No. 607,358. Patented July 12, 1898.

J. FISHER.

FISH PLATE FOR RAILS.

(Application filed Oct. 16, 1897.)

(No Model.)

Fig. 1

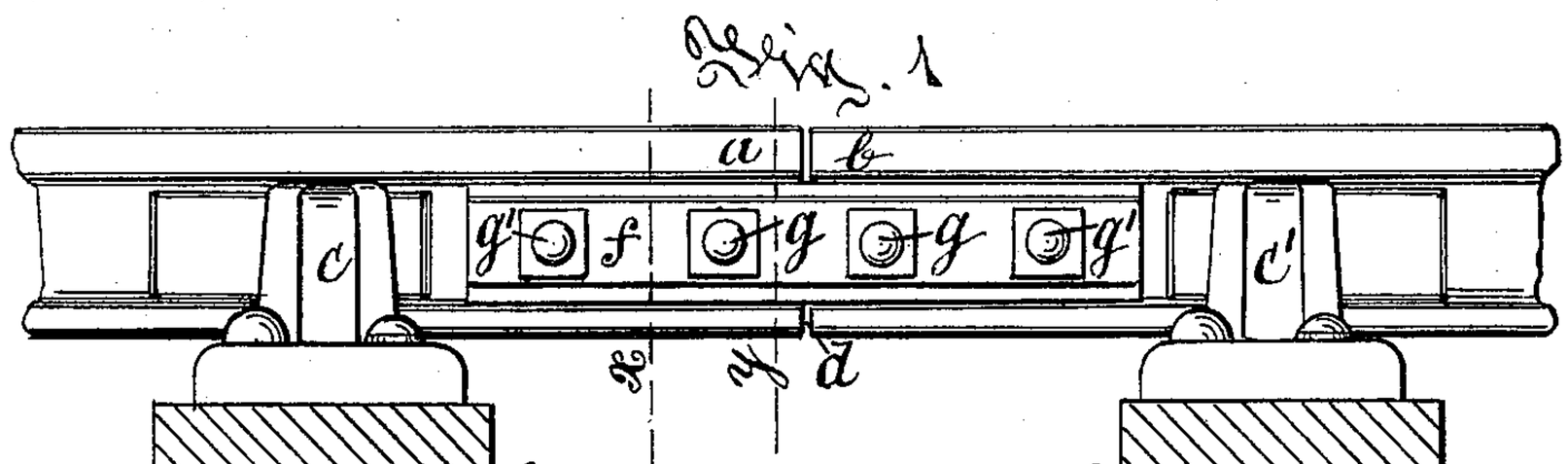


Fig. 2

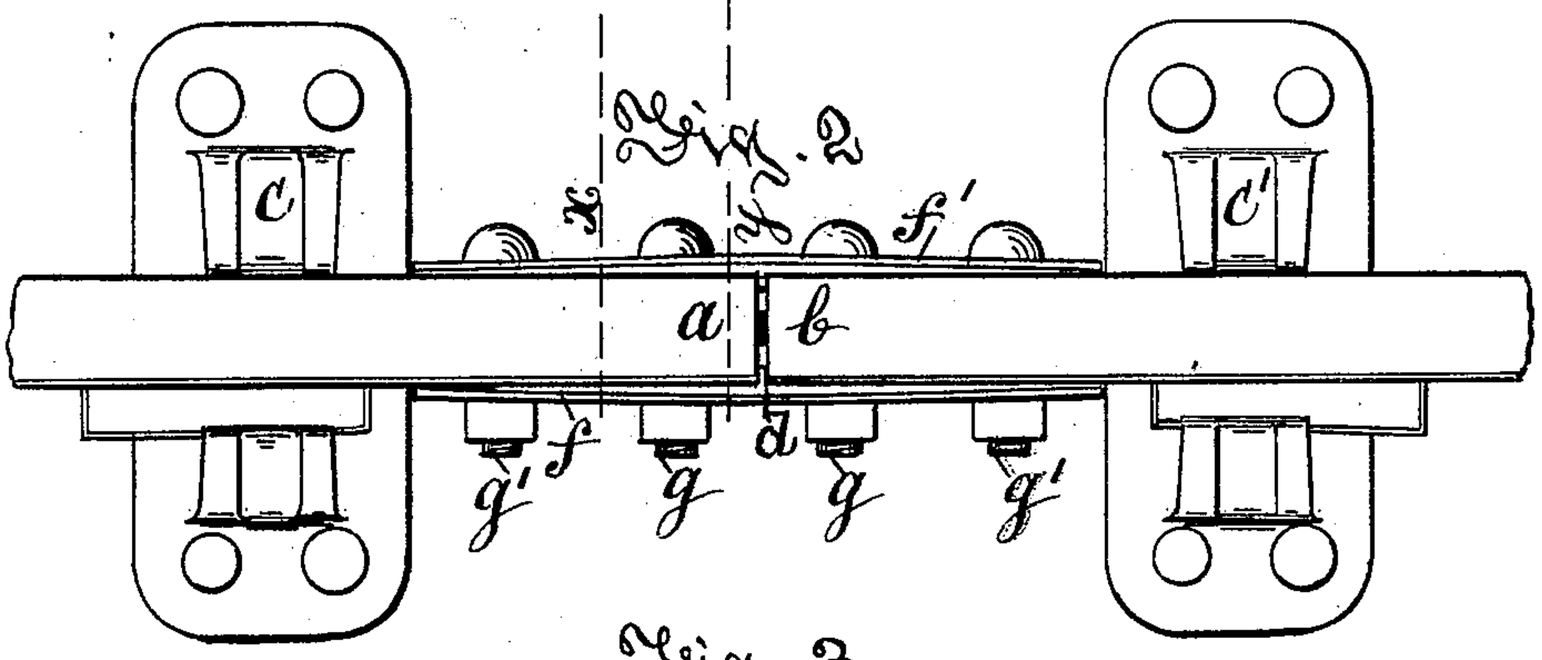


Fig. 3

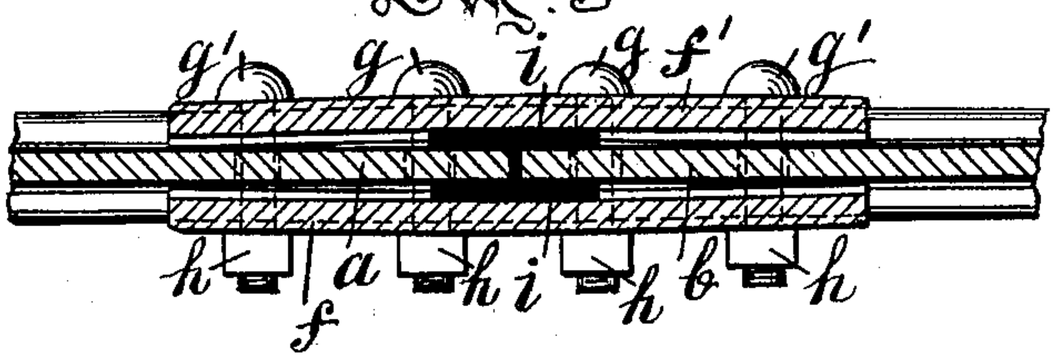


Fig. 4

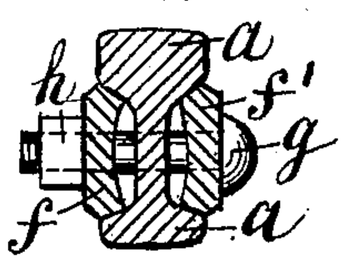


Fig. 5

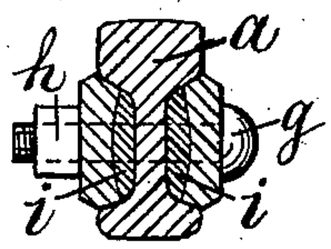


Fig. 6

Fig. 7

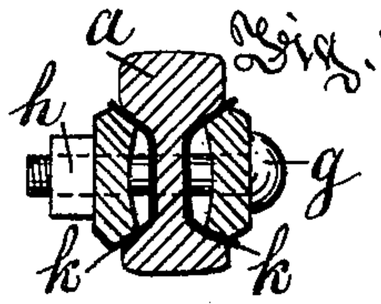


Fig. 9

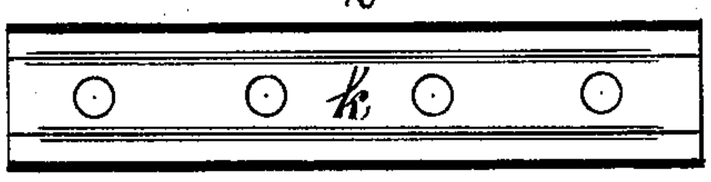
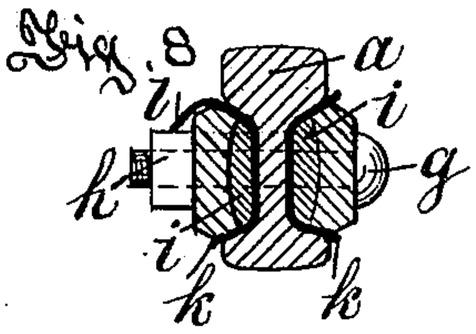


Fig. 8



Witnesses:-
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Attys.

UNITED STATES PATENT OFFICE.

JOHN FISHER, OF MATLOCK BATH, ENGLAND.

FISH-PLATE FOR RAILS.

SPECIFICATION forming part of Letters Patent No. 607,358, dated July 12, 1898.

Application filed October 16, 1897. Serial No. 655,608. (No model.)

To all whom it may concern:

Be it known that I, JOHN FISHER, a subject of the Queen of Great Britain, residing at Matlock Bath, England, have invented certain new and useful Improvements in Fish-Plates for Rails, of which the following is a specification.

My invention relates to improvements in fish-plates for rails, by which the ends of adjoining rails are firmly secured together; and the objects of my improvements are, first, to provide a solid and strong connection between the fish-plates and the rails; second, to add to the safety and durability of the joint between the rails, and, third, to reduce the vibration caused to cars passing over the joints of rails on railways. I attain these objects by the devices illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the entire joint between the ends of two rails. Fig. 2 is a plan of the same. Fig. 3 is a longitudinal section of the fish-plates and the joint between the ends of the two rails. Fig. 4 is a transverse vertical section at *x* in Fig. 1. Fig. 5 is a similar section at *y*, Fig. 1. Fig. 6 is a front view of the packing-piece. Fig. 7 is a similar section to Fig. 4, but showing a separate lining between the rail and the fish-plate. Fig. 8 is a similar section to Fig. 5, but showing the same separate lining and also a part of the latter bent down to prevent the nuts from unscrewing; and Fig. 9 is a front view of the said separate lining.

Similar letters refer to similar parts throughout the several views.

a b are the ends of two rails, which are to be rigidly connected together, a small space being left between them at *d* to allow for expansion. These rails are shown of the well-known double-headed section, and are carried by chairs *c c'*, secured to sleepers *e* in the usual way.

f f' are fish-plates, one of which is fitted upon each side of the rails between the flanges of the latter, the fish-plates being held by bolts *g g g' g'* passing through holes in the rails and in the fish-plate and tightly screwed up by nuts *h*, the holes in the rails being slightly elongated in the usual way to allow for expansion.

