

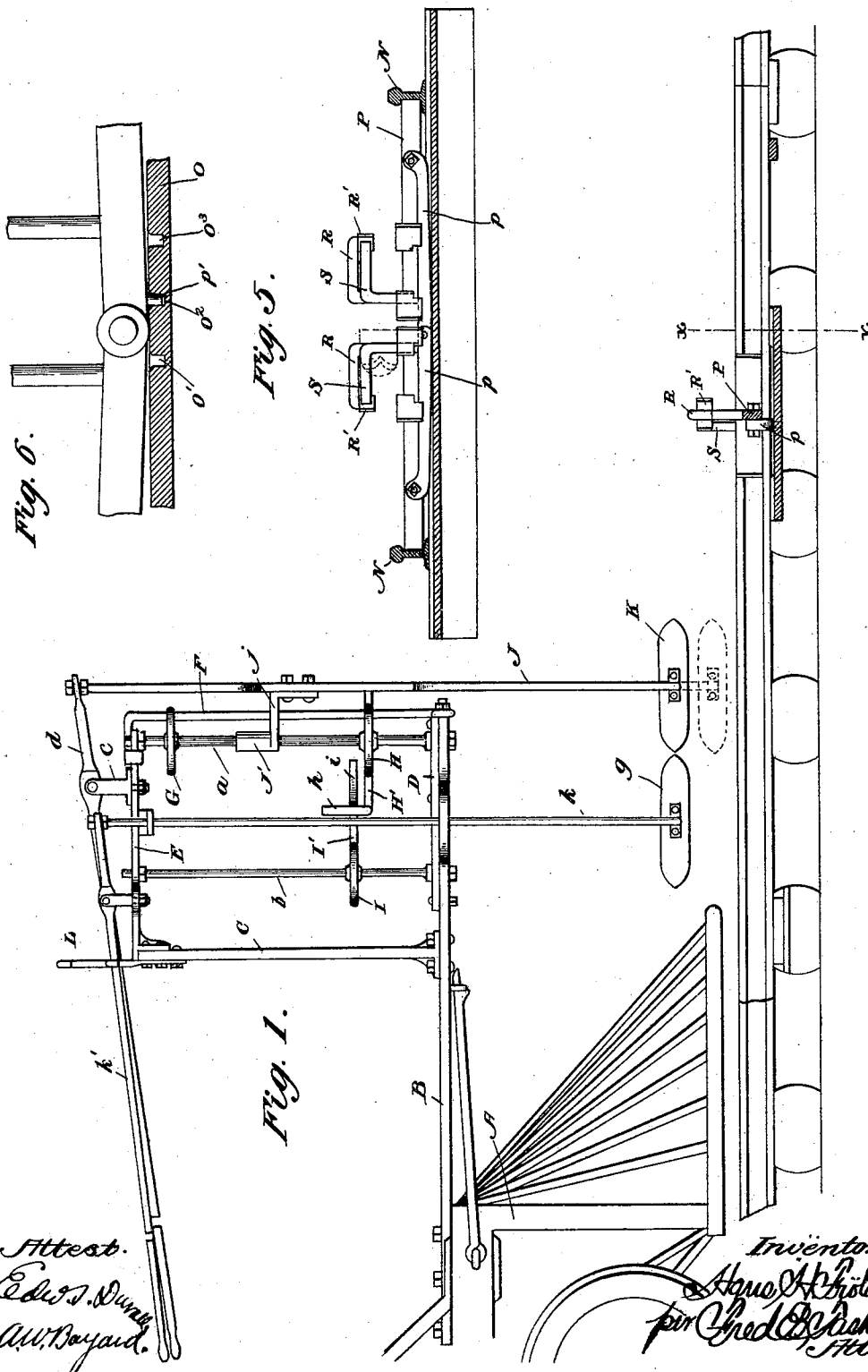
(No Model.)

3 Sheets—Sheet 1.

H. H. FRÖLAND.
AUTOMATIC RAILWAY SWITCH.

No. 568,844.

Patented Oct. 6, 1896.



THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

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Fig. 3.

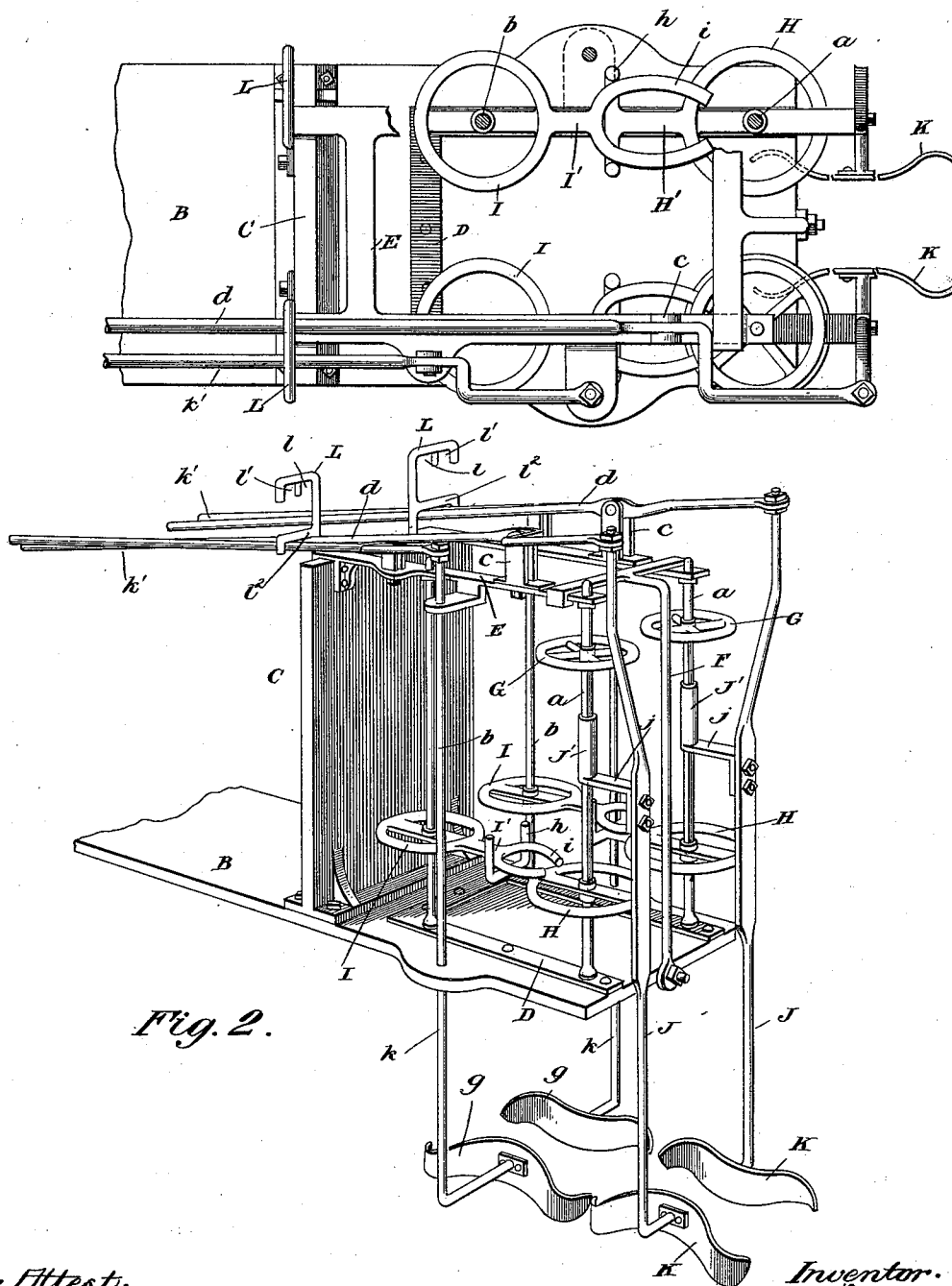


Fig. 2.

