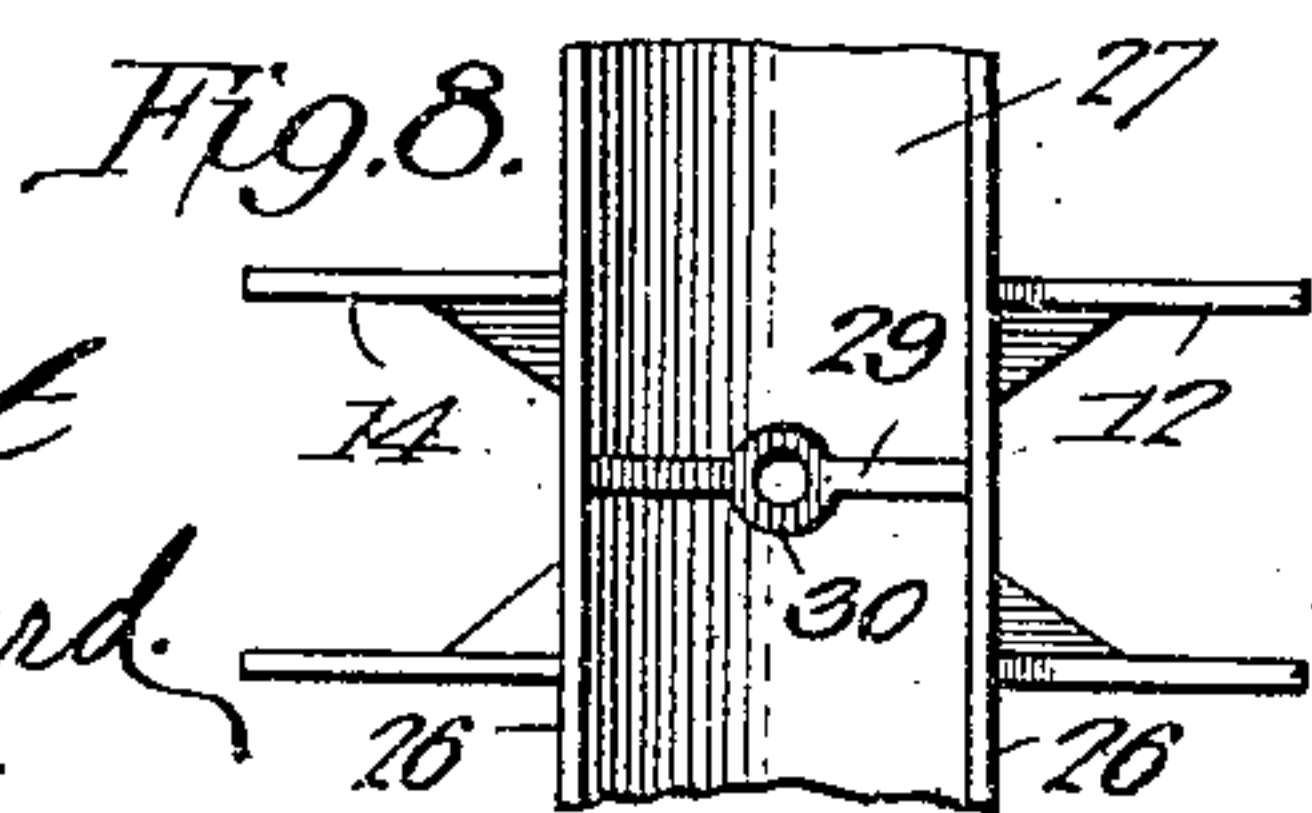
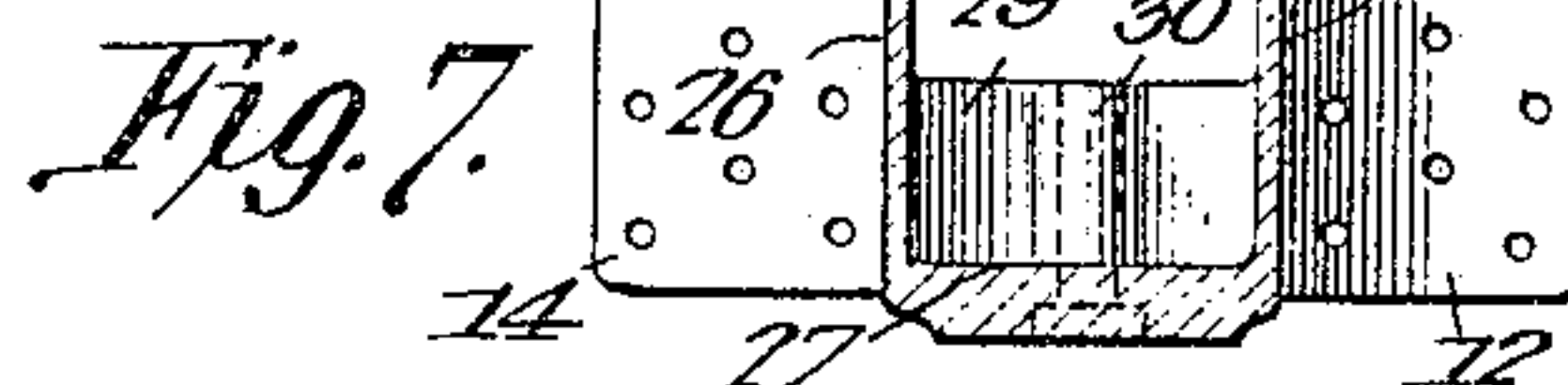
