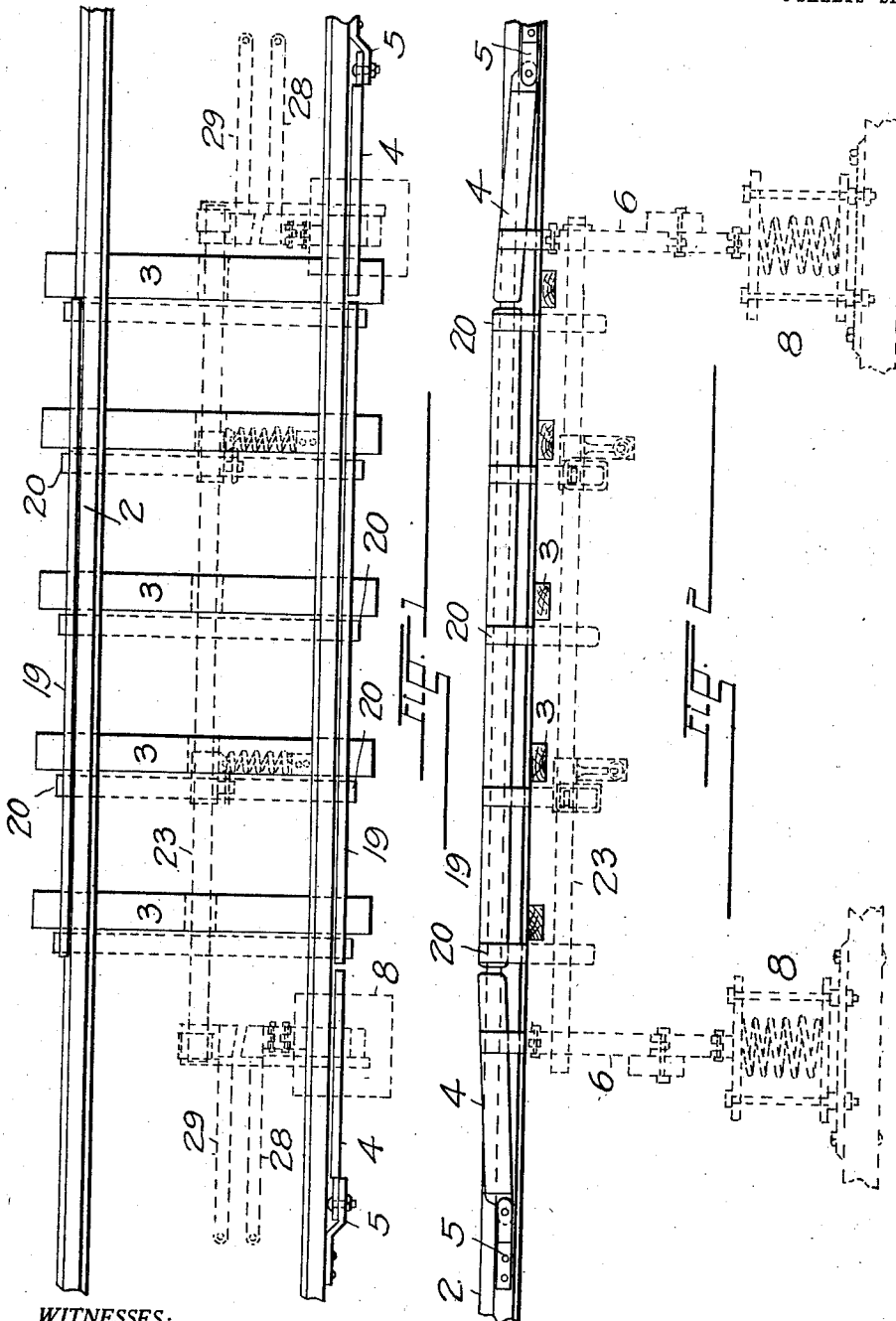


P. H. SHUE.  
RAILWAY SIGNALING APPARATUS.  
APPLICATION FILED MAY 17, 1909.

965,028.

Patented July 19, 1910.

