

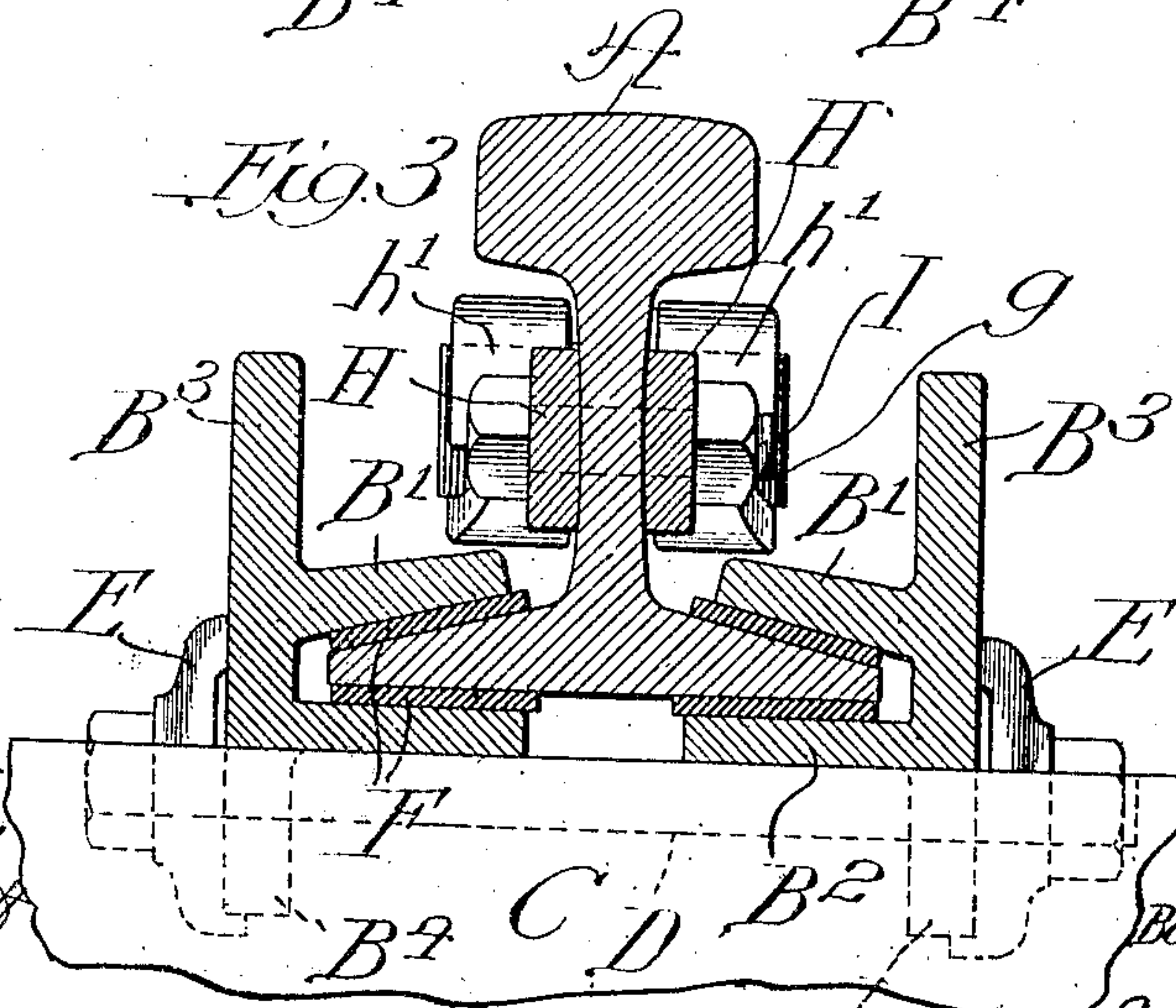
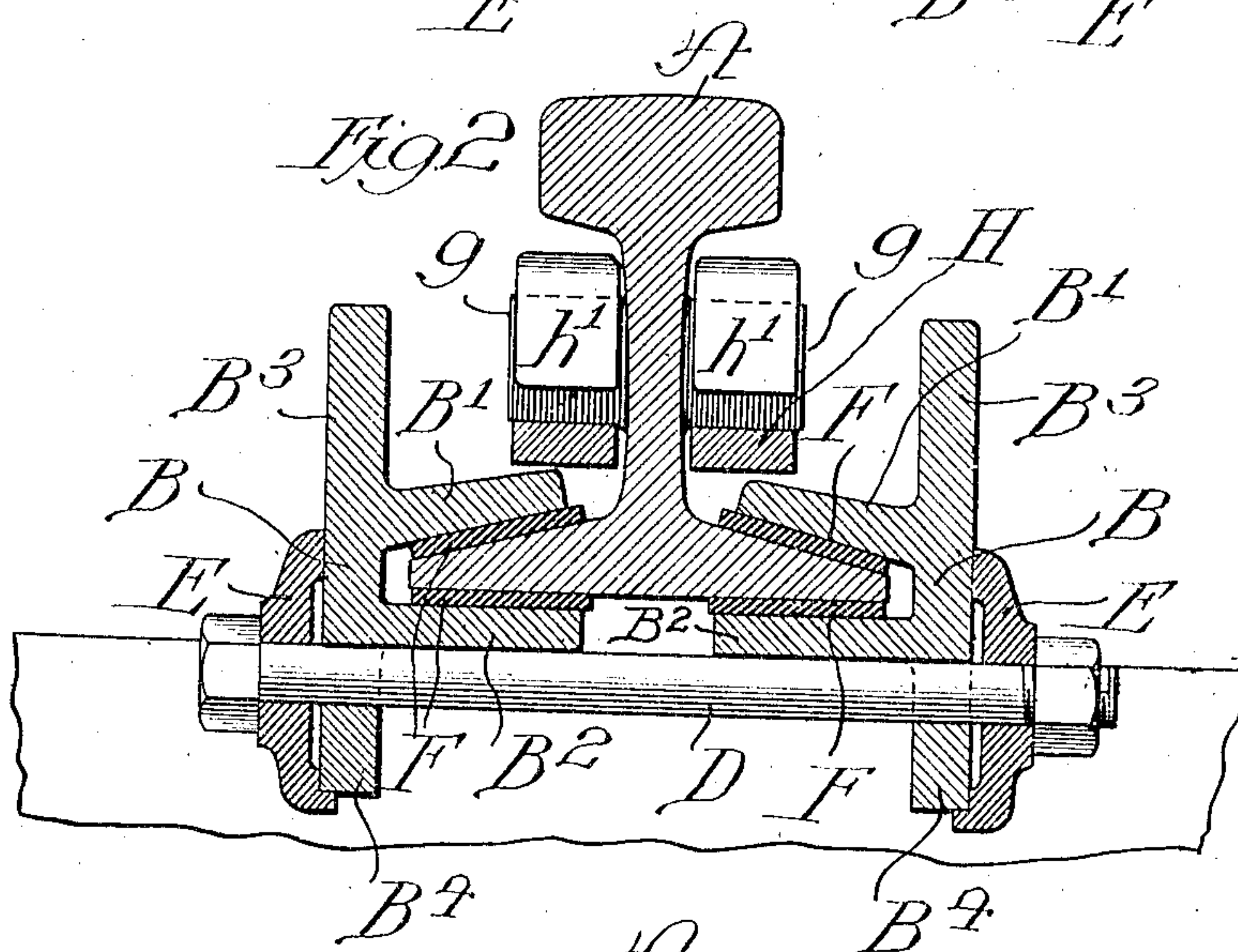
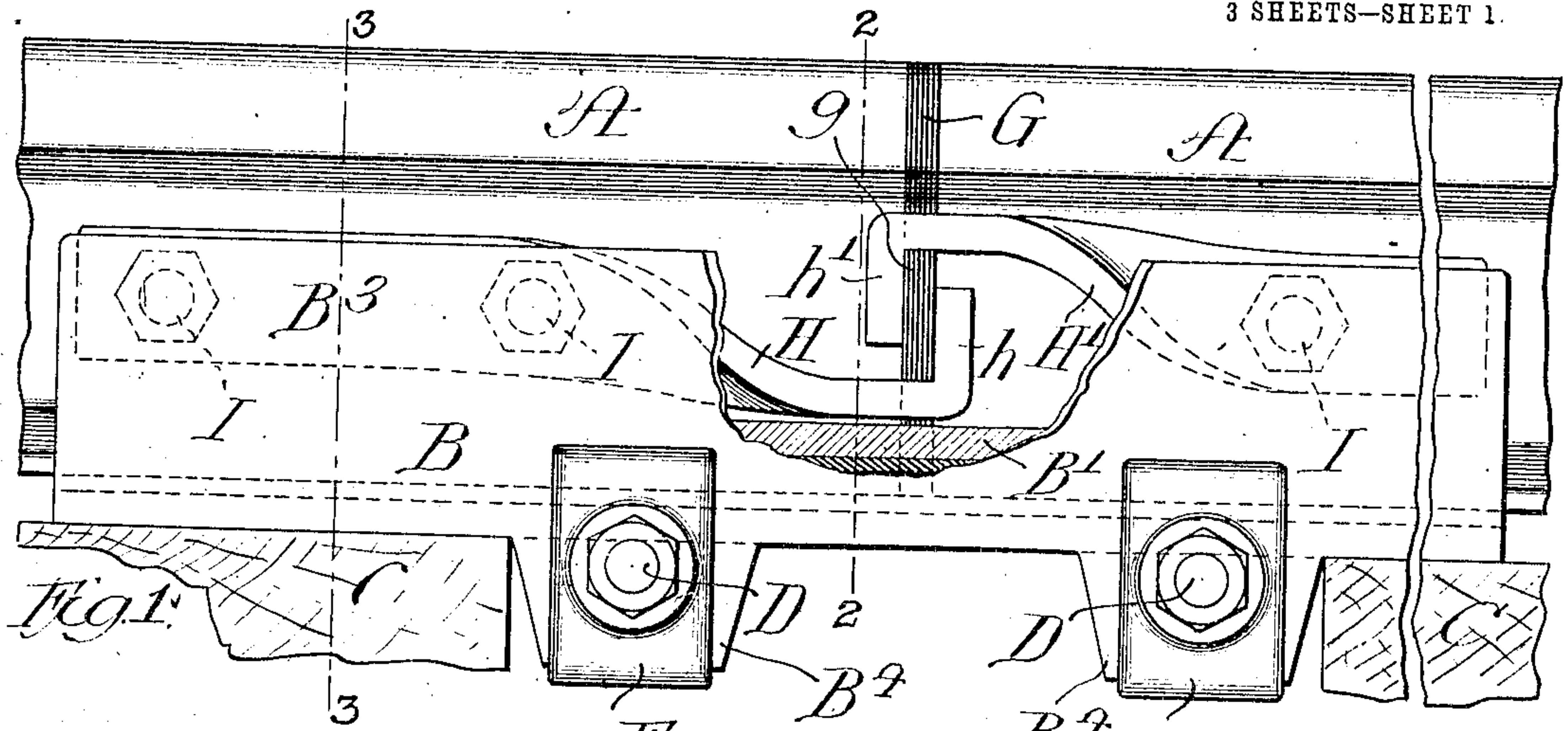
No. 836,953.