Attest.
Edw. D. Durall, Jr.
Att. By.

Inventor.
Hans Hansen Fröland
per Fred. O. Asker
Atty.

(No Model.)

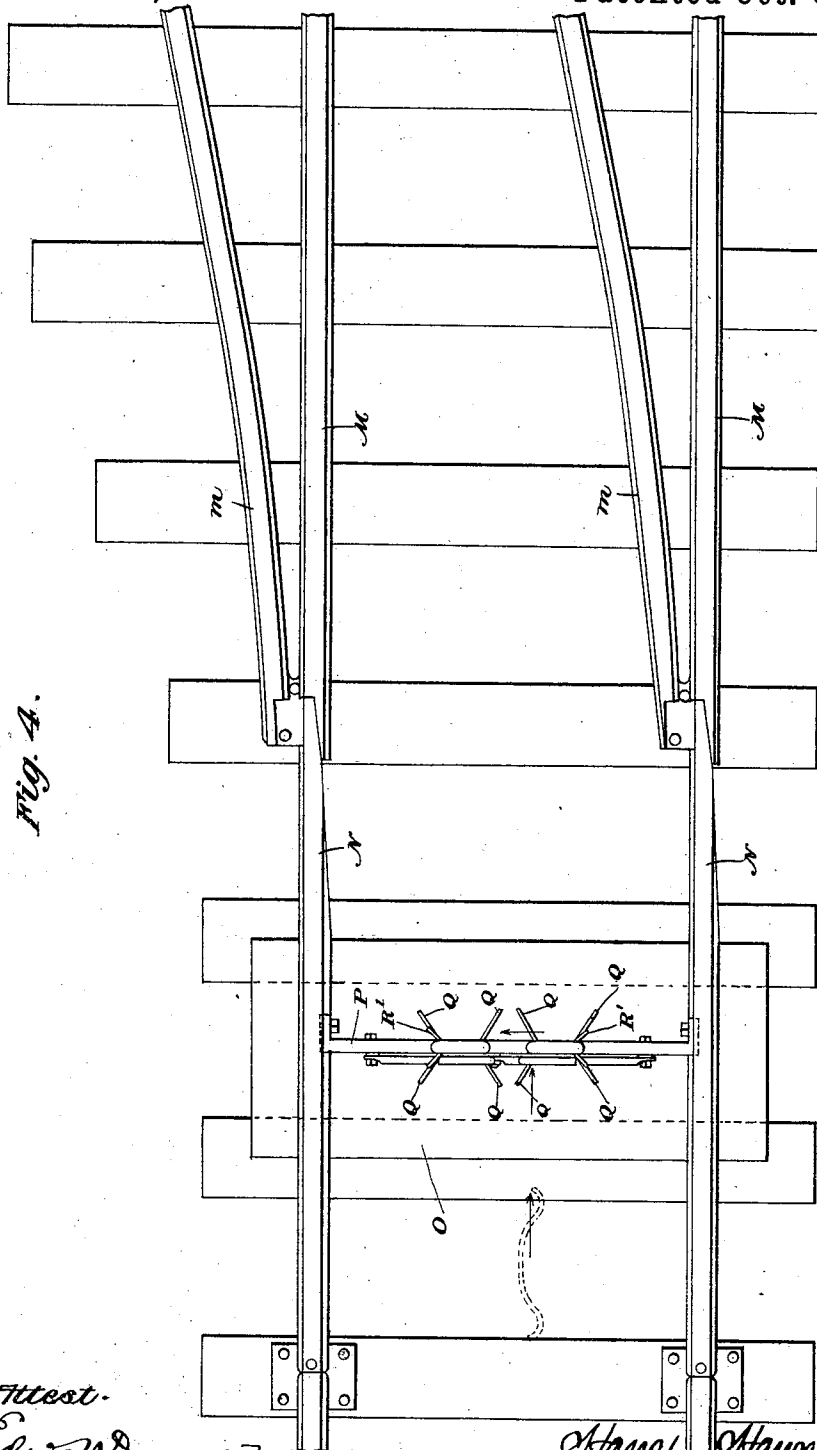
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Fig. 4.



