No. 620,071. Patented Feb. 21, 1899.

A. C. HEIDELBERG.

RAIL JOINT AND PROCESS OF FORMING SAME.

(Application filed Apr. 23, 1898.)

(No Model.)

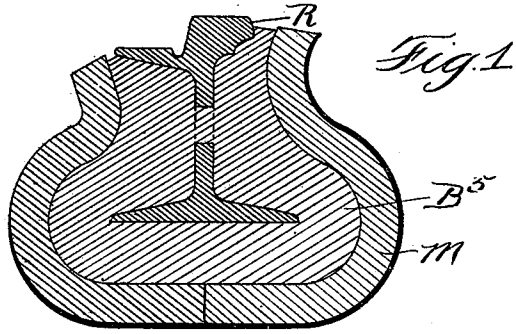


Fig. 1.

Fig. 2.

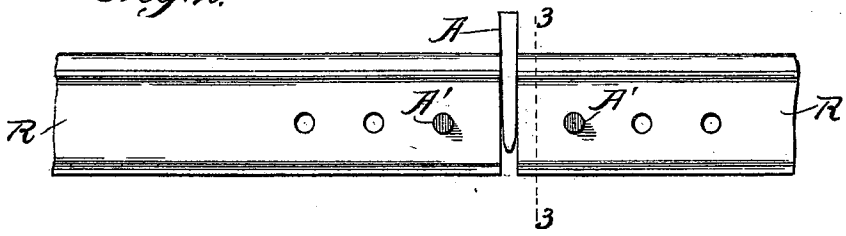
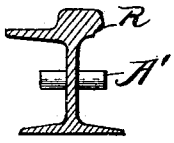


Fig. 3.



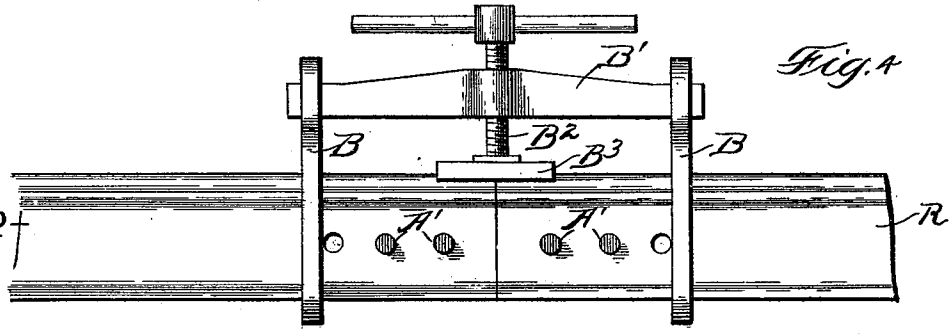


Fig. 4

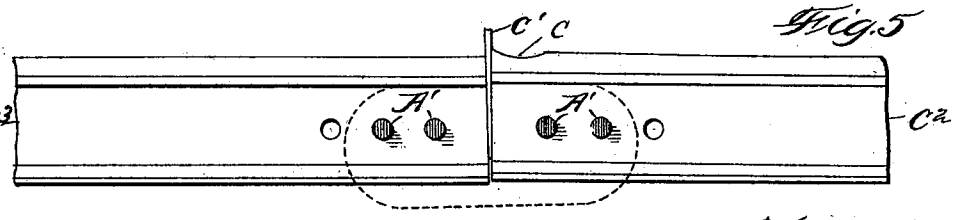


Fig. 5

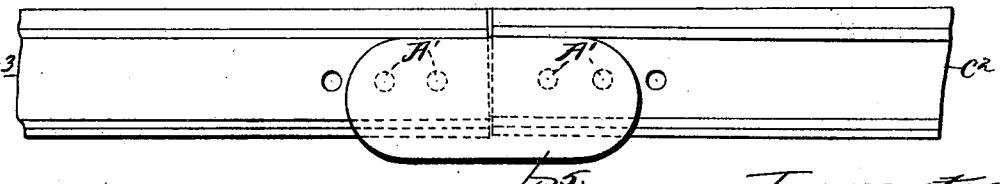


Fig. 6.

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UNITED STATES PATENT OFFICE.

AUGUSTUS C. HEIDELBERG, OF CHICAGO, ILLINOIS.

RAIL-JOINT AND PROCESS OF FORMING SAME.

