No. 630,896. Patented Aug. 15, 1899.

D. B. KENNEDY & W. B. SCAIFE.

CAR BOLSTER.

(Application filed Jan. 23, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1

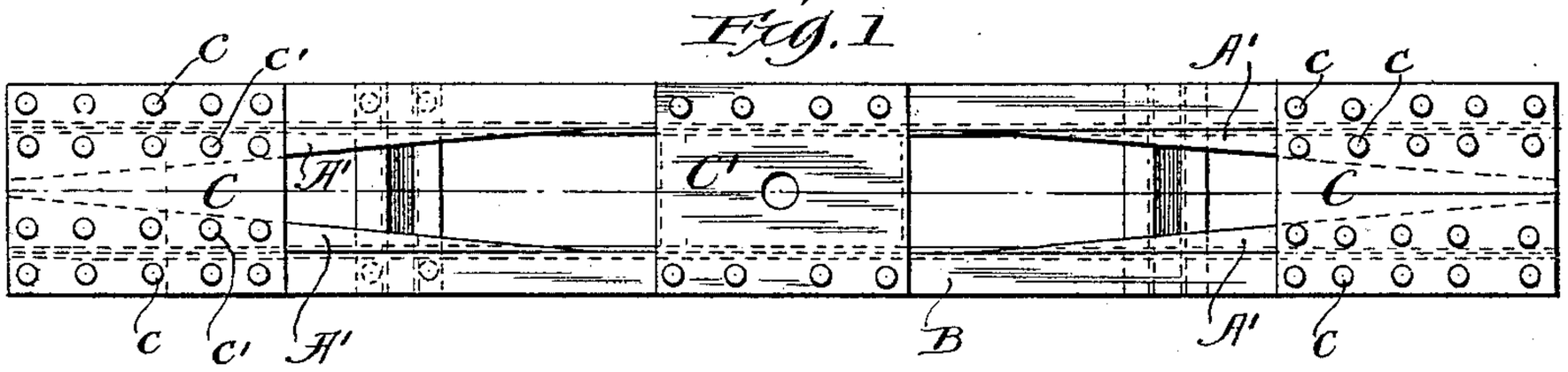


Fig. 2

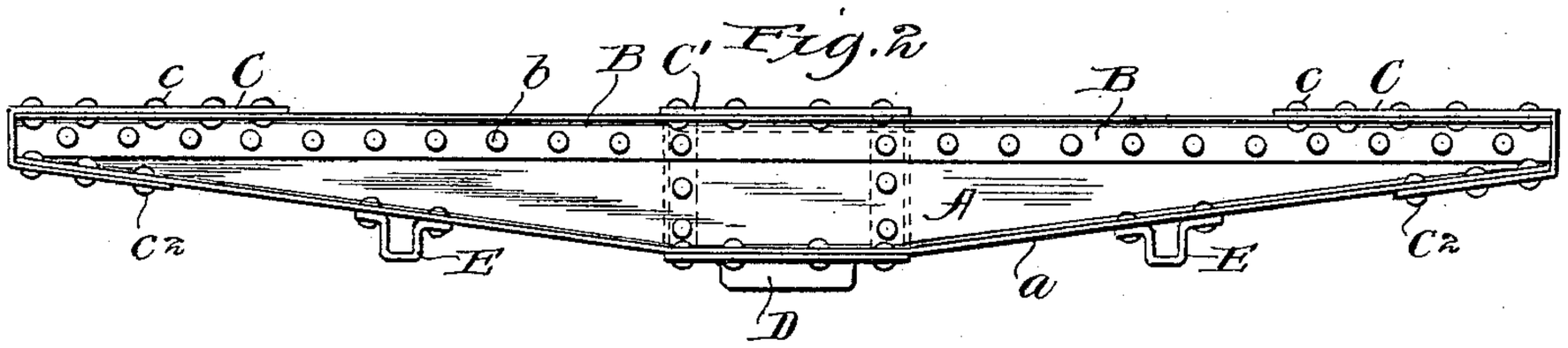


Fig. 3

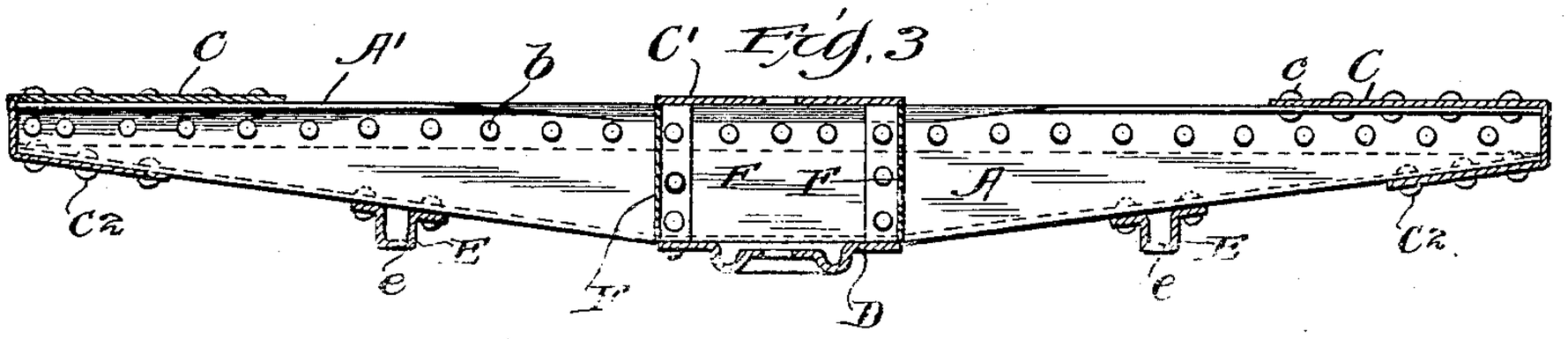


