No. 894,720. PATENTED JULY 28, 1908.

E. M. BOURNONVILLE.

METHOD OF FORMING RAIL BONDS.

APPLICATION FILED DEC. 30, 1907.

Fig. 1.

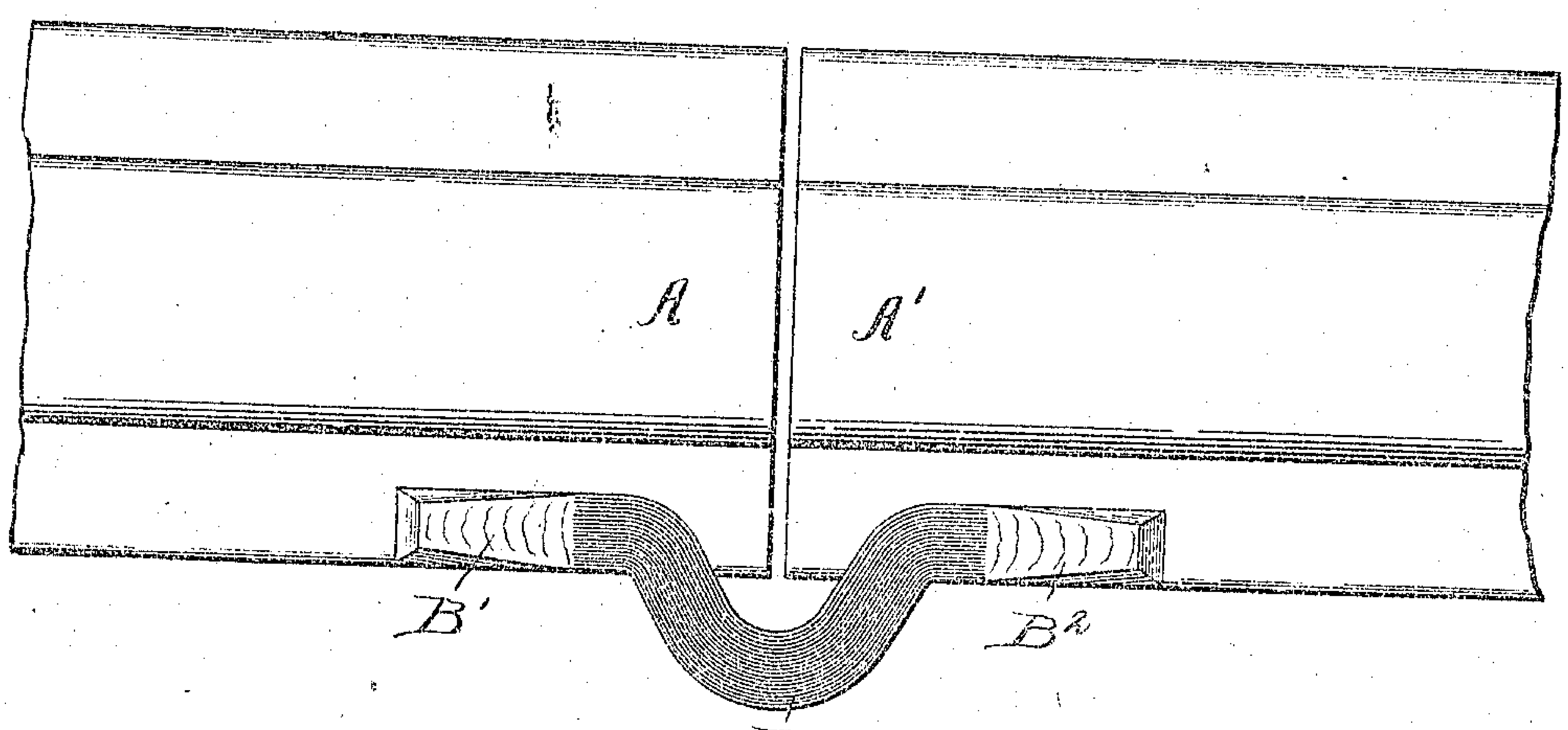
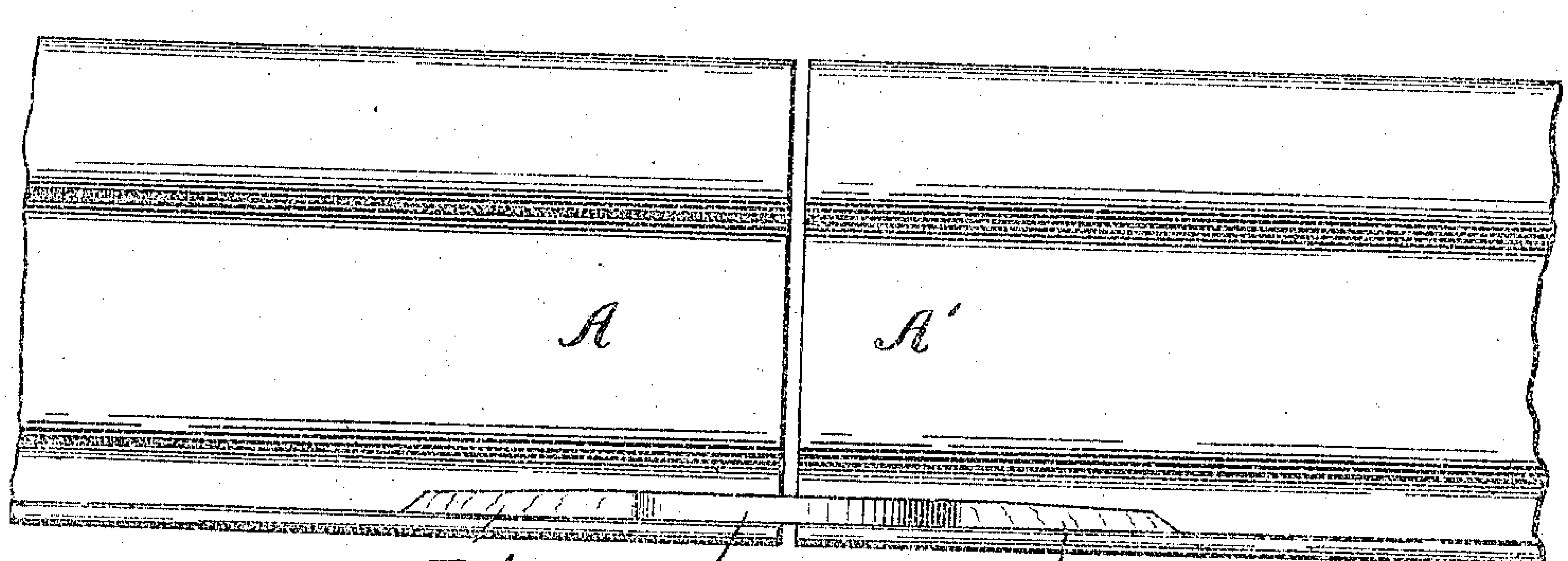