SPECIFICATION forming part of Letters Patent No. 620,071, dated February 21, 1899.

Original application filed March 31, 1897, Serial No. 630,189. Divided and this application filed April 23, 1898. Serial No. 678,665. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS C. HEIDELBERG, 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 Rail-Joints and Processes of Forming the Same, of which the following is a specification, reference being had to the accompanying drawings, forming a part of the same.

My invention relates to improvements in rail-joints and process of forming the same, and has for its object the provision of a method and means for effecting the connection of individual rails substantially in continuous lengths and for maintaining a highly efficient and satisfactory joint at the point of such connection, whereby the continuous rail thus formed is better adapted to subserve its purpose than when individual rails are united in any manner known to the prior art.

The invention herein described and claimed is a division of my application for United States Letters Patent, Serial No. 630,189, filed March 31, 1897, for improvements in processes of and means for forming rail-joints.

When rails are united substantially in continuous lengths in any suitable manner—as, for example, by casting a metal joint upon the ends thereof adapted to maintain said rails in their relative positions—it has been found in practice that surface fusion of the casting and rails may be partially or entirely dispensed with by providing projections at the rail ends. These projections provided upon the ends of the united rails preferably extend within the uniting bodies of metal and serve to maintain said rails in their relative positions. Such projections accordingly will receive the strain and prevent fracture or injury to the joint as thus formed. Furthermore, in uniting the rails in this manner it frequently becomes desirable to employ a shim or wedge occupying the space between the individual rails, thereby insuring the continuity of the rail-head at said joint and affording a perfectly even surface whereon the wheels are adapted to travel. This portion of my invention, however, I have more fully described and claimed in my original application above referred to.

The rail-joint and continuous rail of my invention herein claimed may be briefly described as consisting of rails disposed end to end, which have their abutting ends united by means of a body or mass of metal disposed thereon, the said rail ends being provided with a projection or projections extending within the mass or body of metal and adapted to maintain the respective parts of the joint in their relative relation. I may also employ in connection therewith a shim or wedge disposed within the space separating the rail ends, the same being trimmed or dressed down to the level of the rail-head. Moreover, in forming the rail-joints I preferably employ a clamping device, which being placed upon the rail ends in proximity to the joints about to be formed serves to maintain the rails securely in position.

My invention will be more readily understood by reference to the accompanying drawings, wherein—

Figure 1 is a cross-sectional view through a rail-joint formed by casting or fusing a mass of metal upon the lower portion of the rail ends, showing the mold in position. Fig. 2 illustrates the insertion of a compression-wedge between abutting rail ends before the joint is formed. Fig. 3 is a cross-sectional view of a rail on line 3 3 of Fig. 2, having a pin or projection provided in the web of the rail. Fig. 4 shows a removable clamping device which I preferably employ in forming the rail-joints in accordance with my invention. Fig. 5 illustrates the use of a shim or wedge in repairing old rails preparatory to casting a mass of metal thereon to unite the same. Fig. 6 illustrates a portion of a continuous rail and a completed rail-joint formed in accordance with my invention.

The same letters of reference are used to designate like parts throughout the several figures of the drawings.

The following is the preferred manner of constructing a rail-joint in accordance with my invention: The rails R R which are to be united are placed in alinement and a mold M is secured upon the abutting rail ends. When new rails are thus joined, I preferably employ a compression-wedge A, which is driven between the abutting rail

ends, as shown in Fig. 2, in order to compress the rails and prevent the joint from being injured by the contraction of the rails in cold weather. This wedge is a permanent part of the joint and is cut off level with the surface or heads of the rails after having been driven in sufficiently to produce the desired compression and prevent the joint from being injured by contraction. The rail ends are also provided with one or more pins or projections A′, extending through holes provided in the webs of the rail ends, which project upon either side thereof and extend within the body or mass of metal subsequently cast upon the lower portions of the rail ends to unite the same. In forming the rail-joint I preferably employ a removable clamp, as shown in Fig. 4, consisting of hooks B B, adapted to engage the lower portions of the rail ends, which are united by a cross-piece B′, extending above the heads of the rails. Through a tapped hole in said cross-piece the threaded rod B^2 is inserted, which carries upon its upper end an operating-handle and upon its lower end a foot or shoe B^3, adapted to engage the upper portions of the rail ends and hold them firmly in their relative positions. It is desirable that such removable clamping device be employed, as the rail-joint otherwise is liable to become warped or distorted during the process, broadly, of casting the joint, and I have claimed such process in a contemporary application, Serial No. 678,656, forming a division of my original application above referred to. Before casting the mass or body of metal upon the rail ends said ends preferably are heated in any desired manner, so that the molten metal may readily unite therewith in order to secure partial or entire surface fusion and form a solid joint. A fusing agent, such as borax, may be applied to the rail ends in order to assist in this process, which causes the rail to become a more satisfactory conductor of electricity and materially strengthens the joint. The steps above indicated having been taken, molten metal is poured into the mold and the same is permitted to cool, forming a bond or union B^5, thus uniting the rails substantially in a continuous length. The clamp and mold are then removed from the rail ends after the joint has cooled, and the continuous rail is dressed or trimmed down to the level of the track should the same be found necessary or desirable, thus providing a perfectly even head at the rail-joint.