3 SHEETS—SHEET 1.



WITNESSES:

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M. L. Geary.

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P. H. Shue

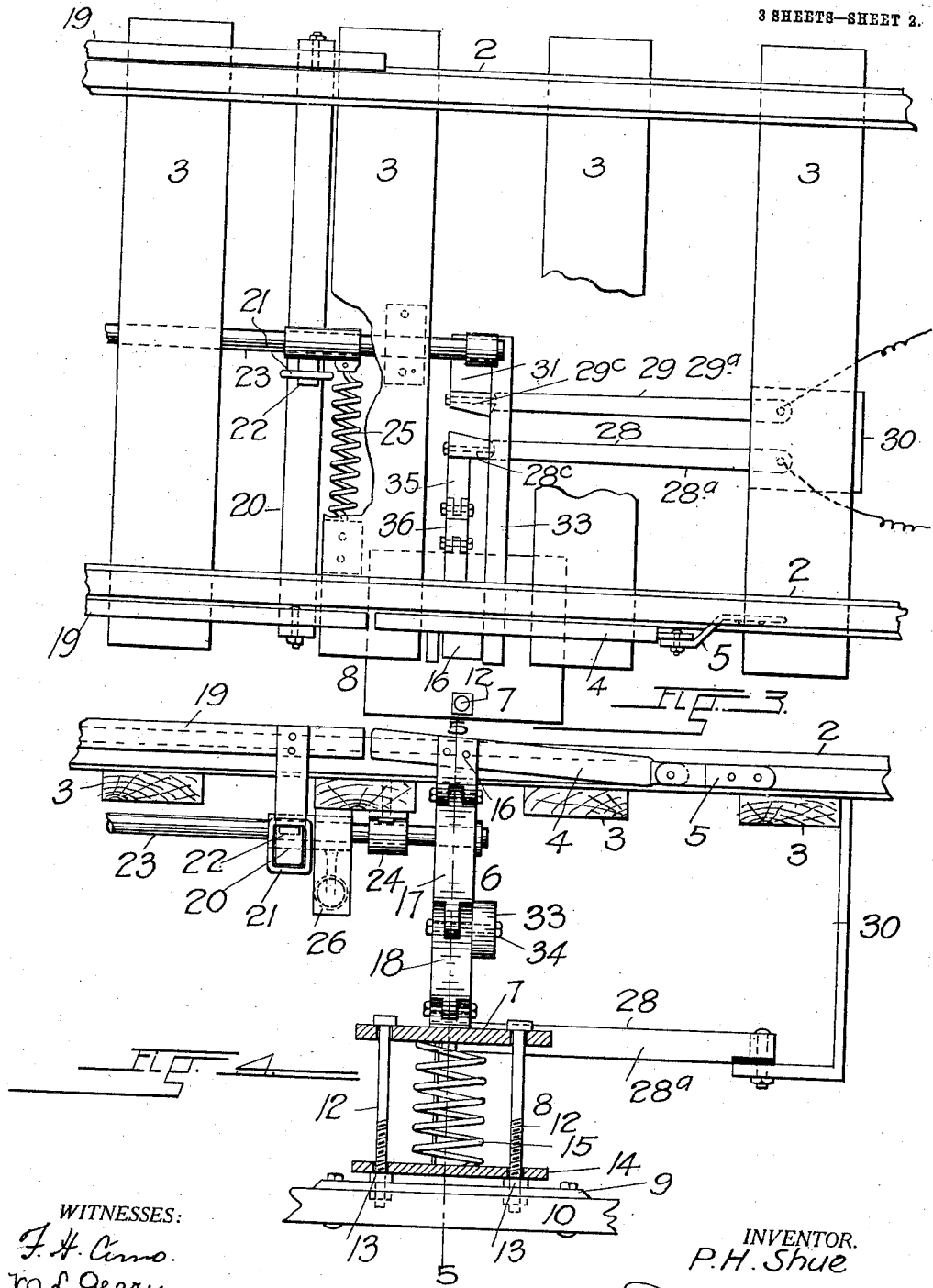
BY *[Signature]*  
ATTORNEY.

