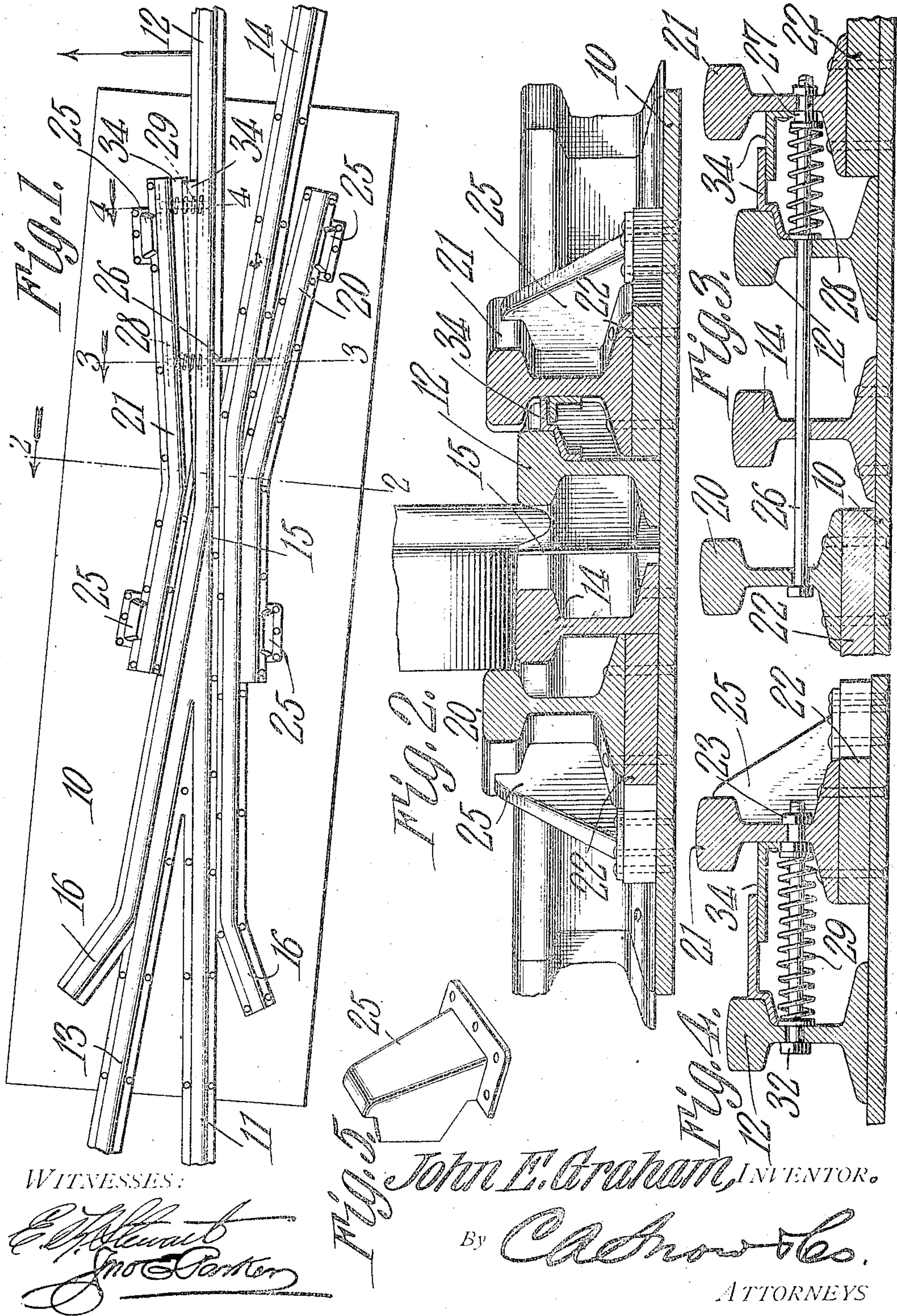


No. 875,169.

PATENTED DEC. 31, 1907.

J. E. GRAHAM.
RAILWAY SWITCH FROG.
APPLICATION FILED APR. 30, 1907.



WITNESSES:

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JOHN E. GRAHAM, OF SALEM, VIRGINIA, ASSIGNOR TO AMERICAN FLANGE FROG AND RAILWAY IMPROVEMENT COMPANY, OF GAINESVILLE, FLORIDA, A CORPORATION OF FLORIDA.