As indicated above, it is not necessary to secure the surface fusion of the body of cast metal with the rail ends, thus insuring an absolutely solid or integral joint, inasmuch as the pins or projections being embedded or extending within the metal prevent the joint from being injured by any normal strain applied thereto.

It will be understood that the processes as herein described preferably contemplate the formation of rail-joints after the rails have been laid in position and spiked down to the ties.

In Fig. 5 I have shown an analogous method of uniting the ends of old and somewhat worn rails. After rails have been in use for some time it is found that the surface of the rail last engaged by the car-wheel, or, in other words, the receiving-rail, becomes battered, as shown, for example, at C. In uniting such rails I force a wedge or shim C′ between the rails and move the rail ends relatively in any convenient manner—as, for example, by supporting one rail end and hammering upon the other until the bottom of the battered portion C of the receiving-rail C^2 is level with the head of the other rail C^3. The joint is then formed in the manner above indicated and the rail-head and shim are trimmed down, rail C^2 being cut away until a smooth clean joint is formed, as shown in Fig. 6.

I have illustrated in the drawings particular means for practicing my invention; but other means than those herein shown and described and modifications of the rail-joint obviously may be made without departing from the spirit of my invention, and accordingly I do not wish to be limited to the specific means and structure herein adverted to.

I therefore claim, and desire to secure by these Letters Patent, the following:

1. A rail-joint comprising two rails placed end to end, each rail provided near its end with one or more projecting pins, a portion of cast metal uniting the two rail ends and surrounding said pins, so as to form a solid connection between them, substantially as described.

2. A rail-joint comprising two rails placed end to end, each rail provided with a pin extending through the web and projecting outwardly from said web, a compression-wedge between the rails formed so as to be flush with the top or head of the rails, a cast-metal piece surrounding said pins and a portion of the ends of said rails, said cast metal being united with the ends of the rails so as to be a part thereof, substantially as described.

3. The process of forming rail-joints consisting in forming the ends of the rails with one or more projections, the ends of the rails being in proximity to each other, and surrounding a portion of the ends of said rails and said projections with molten metal, said metal being confined so as to adhere to the rails and connect them together, substantially as described.

4. The process of forming rail-joints consisting in forming the rails with an opening or openings near their ends and inserting a pin or pins in said opening or openings, the ends of the rails being placed in proximity to each other and then surrounding a portion of the ends of said rails and said pins with molten metal, said metal being confined so as

to adhere to the ends of the rails and firmly connect them together, substantially as described.

5. A continuous railway-rail comprising a plurality of rails disposed end to end and provided with projections at their ends, and a mass or body of metal cast upon the webs and base-flanges of the abutting ends of said rails within which mass said projections extend, substantially as described.

6. A continuous railway-rail comprising a plurality of rails disposed end to end, a mass or body of metal cast upon the lower portions of the abutting ends of the said rails, and a projecting pin or pins provided at the joint thus formed, extending within the mass of metal, substantially as described.

7. A rail-joint comprising two rails disposed with their ends abutting, a shim interposed between the said ends, pins or projections provided in the rail ends, and a mass or body of metal cast or formed upon the lower portions of said rail ends, whereby said rails are formed in a continuous length, substantially as described.

8. The herein-described process of forming rails substantially in continuous lengths, consisting in disposing and maintaining the individual rails in alinement and with their ends abutting, providing projections at the said ends, and casting upon the lower portions of the rail ends masses or bodies of metal, within which masses said projections extend, whereby the rails are united in a continuous length.

