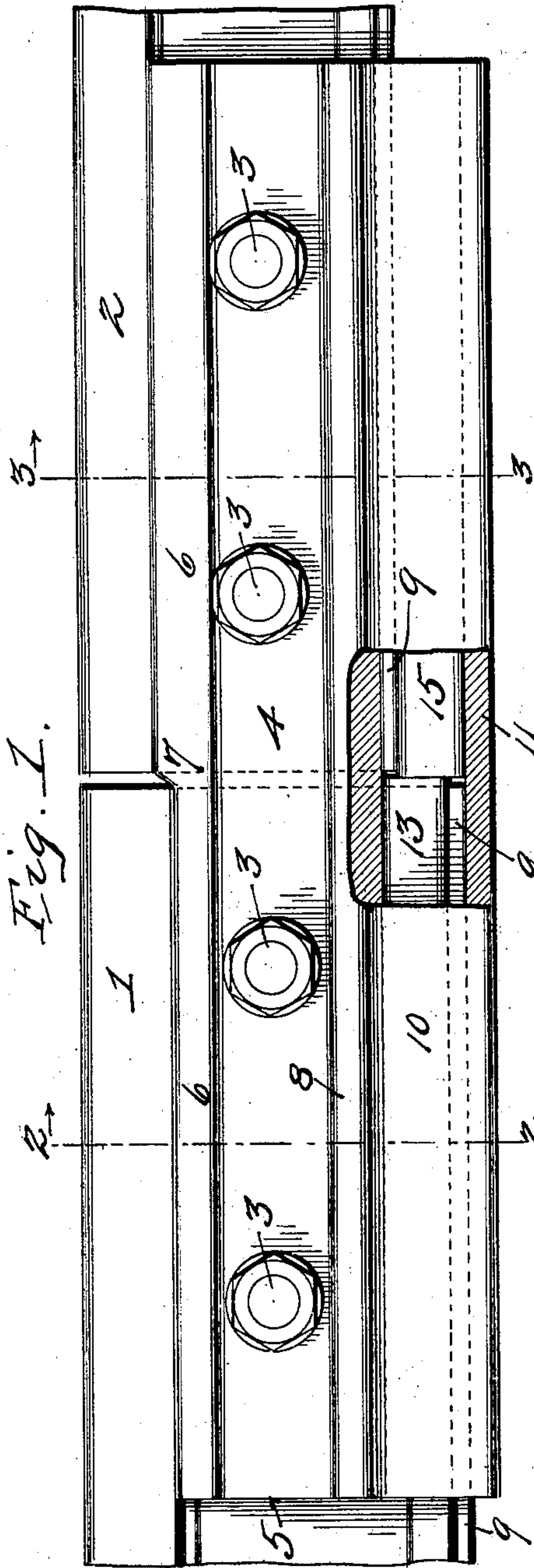
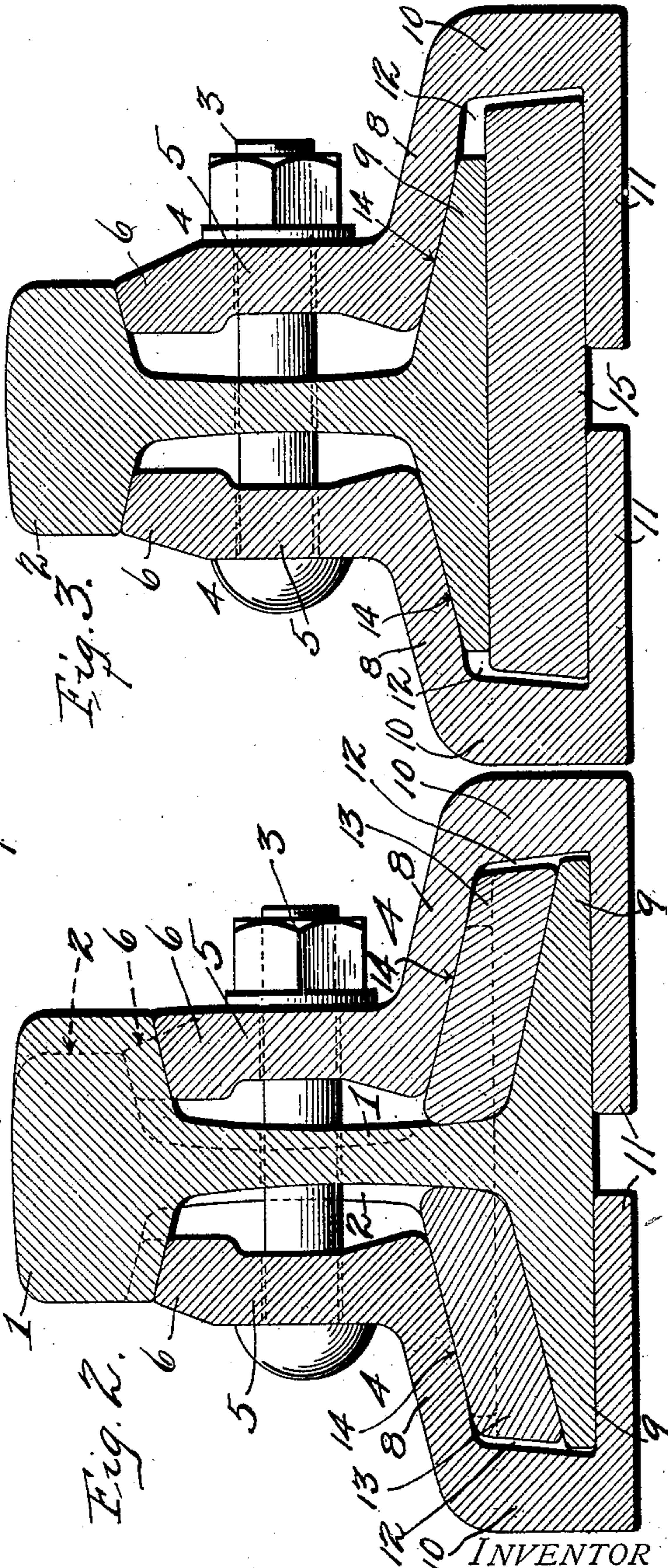


