W. J. COOK.

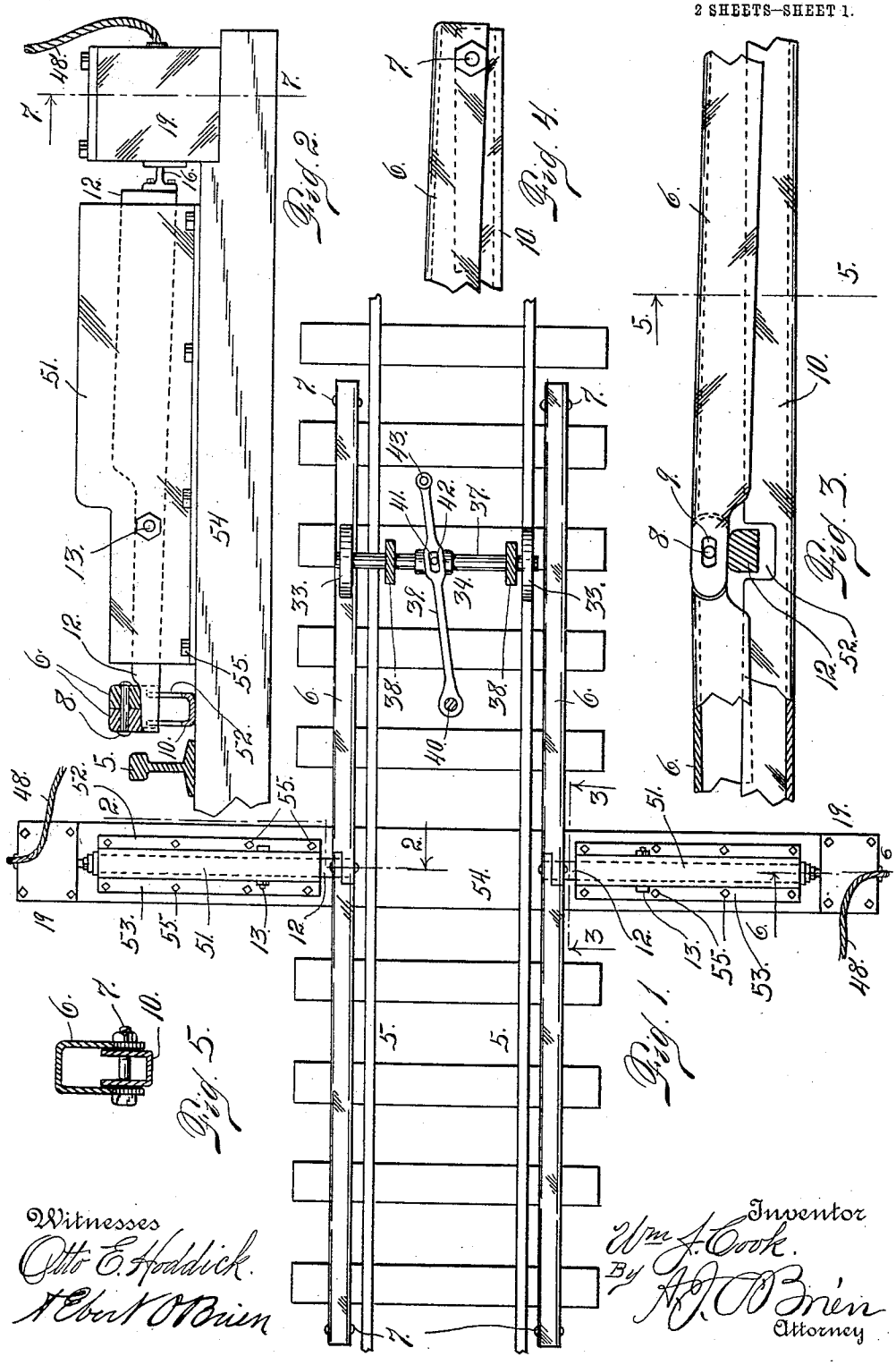
CIRCUIT MAKE AND BREAK DEVICE FOR RAILWAY SIGNALING SYSTEMS.

APPLICATION FILED JAN. 10, 1911.

1,041,966.

Patented Oct. 22, 1912.

