

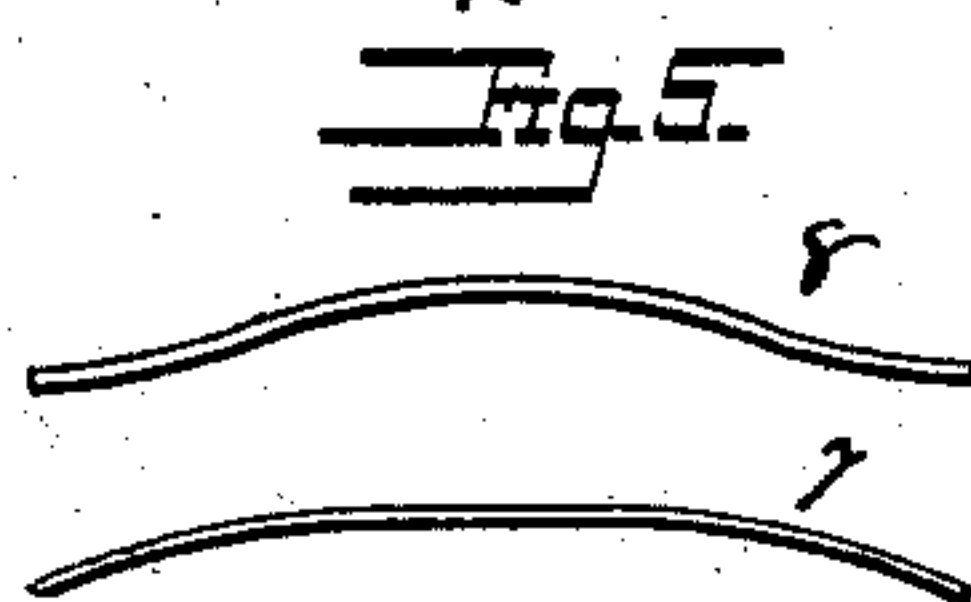
