No. 842,508. PATENTED JAN. 29, 1907.

B. WOLHAUPTER.

RAIL JOINT.

APPLICATION FILED SEPT. 28, 1906.

2 SHEETS—SHEET 1.

Fig. 1

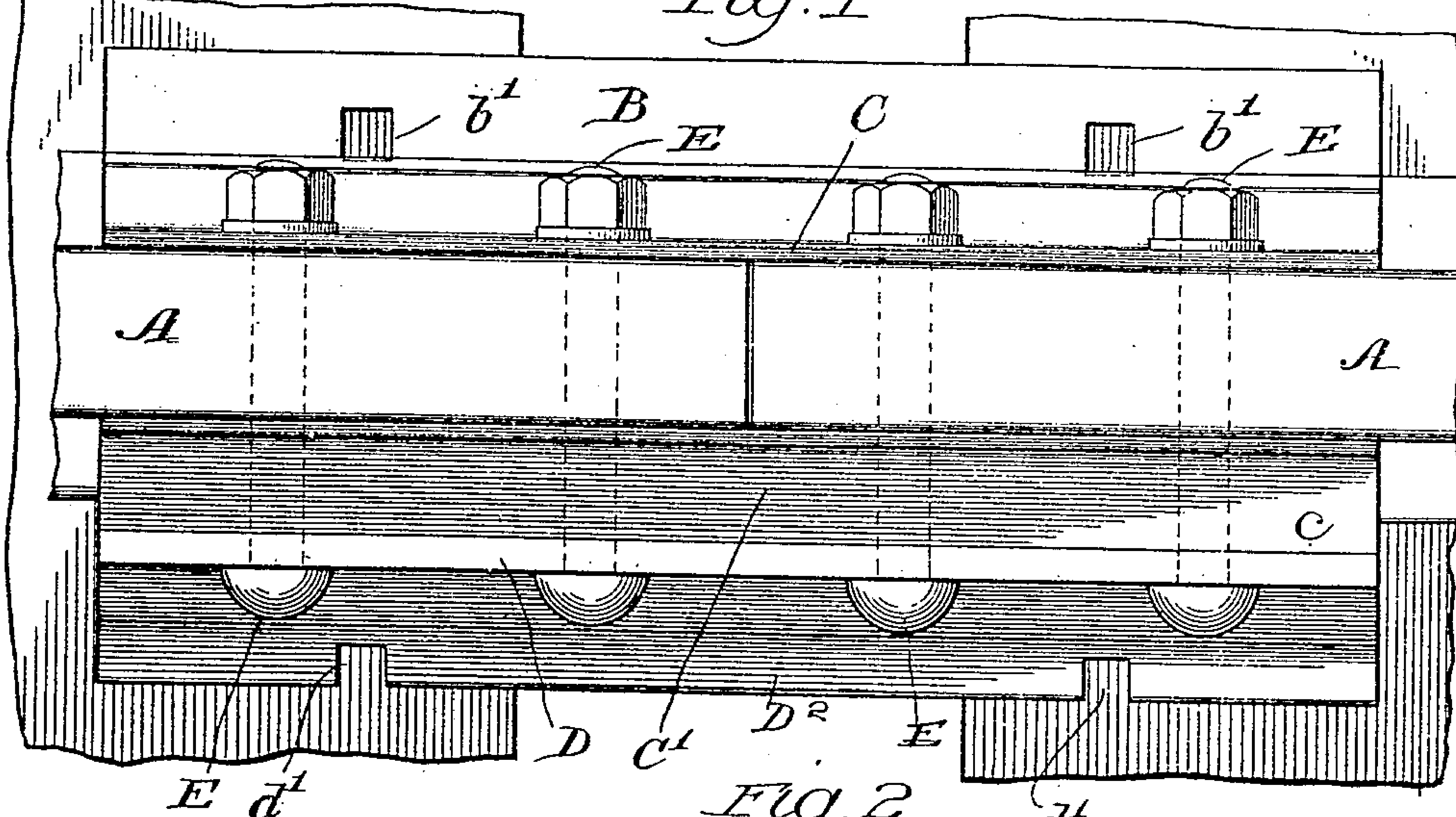


Fig. 2

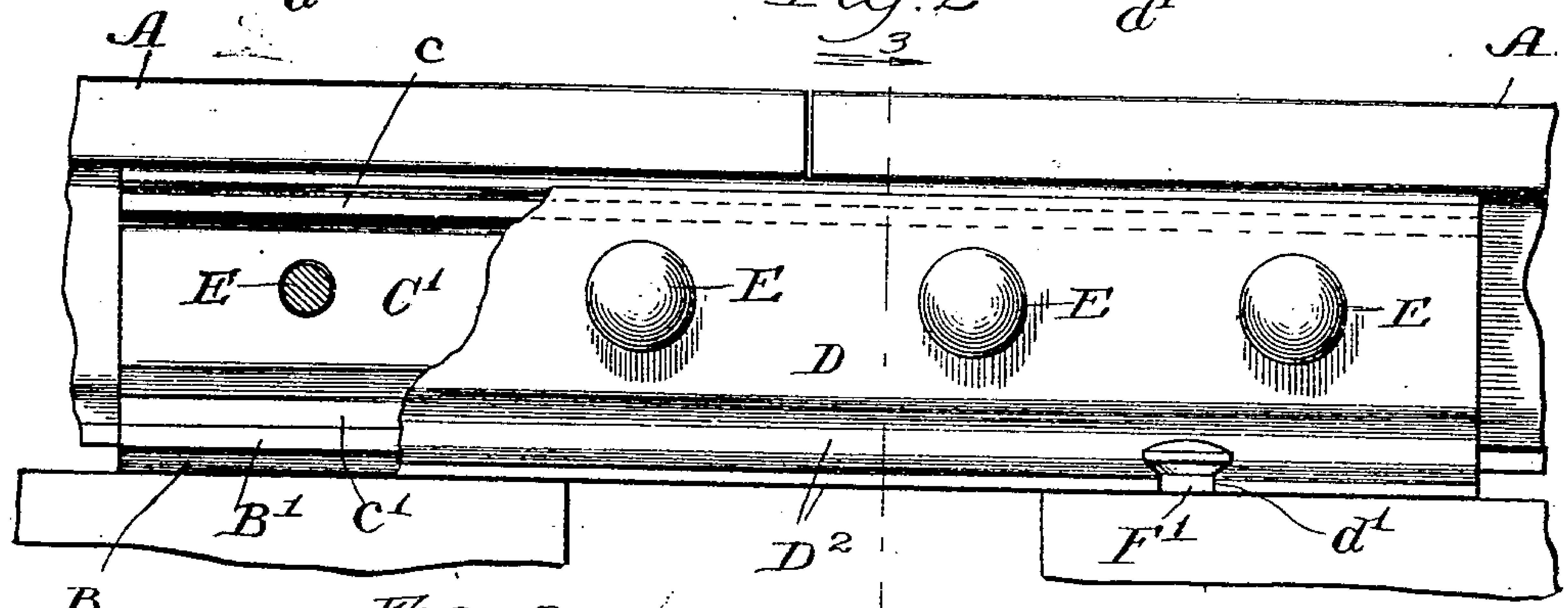


Fig. 3

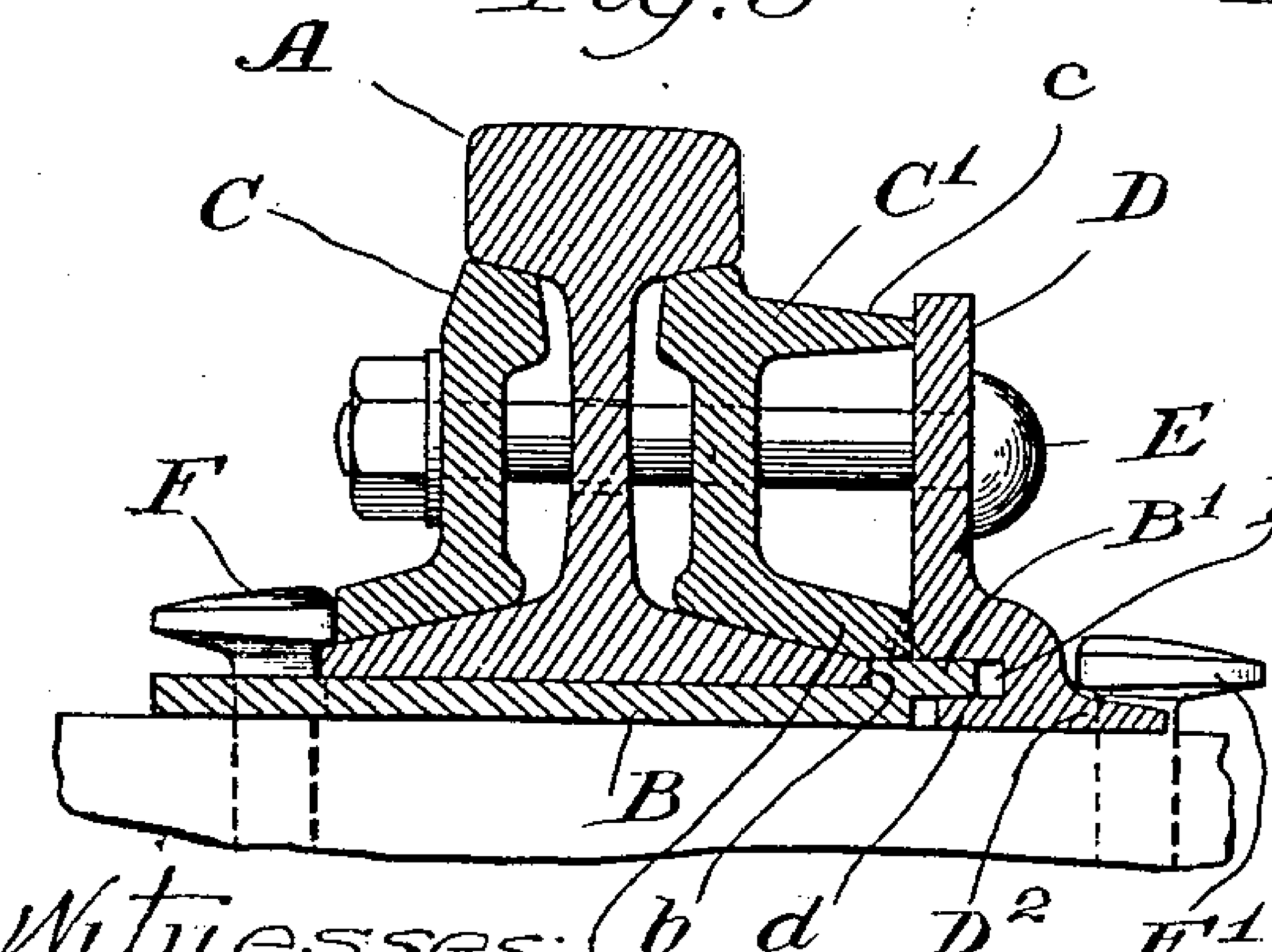