2 SHEETS—SHEET 1.



Witnesses
Otto E. Hoddick.
Robert O'Brien

Inventor
Wm. J. Cook.
By A. J. O'Brien
Attorney

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

W. J. COOK.

CIRCUIT MAKE AND BREAK DEVICE FOR RAILWAY SIGNALING SYSTEMS.

APPLICATION FILED JAN. 10, 1911.

1,041,966.

Patented Oct. 22, 1912.

2 SHEETS—SHEET 2.

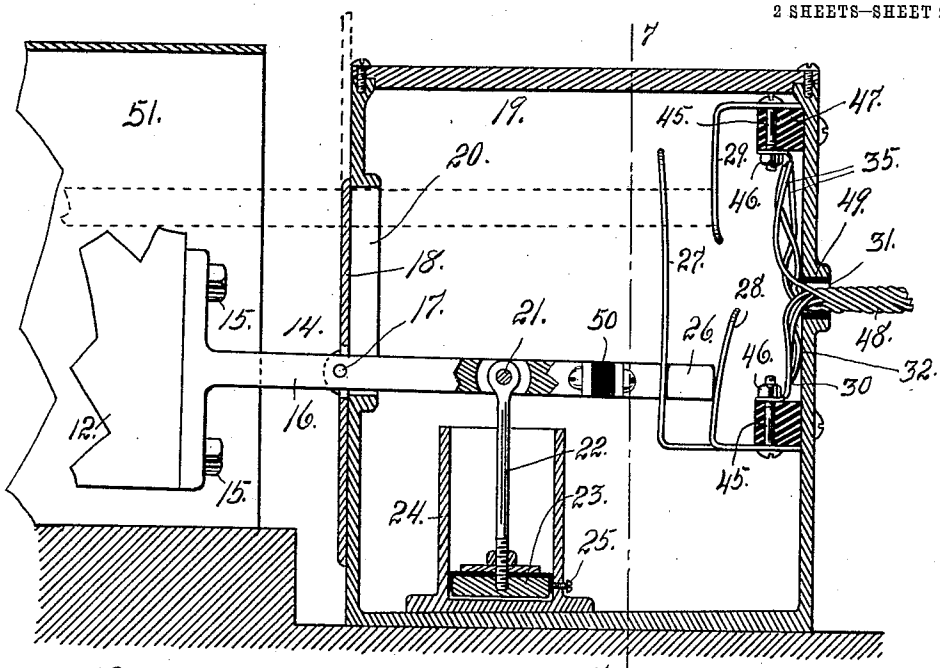


Fig. 6.

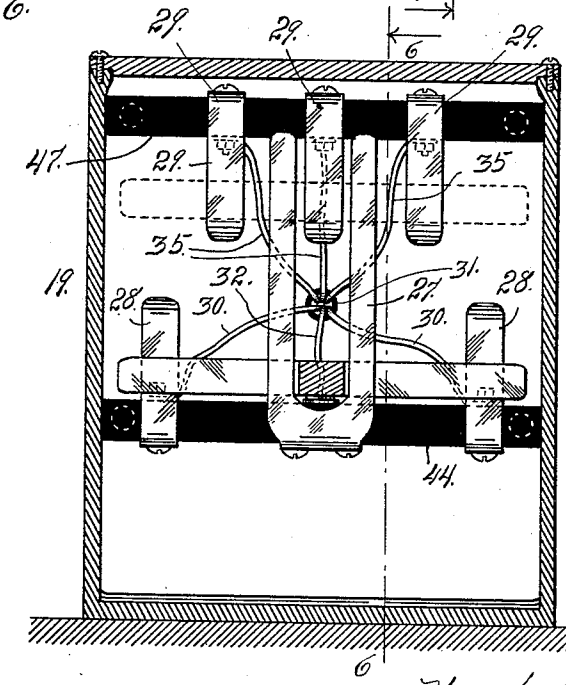


Fig. 7.

Witnesses

Otto E. Haddick.

N. Abert O'Brien

Inventor

Wm. J. Cook.

By A. J. O'Brien

Attorney

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM J. COOK, OF DENVER, COLORADO, ASSIGNOR TO THE COOK RAILWAY SIGNAL COMPANY, OF DENVER, COLORADO, A CORPORATION OF COLORADO.

CIRCUIT-MAKE-AND-BREAK DEVICE FOR RAILWAY SIGNALING SYSTEMS.