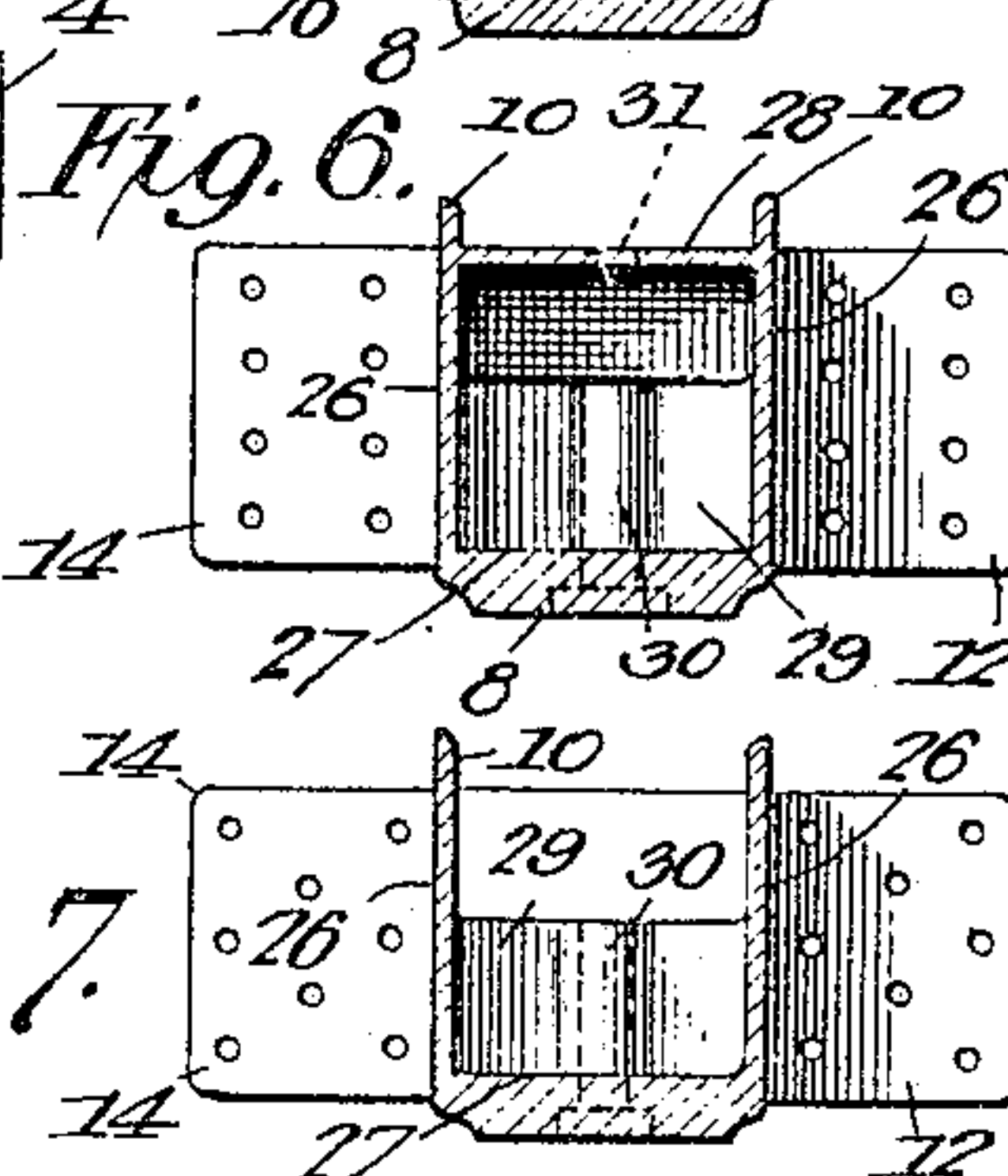