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3 SHEETS—SHEET 2.



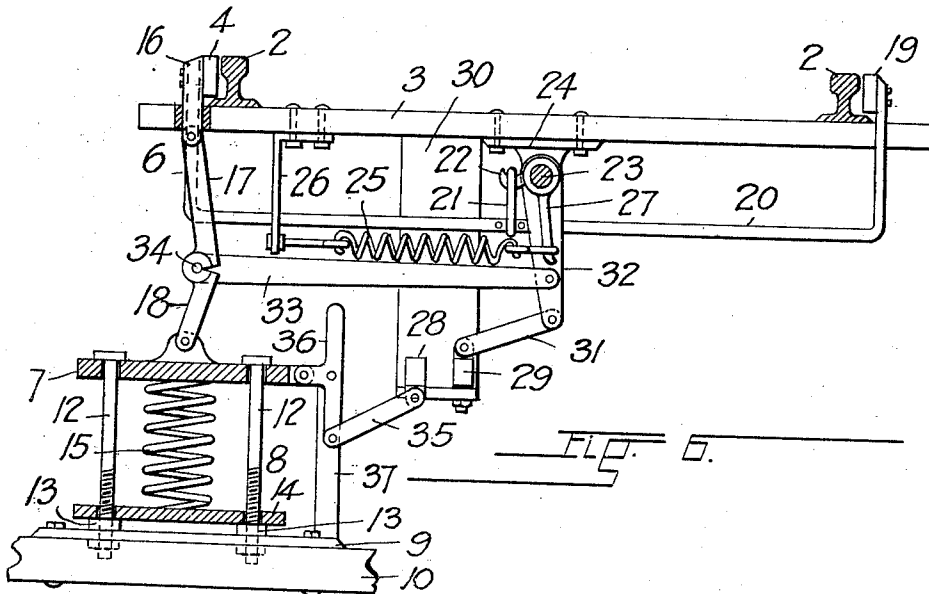
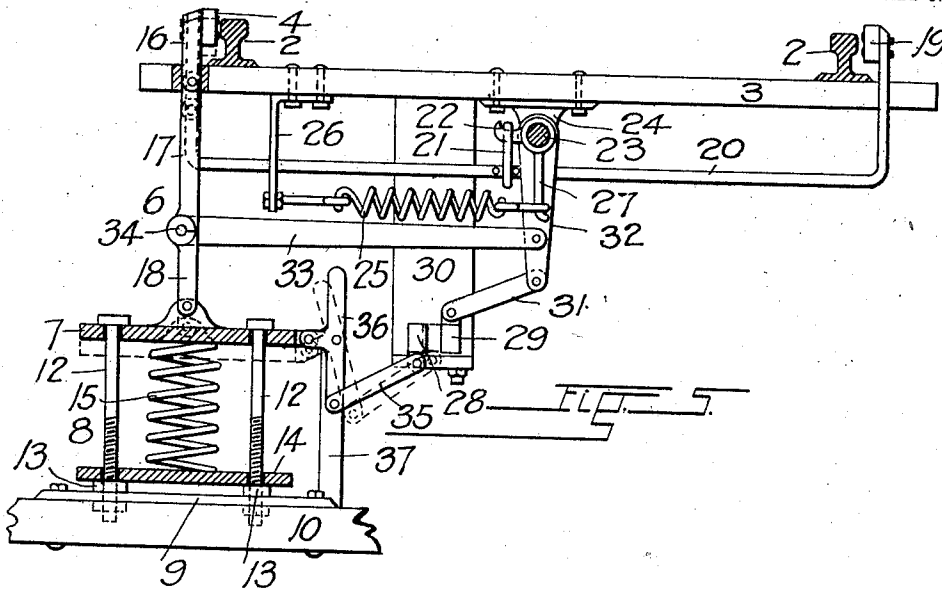
WITNESSES:  
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**965,028.**

3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

PHILIP H. SHUE, OF DENVER, COLORADO.

## RAILWAY SIGNALING APPARATUS.

965,028.

