

(No Model.)

3 Sheets—Sheet 1.

F. G. JOHNSON.

RAILROAD TIE.

No. 354,147.

Patented Dec. 14, 1886.

Fig. 1.

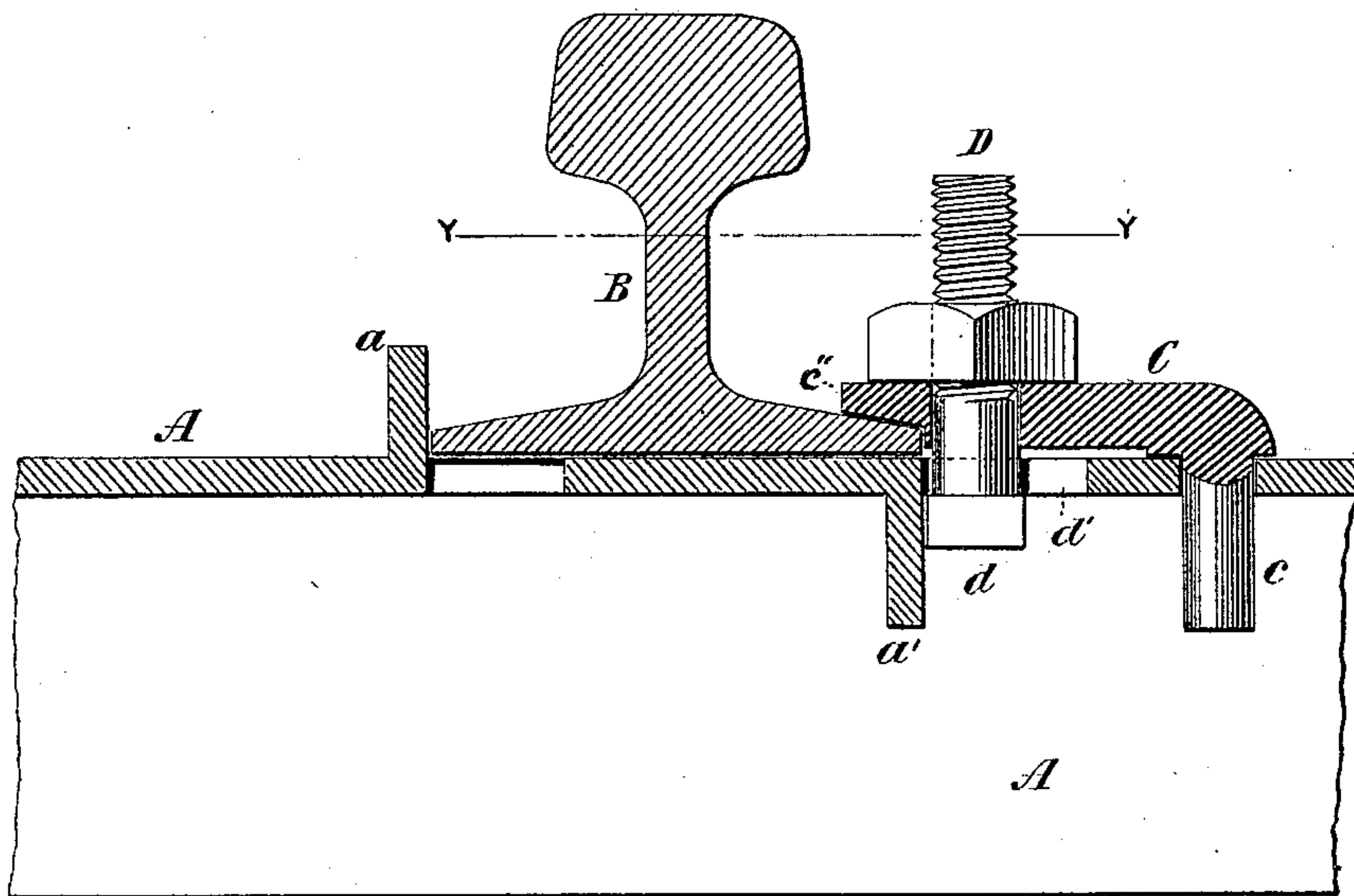
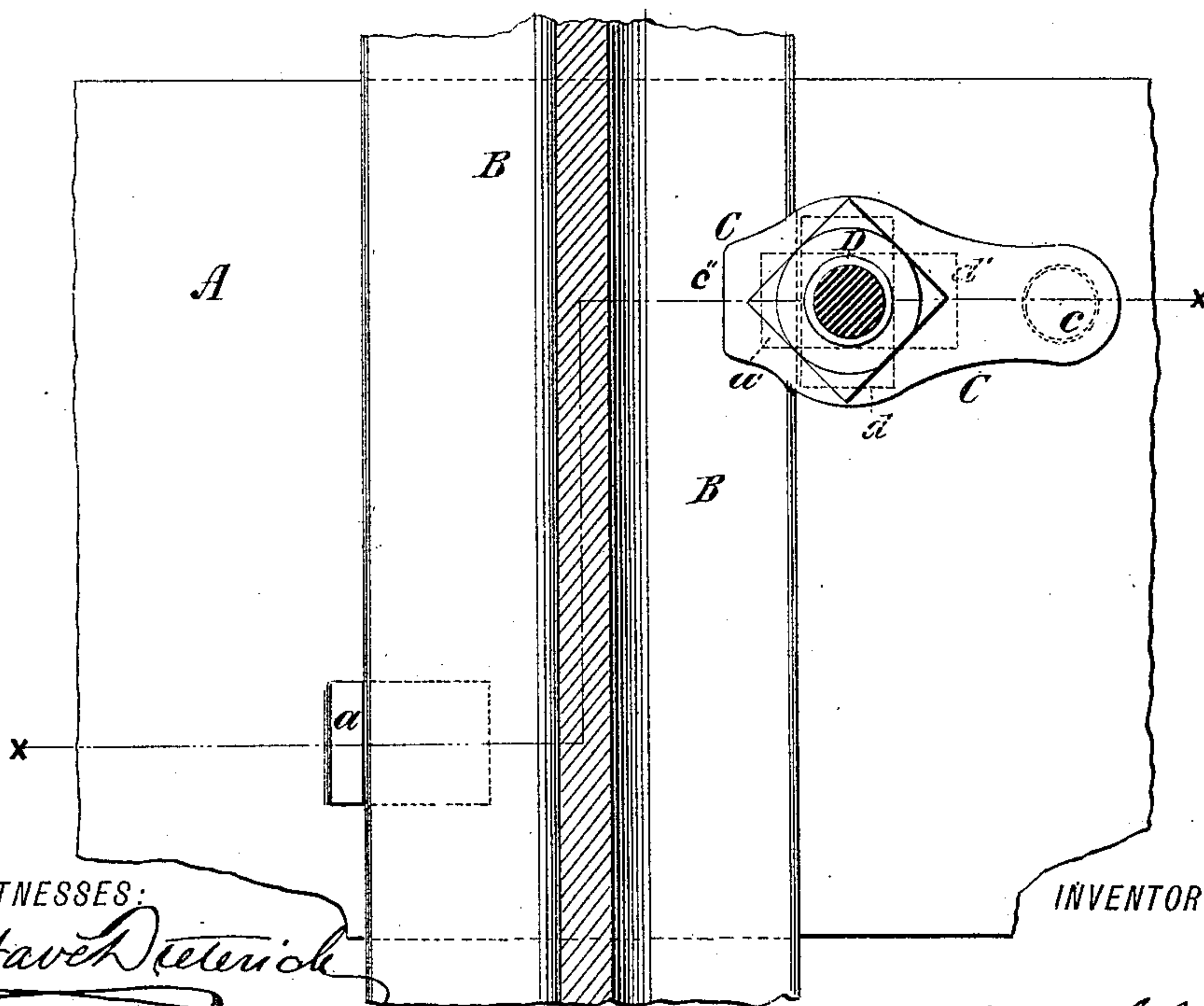


Fig. 2.