Fig. 4

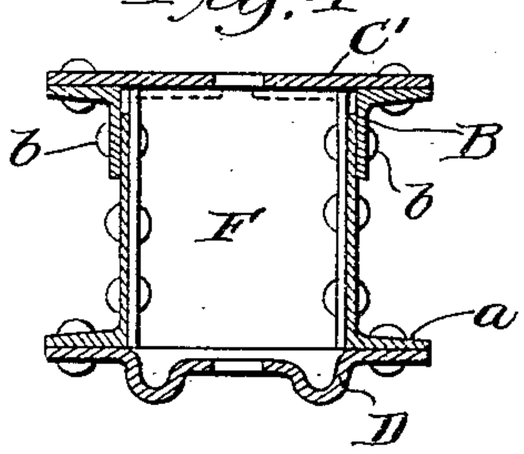


Fig. 5

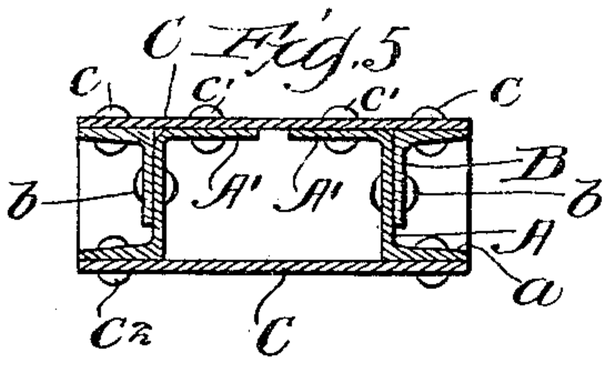
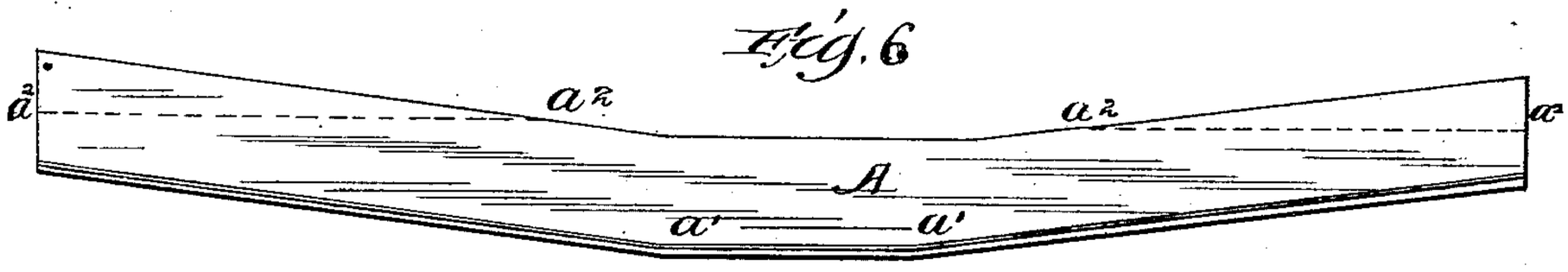


Fig. 6



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Inventors:
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Fig. 7

