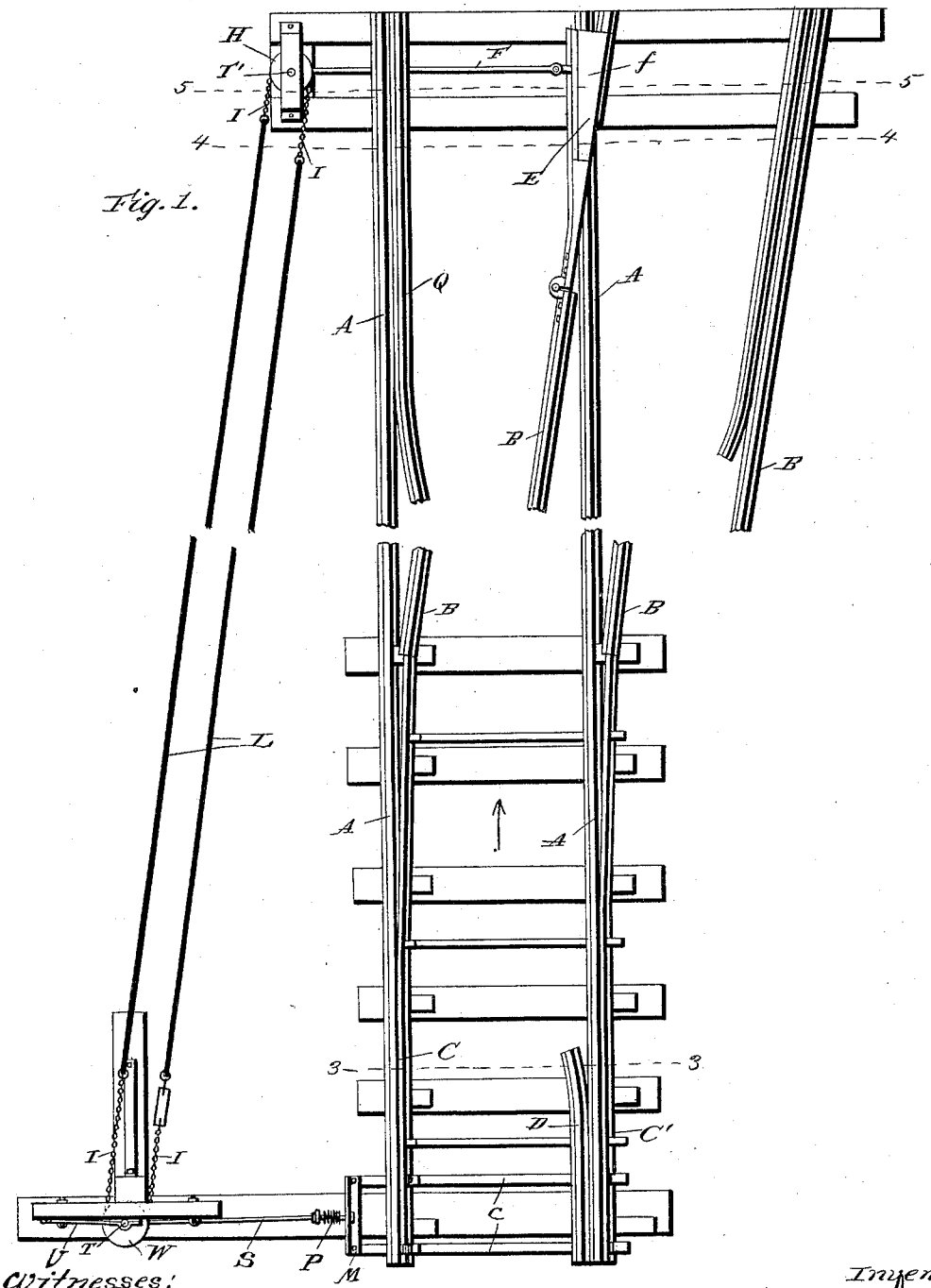
(No Model.) 3 Sheets—Sheet 1.

D. MACPHERSON.

SAFETY SWITCH FROG.

No. 465,531. Patented Dec. 22, 1891.

