(No Model.) 2 Sheets—Sheet 1.

J. A. SMEIGH.

RAILROAD FROG.

No. 262,841. Patented Aug. 15, 1882.

Fig. 1.

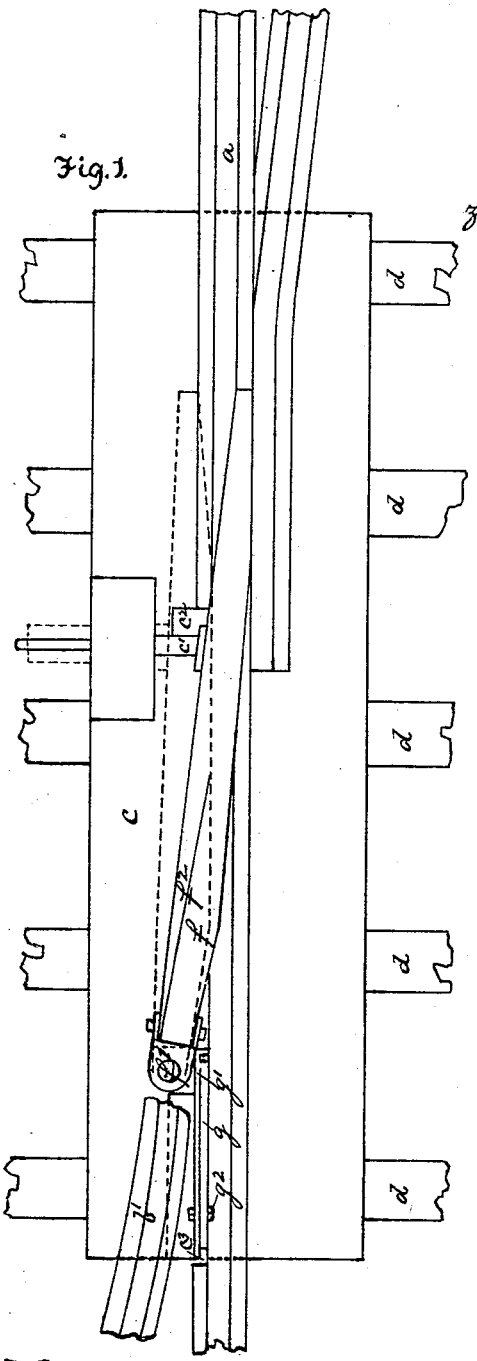


Fig. 2.

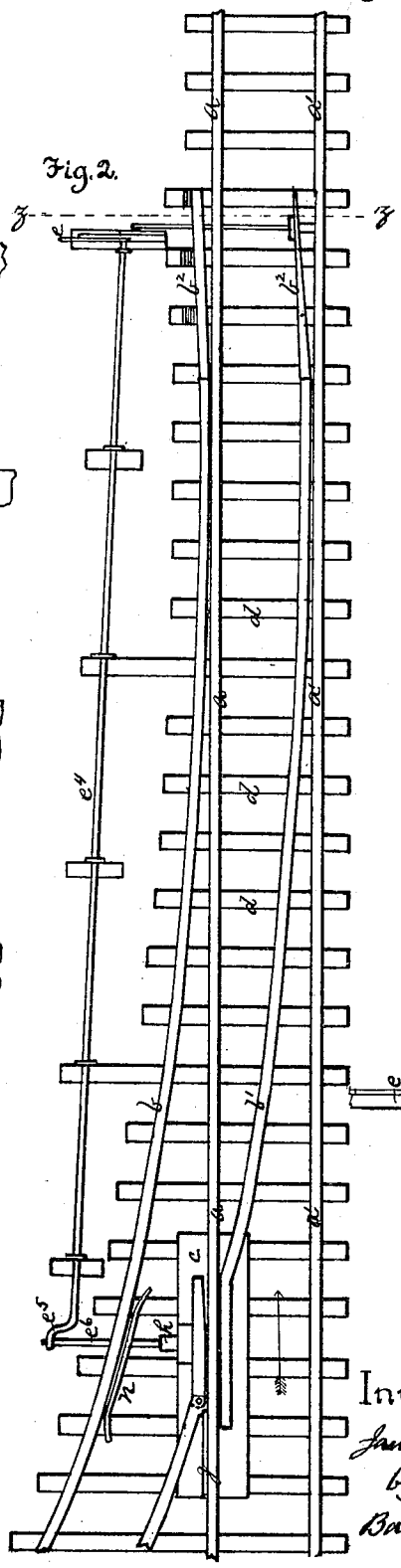
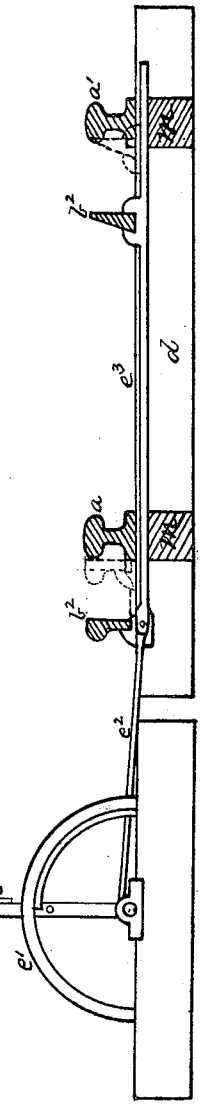