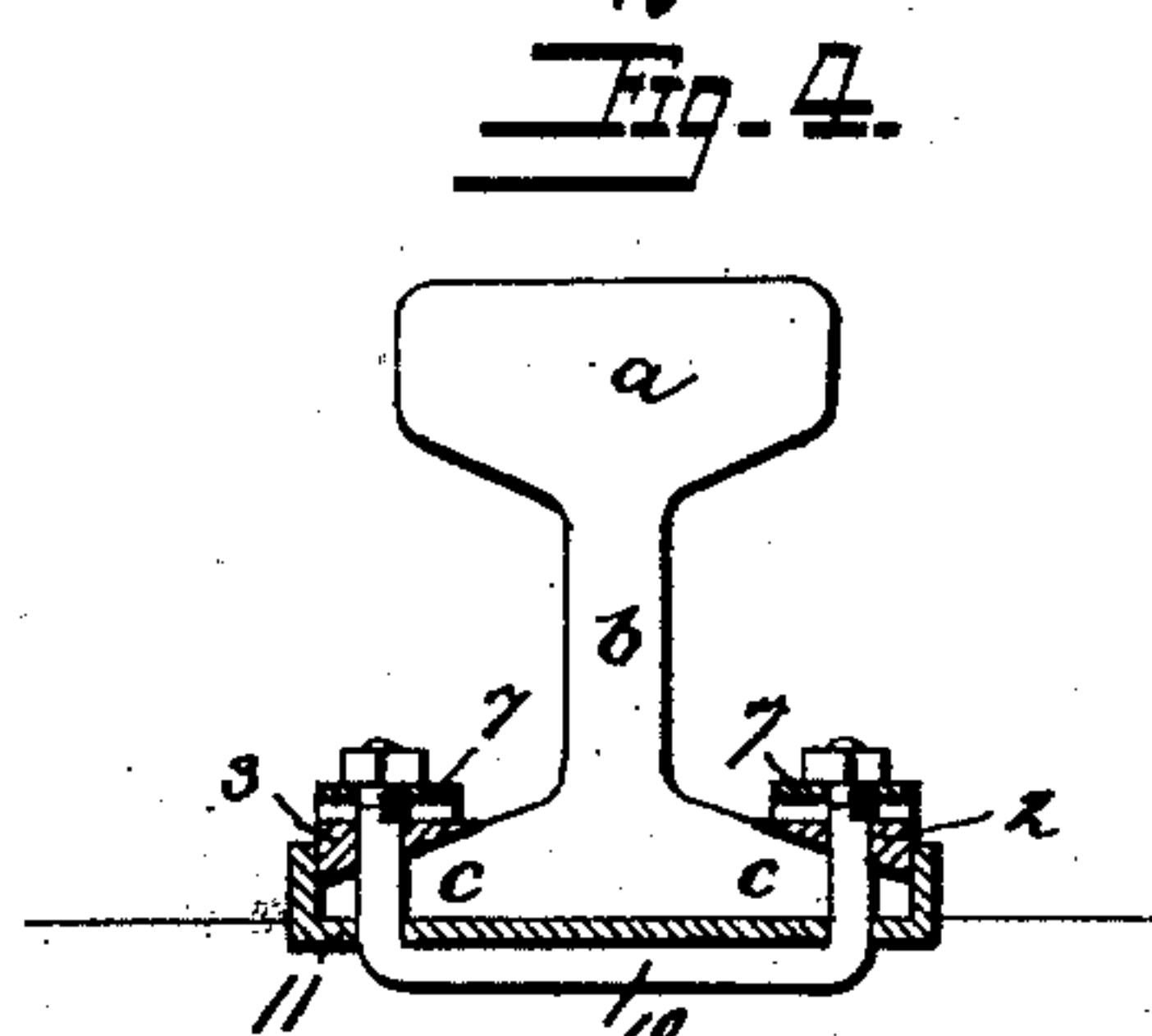
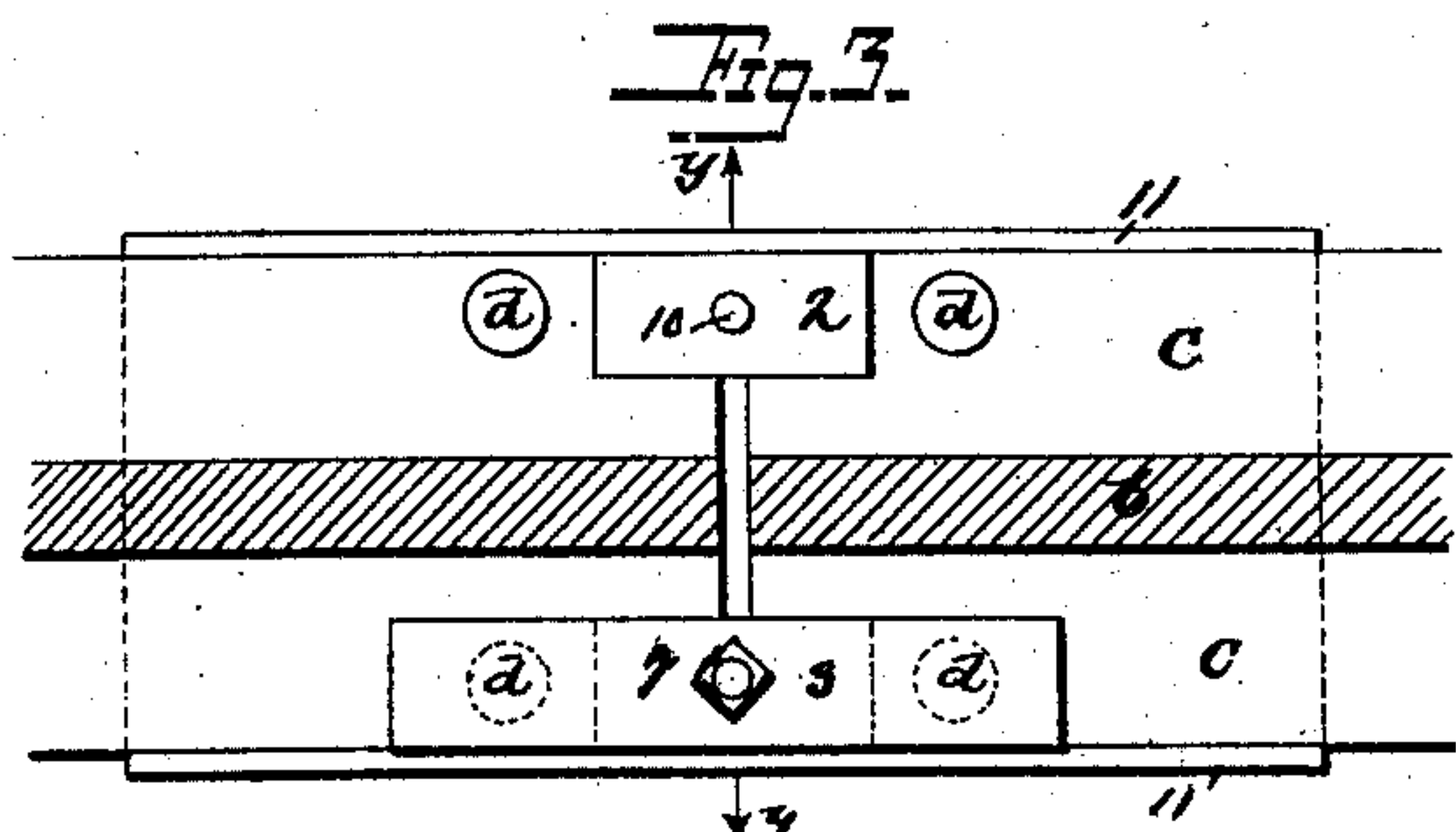