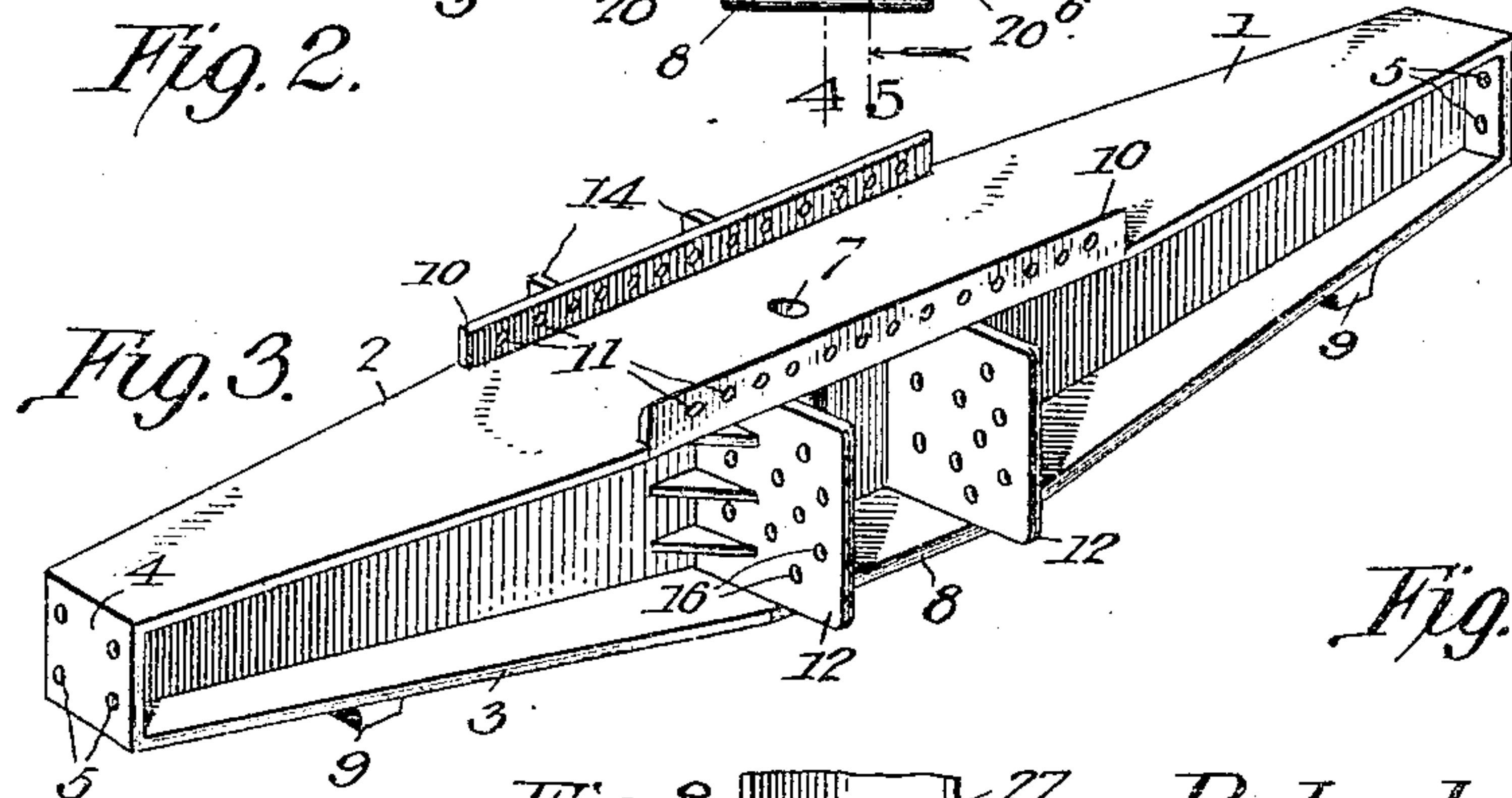
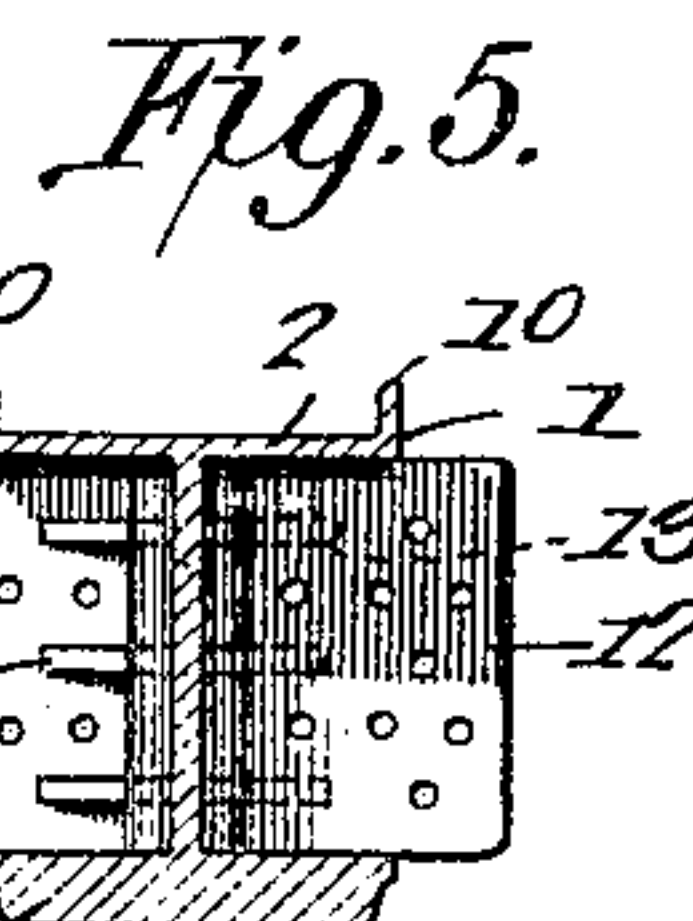
