

No. 608,178.

Patented Aug. 2, 1898.

W. R. COCK.

ELECTRICAL RAIL BOND AND METHOD OF SECURING SAME IN PLACE.

(No Model.)

(Application filed Dec. 7, 1897.)

FIG. 1.

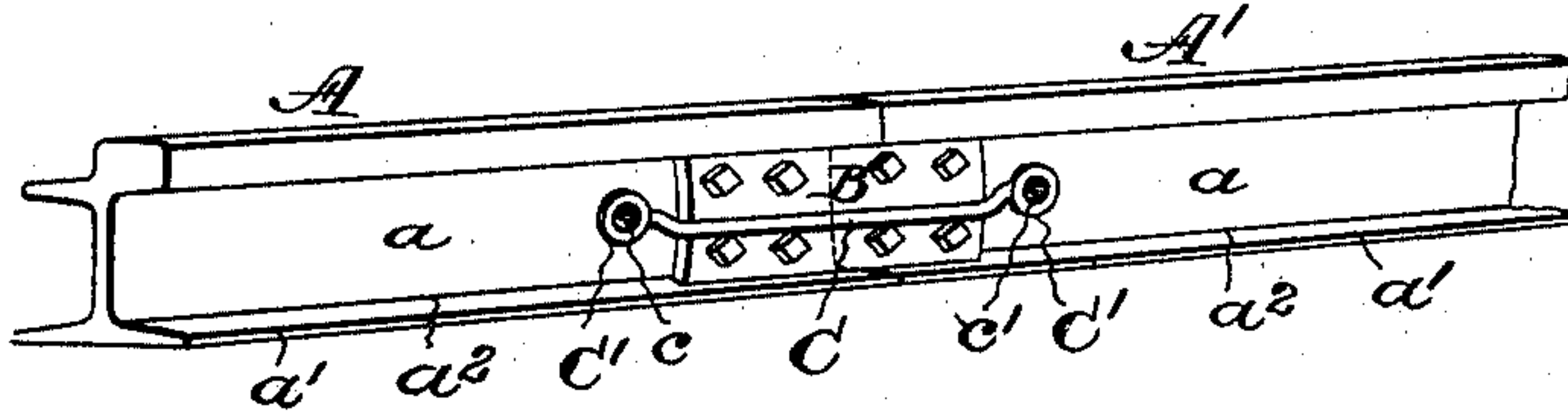


FIG. 2.

