No. 646,825. Patented Apr. 3, 1900.

J. E. GRAHAM.

COMBINED GUARD RAIL AND FROG BRACE.

(Application filed Jan. 6, 1900.)

(No Model.)

Fig. 1.

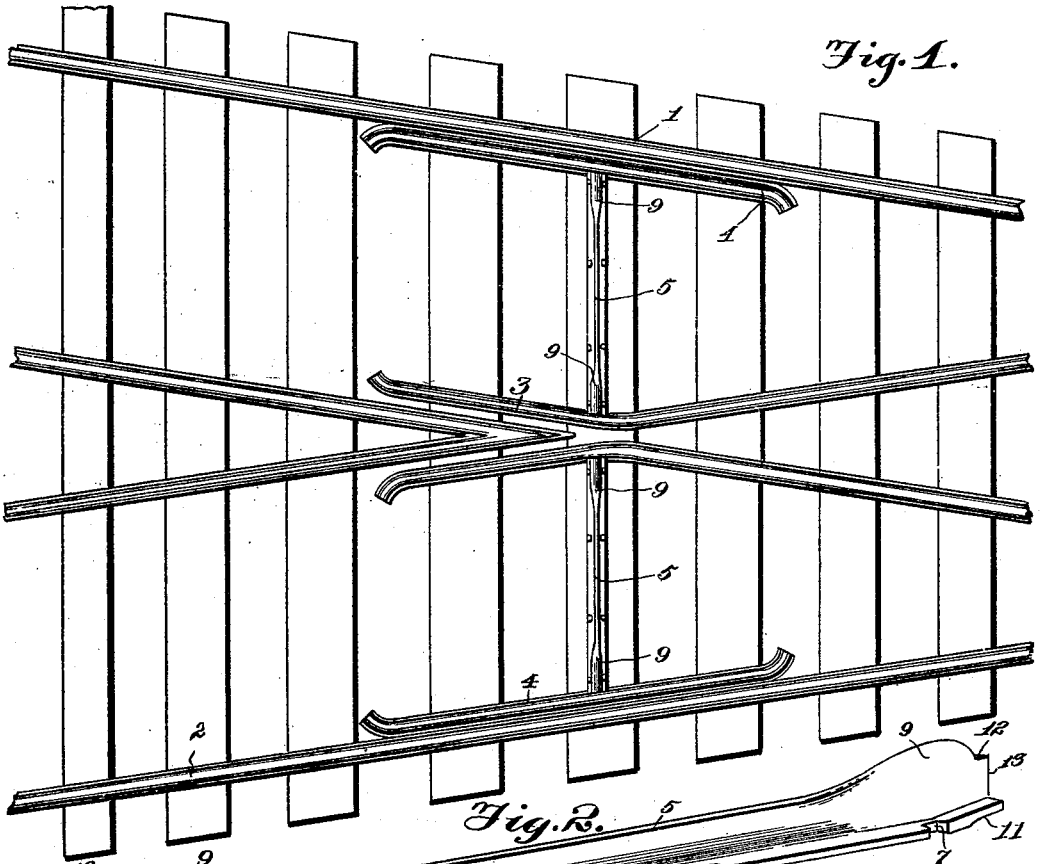

Fig. 2.

Fig. 3.

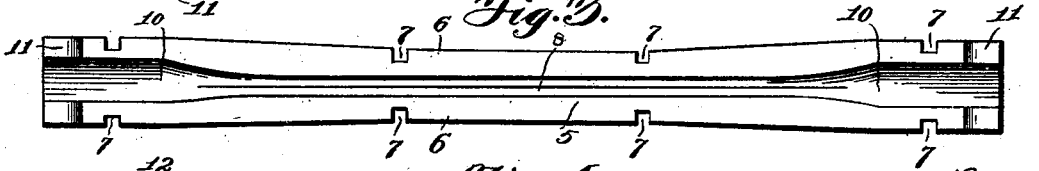

Fig. 4.

Witnesses

Leo A. Bondurant

Chas. S. Hoyer.

J. E. Graham Inventor

By his Attorneys,

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

JOHN E. GRAHAM, OF ROANOKE, VIRGINIA.

COMBINED GUARD-RAIL AND FROG-BRACE.

SPECIFICATION forming part of Letters Patent No. 646,825, dated April 3, 1900.

Application filed January 6, 1900. Serial No. 577. (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 Combined Guard-Rail and Frog-Brace, of which the following is a specification.

This invention relates to a combined guard-rail and frog-brace; and the object in view is to provide a device of this character of continuous form or integral construction from end to end, having a flat base for firm attachment to a tie or other support to prevent movement of the brace and insure a performance of its function in a positive manner at all times and in accordance with its primary adjustment, and thereby obviate the disadvantages and overcome the inconveniences, as well as serious consequences, that have existed in braces as heretofore constructed, the improved brace being of invariable length when applied to uniformly maintain the gage-space between the point of the frog and the guard-rail.

With these and other objects and advantages in view the invention consists in the construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

In the drawings, Figure 1 is a top plan view of a portion of a railroad-track, showing the improved brace applied thereto in operative position. Fig. 2 is a detail perspective view of the improved brace. Fig. 3 is a bottom plan view of the same. Fig. 4 is a longitudinal vertical section of the brace.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

The numeral 1 designates a main track, and 2 a side track, a frog 3 being interposed between rails of the main and side tracks for obvious reasons, and guard-rails 4 are also shown disposed adjacent the outer rails of both the main and side tracks opposite the position of the frog 3. This arrangement of track-rails does not form a part of the invention, but is explained to illustrate the mode of applying the improved brace and the advantages arising from the novel construction in the particular application which will be hereinafter explained.