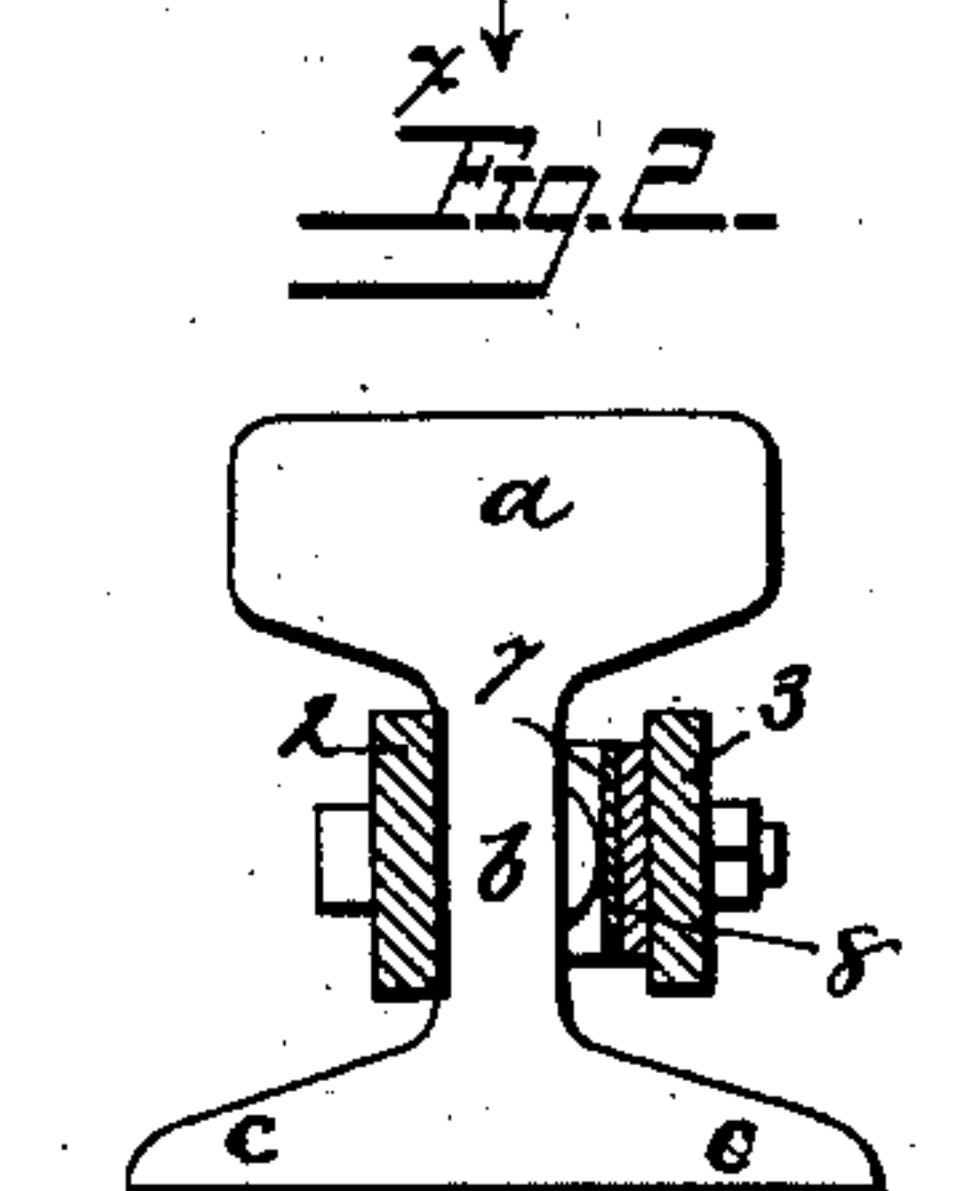
