

No. 626,979.

Patented June 13, 1899.

F. H. DANIELS.
RAIL BOND FOR ELECTRIC RAILWAYS.

(Application filed Nov. 25, 1898.)

(No Model.)

Fig. 2.

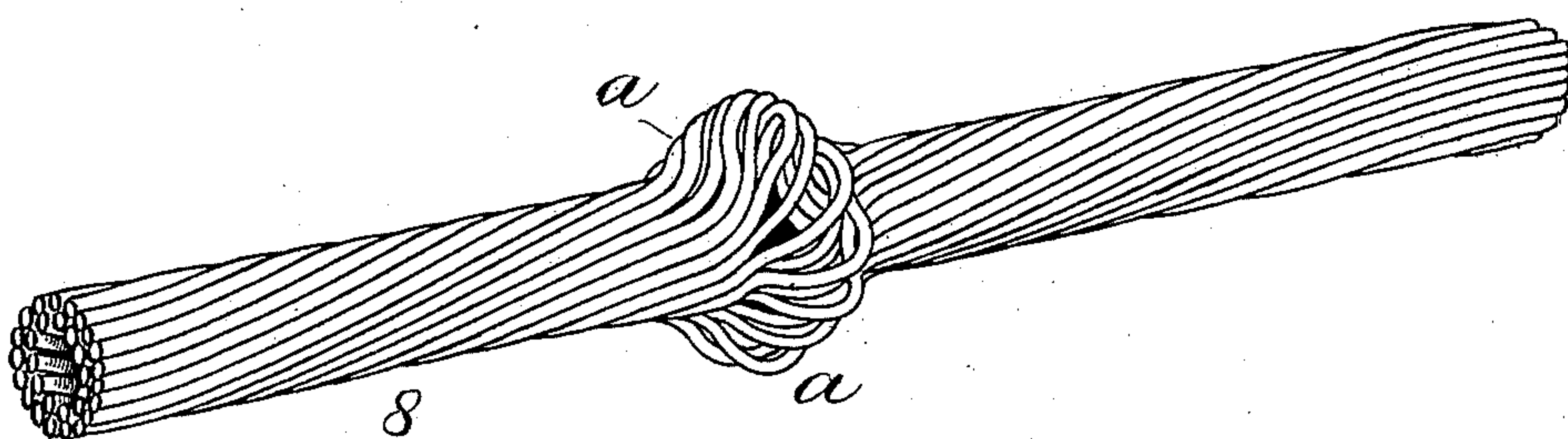
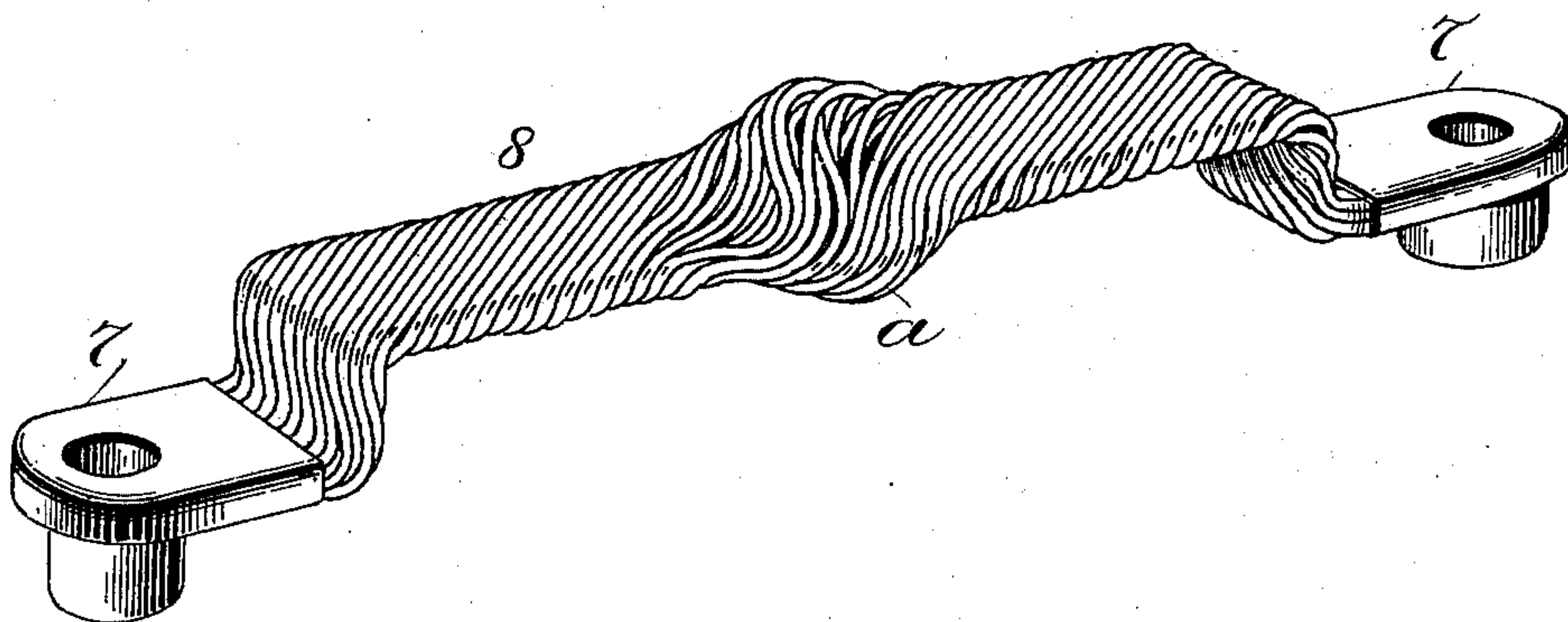


Fig. 1.



