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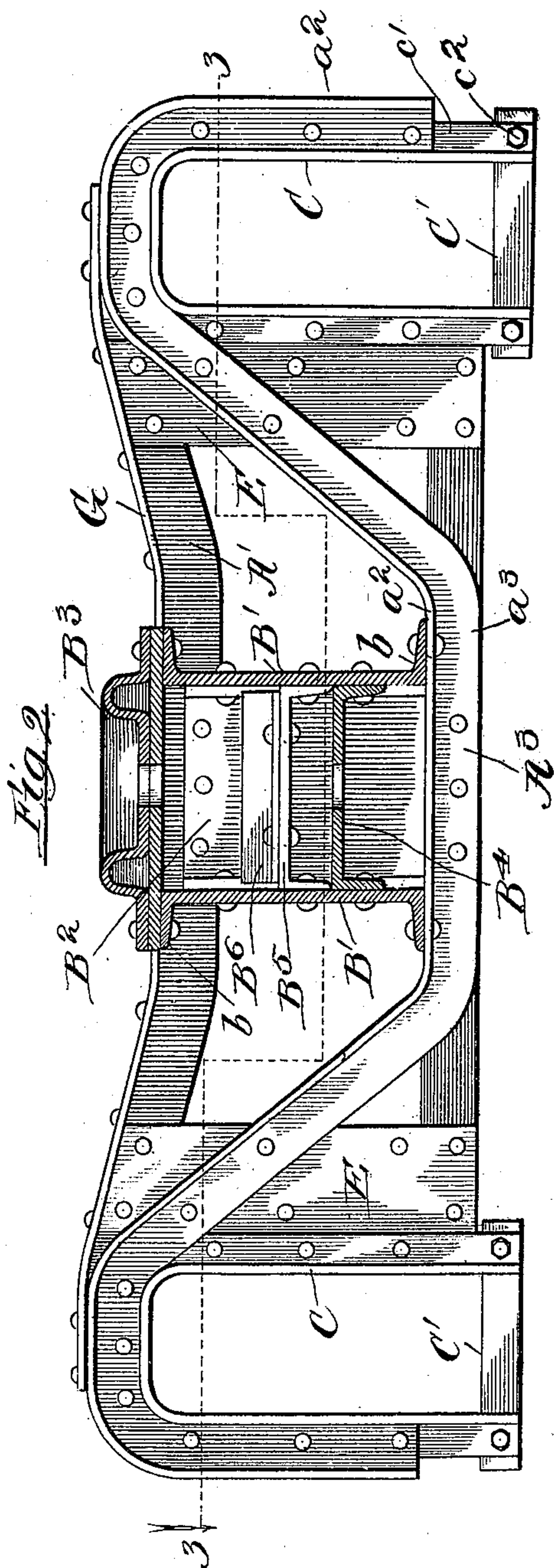
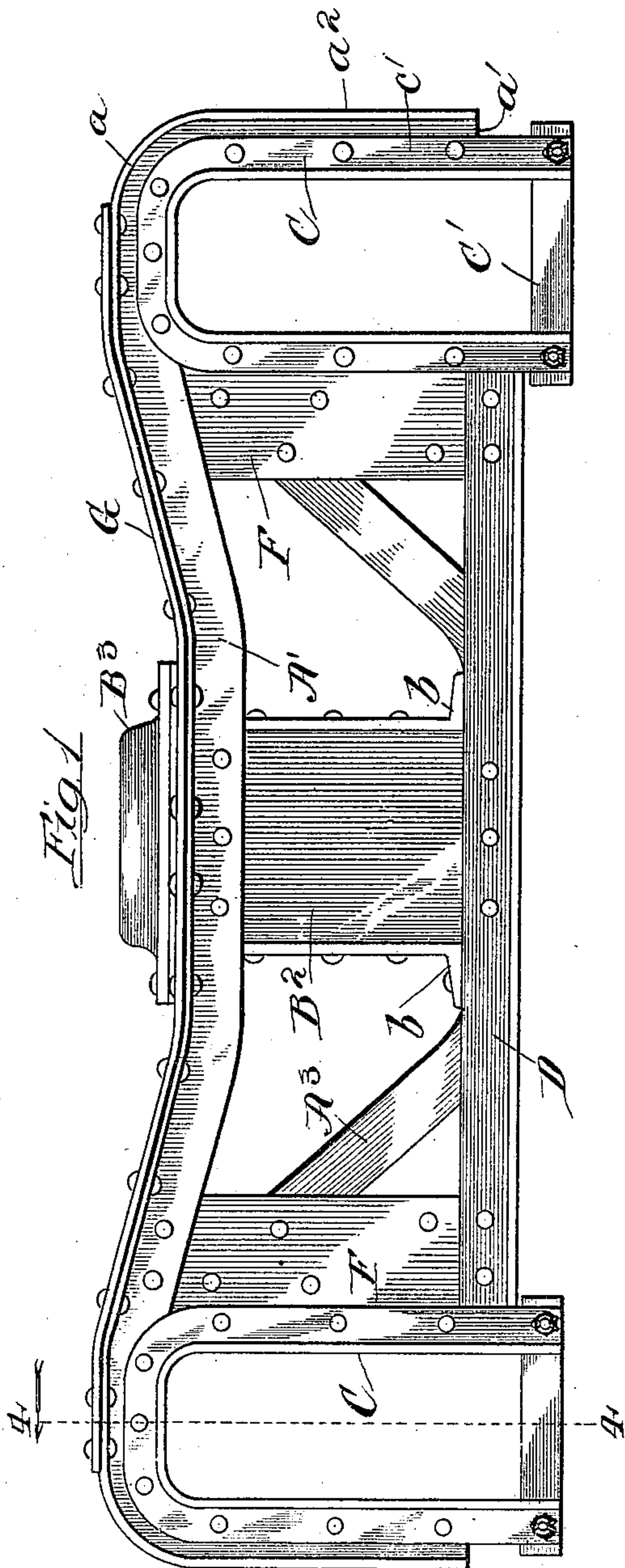
Patented Jan. 16, 1900.

