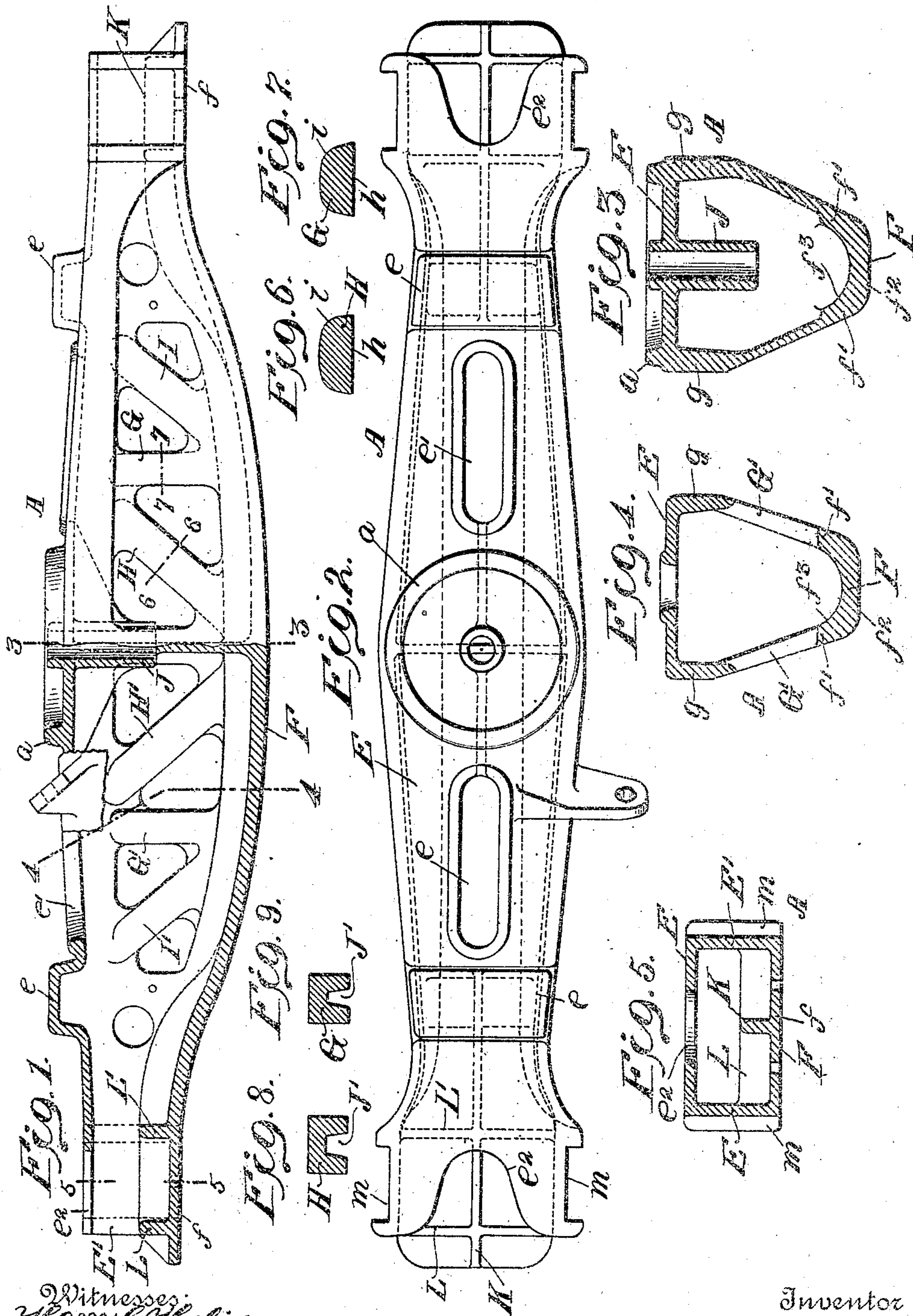


E. H. BENNERS.
CAR BOLSTER.
APPLICATION FILED NOV. 28, 1908.

946,099.

