





# UNITED STATES PATENT OFFICE.

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## RAIL-BRACE.

SPECIFICATION forming part of Letters Patent No. 697,401, dated April 8, 1902.

Application filed February 28, 1901. Serial No. 49,336. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. GRAHAM, a citizen of the United States, residing at Roanoke, in the county of Roanoke and State of Virginia, have invented a new and useful Rail-Brace, of which the following is a specification.

This invention relates to rail-braces, and particularly to that class adapted for use in connection with frog-rails.

The device of the present invention is an improvement on a combined guard-rail and frog-brace for which I obtained Letters Patent in the United States, dated April 3, 1900, and numbered 646,825. The device embodying the improvement covered by the said Letters Patent is thoroughly efficient for the purpose designed; but its utility is limited in scope, for the reason that the rail-engaging terminals are constructed in such manner as to be efficiently operable only in conjunction with a predetermined-sized rail. In other words, said terminals are adapted closely to impinge the inner side of a rail from and including the upper surface of the base to the top surface of the tread.

The object of the present invention is to enlarge the scope of usefulness of the brace by adapting it for use in connection with rails of different sizes without requiring any change in the structural arrangement of the rails.

With these and other objects in view, as will appear as the nature of the invention is better understood, the same consists, generally stated, in a rail-brace having its rail-base-engaging portions constructed to coact either with a broad or a narrow base and its tread and web-engaging portions similarly contoured. Thus where a light rail is employed—say a sixty-pound rail—the terminals of the brace will bear directly against the webs and the under sides of the treads of the rails, the bases of the rails being free from engagement with the brace, and thus a rigid and non-yielding reinforcement of the rails is effected. Where a heavy rail is employed—say a hundred-pound rail—the sides of the treads and the webs will be engaged by the terminals of the brace as well as the base, thereby positively bracing the rails against yielding.

Further and more specific advantages accruing from the device of the present invention will hereinafter appear.

In the accompanying drawings, forming a part of this specification, and in which like numerals of reference indicate corresponding parts, there is illustrated one form of embodiment of the invention capable of carrying the same into practical operation, it being understood that the elements therein exhibited may be varied or changed as to shape, proportion, and exact manner of assemblage without departing from the spirit thereof, and in these drawings—

Figure 1 is a view in transverse section through a pair of track-rails, representing in this instance frog-rails, showing the improved brace in side elevation and applied in operative position to the rails. Fig. 2 is an enlarged detail view in perspective of one end of the brace. Fig. 3 is an enlarged detail sectional view of a portion of a rail and the end portion of the brace.

Referring to the drawings, 1 designates in this instance a pair of frog-rails, although they may represent ordinary track rails or guides, the character of rails employed being dependent on the application of the device.

The brace comprises an intermediate body 5, which is substantially triangular in cross-section and for a greater portion of its length of less height than the distance from the upper surfaces of the ties to the like surfaces of the rail-treads. Projecting laterally from the lower opposite sides of the base portion of the body are flanges 6, having spiked notches 7 at regular intervals, as shown in Fig. 2, both of the flanges being in the same horizontal plane and providing a flat base for the brace, and which when spiked to the ties will positively prevent longitudinal movement of the brace from jars or vibrations. The brace is hollow throughout to avoid excessive weight. The terminals 8 of the brace are enlarged, and the particular construction now to be described constitutes the basis of specific improvement over the structure covered by the patent above referred to. The terminals 8 flare upwardly, and the base-flanges 6 are regularly continued with the



flare of the terminals. The web-engaging portions 9 of the terminals are rounded somewhat to conform to and snugly fit against the webs, as clearly shown in Fig. 3, and above the terminals are disposed solid brace-tables 10, adapted to fit under the treads of the rails, thereby to hold the said terminals positively against any tendency of lifting, even should they become loose by working out of the holding-spikes. Above the tables 10 the terminals of the brace are formed into guard-faces 11, which incline inwardly toward each other, and thus away from the treads of the rails, thereby to obviate any interference between these portions and the wheel-flanges of the rolling-stock where the upper portions of the terminals project above the rail-treads, as shown in Figs. 1 and 3, wherein the terminals 8 of the brace are shown as bearing directly against the web of the rails and against the under side of the tread thereof, the upper surfaces of the base and inner sides of the treads being free from engagement with the terminals. This disposition of the parts obtains only when a light rail—say a sixty-pound rail—is employed; but where a heavy rail—say a hundred-pound rail—is employed it is essential that provision be made whereby the brace may be readily adaptable thereto. To effect this, the under sides of the terminals are formed with recesses 9<sup>a</sup> of a length greater than the width of the base from the web outward of a sixty-pound rail. Thus when the brace is associated with a heavy rail the recesses will be entirely filled by the rail-bases, and owing to the greater height of the web and cross-diameter of the tread the upper portion of the terminals will occupy a plane approximately horizontal to that of the upper sides of the treads, the terminals being in partial engagement with the web, as in the arrange-

ment shown in Figs. 1 and 2. The adaptation of the brace to rails of different sizes is all-important, as it obviates the necessity of making the braces in different sizes and, as will be obvious, largely increases the field of usefulness of the device. The features, therefore, which define this invention over that shown in the patent are in inclining the guard-faces 11 away from the tread in order to permit the terminals 9 to impinge the web irrespective of the spread of the tread and in making the recesses 9<sup>a</sup> of greater length than the lineal dimensions of a light-weight rail.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A rail-brace of a length to engage the webs of a pair of seated rails, the terminals of the brace being provided with tables to engage the under sides of the rail-treads and with guard-faces disposed at diverging angles to the inner sides of the treads, thereby to adapt the brace to rails having treads of different widths.

2. A rail-brace of a length to engage the webs of a pair of seated rails, the upper portions of the terminals of the brace being provided with tables to engage the under sides of the treads and with guard-faces disposed at diverging angles to the inner sides of the treads, and the lower portions of the terminals being provided each with a recess of a size to include a rail-base of any standard size.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN E. GRAHAM.

Witnesses:

E. E. DOYLE,

F. J. APPLEMAN.