Fig. 3.



Witnesses

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(No Model.)

2 Sheets—Sheet 2.

J. A. SMEIGH.

RAILROAD FROG.

No. 262,841. Patented Aug. 15, 1882.

Fig. 4.

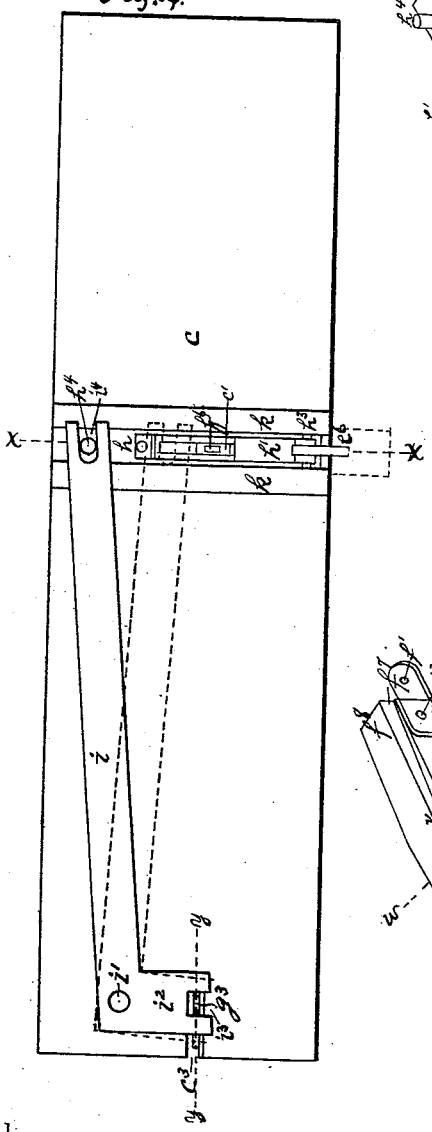


Fig. 11.

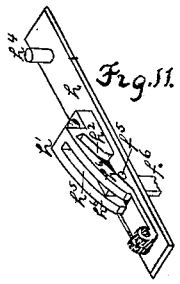


Fig. 5.

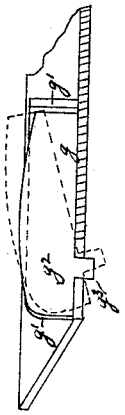


Fig. 6.

