W. H. WHERRY.

MOLD FOR CASTING RAIL BOND TERMINALS.

APPLICATION FILED JULY 12, 1907.

918,108. Patented Apr. 13, 1909.

Fig. 1

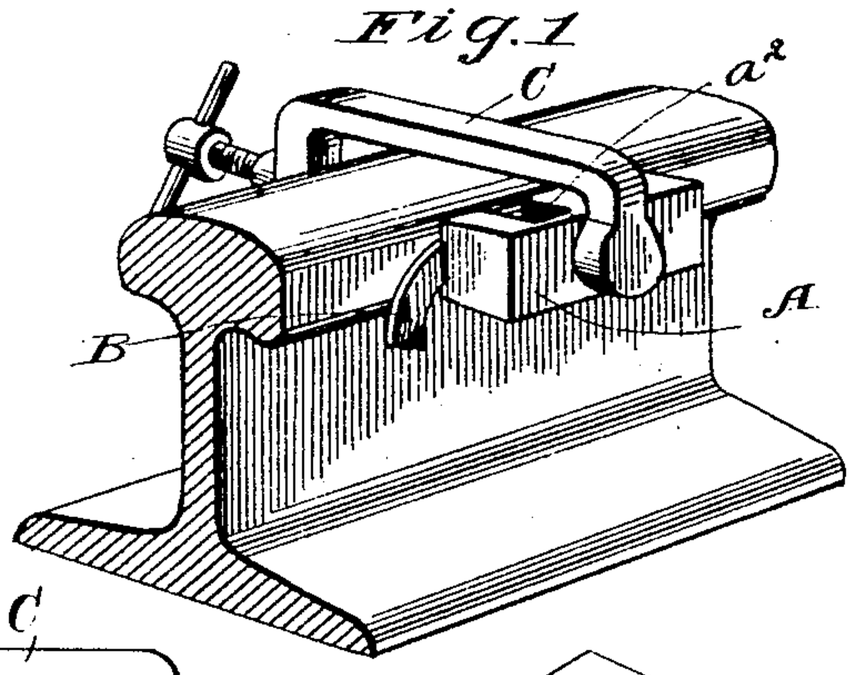

Fig 2.