1,041,966. Specification of Letters Patent. Patented Oct. 22, 1912.

Application filed January 10, 1911. Serial No. 601,873.

To all whom it may concern:

Be it known that I, WILLIAM J. COOK, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Circuit-Make-and-Break Devices for Railway Signaling Systems; 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, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in means for making and breaking circuits in railway electrical signaling systems; and my improved construction includes means arranged along the track at suitable intervals and actuated by a device carried by the train for making and breaking circuits through the instrumentality of switch mechanism connected in operative relation with the means adjacent the track.

As illustrated in the drawing the means located in proximity to the track consists of two arms connected together at what may be termed their inner extremities and normally maintained at their upward limit of movement by means of a lever, one extremity of which protrudes underneath the connected extremities of the said arms, the arrangement being such that as the train passes, a device carried thereby and suspended preferably from the locomotive, will serve to depress the connected extremities of the two arms and actuate the said lever to operate a switch arm, the movement of the latter serving to interrupt the passage of the current through certain circuits and cause it to pass through other circuits, as may be desired. One set of mechanism is arranged to operate two sets of signals arranged on opposite sides of the track.

My improved mechanism as outlined above is duplicated at intervals on both sides of the track, one set of mechanism being utilized when the train is going in one direction, and the other set when the train is going in the opposite direction.

All apparatus carried by the train is shiftable to cause wheels forming a part thereof to alternately operate the devices on opposite sides of the track. Specifically as illustrated in the drawing, the mechanism carried by the train consists of a shaft longitudinally slidable in suitable supports mounted on the train, the opposite extremities of the said shaft being equipped with wheels or rollers, one of which is always inactive. When the device is in position to act upon the make-and-break mechanism for signaling purposes, one wheel is constantly in position to operate the make-and-break mechanism on one side of the track, but may be readily shifted for operating the mechanism on the other side of the track. While going over a line of track in one direction there is never any necessity for shifting the device carried by the train except when backing up. The device carried by the train may be so adjusted that it will not serve to operate the make-and-break mechanism on either side of the track, as, for instance, when it is desired to run the train without operating signals.

Having briefly outlined my improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing: Figure 1 is a top plan view of a section of track equipped with my improved construction. Fig. 2 is a section taken on the line 2—2, Fig. 1, looking toward the left or in the direction of the arrow adjacent the said line, the parts being shown on a larger scale. Fig. 3 is a section taken on the line 3—3, Fig. 1, the parts being shown on a larger scale. Fig. 4 is a fragmentary view showing a portion of the construction illustrated in Fig. 3, and it may be said that the construction illustrated in Fig. 4 is broken from the right-hand extremity of Fig. 3 for lack of room on the sheet. Fig. 5 is a section taken on the line 5—5, Fig. 3. Fig. 6 is a section taken on the line 6—6, Figs. 1 and 7, the construction being shown on a scale greatly enlarged as compared with Fig. 1. Fig. 7 is a section taken on the line 7—7, Figs. 2 and 6.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the rails of a track of any suitable gage. Arranged outside of the rails and on each side of the track are two companion arms 6 pivotally connected at their outer extremities as shown at 7, their inner extremities being connected by a pin 8 which passes through slotted openings 9 formed therein, the adjacent extremities of the two arms being partially cut away where they are connected together so that at the point of connection the extremities of the two arms have only the same thickness as the body portion of each arm.

As illustrated in the drawing the arms 6 are channel-shaped and straddle a relatively stationary U-shaped member 10 with which the arms 6 are pivotally connected at the point 7. The sides of the arms 6 occupy positions outside of the adjacent side members of the part 10.

The connected extremities of the two arms 6 are normally held at their upward limit of movement (see Fig. 3), by one extremity of a lever 12 extending at right angles to the arms 6 and fulcrumed at 13. The short arm of the lever projects beneath the connected extremities of the arms 6, while its longer and heavier arm is of sufficient weight to normally hold the arms 6 at their upward limit of movement. The weighted extremity of the lever 12 is equipped with a T-shaped member 14, the head of the said member being secured to the lever by means of bolts 15. The main arm 16 of the T-shaped member is pivotally connected as shown at 17 with a plate 18 slidably mounted on the adjacent side of a switch box 19, the said plate being arranged to close an opening 20 in the box through which the part 16 passes. The inner portion of the part 16 is pivotally connected as shown at 21 with a rod 22 carrying a piston 23 located in a cylinder or casing 24, constituting a dash pot, a screw 25 being inserted in an opening at the bottom of the casing for the purpose of regulating the exit or inlet of air, depending upon the direction of the piston's movement. The extremity of the part 16 within the switch box is equipped with a transversely arranged member 26 which projects for a considerable distance on each side of the part 16, whereby it is of sufficient length to engage a number of contacts located within the box.

