

No. 646,454.

Patented Apr. 3, 1900.

S. L. NEELY.  
TRACK CIRCUIT CLOSER.

(Application filed May 10, 1899.)

(No Model.)

2 Sheets—Sheet 1.

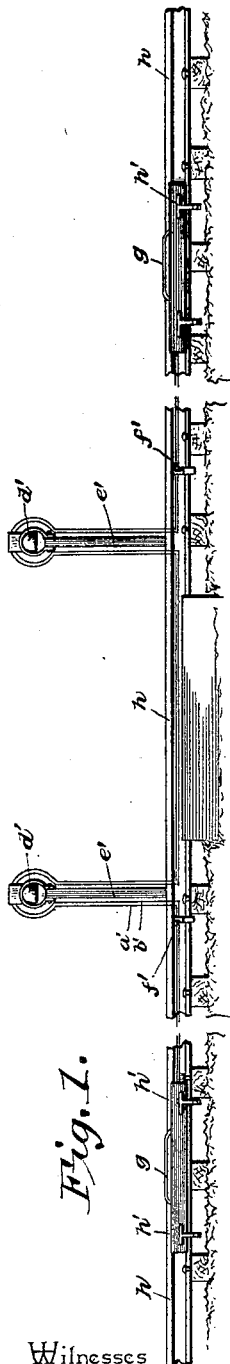


Fig. 1.

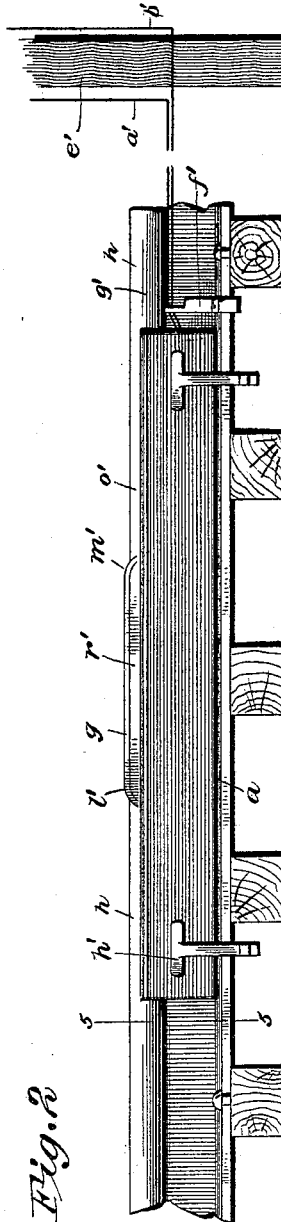


Fig. 2.

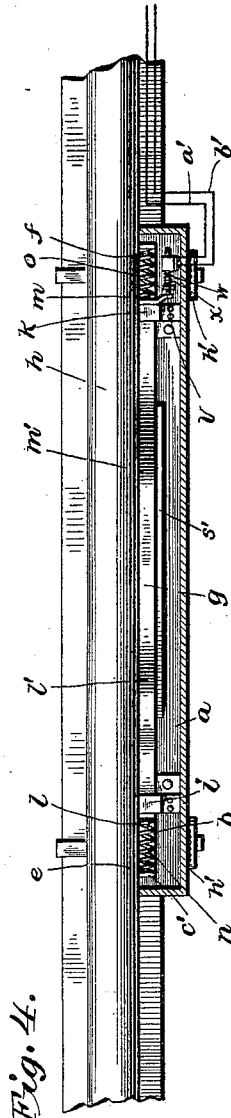


Fig. 4.

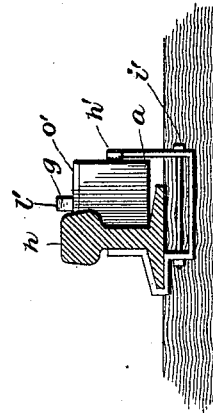


Fig. 5.

Witnesses

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2 Sheets—Sheet 2.