WITNESSES:

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Gustave Dietrich

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INVENTOR

Frank L. Johnson

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Fig. 3.

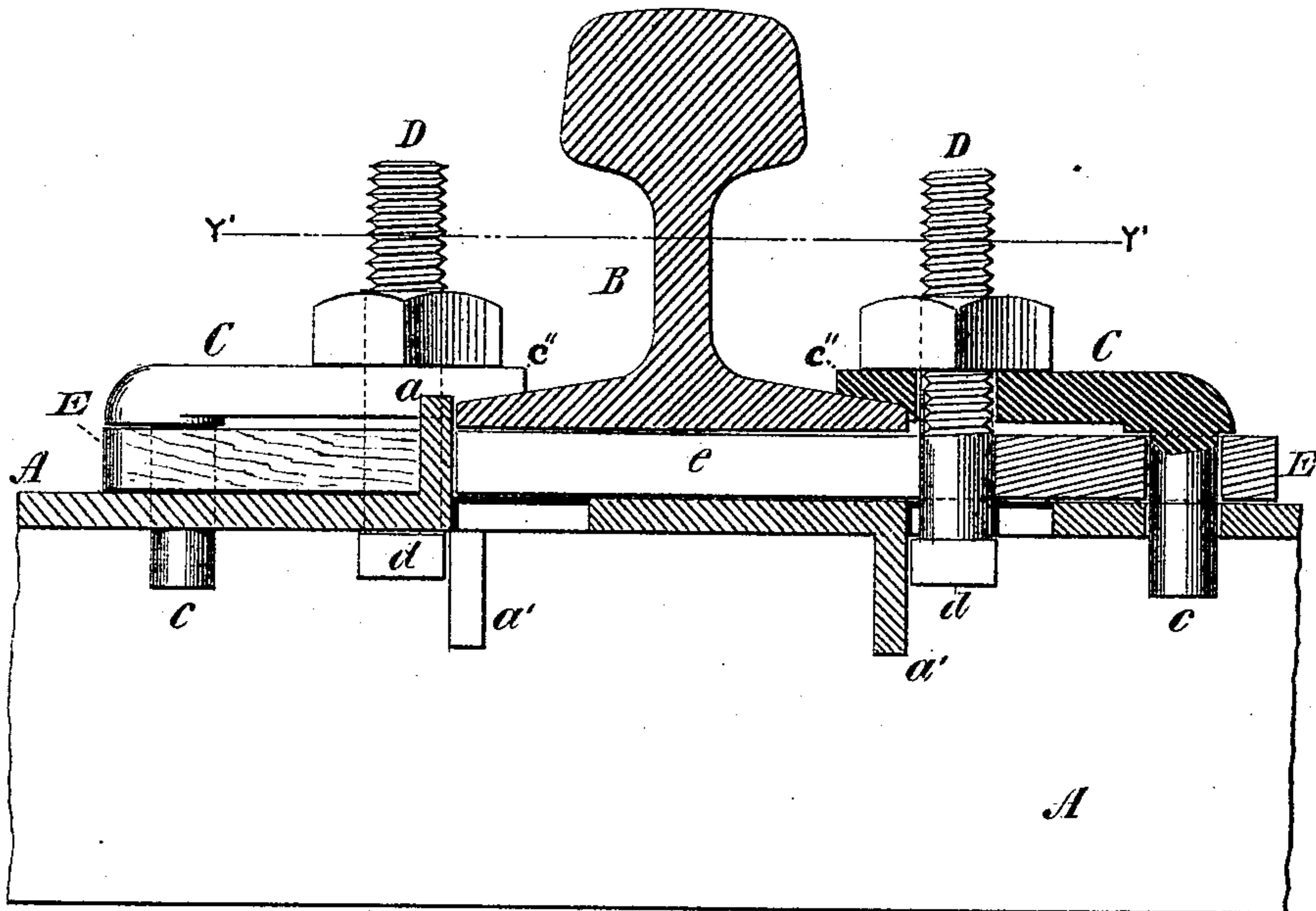
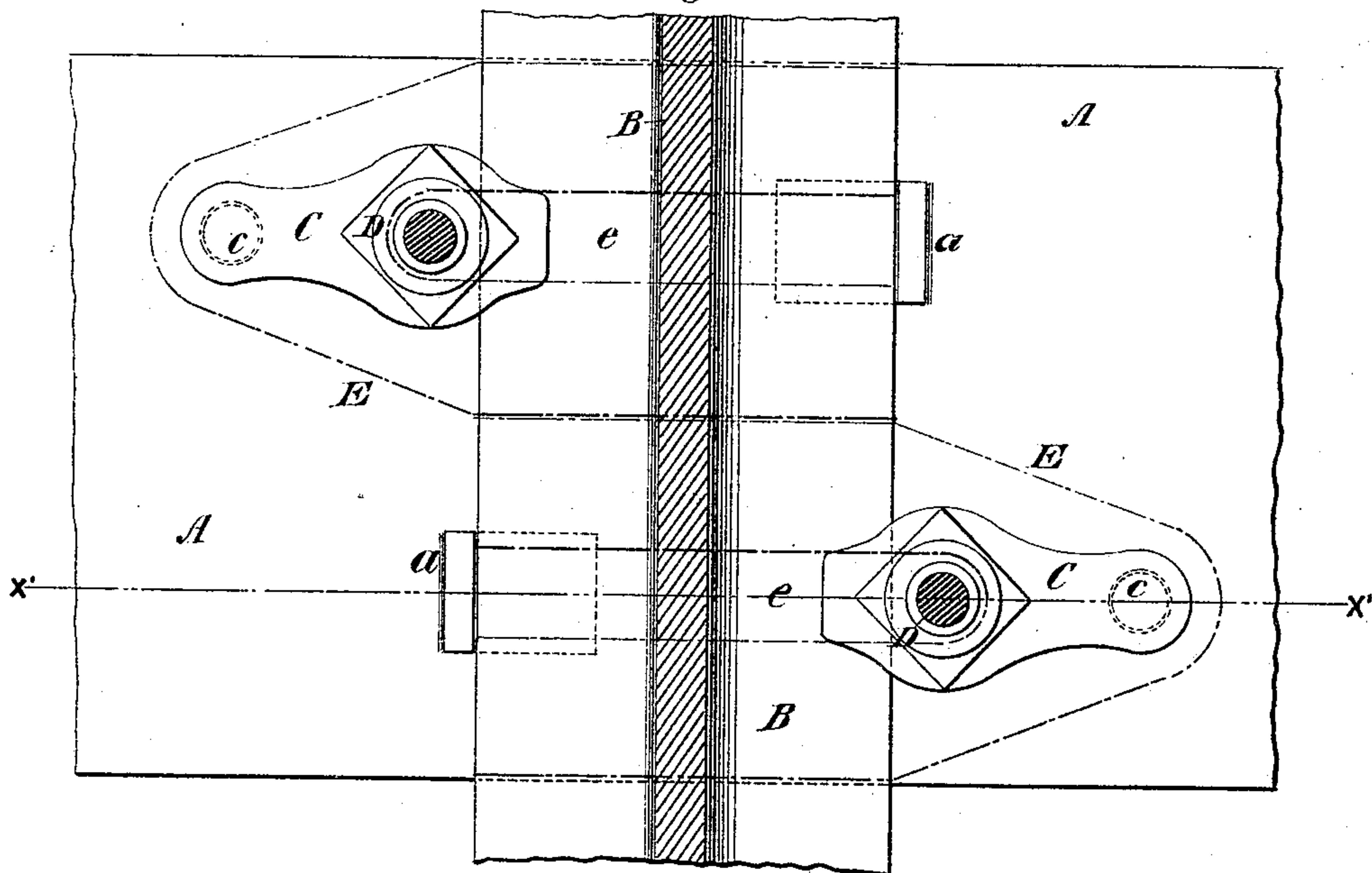


Fig. 4.