Patented Jan. 11, 1910.
2 SHEETS—SHEET 1.



Witnesses:
Harry C. Hebig.
V. E. Markmann

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Edwin H. Benners
By his Attorneys
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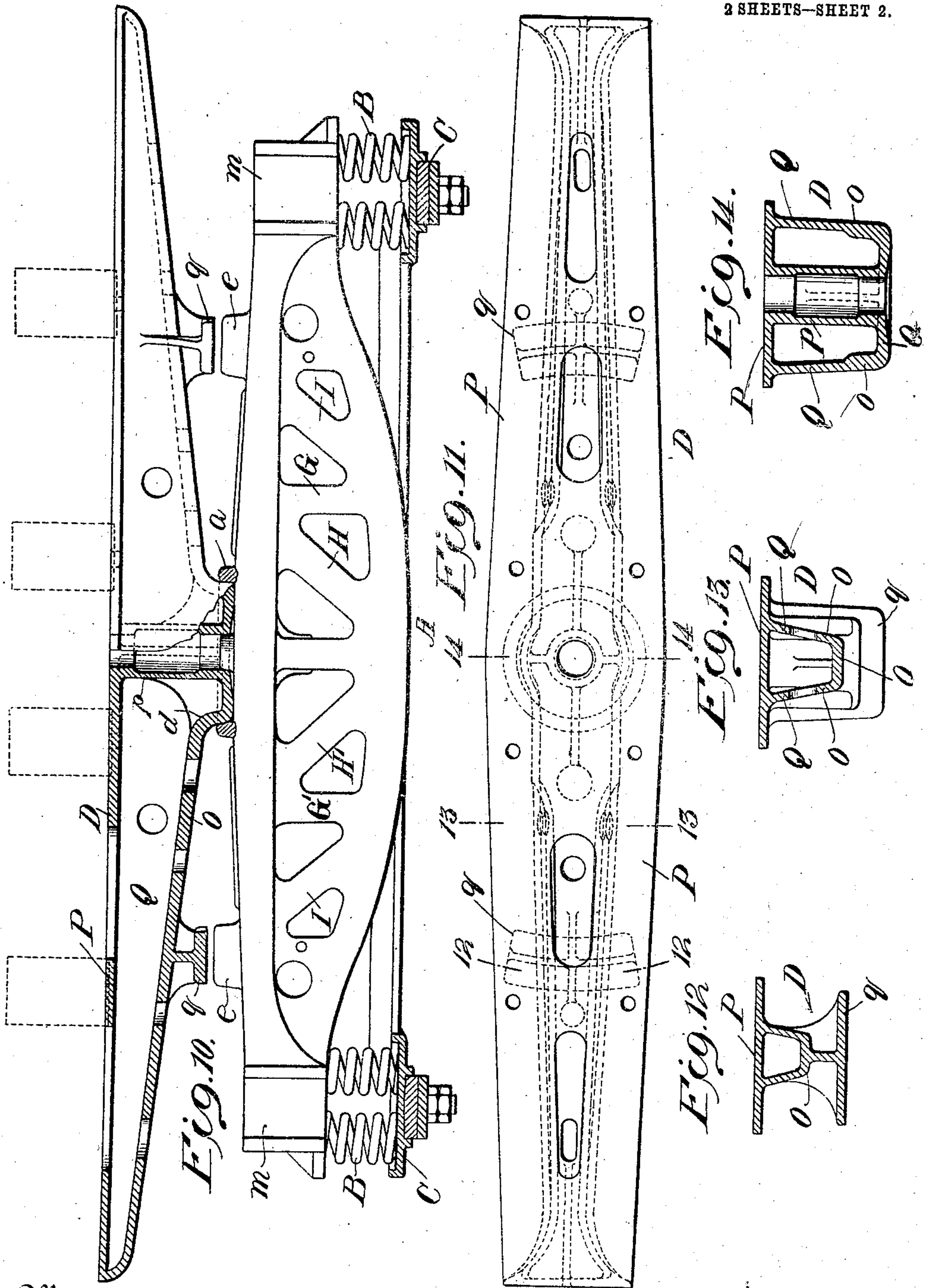
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UNITED STATES PATENT OFFICE.