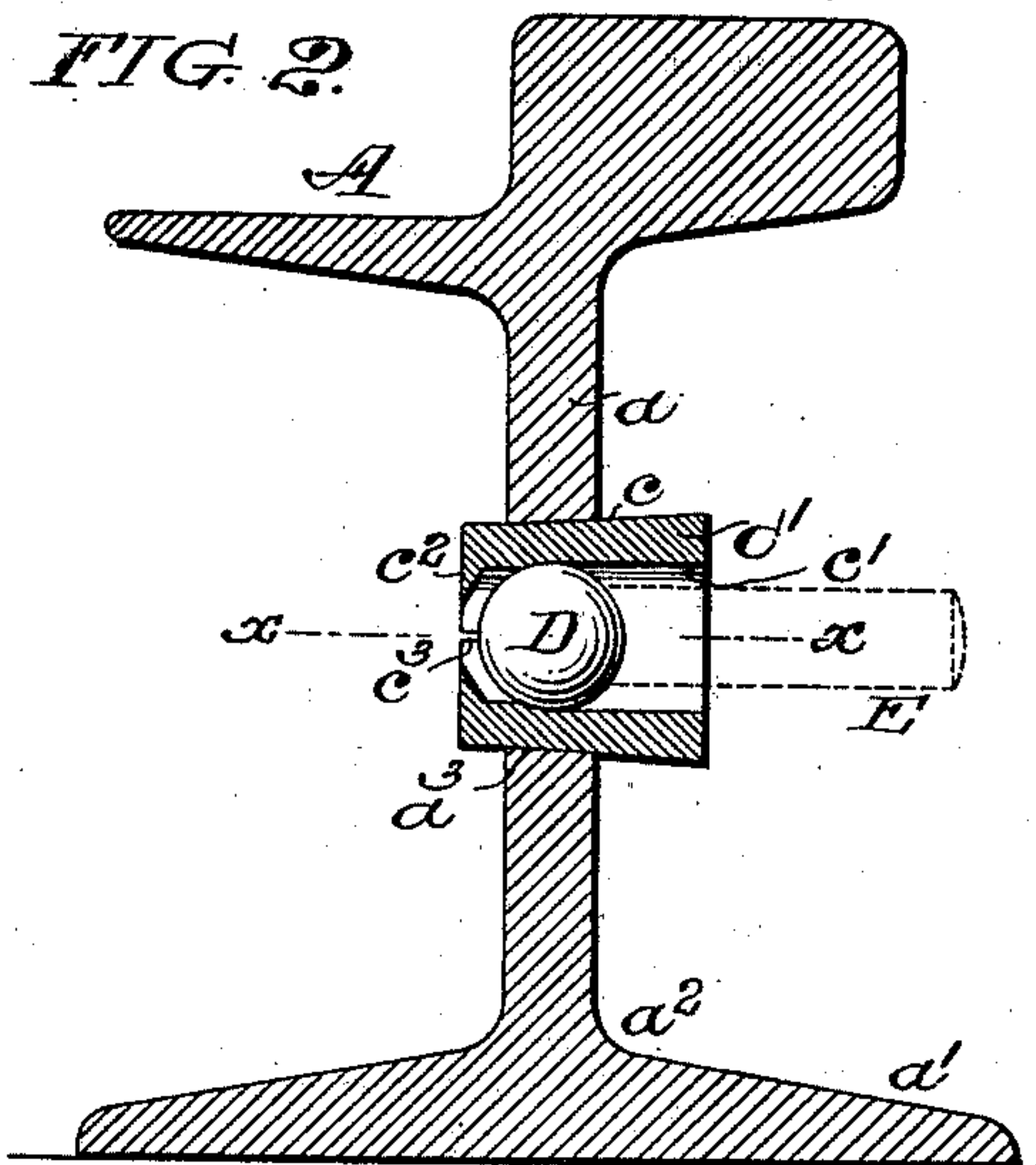


FIG. 3.