920,817.



WITNESSES:

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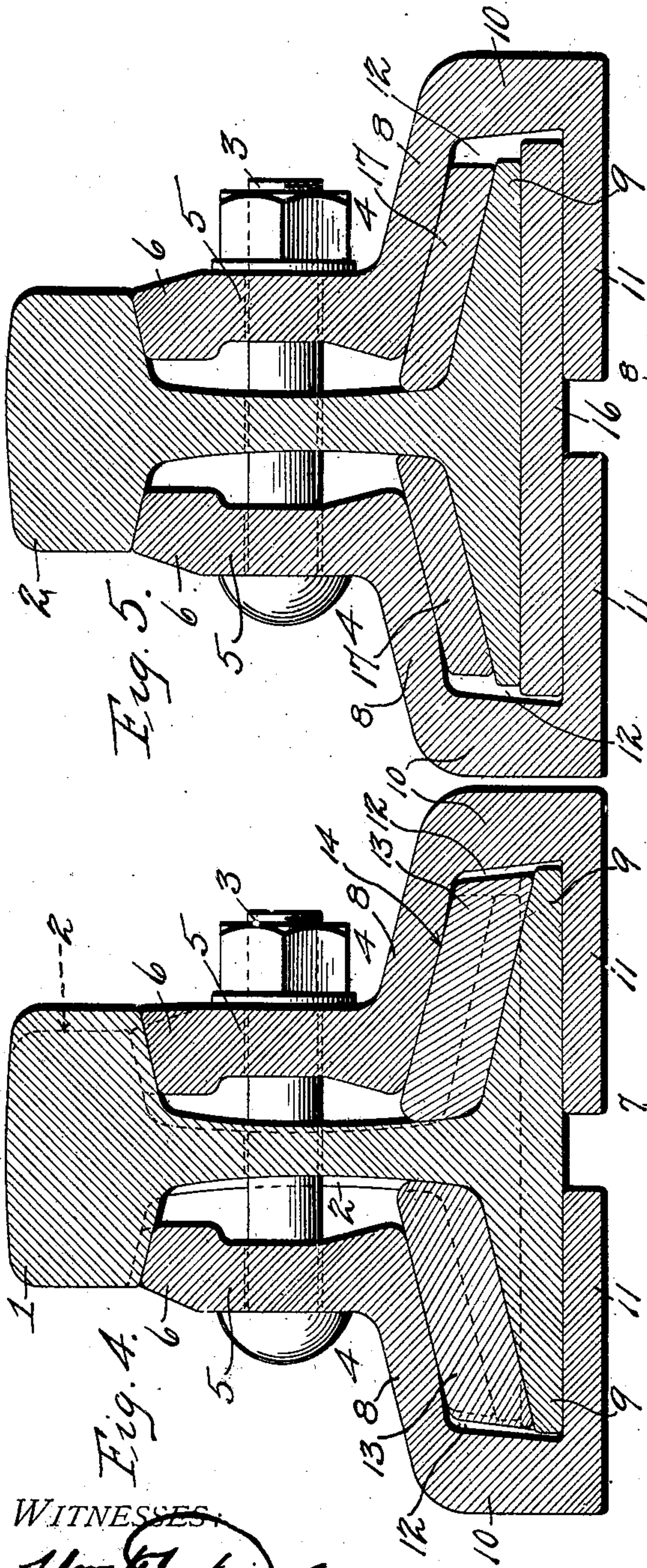
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Patented May 4, 1909.
 3 SHEETS—SHEET 2.