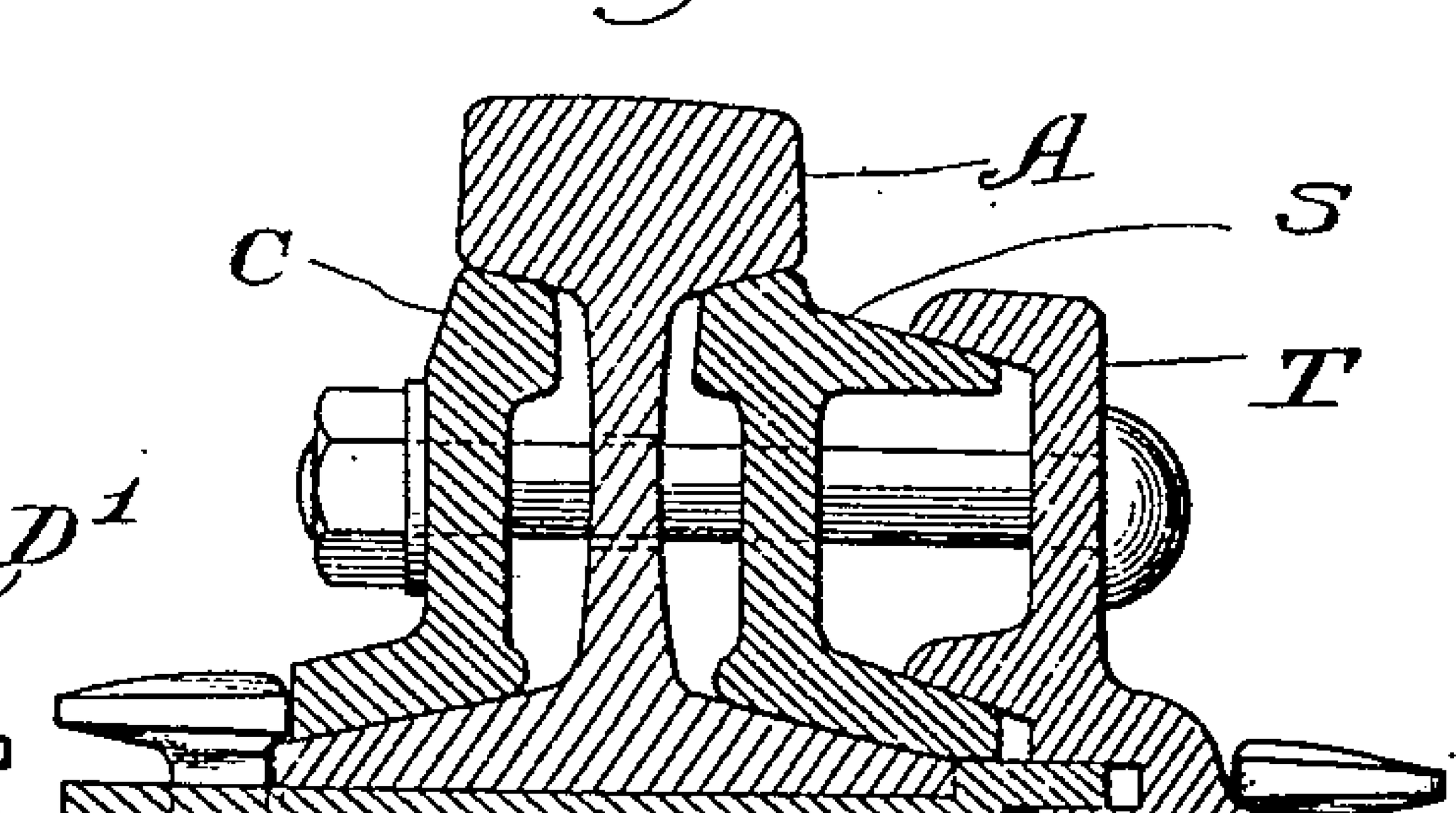


Fig. 7.



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2 SHEETS—SHEET 2.

Fig. 4.