PATENTED NOV. 27, 1906.

B. WOLHAUPTER.  
RAIL JOINT.

APPLICATION FILED MAR. 24, 1905.

3 SHEETS—SHEET 1.



Witnesses:  
Edw. R. Davis  
H. Barnett

Inventor  
Benjamin Wolhaupter  
by Poole & Brown  
his Atty's



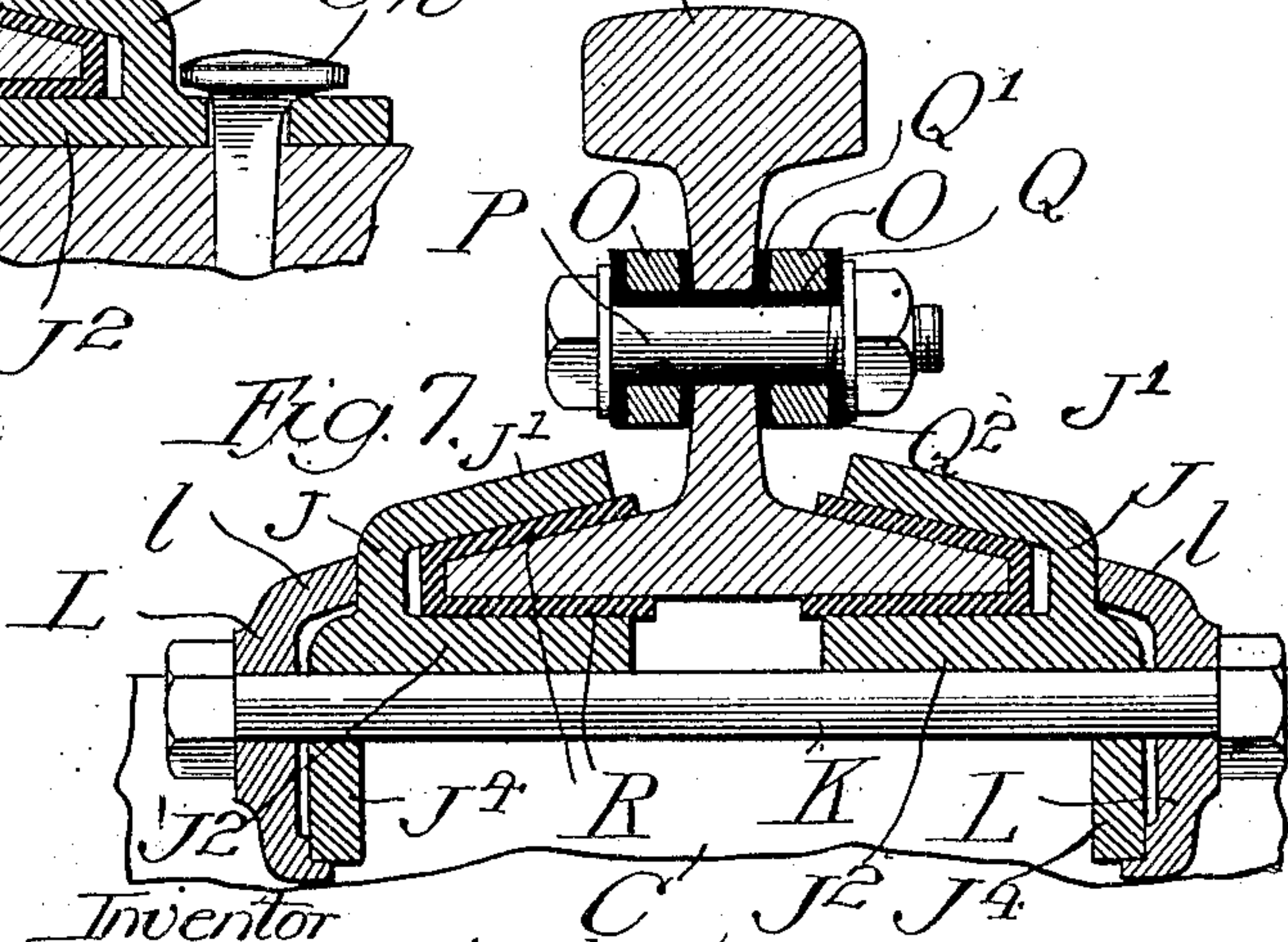