Fig. 1.



Witnesses:
C. H. Paeder.
M. F. Matthews.

Inventor
Duncan MacPherson
by James J. Sheehy
Attorney

(No Model.)

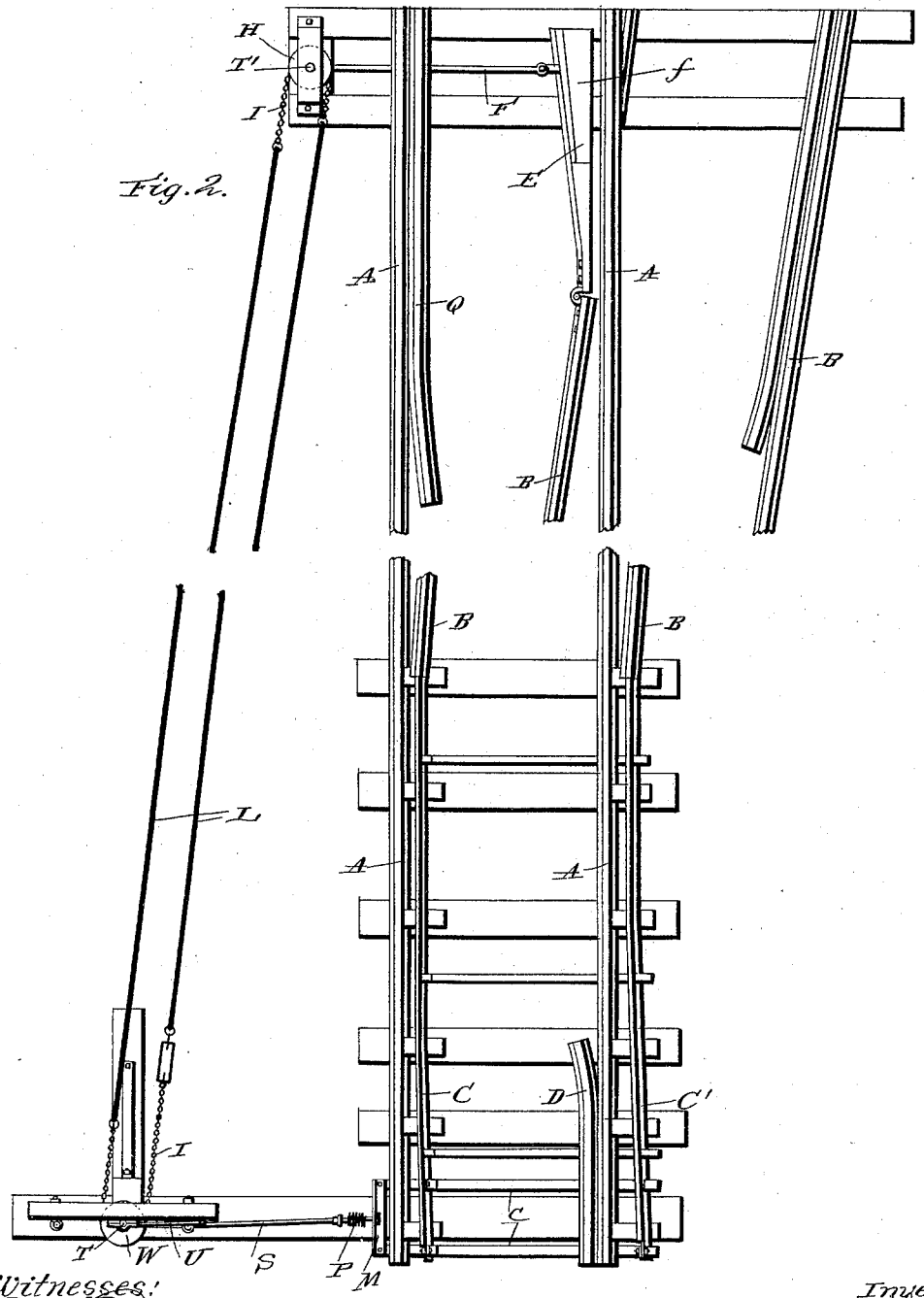
3 Sheets—Sheet 2.