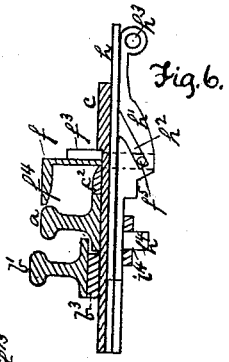
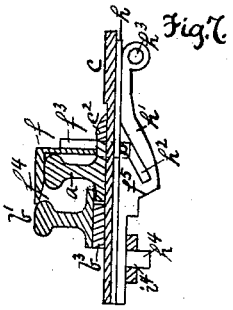


Fig. 7.



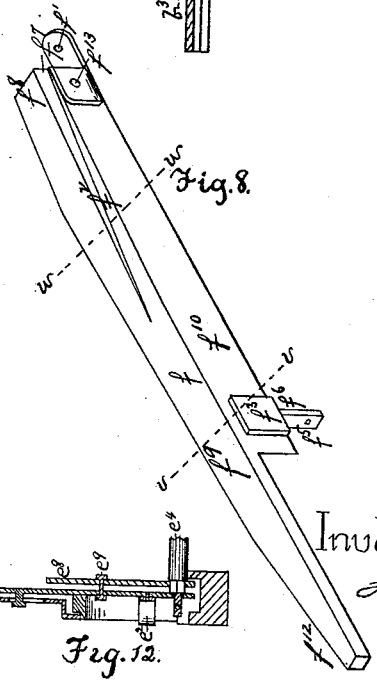


Fig. 8.

Fig. 9.

Fig. 10.

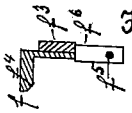


Fig. 12.

Witnesses

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UNITED STATES PATENT OFFICE.

JAMES A. SMEIGH, OF PITTSBURG, PENNSYLVANIA.

RAILROAD-FROG.

SPECIFICATION forming part of Letters Patent No. 262,841, dated August 15, 1882.

Application filed March 4, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. SMEIGH, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Railroad-Frogs; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention consists in the construction of an improved railway-frog for railway-switches and similar places, the purpose of which is to enable the switch-track to cross the rail or rails of the main track without cutting them. As ordinarily constructed, these frogs have been made with a diagonal cut for the passage of the flanges of the wheels of the car, and have been placed in the line of the main track at the point of crossing. The cutting of the main rail or rails is an objectionable feature, in that it is a fruitful cause of accidents, which are always attended with expense and sometimes loss of life.

To enable those skilled in the art to make and use my invention, I will now describe it with reference to the accompanying drawings, in which—

Figure 1 is a plan view of the same, showing it as applied to one of the rails of the main track. Fig. 2 is a plan view of the switch, showing the relation of the improved frog to the switch and main tracks. Fig. 3 is a cross-section on the line *z z* of Fig. 2, looking in the direction of the incoming switch-track. Fig. 4 is a bottom view of the frog. Fig. 5 is a section at the line *y y* of Fig. 4. Figs. 6 and 7 are sections on the line *x x* of Fig. 4, and show the frog in open and closed positions, respectively. Fig. 8 is a perspective view of the movable end of the switch-rail *b'*. Fig. 9 is a cross-section on the line *w w* of Fig. 8. Fig. 10 is a cross-section on the line *v v* of Fig. 8. Fig. 11 is a perspective view of the slide *h* in an inverted position. Fig. 12 is a view of the switch rack and lever.

Like letters of reference indicate like parts in each.

In the drawings the main-track rails are marked *a a'*, the switch-rails *b b'*, the improved frog *c*, and the cross-ties *d*.

The switch is of the ordinary construction, having a lever, *e*, working on the rack *e'*, and pivotally connected by a rod, e^2, to a sliding bar, e^3, which rests upon the stringers *m*, and is connected to the pivoted ends b^2 of the switch-rails *b b'* in the ordinary way. A rod, e^4, is rigidly connected to the lever *e*, and extends longitudinally up the track to a point opposite to the place where the main-track rail *a* is ordinarily cut for the insertion of the frog *c*. At this point the rod e^4 is provided with a crank, e^5, which is pivoted to a rod, e^6, which in turn is pivotally connected to the slide *h* by means of an eye, h^3.