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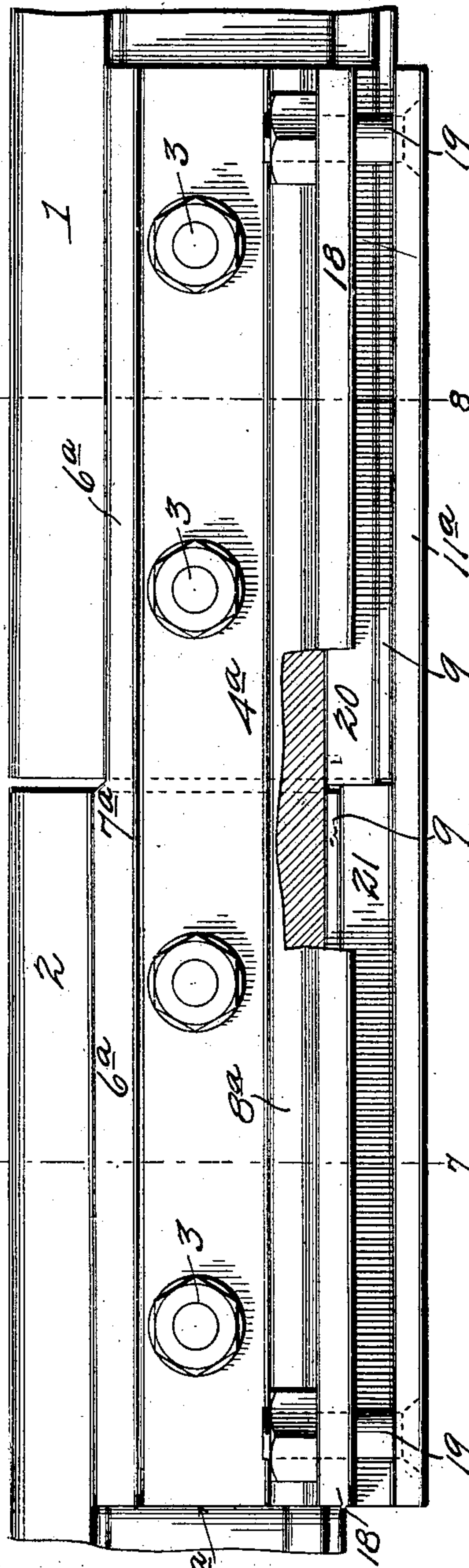


Fig. 6.