RAILWAY-SWITCH FROG.

No. 875,169.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed April 30, 1907. Serial No. 371,106.

To all whom it may concern:

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

This invention relates to switch frogs, and has for its principal object to provide a device of this class in which the main track is normally continuous in order to prevent noise or hammering during the passage of the train, and in which provision is made for positively preventing the wheel flange or flanges from engaging with the point of the frog while passing in either direction.

A further object of the invention is to provide a railway frog in which a movable rail, preferably a spring rail, is engaged and moved by the inner face of the wheel flange when the train is running on a siding, provision being made for preventing any clamping action on the flange between the fixed and spring rails by the employment of a guard flange or member which engages with the outer side of the wheel rim and positively holds the wheel in proper position for throwing the spring rail, and at the same time prevents any contact of the wheel flange with the point of the frog.

A still further object of the invention is to provide a device of that class in which the guard flange or rail is disposed obliquely to the plane of the traffic rail on which the wheel is running, so that a gradual cam action will result, the wheel being gradually but positively forced inward during the entire movement until the spring rail is fully opened and the wheel flange has passed beyond the point of the frog.

Further objects of the invention are to improve and simplify the construction of devices of this class, to prevent the accumulation of dirt, and to provide for the rigid bracing of the structure.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor

details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a plan view of a spring frog constructed in accordance with the invention. Fig. 2 is a transverse sectional view of the same on the line 2—2 of Fig. 1, the view being on an enlarged scale. Fig. 3 is a similar view on the line 3—3 of Fig. 1. Fig. 4 is a transverse section on the line 4—4 of Fig. 1. Fig. 5 is a detail perspective view of one of the supporting braces detached.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The switch frog as a whole is carried by a base plate 10 formed of metal and arranged to be spiked, bolted, or otherwise secured to the ties. On this plate is mounted the ends of main rails 11 and 12, the latter in this instance constituting the spring rail, and crossing rails 13 and 14.

The rail sections 11 and 13 are joined together and are disposed at an acute angle to each other, forming what is termed a frog point 15, and in ordinary structures there is great danger of derailment through the flanges of the wheels striking this frog point when passing from section 14 to section 13, or from section 12 to section 11.

The spring rail 12 is pivoted at one end where it joins to the main rail, while the rail section 13 is rigidly secured to the base plate, and the inner face of its head is in direct alignment with the inner face of the head of rail 13. The two rails 12 and 14 gradually converge in the direction of the frog point, but at a point some distance in advance of the frog point they start to diverge on lines parallel to the rail sections 11 and 13 and at their extreme ends are curved outward further, as indicated at 16, in order not to interfere with the free passage of the flanges of wheels on trains approaching on the track sections 11 and 13.

The section 14 is permanently riveted to the base plate, and is permanently spaced from the section 11, while the spring rail 12 bears against the face of the rail 13 under normal conditions, so that the parts 11 and 12 will afford a continuous tread for the wheels of a train traveling on the main line.

At points beyond the wheel supporting

sections are guard flanges 20 and 21 which are preferably formed of rails of the same size and weight as those of which the frog is formed, or they may be heavier. If these guard rails are formed from T-rails of the same size as the rails of the frog, said guard rails or flanges will be mounted on spacing strips 22, and the whole structure be permanently secured to the base plate. These guard flanges 20 and 21 are each bent to form two portions at an obtuse angle to each other, and the points at which they converge are at or beyond the frog point 15. The main portions of these guard flanges which extend alongside the rails 12 and 14 are arranged on lines slightly oblique to the treads of the rails as pointed out in reissue patent granted to me on the 12 day of February, 1907, No. 12,605, and the flanges are above the treads of the frog rails, so that as the wheels approach the frog point, the outer sides of their rims will be engaged by the guard flanges 20, 21, depending, of course, upon which track the wheel is traveling on, and the wheels will be gradually forced laterally to such position that the wheel flanges cannot under any circumstances strike against the point 15 of the frog.

One side of the base of each rail 12 and 14 is cut away where the rails are parallel with the guard flanges, that is to say, beyond the frog point, so that the strength of the guard flanges will not be reduced, and these guard flanges are further strengthened or reinforced by braces 25 which may be formed of pressed steel, the flanges of which are riveted or otherwise permanently secured to the base plate.