D. B. KENNEDY.
CAR TRUCK FRAME.

(Application filed Jan. 21, 1899.)

(No Model.)

3 Sheets—Sheet 1.



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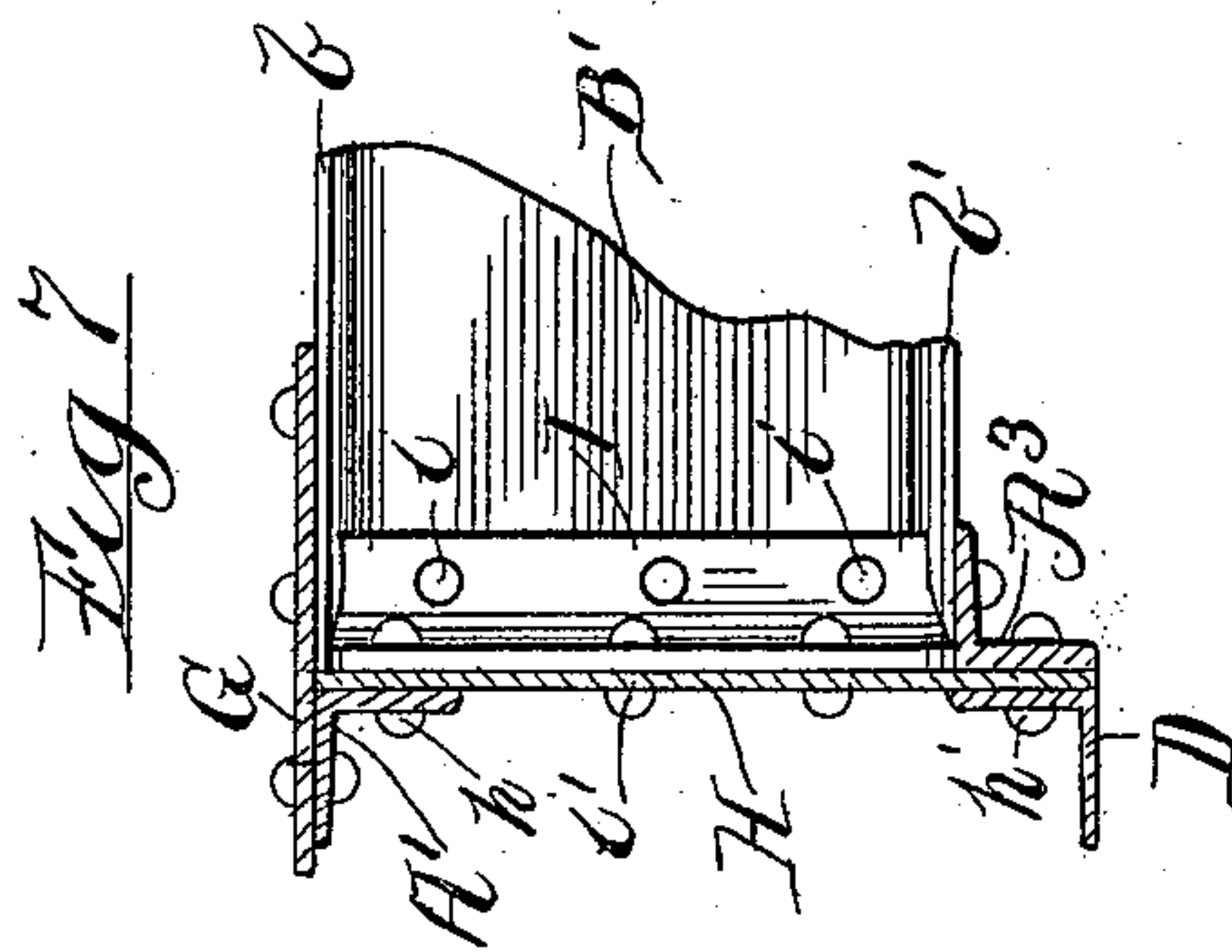
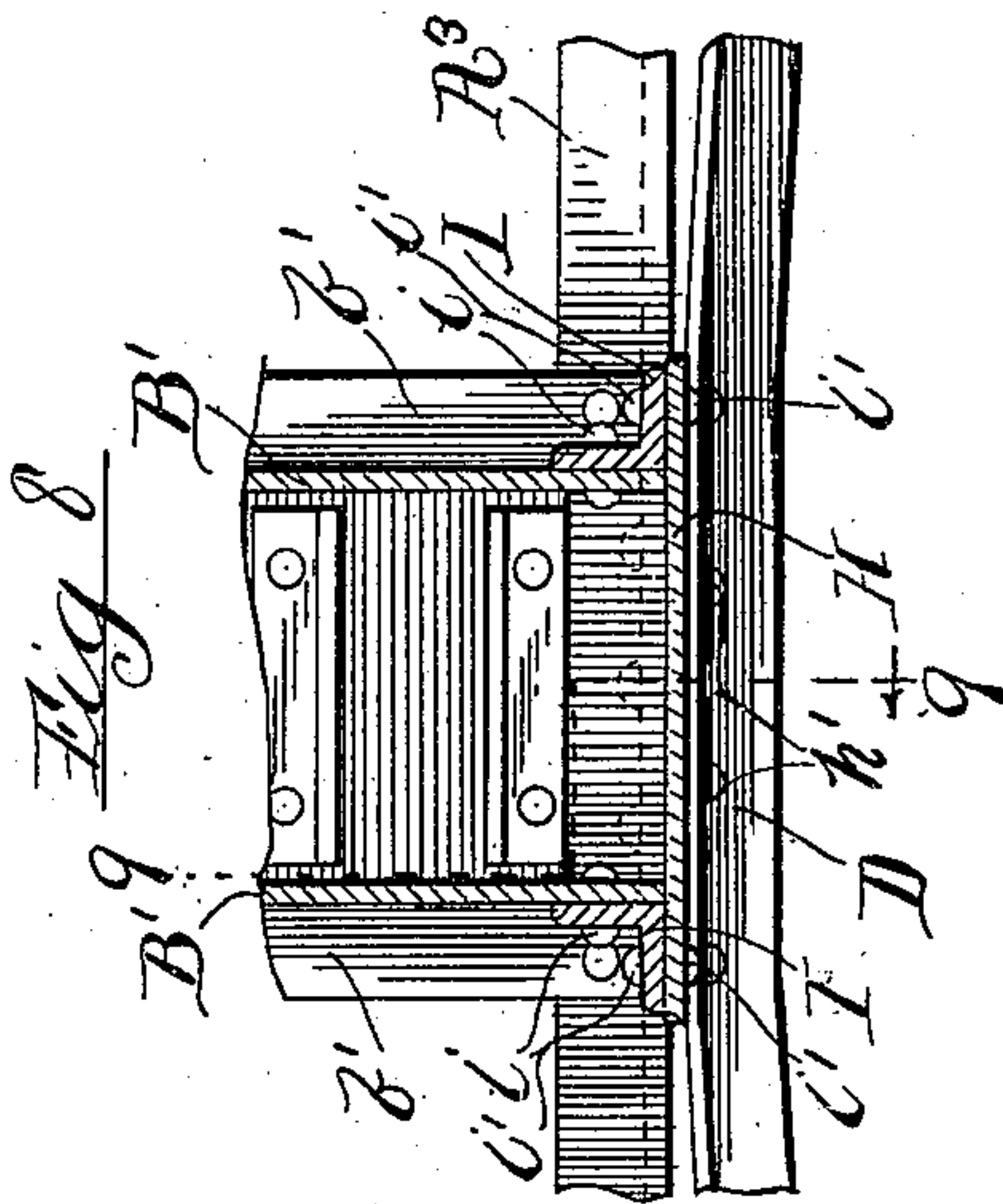