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3 Sheets—Sheet 3.

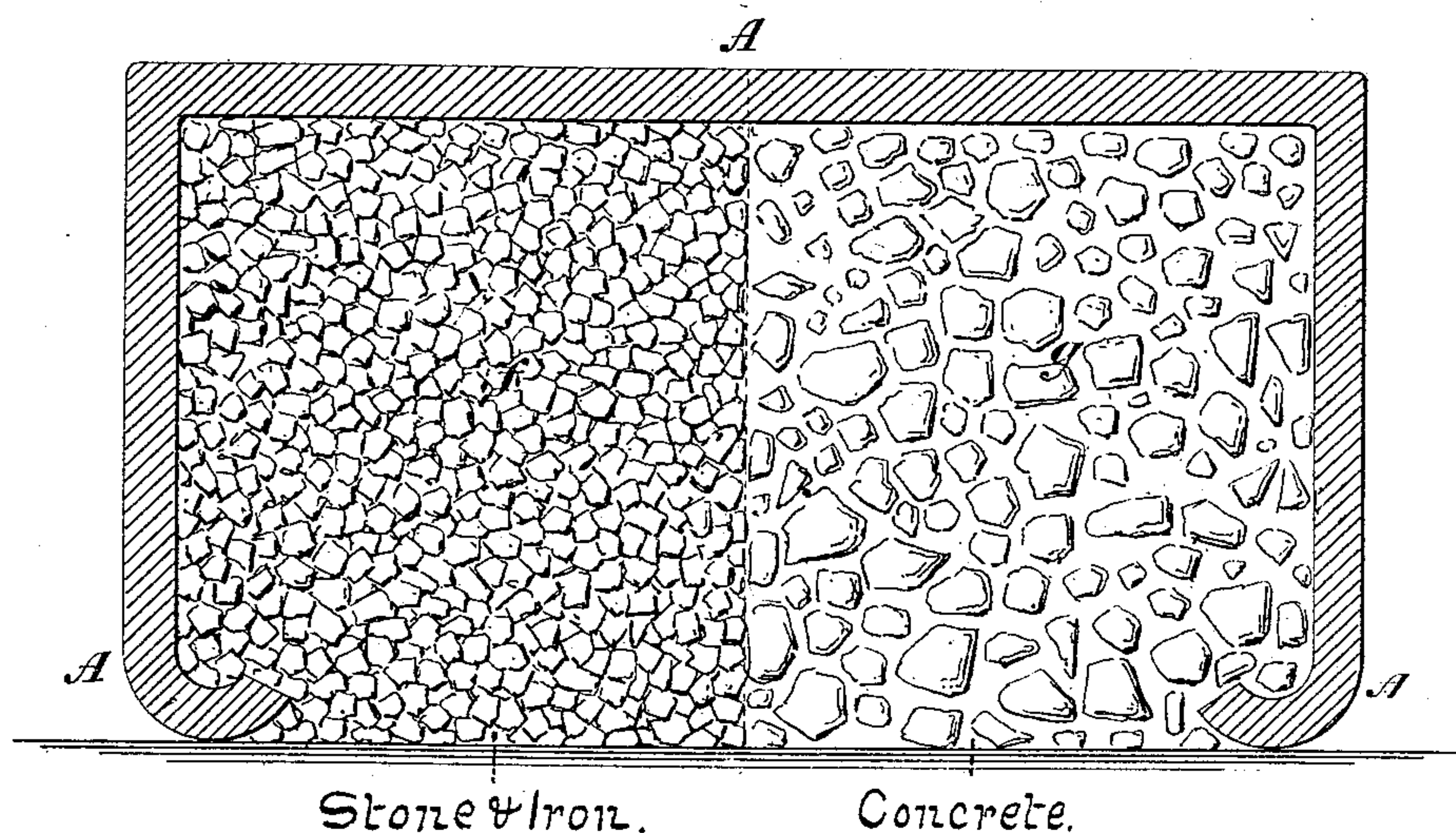
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Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANK G. JOHNSON, OF NEW YORK, N. Y.