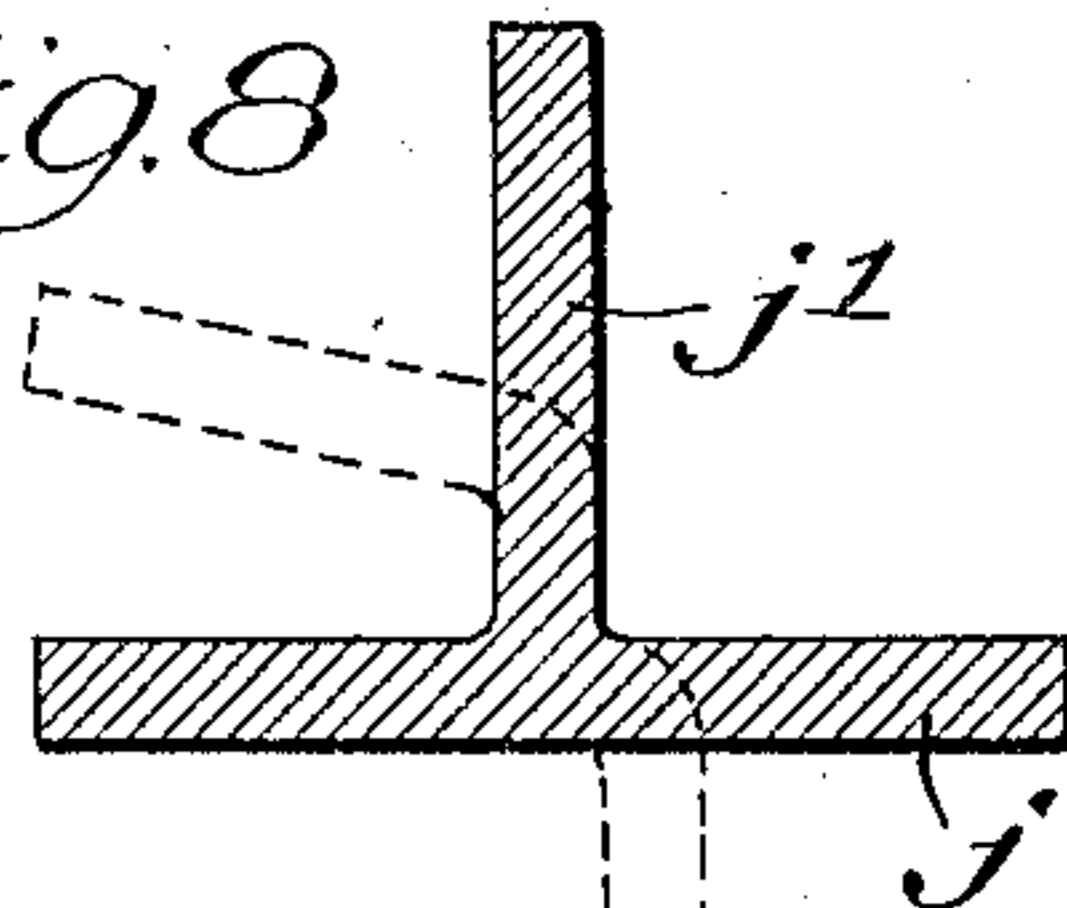
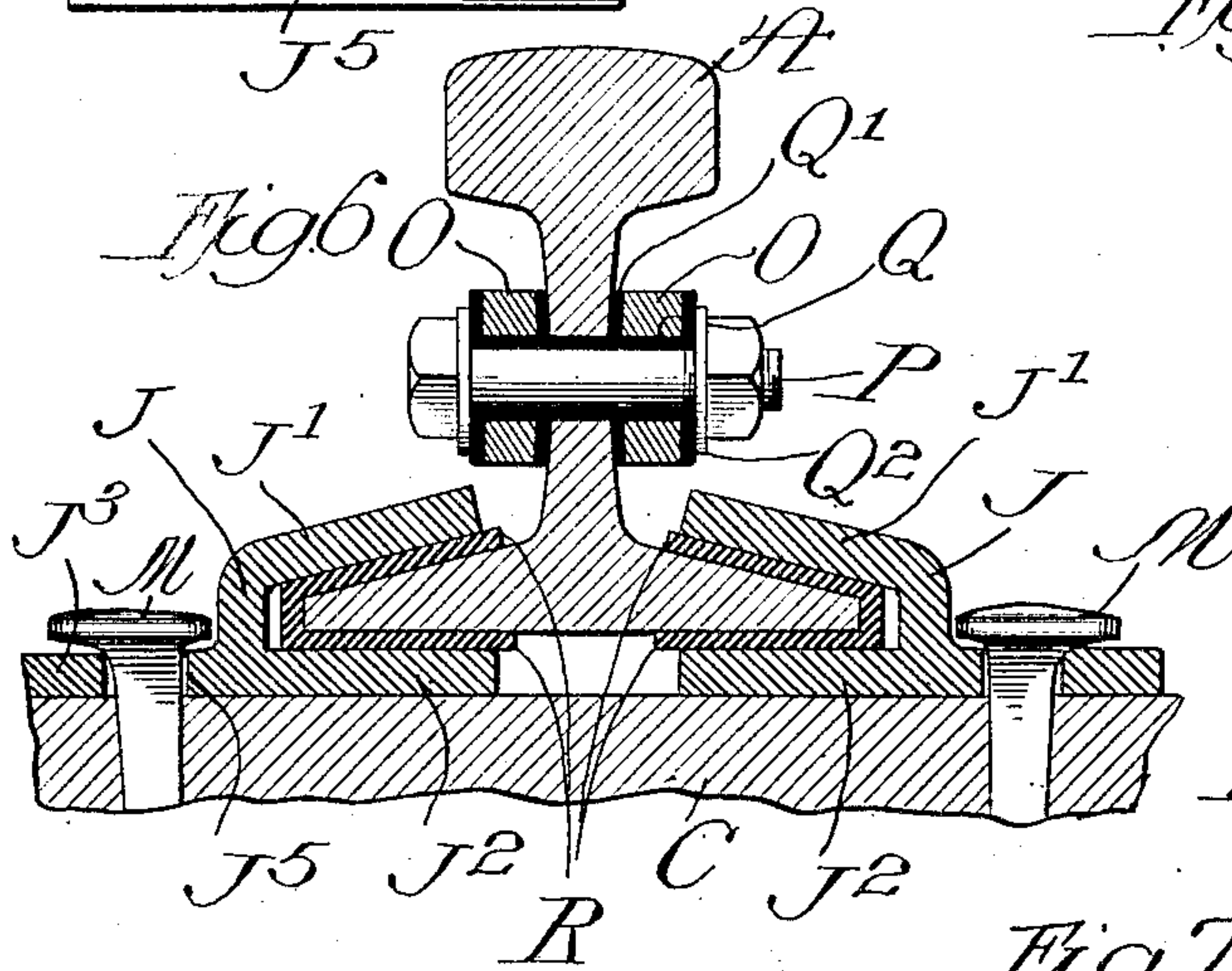
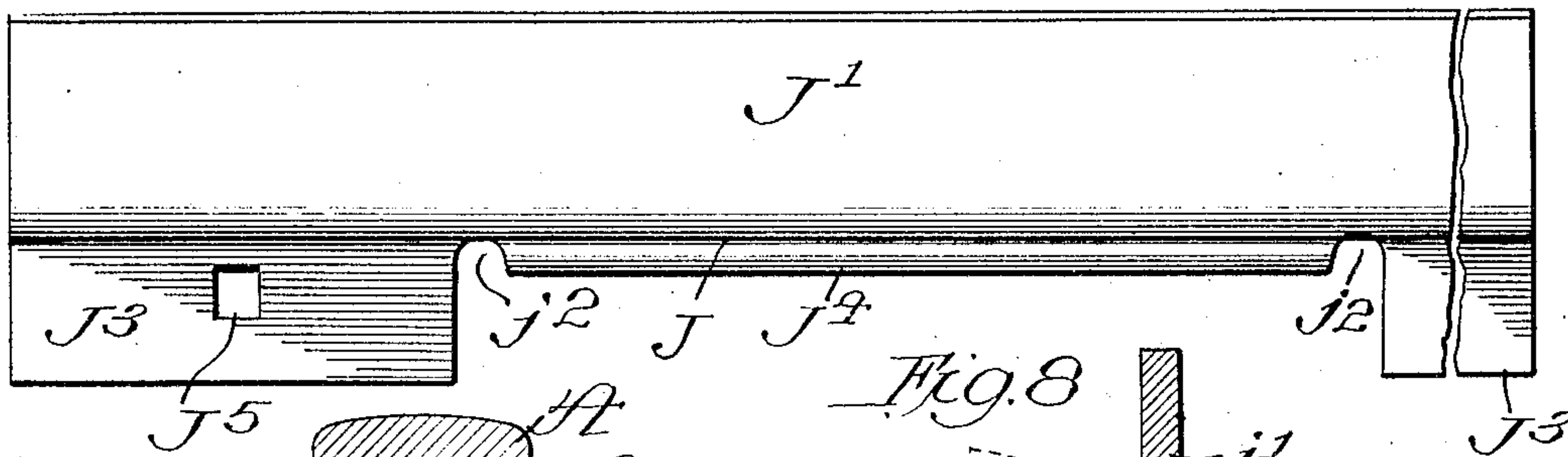
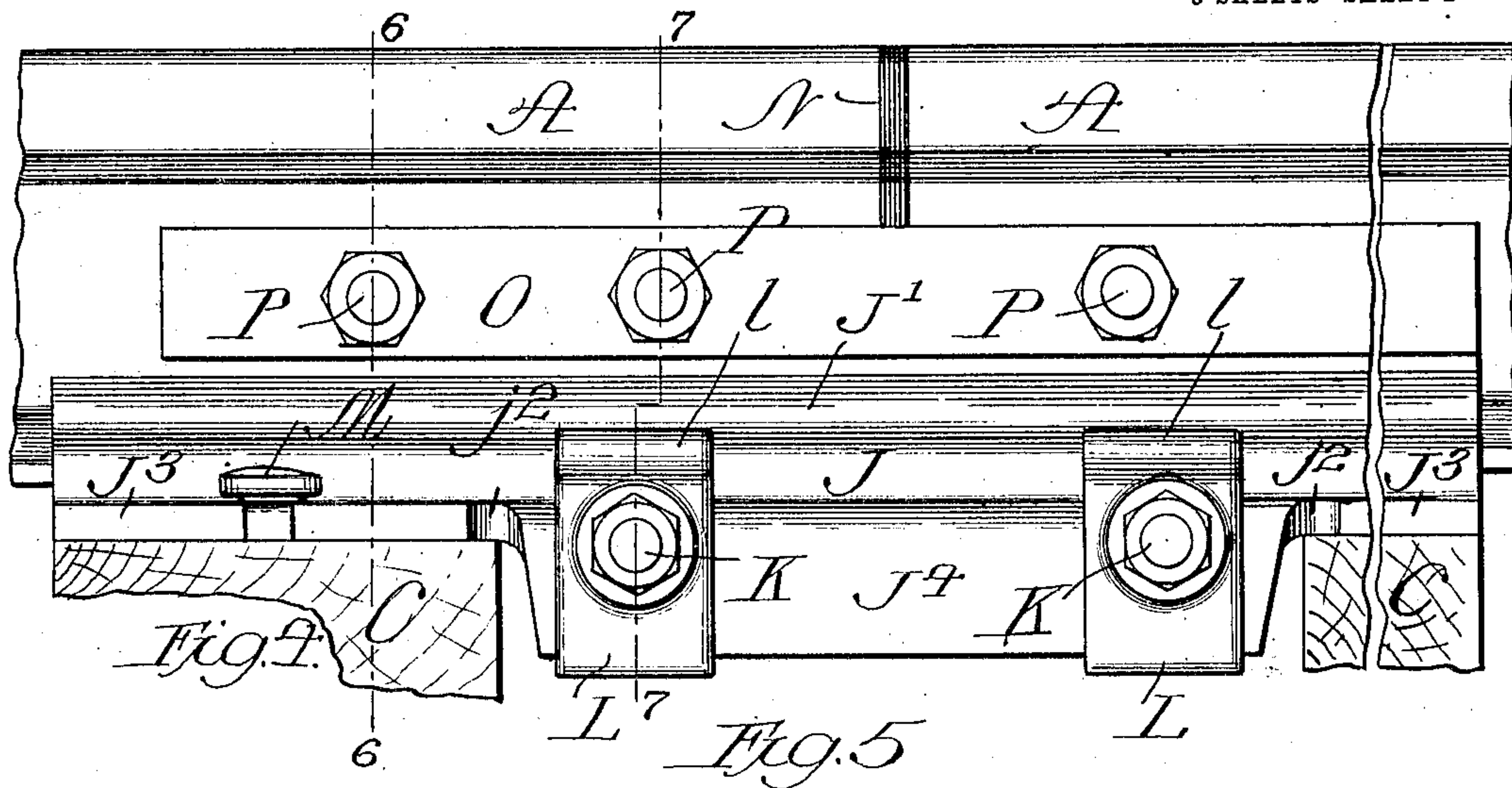
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3 SHEETS—SHEET 2.