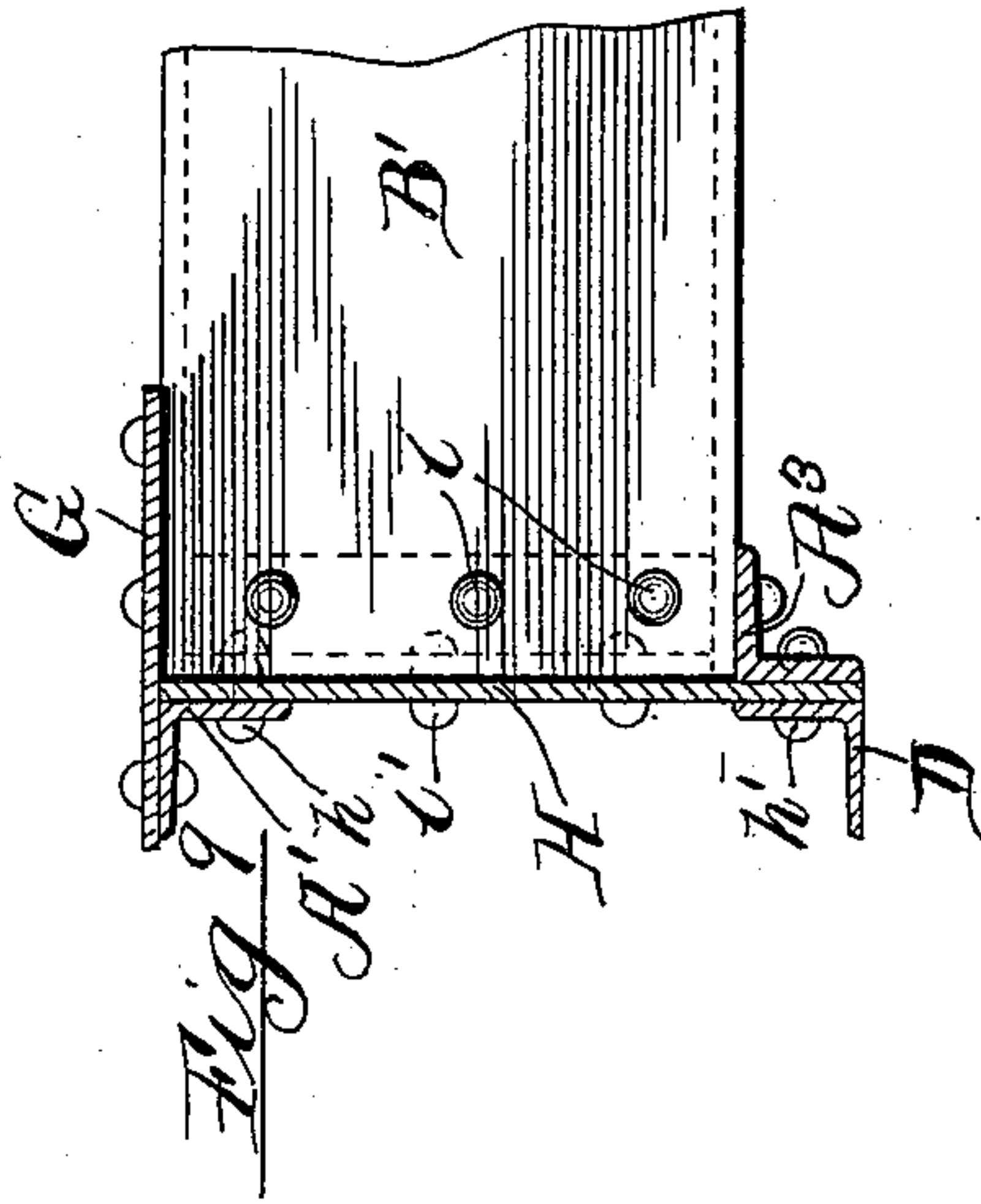
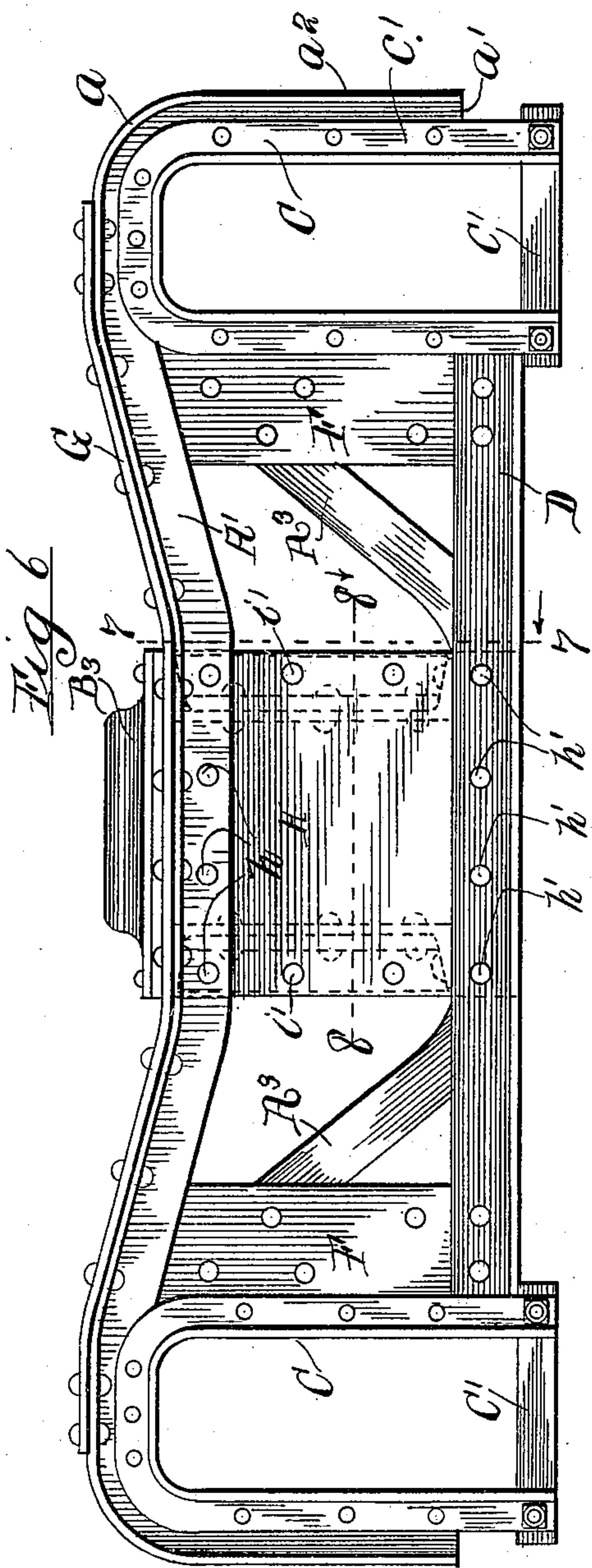
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