RAILROAD-TIE.

SPECIFICATION forming part of Letters Patent No. 354,147, dated December 14, 1886.

Application filed March 31, 1886. Serial No. 197,250. (No model.)

To all whom it may concern:

Be it known that I, FRANK G. JOHNSON, a citizen of the United States, residing in the city, county, and State of New York, have invented new and useful Improvements in Railroad-Ties, of which the following is a specification.

My invention relates to that class of railroad-ties intended as an improved substitute for and to take the place of the ordinary wooden ties now commonly used on steam-roads.

The main objects of my invention are to provide a new railroad-tie, to take the place of the ordinary wooden tie, and made in such a manner and composed of such materials as, first, to render it very durable and lasting; second, to make it very strong; third, to render it conveniently and solidly "ballasted;" fourth, to render it possible and convenient to securely fasten to it the rails; fifth, to render it convenient (here and there) to detach, remove, and replace the tie without disturbing the rail; sixth, to detach, remove, and replace the rail without disturbing the tie; seventh, to render it possible and convenient, (here and there,) as may be required, to vertically adjust the bearing of the tie to the rail without changing the position of the tie itself, an operation known as "shimming up," which becomes necessary in freezing climates, as a means of bringing all the bearings of the ties up to a common horizontal plane with the base of the track without elevating the ties, which is made necessary in consequence of the unequal vertical displacement of the ties (here and there) by the freezing of the ground, and the consequent difficulty, while the ground is still frozen, of elevating or depressing the ties into a common level to adjust them to the line of the track; eighth, to render it convenient to remove the "shims" when the ground becomes thawed out and the ties themselves are to be reballasted up to the rail; ninth, to render the tie, considering its durability, sufficiently inexpensive to be afforded. These objects I attain by the peculiarly-constructed tie illustrated in the accompanying drawings, consisting of three sheets, in which—

Figure 1 is a vertical section on the zigzag line *xx*, Fig. 2. This Fig. 1 is a vertical transverse section as to the rail-track B, but a vertical longitudinal view as to the tie A. Fig.

2 is a top view, seen by looking vertically downward. Fig. 3 is a vertical section, similar to Fig. 1, showing the rail B "shimmed up" with the shims E E. Fig. 4 is a top view, seen by looking vertically downward, showing the upper sides or faces of the shims E E. Fig. 5 is a transverse section of the body of the tie without the attachments for fastening the rails thereto, but showing the filling of the tie.

Similar letters refer to similar parts throughout the several views.

A detailed description of my invention is as follows:

A A is the tie, which consists of plate-iron, about a quarter of an inch thick, bent longitudinally at right angles at the top, and the bottom edges of the sides curved, preferably, in toward the center, as shown in Fig. 5. To render the tie more solid and stronger and more conveniently and firmly ballasted, the interior is filled with broken stone and melted iron *f*, the stone being first well rammed and compacted in, and then cemented or joined into a solid mass by pouring in cheap melted iron, the stone and plate-iron being first heated quite hot to allow the melted iron to run more freely and to cause the plate-iron to shrink tightly upon the filling when cooling, the object of curving the lower edges of the plate-iron, as shown, being to assist in holding the vertical sides or walls of the plate-iron to the filling, and prevent them from spreading apart, and also to render the act of ballasting the tie more convenient, when for this purpose the ballasting bar or iron is thrust under the tie. The plate-iron I will term the "plate-iron tie," and the contents within it the "filling."

Having thus described the body of the tie and the method of making it, I will now describe and explain the method and means of fastening to it the rail B.

