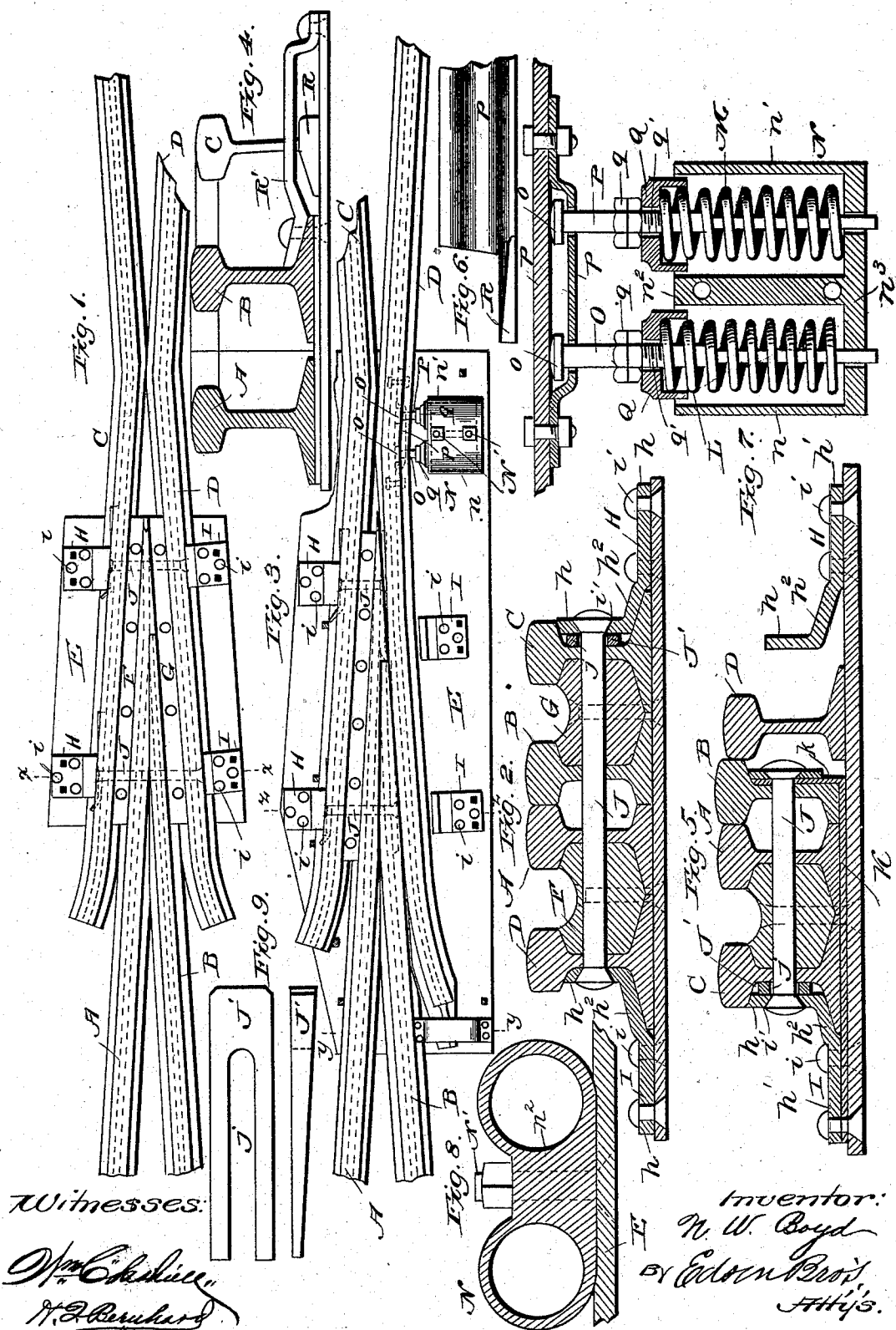


(No Model.)