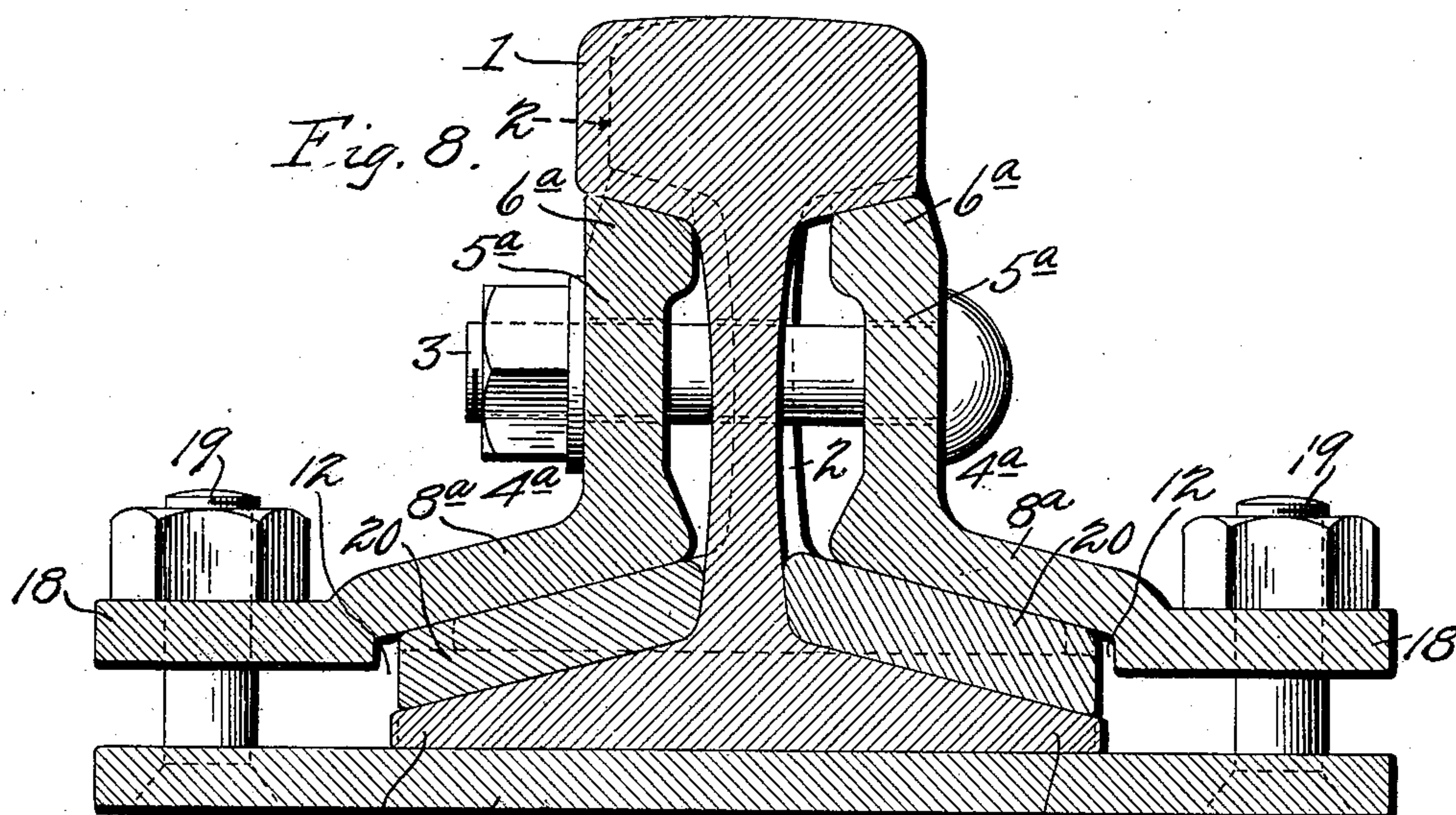
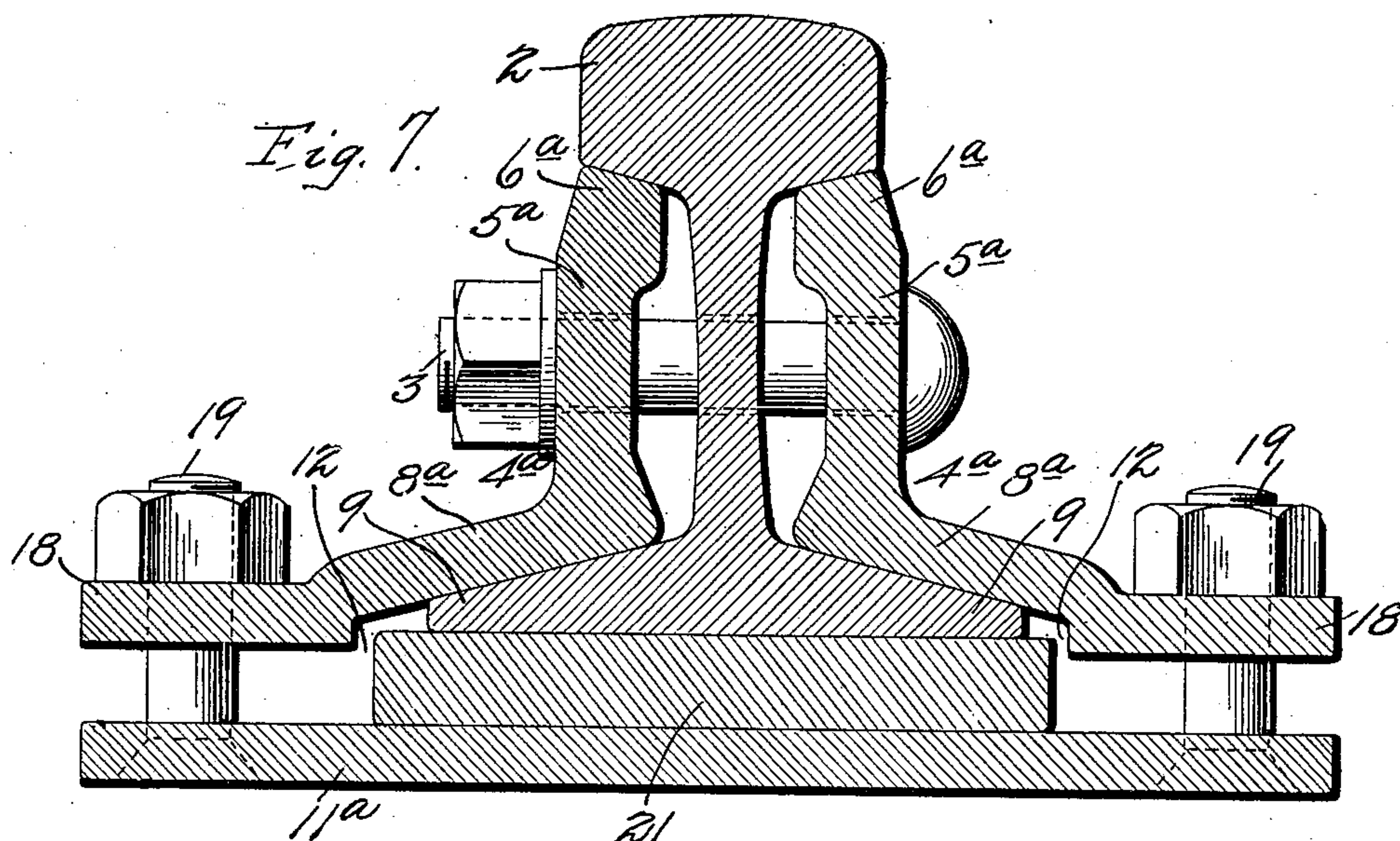
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COMPROMISE RAIL JOINT.
APPLICATION FILED NOV. 30, 1908.