Witnesses:  
Edw. P. Barrett  
H. G. Barrett

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Benjamin Wolhaupter  
by Poole & Brown His Attys



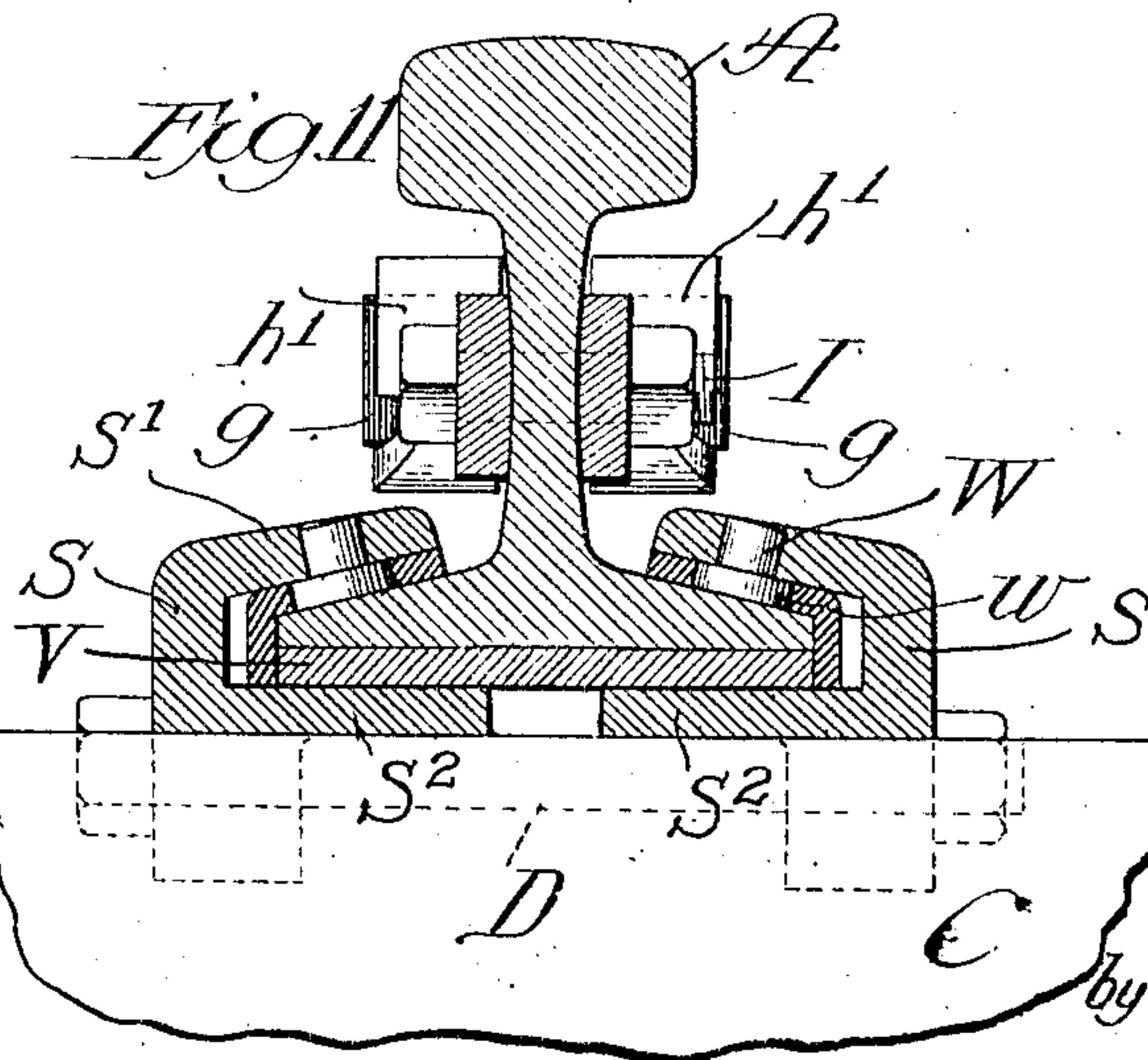