D. MacPHERSON.

SAFETY SWITCH FROG.

No. 465,531. Patented Dec. 22, 1891.

Fig. 2.



Witnesses:
C. H. Traeder
M. F. Matthews.

Inventor
Duncan MacPherson
by James J. Sheehy
Attorney

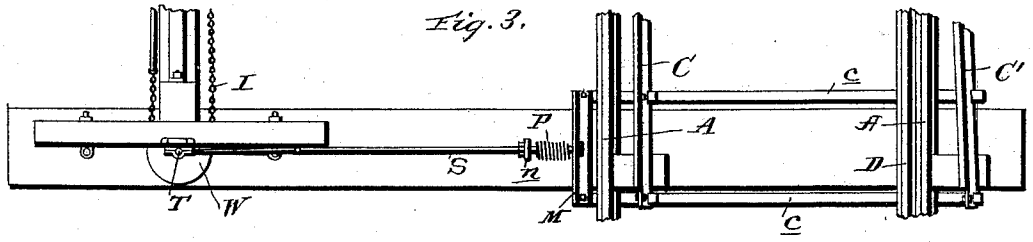
(No Model.) 3 Sheets—Sheet 3.

D. MACPHERSON.

SAFETY SWITCH FROG.

No. 465,531. Patented Dec. 22, 1891.

Fig. 3.



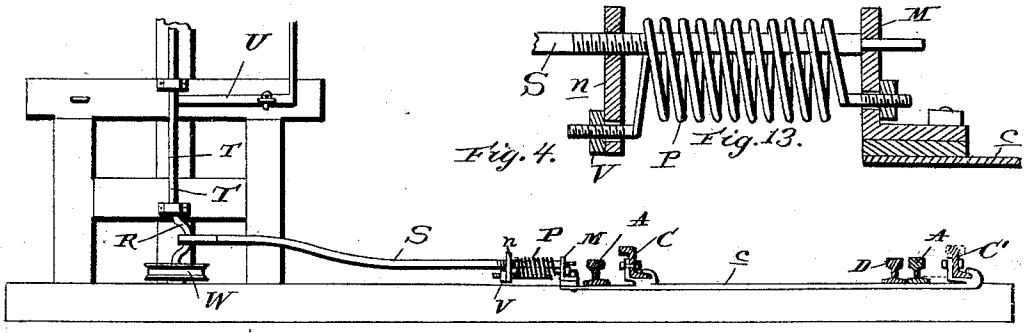


Fig. 4.

Fig. 13.

Fig. 6.

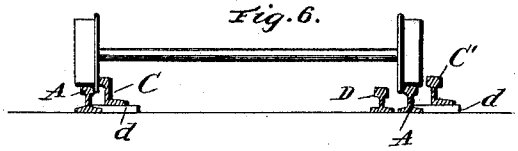


Fig. 5.

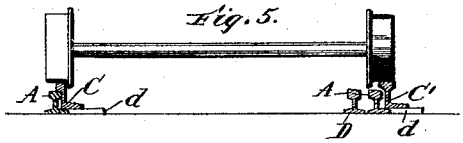


Fig. 7.

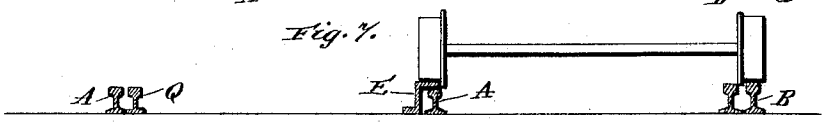


Fig. 8.

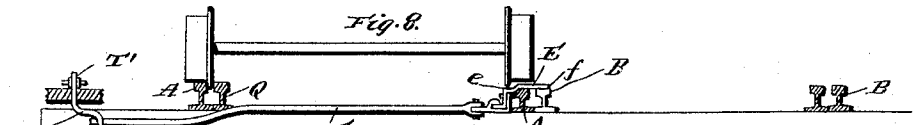


Fig. 9.