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Inventor.
Hans Fröland
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UNITED STATES PATENT OFFICE.

HANS HANSEN FRÖLAND, OF IOLA, WISCONSIN.

AUTOMATIC RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 568,844, dated October 6, 1896.

Application filed September 14, 1895. Serial No. 562,473. (No model.)

To all whom it may concern:

Be it known that I, HANS HANSEN FRÖLAND, a citizen of the United States, residing at Iola, in the county of Waupaca and State of Wisconsin, have invented certain new and useful Improvements in Automatic Railway-Switches; 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.

This invention relates to certain improvements in the operating mechanism of switches used on railways, the object of the invention being to provide a simple and easily-operated automatic mechanism which will operate unfaillingly to accomplish its purpose; and the invention consists, essentially, in a mechanism carried either by the locomotive or a car and adapted to automatically operate in conjunction with the locking device on the movable-switch for the purpose of releasing the same and shifting the switch, so that the moving train may be deflected from the main track to a siding, or vice versa, in order to avoid danger or for such other purposes as may be necessary, the whole arrangement being compact, novel, simple, and accurate in its movements and in its results; and the invention therefore consists also in certain peculiarities in the construction, arrangement, and combination of parts, substantially as will be hereinafter described, and then more particularly pointed out in the ensuing claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a side elevation of my improved self-acting switch. Fig. 2 is an enlarged perspective view of the portion of the switch mechanism which is carried on the front end of the locomotive or car. Fig. 3 is a top plan view of the same. Fig. 4 is a plan view of a railway-track at a switching-point illustrating an embodiment of my present improvement. Fig. 5 is a cross sectional elevational view of the movable portion of the switch-track, showing the switch locking and releasing mechanism, said view being taken upon the line *xx* of Fig. 1. Fig. 6 is an enlarged detail view of a portion of the same mechanism shown in Fig. 5 and indicat-

ing more clearly the specific kind of locking device employed.

Similar letters of reference designate corresponding parts throughout all the different figures of the drawings.

A designates the front end of a locomotive, car, or other moving vehicle to which my improved automatically-operating switch mechanism is applied. In the arrangement of mechanical parts of my invention I attach a horizontal forwardly-projecting platform B to the front end of the locomotive. On this platform is an upright C, which forms a portion of the main frame for supporting said mechanical parts of my improved device. On the platform B, in front of the upright C, is secured a mettalic frame D. To the upper end of the upright C is secured another mettalic frame E.

F denotes a forward brace, the lower end of which is bolted to the front end of the platform B, while the upper end is T-shaped and is constructed, as shown in Fig. 2, to engage and firmly hold the parallel longitudinal parts of the frame E in a horizontal position in order that the several upright shafts and other mechanical parts, to be hereinafter specified, may be secured in position in connection with said frame E.

a a designate two upright shafts which are journaled at their lower ends in the parallel side pieces of the lower mettalic frame D and at their upper ends in the parallel side pieces of the upper mettalic frame E, said shafts being susceptible of an oscillatory motion in their bearings. The upper and lower ends of these vertical shafts *a a* are preferably screw-threaded and provided with adjustable nuts for the purpose of keeping the shafts in place in their bearings and for enabling them to be readily removed therefrom when desired. Further, it will be noted that on the shafts *a a*, near their upper ends, are the hand-wheels G G, which may or may not be used, as preferred. When necessary, these hand-wheels afford convenient means to be laid hold of by the operator for the purpose of partially rotating the shafts *a a* when such rotation may be found necessary in the adjustment of the shafts or the manipulation of the mechanism for any desired purpose. Another pair of

vertical shafts *b b*, similar to the vertical shafts *a a* and situated behind the shafts *a a*, are likewise journaled at their upper and lower ends in the upper and lower frames E and D, in like manner as the shafts *a a* are arranged.