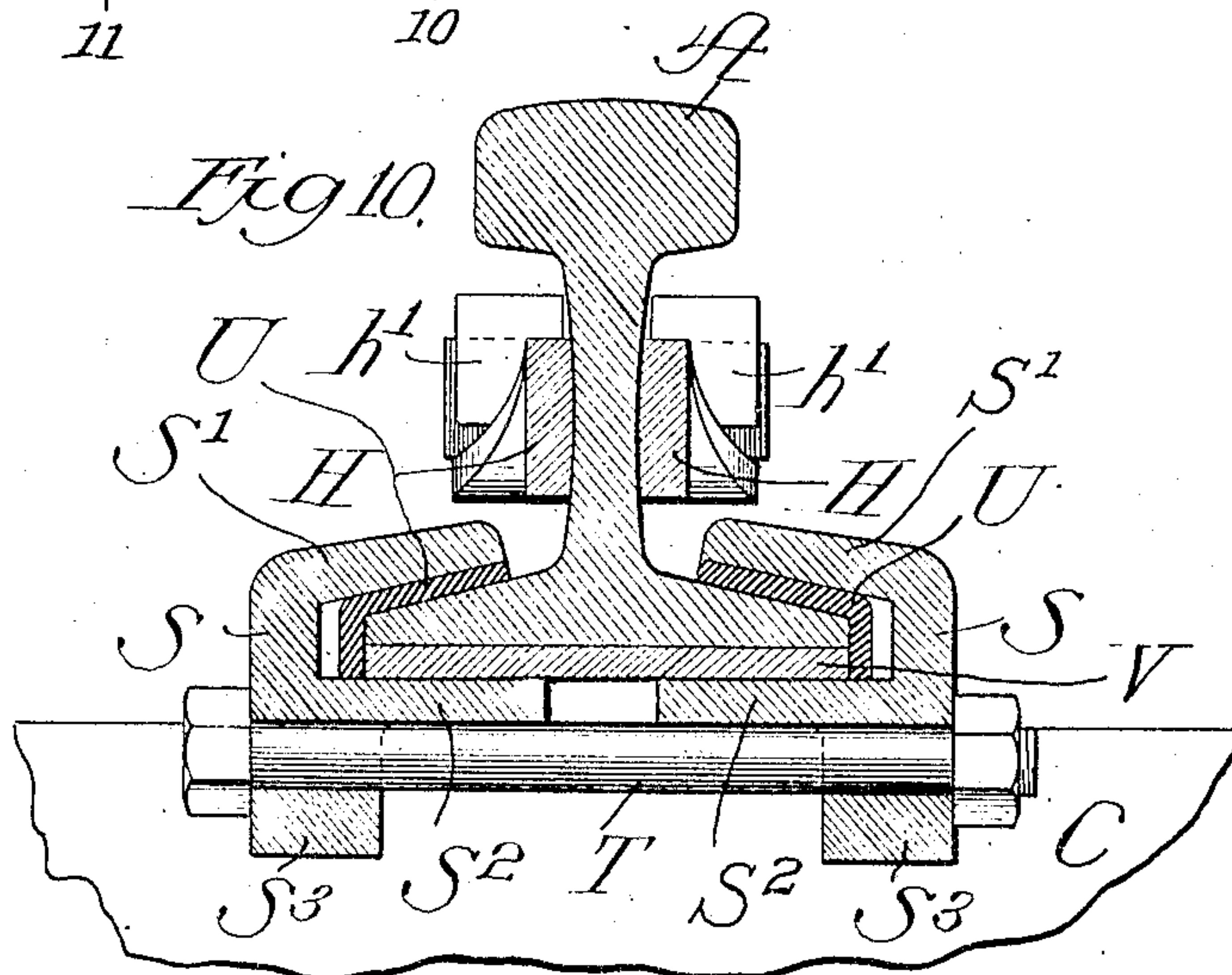
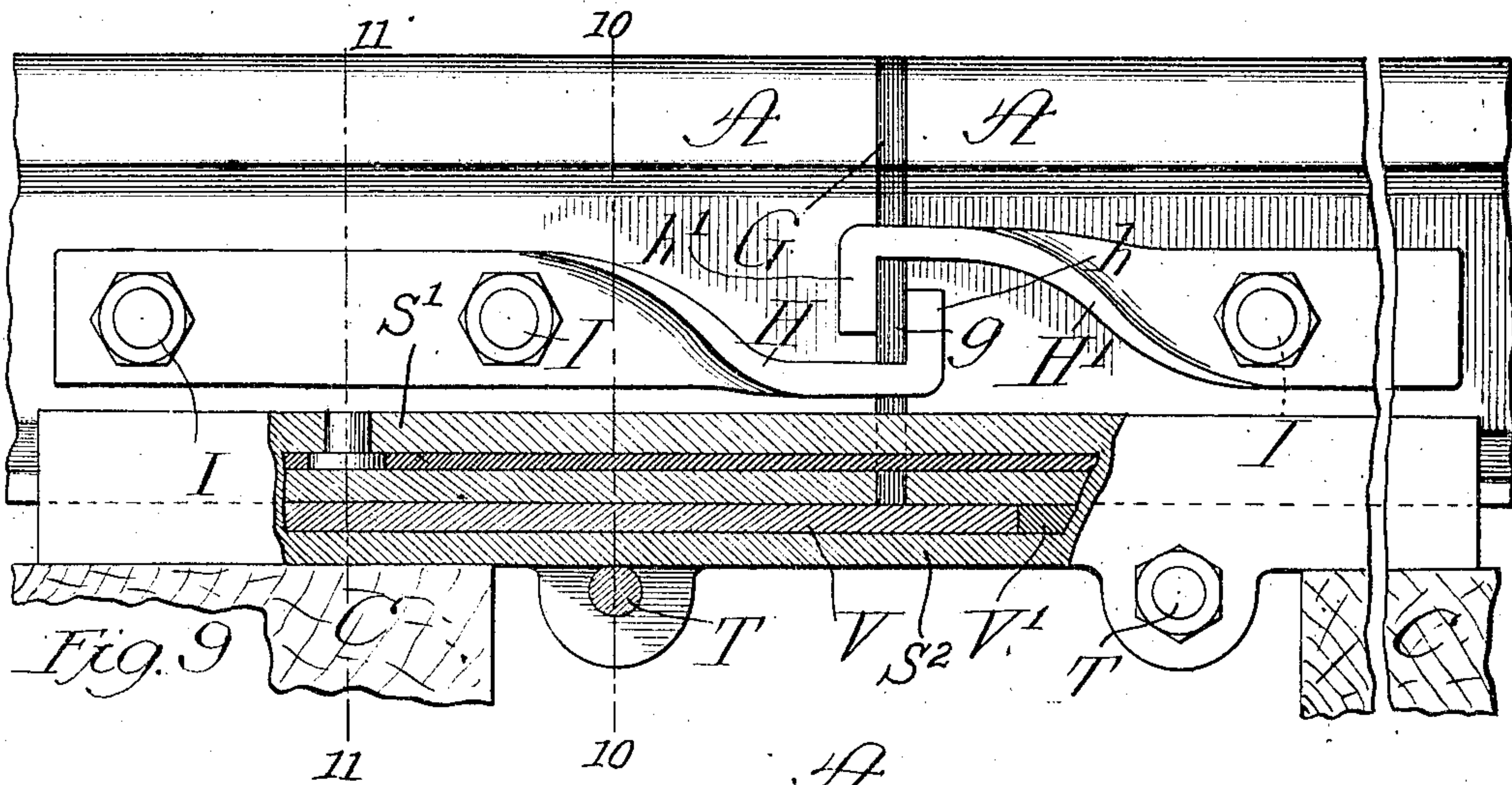
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3 SHEETS—SHEET 3.