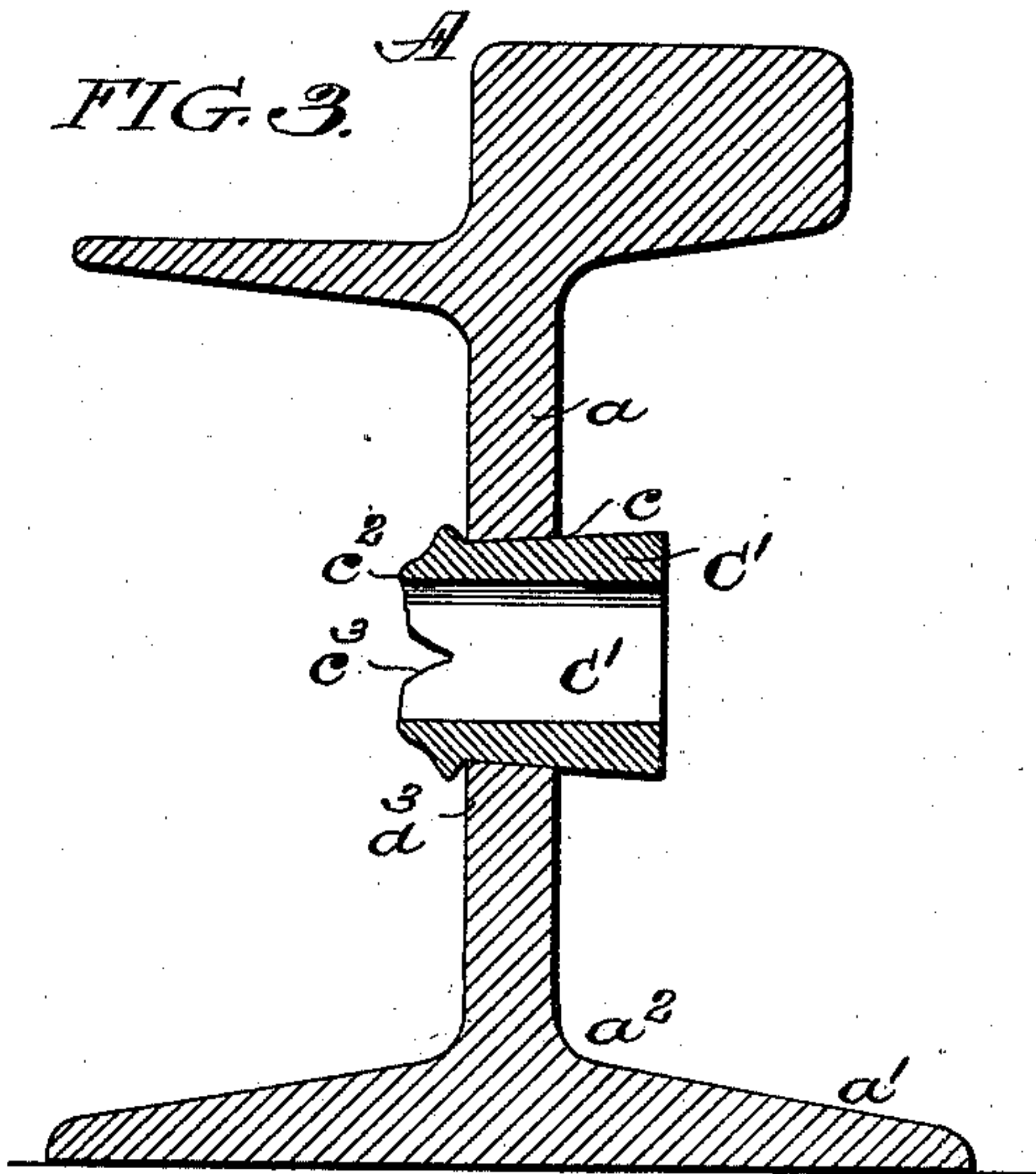


FIG. 5.