N. W. BOYD
RAILWAY FROG.

No. 505,022.

Patented Sept. 12, 1893.



Witnesses:

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UNITED STATES PATENT OFFICE.

NATHANIEL W. BOYD, OF CARLISLE, PENNSYLVANIA.

RAILWAY-FROG.

SPECIFICATION forming part of Letters Patent No. 505,022, dated September 12, 1893.

Application filed September 12, 1892. Serial No. 445,658. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL W. BOYD, a citizen of the United States, residing at Carlisle, in the county of Cumberland and State of Pennsylvania, have invented certain new and useful Improvements in Railway-Frogs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The first part of this invention relates to means for immovably holding and bracing in position the point and one of the main line rails of a spring-rail frog to prevent the rigid rails forming the stiff frog-body from spreading under the weight or impact of a passing train, the movable wing rail of this form of frog being normally held in lateral contact with one of the stiff rails of the body of the frog by suitable tension or pressure springs.

The second part of the invention relates to a novel spring mechanism for a spring-rail frog in which the spring housing is rigidly held in place and forms the guides for the spring controlled rods which are connected to said movable wing-rail, suitable means being provided for regulating the tension of the spring or springs.

The invention consists in the novel combination of devices and peculiar construction and arrangement of parts as will be hereinafter fully described and pointed out in the claims.

The invention is fully illustrated in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a plan view of a stiff frog embodying my improvements, and Fig. 2 is a vertical cross sectional view through the same on the plane indicated by the dotted line $x-x$ of Fig. 1. Fig. 3 is a plan view of a spring rail frog constructed in accordance with this invention. Fig. 4 is a cross sectional view through the spring rail frog on the plane indicated by the dotted line $y-y$ of Fig. 3. Fig. 5 is a cross sectional view on the line $z-z$ of Fig. 3, showing the keeper for holding the wing rail against vertical displacement. Fig. 6 is a detail view of the free end of the wing rail. Figs. 7 and 8 are detail sectional

views of the springs and housing for the wing rail. Fig. 9 is a detail view of the key.

Like letters of reference denote corresponding parts in all the figures of the drawings.

A, B, designate the fixed frog rails and C, D, are the main line rails of a railway track and frog, which rails are seated or bear on a bearing plate E placed underneath the rails and firmly spiked or otherwise fixed on the ties of a track. This bearing plate E may be made of a single continuous flat piece of metal, as shown in Figs. 1 and 3 of the drawings, or it may be made in sections, each of which is spiked to a tie; hence I do not strictly confine my invention to the use of either a single or continuous plate or a sectional bearing plate, either of which is within the scope of my invention.

All the rails forming the body of the frog, except the wing rail of the spring-rail frog in Figs. 3 and 4, are united and braced solidly together to prevent them from spreading under the action of the wheel-flanges and the weight of a passing train by the novel devices which I will now describe.

Referring now more particularly to Figs. 1 and 2, which illustrate the stiff frog, the frog and main line rails are arranged in the usual manner, and between the adjacent frog and main line rails A, C, and B, D, are interposed, respectively, the distance or filling blocks F, G, which lie a suitable distance below the heads of the rails and which extend from the frog-point a proper distance toward the ends of the main line rails, or these blocks may each be of two or more sections instead of continuous pieces.

The main line rails C, D, and the whole frog, are braced and strengthened by means of the braces H, I, which are fixed or rigidly united to the bearing plate E and bear against the outside of the webs of said rails C, D. The fixed braces H, I, are each preferably made of a single piece of metal, and consist of a vertical arm h , a flat horizontal base h' and an inclined arm h'' which joins the vertical upper arm h and the flat base h' . The flat base of the brace is riveted or otherwise united, at i , to the bearing plate E, and the inclined and vertical arms bear firmly against the foot and web of the rail, as shown. Through