On the shafts *a a*, near their lower ends, are fastened the rings H, connected at their outer ends with rods J and having the stem H' projecting therefrom, which is formed at its outer end with the vertical yoke *h*. On the shafts *b b*, near their lower ends, are the horizontal rings I, each of which has a projecting stem I', which is formed integral with the outer curved yoke or bow *i*. The horizontal bow-shaped parts *i* engage the vertical yoke-shaped parts *h* in the loose manner shown and described, and yet in a manner sufficient to keep them in constant connection with each other, so that when the rings H partially rotate the result will be to partially shift the rings I, and, vice versa, when the rings I are partially rotated or shifted the rings H will be more or less revolved. The rings H and their yoke-shaped integral extensions I preferably term the "outer guides," and the rings I, with their horizontal bow-shaped extensions, I preferably term the "switch-guides," because these parts, in consequence of their intimate relationship and interengagement with each other, as shown and described, assist in steadying the movement of the switch-operating shoes and effectually serve to guide the latter in the performance of their functions in connection with the release of the track-locking parts. These rings I may also be employed as hand-wheels to operate the forward shoes.

J J denote vertical movable shoe-carrying rods having attached to their lower ends the horizontal shoes or keys K, which I design to operate in connection with the switch-locking or track-locking mechanism. These shoes K are compoundly curved from end to end longitudinally, and also their ends are horizontally curved, so as to be somewhat tapered or pointed.

The vertical rods J J are secured rigidly to the guide device H H, so that as the rods J move up and down these rings H move up and down, said rings having at their center square openings which fit upon squared portions of the rods *a a*. Furthermore, the vertical rods J are provided with the angle-pieces *j j*, which are bolted securely thereto, said angle-pieces carrying the tubular guides J' J', which slide upon the vertical rods *a*. By means of these guides J', therefore, the rods J and the shoes K are guided in their vertical movement. Rods J and shoes K are moved up and down by means of the levers *d d*, which are pivoted to the upper ends of said rods J and are fulcrumed in the standards *c c*, pivotally swiveled on the upper frame E. It is apparent that a slight movement of the levers *d d* is sufficient to operate the shoes. On the upper end of the upright C

are the upright rods L L, having the upper notches *l l'* and the lower notches *l²*, said notches being for the purpose of holding the arms *d* in any desired position. When the shoes K are elevated, the arms *d* may be caused to engage the notches *l²*. When the shoes K are depressed, then the arms *d* may be placed in the notches *l* or *l'*.

g g denote another pair of horizontal shoes, similarly shaped, constructed, and situated to the forward pair of shoes K, said shoes *g* being directly in the rear of the shoes K and being carried by the depending rods *k*, which work through perforations in the platform B and which pass upward through the frame E, there being attached to their ends the operating-levers *k' k'*, which lie alongside of the operating-levers *d d* and which are fulcrumed in supports on the upper frame E, and which are adapted to engage notches in the rod L in like manner as the arms or lever *d* are arranged and adapted to operate.

The shoes K K act as keys in connection with the track-locking devices, and the shoes *g g* have the same function. The shoes K K operate when the train is moving in one direction and the shoes *g g* when it is moving in the opposite direction. Either one or the other of the shoes K K or the shoes *g g* may be brought into active position, according as it may be desired to shift the movable part of the switch in one direction or the other.

In Fig. 4 I have represented a railway-track to which my present improvements are applied.

M M designate the rails of the main track, and *m m* the rails of a siding or switch-track.

N N denote the pivoted rails of a movable portion of the main track, said rails being connected together by the transverse horizontal bar P, which is securely bolted at each end to the rails N N, and said rails being arranged to slide upon the switch-plate O, which is supported on the ties, as shown.

p p denote two horizontal links, which are pivoted at their outer ends to the cross-bar P and at their inner ends are pivoted to each other. On the lower edge of one of these links *p* is a downwardly-projecting pin *p'*, which is adapted to engage one or the other of the notches O', O², and O³ in the bottom plate O. (See Figs. 5 and 6.) Each of the links *p* is provided with a right-angled upwardly-projecting finger S. On the stationary bar P are situated stationary right-angled fingers R R, which are similar in shape and form to the fingers S and are contiguous thereto, but are of a slightly greater vertical height. On the bent ends of the stationary fingers R are the rigid deflecting wings R'. Also on the stationary bar P, opposite to the points where the fingers R and S are situated and on both sides of the bar P, are the rigid inclined deflecting wings Q Q, which form, as it were, mouths or guides to receive the shoes K or *g* belonging to the locomotive-carrying mechanism of the switch.