The brace comprises an intermediate body 5, which is substantially triangular in cross-section and of less vertical height than the distance from the upper surfaces of the ties to the upper planes of the rail-heads. This intermediate body portion of the brace is uniform for a greater part of the length of the latter, and extending from the lower opposite portions of the same are horizontal flanges 6, which are formed with spike-notches 7 at regular intervals, both flanges 6 being in the same horizontal plane and providing for the brace a flat stable base-rest, which is disposed on the upper surface of a tie or analogous support and firmly secured by spikes driven through the notches 7 to prevent longitudinal movement of the brace either from vibration or expansion. As clearly shown in Figs. 3 and 4, the greater portion of the brace is provided with an angular or substantially V-shaped groove 8 to form a hollow structure, which will materially strengthen the entire device and at the same time lighten it and avoid the use of an excess of metal without obtaining any additional advantage by such overplus of material. The opposite extremities 9 of the brace are enlarged and flared upwardly, so as to produce opposite abutting ends for bearing against the inner opposing sides of track-rails or, as shown, guard-rails and opposite portions of an intermediate frog. The upper flare and increased dimension in each extremity 9 provide also for an abutment against a greater portion of a rail or frog side and materially increase the resistance against lateral movement of said railroad appurtenances and also displacement by weight-pressure incident to continual travel thereover of the rolling-stock. The hollow formation of the brace, as heretofore set forth, is continued through the extremities 9 by the provision of longitudinal openings 10, which merge into the substantially V-shaped groove 8, said openings 10 being larger in dimension than the groove and having more of an arched form. The flanges 6 are also continued completely to the opposite ends of the brace and have an upward trend or direction corresponding to the angle of the extremities 9, and adjacent their outer extremities said flanges have their under faces formed with recesses 11, corresponding in shape to the base-flange of a rail.

The upper portions of the opposite ends of the brace are also formed with rail-head seats 12 by removing the metal at such point, and thereby permit the vertical faces 13 of the said opposite ends to abut squarely against the web between the base-flange and the head of the rail, as clearly shown in Fig. 4. The opposite extremities 9 of the brace do not extend high enough, however, to interfere with the tread of the car-wheels, and the said end enlargements are also of importance and act with benefit in resisting the pound or short acute vibrations that are brought to bear upon all braces at the points where they connect with the rails or other track appurtenances by the car-wheels moving rapidly thereover and which is due to the rigidity established at the points where such braces are applied. It will also be observed that the braces embodying the improved braces will resist the deleterious effects of frosts, sudden expansions, the rapid coolings, and shocks or jars generally by reason of the hollow construction specified.

As shown by Fig. 1, the braces are illustrated as applied at a point where a frog is located and between the opposite sides of the frog and the ordinary guard-rails. This is a very effective application, because the regularity of gage between the guard-rails and the opposite sides of the frog is maintained under all conditions and which is due largely to the flat base-rest provided for each brace by the flanges 6, and, furthermore, the securement of the said flanges by spikes overcomes any tendency whatever to a longitudinal shifting movement. This longitudinal shifting movement is a grave defect encountered in the ordinary form of brace or those depending upon adjustment in a longitudinal direction to obtain a regularity in the gage. Moreover, in the ordinary form of brace the major part of the same is suspended above the track-bed below and frequently becomes bent or broken from various causes and which would not ensue if a resisting foundation or base-rest was provided therefor, as in the present form of improved brace. By making the intermediate body portion of the improved brace of less height than the opposite extremities 9 the occupancy of the space between the rails in a vertical direction is reduced relatively to the plane of the greatest normal vertical extent of the rails and without detracting in the least from the durability or strength of the brace.

The improved brace is primarily made of such length that it cannot be applied unless the frog is disposed in perfect gage, and when so applied the guard-rail cannot move inwardly in the least without equally shifting the frog, and thereby a uniform gage between the guard-rail and the frog will always be preserved. Accidents result in a switch of this kind from a derangement or irregular shifting of the point of the frog relatively to the guard-rail, and the salient feature of the improved brace is to always maintain this uniformity of gage between the frog-point and the guard-rail no matter how much the adjacent rail construction may move or be out of line, and it has been found by practical experiment and use that the particular construction of brace forming the subject-matter of this invention is the only one that will hold a guard-rail the proper distance or gage from the frog-point and in accordance with the standard gage.

In the manufacture of the improved brace any applicable mode of forging may be pursued or other method employed, and in addition to the obvious variations referred to as to position and dimension changes may be made in the proportions and minor details, as well as the form, without departing from the principle or sacrificing any of the advantages of the invention.

Having thus described the invention, what is claimed as new is—

1. A brace of the character set forth, of continuous or integral form from end to end and having a vertical body portion with opposite side flanges in the same horizontal plane and providing a flat base formed with spike-notches at intervals to receive spikes for securing the brace directly on a tie or analogous device.

2. A brace of the character set forth, of continuous or integral form from end to end and having an intermediate vertical body portion and opposite upwardly-inclined extremities to bear directly against the inner opposing sides of railroad devices, the said brace having a flat base formed by opposite side flanges for disposition upon and securement to a tie or other analogous support.

3. A brace of the character set forth, of continuous or integral form from end to end and having an intermediate vertical body portion and opposite upwardly-inclined extremities provided with end seats for portions of railroad devices, the said brace having a flat base formed by opposite side flanges for disposition upon and securement to a tie or other analogous support.

4. A brace of the character set forth, of continuous integral form from end to end and having an intermediate vertical body portion and opposite enlarged upwardly-extending extremities provided with end seats for portions of railroad devices, the said brace having a flat base for disposition upon and securement to a tie or other analogous support, the said base extending also from end to end of the brace and adjacent its terminals formed with recesses on the inner portions of the flanges.

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:
CHAS. S. HYER,
M. PERRY HAHN.