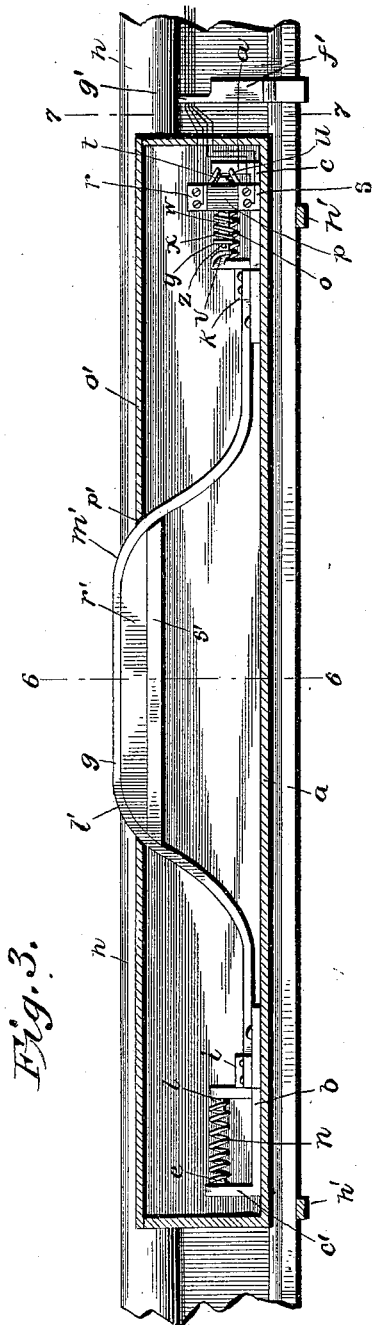


Fig. 3.

Fig. 7.

Fig. 6.



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# UNITED STATES PATENT OFFICE.

SAMUEL L. NEELY, OF PIERRON, ILLINOIS.

## TRACK-CIRCUIT CLOSER.

SPECIFICATION forming part of Letters Patent No. 646,454, dated April 3, 1900.

Application filed May 10, 1899. Serial No. 716,272. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL L. NEELY, a citizen of the United States, residing at Pierron, in the county of Bond and State of Illinois, have invented a new and useful Track-Circuit Closer, of which the following is a specification.

My invention relates to electrically-operated signal systems, and more particularly to that class employed in connection with railways, the specific object being to provide a cheap and effective track mechanism which will close a circuit, including an electromechanical alarm, and in which said circuit will be closed from one direction only, thus preventing the sounding of an alarm after a train has passed the danger-point.

A further object of my invention is to provide means for retaining the track mechanism in an operative position with respect to the track-rail and also to provide means for supporting a conductor beneath the tread of a rail, thus eliminating the necessity for poles or other expensive supports.

In the drawings forming a portion of this specification, and in which like letters of reference indicate similar parts in the several views, Figure 1 is a view showing a signal system equipped with my invention. Fig. 2 is a side view of a portion of a rail with my track mechanism in circuit with a signal or alarm. Fig. 3 is a detail view of the track mechanism with the side of the casing removed. Fig. 4 is a plan view of a portion of a rail and my mechanism with the cover of the casing removed. Fig. 5 is a section on line 5 5 of Fig. 2 looking to the right. Fig. 6 is a section on line 6 6 of Fig. 2, showing the retaining-flange on the tread-piece. Fig. 7 is a section on line 7 7 of Fig. 2 looking to the right.

Referring now to the drawings, in operating in accordance with my invention I form a casing of a height suitable to allow it to fit between the flange and the overhanging tread of a rail and of a sufficient width to accommodate my mechanism.

Upon the base *a* of the casing and adjacent to each end thereof I secure a metallic plate *b* and *c*, respectively, having their farther ends turned upwardly at right angles, as shown at *c'* and *d*, these upturned ends having horizontal projections or lugs *e* and *f*

formed thereon and projecting toward each other. Slidably connected with the upper surface of each plate *b* and *c* is the end of a spring-strap *g*, of substantially inverted-U shape, with its ends turned outwardly in a common horizontal plane, the distance between the points of outward turning of the ends being somewhat less than the distance between the plates *b* and *c*, and the height of the strap being sufficient to cause it to project slightly above the tread of the adjacent rail *h*, against which it lies.

In order to prevent lateral displacement of the spring-strap *g* from the plates *b* and *c*, I secure over the horizontally-projecting portions retaining-straps *i* and *k*, which are riveted or otherwise secured to the plates *b* and *c*. The extremities of the horizontally-projecting ends of the strap *g* are turned upwardly to lie parallel with the extensions *c'* and *d'* of the plates *b* and *c* and have upon their outer faces lugs *l* and *m* upon a common axis with the lugs *e* and *f*, respectively.