DWIGHT BRUCE KENNEDY, OF OAKMONT, PENNSYLVANIA, ASSIGNOR TO
SAMUEL W. McMUNN, TRUSTEE, OF CHICAGO, ILLINOIS.

CAR-TRUCK FRAME.

SPECIFICATION forming part of Letters Patent No. 641,518, dated January 16, 1900.

Application filed January 21, 1899. Serial No. 702,942. (No model.)

To all whom it may concern:

Be it known that I, DWIGHT BRUCE KENNEDY, of Oakmont, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Car-Truck Frames; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in car-truck frames, and refers more specifically to that class of such frames constructed of a plurality of metal bars and plates of suitable form which are secured rigidly together by bolts or rivets.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation of a truck-frame made in accordance with my invention. Fig. 2 is a view of the truck-frame, partly in side elevation and partly in vertical section. Fig. 3 is a view, partly in top plan and partly in horizontal section, of the truck-frame. Fig. 4 is a vertical section taken on line 4 4 of Fig. 1. Fig. 5 is a detail section taken on line 5 5 of Fig. 3. Fig. 6 is a view in side elevation of a truck-frame in which the ends of the transom member are attached to the side members of the frame by a construction differing from that shown in Figs. 1 to 5. Fig. 7 is a vertical detail section of the same, taken on line 7 7 of Fig. 6. Fig. 8 is a detail plan section taken on line 8 8 of Fig. 6. Fig. 9 is a sectional elevation taken on line 9 9 of Fig. 8.

In said drawings, A' A³ designate the side members of the frame, arranged parallel with each other, and B a transverse transom member attached at its opposite ends to the side members midway between the ends thereof. Each of the side members is provided on its opposite ends with a pedestal (indicated as a whole by C) which is adapted to receive the journal-box for the car-wheel axles. The transom member B consists of two rolled channel-plates B' B', arranged in vertical planes parallel with each other, and end plates B², which fit between the side plates B'. The lon-

gitudinal flanges *b* of the side plates, at the upper and lower edges thereof, are directed outwardly in horizontal planes, said flanges giving lateral stiffness to the side plates and also affording a means of attaching parts of the side members to the transom members, as will hereinafter appear. Said end plates B² are made of sections of channel-plates like the side plates and arranged with their flanges *b'* in vertical planes and directed inwardly. Said end plates are secured to the side plates, with their outer faces flush with the ends of said side plates, by means of rivets or the like passing through the flanges *b'* thereof and through said side plates. A center plate B³, which pivotally sustains the body-bolster of the car, is attached to the upper sides of the side plates B', centrally between the ends thereof, by means of rivets or the like passing therethrough and through the upper flanges *b* of said side plates. A transverse plate B⁴ extends between the side plates B' below the center plate. Said transom member is provided adjacent to each end thereof with shelves or ledges, which are adapted to sustain end supports or bearings of any suitable form for the body-bolster. Said shelves consist of sections of channel-plates B⁵, arranged transversely between the side plates of the transom members, with their flanges directed downwardly in contact with said side plates and secured thereto by means of rivets or the like passing through said flanges and through said side plates. Said transverse plates B⁵ are provided on their upper sides with laterally-separated parallel bars B⁶, herein shown as made of angle-bars, between which are formed seats for said end supports of the bolster. Other preferred forms of bolster supports or bearings may be employed. Each of said side members comprises an open truss-frame which is made as follows:

A' designates an upper or compression member which is attached centrally thereof to one end of the transom member at the upper side of the latter. Said compression member consists of an angle-bar of L shape in cross-section, with its web *a'* in a vertical plane and its flange *a* uppermost and directed outwardly. Said compression member is attached to the

transom member by means of rivets or the like, which pass through its vertical web a' and through the end plate B^2 of the transom member, Fig. 5, its laterally-directed web a being on a level with the top surface of the transom member. Said compression member is shown as bent so that its end portions are inclined and rise from the opposite sides of the transom member above the level of the latter. At its outer ends said compression member is extended over the pedestals C and then downwardly at the outer faces thereof, this construction giving to said outer ends a hook form. The end portions of said compression members form parts of the top and outer portions of the frames of the pedestals C.

A^3 designates a tension member which extends beneath the end of the transom member and rises obliquely upwardly on each side of the latter to the level of the upper parts of the pedestals C, to which the ends of said tension member are attached or of which they form parts. The outer ends of the tension member extend downwardly outside of the pedestals, said outer portions of the tension member being parallel with the outer parts of the compression member and the end portions of the tension and compression members together forming the outer sides and upper ends of the pedestal-frames. Said tension member A^3 consists of an angle-bar of L shape in cross-section and is arranged at its central part with its web portion a^3 in a vertical plane and its flange a^2 horizontal and directed inwardly, said flange being in bearing contact with the side plates B' , so that said side plates, in fact, rest at their ends on said tension member. Said tension member is attached to the transom member by means of rivets or the like passing through its flange a^2 and through the lower flanges b of the side plates B' and other rivets passing through its vertical part or web a^3 and through a downwardly-projecting lip or projection B^7 of the end plate B^2 of the transom member, which overlaps the same, Fig. 5. The outer ends of said tension and compression members are arranged adjacent to each other, with flanges a and a^2 thereof, which extend oppositely from each other, in the same planes, the parallel relation of the webs of the end portions of the tension and compression members being preserved from the extreme outer ends thereof to the inner side of the upper end of the pedestal-frame, at which points said members diverge, one being directed toward the top and the other toward the bottom of the transom member.