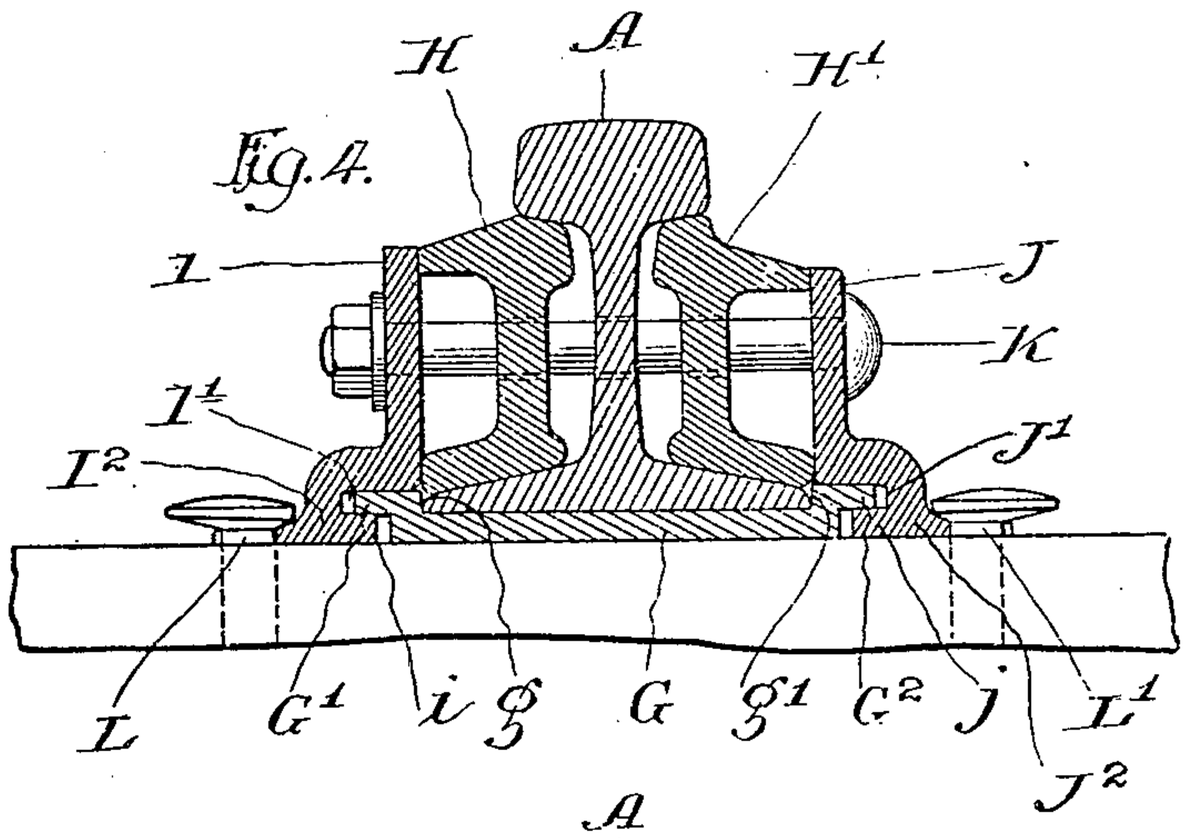


Fig. 5.