Patented May 4, 1909.
3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

BANCROFT G. BRAINE, OF NEW YORK, N. Y., ASSIGNOR TO THE RAIL JOINT COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

COMPROMISE RAIL-JOINT.

No. 920,817.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed November 30, 1908. Serial No. 465,159.

To all whom it may concern:

Be it known that I, BANCROFT G. BRAINE, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Compromise Rail-Joints, of which the following is a specification.

This invention relates to the subject of rail joints of the compromise or step type, which are employed to connect rails of different heights and sections so that the tops and inner sides of these dissimilar rails are supported in alinement.

Heretofore, in the formation of joint bars for use in a compromise or step joint, the bars are generally made of steel or malleable iron castings, and of a design and configuration corresponding to that of the rail sections to be united, besides providing for the stepped relation of the rail supporting base sections by making the base supporting section for the lighter rail thicker than the other, thereby disposing the upper supporting faces of the separate base sections in different elevations, that is, in different horizontal planes. This well known construction, involving the idea of a thick, heavy rail-supporting base section for light rail ends, and a relatively thinner rail supporting base section for heavy rail ends, necessarily provides a joint bar in which one end is much heavier than the other, with the consequence of there being an uneven distribution of weight and material. It is for the purpose of improving these structural features that the present invention is designed.

To this end the invention has in view an improved compromise or step joint embodying in its organization joint bars of uniform design and dimensions throughout, and in which the weight and thickness of material are uniformly distributed over the entire length of the bar, thereby materially contributing, not only to the lightness of the joint bar and to its facility of manufacture by the ordinary rolling mill processes, but also serving to more evenly distribute strains imposed thereon by the load.

A further object of the invention is to embody the above features in a rail point of the base supporting type, that is, of the type having rail supporting base sections or base plates underlying the rails.