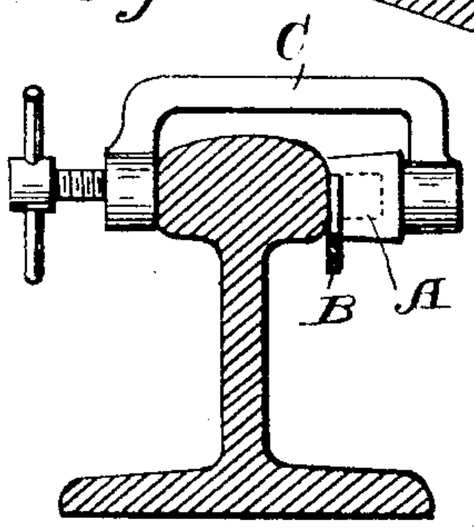

Fig. 3

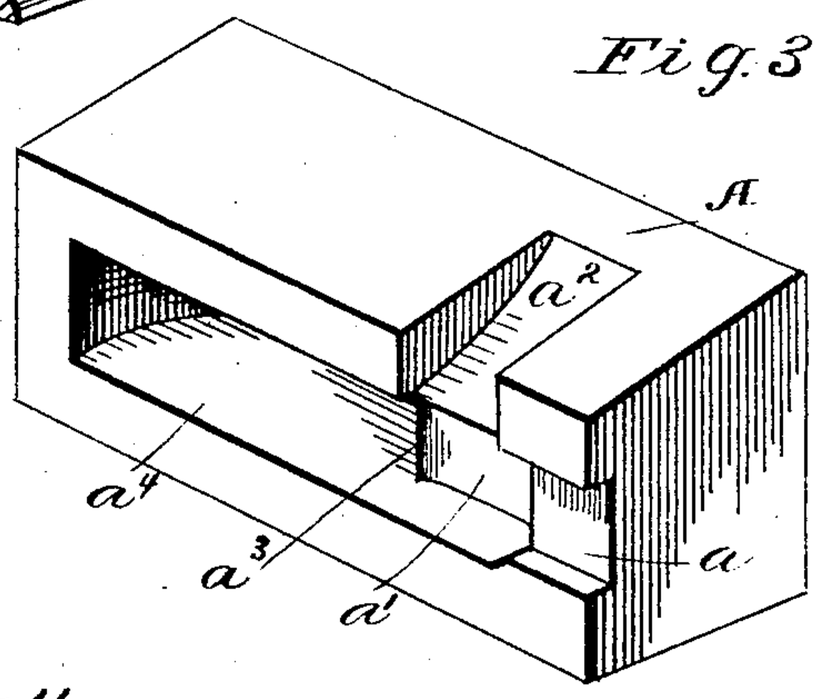

Fig. 4

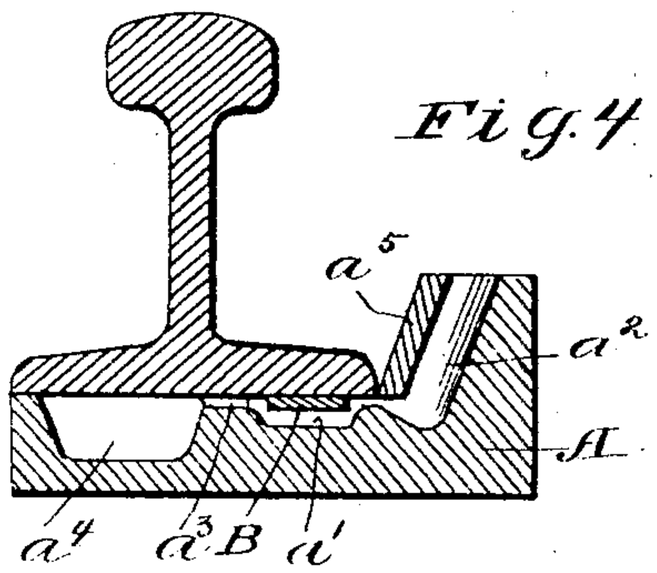

Fig. 5

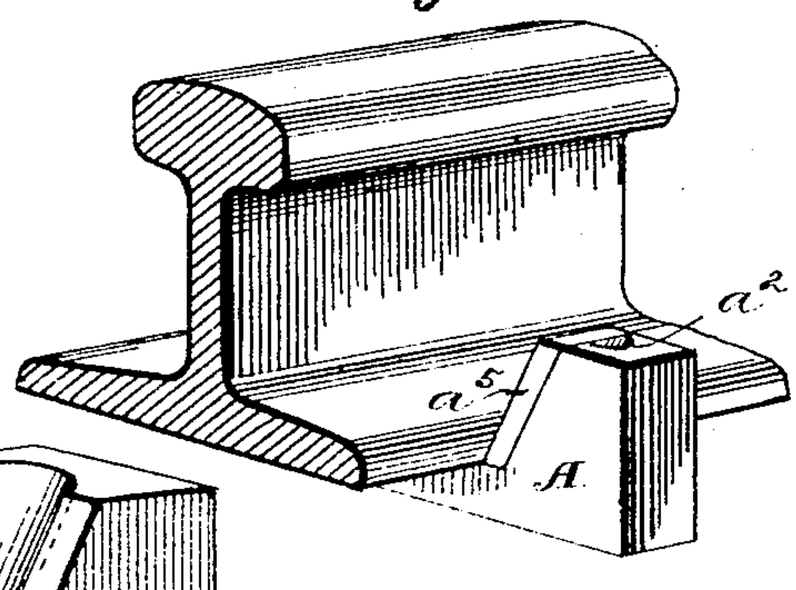

Fig. 6

Witnesses:

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UNITED STATES PATENT OFFICE.

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MOLD FOR CASTING RAIL-BOND TERMINALS.

No. 918,108. Specification of Letters Patent. Patented April 13, 1909.

Application filed July 12, 1907. Serial No. 383,383.

To all whom it may concern:

Be it known that I, WILLIAM H. WHERRY, a citizen of the United States, resident of Cleveland, county of Cuyahoga, State of Ohio, have invented a new and useful Improvement in Molds for Casting Rail-Bond Terminals, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My present invention relates to improved apparatus for use in connection with my process of uniting two metals, specifically copper rail-bonds to steel rails, described and claimed in United States Letters Patent No. 750,511, issued to me January 26, 1904.

The object of the present invention is the provision of a mold whereby a more effective and economical use of molten metal may be had, in such process of casting rail-bond terminals.