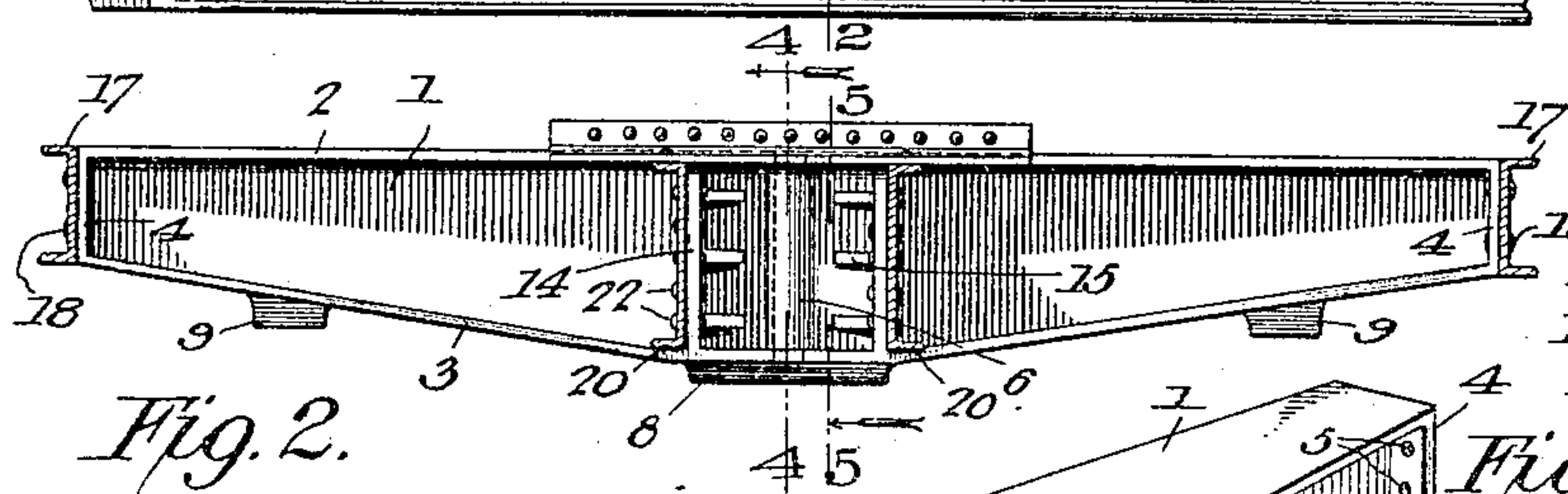