Also, the invention has in view a construction possessing special utility in its application to joint bars of the continuous type, and preserving all of the well known and desirable functions of that class of bars, while at the same time effectually performing the function of stepping and alining, as well as supporting, dissimilar rails.

With these and many other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated, and claimed.

The essential features of the invention involved in carrying out the objects above indicated, are necessarily susceptible to embodiment in various forms of construction without departing from the scope of the invention, but certain preferred and practical embodiments are exemplified by the accompanying drawings, in which:

Figure 1 is a side elevation of a compromise rail joint constructed in accordance with the present invention, and showing the latter embodied in a structure involving the employment of joint bars of the continuous type. Fig. 2 is an enlarged cross sectional view on the line 2—2 of Fig. 1. Fig. 3 is an enlarged cross sectional view on the line 3—3 of Fig. 1. Figs. 4 and 5 are sectional views similar to Figs. 2 and 3, but illustrating a different arrangement of the filler blocks to meet a condition where the two rails do not vary so much in weight. Fig. 6 is a side elevation, partly in section, of a modification of the invention, wherein the rail supporting base plate is a separate part, and has a bolted or equivalent connection with the side angle bars. Fig. 7 is a vertical cross sectional view on the line 7—7 of Fig. 6. Fig. 8 is a similar view on the line 8—8 of Fig. 6.

Like references designate corresponding parts in the several figures of the drawings.

As above indicated, the invention claimed herein possesses special utility in its application to a compromise rail joint involving the use of side joint bars of the conventional continuous type, and as shown in Figs. 1 to 4, inclusive, a joint of that type constructed in accordance with the present invention includes in its general organization the dissimilar service rails 1 and 2 of differ-

ent height and section, the usual joint bolts 3, and the oppositely arranged side joint bars 4. Each of the side joint bars 4, being of the conventional continuous design, is so patterned and formed that the same is provided with an upright splice member or girder 5 having at its upper edge a thickened bearing head 6 offset at a central point, as at 7, so that the separate portions of said head, respectively at opposite sides of said offset, will engage against the under sides of the heads of the dissimilar rails 1 and 2, as plainly shown in Fig. 1 of the drawings. At the lower edge of its upright splice member 5, which fits the fishing spaces of the rails, each joint bar 4 is formed with an outwardly extending foot flange 8 lying above the base flanges 9 of both rails and having integral with the outer edge portion thereof, a pendent flange extension 10 carrying an integral inwardly extending horizontal rail supporting base plate 11 underlying the base flanges of both rails; there being a continuous flange receiving pocket or space 12 provided between the flange 8 and the base plate 11 for the reception of the base flanges of the rails.

A characteristic and distinguishing feature of the present invention resides in the fact that the flange receiving pocket or space 12 of each joint bar 4 is very large, that is to say, the vertical height of such pocket or space is sufficiently great to permit the same to accommodate the base flanges of two rails differing greatly in height and section, or differing greatly in weight as it is more usually termed. Also, this large flange receiving pocket or space 12 accommodates therein the base flanges of all of the ordinary weights of standard rail sections, and admits of the employment of suitable means for firmly chocking the rails within the joint bars in their proper service relation. In this connection, it is to be further observed that the integral rail supporting base plate 11 of each joint bar extends the full length of the latter from one end to the other, and is intended to be of uniform thickness throughout. Also, the said base plate is arranged in the same longitudinal plane throughout and has no stepped supporting surfaces.

To provide for stepping the dissimilar rails within the opposite joint bars 4 constructed as described, the present invention contemplates utilizing suitable means for rigidly chocking the base flanges 9 of the rails within the flange receiving pockets or spaces 12. While this may be accomplished in various ways, a preferable and practical construction is the one shown in the drawings, viz: that of employing filler blocks or equivalent members. Referring particularly to the construction and arrangement of parts illustrated in Figs. 1, 2, and 3 of

