Nov. 9, 1926. 1,606,229

J. A. HYLE ET AL

INSULATED RAIL JOINT

Filed Jan. 15, 1926 2 Sheets-Sheet 1

Fig. 1.

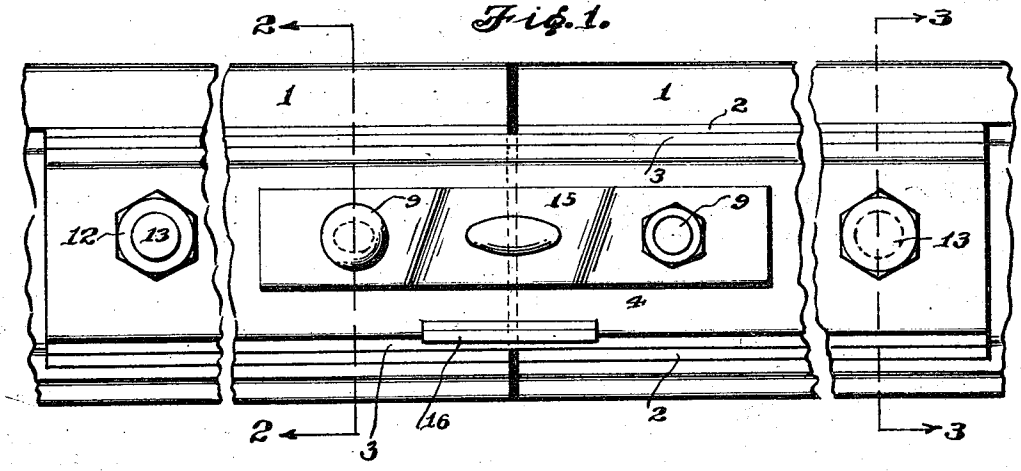


Fig. 2.

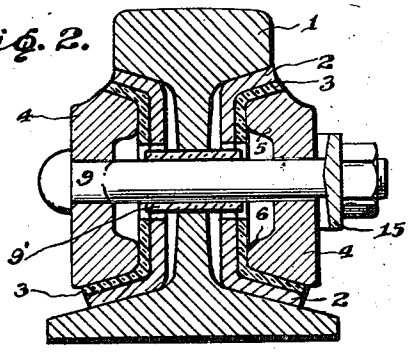
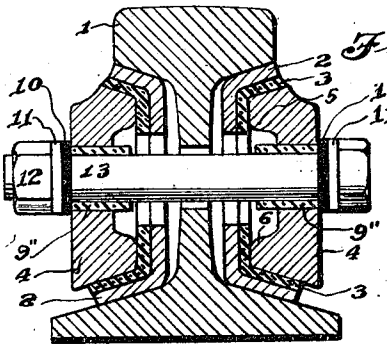


Fig. 3.



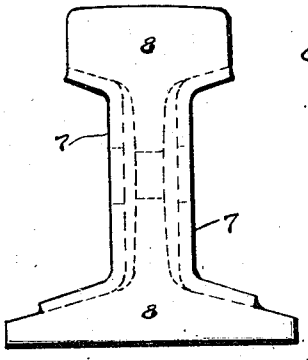


Fig. 4.

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INSULATED RAIL JOINT

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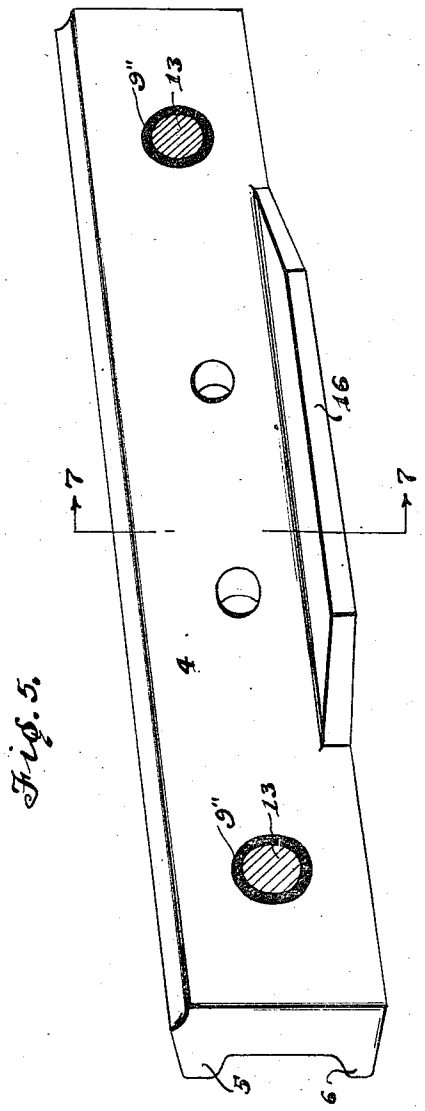


Fig. 5.