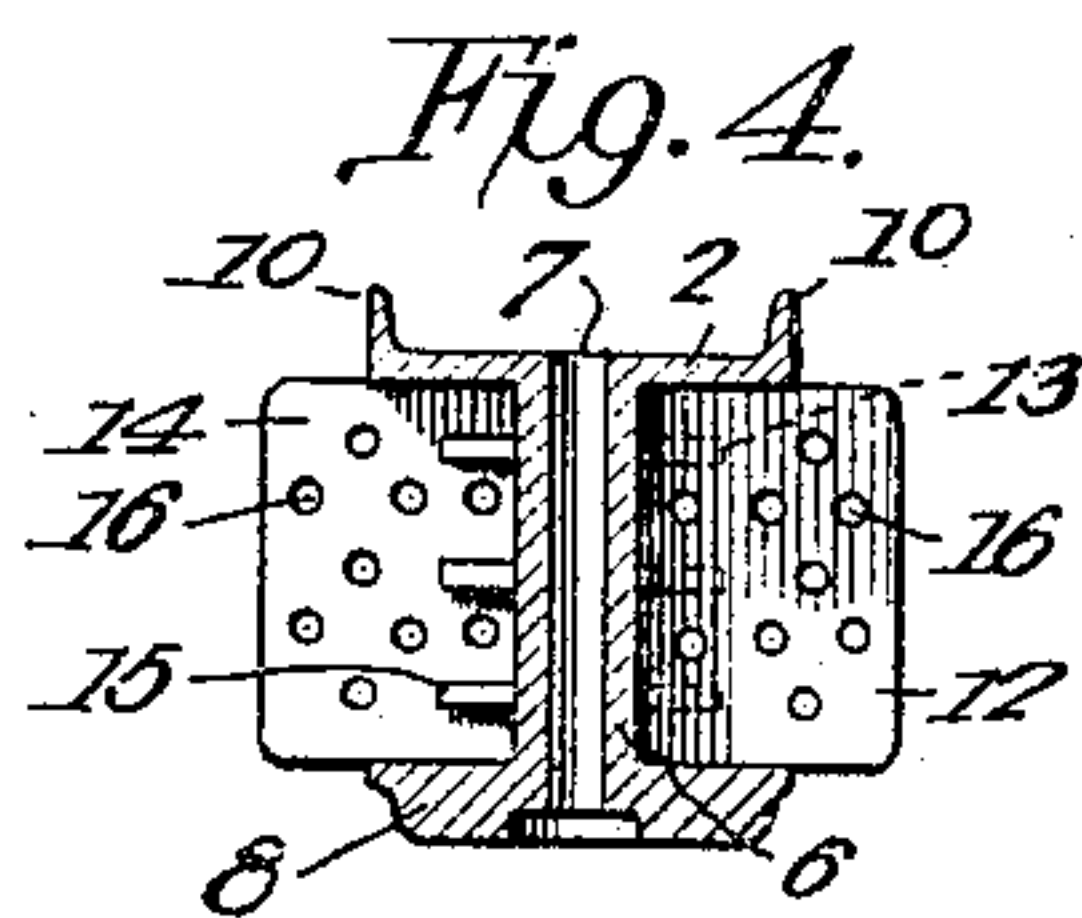
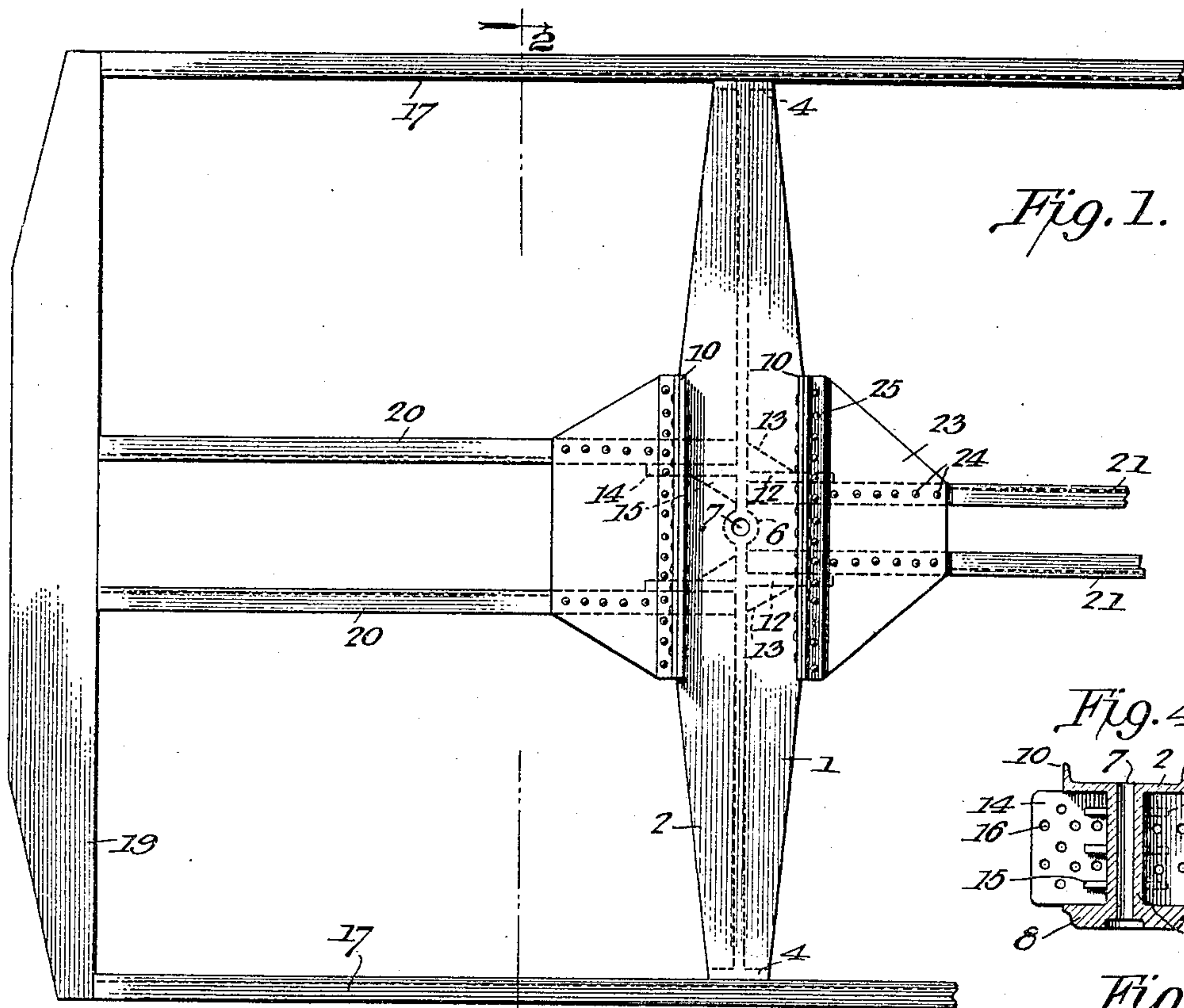