Pivoted to the frog *c* at *f'* is the vibrating section *f* of the inner switch-rail, *b'*. The vibrating piece *f* is not only capable of a horizontal movement on its pivot *f'*, but also of a vertical movement on the pivot f^{13} sufficient to carry its top flange, f^4, upon the top of the rail *a*, as shown in Fig. 7. In the upper surface of the piece *f* is a longitudinal recess, f^2, which at the butt-end f^7 is deep and narrow, and which, as it extends toward the other end of the piece *f*, widens and grows shallower until it is gradually merged into the even upper surface of the piece.

Secured to the vertical flange f^{10} by means of the plate f^3 or otherwise, is a pendent stem, f^6, which is provided with a lateral pin, f^5, the purpose of which will be hereinafter described.

The slide *h*, before mentioned, is placed in a lateral groove formed by the plates *k* on the under side of the frog *c*, said plates extending under the edges of the slide *h*, and serving as ways upon which it travels.

Fastened to the slide *h*, and projecting from its under surface between the plates *k k*, is a piece, *h'*, which is longitudinally slotted, as at h^5, directly under a similar slot, *c'*, in the bottom plate of the frog *c*. The piece *h'* is also diagonally slotted, as at h^2, in the sides h^6 of the said longitudinally-slotted piece *h'*. It also has a pin or projection, h^4, at or near the rear end. At one side of the slot *c'* is a wedge or incline, c^2. When the parts are placed together the stem f^6 of the piece *f* projects down through the slot *c'* into the slot h^5, and its pin f^5 extends laterally in the diagonal slots h^2.

Fastened to the under side of the frog *c* at *i'* is an angle-lever or bell-crank, *i*, the forward

end of which is notched or bifurcated, as at i^4. The pin h^4 of the slide h extends down into the notch or slot i^4. The short arm of the lever i is bifurcated in a similar manner at i^3.

Attached to the frog c is a plate, g', and pivoted to the plate g', as at g^2, at the side of the rail a forward of the point where the switch-rail b' crosses it, is a bell-crank or angle lever, g, the short arm g^3 of which extends down into the notch i^3 of the lever i. The adjacent end of the switch-rail b' is raised above the rail a by means of the plate b^3, placed under it, to a height equal to the height of the rail a and the thickness of the flange f^4 of the vibrating section or piece f.

When the switch-lever e is turned to open the switch the crank e^5 throws the slide h into the position shown in Fig. 7. The movement of the slide h causes the pin f^5 to ride up on the incline h^2, and forces the outer end of the piece f up on the incline c^2, and when the stem f^6 comes in contact with the end of the slot h^5 the piece f is pressed laterally over the top of the rail a until its beveled portion f^{12} comes in contact with the side of the raised rail b'. This position is shown in Figs. 1 and 7. The switch is then open, and the wheels of the car entering upon the main track from the switch can pass over the rail a with safety. In this way I am enabled to cross the rail a at this point without cutting the same for the passage of the flanges of the wheels.

At the point where the rail b' joins the butt-end of the piece f the elevated portion f^8 corresponds with and is a continuation of the top of the rail, so that in case the switch is open without the piece f being thrown into the position shown in Fig. 7, and a car passes onto or off of the main track over the switch-track, the tread of the wheels shall roll upon the surface f^6 and the flanges pass along the recess f^2, and the weight of the car be gradually shifted from the tread of the wheels to the flanges as the latter come in contact with the upper surface of f by reason of the gradual shallowing of the recess f^2, the wheels crossing the main rail a from the piece f to the elevated rail b', or vice versa. The flanges of the opposite wheels, being held by the guard-rail n on the rail b, cause the flanges of the wheels on the rail b' to pass safely over the top of rail a without displacement from the track.

The construction just described may be used for general purposes without shifting the piece f from the position shown in Fig. 2, but is not so desirable as the construction first described, because there is less jar in the passage of the car when the piece f is thrown upon the top of the rail a and the car traverses its whole length than when it crosses it and the main rail a in entering and passing from the main track.