EDWIN HENDRY BENNERS, OF ELIZABETH, NEW JERSEY.

CAR-BOLSTER.

946,099.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed November 28, 1908. Serial No. 464,977.

To all whom it may concern:

Be it known that I, EDWIN HENDRY BENNERS, a citizen of the United States, residing in Elizabeth, county of Union, and State of New Jersey, have invented certain new and useful Car-Bolsters, of which the following is a specification.

This invention is a bolster of simple construction and wherein is embodied a maximum of strength for a minimum amount of material employed in its construction.

Among the several features of novelty embraced in the invention, may be mentioned the following, which, however, are not exclusive; the cross sectional shape of several of the members forming the construction of the bolster, the particular arrangement and location of the tension and compression members of the bolster, and the particular construction of webs at the respective ends of the bolster.

The bottom member of both the truck and body bolsters, and the truck bolster in particular, is channel shaped in cross section, the inner face of the channel in the truck bolster being preferably in the form of an inverted arch. The upper portions of the side members of the truck bolster, in the preferred form, have their inner faces positioned at an oblique angle to the top member of said bolster, and, moreover, they are preferably made tapering in the direction in which they recede from the top member. The upper and lower members of the truck bolster are joined by means of a plurality of compression and tension members, respectively, said tension members being so arranged or positioned as to impart great strength, rigidity and durability to the structure.

The foregoing features of construction of the upper and lower members, coupled with the cooperating compression and tension members, result in a structure having the maximum of strength considering the comparatively small amount of material employed in the construction of the bolster.

Other features of novelty embodied in the invention, but hereinbefore specified, will be readily apparent from the following detailed description of the invention.

In the accompanying drawings I have illustrated different practical embodiments of the invention, but the constructions shown

therein are to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 is a view partly in elevation and partly in longitudinal section of a truck bolster constructed in accordance with the invention. Fig. 2 is a plan view. Figs. 3, 4 and 5 are vertical cross sections through said bolster on the lines 3—3, 4—4, and 5—5, respectively, of Fig. 1. Figs. 6 and 7 are detail cross sections through a diagonal strut, and a vertical strut, respectively, on the lines 6—6 and 7—7, of Fig. 1. Figs. 8 and 9 are cross sections similar to Figs. 6 and 7, respectively, of modified forms of the struts. Fig. 10 is an elevation, partly in section, showing a truck bolster and a body bolster in cooperative relation to each other, a part of the truck frame and certain bolster springs being shown for supporting the truck bolster. Fig. 11 is a plan of the body bolster. Figs. 12, 13 and 14, are vertical cross sections on the lines 12—12, 13—13 and 14—14, respectively, of Fig. 11.

A practical form of bolster, A, for use in connection with a car truck is shown in Figs. 1 to 7, inclusive, of the drawings. Said truck bolster, A, is represented in Fig. 10 as being supported by springs, B, within a suitable truck frame indicated generally at C. Said bolster A, is provided with a center bearing, *a*, which receives a depending center bearing, *d*, of a body bolster, D, all as will hereinafter more fully appear.