Witnesses

L. C. Hill
For

Inventor:

Fred H. Daniels,

By *Marshall Bailey*
his Attorney

UNITED STATES PATENT OFFICE.

FRED H. DANIELS, OF WORCESTER, MASSACHUSETTS.

RAIL-BOND FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 626,979, dated June 13, 1899.

Application filed November 25, 1898. Serial No. 697,393. (No model.)

To all whom it may concern:

Be it known that I, FRED H. DANIELS, a citizen of the United States, and a resident of Worcester, in the county of Worcester and State of Massachusetts, have invented a certain new and useful Improvement in Rail-Bonds for Electric Railways and other Purposes, of which the following is a specification.

10 The rail-bond in which my invention is comprised is designed with more particular reference to its use on electric railways and is of that type in which the bond proper or connector between the two terminals consists
15 of strands of copper wire twisted together or, in other words, copper-wire rope or cable.

The characteristic of my improved rail-bond is that the wire-rope connector at a point between its ends or the terminals bulges or
20 is enlarged in size and has its strands loosened and spread apart. This structural feature of the bond has the advantage, among other things, not only of enhancing the flexibility of the bond, but of giving it the capacity to
25 elongate or contract quite sufficiently to compensate for any expansion and contraction in the rails which it connects.

To enable those skilled in the art to understand and use my invention, I will now proceed to describe the manner in which the
30 same is or may be carried into effect by reference to the accompanying drawings, in which—

Figure 1 is a view of the complete rail-bond embodying my invention in its preferred
35 form. Fig. 2 is a view of the section of wire rope or cable which forms the connector, showing the bulged and spread-apart portion of its strands before the section is flattened.

40 The particular rail-bond which I have selected to illustrate my invention is one made in accordance with my Letters Patent No. 582,849—that is to say, having a flexible body portion 8, combined with terminals or ends
45 7, made separate therefrom and secured or welded thereto by pressure, so as to be substantially integral therewith, although my improvements may be applied also to rail-bonds in which the terminals are otherwise
50 formed and secured to the wire rope or cable connector.

In order to carry out my invention, I take

a section of copper-wire rope or cable cut to proper length, and at a point between its ends, preferably about midway its length, I
55 spread apart and loosen up the strands, giving the rope a bulged formation and enlarged diameter or size at this point, as indicated at *a*, Fig. 2, which shows the wire-cable section after it has been thus formed. The local enlargement of the wire-cable section and the
60 loosening and spreading apart of the wire strands consequent thereon can be effected in various ways—as, for example, by upsetting it, which is the way in which I prefer to
65 obtain the result. The wire section may be upset at more than one point between its ends, if desired; but for practical purposes and for ordinary uses it will be sufficient to upset it
70 at one point only. The wire rope or cable section thus formed is then provided with suitable terminals, for which purpose I prefer to proceed as set forth in my Letters Patent No. 582,849, hereinbefore referred to, the
75 wire-rope section being put into terminals and then by very heavy pressure under proper conditions welded into said terminals and the enlarged portion *a* flattened along with
80 the body of the rope 8, all at the same time and in the proper press, forming the finished rail-bond shown in Fig. 1. The result is a rail-bond in which the wire connector has marked flexibility sidewise in both directions and ample capacity to elongate and contract,
85 so as to compensate for any expansion and contraction of the rails which it connects.

The copper-wire rope or cable from which the connector is made is shown in Fig. 2 as a tubular or pipe-like structure. This form of cable I prefer for certain reasons, which,
90 however, it is not necessary here to state, inasmuch as they do not concern the particular subject-matter of my present application. Said feature is not here claimed, the same being the subject of a separate application in
95 my name for Letters Patent filed April 25, 1899, Serial No. 714,395, on which Letters Patent will issue of even date herewith.

Having described my improvement and the best way now known to me of carrying the
100 same into effect, what I claim herein as new and of my own invention is as follows:

1. A rail-bond in which the body portion is made of wire rope or cable which at a point

between the terminals or ends is bulged or enlarged and has its strands loosened up and spread apart, substantially as and for the purposes hereinbefore set forth.

- 5 2. A rail-bond in which the terminals are combined with a flattened wire rope or cable connector enlarged or bulged at a point between its ends so as to spread apart and loosen up the several strands, said enlarged

portion being also flattened with its strands in their spread-apart condition, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 23d day of November, 1898.

FRED H. DANIELS.

Witnesses:

FRANK L. BROWN,
A. F. BACKLIN.