

No. 671,605.

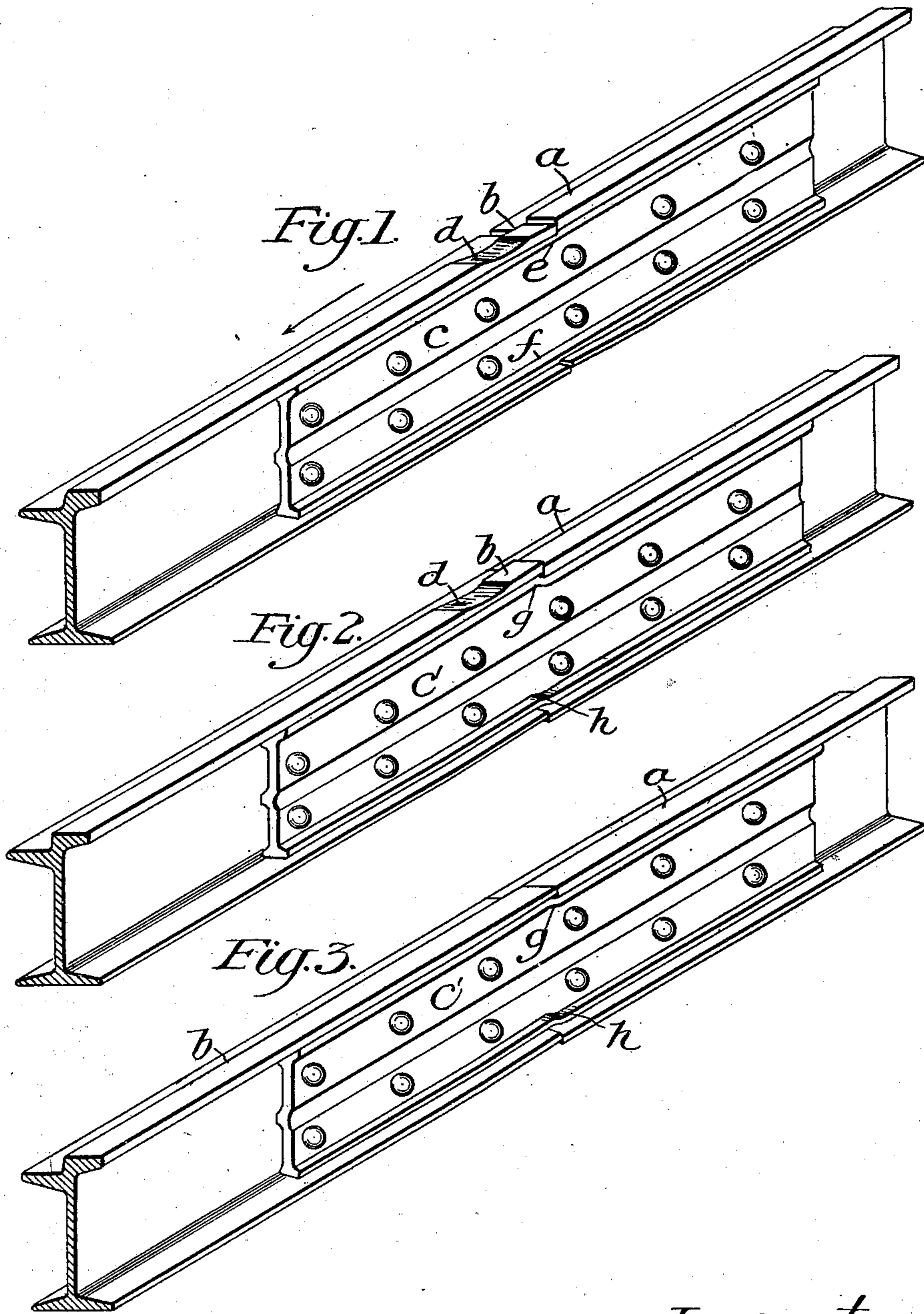
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RAIL JOINT.

(Application filed Nov. 6, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 671,605, dated April 9, 1901.

Application filed November 6, 1900. Serial No. 35,618. (No model.)

To all whom it may concern:

Be it known that we, HARRY B. NICHOLS and WILFRED E. BOUGHTON, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Rail-Joints; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to the restoration of railway-joints of the standard construction—*i. e.*, joints embodying the connection of the rail ends by means of fish-plates or splice-bars interposed between the head and base of the rails and spanning the proximate ends of adjacent rail-sections to which they are bolted or otherwise secured. With joints of this character the car-wheels in passing from one rail end to the proximate end of the next rail tend to depress the latter, and thereby initiate a wearing away of the under surface of the head of the rail and the top surface of the fish-plate and to a lesser degree the upper surface of the base of the rail and the lower surface of the base-flange of the fish-plate. This wearing away not only becomes gradually more and more aggravated, but soon causes in the case of a track on which cars run in one direction only a depression or hollow on the tread of the receiving-rail about two and one-half or three inches from end of same, this distance depending on the size of the wheels in use. It finally becomes necessary to introduce shims for the purpose of occupying the worn places and to adjust the ends of the rail to approximately their original relative positions. This expedient affords but temporary relief, for the reason that the shims themselves presently become loosened and drop out of place. Moreover, they present an unsubstantial and insecure appearance and are tolerated only for temporary use.