In order to close the switch, if inadvertently left open, I have shown the apparatus constituted of the levers g and i. If a train is passing in the direction of the arrow in Fig. 2, the flange of the wheel striking the lever g, which is raised by the opening of the switch, will depress it, throwing back the lever i in the position shown by the dotted line in Fig. 4, which will cause the slide h to be thrown back, the pivoted piece f to be forced into the position shown by Fig. 6, and the switch to be closed, thereby clearing the main track, both at the frog and at the switch.

I will now describe the construction of the switch-lever e, which enables it to be used either to operate the switch alone or to operate the switch and piece f simultaneously. The lever e is composed of two bars, e^7 and e^8. The bar e^7 is the switch-lever proper. It is loosely pivoted on the rod e^4, so as to turn thereon without turning the rod, and the rod e^2 is pivoted to it. The bar e^8 is fastened rigidly to the rod e^4, so as to turn it, and is bolted to the bar e^7, so as to be moved thereby.

When it is desired to use the lever e as a switch-lever only, the bolts e^9, that fasten the bar e^8 to the bar e^7, are removed, and then the lever will operate the switch only; but when it is desired to operate both the switch and the pivoted piece f the two bars e^7 and e^8 are bolted together, as shown in Fig. 12. The effect of the incline c^2 is to sustain the weight of the piece f in part, and thus to that extent relieve the inclined slots h^2 and pin f^5 of a portion of the weight and friction. It is a desirable but not a necessary feature, because the device will operate without it.

My invention is simple in its construction and not liable to get out of order, and hence is useful for practical purposes.

The advantage of not cutting the main rail a consists in reducing the liability to expensive and dangerous accidents.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with an elevated switch-rail, of a vibrating section having a horizontal and vertical pivot and an inclined slide adapted to move the vibrating section radially and to elevate the pivoted end thereof, substantially as and for the purpose specified.

2. The combination, with the elevated switch-rail, of a vibrating section having a vertical and horizontal pivot and an incline or groove which increases in width and decreases in depth from the pivoted end of the section, an inclined slide for actuating the vibrating section, an angle-lever, and a trip-lever, g, substantially as and for the purpose specified.

3. The switch-lever composed of two parts, one pivoted loosely and operating the switch and the other removably fastened to the pivoted part and rigidly fastened to a crank-rod, substantially as and for the purposes described.

4. The combination, in a railway-frog, of a pivoted piece having a pendent stem provided with a laterally-projecting pin, with a slide having lateral inclined slots therein, the edges of which, operating upon the pin, give the piece f a vertical movement, and the ends of

which, operating upon the pin, give the piece *f* a radial movement on its pivot, substantially as and for the purposes described.

5. The piece *f*, having a deep narrow inclined groove, f^2, extending along its side, the lowest point of said groove being next the pivotal point of the piece *f* to shift the weight from the tread to the flange in passing from the switch to the main track, substantially as specified.

6. The piece *f*, of angular form at its free end, and provided at its opposite end with a horizontal and a vertical pivot, said piece having the inclined groove f^2, substantially as and for the purpose specified.

7. The slide *h*, having a central longitudinal slot and inclined slots in its sides opening into the central longitudinal slot, in combination with a pivoted or vibrating crossing section, having a pendent stem provided with lateral pins, substantially as and for the purposes described.

8. The combination of the angle-lever *g* with the angle-lever *i*, the slide *h*, having the central longitudinal slot and inclined slot, and a vibrating crossing section having a stem and pins to engage with the slide, substantially as and for the purposes described.

9. The combination of the angle-levers *g* and *i*, slide *h*, crank-rod e^4, lever *e*, rod e^2, and switch-bars *b*, operated thereby, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 28th day of February, A. D. 1882.

JAMES A. SMEIGH.

Witnesses:

T. B. KERR,

JAMES H. PORTE.