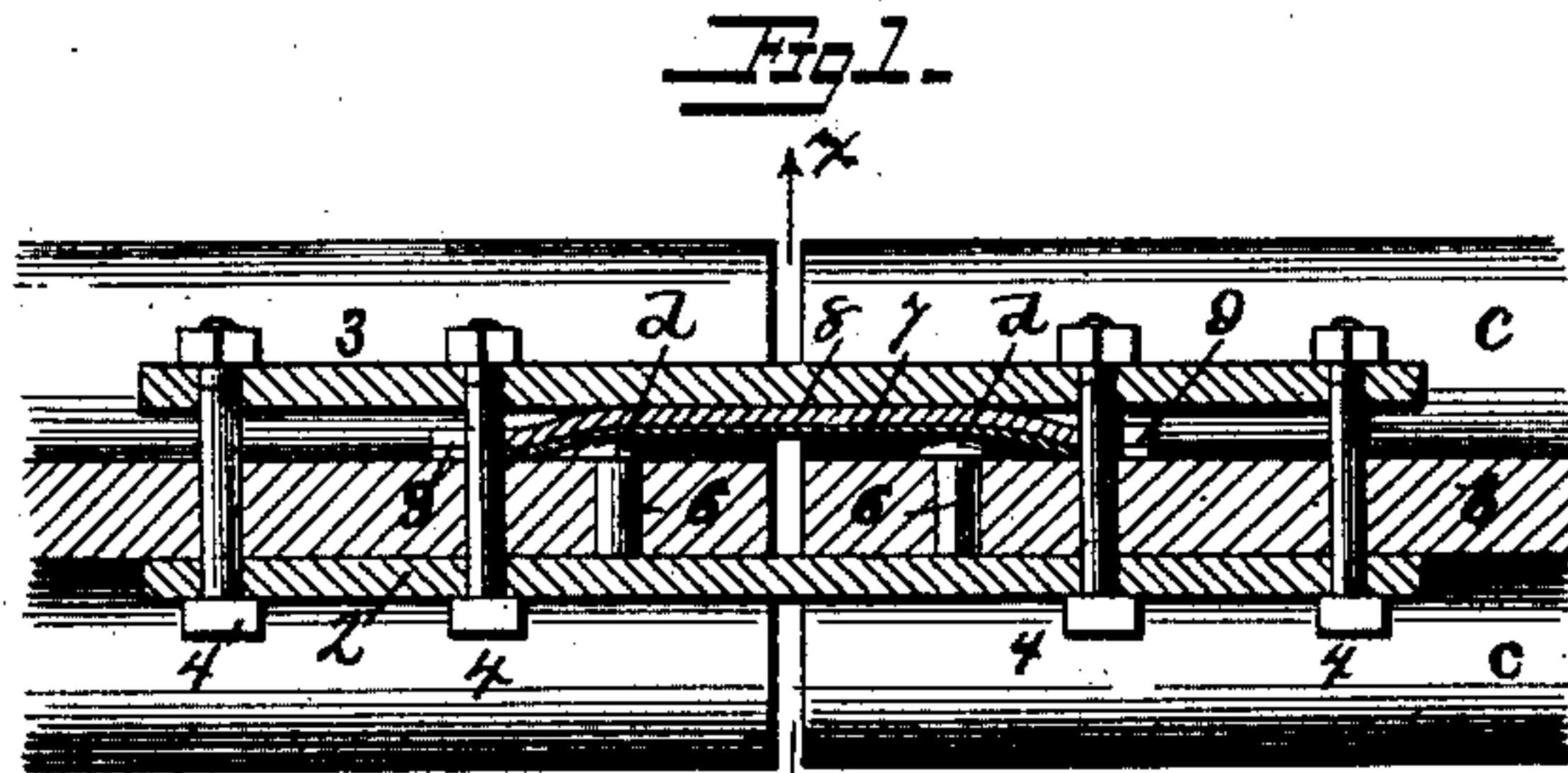
(No Model.)