D designates a tie-bar consisting of a straight angle-bar located outside of the tension member and attached centrally thereof to the downwardly-projecting lip B^7 of the end plate of the transom member, on the side thereof opposite the tension member, by rivets or the like, which pass through the same and through said end plate and tension mem-

ber. Said tie-bar extends on each side of the transom member to the inner sides of the pedestal-frames C. E designates a vertical web-plate which extends from the bottom of said bar D at each end of the frame to the top of the upper or compression member A' and is attached to the inner side of said bar and to the vertical part or web a' of the said compression member by means of rivets or the like. Said plate engages also the outer surface of the obliquely-directed portion of the tension member and is secured thereto by means of rivets or the like passing through the same and through the vertical part or web of said tension member. F, Figs. 1 and 3, designates a second vertical plate which is attached to the outer face of the plate E by means of rivets or the like and extends from the upper margin of the tie-bar B to the inner margin of the vertical part or web a' of the compression member, against which latter web its lower end abuts. Said plate F is wider than the plate E and extends beyond the latter between parts of the pedestal, as clearly shown in Fig. 3.

The pedestal C at each end of the frame is formed in part by the end portions of the tension and compression members and in part by two angle-bars C^2 of inverted-U form and of L shape in cross-section. Said bars C^2 are arranged side by side, parallel with each other, and within the spaces inclosed by the outer hooked ends of the tension and compression members and the vertical plates E and F. The laterally-directed flanges c of the pedestal-bars are oppositely and outwardly directed and arranged in like planes, and the vertical webs c' of said bars are arranged adjacent to and parallel with each other and have overlapping engagement with the adjacent parts of the said tension and compression members. Said webs c' of both pedestal-bars have overlapping engagement at the inner sides of the pedestal with the marginal part of the vertical plate F, which projects beyond the plate E, and are attached thereto by means of rivets or the like, Fig. 3. At the outer sides and tops of the pedestals said webs C' of the pedestal-bars have overlapping engagement with the inwardly-directed webs a' and a^3 of the tension and compression members in their vertical and horizontal portions and are secured thereto by means of rivets or the like. By the arrangement described it will be seen that the bars which constitute or form the principal parts of the pedestals are rigidly secured in place and serve also to firmly join the outer ends of the tension and compression members and the vertical plates F, thereby affording an exceedingly strong construction in this part of the frame. The laterally-directed webs C of said pedestal-bars, being arranged in the same plane with each other, form broad inwardly-facing bearing-surfaces on each side of the pedestal, said bearing-surfaces being parallel with each other and connected at

their upper ends by the transverse surface of said webs. Said pedestal-bars preferably, but not necessarily, extend below the level of the outer ends of the tension and compression members and are closed at their lower ends by means of transverse bars C' , which are detachably secured to the opposite ends of the pedestals by means of bolts c^2 .

Top plates G , attached to the upper surfaces of the side members, serve to additionally secure the side members to the transom member and the compression and tension members of said side members together. Said top plates are applied over said compression and tension members of the frame and are bent to conform to the curvature of the compression members. The said plates are attached to the laterally-directed webs of the compression members by means of rivets or the like and are also attached at their opposite ends to the laterally-directed webs of the upper portions of the tension members or the parts of the same which extend over the pedestals. Said plates are made of considerable width at their middle portions, at which point they overlap the end of the transom member, to which latter they are attached by means of rivets or the like, which pass therethrough and through the upper flanges of the side plates of said transom member. When the form of bolster bearing or support herein illustrated is employed, the plates G will be provided centrally in their inner margins with notches to afford room therefor. The central parts of said plates G serve the purpose of gusset-plates, giving great strength to the frame to resist torsional strains, which tend to throw the side members out of their perpendicular relation to the transom member. Moreover, in the particular arrangement of the tension and compression members herein shown the outer ends of said top plates greatly aid in affording strong and rigid joints between said members.

The construction described, in which the tension and compression members are arranged with their laterally-directed webs uppermost and extending in opposite directions and in which the outer ends thereof are arranged parallel with each other in the same plane and secured together in the manner described, is of great importance, as it affords great lateral stiffness to the side members of the frame.

The making of the tension member of an angle-bar arranged with its web vertical and its flange at its upper edge has the important advantage of bringing the flanged part of the tension member in such relation to the others of the side members that it will take its full share of the strain due to the load carried by the truck and which is transmitted to the pedestals by the inclined portions of said tension member. This will be better understood by consideration of the fact that in the construction described the ends of the transom rest directly upon the said horizontal flanges

