

C. F. JACOBS.
PROCESS OF UNITING METAL PIECES.
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933,459.

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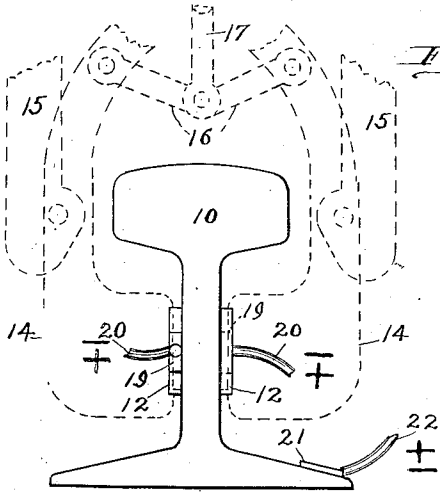


Fig. 1.

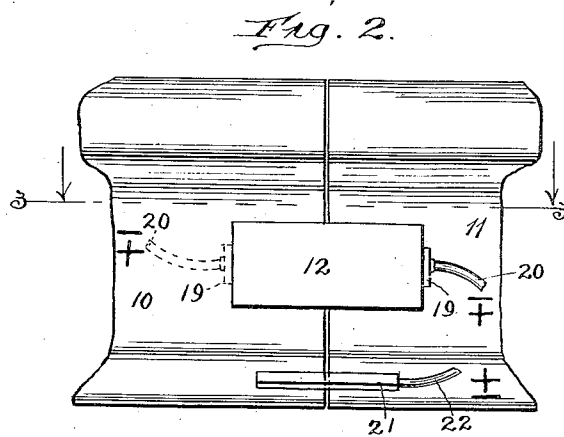


Fig. 2.

Fig. 3.

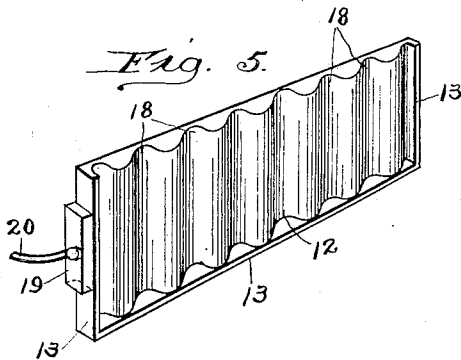
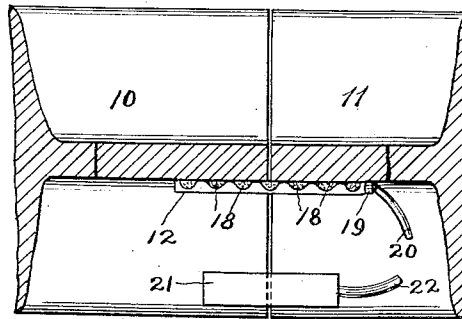


Fig. 5.

Fig. 6.

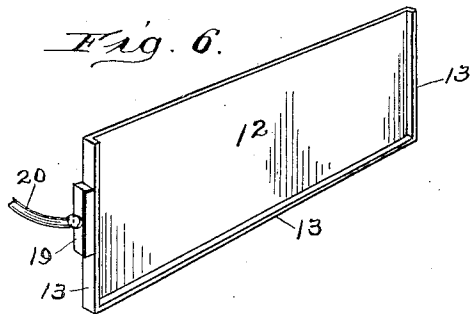
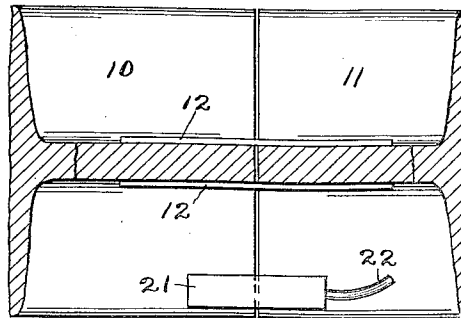


Fig. 4.



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PROCESS OF UNITING METAL PIECES.

933,459.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES F. JACOBS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Processes of Uniting Metal Pieces, of which the following is a specification.

This invention has relation to the art of electrically uniting metallic pieces, and the objects thereof are to provide a simple, efficient and economical method or process of uniting two or more metal pieces at a great saving of time, labor, material and expense.

While the present invention is more especially intended for use in uniting the rails of electric railways so as to afford permanent and perfect electric conductivity through the same, and is so illustrated in the drawing, yet it is applicable for uniting rails or two or more metallic pieces, employed for other purposes; and it consists in certain novel features, acts, procedure and steps practiced in carrying out the process, and it will be understood that any suitable appliances or apparatus may be employed for practicing certain of the steps of the process, and in the accompanying drawing I have shown one form of such a device, but I do not desire to be limited thereto, as other means may be employed therefor, but to facilitate the explanation of the process so that it may be more easily and thoroughly understood, it is deemed necessary to illustrate one form thereof.

By my present process the operation of uniting the metallic pieces is effected in substantially a different manner from any process for a like purpose that I am aware of, and embodies simplicity, economy, efficiency and effectiveness.