the drawings, the larger rail 1 is illustrated as being of such a size that the base flanges 9 thereof take a direct bearing support on the upper sides of the base plates 11, and in order to rigidly maintain this position of the larger rail, and securely chock the flanges thereof within the flange receiving pockets of the joint bars, longitudinally arranged filler blocks 13 are interposed between the upper inclined faces of the rail flanges 9 and the under inclined faces 14 of the outwardly extending foot flanges 8 of the side joint bars 4. In this application of the invention, that is, the one suggested in Figs. 1, 2 and 3 of the drawings, the two extremes in the weights of the different rails are illustrated, viz: a larger rail whose base flanges take a direct bearing support on the upper sides of the base plates 11 as above indicated, and a smaller rail 2 of such a size, that the base flanges 9 thereof have their upper inclined faces take a direct and solid bearing against the under inclined faces 14 of the outwardly extending foot flanges 8, and to provide for rigidly maintaining this position of the smaller rail, a bottom filler block 15 is interposed between the bottom of the smaller rail 2 and the upper sides of the base plate 11 of the joint bars. It will be observed that this bottom filler block 15 is of such dimensions as to provide a solid metallic base support for the smaller rail throughout the entire area thereof within the joint bars, while at the same time firmly chocking the smaller rail in place, though not interfering in the least with the lateral adjustment or "take up" of the joint bars through the adjustment of the joint bars whenever necessary. This is also true of the longitudinally arranged filler blocks 13 interposed between the upper sides of the rail flanges 9 of the larger rail, and the under side of the foot flanges 8 of the angle bar portions of the joint bars, inasmuch as such filler blocks 13, though of a width substantially equaling the width of the rail flanges and equaling one-half the length of the joint, at the same time admit of the necessary clearance at the outer edges thereof for the adjustment of the joint bars.

Between the extremes in the weights of the dissimilar rails which may be accommodated within the joint bars and chocked in place through the medium of the filler members, various weights or sizes of rail sections may be secured within the bars and maintained in their stepped relation. To exemplify this, there is suggested in Figs. 4 and 5 of the drawings, a construction and arrangement of parts adapting the joint to rails which do not vary so much in weight, as for instance a 90 pound rail and a 100 pound rail. In this application of the invention, the larger or 100 pound rail 1 is illustrated as taking a direct bearing at its

bottom on the upper sides of the base plates 11 of the side joint bars, and being chocked in place through the medium of the said upper filler blocks 13 interposed between the upper sides of the rail flanges of said larger rail and the under sides of the outwardly extending foot flanges 8 of the joint bars. However, in this construction, (Figs. 4 and 5 of the drawings), the smaller rail 2 does not have its flanges 9 contact with either the foot flanges 8 or the base plates 11, and is chocked in place within the flange receiving pockets or spaces 12, through the employment of a single bottom filler block 16, and a pair of upper filler blocks 17. The said bottom filler block 16 is interposed between the bottom of the smaller rail 2 and the base plates 11, while the said upper filler blocks 17 are interposed between the upper sides of the rail flanges 9 and the under sides of the foot flanges 8, all of which is plainly shown in said Fig. 5 of the drawings. It will, therefore, be apparent from the figures of the drawings and the construction illustrated in Figs. 1, 2 and 3 of the drawings, that in carrying out the invention, the side joint bars are provided with base plates arranged in the same longitudinal plane throughout and having no stepped supporting surfaces, and that the supporting and chocking of the differential rails in stepped relation with their tops and inner sides registering is accomplished through the employment of filler members arranged either above or below, or both above and below the rail flanges according to the weights of the two rails and the extent of stepping required according to the difference in the weights thereof.

The principles of construction already described may be embodied in different forms without affecting the invention. In the forms already described, the chocking filler blocks are illustrated in connection with angle bars having fixed or rigid base plates 11 integral therewith, but as suggested in Figs. 6, 7 and 8 of the drawings, a compromise rail joint embodying the invention may be made up with angle bars which are separate from the base plates connected therewith. Referring particularly to this form of the joint, it will be observed that the same essentially comprises, in connection with the dissimilar service rails 1 and 2, the oppositely arranged side joint bars 4^a which are of plain angle bar formation, and each of which is provided with an upright splice member or girder 5^a fitting the fishing spaces of the rails, and having at its upper edge a thickened bearing head 6^a offset at a central point, as at 7^a, so that the separate portions of said bearing head, respectively at the opposite sides of said offset, will engage against the under sides of the heads of the rails, as plainly shown in Fig. 6 of the