The parts of the rails which require to be most firmly supported and held by the fish-plates are those adjoining the ends of the rails, and with such fish-plates as are ordinarily used these are the parts which are most quickly loosened by the vibration and pressure caused by the weight of the traffic passing over them.

i i are packing pieces or plates, of steel or other metal, fitted upon each side of the ends of the rails, inside the fish-plates *f f'*, these plates extending to or partly or entirely over the inner bolt-holes (see Fig. 6) and having holes through them corresponding with these latter. Their inner sides are made flat, (see Figs. 4, 5, 7, and 8,) so that they fit closely against the sides of the web of the rail for its full depth, and their outer sides are rounded, so that they fit as closely as possible against the inner hollow sides of the fish-plates *f f'*. I make these plates *i i* very slightly thicker than the space between the flat side of the rail and the inner curved side of the fish-plate.

When the rails *a b*, fish-plates *f f'*, plates *i i*, and bolts *g g g' g'* have been fitted together, the outer bolts *g' g'* are screwed tightly up, bending the ends of the fish-plates slightly against the flanges of the rails and pressing their central parts with great force upon the plates *i i*, and the central bolts *g g* are then tightened up, so that the ends of the rails for a considerable distance back from their extremity at *d*, where any vibration or deflection will be most felt, are held absolutely firmly and solidly together between the plates *i i*, while their top and bottom flanges are also firmly held and supported between the upper and lower beveled edges of the fish-plates *f f'*, and the entire joint is practically one solid mass.

By the weight of the traffic passing over the rails a small movement of the surfaces in contact takes place, by the wear from which they come into more perfect contact and are from time to time tightened up.

I have shown my invention applied to ordinary double-headed rails and corresponding fish-plates; but it may obviously be also applied to rails of other forms of section.

The plates *i i* may be slightly tapered in thickness toward their ends at their outer sides, so that the fish-plates, when forcibly bent down upon them by screwing up the

bolts g' g', may take a more gradual bearing upon them, and instead of the plates i i being separate from the fish-plates f f' they may be formed upon the inner sides of the latter during the process of manufacture.

In order that the fish-plate and packing-plate may be reused after they have become worn, I use liners k k, Figs. 7, 8, and 9, formed of thin metal of the same length as the fish-plates f f' and bent at both their top and bottom edges to fit against the flanges of the rail. The packing-plates i i are fitted between the outer sides of these liners and the fish-plates f f', the bolts passing through holes in the liners corresponding with those in the fish-plates. The top or bottom edge of one of the liners k may be extended sufficiently to be bent down, as shown at l, Fig. 8, (when the bolts have been screwed up,) and serves as a stop to prevent the nuts h from becoming unscrewed.

Two or more thicknesses of the liners k may be used, one of which may be of greater length than the other.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a rail-joint, the combination with a fish-plate provided with bolt-holes corresponding to the bolt-holes through the rails; of the rigid block i shaped upon its sides to fit the said fish-plate and the side of the rails, respectively; the said block being of slightly-greater length than the distance between the two inner bolt-holes through said fish-plate, and the ends of said block being provided with openings corresponding to the inner bolt-holes through said fish-plate, substantially as described.

2. In a rail-joint, the combination with a fish-plate provided with bolt-holes corresponding to the bolt-holes through the rails, and having a concave inner face; of the rigid block i shaped upon its sides to fit the said fish-plate and the side of the rails, respectively; the said block being of less width than said fish-plate, and being of slightly-greater length than the distance between the two inner bolt-holes through said fish-plate, and the ends of said block being provided with openings corresponding to the said inner bolt-holes through said fish-plate, substantially as described.

3. In a rail-joint, the combination with a fish-plate provided with bolt-holes corresponding to the bolt-holes through the rails, and having a concave inner face; of the rigid block i shaped upon its sides to fit the said fish-plate and the side of the rails, respectively; the said block being of less width than said fish-plate, and of slightly-greater length than the distance between the two inner bolt-holes through said fish-plate, and the ends of the said block being provided with openings corresponding to the said inner bolt-holes through said fish-plate; and a metallic lining-plate k having a flexible extension upon one side edge adapted to be bent over upon the outside of said fish-plate, and engage the bolt-nuts of the joint, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

JOHN FISHER.

Witnesses:
C. K. EDDOWES,
GEO. R. EDDOWES.