To the accomplishment of this and related objects said invention consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:—Figure 1 represents in perspective one form of mold part as applied to the ball of the rail, such mold part embodying my several improvements; Fig. 2 is an end elevation of such mold part; Fig. 3 is an enlarged perspective view of the same removed from the rail; Fig. 4 is a transverse cross section of a modified form of my improved mold part designed for casting rail-bond terminals against the under side of the rail base, such part being shown as in operative position with respect to a rail; Fig. 5 is a perspective view of such mold part similarly operatively positioned with respect to a rail; and Fig. 6 is an enlarged perspective view of such mold part by itself.

The process in connection with which the improved apparatus here described is intended to be utilized consists in fitting over the cold metal where it is desired to cast the molten metal a mold having a recess for forming the terminal to be cast, with which recess communicate suitable sprues for allowing molten metal to enter and escape from such recess. This molten metal is preferably allowed to run through the mold until the cold metal becomes heated, softer and more porous whereby an intimate and permanent union is obtained between the two metals when the desired quantity of molten metal is retained upon the cold metal and allowed to cool. As such process has heretofore been practiced, the molten metal employed in preliminarily heating the cooled parts to be joined, has been simply allowed to escape from the mold, thereafter to be collected as most convenient in order to be reheated and used again. This method is obviously more or less wasteful of material, and has been found to have a further disadvantage in that the amount of metal, allowed thus to pass through the mold, cannot always be accurately gaged even by a skilled operator, in spite of the fact that the length of time that the molten metal should flow, can be quite accurately calculated in any particular instance since it depends upon the physical characteristics of metals which it is desired to unite. The first feature, then, of my present invention, to which it is desired to call attention, is the provision of means for accurately gaging the amount of metal thus employed in the preliminary heating operation.

Having reference to the drawing, where like letters designate corresponding parts in each of the several forms of molds there shown, A will be seen to indicate the mold part proper, the form of which will obviously depend upon whether it is to be employed to cast a terminal against the ball of a rail or against the web, or the base of the same. As has been stated two such diverse forms are shown only. Such mold part A is provided with a recess a that is adapted for the reception of the conductor B. Whether the latter be simply a wire or laminated bond makes no difference, the form of the recess being varied to suit. Adjacent to such recess a is a second, larger, recess a' for forming the bond terminal. Connected with the latter recess a' is an ingress sprue a^2 and egress sprue a^3, whereby the molten metal may be caused to pass into and through such recess a' in the manner described above, it first being necessary to heat the adjacent parts to be joined

before finally forming the bond-terminal or head. Instead, however, of allowing the metal that passes out of egress sprue a^3 to escape, as heretofore, a reservoir a^4 is provided for the reception thereof. This reservoir, as shown, is most conveniently formed in the same mold body A in which the several recesses just described are formed. Obviously, however, it is a matter of indifference whether the reservoir be thus provided, or whether it be formed in a separate part that can at the proper time be brought into juxtaposition with egress sprue a^3. Whatever the construction in this particular, the capacity of the reservoir is designed to be substantially equal to the amount of molten metal required in excess of that entering into the terminal, or, in other words necessary to fill recess a', to raise the temperature of the metals to be united to the proper point.

The second feature to which attention is called is illustrated in connection with the second form of mold part only, Figs. 4, 5 and 6, being most clearly shown in the first of the figures just named. This relates to the conformation of the ingress sprue a^2 whereby the metal, as it enters into the recess a' for forming the bond terminal, is caused to impinge directly against that particular portion of the rail surface where the contact is desired, instead of being allowed simply to flow past such surface as in the earlier form of mold part. Thus in connection with the mold part for casting the terminals on the under sides of the rail, the lower end of ingress sprue a^2 extends, as will be seen in Fig. 4, below the point of entrance into the terminal-forming recess and is then curved upwardly to meet such entrance. Obviously the molten metal descending the sprue, upon striking the lower portion thereof, will be deflected upwardly and thus be directed as stated in the manner most advantageous for the purpose in hand, that of extracting the largest quota of heat therefrom. It will also be noted in connection with the form of block illustrated in Figs. 4, 5, and 6 that the outlet sprue a^3 is at substantially the same elevation as the inlet sprue a^2 where the latter enters the recess a'. The effect of this arrangement will obviously be to retain the level of metal in recess a' at a corresponding elevation, thus rendering it unnecessary to insert a stop in the outlet sprue in order to hold in the recess the metal necessary for the formation of the bond terminal as is the case in the apparatus illustrated in the patent referred to.