9. The herein-described process of forming rails substantially in continuous lengths, consisting in disposing and maintaining the individual rails in alinement and with their ends abutting, providing projections at the said ends, disposing a shim or stratum of metal between the abutting rail ends, and casting upon the lower portions of the rail ends masses or bodies of metal, within which masses said projections extend, whereby the rails are united in a continuous length.

10. In a continuous railway-rail, the combination with a plurality of individual rails having their ends abutting, of pins or projections provided at the said ends, and masses or bodies of metal formed or cast upon the said rail ends, adapted to unite the several rails and form substantially a single continuous rail, substantially as described.

11. In a continuous railway-rail, the combination with a plurality of individual rails having their ends abutting, of pins or projections provided at the said ends, a shim or stratum of metal disposed between the abutting rail ends, and masses or bodies of metal formed or cast upon the said rail ends, adapted to unite the several rails and form substantially a single continuous rail, substantially as described.

12. In a rail-joint, the combination with abutting rail ends, of projections provided at said rail ends, and a mass or body of metal formed upon the lower portions of said rail ends, within which mass said projections extend, adapted to unite the rails and form substantially a continuous rail, substantially as described.

13. The herein-described continuous railway-rail, consisting of a plurality of individual rails arranged with their ends abutting, projections provided at the said ends, and masses or bodies of metal formed upon the lower portions of the rail ends, adapted to unite the several rails and form substantially a single continuous rail.

14. The combination in a rail-joint with the ends of abutting rails, of projecting parts provided upon the lower portions of said rail ends, and a mass of metal cast upon the rails embracing their lower portions, within which mass the said projections extend, substantially as described.

15. The combination in a rail-joint with the ends of abutting rails, of projecting parts provided upon the lower portions of said rail ends, a shim or stratum of metal disposed between the said ends, and a mass of metal cast upon the rails embracing their lower portions, within which mass the said projections extend, substantially as described.

16. The combination in a rail-joint with the ends of abutting rails, of projecting parts provided upon the lower portions of said rail ends, and a mass or body of metal formed upon the rail ends embracing their lower portions, within which mass the said projecting parts extend, substantially as described.

17. The process of forming rails substantially in continuous lengths, consisting in forcing a shim or wedge between the abutting ends of the rails to be united, placing a removable clamping device upon the rails adapted to restrain the rail ends from vertical displacement during the process of uniting the same, casting or fusing a mass or body of metal upon the lower portions of said rail ends, removing the clamping device and cutting off the shim or wedge level with the railhead, substantially as described.

18. The process of uniting a plurality of railway-rails in a continuous length, which consists in filling the spaces between the abutting rail ends by interposing wedges or shims, applying removable clamping devices adapted to maintain the rails in substantial alinement during the process of uniting the same, casting upon the lower portions of said rail ends masses or bodies of metal adapted firmly to unite the rails and thereafter removing the clamping devices, substantially as described.

19. The herein-described process of forming rails substantially in continuous lengths, consisting in filling the space between the abutting ends of the rails to be united by the insertion of a shim or wedge, applying to said rail ends a removable clamping device adapted securely to hold the same rigidly in position during the process of joining the rails, casting or fusing a mass or body of metal upon the lower portions of the abutting rail ends,

whereby the rails are united and thereafter removing the clamping device.

20. The process of uniting rails substantially in a continuous length, which consists in forcing between the abutting ends of the individual rails to be united wedges or shims, placing removable clamping devices upon said rails, adapted to maintain the ends thereof rigidly in position during the process of uniting the rails, casting upon the lower portions of the said abutting rail ends masses or bodies of metal adapted to unite the individual rails and form a continuous rail, removing the clamping devices from the joints thus formed and cutting off or surfacing the projecting wedges at said joints to the level of the rail-head, substantially as described.

21. The method of uniting rails in continuous lengths consisting in driving shims or wedges between the abutting ends of the rails, applying clamping devices to the rail ends adapted to maintain the rails rigidly in position during the process, heating said rail ends, casting thereon bodies or joints of metal thereby securing surface fusion between the rails and joints and removing the clamping devices from the rail ends after the joints have cooled, substantially as described.

In testimony whereof I have subscribed my name in the presence of two witnesses.

AUGUSTUS C. HEIDELBERG.

Witnesses:

MINA L. SWARTWOUT,

WINFIELD W. LEACH.