No. 791,979.

PATENTED JUNE 6, 1905.

R. L. ETTINGER.
UNDERFRAMING FOR RAILWAY ROLLING STOCK.
APPLICATION FILED FEB. 6, 1905.



Witnesses

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UNDERFRAMING FOR RAILWAY ROLLING-STOCK.

SPECIFICATION forming part of Letters Patent No. 791,979, dated June 6, 1905.

Application filed February 6, 1905. Serial No. 244,460.

To all whom it may concern:

Be it known that I, ROBERT L. ETTENGER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented a new and useful Underframing for Railway Rolling-Stock, of which the following is a specification.

This invention relates to underframing for railway rolling-stock, and has for its object to overcome certain objectionable features existing in metallic underframing as now commonly constructed.

It is a common practice to employ center sills which are continuous from one end sill to the other end sill, with the body-bolsters secured across the bottoms of the end sills, thereby elevating the underframing to an objectionable extent above the trucks. To bring the underframing down on a level with the body-bolsters, the center sills have been passed through the body-bolsters, thereby weakening the latter, and in other instances the body-bolsters have been built up between and at opposite sides of the center sills, which is of course a weak structure. Additional to these objections is the fact that when a continuous center sill becomes bent or broken it is necessary to take out the entire sill for repairs or to replace the same, and to take out the sill it requires a general disturbance of the entire underframing. In view of these objections it is proposed to have the center sills made up of longitudinal sections which are entirely independent of one another and extend, respectively, between the body-bolsters and between the end sills and the adjacent body-bolsters of the underframing, whereby any individual center sill may be removed and replaced without interfering with any of the other sill-sections or with any of the other portions of the underframing.

Another object of the invention is to provide for spacing the pairs of center sills at any predetermined distances, according to the nature of the car. For instance, the adjacent end sections of the sills may be spaced at any predetermined interval to accommodate the draft-rigging, while the middle sections of the

center sills may be spaced at a different interval, particularly to accommodate hopper-bottoms of various sizes and styles.

By dividing the center sills into sections it is possible to have each body-bolster formed in a single casting, thereby materially decreasing the expense, while at the same time increasing its strength and durability.

With these and other objects in view, the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made, within the scope of the claims, without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a plan view of one end portion of an underframing embodying the features of the present invention. Fig. 2 is a cross-sectional view on the line 2 2 of Fig. 1. Fig. 3 is a detail perspective view of the body-bolster. Fig. 4 is a cross-sectional view on the line 4 4 of Fig. 2. Fig. 5 is a similar view on the line 5 5 of Fig. 2. Figs. 6 and 7 are similar cross-sectional views illustrating modified forms of the bolster. Fig. 8 is a plan view of Fig. 7.

Like characters of reference designate corresponding parts in each and every figure of the drawings.

In explanation of the present invention I will first describe a preferred embodiment of body-bolster and then describe the assembly of the sills with this form of bolster in the construction of the present underframing.

As best illustrated in Figs. 3, 4, and 5 of the drawings, it will be noted that the present bolster has the general shape of an I-beam, the top edge of which is disposed horizontally and its under edge inclined upwardly from the middle thereof. The top and bottom flanges 2 and 3 of the bolster are comparatively broad and are connected at their ends by the end flanges 4, which are pierced by suitable openings 5 for convenience in riveting the side