Witnesses  
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# UNITED STATES PATENT OFFICE.

BENJAMIN WOLHAUPTER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE  
RAIL JOINT COMPANY, A CORPORATION OF NEW YORK.

## RAIL-JOINT.

No. 836,953.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed March 24, 1905. Serial No. 251,705.

*To all whom it may concern:*

Be it known that I, BENJAMIN WOLHAUPTER, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rail-Joints; 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.

A rail-joint embracing my invention embraces in its general features two joint-bars provided with inwardly-facing longitudinal grooves adapted to receive the base-flanges of the rails and clamping means holding the said bars in contact with the opposite sides of the rails, together with separate coupling means for joining the abutting ends of the rails, so as to prevent relative endwise movement thereof. It also includes means for electrically insulating the rails from each other, embracing layers of insulating material interposed between the said base-flanges of the rails and the parts of the joint-bars which embrace the same, and insulation interposed between the engaging parts of the coupling means by which the abutting ends of the rails are joined to each other.

The invention consists in the matters hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a view in side elevation of a rail-joint embodying one form of my invention. Fig. 2 is a cross-section taken upon line 2 2 of Fig. 1. Fig. 3 is a cross-section taken upon line 3 3 of Fig. 1. Fig. 4 is a side view of another form of joint embodying the main features of my invention. Fig. 5 is a plan view of one of the joint-bars illustrated in Fig. 4. Fig. 6 is a cross-section taken upon line 6 6 of Fig. 4. Fig. 7 is a cross-section taken upon line 7 7 of Fig. 4. Fig. 8 is a cross-section of a T-bar from which the joint-bar shown in Figs. 4 to 7 may be made. Fig. 9 is a view in side elevation with parts in section, showing still another form of joint embodying the principal features of my invention. Fig. 10 is a cross-section taken on line 10 10 of Fig. 9. Fig. 11 is a cross-section taken upon line 11 11 of Fig. 9.

First referring to the form of construction shown in Figs. 1, 2, and 3, A A indicate the meeting or abutting ends of two rails to be joined, and B B two joint-bars, which are located at opposite sides of the rails and are provided with inwardly-facing longitudinal grooves adapted to receive the opposite margins of the base-flanges of the rails, said joint-plates B B, as shown in the said figures, having on their inner faces inwardly-extending flanges B' B<sup>2</sup>, between which are formed the grooves referred to, the upper flanges B' extending above the base-flanges of the rails and the lower flanges B<sup>2</sup> extending below or beneath the same. Said upper flanges B' are inclined inwardly and upwardly to correspond with the inclination of the top surfaces of the base-flanges, while the lower flanges B<sup>2</sup> are horizontal and have their upper surfaces parallel with the bottom surface of the rail. Said bottom flanges B<sup>2</sup> B<sup>2</sup> rest at their end portions upon the ties, which are indicated by C C, and form supporting members on which the rail ends rest. The joint-bars are also provided with vertical longitudinal stiffening-flanges B<sup>3</sup> B<sup>3</sup>, extending upwardly from the upper flanges B' B' and reaching the entire length of the joint-bars. At their central parts, between the ties C C, the joint-bars are also provided with depending bolt-engaging lugs B<sup>4</sup> B<sup>4</sup>, the bottom surfaces of the horizontal flanges B<sup>2</sup> B<sup>2</sup> affording flat bearing-surfaces at the ends of the joint-bars for contact with the upper surfaces of the said ties C C, as clearly seen in Fig. 1. The central parts of the joint-bars have the stiffness or capacity to withstand vertical stresses due to the extension of the stiffening-flanges B<sup>3</sup> above the flanges B' and B<sup>2</sup>, so that said joint-plates possess greatest strength at the part thereof which extends between the ties, where the greatest strength and stiffness is required to withstand tendency to downward flexure at the meeting ends of the rails. To hold the joint-plates made as described in contact with the sides of the rails, horizontal clamping-bolts D D are employed, which extend through apertures in the lugs B<sup>4</sup> B<sup>4</sup> below the horizontal bottom flanges B<sup>2</sup> B<sup>2</sup> thereof.