I will now proceed to describe in detail the preferred form of truck bolster, A. It consists, mainly, of a top member, E, a bottom member, F, compression members G, G', and tension members, H, H', and I, I'. The top member, E, is in the form of a plate which may be curved lengthwise or it may occupy a horizontal position. This plate is shown as provided with the central bearing, *a*, side bearings, *e*, *e*, and longitudinal openings, *e'*, the ends of said top member being cut away as at *e*². Bottom member, F, is curved for substantially its length except at the end portions, *f*, thereof, said end portions being substantially horizontal and adapted to receive the bolster springs, B. Said bolster springs may be retained in position on end part, *f*, by any preferred form of spring seats should they be desired.

An essential feature of the present inven-

tion, in so far as it relates to bottom member, F, consists in a channeled construction of said bottom member. As shown, member, F, is provided with up-standing webs, f' , at the sides thereof, it is formed with a substantially flat bottom face, f^2 , and with a curved upper face, f^3 , the latter being in the form of an inverted arch, as shown in Figs. 3 and 4. The arched upper face, f^3 , of bottom member, f , extends from one flat end, f , to the other flat end as indicated in Fig. 1, whereby the channeled form is imparted to bottom member, F, for substantially its length.

Top member, E, is provided at its respective side edges with longitudinal webs or flanges, g , g , the latter being positioned at an obtuse angle to the plane of said member, E, as shown in Figs. 3 and 4, and, furthermore, each web, g , tapers in the direction which it extends from said top member, E. Said webs, g , are not at a right angle to top member, E, because, as previously stated, they occupy a slightly obtuse angle with respect to said top member. Top member, E, and bottom member, F, are joined at the sides of the bolster by two series of struts, or as they may be termed, compression members, G, G', and tension members, H, H', and I, I'. The side portions of the bolster intermediate members E, F, are skeletonized to produce the aforesaid tension and compression members or the vertical and diagonal struts, but the ends of members, E, F, are united by plates, E', said ends being hollow, as shown in Figs. 1 and 5, and the top member being recessed at e^2 , as hereinbefore described. Parts H, H', are tension members or diagonal trusses which converge downwardly from top member, E, toward the base of a king-pin post, J, and, also, toward bottom member, F. Parts I, I', are, also, tension members or diagonal struts, and they incline from member, E, toward member, F, said parts, I, I', converging downwardly. Parts G, G', are vertical, and they serve as compression members or vertical struts. They are positioned intermediate diagonal struts, H, I, and H', I', respectively, diagonals, H, H', being between the vertical struts, see Fig. 1. These struts join the webs, g , of top member, E, with flanges, f' , of bottom member, F, but the struts of the two series are laterally inclined with respect one to the other and upwardly with respect to bottom member, F, whereby the bolster is given a tapering form in cross section, see Figs. 3 and 4.

The diagonal struts intermediate top and bottom members have their upper edges at an obtuse angle to the plane of top member, E. In cross section, each strut is provided with a flat bottom edge, h , and a top curved edge, i , see the cross sectional views Figs. 6 and 7, but it is evident that said struts may

have a channeled cross sectional shape, as shown at J' in Figs. 8 and 9. Bottom member, F, is provided with central webs, K, and with a plurality of transverse webs, L, L'. These webs project upwardly from the top face of said member, and they intersect as shown in Figs. 1, 2 and 5. Central web, K, rises from the arched face, f^3 , of channeled member, F, and it runs from said face to the end of said bottom member, the top edges of said webs being flush. The ends of bolster, A, are substantially rectangular in cross section, see Fig. 5, whereas at all other points intermediate the ends, the bolster is, approximately, triangular in section, bottom member, F, being considerably narrower than top member, E. The ends of the bolster may be said to be skeletonized, and said ends are recessed at m for coöperation with the channel guides of the truck side frames. Body bolster, D, shown in Figs. 10 to 14, inclusive is constructed with a lower member, O, of channeled cross section, said lower member having side flanges, o , as shown. Said bolster consists of said member, O, a top member, P, and side members, Q, the bolster uniting the top and bottom members. Each bolster, that is, truck bolster, A, and body bolster, D, is cast in a single piece, it being preferred to make said bolster of cast steel. Bolster, D, is provided with a king-bolt post, p , and with bearing, d , on bottom member, O, whereby said bolster, D, is adapted to coöperate with truck bolster, A. Bottom member O is provided, also, with depending side bearings, q , positioned above bearings, e , of bolster, A, and adapted to coöperate therewith. Bolster, D, is skeletonized by appropriate slots or openings which are so distributed as to retain the strength of the metal while reducing the weight of the structure. Said bolster is adapted to receive the sills of the truck frame, as shown in dotted lines in Fig. 10, but if desired, the end portions of said bolster, D, may be recessed to provide seats of the usual form adapted to receive the side sills of the car body.