A helical spring *n* is arranged with its ends inclosing the lugs *e* and *l* and tends to hold their respective projections apart, a second similar spring *o* being arranged upon lugs *m* and *f* for a like purpose. Thus it will be seen that if the strap *g* is moved in either direction longitudinally of its casing and is released it will immediately assume its normal position, due to the influence of the springs *n* and *o*. Adjacent the plate *c* is a support *p*, of insulating material, upon which are secured plates *r* and *s*, having projecting contact-pieces *t* and *u*, adapted for engagement by a contact-pin *w*, passed through the support *p* and adapted to move in a plane parallel with the plane of movement of the lug *m*. A lateral projection *v* is formed upon the adjacent upturned extremity of the strap *g* and extends in a position to engage the head of the pin *w*, so that as the strap *g* is moved in the direction of the lug *f* the pin *w* will be pressed into engagement with contact-pieces *t* and *u* and will electrically connect said pieces. As the strap *g* is returned under the influence of the spring *o* it releases the pin *w*, which latter is returned to its normal position through the medium of an inclosing helical spring bearing at one end against the adjacent face of the support *p* and at the other

upon a washer *y* upon the pin and held in place by means of a key *z*. The plates *r* and *s* form the terminals of an electric circuit to be closed by my mechanism and including  
 5 any style of signal or alarm, and in Fig. 2 I have shown such circuit, including wires *a'* and *b'*, extending to an electromechanical alarm *d'*, supported upon a post *e'* adjacent the track. In this connection I have shown  
 10 a wire-support consisting of an iron having the shape of the web and flange of a rail and adapted to fit over said web and flange, one of its vertically-projecting portions *f'* having a perforation *g'* adjacent its upper end,  
 15 through which the wires *a'* *b'* are passed, thus forming a cheap and effective support for the wires directly beneath the tread of the rail and in a position to protect them from abrasion.

20 Referring now more particularly to Fig. 5 of the drawings, in order to hold the casing of my mechanism fixedly against the side of the rail-web I employ a clamp having a T-shaped serrated head *h'*, which engages the  
 25 outer face of the casing and from which head the clamp is extended downwardly to a point below the flange of the rail, then laterally beneath the rail to a point in the plane of the opposite face of the web, then upwardly and  
 30 around the adjacent portion of the rail-flange, and finally vertically against the face of the rail-web on the side opposite the casing. A bolt passed through the vertical portions of the clamp below the rail is provided with a  
 35 nut *z'*, through the medium of which the serrated head *h'* is drawn firmly into engagement with the casing.

The operation of my construction is as follows: Referring more particularly to Fig. 3  
 40 of the drawings, the mechanism shown is designed to close a circuit when a train is moved from left to right and to maintain an open circuit when the train is moving in the opposite direction, it being understood that this  
 45 mechanism is located to be operated in advance of the danger-point. A train approaching from the left the tread of its wheel will strike the point *v'* of the strap *g* and will force the strap downwardly and in the direction of plate *c*. The downward forcing of  
 50 the strap *g* causes the strap to impinge the adjacent edge of plate *b* and causes the adjacent end of the strap to rise slightly and impinge the retaining-strap *i*, such impingement offering an amount of friction sufficient  
 55 to prevent retrograde movement of the strap *g*. The upward curve of strap *g* and its position with respect to its coöperative parts are such that the resultant motion of the opposite end of the strap is substantially horizontal, so that there is no excessive friction between the strap and its keeper, and the projection *v*, engaging the pin *w*, is enabled to move the latter to complete the circuit between the contacts *t* and *u*, and thus energize whatever form of alarm or signal may be  
 65 included in the circuit of the contact-pieces.