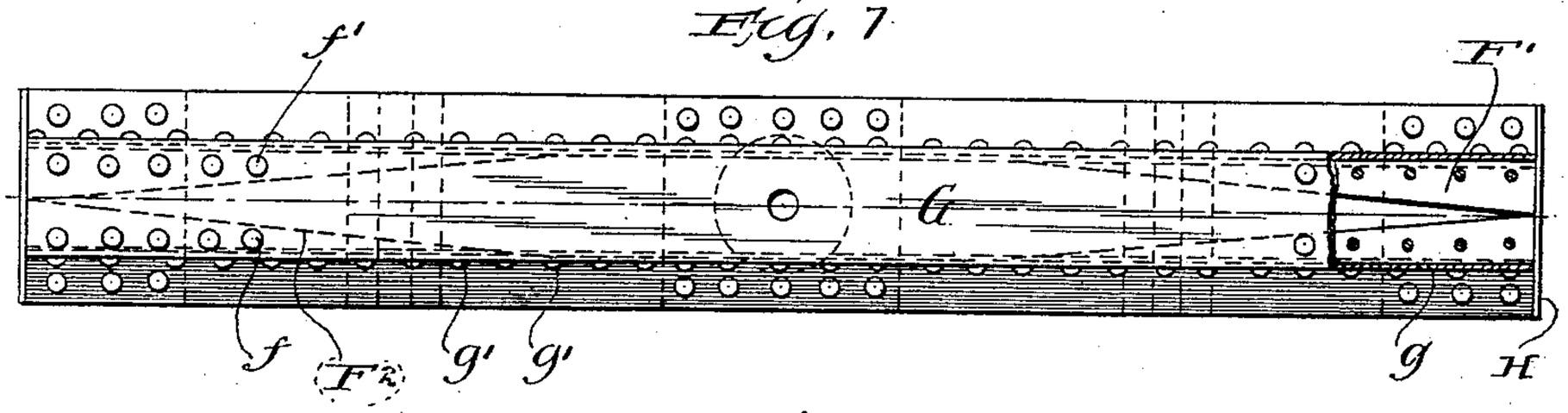

Fig. 8

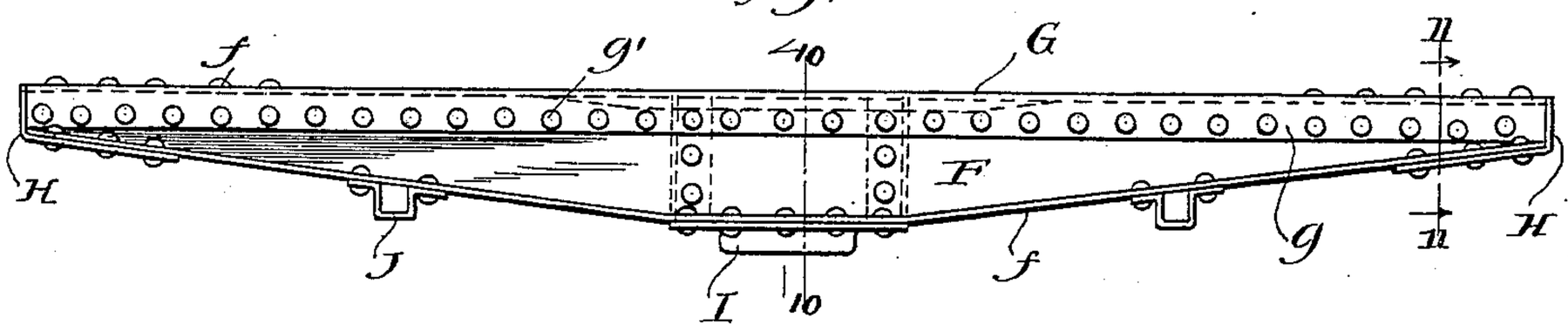

Fig. 9

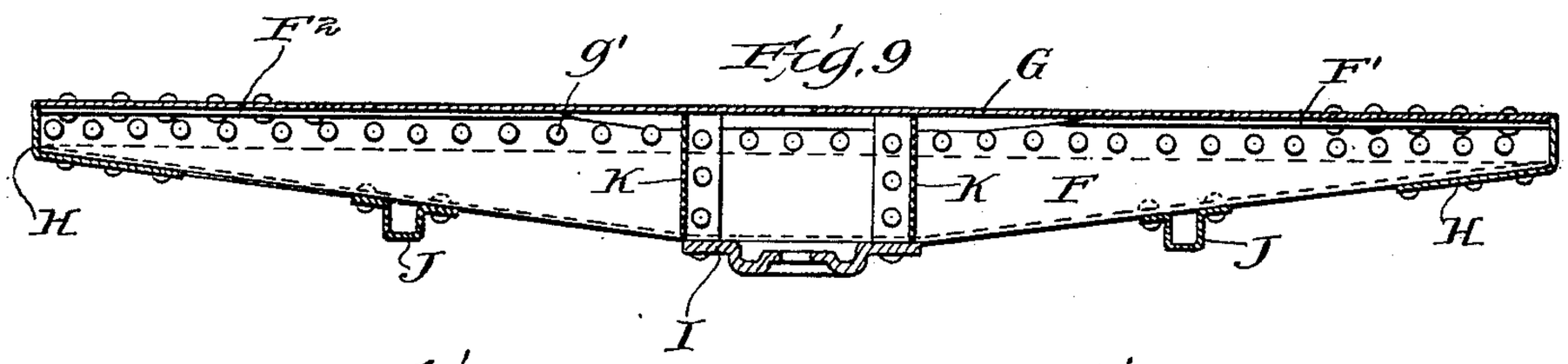

Fig. 10

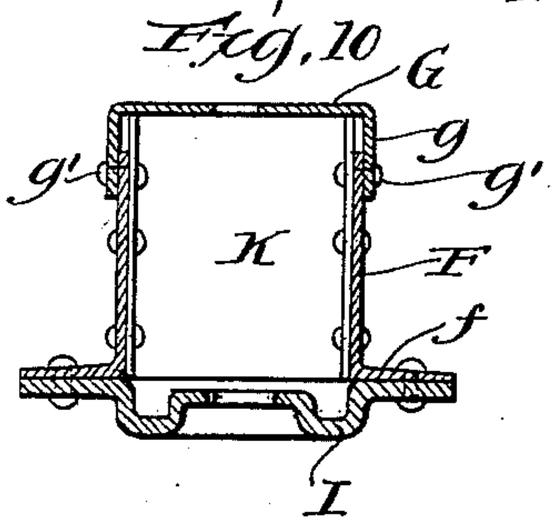

Fig. 11

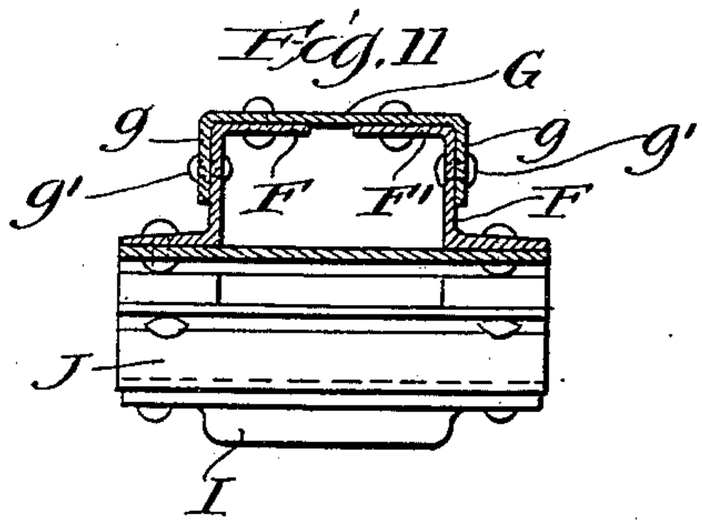

Fig. 12

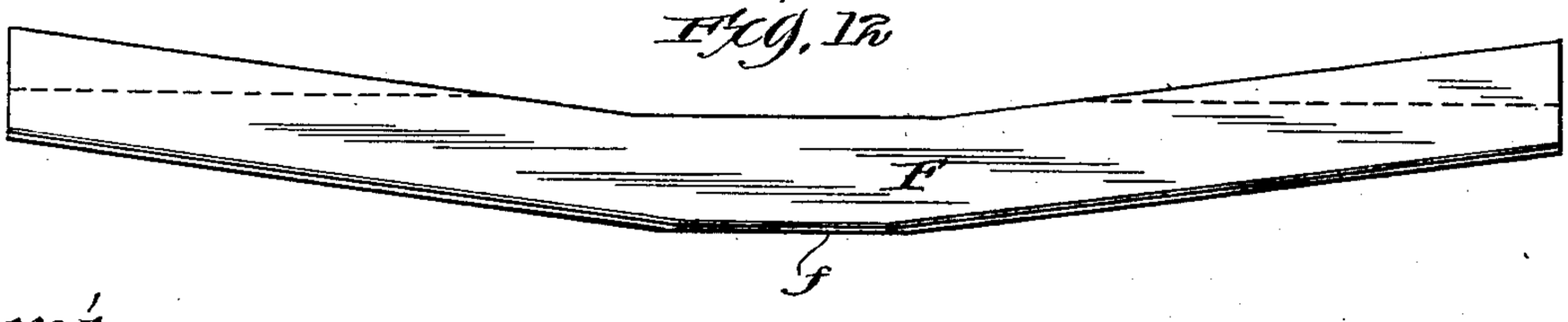

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Fig. 13

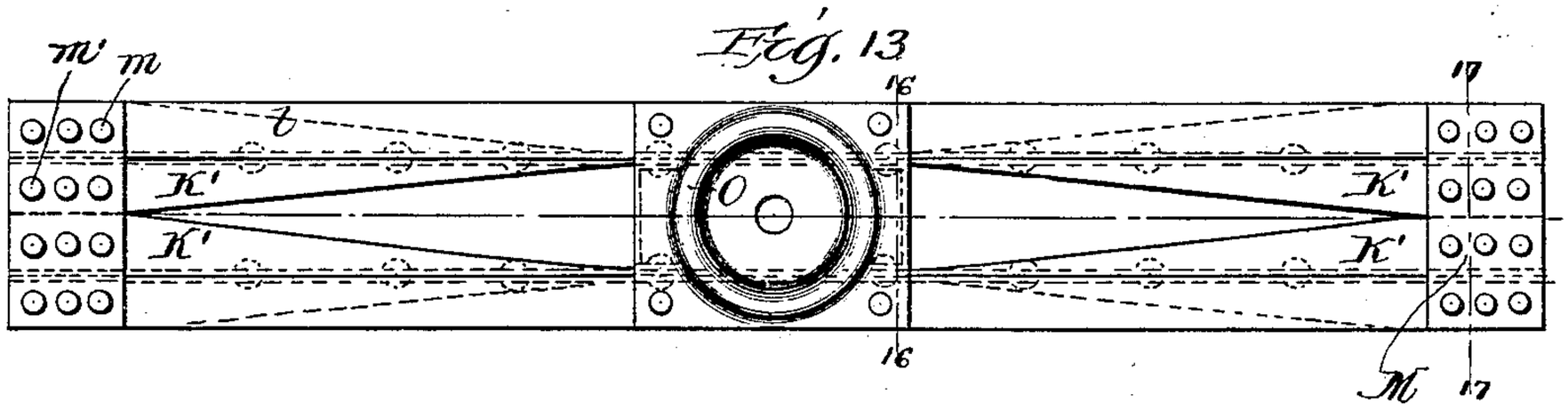


Fig. 14

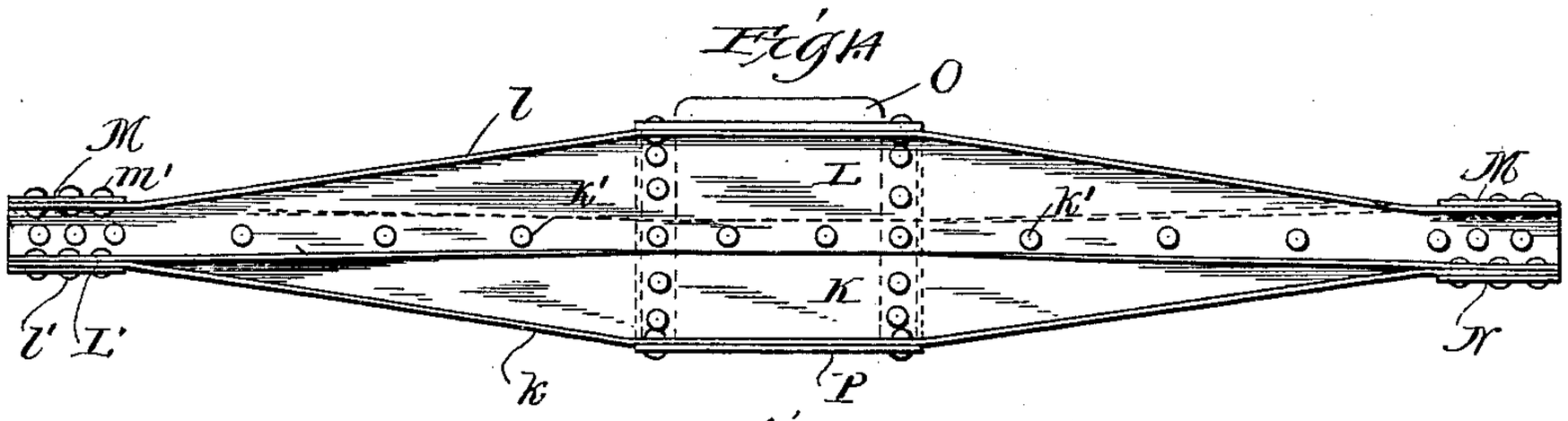


Fig. 15

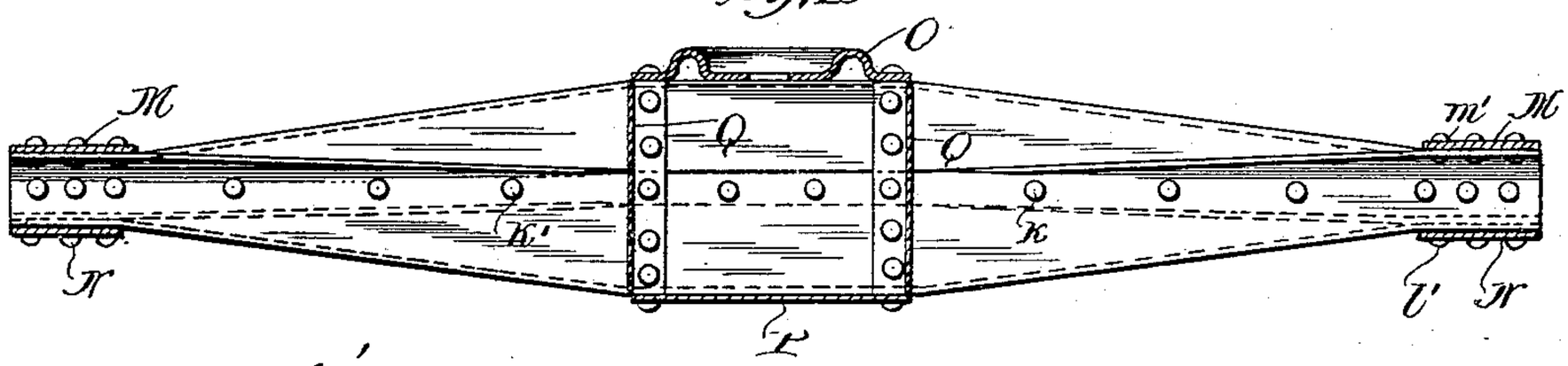


Fig. 16

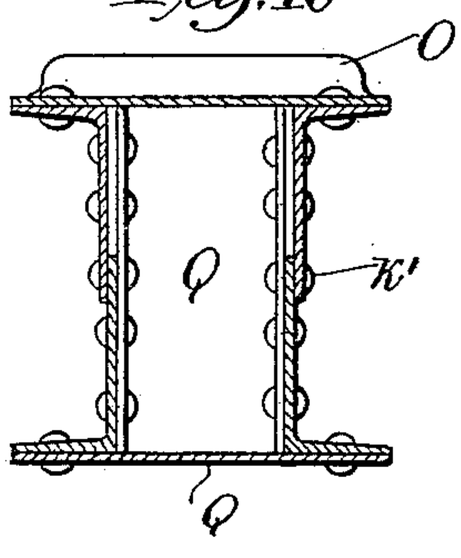


Fig. 17

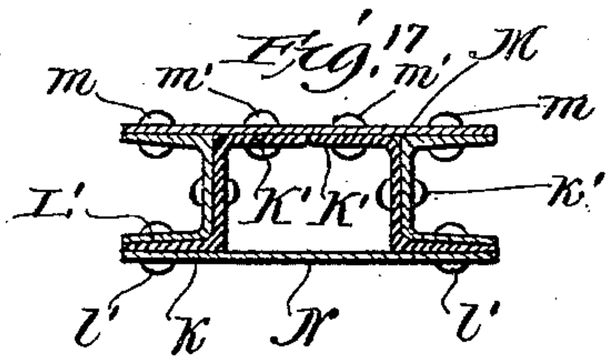
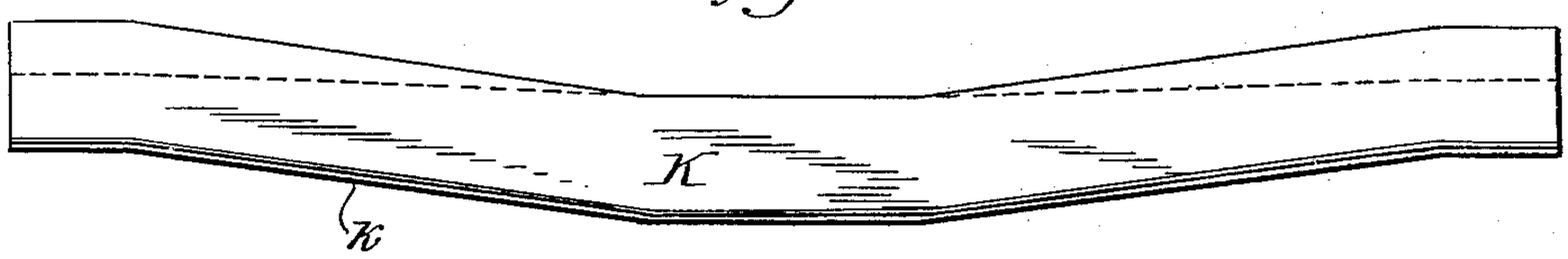


Fig. 18



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UNITED STATES PATENT OFFICE.

DWIGHT BRUCE KENNEDY AND WILLIAM B. SCAIFE, OF PITTSBURG, PENNSYLVANIA.

CAR-BOLSTER.

SPECIFICATION forming part of Letters Patent No. 630,896, dated August 15, 1899.

Application filed January 23, 1899. Serial No. 703,014. (No model.)

To all whom it may concern:

Be it known that we, DWIGHT BRUCE KENNEDY and WILLIAM B. SCAIFE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Car-Bolsters; and we 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 an improved construction in metal car-bolsters of that class consisting of girders having tension and compression members suitably joined by intermediate connecting parts or webs to give strength and rigidity to the bolster.