sills to the ends of the bolster. Upon reference to Fig. 1 it will be noted that the top and bottom flanges taper in opposite directions from the middle of the bolster, and while this is desirable for the purpose of somewhat reducing the weight of the bolster without impairing the strength thereof it is, of course, not absolutely necessary, as the opposite longitudinal edges of the flanges may be parallel or diverged whenever such forms may be desirable. At the middle of the bolster there is an upright cylindrical enlargement 6, through which extends an upright opening 7, intersecting the top and bottom of the bolster for the reception of the usual king-bolt. For a suitable distance at each side of the bottom of the king-bolt opening the bottom flange of the bolster is thickened, as at 8, with its under side substantially parallel with the top of the bolster, so as to form the center bearing. Suitable side bearings 9 are formed integrally upon the bottom of the bolster adjacent the opposite ends thereof. For a suitable distance at opposite sides of the center of the bolster the opposite edges of the upper flange 2 are parallel and provided with upstanding flanges 10, which are pierced by corresponding perforations 11. At one side of the bolster there is a pair of upstanding integral wings 12, disposed equally at opposite sides of the king-bolt opening 7 and extending throughout the distance between the top and bottom flanges 2 and 3 and braced at their upper sides by a vertical series of substantially horizontal webs 13. Similar wings 14 are provided upon the opposite side of the bolster and usually spaced at a less distance than the wings 12, the bracing webs 15 for the wings 14 being located at the inner sides of the wings for a purpose as will hereinafter appear. Each of the wings 12 and 14 is provided with a plurality of perforations 16 for use in riveting the center sills to said wings. With a body-bolster of this character the side sills 17 of channel-iron are applied to the end flanges 4 and rigidly connected thereto by means of rivets 18 passed through the perforations 5, as best shown in Fig. 2 of the drawings, corresponding ends of the side sills being connected by a suitable end sill 19. (Shown in Fig. 1.) By this arrangement it will be understood that the end sills, the side sills, and the bolsters have their upper faces in the same horizontal plane, whereby the underframing is brought down close to the truck-bolster, which is a very important consideration in the construction of rail-way-cars.

As hereinbefore indicated, it is an important object of the present invention to obviate the employment of continuous center sills to which the draft and buffing strains are ordinarily applied, and this result is attained as illustrated in Fig. 1, wherein it will be noted that the spaced center-sill sections 20 between the bolster and the end sill are entirely inde-

pendent of the middle center-sill sections 21, which extend from one bolster to the other bolster. The end center-sill sections 20 are connected in any suitable manner to the adjacent end sill 19, with their inner ends resting upon the bottom flange 3 of the bolster and connected to the wings 14 by means of rivets 22. Where the webs 15 are at the inner sides of the wings 14, the sill-sections are of course applied to the outer sides of the wings, and vice versa. The ends of the middle center-sill sections rest upon the adjacent portion of the base-flange of the adjacent bolster and are bolted to the wings 12, Fig. 1 of the drawings showing the sill-sections 21 upon the inner sides of the wings 12, and thereby closer together than the sill-sections 20. It will now be understood that the middle center-sill sections are entirely independent of the end center-sill sections, and each of the sections may be replaced without disturbing any of the other sections or any of the other portions of the underframing, whereby repairs may be made at small cost in a very simple and expeditious manner.

To further brace the connection between each pair of center-sill sections and the bolster, a flat plate 23 is applied to the tops of the sills and snugly against the adjacent upstanding flange 10 at the top of the bolster, said plate projecting at opposite sides of the sills and secured thereto by rivets 24, piercing the top flanges of the sills. Connection is had between the plate and the flange 10 by an angle-bar 25, fitted in the angle between the plate and the flange and riveted to these members. This manner of connecting the sills to the bolster is a very important feature of the present invention in that the extension of each plate 23 beyond the sills and against the bolster effectually braces the sills against the severe lateral strains to which they are subjected, particularly in rounding curves.

It will here be explained that the end center-sill sections serve to support the draft-rigging, and therefore must be spaced at a predetermined distance to accommodate some prescribed form of car-coupler. Where the center sills are continuous between the end sills of the underframing in the ordinary construction, the space between the middle portions of the center sills is of course determined by the spacing of the ends of the sills to accommodate the draft-rigging, whereas in the present invention the middle center-sill sections being independent of the end sections said middle sections may be spaced to accommodate the conditions of the bottom of the car, which is a very important feature in the construction of hopper-bottom cars wherein the middle sections of the center sills may be brought very close together to accommodate hoppers of greater width than can be obtained with the ordinary arrangement of continuous center sills. This independent feature of the sections

of the center sills is emphasized by the fact that it is desirable to have comparatively deep middle center-sill sections between the bolsters to properly support the weight of the car and the load thereon, while the end sections for the support of the draft-rigging being comparatively short need not be so deep as the middle sections, and therefore by producing the middle sections independently of the end sections a considerable saving may be made in the cost thereof, thereby allowing the designer considerable latitude, while at the same time complying with the law and requirements with respect to the coupler and the height of the car.

I am aware that center sills have been made in sections; but these sections have been successively coupled together and, in effect, are continuous sills, for the reason that they are subjected throughout their lengths to the draft and buffing strains, and therefore have not the advantage of the present arrangement, wherein each section is entirely independent of the other sections, and the body-bolsters are interposed between the middle and end sections, wherefore draft and buffing strains do not come upon the middle sill-sections.