of the tension members and bear thereon equally throughout the entire width of such flanges. Moreover, the horizontal flanges of the tension members at the outer ends thereof are rigidly connected with the pedestals and with the ends of the compression members both by the rivets connecting the parts and by the end portions of the top plates G , which are riveted to said flanges, while at the same time great rigidity in said flanges is attained by the curvature thereof where the end portions of the tension members are bent to conform to the tops of the pedestals. It will be seen from the above that strains tending to elongate the said inclined portions of the tension members or to straighten out the bends of such inclined portions will come not only upon the vertical or web portions thereof, but practically to an equal extent upon the flanged portions thereof, inasmuch as said flanged portions are in contact with the transom at the lower ends of the inclined portions and are rigidly secured to the pedestals at the upper ends of said inclined portions. With respect to this feature of my invention it will be noted that if the angle-iron forming the tension member were reversed and its flanged edge turned downwardly the transom would bear upon the upper edge of the web and the flanged portion of said angle-iron would receive the pressure of the transom at its inner edge only and it would become much less efficient to withstand longitudinal strain, because by reason of the elasticity of the metal the outer or free edge of the flange would in that case be liable to spring or yield at the bent or curved lower portions of the inclined parts, and thereby permit the said inclined parts to stretch or lengthen at such curved portions to an appreciable extent under a strain equal to or less than the ordinary load upon the tension-bar. Obviously in the construction illustrated no such springing or yielding of the flange can take place, because the downward pressure of the transom acts equally at the inner and outer edges of the flange, and strain is therefore taken by the flange to a practically equal extent with the web, as hereinbefore stated.

The construction described of the pedestals C and the manner of their attachment to the side frames is of great importance, as it provides great strength in this part of the frame to resist both the lateral and vertical strains coming thereon. Furthermore, the laterally-directed flanges c of said pedestal angle-bars provide a bearing for the journal-boxes without the necessity of an additional or special construction.

A great advantage of the construction herein shown and described is that every part of the frame is adapted to be made from bars and plates of regular stock sizes, so that no special material is required which would require special machinery for the manufacture thereof and no extensive and complicated

plant is required for the manufacture of said truck-frame, thereby effecting a great saving in the manufacture thereof.

In Figs. 6, 7, 8, and 9 I have shown a modified construction at the ends of the bolster, intended to stiffen the lower flanges b' of the channel-irons B' , so as to prevent possibility of said flanges being bent upward under the upward strain or tension brought on the outer edges thereof by the tension-bars A^3 . As shown in said figures last referred to, the channel-plates $B' B'$ are arranged in the same manner hereinbefore described; but in place of the end plates B^2 , made of short sections of channel-plates, I employ a flat end plate H , which is applied over the ends of the channel-plates and is made wide enough to project to or beyond the outer margins of the flanges $b b'$ of said channel-plates. I also place at the ends of the channel-plates vertically-arranged bars I , which fit against the webs of the channel-plates and are fitted at their upper and lower ends to conform to the shape of and in close contact with the said flanges $b b'$. The angle-bars I thus arranged are secured to the webs of the channel-plates by rivets i and to the margins of the end plate H by rivets i' , the angle-bars by this arrangement serving as a means for attaching the end plates to the channel-plates. The main or principal purpose of the angle-bars arranged as described is, however, to form struts or braces acting on the lower flanges of the channel-bars to prevent the same from bending or yielding upwardly under the strain coming upon the tension members A^3 , which tends to straighten out the bends at the lower ends of the inclined parts of said tension members, it being obvious that the said angle-bars being rigidly attached to the channel-plates and to the end plate will support or reinforce the said lower flanges in a manner to prevent the possibility of their being so bent upwardly. The end plate H is shown as secured to the upper or compression member A' by rivets h . The said plate is extended below the channel-plates B' and inserted between the tension member A^3 and the tie-bar D and secured by rivets h' to said parts.

By reason of the improved results secured through the employment of the struts or brace-bars I a construction embracing the same is herein claimed as part of my invention. In this connection it is to be noted that said bars need not necessarily have the form of angle-bars, as herein shown, inasmuch as the same general results may be obtained by the use of bars of other shape than angle-bars and attached otherwise than as shown, provided their lower ends bear upon the flanges of the channel-plates in such manner as to resist upward flexure thereof under the upward pressure of the tension member. Important advantages in point of simplicity of construction are obtained, however, by making said bars or struts in the shape of angle-irons, as

shown, for the reason that this form affords simple and strong means of attaching the struts to the plates and securing the end plates to the channel-plates.

I claim as my invention—

1. A car-truck frame comprising a transom member and two parallel side members, each of said side members comprising an upper or compression member, and a lower or tension member, which members are attached centrally thereof to the bottom and top of the transom member and have their end portions arranged parallel with each other; the said tension member consisting of an angle-bar, the web of which is arranged vertically and the flange of which is located at its upper edge and in bearing contact with the transom member, the horizontal parts or flanges, as well as the webs of the said parallel end portions of the tension and compression members being rigidly attached together.

2. A car-truck frame comprising a transom member and two parallel side members, each of said side members comprising an upper or compression member and a lower or tension member, consisting of angle-irons having vertical webs and flanges at their upper edges; said members being attached centrally thereof to the bottom and top of the transom members and having their end portions adjacent to each other with their flanges in the same plane, and plates attached to the flanges of the end portions of the tension and compression members and rigidly connecting the same.

3. A car-truck frame comprising a transom member and two parallel side members, each of said side members comprising two pedestals, an upper or compression member and a lower or tension member, said members being attached centrally thereof to the bottom and top of the transom member and with their end portions arranged side by side and bent to extend over the top, and downwardly over the sides of the pedestals, said tension member consisting of an angle-bar having its web portion in a vertical plane and its flanged portion at its upper edge and in bearing contact with the transom member, the outer parallel portions of the tension and compression members being rigidly secured to each other.