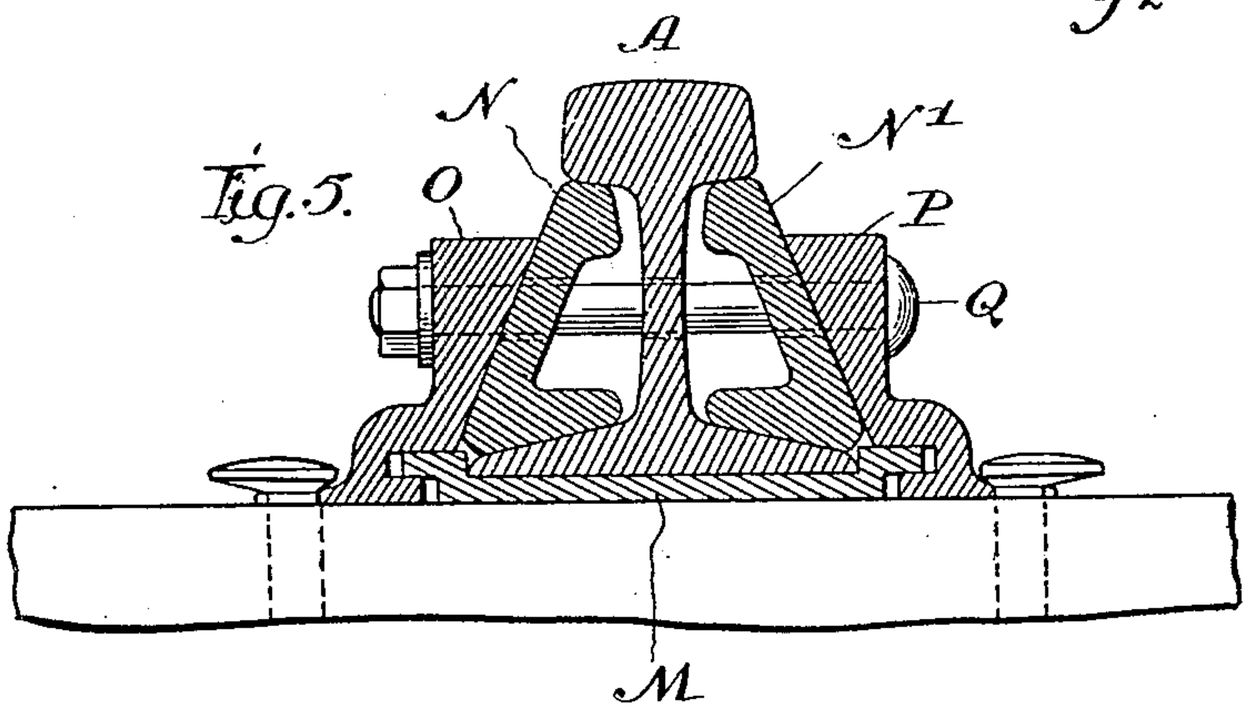
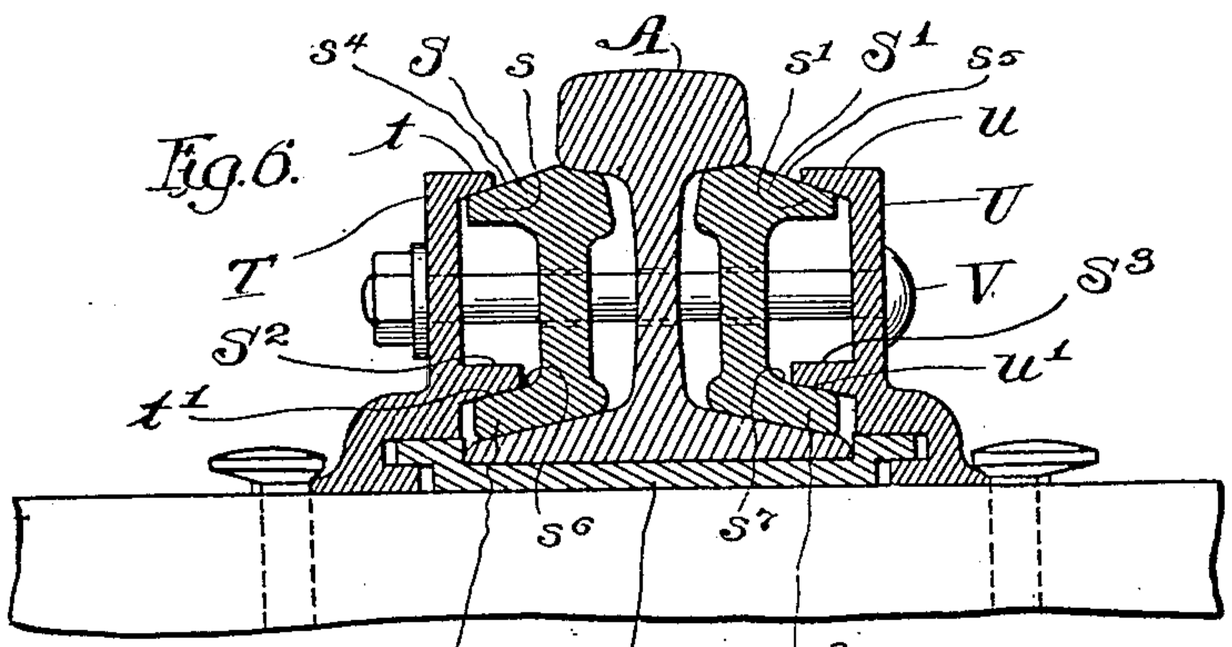


Fig. 6.



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UNITED STATES PATENT OFFICE.

BENJAMIN WOLHAUPTER, OF NEW YORK, N. Y., ASSIGNOR TO THE RAIL JOINT COMPANY, A CORPORATION OF NEW YORK.

RAIL-JOINT.

No. 842,508. Specification of Letters Patent. Patented Jan. 29, 1907.

Application filed September 28, 1906. Serial No. 336,600.

To all whom it may concern:

Be it known that I, BENJAMIN WOLHAUPTER, a citizen of the United States, a resident of New York city, in the county of New York and State of New York, 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.

This invention relates to improvements in rail-joints of that class in which the joint embraces a base-plate which supports the meeting ends of the rails, two joint-bars, and a longitudinal stiffening plate or girder.

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

As shown in the accompanying drawings, Figure 1 is a plan view of a rail-joint embodying one form of my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a transverse section taken upon line 3 3 of Fig. 2. Fig. 4 is a transverse section showing a construction generally similar to that shown in Figs. 1, 2, and 3, but which embraces two stiffening plates or girders, one located at each side of the base-plate. Fig. 5 shows another form of joint which is generally like that shown in Fig. 4, but in which the stiffening plates or girders are provided with oblique inner faces. Fig. 6 is a modification of the construction shown in Fig. 5, in which each stiffening plate or girder is provided with two oblique faces adapted to act upon corresponding oblique faces formed upon the joint-bars. Fig. 7 is a view in cross-section of a joint like that shown in Fig. 6, but having one girder-plate and one flanged joint-bar only.

As shown in the said drawings, A A indicates the meeting ends of the rails; B, a horizontal base-plate, on which said meeting ends of the rails rest, and C C′ two joint-bars, which are fitted between the under faces of the rail-heads and the top surfaces of the base-flanges of the rails.