Specification of Letters Patent.

Patented July 19, 1910.

Application filed May 17, 1909. Serial No. 496,569.

*To all whom it may concern:*

Be it known that I, PHILIP H. SHUE, citizen of the United States of America, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Railway Signaling Apparatus, of which the following is a specification.

This invention relates to certain new and useful improvements in railway signaling apparatus and more particularly in the track instruments which, when actuated by a passing train, closes an electric circuit to operate one or more semaphores or other signaling instruments.

The track instruments are, preferably, located at the ends of a section of railway of predetermined length, usually called a block, for the purpose of indicating to the engineer of an approaching train or at stations and other points, whether or not a train running in opposite direction is traveling within the limits of said block.

The objects of the present invention reside in the provision of an apparatus of the class named in which the electric circuit for operating the signal or signals, is closed by the depression of an element engaged by the first wheels of a passing train, while a second depressible element, coöperatively associated with the first one, is arranged to be engaged by said wheels after they have passed over the first element, for the purpose of depriving the latter of its capability for closing the circuit, while it is subjected to the depressing influence of the succeeding wheels of the passing train.

The improved track instrument is, furthermore, adapted to be operated by trains passing in either direction so that a signal will be given when a train leaves as well as when it enters the block at whose terminal points the instruments are disposed.

Further objects of my invention will be brought out in the following description, reference being had to the accompanying drawings in the various views of which like parts are similarly designated and in which—

Figure 1, represents a plan view of a railway track, with my improved track instrument in operative position, Fig. 2, a side-elevation thereof, Fig. 3, an enlarged plan view of an end portion of the instrument and the therewith associated circuit

controlling mechanism, Fig. 4, a side elevation of the parts shown in Fig. 3, Fig. 5, a transverse section along the line 5—5 Fig. 4 and Fig. 6, a similar section with the parts in the position they occupy after the circuit has been opened and subsequently broken by action of the first wheels of the train and while the other wheels are still passing over the instrument.

Referring to the drawings by numerical reference characters, let the numeral 2 designate the rails of a railway track, supported upon the cross-ties 3. A normally inclined tongue 4, whose free extremity projects above the upper surface of one of the rails, is hingedly connected therewith at its opposite end, by means of a strap 5 and this tongue connects with a normally vertically downwardly extending thrust-bar 6 whose lower extremity is pivotally connected with the follower 7 of a buffer 8. The latter consists of a base plate 9 rigidly secured upon a timber 10 and supporting four upright, headed posts 12 upon which the follower 7 is slidably mounted. The lower portions of the posts, are threaded and provided with nuts 13 upon which a plate 14 is vertically movably supported, and a coiled spring 15 is disposed between said plate and the follower so as to be compressed when the latter, impelled by the motion of the tongue 4, is moved downwardly. By adjustment of the nuts 13 upon the posts, the distance between the plate 14 and the follower 7, may be varied for the purpose of regulating the tension of the coiled spring 15.

The thrust bar 6 is composed of three normally longitudinally alined, pivotally connected members 16, 17 and 18, the upper one 16 of which is rigidly secured to the tongue 4 while the lower one 18 is movably connected with the follower 17, and the members thus associated, form coöperatively a toggle or knee joint which, in the operation of the device, serves to lessen the distance between the tongue 4 and the follower so as to temporarily retain the former in the depressed position.

The element above described, is designed to be actuated by contact of the wheels of an approaching train, which by subsequent engagement of the second depressible element, hereinbefore referred to, re-open the circuit closed by movement of the tongue in the first named element and temporarily inca-

pacitate said tongue for further action by maintaining it in a depressed position while the wheels of a train, succeeding the first ones, pass over the same.

5 To render the invention available for trains approaching the point of its location from opposite directions, I locate two elements similar to the one above described at opposite ends of the second element and the  
10 distance between the tongues comprised in the said two elements should exceed that between the centers of the last and first wheels of two successive trucks in a railway train, so that the wheels of the one  
15 truck will not disengage the depressible elements before those of the next succeeding truck have come in contact therewith.