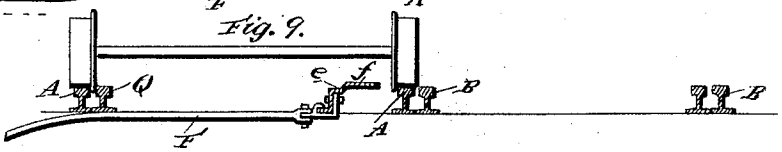


Fig. 12.

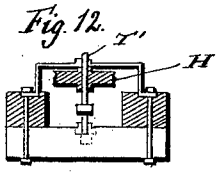


Fig. 10.

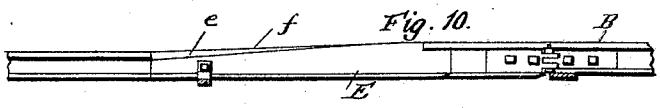
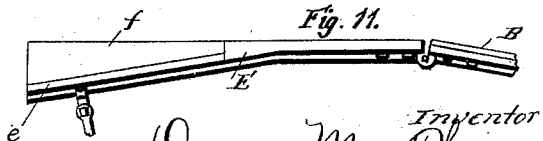


Fig. 11.



Witnesses:
C. H. Paeder
M. F. Matthews.

Inventor
Duncan MacPherson
By James J. Sheehy
Attorney

UNITED STATES PATENT OFFICE.

DUNCAN MACPHERSON, OF MONTREAL, CANADA.

SAFETY SWITCH-FROG.

SPECIFICATION forming part of Letters Patent No. 465,531, dated December 22, 1891.

Application filed May 29, 1891. Serial No. 394,605. (No model.) Patented in Canada May 19, 1891, No. 36,626.

To all whom it may concern:

Be it known that I, DUNCAN MACPHERSON, a citizen of Canada, residing at Montreal, in the county of Hochelaga and Province of Quebec, Canada, have invented certain new and useful Improvements in Railway-Track Turn-Outs; and I do 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.

My invention has relation to improvements in railway-track turn-outs, for which I have obtained a patent in Canada, No. 36,626, bearing date May 19, 1891; and it consists in the construction, novel combination, and adaptation of parts hereinafter described, and particularly pointed out in the claims appended.

In the accompanying drawings, Figure 1 is a general plan view of my improved track turn-out, illustrating the switch and frog as set to allow trains traveling in the direction of the arrow to pass into the siding. Fig. 2 is a similar view illustrating the switch and frog as set for a clear main line. Fig. 3 is a detail plan view of a portion of the main track, switch-rails, and the switch-stand, together with the devices for adjusting the switch-rails, which are illustrated as set for a clear main track. Fig. 4 is a transverse section of the main track and the switch-rails set for a clear main track, together with the switch-stand and operating devices, which are illustrated in elevation. Fig. 5 is a transverse section taken in the plane indicated by the line 3 3 on Fig. 1, the switch being set for siding. Fig. 6 is a transverse section taken in the same plane as Fig. 5, car-wheels being shown to illustrate how the wheels traveling upon the main line in the direction opposite to that indicated by the arrow in Fig. 1 pass through the switch. Fig. 7 is a transverse section taken in the plane indicated by the line 4 4 on Fig. 1, illustrating the frog set over the main-track rail and a truck passing onto the turn-out or siding rails. Fig. 8 is a transverse section taken in the plane indicated by the line 5 5 on Fig. 1, illustrating car-wheels traveling on the main line in a direction opposite to the arrow in Fig. 1 as passing over the frog, which has been set for siding. Fig. 9 is a section taken in the same plane as Fig. 8, illustrating the frog as set for main line in either direction. Fig. 10 is a side elevation of the frog, together with a portion of one main-track rail and the turn-out rail to which said frog is connected. Fig. 11 is a plan view of the same. Fig. 12 is a vertical transverse section illustrating the manner of connecting the bearings of the frog-actuating chain-wheel to the ties, and Fig. 13 is an enlarged sectional detail view of the angle-plate, connecting-rod, and spring with attachments.

In the said drawings similar letters indicate corresponding parts throughout the several views, referring to which—

A indicates the main-track rails, which may be of the ordinary or any approved form, and are fixed upon the ties in any suitable manner, and B indicates the fixed turn-out rails, to the inner one of which the frog is connected, as will be presently pointed out.