A bolster embodying our invention embraces as its main or essential parts tension and compression members which converge toward each other at the ends of the bolster and one of which consists of a flanged plate the web of which is vertical and bent at its end portions, at its margins opposite its flanged edge, to form on such margins longitudinal flanges, through the medium of which the ends of such flanged plate are riveted to the ends of the other member to afford a strong and rigid connection between the ends of said members. A bolster embodying this main feature of construction may be used either as a body-bolster for cars or as a truck-bolster.

In the accompanying drawings a bolster embodying the features of the construction above referred to is shown as made of three different forms, two of which are intended for car-body bolsters and the third for a truck-bolster.

In said drawings, Figure 1 is a plan view of a body-bolster. Fig. 2 is a side view thereof. Fig. 3 is a longitudinal vertical section thereof. Fig. 4 is a central cross-section thereof, taken on line 4 4 of Fig. 1. Fig. 5 is a cross-section of the end of the bolster, taken on line 5 5 of Fig. 1. Fig. 6 is a side elevation of the angle plate or bar forming the lower or compression member. Fig. 7 is a plan view of a car-body bolster. Fig. 8 is a side view thereof. Fig. 9 is a longitudinal vertical section thereof. Fig. 10 is a central cross-section thereof, taken on line 10 10 of Fig. 7. Fig. 11 is a cross-section of the end of the bolster, taken on line 11 11 of Fig. 7. Fig. 12 is a side elevation of the angle plate or bar forming the lower or compression member. Fig. 13 is a plan view of a truck-bolster. Fig. 14 is a side view thereof. Fig. 15 is a longitudinal vertical section thereof. Fig. 16 is a central cross-section thereof, taken on line 16 16 of Fig. 13. Fig. 17 is a cross-section of the end of the bolster, taken on line 17 17 of Fig. 13. Fig. 18 is a side elevation of the angle plate or bar forming the lower or tension member.

As shown in Figs. 1 to 6 of the accompanying drawings, the bolster consists of two parallel beams or girders connected by suitable cross-pieces, as hereinafter described. Each girder consists of angle-irons A and B, forming upper or tension and lower or compression members and joined by means of rivets *b*, inserted through their vertical or web portions. The lower or compression member A of each girder consists of an angle iron or plate the web portion of which is of greater width at the center than at the ends thereof and which is provided with an outwardly-directed flange *a* at its lower margin. Said flange *a* is bent or deflected upwardly at the points *a' a'* near the center of the bolster, such upward deflection of the lower flange being produced by bending the entire angle-iron, including the web portion thereof, in the plane of said web portion at the points *a' a'*. The said angle-plates A are originally of the shape in which they are rolled, having parallel top and bottom edges, and tapered form is given to the end portions thereof by bending inwardly the margins of the end portions of the webs along oblique lines, as clearly seen in Fig. 6, which shows the angle-iron after it has been bent vertically at the points *a' a'*, but before it has been bent on such oblique lines, which latter are indicated by the dotted lines a^2 a^2 of said figure. The result of this bending is to form on the upper margin of the web of each angle-iron an inwardly-directed longitudinal flange A', which is of triangular shape, as seen in plan view.