In use my improved mold part is designed to be clamped against the rail, or otherwise supported in the same manner as before. Thus where the bond is to be laterally attached, as to the ball or web of the rail, clamps C, Figs. 1 and 2, of the ordinary type are conveniently utilized. In connection with the type of mold part here shown for casting the bond on the under side of the rail base, such clamping means will not ordinarily be necessary, inasmuch as the mold part, or block, can be supported directly on the road bed by wedges or the like, so as to form a sufficiently tight contact with the rail. In order that the full effect, due to deflection of the current of molten metal in the manner above described, may be had it is desirable that ingress sprue a^2 extend some distance upwardly, and it is to this end that the block is given the peculiar form shown. In order that such sprue may not be wholly closed and thus occasion afforded for the molten metal on cooling to clog the same, the sprue consists simply of a deep groove in the face of the upwardly extending portion of the block, which groove can be closed laterally by means of a small supplementary block a^5, Figs. 4 and 5. The upward extension of the sprue also serves to more conveniently dispose the same for the pouring of the molten metal, as will be obvious.

It has already been indicated that by rail-bond, as herein used, I mean any type of detached electrical conductor employed in connecting the abutting ends of rails, or like, more extended, conductors. It should further be stated that the term "rail" as employed alike in the specification and claims is intended to connote not merely the ordinary tread rail of a railway, but also the various forms of third-rail construction, or, in short, any one of the various types of discontinuous conductors that require to be "bonded" together in order to form an unbroken electrical circuit.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. Means for casting rail-bond terminals, comprising a mold part provided with a recess for receiving the end of the conductor forming the bond and a second recess adjacent thereto for forming the bond terminal, said mold part being further provided with ingress and egress sprues communicating with such last named recess; and a reservoir connected with the egress sprue of said mold part.

2. Means for casting rail-bond terminals, comprising a mold part provided with a recess for receiving the end of the conductor forming the bond and a second recess adjacent thereto for forming the bond terminal, said mold part being further provided with ingress and egress sprues communicating with such last named recess; and a reservoir connected with the egress sprue of said mold

part, the capacity of said reservoir being substantially equal to the amount of molten metal required to heat the metals to be united.

3. Means for casting rail-bond terminals, comprising a mold part provided with a recess for receiving the end of the conductor forming the bond and a second recess adjacent thereto for forming the bond terminal, said mold part being further provided with ingress and egress sprues communicating with such last named recess, such ingress sprue being conformed to direct the molten metal against the metals to be united; and a reservoir connected with the egress sprue of said mold part.

4. Means for casting rail-bond terminals on the under side of a rail base, comprising a mold part provided with a recess for receiving the end of the conductor forming the bond terminal, said mold part being further provided with ingress and egress sprues communicating with such last named recess, such ingress sprue extending below the point of entrance to such recess and then curving upwardly thereto so as to cause the molten metal to impinge against the metals to be united.

5. Means for casting rail-bond terminals on the under side of a rail base, comprising a mold part provided with a recess for receiving the end of the conductor forming the bond terminal, said mold part being further provided with ingress and egress sprues communicating with such last named recess, such ingress sprue extending below the point of entrance to such recess and then curving upwardly thereto so as to cause the molten metal to impinge against the metals to be united; and a reservoir connected with the egress sprue of said mold part, the capacity of said reservoir being substantially equal to the amount of molten metal required to heat the metals to be united.

6. Means for casting rail-bond terminals, comprising a mold part provided with a recess for receiving the end of the conductor forming the bond and a second recess adjacent thereto for forming the bond terminal, said mold part being further provided with ingress and egress sprues communicating with such last named recess, such egress sprue being at a suitable elevation to permit the retention of metal in such last named recess required to form the bond terminal.

7. Means for casting rail-bond terminals, comprising a mold part provided with a recess for receiving the end of the conductor forming the bond and a second recess adjacent thereto for forming the bond terminal, said mold part being further provided with ingress and egress sprues communicating with such last named recess, such egress sprue being at substantially the same elevation as such ingress sprue, so as to permit the retention of metal in such last named recess required to form the bond terminal; and a reservoir connected with the egress sprue of such mold part.

Signed by me this 9th day of July, 1907.

WILLIAM H. WHERRY.

Attested by—
MARY ISRAEL,
JNO. F. OBERLIN.