In the accompanying drawing, which serves to illustrate the invention—Figure 1 is an end elevation of a railway rail, showing a plate or metallic piece located on each side of the web thereof ready to be united to the same by the process, and illustrating by dotted lines a clamping device to be used for forcing the plates or metallic pieces into intimate contact with the web of the rail; Fig. 2 is a view in side elevation of a portion of two railway rails, showing the means for electrifying the same, as well as one of the plates or metallic pieces to be united thereto; Fig. 3 is a plan sectional view taken on line 3—3 of Fig. 2 looking in the direction indi-

cated by the arrows, and showing the position the parts of the plate or metallic piece will occupy in the initial steps of my process; Fig. 4 is a similar view of like parts, showing the plates or metallic pieces after they have been united to the webs of the rails; Fig. 5 is a detached perspective view of one of the pieces to be joined;—and—Fig. 6 is a similar view, showing a modification in the construction of one of said pieces.

Like numerals of reference, refer to corresponding parts throughout the different views of the drawings.

As before stated, I have shown in the drawing the invention as designed for use in uniting metal pieces to railway rails, and in the present instance will so describe it, but I desire it understood that my present invention is not limited in its scope to such use or application, as shown, for it will be evident from the following description and explanation that it may be employed for uniting two or more metallic pieces, which may be of any desired construction and employed for any purpose.

The reference numerals 10 and 11 designate portions of railway rails or other metallic pieces which it is desired to connect at their joints, but instead of being separated, as shown, they may be abutted or may be a continuous piece to which one or more plates or metallic pieces 12 may be united by my process. As is clearly shown in Figs. 1, 2, 3 and 5 of the drawings, the metallic pieces or plates 12 are provided at three sides of their perimeters with inwardly extending flanges 13, which, when in place on the web of the rails 10 and 11 or on another piece or pieces to which said plate or plates is to be joined, will rest snugly against the surface thereof, and said plates or pieces 12 may be held in such position by means of clamping jaws 14 which are pivotally connected to upwardly extending arms 15 of a yoke or other support. The upper portions of the jaws 14 are loosely connected together by means of a toggle 16, the members of which are pivoted at their outer ends to the upper portions of said jaws, and are similarly connected at their inner ends to a rod 17 which may be raised and lowered by any suitable means, in which operation it is evident that the jaws 14 will be caused to clamp or release the plate or plates 12 against the piece or pieces to which they are to be joined. Each of the plates 12 is provided on its inner surface

with a series of inwardly extending portions 18 which are reduced in size toward their free extremities or portions adjacent to the piece or pieces to which they are to be secured. These inward extensions are shown as being located vertically and as extending from the upper edge of each of the plates to the lower flange 13 thereof, but they may be otherwise arranged and may extend the entire depth or width of said plates, or only partially of said depth or width, without departing from the principle of the invention.

Instead of forming each of the plates with the inwardly extending extensions 18, a plate of the construction shown in Fig. 6 of the drawing may be employed, which consists in employing the flanges 13 at three sides of the perimeter thereof as in the other construction just above-described, but in omitting the inward extensions.

To each of the plates, when more than one is used, an electrode 19 is secured in any suitable manner, and to this electrode is connected a conductor 20 which leads to a source of electric supply. Secured to the other piece or pieces to which the plate or plates 12 is to be secured is another electrode 21 which has leading therefrom a conductor 22 to a source of electric supply.

By placing the plate or plates against the surface of the piece or pieces to which it is to be united, and holding the same thereagainst by any suitable means, but preferably by means of a clamping device which can be used for instantly forcing the plate or plates into intimate contact with the piece or pieces, it is apparent that the body of the plate or plates will be held at a distance from the surface of the piece or pieces to which it or they are to be joined, but that the flanges 13 and the reduced portions of the extensions 18, when the latter are employed, will rest against the surface of the rail or pieces, thus providing means for receiving and holding molten flux of a suitable sort between the plate and the piece or pieces to which it is to be joined. The flux employed may be such as borax, fluorspar, cryolite, sodium chlorid, or other suitable kinds of fluxes *ad libitum*, which ingredients may be used singly or in combination. When the modified form of plate shown in Fig. 6 is employed, it is obvious that one compartment, substantially coextensive with the plate, will be provided for the flux, but in the constructions illustrated in Figs. 3 and 5

several separate compartments for the flux will be provided. After the plate has been placed and is held in the position to which it is desired to secure the same, a quantity of molten flux is interposed between that portion or portions of the plate which is separated from the piece to which it is to be secured, and as said plates are electrically connected by means of the electrodes 19 and 21 and conductors 20 and 22, respectively, it is apparent that the flanges 13 and reduced portions 18 of the plate or plates will be quickly fused or melted, and that the rail or rails or piece or pieces to which the plate or plates are to be joined will also be quickly heated to the desired degree of temperature to the end that by forcing the plate or plates into intimate contact with the other piece or pieces, the same will be securely united.

Obviously, there may be many ways of forming or providing one of the pieces to be secured to another with a recess or recesses to receive a suitable kind of flux which will contact with the adjacent surfaces of both of said pieces in the operation of uniting them, and for this reason I do not desire to be limited to the specific constructions herein shown and described, as I may employ other forms without a departure from the principles and spirit of the invention.

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

1. The process of uniting metal pieces which consists in placing two or more metal pieces together so that parts thereof will be in contact and other parts thereof out of contact, placing molten flux between the spaced apart portions, heating the pieces by means of the flux and electricity, and then forcing the pieces into intimate contact.

2. The herein described process of uniting metal pieces which consists in placing together two or more metal pieces one or more of which is provided with inwardly extending projecting portions a part or all of which is reduced toward its free parts, then placing molten flux between the spaced apart portions, heating the pieces by means of the flux and electricity, and then forcing the pieces into intimate contact.

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