As the construction of the two tongues and the therewith associated parts, as well  
20 as their connections with the interposed circuit closing element, is identical at both ends of the instrument the description of one will be sufficient to convey a complete understanding of the working of the apparatus  
25 and the same reference numerals designating the parts at one end of the device, have for this reason, been used to indicate like parts at the other end thereof.

The depressible element interposed between the two circuit closing elements hereinabove described, comprises two tread-bars  
30 19 which extend, longitudinally in juxtaposition to the outside of the balls of the two rails 2 of the track, and whose upper edges project, normally above the latter's treads.  
35

The two bars 19 are united by means of a plurality of inverted U-shaped yokes 20 which extend underneath the track in transverse relation thereto, and the entire structure is suspended by means of links 21, from  
40 laterally projecting horns 22 on a shaft 23 which is revolvably carried in journal boxes 24 on the underside of the cross-ties 3, parallelly to and centrally between the rails 2  
45 and the juxtaposed bars 19.

The connected bars 19 are resiliently maintained in their raised position by means of a plurality of coiled springs 25, the extremities of which are respectively connected  
50 with stationary brackets 26 secured upon the under surface of the ties 3, and with the lower ends of arms 27 depending from the shaft 23 upon which they are fixedly mounted.

The contacts, which when in engagement, close the circuit in which the signaling instruments are included, are designated in the drawings by the numerals 28 and 29 and are composed of normally parallel bars 28<sup>a</sup>  
60 and 29<sup>a</sup> whose outer extremities are fulcrumed upon a hanger 30 which is suspended from a tie of the railway track, while their opposite ends carry the contact-blocks 28<sup>c</sup> and 29<sup>c</sup>.

65 The inner extremity of the bar 29<sup>a</sup> is connected

by means of a link 31, with the lower end of a crank-arm 32 which extends downwardly from the shaft 23 upon which it is rigidly secured, and this same arm is connected, by means of a pitman 33 with the  
70 pivot pin 34 of the toggle joint composed of the members 17 and 18 of the thrust bar 6.

The bar 28<sup>a</sup> of the second contact, 28, is connected at its inner end by means of a link 35, with the dependent arm of a bell  
75 crank lever 36 which is fulcrumed upon a standard 37 erected upon the timber 10 which carries the buffer 8, and whose other arm is pivotally connected with the follower 7.  
80

While the tongues 4, whose free extremities are in close proximity to the adjacent end of the corresponding bar 19, have been shown in the drawings, as being disposed at the same side of the track, it will be understood that, if so desired, they may be placed  
85 at opposite sides thereof, and, although the mechanism as shown and described is preferable by reason of its simplicity and practicability in use, variations in the form and arrangement of the various parts comprised  
90 therein may be availed of without departing from the spirit of my invention.

The operation of my improved track-instrument, will, from the foregoing description, be readily understood.  
95

A train approaching the instrument from either side, will by engagement of its first wheels, depress the first inclined tongue 4, whose downward movement is through the  
100 instrumentality of the thrust-bar 6, transmitted to the follower 7, which in consequence, compresses the spring 15. The downward motion of the follower 7, results in a simultaneous movement of the bell  
105 crank 36 about its fulcrum, which movement is, by means of the link 35, transposed into a similar movement of the contact arm 28<sup>a</sup>, with the result that the contact block 28<sup>c</sup> is carried in engagement with the  
110 opposed block 29<sup>c</sup> and the electric circuit of which said blocks constituted the terminals, is closed. The first wheels of the train after having passed over the tongue 4, engage the  
115 bars 19 of the circuit opening element, whose consequent downward movement is, by means of the links 21, transposed into a rotary movement of the shaft 23. The consequent motion of the crank-arm 32, causes, through the instrumentality of the pitman  
120 33, the toggle joint to flex, as is shown in Fig. 6 of the drawings, with the result that, while the follower 7, was by action of the spring 15, returned to its original position, the tongue is held below the surface of the  
125 rail upon which it is fulcrumed so as to remain unaffected by the wheels of the passing train. The movement of the crank-arm 32 is also transposed into a movement of the contact arm 29<sup>a</sup> about its fulcrum so as to  
130

