E. PAYNE.
Rail-Joint.

No. 197,493. Patented Nov. 27, 1877.

Fig. 1.

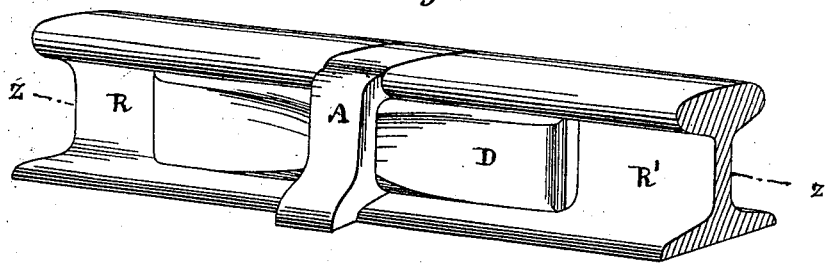


Fig. 2.

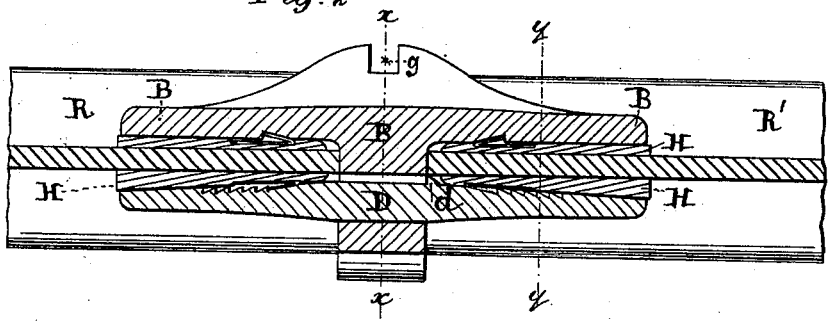


Fig. 3.

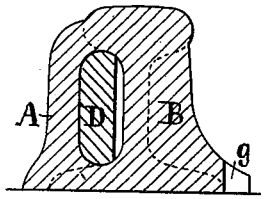


Fig. 4.

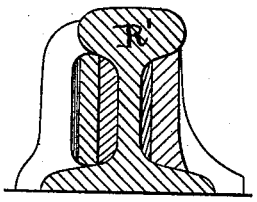


Fig. 5.

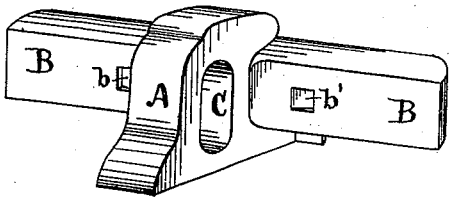


Fig. 6.

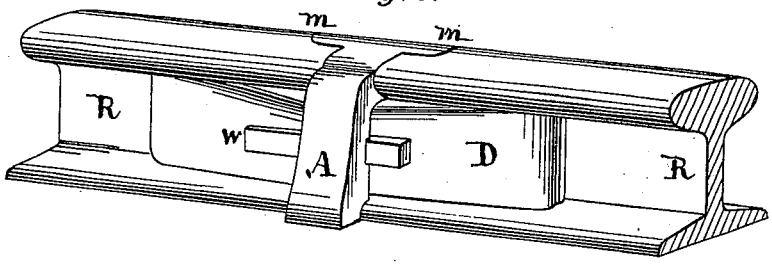
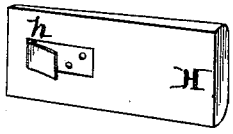


Fig. 7.



Witnesses:
E. A. Dick
D. R. Howe

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UNITED STATES PATENT OFFICE.

EDWARD PAYNE, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN RAIL-JOINTS.

Specification forming part of Letters Patent No. **197,493**, dated November 27, 1877; application filed November 7, 1877.

To all whom it may concern:

Be it known that I, EDWARD PAYNE, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Rail-Joints, which improvement is fully set forth in the following specification:

It is not necessary, for the purpose of explaining and elucidating the principle of my invention, to refer to desiderata of rail-joints, they being well understood by railway-engineers and others familiar with the construction and operation of railways. It will suffice to say that I have for object the production of a joint which, while insuring exact continuity of abutting rails and unyielding support of their ends, shall be compact, not liable to dismemberment, yet allow of the expansion and contraction of the rails under the influence of varying temperatures. And these objects I propose to accomplish by means of a device of easy and comparatively inexpensive construction, of ready application, and of great durability and permanency.

These objects I believe to have accomplished, first, by a joint-piece so constructed as to interpose between the abutting ends of rails a block which, while forming continuity of the top flange or tread, shall afford lateral support to both the abutting rails by a fixed and a movable lapping clasp or fish-plate; second, by the formation of both or either the fish-plates of such joint-piece with internal toothed or notched surfaces, and by the employment, in connection therewith, of locking-wedges or spring-keys; third, by the use, in combination with such joint-pieces, and the application to the movable fish-plate, of a tightening wedge or key.