The angle-iron B, constituting the upper or tension member of the girder, is secured to the outer face of the angle-plates A, with

its flange directed outwardly, by means of the rivets *b*, passing horizontally through the depending flange or web of the angle-bar and the web of the angle-plate A. The outwardly-directed flanges of the bars B are connected with the inwardly-directed flanges A′ by means of top cross-plates C, which are secured by rivets *c* to the bars B and by rivets *c′* to the flanges A′ of the members A and which afford a connection between the ends of the members A and B in addition to that afforded by the rivets which unite the webs of said parts and giving great strength and rigidity to the connection between said ends. The cross-plate C also forms a transverse connection between the two girders at the ends of the bolster. The angle-plate or lower member A, together with said angle-bar or upper member B, constitute a flanged beam or girder tapered in its end portions and having at its upper and lower margins outwardly-extending flanges and at its extremities having also at its upper edge inwardly-projecting flanges. Said inwardly-extending flanges serve not only to afford means for attaching the ends of the lower to the ends of the upper member by attachment of the plate C to the said flanges, but also serve to give additional lateral rigidity to the end portions of the girders. The two girders thus constructed are joined by suitable transverse pieces the same as herein shown, consisting of the two end top plates, hereinbefore referred to, a center top plate C′, a central bottom plate D, and cross-pieces E E, which are secured to the lower flange of the beam and have depending parts or ribs *e*, which form the side bearings for the bolster, adapted for contact with the bearing-plates on the truck. The top plate C′ is attached to the side girders by rivets passing through said top plate and the flanges of the angle-bars B.

The central part of the bolster is additionally strengthened by means of vertical transverse tie-pieces F, the same consisting of flanged plates having on their vertical edges flanges which are secured to the inner faces of the two girders by rivets passing through the webs of the plates A. As a means of additionally strengthening the ends of the bolster the end margins of the top plates C are extended around the ends and inwardly along the lower surfaces of the girders, the inwardly-bent extremities of the plates being secured to the flanges *a* of the angle-plates A by rivets c^2.

The longitudinal flanges A′, formed by bending the upper margins of the flanged plates A, as described, afford a means of strongly and rigidly connecting the ends of the plates A and angle-bars B, constituting the compression and tension members of the girders, it being obvious that the top plates D not only serve to join the girders, but by reason of being strongly riveted to the angle-bars B and to the flanges A′ of the angle-plates A serve as an additional connection between the ends of said parts, affording a much stronger connection than would exist in the absence of said flanges A′. It is well understood that the efficiency of a girder of the class here described—namely, one involving the principle of the truss—is greatly increased by making provision for an unyielding connection between the ends of the tension and compression members, as otherwise the strength of the girder will be reduced to that due to the stiffness of the longitudinal members when separated from each other, and it follows that the employment of the said flanges A is of great advantage because affording the desired unyielding connection without increasing the number of parts and with a very slight increase in the quantity of metal used and cost of the girder.

In the construction illustrated in Figs. 7 to 12 the compression member of each girder consists of an angle iron or plate F, which is made like those hereinbefore described and having at its lower edge an outwardly-extending flange *f* and at its end portions inwardly-extending longitudinal flanges F′ F′, as hereinbefore set forth. In this instance, however, the said angle-plates are joined at their upper edges by means of horizontal plates G, provided with depending marginal flanges *g*, which overlap the upper margins of said angle-plates and are secured by rivets *g′* to the same. The said plate G in this instance constitutes the tension members of the girders and also takes the place of the top cross-pieces before described as a means of connecting the girders with each other. Said top plate is not only joined by its flanges to the flanged plates F, but is also secured in its body part or web to the longitudinal inwardly-directed flanges F′ of said flanged plates by means of rivets *f′* in the manner illustrated, so that the tension member is in this instance directly connected with the said flanges F′. In other words the ends of the tension member in this instance are attached to the compression members by two sets of rivets, one inserted through the flanges of the top plate and the other through the body of said plate and the longitudinal end flanges F′. At the ends of the bolster an end plate H′ is applied over the ends of the girders and is carried along the lower surface thereof toward the center of the bolster, such plate being preferably made of sufficient width to extend to the outer margins of the flanges *f* and being secured thereto by rivets.

In the form of bolster last described the flanged margin of the top plate G obviously performs the same function as the angle-bars B of the form of construction first described, the same forming, in effect, the tension members of the girders, of which the flanges on the lower margins of said angle-plates form the compression members. Said bolster (shown in Figs. 6 and 12) is provided with a central bottom plate I and cross-pieces J J, which form the side bearings for the bolster.

Transverse vertical stays K K are provided at the center of the bolster like those hereinbefore described in connection with Figs. 1 to 6.