E E indicate washer-plates, which are applied between the head and nut on the ends



of the bolts and the outer faces of the joint-bars B B. Said washer-plates are preferably extended a considerable distance above and below the bolts and are made of considerable thickness, giving them great rigidity. The lower ends of said washer-plates bear on the lower margins of the lugs B<sup>4</sup> B<sup>4</sup>, and their upper ends bear on the joint-bar horizontally opposite the base-flanges of the rails, said washer-plates E being recessed on their inner faces between their ends; so that they bear at their end portions only on the joint-plate. The washer-plates thus constructed and arranged serve to transmit the endwise tension of the bolts to the joint-plates at points opposite the base-flanges of the rails, notwithstanding any slight inward bending or flexure of the lugs B<sup>4</sup> B<sup>4</sup>, which may take place in the tightening of the bolts by reason of the flexibility of said lugs. The lower end of each lug B<sup>4</sup> serves as a support or fulcrum for the lower end of the washer-plate engaged therewith, the upper end of said washer-plate being forced against the joint-bar above the bolt by the pressure of the heads or nuts on the bolt against the central part of said washer-plate.

F F indicate strips or layers of insulating material interposed between the top and bottom surfaces of the base-flanges of the rails and the flanges B<sup>1</sup> B<sup>2</sup> on the joint-plates, or, in other words, between the rail-flanges and the opposed surfaces of the grooves which receive said base-flanges. Said strips or layers F F of the insulating material thus applied serve to insulate the ends of the rails from the joint-plates, and therefore, in connection with an insulating post or layer G, which is interposed between the meeting ends of the rails, to insulate the said rails from each other.

In connection with the joint bars or plates arranged to engage the base-flanges of the rails, as above described, provision is made for connecting the ends of the rails with each other in such manner as to prevent relative endwise movement thereof, as follows: To the opposite sides of each of the rails A A are secured longitudinally-arranged coupling bars or members H H'. Said bars are adapted for interlocking engagement with each other at their meeting ends, and for this purpose are provided at their adjacent ends with oppositely-extending vertical arms h h', arranged in overlapping relation to each other. The arm h on the bar H extends upwardly therefrom, while the arm h' on the bar H' extends downwardly therefrom, and said adjacent ends of the bars H H' have their horizontal parts disposed at such distance vertically from each other and the ends of their arms h h', which extend toward each other in overlapping relation, at such distances from the adjacent horizontal parts of the bars that

said arms h h' are free from contact with said horizontal parts of the bars and from contact with each other.

The insulating layer or post G, interposed between the ends of the rails, is provided at its opposite sides at points between the base-flanges and the heads of the rails with laterally-extending projections or lugs g g, Fig. 2, and said lugs are arranged in such relation to the arms h h' on the bars H H' that said arms engage opposite sides of said lugs g, and the lugs are thus interposed between said arms. In other words, the end of each bar H extends beneath the lug g with its arm h engaging the said lug at the side thereof opposite the bar, while the bar H' extends above the upper margin of the lug g and its arm h' extends downwardly at the side of the lug opposite that engaged by the arm h. The bars H and H' being rigidly attached to the rails the vertical arms h h' by their contact with opposite sides of the interposed lugs g serve to hold the rails from endwise movement in a direction away from each other, while at the same time metallic contact between parts attached to the two rails is avoided. In the particular construction shown the bars H H' have their outer end portions arranged vertically and in contact with the webs of the rails and are secured to the latter by bolts passing through said bars and the rails, one of said bolts being indicated by I in Fig. 3.

Now referring to the form of construction in the joint illustrated in Figs. 4 to 7, both inclusive, A A in said figures indicate the meeting ends of the rails, and J J two joint-bars which engage the opposite sides of the bar-flanges of the rails, generally in the same manner as hereinbefore described in connection with the joint-bars B B. In this instance, however, said joint-bars J have inwardly-extending upper and lower flanges J<sup>1</sup> J<sup>2</sup> extending the entire length of the joint-bars and forming between them grooves to receive the side margins of the base-flanges of the rails. At the end portions of the joint-bars, which rest upon the ties C C, said joint-bars are provided with outwardly-extending flanges J<sup>3</sup> J<sup>3</sup>, arranged in the same horizontal plane with and forming horizontal outward extensions of the flanges J<sup>2</sup>, on which the rail ends rest. At their central parts and between the ties C C the joint-bars are provided with depending vertical stiffening-flanges J<sup>4</sup>, that serve to give stiffness to the central parts of the joint-bars. Said depending flanges J<sup>4</sup> J<sup>4</sup> are offset outwardly from the central vertical part of the bar which joins the flanges J<sup>1</sup> J<sup>2</sup>. The joint-bars J (shown in Figs. 4 to 7) when shaped in the particular manner shown have the advantage that they may be made from a blank, such as is shown in Fig. 8, having the shape of a double angle



or T bar. Said blank (shown in Fig. 8) has a main part or web  $j$  and a centrally-disposed flange  $j'$  at right angles thereto. Said blank is bent to form to the angle-bar by bending one side of its web part  $j'$  downwardly to the position shown in dotted lines in said Fig. 8 and by bending the marginal part of its central flange  $j'$  laterally into an inclined position, as is also shown in dotted lines in Fig. 8. The end portions of the web part  $j$  are severed from the central part thereof by notches  $j^2$ , (shown in Fig. 5,) so that the end portions of said web  $j'$  may be left flat and the said central part thereof bent downwardly to form the stiffening-flange  $J^4$ . The joint-bars  $J J$  are joined by means of horizontal bolts  $K$ , passing therethrough and provided at their ends with washer-plates  $L$ , like those hereinbefore described. Said washer-plates in this instance, however, are shown as provided at their upper ends with inwardly-extending arms or lugs  $l$ , which reach to and have bearing contact with the outer surface of the main upright parts of the joint-bars above the flanges  $J^4$  and horizontally opposite the grooves which receive the rail-flanges. By this construction the clamping action of the bolts  $K$  is transmitted to the parts of the joint-bars horizontally opposite the rail-base through the said washer-plates  $L$  and their arms  $l$ , the lower ends of said washer-plates being adapted to bear inwardly upon the stiffening-flange below the bolts. The joint-bars  $J J$  are shown as provided with spike-holes  $J^5 J^5$ , which extend through the horizontal flanges  $J^3$  thereof and through which may be driven holding-spikes  $M$ , as shown in Figs. 4 and 6. The abutting ends of the rails  $A A$  are insulated from each other by means of an insulating layer or post  $N$ . Provision is made in this instance for connecting the meeting ends of the rails with each other, embracing metal bars or straps  $O O$ , applied against opposite sides of the webs of the rail and secured thereto by bolts  $P P$ . The said straps  $O O$  are insulated from the rails, preferably by means of thimbles  $Q$  of insulating material, which surround the bolts  $P$  and extend through the rail-web and also through the bolt-apertures of said bars, together with strips  $Q'$  of insulating material interposed between said bars and the rails and insulating-washers  $Q^2$  interposed between the bars and the heads and nuts on the bolts. In the construction shown in said Figs. 4 to 7 the insulation of the ends of the rails from the joint-bars  $J J$  is effected by means of strips  $R$  of insulating material, which are folded over the side margins of the base-flanges of the rails and are interposed between said base-flanges and the opposed surfaces of the grooves in the joint-bars.