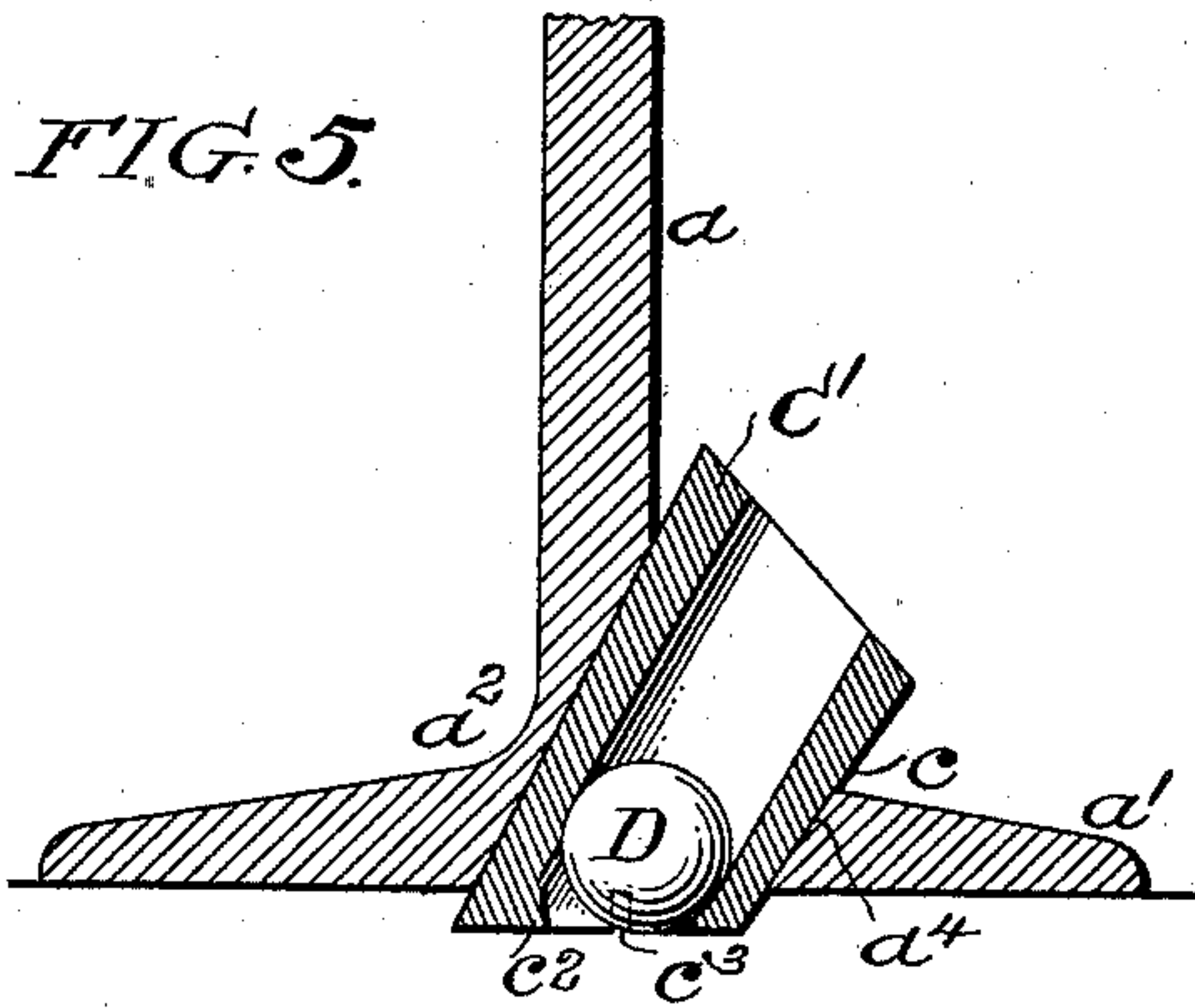
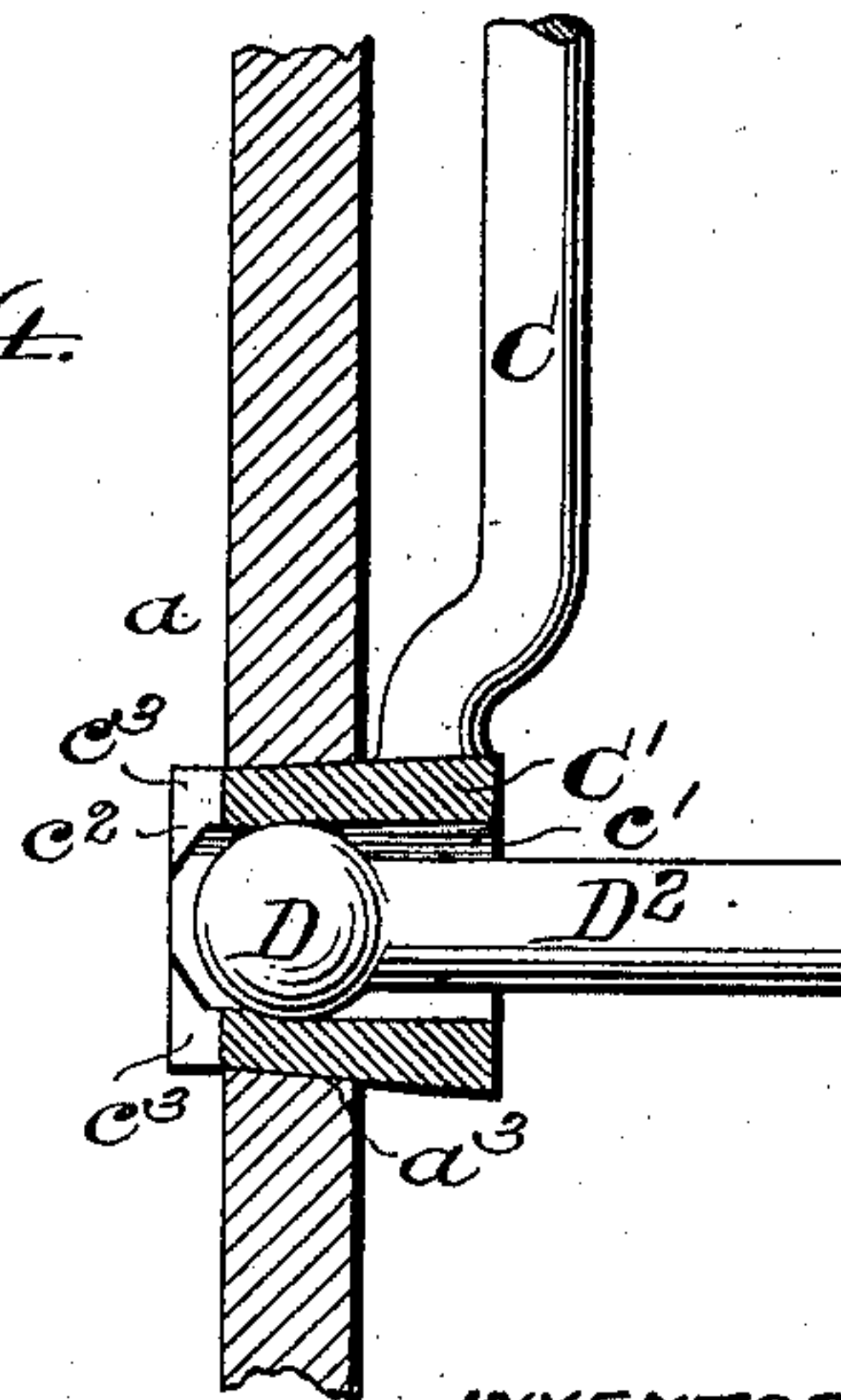