As shown in Figs. 1, 2, and 3, D indicates a longitudinal vertically-arranged stiffening or girder plate located at the outer side of the joint and having interlocking engagement at its lower margin with the adjacent side margin of the base-plate B in such a manner that said girder-plate is laterally movable or adjustable with respect to the base-plate, but is held from vertical movement relatively to said base-plate throughout its length, so that it serves as a stiffening member for the base-plate, acting to prevent or restrain bending or flexure of said base-plate under vertical or downward strains. E E designate track-bolts, which are inserted through the rails, joint-bars, and the girder-plate for clamping said parts together. At its side margin adjacent to the girder-plate D the base-plate is provided on its upper surface at one side of the rail-seat with an inwardly-facing longitudinal shoulder *b*, against which laterally bear the adjacent side margins of the base-flanges of the rails. The said shoulder *b* is designed to take the lateral stress on the rails due to the pressure on the inner edges of the rail-heads of the wheel-flanges, and the base-plate is therefore arranged with its shoulder *b* at the outer side of the rail. The base-plate is provided near its inner margin with spike-holes *b′ b′*, through which are inserted spikes, as shown at F in Figs. 2 and 3, for the holding of the base-plate to the tie and preventing outward shifting or movement of the base-plate on the tie. To provide for the interlocking connection of the outer margin of the base-plate with the girder-plate D, a construction is provided as follows: On the outer margin of the base-plate is formed a longitudinal outwardly-extending horizontal flange B′, located above the level of the bottom surface of the base-plate. The lower part of the girder-plate D is shaped to surround or embrace the flange B′, and for this purpose is extended outwardly over the top of said flange and has at its lower margin an inwardly-extending flange *d*, which projects beneath the flange B′ of the base-plate, said flange *d* with the part of the girder-plate above it forming a groove D′, having horizontal top and bottom surfaces and adapted to receive said flange B′ on the base-plate. Said girder-plate is shown as having a bottom horizontal bearing-surface, which is flush with the horizontal bottom surface of the base-plate and is thereby adapted to rest on the tie. The girder-plate is shown as also provided at its lower margin with an

outwardly-extending horizontal flange D^2, which forms with the flange *d* a flat horizontal bearing-surface on the girder-plate located in the same horizontal plane with the bottom surface of the base-plate B and adapted for contact with the tie. The outwardly-extending flange D^2 is preferably provided with apertures *d' d'*, through which spikes, one of which is shown at F' in Fig. 3, may be driven to hold the girder-plate in contact with the tie. The said apertures *d' d'* are transversely elongated or have the form of open notches, as shown in the drawings, in order to permit the girder-plate to be shifted toward the base-plate in tightening the joint, as hereinafter described. In the form of joint shown in said Figs. 1, 2, and 3, the joint-bar C', adjacent to the said girder-plate D, is provided with upper and lower outwardly-extending longitudinal flanges *c c'*, the upper flange being located above the track-bolts E E and the lower flange being in contact with the base-flange of the rail, said flanges *c* and *c'* being adapted for contact at their outer edges with the inner face of the girder-plate, so that when the base-flange of the rail is in bearing against the shoulder *b* of the base-plate the main part of the girder plate will rest or bear against the said flanges *c' c'* of the joint-bar C'. It will be understood that the base-plate is permanently secured in position upon the ties and that any outward movement of the rails from the normal position thereof is prevented by contact of the outer margins of the base-flanges of said rails with the shoulder *b*. The flanges *c* and *c'* on the joint-plate C' serve not only to transmit the inward pressure of the girder-plate to the body of the said joint-plate, thereby forcing the same into contact with the rails when the track-bolts are tightened, but said flanges also serve to give longitudinal stiffness to the said joint-bar, giving it greater capacity to resist tendency to bending or flexure under both vertical and horizontal strains or stresses. In assembling the parts of the joint the base-plate is secured in proper position upon the ties with its shoulder *b* in bearing against the outer margin of the base-flange of the rails, and when it becomes necessary to tighten the joint by screwing up the nuts on the track-bolts E such tightening may be accomplished without shifting in position of the rails on the base-plate, because under any shifting of the joint-bars C and C' in the tightening of the joint said girder-plate will be shifted slightly inward. This movement of the girder-plate is permitted by the horizontally-sliding interlocking connection of the girder-plate and base-plate afforded by the flange *b* and the groove D' without affecting the interlocking engagement or connection of the girder-plate with the base-plate, by which the base-plate is stiffened or held from vertical flexure to such an extent as is afforded by the stiffness or capacity to resist vertical flexure of the girder-plate itself.