When the train has passed beyond my mechanism, the strap will be returned to its normal position by the springs *n* and *o* and by  
 70 its own elasticity, while spring *x* will withdraw the pin *w* from the contact-pieces *t* and *u*. Conversely, as a train approaches from the opposite direction—i. e., from right to left—its wheel will engage the point *m'* of the strap *g* and in depressing that portion of  
 75 the strap will first cause impingement between the strap and the plate *c* and keeper *k*, thus preventing movement of the pin *w* to close the circuit between the pieces *t* and *u*, and as the wheel further depresses the strap its opposite end will be moved through its keeper *i* and against the action of the spring *n*. As the last wheel leaves the strap it will rise under the influence of its own  
 85 elasticity and will assume its normal position through the medium of springs *n* and *o*. Thus it will be seen that with my mechanism the circuit, including the contact-pieces *t* and *u*, will be closed only when the train is moving in a predetermined direction. The casing is provided with a cover *o'*, having a slot  
 90 *p'*, through which the strap *g* projects, the inclosure of the upwardly-extending portion of the strap being filled by a web *r'*, of wood or other suitable material, acting as a follower for the strap and extending to a point within the casing. This web is of a width sufficient to completely fill the slot through which the strap projects and is provided with a laterally  
 95 extending flange *s'* to limit its upward movement. With the employment of this filling access of foreign matter to the casing is prevented.

In practice I may make that portion of the strap which projects beyond the rail sufficiently long to reach from one truck to another in a train, so that there will be a continuous depression and a continuous closing of the operating-circuit from the time the first wheel  
 100 strikes the strap until the last wheel has left it. Also I may use a plurality of my mechanisms so that an alarm or signal will be operated a corresponding number of times during the approach of a train, and I may employ my  
 105 track mechanism to close a simple or a complex circuit, whether it be complete metallic or a grounded circuit and may use my mechanism in whatever manner and wherever it may be applicable. Also I may vary the specific  
 110 construction and arrangement herein shown and described, and I may employ whatever materials I may deem expedient without departing from the spirit of my invention.

Having thus described my invention, what I claim is—

1. A device of the class described, comprising a base, a plate upon the base, a second plate upon the base and separated from the first plate by an interspace, a spring-strap  
 130 having an upwardly-extending portion and outwardly-turned ends slidably connected with said plates and continuing inwardly beyond the inner edges thereof, said strap be-

ing adapted to be depressed between the plates to fixedly impinge the first plate and slide over the second plate and then to impinge the second plate and slide over the first plate, under the influence of a rolling pressure traveling alternately in opposite directions, keepers secured to the plates and inclosing ends of the strap, electrical terminals carried by a support adjacent the strap, and means connected with the strap for bridging said terminals.

2. A device of the class described comprising a base, plates secured to the base and separated by an interspace, an inverted-U shaped strap having its ends turned outwardly and connected slidably with said plates through the medium of keepers, said outward turns lying between the plates, said plates having upward extensions, springs arranged between said extensions and the ends of the spring-strap, one of said ends having a lateral projection, a slidable contact-pin engaging said projection, and contact-pieces in the path of said pin and adapted to be bridged thereby, substantially as specified.

3. In a device of the class described, the combination with a casing, of a spring-strap passed through an opening in the casing, a circuit-closer within the casing and operatively connected with said strap, said strap being adapted to rise and fall through the slot in the casing, and a follower carried by the strap and acting to maintain the closure of said slot, substantially as specified.

4. The combination with a rail and a body adapted for reception between the tread and the flange of the rail, of a clamp having a

laterally-extending head engaging the body, said clamp extending from the head downwardly and partly beneath the rail-flange, then upwardly and over the adjacent portion of the flange and in engagement with the contiguous face of the rail-web, and means for drawing the upwardly-extending portions of the clamp toward each other, substantially as specified.

5. The combination with a railway and a rail thereof, of a casing located intermediate the tread and flange of the rail, a spring-strap extending upwardly through an opening in the casing and projecting above the tread of the rail, said strap having its inner ends turned outwardly in opposite directions and projected upwardly, the outwardly-projected portions slidably engaging bearing-plates having upwardly-turned ends, springs arranged between the upwardly-turned ends of the plates and the upward extensions of the strap ends to hold the strap normally in a predetermined position, said plates terminating intermediate the extremities of the outwardly-turned ends, a contact-pin slidably arranged adjacent the strap, operative connections between the strap and the pin, and contact-pieces in the path of the pin and adapted to be bridged thereby, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

SAMUEL L. NEELY.

Witnesses:

DON V. POINDEXTER,  
LEOPOLD KNEBEL.