the rails, filling blocks and the upper parts of the braces H, I, are passed the through bolts J which secure the several parts so firmly and rigidly together that the rails cannot be separated or "spread" apart by the action of the wheel flanges or the weight of a train. This through bolt is of peculiar form, and without a nut or other kind of removable fastening, said bolt having an imperforate plain shank and integral head at one end of said shank. The bolt is passed through aligned openings in the braces, distance blocks and rails, with the head thereof resting in a countersunk opening i' in one of the braces, and the other end of the bolt having been heated, the metal is upset or swaged to form another head which fits in a similar countersunk recess in the other brace on the opposite side of the frog, whereby the bolt is secured without employing a nut or fastening of any kind. Although I prefer such construction, yet a nutted and headed bolt may be used. Between the web of one of the main line rails and one of the braces is fitted a tapering key or wedge J' , which is provided with a longitudinal slot j (see Fig. 9) that receives the bolt within itself, said key serving to bind the parts together after the bolt has been applied, in the manner disclosed in my prior patent No. 462,297, dated November 3, 1891. No claim is herein made, however, to the combination of the rails, braces, distance block, a through bolt passing through the same, and a bearing plate on which the rails rest, the whole forming a stiff frog, as the same forms the subject matter of a divisional application filed by me on the 15th day of February, 1893, Serial No. 462,425.

In the spring rail frog shown by Figs. 3 and 4, I unite the frog rails A, B, and one main line rail C together by the distance blocks, the brace H, and the through bolt and key in the same manner as the parts of the stiff-frog just described, but the other rail D constitutes the movable wing-rail of the frog and it is arranged laterally of the frog rails in the usual manner to adapt it to have the requisite lateral movement under the action of the wheel-flanges of a passing train.

In order to elevate or raise the fixed body of the frog the requisite distance above the head of the movable wing-rail D I provide the spacing plate K between the bearing plate E and the bases of the frog and main line rails A, B, C, (see Fig. 4,) such spacing plate K being of the desired thickness, say one-fourth of an inch, to raise the heads of the rails forming the body of the frog. This horizontal spacing plate extends under the fixed braces H at one side of the body of the frog, and the inner end of the spacing plate is bent vertically, at k , alongside the inner vertical flat side of the frog rail B, said bent vertical end k of the spacing plate serving as the brace for the inner side of the fixed frog body and so arranged that the tightening key or wedge J' can be driven or forced between the

main-rail C and the vertical end k of the wedge-key J, all as clearly shown by Fig. 5.

As is usual in spring rail frogs of the class to which the frog shown in Figs. 3 to 8 relates, the movable wing-rail D is bent at an intermediate point of its length to lie close against the fixed frog-rail B; and said wing rail is normally held or pressed into position by means of the tension springs L, M, and the connection between said springs and the wing-rail.

There are two springs provided for holding the wing-rail in place laterally against the frog, each of which is adapted for action independently of the other, but I would have it understood that my invention is not restricted to such duplicate arrangement of springs as it is evident that a single powerful spring may be used, although I prefer to use the two independently acting springs placed side by side.

The coiled springs are housed or inclosed in separate compartments n, n' , of a housing N, which is preferably cast in a single piece of metal with a central partition n^2 , to divide its chamber into the compartments; and said housing is rigidly or immovably fastened to the bearing plate E by the vertical bolts N' which are passed through the partition n^2 and the bearing plate (see Figs. 7 and 8). The front end of the housing, or that end adjacent to the wing rail, is open, while the rear end is closed by a fixed head n^3 , either integral with or rigidly secured to the shell of the housing; and through said head n^3 are formed openings that receive the rear ends of the spring-pressed coupling rods O, P, one of which is arranged longitudinally in each of the compartments of the housing. The front ends of these coupling rods O, P, are provided with enlarged heads o , which are confined between the wing rail and the coupling strap p that has its ends bolted or riveted to the web of the wing rail, the rods being passed through suitable openings, of less diameter than the heads o , in the fixed coupling strap p on the wing rail, thus forming a loose or swiveled joint between the web of the wing rail and the spring pressed rods. I do not, however, limit myself strictly to this peculiar connection between the wing rail and the spring pressed rods, as it is evident that the rods can be connected to the wing rail directly or by any equivalent fastening, or the head may simply bear against the web of the spring-rail and have no other fastening than the pressure of the spring or springs. The coiled springs L, M, are fitted on the coupling-rods, and said rods are guided in their back and forth motions by the rear wall of the fixed housing; and the springs are confined within the housing, so as to be protected from the weather and accumulations of dirt, by means of the hollow or cup-shaped followers Q which are fitted loosely on the rods and work freely, but snugly in the open front