In the construction illustrated in Fig. 4 a base-plate G is provided generally like that of the base-plate B before described in connection with Figs. 1, 2, and 3, but which is provided with two inwardly-facing shoulders *g g'* at both the inner and outer sides of the rail-seat and having at its outer and inner edges horizontal outwardly-extending flanges G' G^2. At opposite sides of the rails are located joint-bars H H'. In this construction two stiffening plates or girders I and J are employed, the same corresponding generally in construction with the girder-plates E. (Shown in said Figs. 1, 2, and 3.) The girder-plate I has a horizontal flange *i* extending beneath the flange G' of the base-plate and forming a groove I' to receive said flange G', together with an outwardly-extending horizontal flange I^2, adapted to rest upon the tie, while the girder-plate J is likewise provided with an inwardly-extending horizontal flange *j*, extending beneath the flange G^2 and forming with the part of the girder-plate above it a horizontal groove J' and with an outwardly-extending flange J^2. In this instance track-bolts, one of which is indicated by K, are inserted through the two girder-plates I and J and through the joint-bars H and H' and the ends of the rails, while the flanges I^2 J^2 of the girder-plates are provided with notches to receive the spikes L L'. The girder-plates J, which are located at the inner sides of the rails, are made lower than the girder-plates I at the outer sides thereof, in order to afford room or space for the wheel-flanges. In the construction shown in said Fig. 4 I provide stiffening-girders for both the inner and outer sides of the joint, thus greatly increasing the stiffness of the same and providing a great degree of rigidity to resist vertical strains, while at the same time by reason of the interlocking connection of both of the girder-plates with the side margins of the base-plate provision is made for tightening the joint without affecting the alinement of the rails or gage of the track, it being of course understood that in tightening the joint both of the girder-plates will be shifted inwardly toward the rails, while the base-plate will remain in its normal position or will not be shifted.

In Fig. 5 I have shown still another form of the general structure hereinbefore described embracing a base-plate M like the base-plate G in Fig. 4, joint-bars N N', fitting against the under faces of the rail-heads and the top surface of the rail-flanges and having downwardly and outwardly inclined outer faces, and the girder-plates O and P, which in their lower parts, that are engaged with the base-plate, are like the girder-plates I and J of Fig. 4, but the upper parts of

which have downwardly and outwardly inclined or oblique faces for contact with the similarly-inclined outer faces of the joint-bars N N′. Q indicates one of the track-bolts, which latter are arranged in the same manner as hereinbefore described. The girder-plates O and P in this instance serve to stiffen the joint while permitting the tightening thereof in the same manner as hereinbefore described, while the oblique contact-faces between the said stiffening-girders and the joint-bars are arranged at such inclination as to effect downward pressure of the joint-bars against the base-flanges of the rails when the said girder-plates are drawn inwardly by the track-bolts in tightening the joint. When the track-bolts are tightened, therefore, the girder-plates will be lifted and the base-plate connected therewith thereby clamped firmly against the base-flanges of the rails. This construction has the manifest advantage that in screwing up the nuts on the track-bolts the parts constituting the joint will be tightened or drawn together both vertically and horizontally, or, in other words, the joint will be tightened, so as to resist vertical as well as lateral flexure of the joint and to hold the rail ends from movement relatively to each other both laterally and vertically.

In Fig. 6 I have shown a modification of the construction illustrated in Fig. 5, embracing a base-plate R, like the base-plate G of Fig. 4 or M of Fig. 5, two joint-bars S S′, having outwardly-extending longitudinal upper flanges s and s' and lower flanges s^2 s^3, two stiffening or girder plates T and U, which are interlocked with the side margins of base-plate R in the same manner as before described, and track-bolts, one of which is shown at V. In this instance, however, the girder-plates T and U are provided at their upper margins with inwardly-extending flanges t and u, having oblique lower faces adapted to contact with outwardly and downwardly inclined top surfaces s^4 s^5 on the top flanges s and s' of the joint-bars S and S′, and are also provided near their lower margins and above the base-plate with inwardly-extending horizontal flanges t' u', having inclined or beveled lower faces adapted for contact with downwardly and outwardly inclined surfaces s^6 s^7 on the top surfaces of the lower flanges s^2 s^3 on said joint-bars. In this construction the drawing of the girder-plates T and U inwardly in tightening the track-bolts has the effect of forcing the joint-bars downwardly against the base-flanges of the rails in the same manner as before described in connection with Fig. 5, while the presence of the inwardly-extending flanges t t' u u' on the stiffening-girders serve to greatly increase the strength and rigidity thereof.

In the form of joint shown in Fig. 7 the joint has only one girder-plate T, like the girder-plate T of Fig. 6, and a flanged joint-plate S, interposed between said girder-plate T and the rails, such as is also shown in said Fig. 6. The joint shown in said Fig. 7 has at its side opposite the girder-plate a joint-bar C, like the corresponding joint-bar shown in Fig. 3.

The special form of joint-bar illustrated and claimed is more especially intended for metal joint-bars; but the general features of the invention may be embodied in a joint in which the joint-bars are made of wood, as in the case of an insulating-joint.

I claim as my invention—

1. A rail-joint comprising a base-plate, a longitudinal girder-plate having interlocking connection with one side margin of the base-plate, a joint-bar interposed between the rail ends and the said girder-plate, and track-bolts extending through the rails, the said joint-bar and the said girder-plate.

2. A rail-joint comprising a base-plate, a longitudinal girder-plate having interlocking connection with one side margin of the base-plate adapted to permit horizontal, lateral movement of the girder-plate with respect to the base-plate, a joint-bar interposed between the rail ends and the said girder-plate, and track-bolts extending through the rails, the said joint-bar and the said girder-plate.