In Figs. 9, 10, and 11 I have shown still another form of rail-joint embodying the prin-

cipal feature of my invention.  $A A$  in said Figs. 9 to 11 indicate the meeting ends of the rails, between which is located an insulating plate or post  $G$ . The ends of the rails in this instance are connected with each other by a coupling device like that illustrated in Figs. 1, 2, and 3, consisting of coupling bars or members  $H H'$ , having vertically-arranged overlapping arms  $h h'$ , adapted to bear on opposite sides of lugs or projections  $g$  on the insulating-post and secured to the rails by bolts  $I$ , as hereinbefore described in connection with the corresponding parts illustrated in said Figs. 1 to 3. In this instance  $S S$  are two joint-bars, which engage the opposite sides of the base-flanges of the rails and are generally like the joint-bars  $B B$ , (shown in Figs. 1 to 3,) the same being provided with top and bottom inwardly-extending flanges  $S' S^2$ , adapted to embrace the side margins of the base-flanges of the rails. The said joint-bars  $S S$  in this instance, however, are designed to be made of cast metal and are provided with downwardly-extending lugs  $S^3 S^3$ , through which pass the transverse clamping-bolts  $T T$ , and which are made of considerable thickness and have such rigid connection with the base-flanges  $S^2 S^2$  of the joint-bars that any washer-plates, such as hereinbefore described, are unnecessary, the heads and nuts on the bolts  $T$  being adapted to bear directly against the outer faces of the joint-bars. In this instance insulating-strips  $U U$  are interposed between the top flanges  $S' S'$  and the base-flanges of the rail, while the rails are insulated from the bottom flanges  $S^2 S^2$  by means of a flat plate or strip  $V$  of wood, vulcanized fiber, or the like, which extends beneath and forms the sole support for the end of one of the rails, but projects only a short distance beneath the adjacent end of the other rail, which latter is supported upon the base-flanges  $S^2 S^2$  mainly by a separate supporting plate or strip  $V'$  of metal made of the same thickness as the insulating-strip  $V$  and arranged in endwise-abutting relation thereto. The construction described, including the metal plate  $V'$ , is more especially designed to be employed in a track over which trains usually run in one direction only, and in that case the said metal plate  $V'$  will be located beneath the end of the rail toward which the car-wheels move in passing over the joint, the said plate  $V'$  thus arranged being adapted to resist the jar or impact due to the striking of the wheels against the end of the rails supported thereby as the wheels pass from one rail to the other. It is of course understood that the insulating-strip  $V$  serves to secure insulation of the ends of the rails from each other. In cases where the joint is used on a track over which trains pass in both directions the metal plate  $V'$  will preferably be omitted and the insulating-strip  $V$  made long



enough to extend beneath the ends of both rails and to afford support therefor. Said Figs. 9 to 11 illustrate a device designed to prevent endwise shifting of insulating-strips, such as the strip U, with respect to the rails and the joint-bars. This device consists of a holding-stud W, made of a hard or strong insulating material, such as hard rubber, and having at its lower end an enlarged part or head *w* equal in thickness to the thickness of the insulating layer U, and which fits in a circular opening made in said insulating layer in proper position to receive it, the shank or main part of the stud being inserted and fitting in a socket formed in the upper flange S' of the joint-bar. The stud W, made as described, is inserted in the socket of the flange from beneath, the head thereon serving to hold the stud from outward or upward movement with respect to the flange, while the contact of its head with the rail-base serves to confine the stud within the said socket. Said stud by its engagement with the joint-bar and the insulating-strip manifestly holds the latter from shifting either endwise or laterally, and thus securely maintains it in operative position.

I claim as my invention—

1. The combination with track-rails, of two joint-bars provided with inwardly-facing, longitudinal grooves adapted to receive the base-flanges of the rails, layers of insulating material interposed between the base-flanges and the opposed surfaces of said grooves, clamping means engaging the opposite joint-bars for holding the same in engagement with the said base-flanges, coupling means, separate from the joint-bar, for connecting the abutting ends of the rails with each other in a manner to prevent relative endwise movement thereof, and insulation interposed between the abutting ends of the rails and between the members of the coupling means, for insulating the rails from each other.

2. The combination with track-rails, of two joint-bars provided with inwardly-facing, longitudinal grooves adapted to receive the base-flanges of the rails, said joint-bars being provided at their end portions with horizontal bearing-surfaces for contact with the ties, and at their central portions with stiffening-flanges, layers of insulating material interposed between the said base-flanges and the opposed surfaces of the grooves, horizontal bolts located below the rails for clamping said joint-bar against the rails, coupling means, separate from the joint-bars, for connecting the abutting ends of the rails to each other in a manner to prevent relative endwise movement of said rails, and insulation interposed between the abutting ends of the rails and between the members of the coupling means for insulating the rails from each other.

3. The combination with track-rails, of

two joint-bars provided with inwardly-facing, longitudinal grooves adapted to receive the base-flanges of the rails, said joint-bars having at their end portions outwardly-extending, horizontal flanges and having on their side edges vertical stiffening-flanges, layers of insulating material interposed between the said base-flanges and the opposed surfaces of said grooves, clamping means engaging said joint-bars for holding them in engagement with the rails, coupling means separate from the joint-bars for connecting the abutting ends of the rails in a manner to prevent endwise movement of the rails, and insulation interposed between the abutting ends of the rails and between the members of the coupling means for insulating the ends of the rails from each other.

4. The combination with track-rails, of two joint-bars provided with inwardly-facing, longitudinal grooves adapted to receive the base-flanges of the rails, layers of insulating material interposed between the said base-flanges and the opposed surfaces of said grooves, and means for connecting the abutting ends of the rails with each other, comprising coupling members secured to the rails, and having interlocking parts at their meeting ends, and a layer of insulating material between the contact-surfaces of said interlocking parts.

5. The combination with track-rails, and an insulating layer interposed between the abutting ends thereof, of means for holding the rails from relative endwise movement comprising coupling members bolted to the webs of the rails and provided with interlocking parts, and a layer of insulating material interposed between said interlocking parts.

6. The combination with track-rails, and a layer of insulating material between the abutting ends thereof, of means for holding the track-rails from relative endwise movement comprising a lateral extension or lug on said layer of insulating material, and two coupling members secured to the webs of the rails and provided with interlocking parts engaging opposite sides of said lateral extension or lug on the insulating layer.

7. The combination with track-rails, of two joint-bars having inwardly-facing, longitudinal grooves adapted to receive the base-flanges of the rails, layers of insulating material interposed between the base-flanges of the rails and the inner surfaces of said grooves, an insulating layer located between the ends of the rails and provided with a lateral projection, coupling-bars bolted to the rail-webs and having oppositely-directed vertical arms arranged in overlapped relation and adapted to bear on opposite sides of the said projection on the insulating layer between the ends of the rails.



8. The combination with a rail, a joint-bar,  
and an insulating-strip interposed between  
the rail and joint-bar, of a headed holding-  
stud the shank of which engages a socket in  
5 the joint-bar and the head of which engages  
an opening in the insulating-strip.

In testimony that I claim the foregoing as

my invention I affix my signature, in presence  
of two witnesses, this 5th day of March, A. D.  
1905.

BENJAMIN WOLHAUPTER.

Witnesses:

C. CLARENCE POOLE,  
G. R. WILKINS.