drawings. The angle bar constituting each of the side joint bars 4^a, is constructed at the lower edge of its upright splice member 5^a with an outwardly extending inclined foot flange 8^a terminating in an outwardly extending horizontal bolt flange 18 which receives a series of adjustable fastening bolts 19 which serve to connect the said bolt flange with the edge portion of the rail supporting base plate 11^a. In the construction illustrated, the base plate 11^a is shown as being a single full width base plate, that is, one which extends transversely beneath the rail bottoms and projects beyond the edges of the rail flanges, so that the opposite side edge portions of the base plate may be coupled to the bolt flanges 18 of the opposite angle bars through the medium of the fastening bolts as above described. This completes a structure in which the side joint bars have associated therewith a separate bolt adjusted base plate, but at the same time preserving the structural idea involved in the rigid base plate construction shown in Fig. 1 to 5 inclusive, which idea embraces the feature of providing between the base plate and the outwardly extending foot flange 8^a of the angle bar, a flange receiving pocket or space 12 of sufficient height to accommodate the base flanges of the ordinary weights of standard rail sections and permitting of the latter being chocked in stepped relation through the medium of filler members arranged above or below, or both above and below, the rail flanges, according to the difference in weights of the separate rail sections.

In the particular embodiment of the invention shown in Figs. 6, 7 and 8 of the drawings, the larger rail section is illustrated as taking a direct bearing at its bottom on the upper side of the base plate 11^a and having upper chocking filler members 20 interposed between the upper sides of the rail flanges, and the under sides of the outwardly extending foot flanges 8^a of the joint bars. In this same construction, the smaller rail section is illustrated as having its base flanges taking a direct bearing against the under sides of the outwardly extending foot flanges 8^a and being supported in this position through the medium of a single bottom filler block 21 interposed between the bottom of the said smaller rail and the upper side of the base plate 11^a. In fact, any arrangement of filler members that may be used in connection with the integral construction of joint bars shown in Figs. 1 to 4 inclusive, may likewise be employed in the separate base plate construction just described.

While the principal applications of the invention have been set forth herein, it will be understood that other modifications may be readily resorted to, and in fact changes

in the form, proportion, and minor details of construction employed, without departing from the spirit or sacrificing any of the advantages of the invention.

5 I claim:

1. In a compromise rail joint, the rails, side angle bars carrying a base plate having a supporting surface in the same longitudinal plane throughout, and filler members for
10 chocking the flanges of the separate rails in stepped relation between the base plate and the foot flanges of the angle bars.

2. In a compromise rail joint, the rails, side angle bars carrying a base plate having
15 a supporting surface in the same longitudinal plane throughout, and filler members interposed between the rail flanges and said angle bars and base plate, for chocking the rails in stepped relation.

20 3. In a compromise rail joint, the rails, side angle bars, each of which angle bars engages beneath the rail heads and is provided with a rail supporting base in the same longitudinal plane throughout, and
25 an enlarged flange receiving pocket accommodating the flanges of both rails, and separate means for holding the rail flanges in stepped relation in said pockets.

30 4. In a compromise rail joint, the rails, side angle bars, each of which angle bars fits the fishing spaces of the rails and is provided with an integral inwardly extending base plate and a vertically enlarged flange receiving pocket accommodating the flanges
35 of both rails, and means for holding the rail bottoms in stepped relation.

5. In a compromise rail joint, the rails, side angle bars, each of which angle bars fits the fishing spaces of the rails and is
40 provided with an integral inwardly extending base plate and a vertically enlarged

flange receiving pocket accommodating the flanges of both rails, and separate means for holding the rail bottoms in stepped relation.

6. In a compromise rail joint, the rails, 45 side angle bars, each of which angle bars fits the fishing spaces of the rails and is provided with an integral inwardly extending base plate and a vertically enlarged flange receiving pocket accommodating the flanges 50 of both rails, and filler members arranged to hold the rail bottoms in stepped relation.

7. In a compromise rail joint, the rails, side angle bars fitting the fishing spaces of the rails, and each of which angle bars is 55 provided with an integral inwardly extending base plate, and a vertically enlarged flange receiving pocket accommodating the flanges of both rails, and filler members interposed between the flanges of both rails 60 and the base plates, and the foot flanges of the angle bars for chocking the flanges of the separate rails in stepped relation in said pockets.

8. In a compromise rail joint, the rails, 65 side angle bars fitting the fishing spaces of the rails, each of which angle bars is provided with an integral inwardly extending horizontal base plate and with a vertically enlarged flange receiving pocket or space ly- 70 ing in the same longitudinal plane throughout and accommodating the flanges of both rails, filler blocks for chocking the flanges of the separate rails in stepped relation in said pockets, and the joint bolts. 75

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

BANCROFT G. BRAINE.

Witnesses:

BENJA. WOLHAUPTER,
WALTER S. OGILVY.