In Figs. 12 to 18 is shown a form of bolster embodying our invention more especially adapted for use as a truck-bolster, the end portions of the bolster in this instance being inclined on both their upper and lower edges, so as to make the central part of the bolster much thicker or deeper than in the forms hereinbefore referred to. In this instance the bolster consists of two girders, each consisting of a lower tension member K and an upper compression member L, the bolster being arranged to carry the load at its middle and being supported at its ends. The lower member K is generally like the lower members A and F, hereinbefore described, having an integral marginal flange *k* on its lower edge and provided at the upper margins of its end portions with inwardly-bent longitudinal flanges K′, formed by bending the web portions of the member on oblique lines, as seen in Fig. 18. In this instance also said member K is bent in the plane of its web to give inclined position to the flanges *k* at its end portions. The upper member L is shaped much like the lower member, the same having an outwardly-extending integral flange *l* at its upper edge and being bent in the plane of its web to give downward inclination to the end portions of said integral flanges. The web portions of the members K and L are overlapped and joined by rivets *k′*, the web of the upper member being outside of that of the lower member. The upper and lower members of each girder are joined at their ends and at the top of the same by a cross-plate M, which is secured by rivets *m* to the flange *l* of the upper member and by rivets *m′* to the longitudinal top flange K′ of the lower member, said cross-plate also extending across the tops of both girders and connecting the same with each other. The web portion of the upper member L is made originally wider than the vertical width of the ends of the girder, and said web portion is bent outwardly at the lower margin of its end portions on oblique lines, forming outwardly-directed flanges L′ L′, which fit against the end portions of the flange *k* and are rigidly secured thereto by rivets *l′*. This construction of the member L makes it substantially like the member M, the flange L′ acting in the same manner as the flange *k′* to afford a strong and rigid connection between the ends of the upper and lower members forming the girders, the connection in this instance, however, being even more direct, because the flanges of the two members are directly connected by rivets, while in the case of the top flange *k′* the connecting cross-plate M is employed to connect the flanges *k′* and *l*. A bottom cross-plate N is shown as secured to the lower surface of each end of the bolster by the same rivets *l′* which serve to attach together the flanges L′ and *k*. The girders made of the connected members K and L are in this instance shown as joined at the middle of the bolster by a top plate O, a bottom plate P, and vertical cross-stays Q Q, having the form of channel-irons, the flanges of which are riveted to the web portions of the girders.

We claim as our invention—

1. A bolster embracing tension and compression members, one of said members consisting of a flanged plate, the web of which is vertical and tapered at its end portions, and having on such end portions, at its margins opposite its flanged edge, longitudinal flanges, said tension and compression members being rigidly connected at their ends by rivets or the like inserted through the web of such flanged plate and also through the medium of rivets or the like inserted through said longitudinal flanges.

2. A bolster consisting of two connected girders arranged side by side, each girder embracing a tension and compression member, one of which consists of a flanged plate, the web of which is vertical, is tapered at its end portions and provided at the margins of such tapered end portions, opposite its flanged edge, with inwardly-directed longitudinal flanges, the end portions of the girders and of the tension and compression members forming the same being connected by plates to which the said longitudinal end flanges of the main plate are riveted.

3. A bolster consisting of two girders arranged side by side, and each consisting of upper and lower members, of which the lower member consists of a flanged plate, bent in the plane of its web, the web of said member being arranged vertically and its flange directed outwardly, said web being provided at the upper margin of its end portions, with longitudinal, inwardly-directed flanges and cross-plates uniting the ends of the girders to which cross-plates the said longitudinal flanges of the compression members are secured by rivets.

4. A bolster consisting of connected girders arranged side by side and each consisting of a flanged plate, the flange of which is directed outwardly and the web portion of which is vertical and tapered at its end portions and an angle-bar riveted to the outer face of the web portion of the said flanged plate, said girders being united at their ends by cross-plates which are riveted to the flanges of the angle-bars and the flanged plates being provided at their ends with longitudinal flanges, located in the same plane with the flanges of the angle-bars and secured by rivets to the said cross-plates.

5. A bolster embracing tension and compression members one of said members consisting of a flanged plate, the web of which is vertical and tapered at its end portions, the margin of said web portion opposite the flanged edge thereof, being bent on lines which are oblique to said flanged edge to form longitudinal flanges, said tension and com-

pression members being rigidly connected at their ends by rivets or the like inserted through the web of said flanged plate and also through the medium of rivets or the like inserted through said longitudinal flanges.

6. A bolster embracing tension and compression members, one of said members consisting of a flanged plate of equal width throughout its length and bent in the plane of its web to bring the end portions of its flanged edge in oblique positions and having the edge of its web portion bent on oblique lines to form longitudinal flanges at the end portions thereof and to give tapered form to said web; said tension and compression members being joined by means of rivets or the like inserted through said web and also through said longitudinal flanges.

In testimony that we claim the foregoing as our invention we affix our signatures, in presence of two witnesses, this 13th day of January, A. D. 1899.

DWIGHT BRUCE KENNEDY.
WILLIAM B. SCAIFE.

Witnesses:
CHARLES COOKE SCAIFE, Jr.,
MITCHELL MARTIN FREY, Jr.