frame member and a load carrying member, each of said members having spaced arcuate column guide portions, one of said members having a three-wall vertical flange intermediate said arcuate portions and the other of said members having a channel for reception of said flange, said flange being defined by spaced vertical plane surfaces joined by an arcuate surface.

9. In a truck, the combination of a side frame member and a load carrying member, each of said members having spaced arcuate column guide portions, one of said members having a three-wall vertical flange intermediate said arcuate portions and the other of said members having a channel for reception of said flange, said flanges being defined by spaced vertical plane faces joined by an arcuate face.

10. A load carrying member having column guide surfaces comprising spaced arcuate portions joined by intervening plane portions, all of said plane portions being defined by two planes intersecting in the vertical longitudinal center plane of said load carrying member.

11. A load carrying member having column guide surfaces comprising spaced arcuate portions joined by intervening plane portions, said plane portions lying in two planes which intersect in the vertical plane bisecting the load carrying member longitudinally.

12. A load carrying member having column guide cooperating surfaces, said surfaces comprising spaced arcuate portions and a three-wall vertical flange intermediate said portions, said flange comprising spaced plane faces joined by an arcuate face.

13. A load carrying member having column guide cooperating surfaces, said surfaces comprising spaced arcuate portions and vertical plane faces joining said spaced arcuate surfaces, said plane faces lying in two planes intersecting in the longitudinal vertical center plane of said load carrying member.

14. A load carrying member having column guide surfaces comprising spaced arcuate portions joined by spaced plane portions, all of said arcuate portions being defined from a common center and said plane portions being defined by two planes intersecting on the vertical plane bisecting the load carrying member longitudinally.

15. In a truck the combination of a side frame member and a load carrying member, said members having cooperating column guide surfaces, said surfaces including spaced arcuate portions joined by spaced plane portions, said plane portions being defined by two planes intersecting on the vertical plane bisecting the load carrying member longitudinally.

16. In a side frame the combination of a ten-

sion member, a compression member and spaced column guides, each of said column guides comprising spaced arcuate portions, a three-wall vertical flange intermediate said arcuate portions, said vertical flange being defined by two plane faces joined by an arcuate face.

17. In a side frame, the combination of a tension member, a compression member, and spaced column guides, each of said column guides comprising spaced arcuate portions, and a vertical flange intermediate said spaced arcuate portions, said vertical flange being defined by an arcuate face and two plane faces, all of said plane faces lying in two intersecting planes.

18. In a side frame the combination of a tension member, a compression member and spaced column guides, said column guides comprising spaced arcuate portions and a vertical three-wall flange therebetween, said flange being defined by spaced plane faces and an arcuate portion, all of said arcuate portions being defined from a common center.

19. In a side frame the combination of a compression member, a tension member, and spaced column guides, said column guides comprising spaced arcuate portions, and a vertical flange, said flange being defined by two plane faces joined by an arcuate face, all of said plane faces lying in two intersecting planes.

20. In a side frame, a compression member, a tension member and spaced column guides, each of said column guides comprising spaced arcuate portions, and a vertical flange, said flange being defined by spaced plane faces joined by an arcuate portion, all of said arcuate portions being defined from a common center.

21. In a side frame, the combination of a tension member, a compression member and spaced column guides, said column guides comprising spaced arcuate portions and a vertical three-wall channel therebetween, said vertical channel being defined by spaced plane faces joined by an arcuate portion, all of said arcuate portions being defined from a common center.

22. In a side frame the combination of a compression member, a tension member, and spaced column guides, each of said column guides comprising spaced arcuate portions and a vertical three-wall channel therebetween, said vertical channel being defined by spaced plane faces and an arcuate portion, all of said plane faces lying in two intersecting planes.

23. In a side frame, a tension member, a compression member, and spaced column guides, each of said column guides comprising spaced arcuate portions and a three-wall vertical flange, said flange being defined by two plane faces joined by an arcuate portion, all of said arcuate portions being defined from a common center.

24. In a load carrying member, spaced column guide portions, each of said portions comprising spaced arcuate faces and a three-wall vertical flange, said flange being defined by spaced plane faces joined by an arcuate face, all of said plane faces lying in two intersecting planes.

25. A load carrying member having spaced column guide portions, each of said portions comprising spaced arcuate faces and a three-wall vertical flange, said flange being defined by two plane faces joined by an arcuate face.

26. A load carrying member having spaced column guide portions, each of said portions comprising spaced arcuate faces and a three-wall vertical flange, said flange being defined by two plane faces joined by an arcuate face, all of said arcuate faces being defined from a common center.

27. A load carrying member having spaced column guide portions, each of said portions comprising spaced arcuate faces and a three-wall vertical flange, said flange being defined by spaced plane faces joined by an arcuate face, all of said plane faces lying in two intersecting planes and all of said arcuate faces being defined from a common center.

28. In a load carrying member, the combination of opposite column guide surfaces each having spaced arcuate portions and a three-wall vertical flange therebetween, said vertical flange being defined by two plane faces joined by an arcuate face, all of said plane faces lying in two planes intersecting intermediate said surfaces.

29. In a load carrying member, spaced column guide surfaces, each of said surfaces having spaced arcuate portions and a three-wall vertical flange, said flange being defined by two plane faces joined by an arcuate face, all of said plane faces lying in two planes which intersect in the vertical plane bisecting the load carrying member longitudinally.

30. In a car truck the combination of a truss type side frame having column guide and a load carrying member having column guide surfaces cooperating with said column guides, said column guides comprising spaced arcuate portions and a vertical flange intermediate said portions, said flange being defined by spaced plane faces joined by an arcuate face, each of said flanges having cooperation with a complementary groove in the associated column guide surface, all of said arcuate portions and faces being defined from a common center.

31. In a car truck the combination of a truss type side frame having spaced column guides and a load carrying member having spaced column guide surfaces in cooperation with said column guides, each of said surfaces comprising spaced arcuate portions joined by intervening plane portions, all of said plane portions lying in two intersecting planes and all of said arcuate portions being defined from a common center.

32. In a car truck the combination of a truss type side frame having spaced column guides and a load carrying member having column guide surfaces cooperating with said column guides, each of said column guides comprising spaced arcuate portions and a vertical flange, said flange being defined by spaced plane faces joined by an arcuate face, all of said plane faces lying in two intersecting planes and all of said arcuate faces being defined from a common center.

33. In a car truck the combination of a side frame having column guide surfaces and a load carrying member having spaced portions cooperating with said surfaces, each of said portions and surfaces comprising spaced arcuate faces joined by intervening plane faces, all of said plane faces lying substantially in two intersecting planes and all of said arcuate faces being defined from a common center.

WILLIAM C. HEDGCOCK.