E. L. ORCUTT.

RAIL CONNECTION FOR ELECTRIC RAILROADS.

No. 374,199.

Patented Dec. 6, 1887.



Witnesses  
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# UNITED STATES PATENT OFFICE.

EDWARD L. ORCUTT, OF SOMERVILLE, MASSACHUSETTS.

## RAIL-CONNECTION FOR ELECTRIC RAILROADS.

SPECIFICATION forming part of Letters Patent No. 374,199, dated December 6, 1887.

Application filed February 7, 1887. Serial No. 227,065. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD L. ORCUTT, a citizen of the United States, and a resident of Somerville, Middlesex county, Massachusetts, have invented certain new and useful Improvements in Rail-Connections for Electric Railroads, of which the following is a specification.

My invention has for its object to maintain a continuous electrical connection between the abutting ends of railway-rails; and my invention consists in providing the rails with sockets and with non-corrosive or substantially non-corrosive pins fitting the same, and in securing a connecting-plate in firm contact with said pins to permit the rails to move when contracting or expanding without breaking the good electrical contact with the plate.

In the drawings, Figure 1 is a sectional plan of rails and a fish-joint illustrating my invention. Fig. 2 is a transverse section on the line *x x*, Fig. 1. Fig. 3 is a sectional plan of rails, showing another form of fish-joint. Fig. 4 is a transverse section on the line *y y*, Fig. 3. Fig. 5 shows the connecting-plates.