Referring to the several figures, it will be seen that from the top portion of the plate-iron tie there is punched out two lips, *aa*, each (transversely to the tie) about one and a quarter inch wide, and leaving corresponding holes or openings, and punched out in such a manner that on one side of each of these openings the piece of metal punched out is left attached to the tie, and is bent upward so as to stand at right angles with the top face of the tie. These two pieces or lips *aa*, because of the

function they perform, I will term "lateral rail-holders," which are placed or stand diagonally opposite to each other, the longitudinal distance between them being equal to the width of the base of the rail employed, as shown best in Fig. 4. The object of these lateral rail-holders *a a* is twofold: first, as the term implies, to provide such a secure lateral support of the rail as to render it impossible for the rail to be moved in a lateral direction in the least without carrying the tie with it; second, to furnish the most accurate, convenient, and reliable "gage" or gaging of the road without the necessity of hand-measurement. This latter object is attained as the result of placing the lateral rail-holders *a a* in their position by accurately-working machinery in the manufacture of the tie.

a' a' are also two lips, punched out on three of their sides in a similar manner to those of *a a*, only that they are bent downward, instead of upward, and they stand also at right angles with the upper side of the tie. In form these lips *a' a'* are longer longitudinally with the tie than transversely, as shown by dotted lines *d'*, Fig. 2. The purposes of these lips *a' a'* are such in their function that I will term them "bolt-holders," being the means of preventing the clamping-bolts D from turning around, as will be hereinafter seen. Their position is such that their outer faces (referring to the rail) stand vertically in line with the lateral edges of the base of the rail. They are also located diagonally opposite each other.

C, which I will call the "vertical rail-holder," is made in one piece, and is to consist of cast-steel or wrought-iron or any suitable metal. The horizontal portion of this vertical rail-holder C is beveled at one end to form a nose, *c''*, Figs. 1 and 2, having a shoulder to rest against the lateral edge of the rail, (see Figs. 1 and 3,) and the bevel to fit upon the upper face of the base portion of the rail B. The opposite vertical end, *c*, of this vertical rail-holder C extends down through the upper side of the plate-iron tie through a suitable hole punched therein, which may be round, square, or oblong, and the vertical portion *c* of the vertical rail-holder C is made to correspond with this hole. This vertical rail-holder is clamped and held down upon the upper surface of the base portion of the rail by the bolt D, which I will term the "clamping-bolt," which is an ordinary bolt, save the peculiarity of its head, which, however, differs from the head of an ordinary bolt only in being made oblong, instead of square. (Shown best by the dotted lines *d*, Fig. 2.) The object of making these bolt-holders *a' a'* and the bolt-head *d* both oblong is to provide the means of obtaining counter-hold of the clamping-bolt D on the tie, which is thus explained: The oblong hole *d'*, Figs. 1 and 2, allows the oblong head *d* of the clamping-bolt D to pass down through the top of the tie A, and after it (the head of the bolt) is passed through the top of the tie, it (the bolt) is then turned quarter-way

around, so that the long way of the bolt-head *d* stands across the oblong hole *d'*, which prevents it (the bolt) from being drawn out of the tie by the clamping force of the nut of the bolt D.

The distance between the horizontal center of the bolt D and the horizontal center of the downward projection *c* of the vertical rail-holder C is such as to hold the adjacent longitudinal side of the bolt-head *d* close up to the bolt-holder *a'*, which prevents the clamping-bolt D from turning, while the downward projection *c* of the vertical rail-holder C prevents it (the vertical rail-holder C) from moving laterally away from the rail B, and which in turn prevents the bolt-head *d* from moving away from the bolt-holder *a'*. The nut of the clamping-bolt D, lapping over the nose *c''* of the vertical rail-holder C, gives it (the nose *c''*) great vertical holding power upon the rail.

From the foregoing description of my invention it will be seen that the rail B cannot move laterally in either direction on the tie, for the reason that it is held against lateral pressure or strain, not only by the lateral rail-holders *a a*, but by the downward vertical projection *c* of the vertical rail-holder C, as well as by the pressure-friction between the rail B and the holder C. It will be seen, also, that the rail B is vertically held to the tie A by means of the vertical rail-holder C, clamped and held upon the base portion of the rail by the clamping-bolt D, the nose *c''* being strengthened by the nut of the clamping-bolt D overriding or resting upon the top of it.