FIG. 4.



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ELECTRICAL RAIL-BOND AND METHOD OF SECURING SAME IN PLACE.

SPECIFICATION forming part of Letters Patent No. 608,178, dated August 2, 1898.

Application filed December 7, 1897. Serial No. 661,013. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. COCK, a citizen of the United States of America, residing in Plainfield, in the county of Union, in the State of New Jersey, have invented a certain new and useful Method of Securing Electrical Rail-Bonds in Rails, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to the method of securing electrical rail-bonds; and the object of my invention is to at once secure a more perfect contact between the bond-terminal and the rail in which it is secured and also a more secure anchoring of the bond in place.

I employ bond-terminals which may be formed with or secured to the bond proper in any convenient way and which are formed, preferably, with a slight conical contour, so that they can be driven into a perforation in the rail and a comparatively tight joint formed between the rail and terminal in this way. Through the center of the terminal I form a longitudinal cylindrical perforation, which, however, I preferably do not continue through the entire length of the terminal, as I prefer to form the outer end of the perforation with an inwardly-extending lip, the purpose of which will hereinafter be explained, and also, preferably, I form a slot at the outer end of the terminal to facilitate the spreading of this end, so as to clench the outer edge of the perforation in the rail.

My terminal, as above described, does not differ in general construction from terminals which have heretofore been used and which it has been attempted to expand into closer contact with the rail, and so as to clench the outer end against the rail, by driving a steel plug into the perforation of the terminals, but in this method serious difficulties have arisen, owing principally, as I have discovered, to the large frictional contact between the plug and bond-terminal, which is due to the fact that the blows struck in order to drive the plug or pin in place act to a large extent as though they impinged directly upon the head of the terminal, driving it forward in the perforation of the rail, with the result of tearing the outer surface of the terminal and impairing rather than increasing the

perfection of electrical contact between the terminal and the rail. The method mentioned has also been found defective, and no doubt for the same reason noted above, in that the plug does not sufficiently expand the outer end of the terminal, which not infrequently works loose.