ends of the housing. These cup-shaped followers receive the front ends of the coiled tension springs, and the followers are held in position by means of nuts *q* which are screwed on threaded portions *q'* of the rods; and the tension of the springs can be varied by turning the nuts *q* in the required direction according as it is desired to increase or diminish the tension of the springs.

To hold the free end of the movable wing rail against vertical displacement in a simple and cheap manner and at the same time permit said wing rail to have the necessary lateral movements relative to the body of the frog, I provide said free end of the wing rail with a projecting foot *R* and employ a fixed keeper *R'* beneath which the foot *R* of said rail is free to play back and forth in a horizontal line but not vertically. The foot *R* on the free end of the wing rail is formed by planing or cutting away the head and web of the rail, leaving the base of said rail solid and integral with the body of the rail, all as clearly shown by Fig. 6; and said foot *R* is fitted beneath the loop-shaped strap *R'* forming the keeper, the ends of said strap being firmly secured, by bolts or rivets, to the base of the frog rail *B* and the bearing plate *E*, see Fig. 5. The movement of the wing rail away from the frog body is limited by the fixed stops secured to the bearing plate *E* at proper distances from the rails.

The operation and advantages of my invention will be readily understood and appreciated by those skilled in the art from the foregoing description taken in connection with the drawings.

I am aware that changes in the form and proportion of parts and details of construction of the devices herein shown and described as an embodiment of my invention can be made without departing from the spirit or sacrificing the advantages thereof, and I therefore reserve the right to make such changes and alterations as fairly fall within the scope of the same.

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

1. In a railway frog, the combination with a movable wing rail, of the stiff frog-body comprising the main line rail, the frog-rails, and

the distance blocks, said frog-body being raised above the level of the top of the wing-rail by a horizontal spacing plate fitted beneath the frog-body and having its inner end provided with a vertical flange that bears against the inner frog-rail, and the parts of the frog-body and the vertical flange of the spacing plate being united rigidly together by a through bolt, substantially as and for the purpose described.

2. In a railway frog, the combination with the fixed point rails and the main line rail, a bearing plate, and the distance blocks, of a movable wing rail, the horizontal spacing plate fitted below the fixed body of the frog and having its inner end bent upward to bear against the inner frog rail, the fixed brace bearing against the outer main line rail, and the through bolt passing through the frog and main line rails, the distance blocks and the two braces, substantially as described.

3. In a railway frog, the combination with the fixed frog rails and main line rail, of a movable wing rail, a fixed housing, a spring therein, a coupling rod connected directly to said wing rail and guided in the fixed housing, a cup-shaped follower fitted on said rod and in the open end of the housing, and receiving the outer end of the spring, and an adjustable nut carried by the coupling rod and bearing against the follower, substantially as and for the purpose described.

4. In a railway frog, the combination with the fixed frog and main line rails, of the movable wing rail, a fixed spring housing open at its front end, the coupling rods playing freely in the housing and having the direct loose connection at their front ends with the wing rail, the spring fitted on said rods within the housing, the cup-shaped followers carried by said rods to play freely in the open end of the housing, and receiving within themselves the outer ends of the springs, and the adjustable nuts on said rods and bearing against the followers, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

NATHANIEL W. BOYD.

Witnesses:

JOHN R. MILLER,
DAVID W. WORST.