C C′ indicate the switch-rails, the outer one C′ of which may be of the ordinary or any approved form and is adapted to abut at its heel against one end of the outer turn-out rail. This outer switch-rail C′ rests against the ball of the main-track rail when the switch has been set for siding, whereby the tread of the wheel entering the siding will project over said rail; and, by reason of the inclination on the rail, as will be presently described, the flange of the wheel will clear the main-track rail. As better illustrated in Fig. 5 of the drawings, the inner switch-rail C has the inner edge of its ball and part of its web planed off at and adjacent to its toe end, whereby when the switch is set for siding the outer portion of its ball will project over and rest upon the main-line rail A, the guard-rail D (a portion of which is shown in Fig. 1) preventing the flange of the wheels from striking the point of the switch-rail. These switch-rails C C′, which are connected together by transverse bars *c*, rest upon blocks *d*, which are preferably formed from wrought-iron, and are designed to afford a solid bed for said rails, which are provided with an inclined plane extending upwardly from their toes, where their under sides occupy a horizontal plane parallel to plane of main-track rails, as shown in Fig. 4, a sufficient distance, so that when the

switch is set for siding the wheel-flanges will clear the main-track rails and travel upon the turn-out or siding rails.

The inner turn-out rail B, which abuts against the heel of the inner switch-rail C, is elevated above the plane of the main-track rails between the switch-rail C and the frog, beyond which said rail rests in the same plane as the main-track rails.

The outer turn-out rail, which abuts against the heel of the switch-rail C′, is inclined downwardly from said switch-rail, preferably by means of blocks of various sizes placed beneath it at intervals, until it rests in the same plane as the main-track rails.

E indicates my improved frog, which is connected in a hinged manner at one end to one end of the inner turn-out rail B, and is of a width at its free end sufficient to enable it to cover the main-track and turn-out rails. This frog E, from its connected end to a point adjacent to its middle, is of a corresponding height to the end of the turn-out rail, to which it is connected, and from its middle said frog is inclined downwardly, as indicated at *f*, to its free end, which is of a normal height, and is designed and adapted to lead the wheel from the elevated end of the broken turn-out rail to the continuation of said rail, which latter rests in a normal plane. In addition to the incline *f*, the frog E is provided with an auxiliary incline *e*, which is preferably of a greater pitch than the incline *f*, whereby it will be seen that when the frog has been set for a siding for trains traveling in the direction of the arrow in Fig. 1 trains traveling in the opposite direction on the main track will pass over the frog, as shown in Fig. 8, the guard-rail Q in such case serving to keep the wheels in their proper gage-line.

Suitably connected, as by bolts, to the ends of the transverse switch-connecting rods *c* is an angle-iron M, to which is connected one of the straight threaded ends of a coil-spring P, the other straight and threaded end of which takes loosely through a plate *n*, adjustably fixed on a connecting-rod S, and is provided at its end with an adjusting-nut V, whereby the tension of the spring P may be regulated. This spring P, which surrounds the connecting-rod S, between the plates M and *n*, is of such a tension as to allow the switch-rails to be readily adjusted through the medium of the rod S, and also to give sufficiently to allow the flange of a wheel traveling in a direction opposite to that indicated by the arrow in Fig. 1 to push the switch-rail C away from the main-track rail, as better shown in Fig. 6 of the drawings. As better illustrated in Fig. 4 of the drawings, the end of the bar S is pivotally or loosely connected to the crank portion R of a rocking shaft T, which is provided at a suitable point with a crank branch U or other suitable device, whereby it may be readily turned and the switch adjusted.

Fixed upon the rocking shaft T and preferably adjacent to the lower end thereof, is a sprocket-wheel W to receive a sprocket-chain for a purpose presently pointed out. Connected in a suitable manner to the frog E, and preferably at a point adjacent to the free end thereof, is a rod F, which is connected at its opposite end to the crank portion G of a rocking shaft T′, which is journaled in suitable bearings and is provided adjacent to its lower end with a sprocket-wheel H. Taking around the sprocket-wheel W of the rocking shaft T and around the sprocket-wheel H of the shaft T′ are chains I, the ends of which are connected by rods, as L, whereby it will be seen that when the shaft T is operated to adjust the switch-rails motion will be transmitted to the shaft T′, whereby it will be readily perceived that the switch and frog will be adjusted simultaneously and conjunctively. In some instances it is obvious that the rods L might be dispensed with and a continuous chain belt employed to transmit motion from the switch-operating shaft to the frog-operating shaft.