Having thus fully described the invention, what I claim as new, and desire to secure by Letters Patent is:

1. A bolster having a lower member which is channeled in cross section, an upper member, and struts intermediate said upper and lower members, certain of said struts being inclined upwardly and in diverging relation to each other to serve the purpose of the tension members.

2. A bolster having a lower member which is channeled in cross section, the inner face of said lower member having substantially the form of an inverted arch.

3. A bolster comprising a bottom member, the upper face of which is provided with a longitudinal channel, a top member, and two

side members, the upper and inner face of each side member forming an obtuse angle with the under face of the top member.

4. A bolster having a channeled bottom member, an upper member, and two side members, which taper at their upper ends in the direction which they recede or extend from said upper member.

5. A bolster having a channeled bottom member, an upper member provided with depending flanges at the sides thereof, and two side members which taper at their upper ends in the direction which they recede or extend from said upper member, the upper and inner faces of which side members form an obtuse angle with the inner faces of said depending flanges of the upper member.

6. A bolster comprising an upper member, a lower member, and two side members connecting said upper and lower members, each side member being skeletonized and producing certain upwardly diverging tension members intermediate certain compression members.

7. A bolster having upper and lower members, and upwardly diverging tension members intermediate the upper and lower members, the inner sides or faces of which tension members form acute angles with said upper and lower members, respectively.

8. A bolster having upper and lower members, a central compression member, and two tension members extending from the upper member to the lower member and converging toward the base of said compression member, other downwardly converging tension members intermediate the upper and lower members, and compression members intermediate the tension members.

9. A bolster having upper and lower members, and a plurality of series of tension members, each having an arched inner face connecting said upper and lower members, each series of tension members being at one side of the bolster.

10. A bolster having upper and lower members, and compression and tension members cooperative therewith, each of said compression and tension members being at one side of the bolster and having an arched inner face.

11. A bolster having top and bottom members; cooperating side members connecting

said top and bottom members, each end of said bolster being skeletonized, said bottom member being provided at each end with a plurality of transverse webs and with a single longitudinal web, the latter intersecting said transverse webs at the middle thereof.

12. A bolster having top and bottom members, cooperating side members connecting said top and bottom members, and a central longitudinal web disconnected from the side members and the top member, said web projecting upwardly from the bottom member and extending part way the length of said bottom member, inwardly from the end thereof.

13. A bolster having top and bottom members, cooperating side members connecting said top and bottom members, a central longitudinal web extending upwardly from the bottom member and positioned intermediate said side members, and a plurality of transverse webs cooperating with said longitudinal web and connecting the side members.

14. A bolster having upper and lower members, and compression and tension members cooperating therewith and positioned at the sides of the bolster, said compression and tension members being channeled in cross section.

15. A bolster comprising an upper member, a lower member, and skeletonized side members uniting the upper and lower members, each side member having a plurality of inclined tension members and forming, also, the compression members, said compression and tension members being channeled in cross section.

16. A bolster comprising an upper member, a lower member, and skeletonized side members uniting the upper and lower members, certain parts of said skeletonized side members forming upwardly diverging tension members and producing, also, certain compression members.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN HENDRY BENNERS.

Witnesses:

H. I. BERNHARD,
M. C. POWELL.