Our invention is designed to restore the joint to substantially its original security and integrity and with entire avoidance of make-shift expedients of the kind referred to. To this end when the rail-joint has become worn to an extent requiring its renewal

we disassemble the parts and substitute for the removed fish-plates other fish-plates of the same general standard dimensions, but with the flanges offset, so that a side view of the plate would show the top and bottom flange of one half the plate parallel to, but slightly out of alinement with, the other half. This is for the purpose of raising the extreme end of the receiving-rail to a position slightly above that of the delivering-rail in order to admit of grinding or filing down the former to a smooth and uniform wearing-surface. These plates may also, when necessary, be provided on the upper and lower flanges with integral projections of such configuration as to fully occupy the worn recesses in the under surface of the rail-tread and the upper surface of the rail-base. These substitute fish-plates may in some instances be cast in molds of appropriate form. We prefer, however, to prepare them from the removed fish-plates themselves, and by means of a swaging operation in dies suitable for the purpose and so constructed that when the worn fish-plates are placed in the dies and submitted to the requisite compression a flow of metal will take place therein sufficient not only to restore them to their original dimensions and make the necessary offset in the flanges, but to provide them with supplemental portions projecting sufficiently beyond the normal standard dimensions as to fit within and fill the worn-away portions of the rail ends. When the swaged fish-plates are again adjusted in place, it is evident that the rail-joint is fully restored to its original efficiency.

For purposes of illustration we have shown our invention in the accompanying drawings as applied to a standard girder-joint, although it will of course be understood that it is equally applicable to other similar rail-joints—as, for instance, similarly-constructed T-rail joints.

In the drawings, Figure 1 represents in perspective a standard girder-rail joint and indicates the character of the wear to which the fish-plates and rail ends are subjected. Fig. 2 represents a like view of a restored joint before the grinding or filing of the receiving-rail. Fig. 3 represents a like view of the joint after the grinding or filing operation.

Similar letters of reference indicate similar parts throughout the several views.

Referring to the drawings, wherein the arrow indicates the direction of travel, *a* indicates the end of the delivery-rail, and *b* the end of the receiving-rail, these rail ends in the standard construction being joined by the fish-plates *c*, which span said meeting ends and which are bolted through the rail-webs in the customary manner, as shown.

As illustrated in Fig. 1, the end of the receiving-rail *b* finally becomes worn at the place indicated by the letter *d*, the distance of this place from the end of the receiving-rail depending upon the diameter of the car-wheels and usually being at from two and one-half to three inches from the end of the rail. It will also be noted that the upper flange *e* of the fish-plate is worn at or near its center, as indicated, and that the base-flange *f* of the fish-plate is likewise worn at its center, this additional wear being also due to the impact of the car-wheels as they pass from the delivery-rail to the receiving-rail of the joint. When the wear has attained such a degree as to require renewal of the joint, the joint is disassembled and the fish-plates removed. In lieu of the removed fish-plates substitute fish-plates are inserted of the character indicated in Fig. 2, these substitute fish-plates *c'* being provided with shoulders *g h*, which project slightly beyond the normal level, so as to occupy the recesses due to the raising of the end of the worn receiving-rail. The end of the receiving-rail is raised sufficiently, as indicated in Fig. 2, to bring the tread at a level appropriate to the removal of the wear at the place *d* of the receiving-rail. The joint being then assembled, the projecting portion of the tread of the receiving-rail is ground or filed down to a level with the tread of the delivery-rail, as indicated in Fig. 3, thus removing the depression *d* and thus completing the restoration of the joint without the employment of shims or other like temporary expedients.

In practice we find it convenient to produce the substitute fish-plates from the worn fish-plates by heating the worn fish-plates to a swaging temperature and inserting them in dies so fashioned as to provide recesses within which the swaged metal can flow to an extent sufficient to bring them to the configuration required for the substitute fish-plates. It is evident, however, that in some instances the substitute fish-plates may be cast directly as such from molten metal or that they may be swaged or otherwise formed from new or practically new standard fish-plates.

Having thus described our invention, what we claim is—

1. A restored rail-joint, the end of whose "receiving-rail" has been raised and whose raised receiving-rail tread has been ground or filed down to a level with the tread of the "delivery-rail," said rail-joint being provided with fish-plates spanning the proximate rail ends and interposed between the head and flange portions of the rails, said fish-plates having flanged projections or offsets beyond the standard normal, said offsets fitting within and occupying corresponding recesses beneath the under surface of the raised head of the receiving-rail; substantially as described.

2. A restored rail-joint, the end of whose "receiving-rail" has been raised and whose raised receiving-rail tread has been ground or filed down to a level with the tread of the "delivery-rail," said rail-joint being provided with fish-plates spanning the proximate rail ends and interposed between the head and flange portions of the rails, said fish-plates having flanged projections or offsets beyond the standard normal, said offsets fitting within and occupying corresponding recesses beneath the under surface of the raised head of the receiving-rail and above the base of the delivery-rail; substantially as described.

3. A restored rail-joint, consisting of a "delivery-rail" of substantially normal configuration, and a "receiving-rail" whose end has been raised and whose tread has been ground or filed down to a level with the tread of the "delivery-rail," said rail-joint being provided with fish-plates having flange offsets or shoulders fitting within the recesses thus provided; substantially as described.

4. A fish-plate for restoring worn rail-joints, said fish-plate being of substantially uniform height throughout its length, but provided with a shoulder on its upper flange, said shoulder extending slightly above the normal surface of the flange, so as to underlie a corresponding slight rise of the receiving end of the restored joint; substantially as described.

5. A fish-plate for restoring worn rail-joints, said fish-plate being of substantially uniform height throughout its length, but provided with a shoulder on its upper flange, said shoulder extending slightly above the normal surface of the flange, so as to underlie a corresponding slight rise of the receiving end of the restored joint; and having a similar shoulder in its base-flange; substantially as described.

In testimony whereof we affix our signatures in presence of witnesses.

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