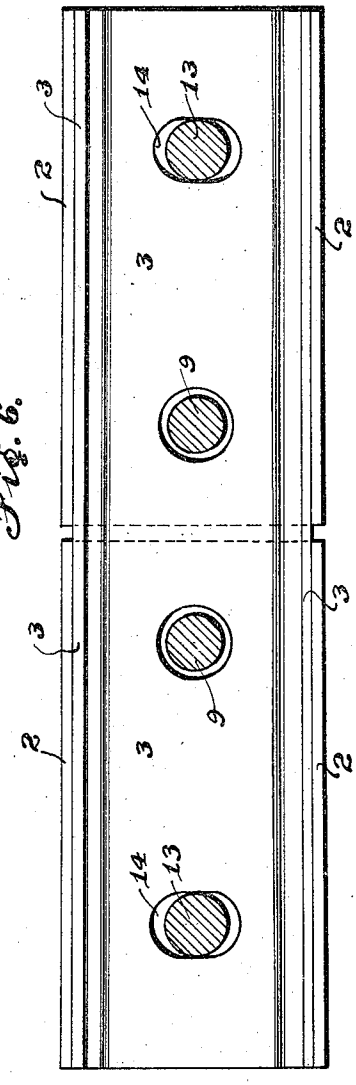


Fig. 6.

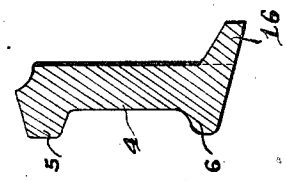


Fig. 7.

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UNITED STATES PATENT OFFICE.

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INSULATED RAIL JOINT.

Application filed January 15, 1926. Serial No. 81,417.

This invention pertains to an improved and novel railway rail joint especially designed to be utilized as an insulated joint.

The prime object of the invention is to provide a simple, economical, reliable, durable and efficient rail joint embodying novel features of construction whereby a joint possessing increased strength, stiffness and durability is produced and to insure safety in the use of the electric control systems adopted by railway corporations.

Another object of the invention is to so construct our improved insulated joint that it will be practically impossible for either of the rails where the joint is installed to be moved apart by expansion and contraction of the track rails, or the creeping or running of said rails.

Another object of the invention is to so construct the joint that a steel shim is utilized at each side of the meeting ends of each of the track rails, and a single fibre shim at each side of the rails adapted to overlap said steel shims.

Further objects of this invention are to so construct the joint clamping bars that they are caused to fit snugly into contact with the outer face of the fibre shims, with the steel shims disposed between said fibre shims and the track rails at a suitable distance away from the web of the rails so that as wear takes place caused by wave motion, or otherwise, by drawing up the nuts on the securing bolts the clamping bars are drawn inwardly on both sides of the meeting ends of the rails until substantially all of the space formed between the shims and the web of the rails shall have been taken up.

The foregoing and such other objects as may appear from the ensuing description are attained by the construction, arrangement, location and combination of the several parts hereinafter more fully described, illustrated by the accompanying drawings, and particularly pointed out in the claims appended hereto, it being understood that slight changes in the precise shape, proportions and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings forming a part of this specification it will be seen that:—

Figure 1 is a side elevation of the improved rail joint embodying our invention.

Figure 2 is a transverse section taken in the plane of the dotted lines 2—2, Fig. 1, looking in the direction of the arrows.

Figure 3 is a transverse section taken in the plane of the dotted lines 3—3, Fig. 1, looking in the direction of the arrows.

Figure 4 is an end view showing the insulating fibre member in full lines fitted on the end of one of the track rails, showing the end of the rail by the inner dotted lines and the metal shim by the outer dotted lines.

Figure 5 is a slightly enlarged perspective of one of the rail joint clamping bars removed from the rail joint, and the securing bolts in cross-section.

Figure 6 is an enlarged side elevation of the shims detached from the joint, showing the formation of their outer face and the securing bolts in cross-section, and

Figure 7 is a transverse section taken in the plane of the dotted lines 7—7, Fig. 5.