To enable others to make and use my said invention, I shall now proceed to describe the same with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of parts of two abutting rails united by means of the joint—subject-matter of this patent. Fig. 2 is a horizontal section of the same on line *z z*. Figs. 3 and 4 are vertical sections on lines *x x* and *y y*, respectively. Fig. 5 is a perspective view of the joint-piece with the solid or fixed fish-plate. Fig. 6 is a perspective view of two pieces of rails united by a joint-piece of a modified character. Fig. 7 is a perspective view of wedge or spring-key.

In said drawings, R R′ are rails of ordinary or suitable form. Only so much of the rails is shown as will be necessary to illustrate the manner in which the same are united at their contiguous ends.

A is the joint-piece, which is composed of a block of suitable thickness to offer the necessary resistance to the impact of the wheels when struck laterally or across its width. This block is of the exact height of the rail, and is so shaped that its top shall conform exactly with the tread or top flange of the rails to be united. The bottom, although wider than the bottom flange of the rail, is flush therewith. On the one end, and corresponding to the side of the web of the rails, and so shaped as to snugly fit both the under side of the top flange and top side of the lower flange, extends transversely to and on either side of the block, the solid or fixed fish-plate B, shaped, preferably, as shown in the drawings—that is to say, with a central re-enforce or swell to give additional strength and rigidity to the plate at the point where it is or may be subjected, particularly on curves, to strain tending to deflect the rails.

On the side intended to face the web of the rail the fish-plate is notched out, as at *b b′*, for the purpose hereinafter to be explained.

Through the depth, or in a direction parallel with the fixed fish-plate, the block A is for the reception of the movable fish-plate D, perforated as shown at C, the mass of metal remaining between the fixed fish-plate and the perforation last referred to being, in shape and position, such as to constitute within the block a continuation of the web of the rail. Into this opening in the block fits a movable fish-plate, which consists of a plate flat on one side, and preferably thicker in the middle than at its ends, the thicker portion being of a sectional area to loosely fit the said orifice. When inserted into the orifice C a shoulder, *d*, butting against the web portion of the block, arrests its further progress when in place. The interior face of the movable fish-plate is serrated, oblique teeth being cut upon the ends on each side of the part which is to fit the orifice in the block.

The base of the joint-block A projects on

the one side, corresponding to the interior opposite sides of the rails—that is to say, to the flanges of the wheels—and a square notch, *g*, or other suitable recess is made for the reception of the spike whereby the block is fastened to the sleeper, hook-spikes being used on the opposite side of the rail, on either side of the block, to fasten the rail by its exterior flange to the sleeper.

The manner in which the rails are joined together is as follows: The two rails to be united being properly laid and secured—that is to say, the abutting ends at a distance apart to admit of the insertion between them of the block A—due allowance having also been made for variation of temperature, the block is put in place, so that the solid and fixed fish-plate shall be on the inside webs of the two rails. This being done, the movable fish-plate is pushed on the outer or opposite side of the rail into the orifice of the block. When the parts are thus placed, the joint is made tight, and locked by means of wedges H, which are inserted in the loosely-fitting ends of the fish-plates.

These wedges (shown in detail in Fig. 7) are taper-shaped flat pieces of wood, to the one side of which are secured inclined spring-blades *h*, which are inclined similarly to the teeth of the serrated surface of the plates, so that while they will allow of their being driven in (the spring yielding to such movement) they cannot be withdrawn without breaking the parts, inasmuch as the spring becomes locked, and there is no way to get access to it to unlock it.

These wedges it may suffice to use on but one side of the web of the rail. They may, however, be used on both sides, as shown in Figs. 2 and 4.

In certain climates, where there is great variation of temperature, the rails, in contracting by cold, may leave gaps large enough to cause unpleasant jolts in the cars, and blows against the ends of the rails, which eventually may produce depression at the joints and deteriorate the road. To obviate this I have shown, in Fig. 6, the block provided with ears or lugs on the contour of the top flange of the rail, these lugs fitting corresponding recesses in the top of the rails. When the rails so joined contract, the tread of the wheel will, notwithstanding the spaces or gaps between the ends of the rails, run on a continuous or unbroken surface on top of the rails.

If, by wear or for other reason, the movable fish-plate should become loose, then I propose to use an additional wedge, W, for the reception of which a recess may be contrived in the block A, on the outside of orifice C of the block.

Having thus described my said invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. A joint-piece constructed, substantially as herein shown and described, so as to interpose between the abutting ends of rails a block which, while forming continuity of the top flange or tread, shall afford lateral support to both the abutting rails by a fixed and a movable lapping-clasp or fish-plate, as set forth.

2. In a joint-piece such as herein shown and described, the combination, with either or both the fish-plates, when serrated or toothed, as described, of locking-wedges or spring-keys, substantially as shown and set forth.

3. The combination, with the joint-piece, such as herein described, of a tightening-wedge applied externally to the movable fish-plate, substantially as herein shown and set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EDW. PAYNE.

Witnesses:
A. POLLOK,
E. A. DICK.