It is further obvious that plain pulleys might be employed instead of the sprocket-wheels W and H, in which case wire ropes or the like would be substituted for the chains I and the rods L, said ropes being connected by suitable clips to one point of each pulley and provided with suitable turn-buckles, whereby slack may be taken up when necessary. By the construction described it will be readily perceived that the main-track rails are not broken or opened, and they may be as securely spiked to the rails adjacent to the switch and frog as at other points.

By the special construction and arrangement described it will be further seen that trains traveling upon the main-line tracks will inflict no blows upon the switch or frog, and it will be further seen that trains may pass at maximum speed over the switch and frog with perfect safety.

By reason of there being no open spaces between the ends of rails at the switch or frog, the great evils of expansion are entirely obviated.

A great objection to split switches has been that snow and cinders may get between them and cause them to foul when set for main line, which objection is obviated by my construction, in which the switch-rails and frog rest clear of the main-track rails when they are set for a clear main track.

Although I have specifically described the construction and relative arrangement of the several elements of my invention, yet I do not desire to be confined to such precise construction and arrangement, as such modifications may be made in practice as fairly fall within the scope of my invention.

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

1. In a railway-track turn-out, the combination, with the fixed and unbroken main-track rails, of the inner broken turn-out rail, the

outer turn-out rail, the adjustable switch-rails provided with upwardly-inclined planes from their toe ends and adapted to abut against the ends of the turn-out rails, the frog of a form, as shown, being from its connected end to a point adjacent to its middle of a height corresponding to the turn-out rail to which it is hinged, its opposite end being of a width corresponding to the combined width of one of the main rails and turn-out rails, and also inclined downwardly to its free end, as indicated at *f*, and further inclined at a greater pitch, as shown at *e*, and connected in a hinged manner to the end of the inner turn-out rail, and a suitable means for adjusting the switch-rails and frog, substantially as specified.

2. In a railway-track turn-out, the combination, with the adjustable switch-rails, the transverse rods connecting the same, and the angular plate M, connecting the ends of the connecting-rods, of the connecting-rod S, the plate *n*, fixed thereon, the coiled spring surrounding the rod S between the plates M and *n*, and having its threaded ends taking loosely through said plates, nuts mounted on the threaded ends of the coiled springs, and a suitable means for adjusting and adjustably fixing the rod S, substantially as and for the purpose set forth.

3. In railway-track turn-outs, the combination, with the main rails, of the turn-out rails inclined as described, and one of said rails being pivoted to the frog, the frog E, of a form as shown, being from its connected end to a point adjacent to its middle of a height corresponding to the turn-out rail to which it is hinged, its opposite end being of a width corresponding to the combined width of one of the main rails and turn-out rails, and also inclined downwardly to its free end, as indicated at *f*, and further inclined at a greater pitch, as shown at *e*, the switch-rails raised above the main rails and adapted to partly overhang the same, and suitable means for moving said frog and switch-rails, substantially as specified.

4. In a railway-track turn-out, the combination, with the main-track rails and turn-out rails, of the frog E, the switch-rails C C′, the rods connecting the switch-rails at one end, the angle-plate M, the spring P, having its opposite ends straight and threaded and one end attached to said angle-plate, the hinged frog, the rod F, connected therewith, the rod S, adjustably connected with the spring P at one end, the rock-shafts T and T′, the sprocket-wheels secured to said rock-shafts, the rods and chains connecting the sprocket-wheels, and the rod connected with the switch-lever, and the rod connected with the frog being secured to the respective rock-shafts, substantially as specified.

Montreal, May 26, 1891.

DUNCAN MACPHERSON.

Witnesses:

THOS. R. HENDERSON,

FRANK TAYLOR.