4. A car-truck frame comprising a transom member and two parallel side members, each of said side members comprising two pedestals, an upper or compression member and a lower or tension member, which compression and tension members are attached centrally to the bottom and top of the transom member and are extended at their end portions over the tops, and downwardly at the outer sides of the pedestals; said tension and compression members being made of angle-bars and having their end portions arranged parallel and with their vertical parts or webs adjacent to each other and their flanges extending oppositely and outwardly, and plates at-

tached to the flanges of said compression and tension members at the said parallel end portions thereof.

5 5. A car-truck frame comprising a transom member which consists of two vertical and parallel channel side plates having the flanges at their upper and lower edges directed outwardly, and two end plates extending between and attached to said side plates, and
10 two parallel side members, each of said side members comprising an upper or compression member attached centrally thereof to the upper side of the transom member and a tension member attached centrally thereof
15 below the transom member, said tension member consisting of an angle-bar having its web arranged vertically, and its flange at its upper edge and in contact with the transom and secured to the flanges of the side plates of the
20 transom member, and its vertical web attached to a downwardly-extending lip or projection on the end plate of said transom member; said compression and tension members being arranged parallel with, and rigidly secured to each other at their outer ends.

6. A car-truck frame comprising a transom member and two parallel side members, each of said side members comprising two pedestals, an upper or compression member and a
30 tension member, which tension and compression members are attached centrally thereof at the top and bottom of the transom member, and are arranged side by side and parallel with each other at their middle and outer
35 ends, and bent over the pedestals at their outer portions; said pedestals embracing two continuous angle-bars of L shape in cross-section which are bent in inverted-U form and arranged side by side and attached to the
40 bent ends of said compression and tension members.

7. A car-truck frame comprising a transom member and two parallel side members, each of said side members comprising two pedestals, an upper or compression member and a
45 tension member, said tension and compression members being attached centrally thereof to the top and bottom of the transom member, arranged side by side and parallel with each other at their end portions, and bent in
50 such end portions to extend over the pedestals, said compression and tension members also being made of angle-bars of L shape in cross-section, and arranged in their end-portion parts with their webs vertical and adjacent to each other, and their flanges directed
55 oppositely and in the same planes with each other; said pedestals each embracing two continuous angle-bars of L shape in cross-section, bent in inverted-U form and arranged side by side, said bars having overlapping
60 engagement with, and being attached to the webs of the compression and tension members.

65 8. A car-truck frame comprising a transom member and two parallel side members, each of said side members comprising two pedestals,

an upper or compression member, and a tension member, and a tie-bar; said compression and tension members consisting of angle-bars having vertical webs and horizontal
70 flanges at their upper edges attached centrally thereof to the top and bottom of the transom member, and arranged side by side and parallel with each other at their end portions, and bent at such end portions to embrace the pedestals, with their extremities directed downwardly and the tie-bar being attached to the central portions of the tension
75 member, vertical web-plates attached at their upper ends to said compression and tension members between the outer ends thereof and the transom member, and attached at their lower ends to the said tie-bar, and said pedestals embracing angle-bars of inverted-U
80 shape and of L shape in cross-section, arranged side by side and having overlapping engagement at their outer sides and upper ends with the webs of the compression and tension members, and at their inner sides with
85 said vertical web-plates.

9. A car-truck frame comprising a transom member and two parallel side members, each of said side members comprising an upper or
90 compression member and a tension member which are attached centrally thereof at the upper and lower sides of the transom member, are arranged side by side and parallel with each other, and bent at their end portions to form portions of the pedestals, said
100 compression and tension members being made of angle-bars arranged with their webs vertical, and their flanges at their upper edges and oppositely directed, and plates extending over the top of said side members, said plate extending over and being attached to the top
105 of the transom member, and being attached at their opposite ends to the oppositely-directed flanges of the compression and tension members.

10. A car-truck frame comprising a transom member which consists of two vertical channel-plates having outwardly-directed flanges at their upper and lower edges, two parallel
110 side members, each of said side members comprising an upper or compression part attached to the upper side of the transom member and a lower or tension member attached to the lower edges of and bearing against the transom member, and upright struts or brace-bars
115 applied to the outer faces of said channel-plates at the ends thereof and bearing at their lower ends against the lower flanges of said channel-plates.

11. A car-truck frame comprising a transom
120 member which consists of two vertical channel-plates having outwardly-directed flanges at their upper and lower edges, end plates applied to the ends of the side plates and extending outwardly past the web portions of
125 the same, upright struts or brace-bars having the form of angle-bars which are riveted to the webs of the channel-bars and to the margins of the end plates and bear at their lower
130

ends against the lower flanges of the channel-
bars, and two parallel side members, each of
which comprises a lower or tension member
which extends beneath and is attached to the
5 lower surface of the transom member and
bears against the flanged lower edges of said
channel-plates.

In testimony that I claim the foregoing as

my invention I affix my signature, in presence
of two witnesses, this 17th day of January, 10
A. D. 1899.

DWIGHT BRUCE KENNEDY.

Witnesses:

MITCHELL MARTIN FREY, Jr.,
ANDREW B. SMITH.