In the embodiment of our invention as illustrated, the numerals 1 indicate a pair of track rails, as shown in Fig. 1, 2 designates what is well known in the art as a shim made by the rolled, pressed or drop forged process of any desired thickness of a suitable grade of steel disposed at each side of the track rail and at each side of the meeting ends of the rails, said shims being adapted to be secured snugly and tightly into contact with the lower surface of the head of the rail and the upper surface of the base of the rail, and 3 is a similar shim formed of a single piece of any desirable insulating fibre and of any suitable thickness, extending the entire length of the joint, each of said fibre shims being disposed in contact with the outer face of each of the steel shims and adapted to be firmly secured into contact with the said steel shims, when assembled, by the rolled steel clamping bars 4, each of said bars being formed with a thickened or reinforced inner upper end or head portion 5, the lower thickened or reinforced inner end or foot portion 6 and a reduced connecting web portion of the same thickness throughout said web portion, as is clearly shown in Figs. 2 and 3, thereby constituting reinforced and materially strengthened head and foot portions.

It will be perceived that each of the steel

shims 2 terminates at its inner end substantially in vertical alinement with the end of the respective track rail to which the shim is secured, with its terminating inner edge in contact with a laterally extended portion 7 of the insulating fibre member 8, which latter member is formed of any desirable thickness and is fitted between the meeting ends of the rails, with its extended portion 7 forming a separating partition for the shims, and to insure safe and practical insulation.

Each steel shim member is provided with two or more openings therethrough, each fibre shim with four or more openings, and each clamping bar 4 is formed with four or more openings therethrough adapted to register with similar openings formed through the web of the track rails for the reception of the fastening bolts, and to each end portion of each large securing bolt 13 is fitted an insulating fibre washer 10, a metal washer 11 and the usual adjustable securing nut 12 for adjustably, firmly and rigidly securing the several parts together when properly assembled.

It is usual in this art to form the openings through the web of each track rail about one fourth of an inch larger than the securing bolt used so that expansion will be permitted, and in our insulated joint it is preferred to use a bolt 9 one inch in diameter, which is passed through the two central openings of the joint, that is, the two openings adjacent the meeting ends of the rails, and within each of said openings is snugly fitted an insulating fibre tube 9′ of sufficient length to pass through the opening formed in each steel shim and to overlap the opening formed through the fibre shim. These tubes being preferably about three sixteenths of an inch thick serve as a safe insulation for the bolts, these bolts 9, and their securing nuts 12 being mainly utilized for forcing the clamping bars tightly into contact with the shims and retaining the joint in a reliably secured condition, while the two larger securing bolts 13, one adjacent each outer end portion of the joint are preferably one and one-fourth inch in diameter, which latter bolts may be properly termed "king bolts" are passed through the respective openings formed through the track rails, said openings being about one and five sixteenths of an inch in diameter. These bolts 13 are so fitted in the openings formed through the rails as to allow the usual slight wave movement thereof, caused by the heavy traffic thereover, and not chafe on the bolts, and since these bolts are heat treated, and possess unusual strength, they serve to prevent the ends of the rails from being forced apart and retain the ends of the rails in tight condition, and to resist all strains to which they may be subjected.

It will be understood that the bolts 13 pass through the fibre and steel shim openings and are adapted to fit snugly at each side of the shims so that said shims are prevented from sliding longitudinally away from the meeting ends of the rails, and the shim openings 14 are slightly elongated at their upper and lower ends, so that in the event that the steel shims are subjected to excessive wear at their upper edges, the said shims will be permitted to rise or move upwardly in tight contact with the lower surface of the rail heads, when the said shims are adjusted inwardly by the securing nuts to compensate for wear, while the openings formed in the shims for the reception of the bolts 9 are sufficiently large to prevent contact of said bolts with the steel shims during said inward adjustment, as will be clearly evident by reference to Figs. 2 and 3 of the drawings.

By reference to Fig. 6 of the drawings will be seen the normal relation of the securing bolts 9 and 13 with respect to the openings formed through the shims for the reception of said bolts at the time the said shims are first clamped and secured to the track rails.

The two central bolts 9 are each provided with an oval shaped neck so as to prevent the bolt from turning when adjusting the securing nuts inwardly, and said bolts are provided with what is known as the "Evertite" spring locking device to retain them always in tight position, thereby insuring a tight joint under all conditions, and furnishing an insulated joint of much increased longevity over the type of joint now employed.