Extending through the rail 14, the spring rail 12 and guard members 20 and flange 21, is a guiding bolt 26 on which is arranged a clamping nut 27. This bolt serves as a guide for the spring rail, and between the spring rail and the guard flange 21 is arranged a compression spring 28 that tends at all times to throw the spring rail to the position shown in Fig. 1 for the purpose of preserving the continuity of the main rail. The action of the spring 28 is assisted by an auxiliary spring 29 that is arranged between the switch point and the guard 21, said spring being mounted on suitable studs 32 that project from the spring rail and guard.

In order to prevent accumulations of dirt between the movable spring rail 12 and the guard 21, each of these members is provided with a projecting cover strip 34, these strips overlapping, and the strip 34 of the spring rail being above that of the guard, so that any dirt which may accumulate on top of the strips will be pushed over in the direction of the guard flange to permit convenient removal.

When the spring rail is in its normal posi-

tion, that is to say, in the position shown in Fig. 1, a train approaching the frog and traveling on the rail 12 will have continuous support, and all strain on the frog point proper will be prevented by the engagement of the outer face of the rim of the wheel with the obliquely disposed guard flange 21, so that the latter will take all the wear, and there will be no friction between the inner face of the wheel flange and the frog point, while at the same time the guard flange, extending beyond the frog point, will positively prevent any contact between the inner face of the wheel flange and the frog until after the wheel has passed beyond the point 15.

When a train is approaching on the track 14, the outer face of the rim of the wheel will engage against the obliquely disposed guard 20, and the wheel will be gradually forced over until its flange strikes the spring rail 12, whereupon the rail 12 will be gradually moved to open position and will be held over until the wheel has passed to a point of safety beyond the front point 15, and after the passage of the wheels of the train, the spring rail will be returned to its normal position by the action of the springs.

I claim:—

1. A spring frog including a spring rail, and a guard flange arranged to be engaged by the outer face of the wheel rim, whereby the wheel flange is forced to engage the spring rail and move the latter to open position.

2. A spring frog including a spring rail, and a guard flange arranged to be engaged by the outer face of the wheel rim, said guard flange being oblique to the tread of the traffic rail and acting as a cam to move the wheel laterally, whereby the wheel flange is forced to engage the spring rail and move the latter to open position.

3. A spring frog including a movable spring rail, and a rigid guard flange arranged to engage the outer face of the wheel rim and force the wheel flange against the spring rail.

4. A spring frog including a spring rail, and permanent guard flanges arranged on opposite sides of said spring rail to be engaged by the outer faces of the wheel rims, one of said flanges serving to assist the wheel in moving the spring rail to open position.

5. A spring frog including a spring rail, a spring normally holding the same in closed position, and an obliquely disposed wheel engaging guard flange serving to force the wheel over and thus move the spring rail into open position, and acting, also, to prevent contact of the wheel flange with the frog point.

6. A spring frog having a normally closed spring rail to preserve the continuity of the main line, and a guard flange arranged at a slight angle to the main line and extending

beyond the frog point, said guard serving by engagement with the outer face of the wheel rim to force the wheel against the spring rail and to a position beyond the frog point.

7. In a spring frog, three permanently secured rail members, a spring rail arranged in alinement with one of them and normally held in closed position to preserve the continuity of the main line, and a pair of rigid guard flanges arranged on slightly convergent lines with respect to the rails, and serving to prevent contact of the wheel flanges with the frog point, one of said flanges serving further to push the wheel of an approaching train to rail opening position.

8. In a spring frog, a base plate, a main line rail, and a pair of cross line rails permanently secured thereto, a spring rail, the frog end of which is free, a spring tending to hold the spring rail in closed position to preserve the continuity of the main line, guard flanges arranged on opposite sides of the rails and at a slight angle thereto, and a bolt extending through one of the rails and one

of the guard flanges, said bolt serving as a guide for the spring rail and as a support for the spring.

9. In a spring frog, a base plate, a pair of cross line rails, and a main rail permanently secured thereto, a spring rail forming a part of the main line, a pair of guard rails or flanges permanently secured to the base plate, a guide bolt extending through one of the cross line rails, the spring rail, and one of the guard flanges, a spring mounted on said bolt and tending to hold the spring rail in closed position, an auxiliary spring also tending to hold the spring rail in closed position, supports for the auxiliary spring, and braces secured to the base and bearing against the outer faces of the guard 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:

WM. J. NEALE,
JNO. E. PARKER.