I will now explain how the above-described tie and its rail attachments provide for the shimming up of the tie, in order that it shall afford support for the rail without itself (the tie) being raised, when such an operation is required.

By referring to Fig. 3, it will be seen that the rail B is raised up from the tie A, and the space between the tie and rail is filled up by the shimming-up pieces or shims E E. The shim (for each bearing of the rail on the tie) consists of two pieces or halves, each half being of similar thickness and forms. (Best seen in Fig. 4.) Each half of the shim (transversely to the tie) equals half the width of the tie, as shown in Fig. 4, and, in order to place it under the rail B without removing the clamping-bolt D from the tie, it (the shim) is provided with a slot, *e*, which extends from one end back as far as to take in the clamping-bolt D, and then extending without a slot beyond the outer end of the vertical rail-holder C, and having a hole through which to pass the vertical portion *c* of the vertical rail-holder.

In order to insert or remove the shims E E, it is only necessary to remove the nuts from the two opposite clamping-bolts D, lift up the vertical rail-holder C, and when they (the shims) are inserted or removed, as the case may be, then replace the vertical rail-holder and screw on the nuts of the clamping-bolts.

Of course, in inserting the shims E E, they are to be so placed as to admit of the vertical stem *c* of the vertical rail-holder passing down through the hole in the shims provided therefor, which also keeps them (the shims) from working out of place without the employment of any other fastening or means therefor. The shims E E will all be of one pattern, save as they vary in thickness, and to be made of hard wood or suitable metal, or other desired material—as, perhaps, compressed paper or other compacted fibrous materials.

It will be seen that by the peculiar relation between the tie A, shims E E, rail B, and vertical rail-holder C, they are all kept firmly in binding contact with each other, and securely and immovably held in their respective and relative position by the simple means of the clamping-bolts D.

Having thus described the construction and operation of my invention, what I claim as new and useful, and desire to secure by Letters Patent, is—

1. In connection with railroads, the plate-iron tie A, having the bolt-holders *a' a'* and oblong holes *d'*, in combination with the vertical rail-holder C and clamping-bolt D, substantially in the manner and for the purposes described.

2. In connection with railroads, the plate-iron tie A, having the lateral rail-holders *a a*, bolt-holders *a' a'*, and oblong holes *d*, in combination with the vertical rail-holder C and clamping-bolt D, substantially as and for the purposes set forth.

3. In connection with railroads, the plate-iron tie A, having the bolt-holders *a' a'* and oblong holes *d'*, in combination with the vertical rail-holder C, clamping-bolt D, and shims

E E, substantially as and for the purposes described.

4. In connection with railroads, the plate-iron tie A, having the lateral rail-holders *a a*, bolt-holders *a' a'*, and oblong holes *d'*, in combination with the vertical rail-holder C, clamping-bolt D, and shims E E, substantially in the manner and for the purposes set forth.

5. In connection with railroads, the plate-iron tie A, filled in with concrete of broken stone and melted iron, substantially in the manner and for the purposes set forth.

6. In connection with railroads, the plate-iron tie A, having the bolt-holders *a' a'*, oblong holes *d'*, in combination with the concrete filling preferably of melted iron and broken stone *f*, vertical rail-holder C, and clamping-bolt D, as and for the purposes set forth.

7. In connection with railroads, the plate-iron tie A, having the lateral rail-holders *a a*, the bolt-holders *a' a'*, oblong holes *d'*, the interior filling of concrete preferably composed of broken stone and melted iron *f*, in combination with the vertical rail-holder C and clamping-bolt D, substantially in the manner and for the purposes described.

8. In connection with railroads, the plate-iron tie A, filled in with concrete preferably of broken stone and melted iron *f*, having the lateral rail-holders *a a*, bolt-holders *a' a'*, oblong opening *d'*, in combination with the vertical rail-holder C, clamping-bolts D, and shims E E, substantially in the manner and for the purposes set forth.

FRANK G. JOHNSON.

Witnesses:

CHAS. RUSTON,
W. T. B. MILLIKEN.