further separate the contact 29<sup>c</sup> connected therewith, from the contact 28<sup>a</sup> which with the follower 7, had returned to its original position, a feature in the operation of my instrument, which, although not essential is advantageous as a precaution against accidental engagement of the two contacts while the train is passing over the instrument. The last wheels of the train, when leaving the bars 19 of the circuit-breaking element, engage the tongue adjoining the latter at the end of the instrument rearmost in relation to the direction in which the train moves, which tongue was depressed simultaneously with the other by the flexing action of the rotating shaft 23 upon its toggle, and the various parts will thus remain in the same position until the wheels of the train are free from the entire instrument, when by action of the spring 25, the members of which the two circuit closing elements and the intermediate element are composed, are returned to their original position.

It will be observed that by the coöperative arrangement of the connected bars 19 and the shaft by means of the links 21 and the springs 25, pressure exerted upon any part of said bars, will be distributed over their entire extent so as to effect an even downward motion and that by adjustment of the cushion-spring 15, the latter's tension may be regulated so that the movement of the tongue will be transmitted to the follower only when the passing car exceeds a certain predetermined weight, for the purpose of preventing the closing of the circuit when the tongue is engaged by an instrumentality other than a train, such as, for example, a hand-car or an instrument in the hands of maliciously inclined persons.

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

1. A track instrument for completing a circuit through a signaling device comprising two movable elements arranged successively along a railway track to be actuated by a passing train, electrical contacts associated with one of said elements so as to be brought in engagement when the latter is moved in one direction, and means actuated by movement of the second element, whereby said contacts are separated without affecting the position of the first named element.

2. A track instrument for completing a circuit through a signaling device comprising three movable elements arranged successively along a railroad track to be actuated by a passing train, a pair of electrical contacts associated with each of the outer elements, so as to be brought into engagement when the respective element is moved in one direction, and means actuated by movement of the intermediate element,

whereby the contacts associated with one of said outer elements, are separated without moving the latter and the other outer element is moved without moving its contacts.

3. A track instrument for completing a circuit through a signaling device comprising two movable elements arranged successively along a railway track to be actuated by a passing train, electrical contacts associated with one of said elements so as to be brought in engagement when the latter is moved in one direction, and means actuated by movement of the second element whereby said contacts are separated without moving the first named element.

4. In a track instrument, two movable elements arranged on a railway track to be successively actuated by a passing train, a buffer including a resiliently supported member, normally separated electric contacts, means whereby the movement of said member is converted into a motion of one of said contacts toward the other, a flexible connection between one of said elements and said member, and a means whereby said connection is flexed through the movement of the second element in one direction.

5. In a track instrument, two movable elements arranged on a railway track to be successively actuated by a passing train, a buffer including a resiliently supported member, normally separated electric contacts, means whereby the movement of said member is converted into a motion of one of said contacts toward the other, a toggle jointed thrust-bar between one of said elements and said member, and a means whereby said toggle is broken through movement of the second element.

6. In a track instrument, two movable elements arranged along a railway track to be successively actuated by a passing train, normally separated electric contacts, means for converting the movement of one of said elements into a movement of one of said contacts toward the other, a shaft, means for converting movement of the second element into a rotative motion of said shaft, and a means whereby said shaft-motion is converted into movement of the first element without moving said contacts.

7. In a track instrument, two movable elements arranged along a railway track to be successively actuated by a passing train, a resiliently supported member, a flexible connection between the latter and one of said elements, normally separated electric contacts, means for converting the movement of said member into a motion of one of said contacts toward the other, a shaft, a means for converting motion of the second element into a rotative movement of the shaft, and a means through which said shaft motion effects a flexing of said connection.

8. In a track instrument, two movable ele-

ments arranged along a railway track to be successively actuated by a passing train, a resiliently supported member, a toggle jointed thrust-bar between the latter and one of said elements, normally separated electric contacts, means for converting the movement of said member into a motion of one of said contacts toward the other, a shaft, a means whereby motion of the second element is converted into a rotative movement of said shaft, an arm on the latter and a pitman between said arm and said toggle whereby the latter is broken by the rotative movement of the shaft.