Another important advantage of the present invention resulting from the independent sectional feature of the center sills is the fact that the body-bolster may be formed in a single casting instead of being built up and is not weakened by openings for the reception of the center sills. Moreover, by having the ends of the sills abut the sides of the bolster all parts of the underframing are in substantially the same plane and the body of the car thereby brought down into the lowest possible proximity to the trucks without sacrificing the underframing or any of the other parts of the car.

In addition to the I-beam form of bolster I have conceived another embodiment, (shown in Fig. 6,) wherein the bolster is in the nature of a hollow casting having substantially parallel upstanding sides 26, a bottom 27, and a top 28, the bottom of the bolster being provided with a thickened portion to form the center bearing 8, as described for the other form of bolster. This modified form of bolster of course has the upstanding flange 10 and the wings 12 and 14 and in addition is provided at its center with a transverse web 29, rising for a suitable distance within the bolster and provided at its center with a cylindrical enlargement 30, pierced by a vertical passage for the accommodation of a king-bolt, the top of the bolster being provided with an opening 31 in alinement with the passage for the introduction of the king-bolt.

A still further modification of the bolster has been shown in Figs. 7 and 8, wherein the essential features of the bolster, as explained, for the first two embodiments are retained, the only essential difference between the last

form and the form shown in Fig. 6 residing in the omission of the top 28, whereby the body of the bolster is in the nature of a channel-beam rather than as a hollow box.

From the foregoing description it will be understood that the carrying out of the present invention does not require any change in the car-body and the draft-rigging as now commonly employed, while at the same time it gives the designer considerable latitude in the construction of the bottom of the car, particularly in hopper-bottom freight-cars, and permits of the convenient adaptation of the underframing to various peculiarities in the construction of car-bottoms.

In addition to accommodating the underframing to peculiarities in the construction of car-bottoms the present invention enables the designer to always comply with the law and requirements governing the height of the car and the relation of the draft-rigging without sacrificing strength, capacity, or any other of the essential features of freight and passenger cars.

Having fully described the invention, what is claimed is—

1. An underframing for railway rolling-stock including a body-bolster having a pair of spaced upright wings projected at one side thereof and provided with an upstanding flange rising from the top of the bolster across the wings, a pair of center sills secured to the wings, a brace-plate secured to the tops of the sills across the tops of the wings and projected at opposite sides of the sills, and an angle-bar fitted in the angle between the brace-plate and the flange and secured to said members.

2. A body-bolster having a king-bolt opening, upstanding longitudinal flanges rising from the top of the bolster at opposite sides of the king-bolt opening, a pair of upstanding wings projected at each side of the bolster with the members of each pair of wings located at opposite sides of the king-bolt opening, one pair of wings being spaced at a greater interval than the other pair and having substantially horizontal bracing-webs extending between the outer sides of the wings and the bolster, the other pair of wings having substantially horizontal brace-webs extending between their inner sides and the bolster.

3. A body-bolster having a king-bolt opening and a pair of upstanding longitudinal flanges rising from the top of the bolster at opposite sides of the king-bolt opening.

4. A body-bolster consisting of a single casting including an upright longitudinal web having a central upright enlargement pierced by an upright passage for the reception of a king-bolt, top and bottom flanges projected at opposite sides of the web, and upright end flanges projected at opposite sides of the web and connecting the top and bottom flanges.

5. A body-bolster having an upstanding longitudinal flange rising from the top thereof and projecting at opposite sides of the middle of the bolster.
- 5 6. A body-bolster having upstanding front and rear longitudinal flanges rising from the top thereof and projecting at opposite sides of the middle of the bolster.
- 10 7. A body-bolster having front and rear pairs of upstanding wings projected laterally therefrom and with their members lying at opposite sides of the middle of the bolster, and front and rear longitudinal flanges rising from the top of the bolster and projecting at 15 opposite sides of the middle thereof across the tops of the respective wings.
- 20 8. A body-bolster comprising a single casting including an upright longitudinal web having substantially horizontal top and bottom flanges projected at opposite sides of the web, upright end flanges projected at opposite sides of the web and connecting the top and bottom flanges, front and rear pairs of upright wings projecting from the longitudinal web and disposed at opposite sides of the 25 middle of the bolster, and front and rear longitudinal flanges rising from the front and rear edges of the top flange and projecting at opposite sides of the middle of the bolster across the tops of the respective pairs of wings. 30
9. A body-bolster having an upright longitudinal flange projecting at opposite sides of the middle of the bolster.
10. A body-bolster having an upright wing projecting laterally from the bolster, and 35 an upstanding longitudinal flange extending across the wing.
11. A body-bolster having an upright wing projecting laterally from the bolster, and an upstanding longitudinal flange extending 40 across the top of the wing.
- In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.
- ROBERT L. ETTINGER.
- Witnesses:
J. H. JOCHUM, Jr.,
J. ROSS COLHOUN.