Fig. 2.



Witnesses:

Chas. A. Read

Langdon Moore

Inventor

EUGENE M. BOURNONVILLE

By his Attorneys

Betts, Bronner & Melliner

UNITED STATES PATENT OFFICE.

EUGENE M. BOURNONVILLE, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO DAVIS-BOURNONVILLE ACETYLENE DEVELOPMENT COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF SOUTH DAKOTA.

METHOD OF FORMING RAIL-BONDS.

No. 894,720. Specification of Letters Patent. Patented July 28, 1908.

Original application filed September 20, 1907. Serial No. 393,783. Divided and this application filed December 30, 1907. Serial No. 408,482.

To all whom it may concern:

Be it known that I, EUGENE M. BOURNONVILLE, a citizen of the United States, residing at Jersey City, Hudson county, New Jersey, have invented certain new and useful Improvements in Methods of Forming Rail-Bonds, of which the following is a full, clear, and exact description.

My invention relates to a new method of electrically uniting or bonding rails and the like.

The object of the invention is to provide a substantially homogeneous connection between the ends of two separate rails or the like without the use of bolts or rivets or other mechanical fastenings.

Heretofore rail bonds have been affixed by bolting, riveting or soldering. In every instance crystallization very soon attacks such connection and in a short time renders it inefficient or totally ineffective. By my method of bonding, the metals of the rails and bonds are unified by a new process and the connections made homogeneous and permanent.

This application is a division of my former application Serial No. 393,783.

To illustrate my invention I refer to the accompanying drawings, in which

Figure 1 is a plan view conventionally representing the ends of two separate rails with my bond applied thereto; Fig. 2 is a side elevation thereof.

A—A′ represent the rail ends.

B represents a bond such as I propose to use in practicing a preferred form of my invention. This bond B is of the shape and length indicated between the dotted lines *x—x* and *y—y*. This part may, of course, be of any desired construction, but is preferably made up of a number of flat strips arranged side by side, bent as indicated in Fig. 1, to allow for expansion and contraction, and secured at their ends.

My process of uniting the rail bond comprises, first, heating the rail, for example, by an oxyacetylene gas flame to a point, say just inside of the melting point. I then place the bond upon the rail and permit the ray of the flame to heat the end thereof. At a point between the end of the bond and the burner, and in a more intensely hot part of the flame, I then introduce the end of a metallic rod, for example, of the same material as the bond (ordinarily copper), and subject it to the heat of the flame until some of the metal melts and drops on to the end of the bond where it is to join the rail, which will be in the zone of flame impingement. I preferably then momentarily remove the flame until the metal thus melted and applied cools slightly. I then repeat the above operation, building out step by step the extension indicated at B′. By this process a homogeneous connection is effected between the bond B and the rail A, the metal where it drops, unifying instantly with the metal of the bond and the rail.

I avoid the danger of burning the metal because that part of the flame which impinges against the rail and bond is of a lower temperature than that projecting against the rod being melted. By removing the flame momentarily, the melted portion is allowed to cool slightly and become unified with the two parts A and B. These steps may be repeated until a sufficient extension B′ has been built up. This method may be followed or the building up of the extension may be commenced at the outer end thereof. Were the bond B′ originally of the shape indicated in Fig. 1, and were an attempt made to fuse the metals together, the application of heat to the outside would necessarily be of such intensity, or would have to be continued for such a time, in order to secure the necessary heat at the under side, that the metal would become burned and thereby seriously impaired if not completely destroyed. By my method, burning is avoided and a construction is afforded in which the bond is as permanently united as though it were integral with the rail end. The same process is repeated, of course, in producing the connection at the opposite end B^2.

From the foregoing it will be seen that my process and construction differs from all others in that heretofore reliance has been placed solely upon either a mechanical connection or mechanical adhesion, the latter being brought about ordinarily by a suitable flux as in the well-known soldering process.

In the drawings, I have shown the bond ends B′ B^2 as filed up to give a proper finish. Obviously, this is immaterial. The heat of the flame employed is sufficient at one time

at least to melt the metals of the members to be united, as well as the bond. The heat available in the case of oxyacetylene flame is approximately 3000° C.

It should be understood, of course, that the bond may be of the shape indicated in Figs. 1 and 2, in which the ends B′ B² are integral with the part B; or, in fact, of any other shape.

What I claim is:

1. The method of connecting to metal bodies, comprising, first, heating the metal of both bodies to a point short of the melting point; second, heating a separate piece of metal to a point where it melts, directing the molten metal to a point where said bodies are to be united while said parts are still being heated, and continuing the application of molten metal until a homogeneous extension is formed where said bodies meet the temperature of both bodies to be united being raised to the melting point by the application of said molten metal.

2. The method of connecting to metal bodies, comprising, first, heating the metal of both bodies to a point close to the melting point, second, heating a separate piece of metal to the point where it melts and directing the molten metal to a point where the bodies are to be united while said parts are still hot, and continuing the application of molten metal until a homogeneous connection is formed between the bond and the rail the temperature of both bodies to be united being raised to the melting point by the application of said molten metal.

EUGENE M. BOURNONVILLE.

Witnesses:

R. C. MITCHELL,

LANGDON MOORE.