The essential feature of my invention consists, after driving the terminal into the rail perforation, in expanding it progressively by means of contacting and acting at one time only on narrow annular sections of the bond, but successively on all portions to be expanded, and in this way I not only direct the force of each blow almost entirely to the work of expanding a section of the terminal, but permit a flow of the metal, which appears to be advantageous to the formation of the electrical contact as well as the grip of the bond on the rail.

To carry my method into effect, I use instead of the plug before mentioned a spherical ball or tool provided with a substantially spherical head, the ball or head being driven through the perforation in the bond-terminal after the said terminal is driven into the rail, and being slightly larger than the perforation in the bond and yet having but small surface contact with said perforation the force exerted in driving the ball through the terminal sets the metal outward into close contact with the perforation in the rail without any undue tendency to force the terminal further forward, thus securing a very perfect electrical contact, and coming at the outer end of the terminal into contact with the inwardly-extending lip the ball forces said lip outward, clenching it, so to speak, against the outer edge of the perforation in the rail, an operation which is facilitated by the slotting of the outer end of the terminal.

Reference being now had to the drawings in which my invention is illustrated, Figure 1 is a perspective view of the end of two rails electrically bonded together by my improved method. Fig. 2 is a vertical cross-section through the bond-receiving perforation of a rail, showing the perforated bond in position therein and the expanding-ball partially driven through the perforation in the bond. Fig. 3 is a similar sectional view showing the effect of driving the ball entirely through the

bond. Fig. 4 is a longitudinal section taken as on the line xx of Fig. 2, but showing, instead of the ball, an equivalent spherical-headed tool; and Fig. 5 is a vertical section through a modified construction in which the terminal instead of passing through the web of the rail passes partly through the web and partly through the bottom flange.

A and A' indicate adjacent rails, the webs of which are indicated at a , the bottom flange at a' , and the meeting place of the web and bottom flange at a^2 .

a^3 indicates the bond-receiving perforation formed in the web of the rail, and a^4 , Fig. 5, a bond-receiving perforation formed at the junction a^2 of the web and bottom flange.

B, Fig. 1, indicates a fish-plate joint between the rails.

C is the bond, having terminals C' C', which are preferably slightly conical in exterior conformation, so as to seat themselves firmly in the perforation of the rail when driven into it.

c' indicates a longitudinal, preferably cylindrical or substantially cylindrical, perforation through the bond-terminal, which at the outer end of the terminal terminates in an inwardly-extending flange, as indicated at c^2 , said outer end of the terminal being also preferably slotted, as indicated at c^3 .

D is a spherical ball of slightly-greater diameter than the perforation c' in the terminal and which is driven through the perforation in the terminal, as by a tool E, (indicated in dotted lines in Fig. 2,) the ball expanding the walls of the terminal, as clearly

indicated in Fig. 2, and setting the metal thereof outward against the walls of the perforation a^3 , and finally coming in contact with the lip c^2 it forces said lip and the end of the bond-terminal outward, as indicated in Fig. 3, clenching the terminal against the outer edge of the perforation in the rail, as shown, an action which is facilitated by the slotting of this end of the terminal.

In some positions it will be practical to use, instead of a spherical ball, a tool, such as D², Fig. 4, having a spherical or substantially spherical head D', but I believe in most positions it will be found best to use a spherical ball, which may of course be re-covered and and reused when practicable, but which when lost is of such small cost as not to add materially to the cost of the joint.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The method of securing a hollow, preferably slightly-conical, electric bond-terminal in place in a rail, which consists, in first forcing the terminal into a perforation in the rail and then expanding it and clenching it against the edge of the perforation in the rail by progressively expanding the hollow bond-terminal by means contacting and acting at one time only on a narrow annular section of the bond-terminal but successively on all portions of the bond to be expanded.

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