As the locomotive or other moving vehicle advances along the track and the engineer or operator desires to switch the train onto the siding, he will lower one or the other of the shoes or keys K. The one which is lowered will be in position to engage the finger S belonging to the track-locking devices. The result of such engagement will be to lift said finger S, and consequently to lift the links *p p*, and thereby disengage the pin *p'* from the plate O. It will be observed that the finger S cannot be raised any higher than the finger R, inasmuch as the finger R is stationary. When the shoe has completed the raising of the finger S, it will at the same time strike against the wings R' on the stationary finger R, and the result of this compact will be to laterally shift the track N N sidewise sufficiently far to carry the movable portion of the track away from engagement with the main line, as it is shown in Fig. 4, and place it in engagement with the siding *m m* or with some other side-track or switch-track, as the case may be. It will be obvious that if the shoe engages the left-hand finger R the movable portion of the track will be shifted to the left and if it engages the right-hand finger R the movable track will be shifted to the right hand. As the locomotive passes on, the shoes K will clear the track-locking devices, and as soon as this clearance is effected the fingers S S and links *p p* will drop back by gravity into their former position, so that the pin *p'* will again engage one of the notches in the plate O and lock the switch in its new position. The lower portions of the arms J are bent at right angles, as shown in Fig. 2, in order that while the shoes K pass through the fingers S and R said rods J may pass outside of them.

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

1. In an automatic-switch mechanism, the combination with the track-locking devices consisting of a transverse bar rigidly connected to the switch-rails, horizontal links pivotally connected to each other and at their outer ends to the transverse bar, and a locking-pin connected to said links, of releasing mechanism carried by the moving train, and consisting essentially of adjustable shoes which engage and shift the track, substantially as described.

2. In an automatic switch, the combination of the mechanism carried by the moving car,

consisting essentially of the vertically-adjustable shoes and the levers for operating them, of the track-locking devices, consisting essentially of the transverse bar connecting the switch-tracks, horizontal links pivotally connected to each other and at their outer ends to the transverse bar, and a locking-pin connected to said links, all substantially as set forth.

3. In a switch mechanism, the combination with the releasing contrivances carried by the moving car and including a curved shoe, of the track-locking devices, consisting essentially of a locking-pin carried by a horizontal linked bar pivotally attached to the rigid transverse bar connecting the rails, a releasing-finger therefor which is actuated by the moving shoe, and a stationary shifting finger, all arranged substantially as described.

4. The combination of the movable mechanism, consisting of the key-acting shoe or shoes, mechanism for supporting and adjusting them, the interlocking guiding devices to steady or actuate the shoes, and the track-locking mechanism, comprising a locking-pin, releasing-fingers for said pin, and rigid shifting fingers for the track, substantially as described.

5. In a switch, the combination with a moving vehicle, of an adjustable shoe thereon, said shoe being compoundly curved and having pointed ends, and the track-locking mechanism, consisting of a locking-pin carried by a linked bar pivotally attached to the rigid transverse bar connecting the rails, a releasing-finger on said linked bar adapted to be engaged by the aforesaid shoe, and a shifting finger which is rigid with the track, substantially as described.

6. In combination with a track-locking device, of key-acting shoe or shoes carried by vertical rods, said rods having horizontal actuating-levers connected therewith and journaled in a framework on the car-platform vertical rods also journaled in said framework, having connection with the shoe-carrying rods and provided with hand-wheels by means of which said shoes may also be operated, substantially as set forth.

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

HANS HANSEN FRÖLAND.

Witnesses:

SAM. S. MILLER,
C. KIMMELL.