The rails A B are constructed, in the usual manner, with heads *a*, webs *b*, and side flanges, *c c*. The abutting ends of the rails are connected by means of the usual fish-joints, one form being shown in Figs. 1 and 2, and another form in Figs. 3 and 4. In Figs. 1 and 2 the fish-plates 2 3 overlap the ends of the rails, and are bolted thereto, as usual, by transverse bolts 4 4 4 4. In the web of each rail a transverse opening or socket is formed to receive the shank 6 of a headed copper pin, *d*. The socket or the shank is tapering or otherwise formed, so that when the shank is driven or forced into the socket until the head of the pin lies against the rail the pin will be firmly wedged. This connection is made while the surface of the socket is clean and unoxidized, and thereby a most perfect electrical connection is secured, the stem fitting the socket so closely that neither liquid nor the air can penetrate the joint to impair the contact. Against the heads or ends of the pins thus secured is laid a connecting-piece, 7, of copper or other non-oxidizable or very slowly oxidizable metal, in such manner as to bear firmly upon the pins, and thus establish an unbroken electrical connection between the pins of the adjacent

rails and thus between the rails themselves. This contact of the connecting-plate and pins is, at least so far as one of the pins is concerned, and preferably as to both, a pressure-contact merely, so that as the rails move from expansion and contraction the pins will slide against the plate with a rubbing contact that maintains the surfaces clear and bright and insures a proper electrical connection. Different means of holding the plate in contact with the pin may be employed. Thus the plate 7 may be interposed between the heads of the pins and the fish-plate 3. I prefer, however, to insert a bent or bow spring-plate, 8, between the plate 7 and fish-plate 3, so that the latter, when drawn in by the bolts, will press upon the bow spring-plate and flatten the latter, which will bear with spring-pressure on the plate 7 and hold it closely upon the pins, and this contact will thus be maintained even if the fish-plate should yield slightly from expansion of the bolts or otherwise. To preserve the plates 7 8 in position, each may have slots 9 at the end to receive the bolts 4 4.

In the joint shown in Figs. 3 and 4 the plates 2 3 lie upon the flanges *c c*, and the flanged bed-plate 11 supports the ends of the rails, while the U-shaped screw-bolt 10 clamps the parts together. In this construction the pins *d d* are preferably driven vertically into sockets in the flanges *c c* of the rails, and the non-oxidizable contact strip or plate 7, and, if desired, the bow spring-plate 8 is confined between one of the plates 2 3 and the pins as before.

It will be evident that the points of connection between the parts are by the above construction prevented from becoming impaired and electrically obstructed, and that the expansion and contraction of the rails instead of impairing the connection tends to maintain it.

It will be evident that the pins and contact-plates may be differently constructed and supported.

I prefer to employ copper for the pins 6 and plates 7 and 8, because it is one of the best conductors of electricity, it is comparatively cheap, and while it oxidizes slightly on exposure to the air, such oxidation does not



practically impair its usefulness as an electric conductor, especially when the parts are arranged as described; but I wish to be understood as considering my invention as including other analogous metals so long as they are of such nature that they will not oxidize to such extent as to impair their usefulness as good electric conductors.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. The combination, with abutting ends of railway-rails, of pins, of copper or analogous material, fitting sockets in the rails, and a metallic strip in contact with both of said pins, substantially as described.

2. The combination, with a conducting strip overlapping the abutting ends of railway-rails, of pins, of copper or analogous material, fitting tightly sockets in the rails and in frictional contact with said strip, substantially as described.

3. The rails provided with sockets and with pins driven tightly into said sockets, and a conducting-strip in frictional contact with said pins, substantially as described.

4. The combination of rails, pins *d d*, and contact-strip 7, and fish-plate clamping said strip against the pins, substantially as described.

5. The combination of the rails, pins, fish-plate, and contact-strip *d*, and bow spring-plate 8, substantially as described.

6. The combination, with the rails, fish-plate, and bolts of a fish-joint, of contact-pins, of copper or analogous material, fitting sockets in the rails, and a plate clamped against said pins and slotted at the ends to receive the bolts, substantially as described.

7. The rails having transverse sockets in the webs, and pins, of copper or analogous material, therein, combined with a conducting-strip and fish-plates and bolts, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD L. ORCUTT.

Witnesses:

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