3. A rail-joint comprising a base-plate, a longitudinal girder-plate having interlocking connection with the adjacent side margin of the base-plate, a joint-bar having upper and lower outwardly-extending longitudinal flanges in contact with said girder-plate, and track-bolts extending through said rails, the joint-bar and the girder-plate.

4. A rail-joint provided with a base-plate having, at the outer side of the rail-seat thereof, an inwardly-facing longitudinal shoulder, a longitudinal girder-plate at the outer side of the rail, having interlocking connection with the side margin of the base-plate at which the said shoulder is located, a joint-bar interposed between the rail and the said girder-plate, and bolts extending through said rails, joint-bar and girder-plate.

5. A rail-joint comprising a base-plate having at the outer side of the rail-seat thereof an inwardly-facing longitudinal shoulder, and outside of said shoulder an outwardly-extending horizontal flange located above the level of its bottom surface, a longitudinal girder-plate provided near its lower margin with a horizontal groove adapted to receive said flange on the base-plate, a joint-bar interposed between the rails and the said girder-plate, and bolts extending through the rails, the joint-bar and girder-plate.

6. A rail-joint comprising a base-plate provided at one of its side margins with an outwardly-extending horizontal flange located above the level of its bottom surface, a longitudinal girder-plate the lower margin of

which is in the same horizontal plane with the bottom surface of the base-plate and which is provided with a horizontal groove adapted to receive said flange on the base-plate, a joint-bar interposed between the rails and the said girder-plates, and bolts extending through the rails, the joint-bar and the girder-plate.

7. A rail-joint comprising a base-plate having at one side of the rail-seat thereof an inwardly-facing longitudinal shoulder, and an outwardly-extending horizontal flange located above the level of its bottom surface, a longitudinal girder-plate provided near its lower margin with a horizontal groove adapted to receive said flange on the base-plate, and the lower margin of which is in the same horizontal plane with the bottom surface of the base-plate, a joint-bar interposed between the rails and said girder-plate, and bolts extending through the rails, the joint-bar and girder-plate.

8. A rail-joint comprising a base-plate, inner and outer longitudinal girder-plates having interlocking connection at their lower edges with the side margins of the base-plate, joint-bars interposed between the rails and said girder-plates, and track-bolts extending through the rails, the said joint-bars and the girder-plates.

9. A rail-joint comprising a base-plate having inwardly-facing, longitudinal shoulders at both sides of the rail-seat thereof, inner and outer longitudinal girder-plates having interlocking connection at their lower edges with the side margins of the base-plate, joint-bars interposed between the rails and the said girder-plates, and bolts extending through said rails, the joint-bars and the girder-plates.

10. A rail-joint comprising a base-plate having inwardly-facing, longitudinal shoulders at both sides of the rail-seat thereof, and provided at its side margins with outwardly-extending horizontal flanges located above the level of its bottom surface, inner and outer longitudinal girder-plates provided near their lower margins with horizontal grooves adapted to receive said horizontal flanges on the base-plate, joint-bars interposed between the rails and said girder-plates, and bolts extending through the rails, the joint-bar and the girder-plates.

11. A rail-joint comprising a base-plate having inwardly-facing, longitudinal shoulders at both sides of the rail-seat thereof, and provided at its side margins with outwardly-extending horizontal flanges located above the level of its bottom surface, inner and outer longitudinal girder-plates provided near their lower margins with horizontal grooves adapted to receive said horizontal flanges on the base-plate, and the lower margins of which are in the same horizontal plane with the bottom surface of the base-plate.

12. A joint-rail comprising a base-plate and girder-plate having interlocking connection at its lower margin with the base-plate, a joint-bar interposed between the rails and said girder-plate, and bolts inserted through the rails, the joint-bar and girder-plate, the contact-surface between the joint-bar and girder-plate being outwardly and downwardly inclined.

13. A rail-joint comprising a base-plate, inner and outer longitudinal girder-plates having interlocking connection at their lower margins with the side margins of the base-plate, joint-bars interposed between the rails and the said girder-plates, and bolts inserted through said rails, the joint-bar and girder-plates; the contact-surfaces between the said joint-bars and the said girder-plates being outwardly and downwardly inclined.

14. A rail-joint comprising a base-plate, a longitudinal girder-plate having interlocking connection at its lower margins with the side margin of the base-plate, a joint-bar interposed between the rails and the girder-plate, and bolts extending through the rails, the joint-bar and the girder-plate said girder-plate being provided with two inwardly-extending horizontal flanges located one above and the other below the track-bolts and having downwardly and inwardly facing oblique surfaces, and said joint-bar having two upwardly and outwardly facing oblique surfaces for contact with the oblique surfaces of the girder-plate.

15. A rail-joint comprising a base-plate, a longitudinal girder-plate having interlocking connection with one side margin of the base-plate, a joint-bar interposed between the rails and said girder-plate, and track-bolts extending through the rails, the joint-bar and said girder-plate, said joint-bar having upper and lower longitudinal flanges in contact at their outer edges with the girder-plate; the lower flange being adapted for contact with the base flange of the rails.

In testimony that I claim the foregoing as my invention, I affix my signature in the presence of two witnesses, this 21st day of September, A. D. 1906.

BENJAMIN WOLHAUPTER.

Witnesses:
J. T. VAN LOAN,
D. STEVENS.