9. In a track instrument, two movable elements arranged along a railway track to be successively actuated by a passing train, a resiliently supported member, a toggle jointed thrust-bar between the latter and one of said elements, normally separated electric contacts, means for converting the movement of said member into a motion of one of said contacts toward the other, a shaft, a means whereby motion of the second element is converted into a rotative movement of said shaft, an arm on the latter, a pitman between said arm and said toggle and a spring arranged to resiliently maintain the parts in their normal position.

10. In a track instrument, two movable elements arranged along a railway track to be successively actuated by a passing train, a resiliently supported member, a flexible connection between the latter and one of said elements, normally separated electric contacts, means for converting the movement of said member into a motion of one of said contacts toward the other, a shaft, a means for converting motion of the second element into a rotative movement of the shaft, a means through which said shaft-motion effects a flexing of said connection and a means whereby said motion is simultaneously converted into a movement of one of said contacts away from the other.

11. In a track instrument, two movable elements arranged along a railway track to be successively actuated by a passing train, a resiliently supported member, a toggle jointed thrust-bar between the latter and one of said elements, normally separated electric contacts, means for converting the movement of said member into a motion of one of said contacts toward the other, a shaft, a means whereby motion of the second element is converted into a rotative movement of said shaft, an arm on the latter, a pitman between said arm and said toggle, and a connection between said arm and one of said contacts whereby the latter is separated from the other during the movement of said shaft.

12. In a track instrument, two movable elements arranged along a railway track to be successively actuated by a passing train, normally separated electric contacts, means

for converting the movement of one of said elements into a movement of one of said contacts toward the other, the other element comprising two bars connected by a plurality of transverse yokes, a shaft, connections between the latter and said yokes whereby pressure exerted upon any part of said bars, effects a rotative motion of the shaft, and a means whereby said shaft motion is converted into movement of the first element without moving said contacts.

13. In a track instrument, two movable elements, arranged along a railway track to be successively actuated by a passing train, normally separated electric contacts, means for converting the movement of one of said elements into a movement of one of said contacts toward the other, the other element comprising two bars connected by a plurality of transverse yokes, a shaft, connections between the latter and said yokes whereby pressure exerted upon any part of said bars, effects a rotative motion of the shaft, a plurality of springs adapted to separately maintain the shaft, resiliently, in its normal position, and a means whereby said shaft motion is converted into movement of the first element without moving said contacts.

14. A track instrument for completing a circuit through a signaling device, comprising in combination with a signaling device two movable elements arranged successively along a railway track to be actuated by a passing train, a pair of electrical contacts associated with one of the said elements so as to be brought into engagement when the latter is moved in one direction, means actuated by the movement of the second element whereby said contacts are separated without affecting the position of the first named element, and means whereby the various parts are returned to their normal positions when the said second element is released.

15. A track instrument for completing a circuit through a signaling device, comprising two movable elements arranged successively along a railway track to be actuated by a passing train, one of the said elements including an elongate member extending along the said track, a pair of electrical contacts associated with the other element so as to be brought into engagement when the latter is moved in one direction, a mechanism for separating said contacts without moving the last named element, and a means whereby pressure exerted upon any point of the said member is uniformly converted into an actuative movement of the said mechanism.

16. A track instrument for completing a circuit through a signaling device, comprising two movable elements arranged successively along a railway track to be actuated by a passing train, one of the said elements including an elongate member extending along the said track, a pair of electrical con-

tacts associated with the other element so as  
to be brought into engagement when the lat-  
ter is moved in one direction, a mechanism  
for separating said contacts, a shaft connect-  
5 ed with the said mechanism so as to actuate  
the same by its rotative movement, and a  
means whereby pressure exerted upon any  
point of the said member is uniformly con-

verted into a rotative motion of the said  
shaft.

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

PHILIP H. SHUE.

Witnesses:

G. J. ROLLANDET,

M. L. GEARY.

10