The clamping plates or bars 4 are preferably made in substantially the contour, such as shown in Fig. 5 of the drawings, each plate or bar being formed with a strengthening extension 16 at its lower edge and centrally disposed, so as to overlap the meeting ends of the rails a suitable distance, with the desired reinforced head and foot inner portions, and the joint is made preferably with only four bolts, although six bolts may be employed by making a longer joint and shims, and the four middle bolts then used will be of the small diameter, and the bolt adjacent to each end of the joint will be of the large diameter, and utilized in substantially the same manner as when the four bolt joint is used. Further, it will be readily obvious that all of the insulating fibre parts employed in connection with our improved joint may be formed of any suitable thickness desired.

It will also be perceived that within each opening adjacent each end of the clamping bar or plates 4 is fitted an insulating tube 9″, which extends a suitable distance beyond the inner face of the plate to form an efficient insulation, while the outer end of

each tube 9″ is adapted to rest in contact with a fibre washer 10, the latter being disposed between a metal washer 11, and the outer face of the plate 4, so that the fibre will not be mutilated or destroyed by the adjustment of the securing nuts 12.

It will be readily obvious that the lateral extensions 16 impart additional strength to the clamping bars or plates 4 at the point where such strength is especially desired, and that the type of joint hereinbefore described provides a safe, practical and reliable insulated joint for the purpose for which it is intended.

It will be understood that the king bolts hereinbefore described may be of any suitable size or dimensions in order that they may be employed in connection with any type or design of track rails to properly adjust the joint. Further, our joint is so designed that the intermediate securing bolts, whether two or more are utilized, are of the standard size, thus making it unnecessary to use any special type of bolt; that each steel and fibre shim may be split longitudinally or transversely into a plurality of sections or pieces if desired; that the main clamping bar 4 may be made of any suitable shape or size, so that it may be employed in connection with any size or construction of track rails, and may be rolled or forged the required shape from any desirable metal.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:—

1. An insulated rail joint, comprising track rails, a steel shim secured to the end portions at each side of the meeting ends of the rails, an insulating fibre shim secured in contact with the outer face of each of said steel shims, means for permitting the upward movement of said shims to compensate for wear and means for tightly securing said shims to the track rails.

2. An insulated rail joint, comprising track rails, a steel shim disposed in contact with the end portion of each rail at each side of the meeting ends of the rails, an insulating fibre shim disposed in contact with and entirely covering the outer face of each steel shim, each of said shims having a vertically formed inner and outer face, means for permitting the upward movement of said shims to compensate for wear and means for securing said shims rigidly in contact with said track rails.

3. An insulated rail joint, comprising track rails, a steel shim secured to the end portion of each rail at each side of the meeting ends of the rails formed with a vertically elongated opening adjacent each end, an insulating fibre shim secured to the outer face of each steel shim, a king bolt fitted to the joint near each end thereof, and means for adjustably and rigidly securing said shims to the track rails.

4. An insulated rail joint, comprising track rails, a metal shim secured to the end portion of each rail at each side of the meeting ends of the rails, an insulating fibre shim secured in contact with the outer face of each metal shim, a clamping plate secured in contact with the outer face of each fibre shim, and having a centrally disposed strengthening extension overlapping the meeting ends of the bases of the rails, means for permitting the upward movement of said shims when adjusted inwardly to compensate for wear, a king bolt fitted to the joint adjacent each end thereof, and means for adjustably securing said plate, shims and track rails together.

5. An insulated rail joint, comprising track rails, a metal shim secured to the end portion of each rail at each side thereof and formed with an elongated opening adjacent each end, an insulating fibre shim secured in contact with the outer face of each metal shim, a clamping plate formed with a lateral extension at its lower edge overlapping the meeting ends of the rails and secured in contact with the outer face of each fibre shim, a fibre tube fitted within each opening formed through the track rail and through each metal shim, and means for rigidly securing the shims, clamping plates and track rails together.

6. An insulated joint of the character described comprising track rails, a metal shim secured to the end portion of each track rail at each side thereof formed with a vertically elongated opening adjacent each end, an insulating fibre shim secured in contact with the outer face of each metal shim, and means for adjustably securing the said shims tightly together in contact with said track rails.

7. An insulating joint of the character described, comprising track rails, a metal shim secured to each end portion of the track rails at each side thereof, an insulating fibre shim secured in contact with the outer face of each metal shim, fibre insulating tubes fitted within the two central openings formed through the track rails, and extending through each opening formed through the metal shims, a clamping plate secured in contact with the outer face of each fibre shim, means for permitting the upward movement of each shim as they are adjusted inwardly to compensate for wear, and means for tightly and rigidly securing the clamping plates, shims and track rails together.

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