As illustrated in the drawing the member 26 is constantly in engagement with a centrally located contact 27, and alternately in engagement with two contacts 28 or three contacts 29, the contact 27 being utilized to complete the circuit through either set of contacts 28 or 29, according to the position of the lever 12. When this lever 12 is in its normal position (see Figs. 2 and 3 of the drawing), the member 26 is at its downward limit of movement, being in engagement with the two contacts 28 which are connected with conductors 30 which enter the box through an opening 31 and may lead to translating devices of any kind, the circuits being completed through a conductor 32 and the contact 27. This is the normal position of the lever and the switch box mechanism, or the position of the said parts in the absence of a train. However, during the passage of a train one of the wheels 33 of the apparatus 34 carried by the train, acts upon the arms 6 to depress the connected extremities of the said arms, whereby the lever 12 is actuated to lift its weighted extremity and throw the member 26 from its lowermost position indicated by full lines in Figs. 6 and 7 to its uppermost position as indicated by dotted lines in the same figures. In this event the circuits are broken through the contacts 28 and closed through the three contacts 29, which are connected with conductors 35 passing through the openings 36 of the switch box and leading to translating devices of any kind, the said circuits being completed through the central contact 27 as heretofore explained.

Attention is called to the fact that the wheels 33 of the apparatus 34 carried by the train are journaled on the extremities of an endwise movable shaft 37 carried by depending members 38 attached to the train, preferably being connected with the locomotive.

As illustrated in the drawing (see Fig. 1), the apparatus 34 is in such position that one of its wheels 33 engages one of the arms 6 on the right-hand side of the track, assuming that the train is traveling toward the left. Now when the train is traveling in the opposite direction, or if the train should back up, this shaft may be shifted so that its opposite wheel 33 shall engage one of the arms 6 of the duplicate apparatus on the opposite side of the track. This is accomplished through the instrumentality of an operating arm 39 pivoted on the train as shown at 40. This arm 39 has a centrally located slot 41 into which a pin 42 mounted on the shaft 37 protrudes. The extremity of the arm 39 remote from the pivot 40 is equipped with an upwardly projecting part 43 located within convenient reach of the trainmen, preferably within reach of the engineer of the locomotive. It will be understood from an inspection of the drawing that by moving this arm in one direction or the other, the shaft 37, which is slidable in the supports 38, may be shifted to throw the wheels 33 carried by the said shaft alternately into and out of engagement with the members 6 on the same side of the track. Or by a more limited movement, the wheels 33 may both occupy positions intermediate the track rails and the

members 6, whereby when the train is in motion the signaling operating mechanism will not be molested.

Attention is called to the fact that my improved mechanism arranged along the track and adapted to be acted upon by passing trains, may be connected with any suitable switch mechanism. In other words, it must be understood that the invention is not limited to the operation of the special mechanism illustrated in Figs. 6 and 7, it being evident that through the instrumentality of suitable connections, the operating arms 6 may serve to make and break signaling circuits through the instrumentality of switch mechanism of any suitable character.

The three contacts 27, 28 and 28 are mounted upon a bar 44 composed of insulating material, the contacts being connected with the insulating bar by bolts 45 passed through the bars, their opposite extremities being connected with their respective conductors by means of nuts 46. In a similar manner the three contacts 29 are mounted on an insulating bar 47.

In order that the transverse member 26 may form a good electrical contact, it is interposed between the common contact 27 on one side and the contacts 28 or 29 on the other side as the case may be, the arrangement of the contacts being such that the member 26 forms a comparatively close fit between the central contact 27 and the cooperating contacts 28 or 35, depending upon the position of the member 26 and its attachments.

All of the conductors 30, 32 and 35 after passing through the opening 31 in the switch box or casing, are twisted into a sort of cable 48 (see Figs. 2 and 6). This opening 31 is lined with insulating material 49 to prevent possible escape of the current to the metal box or casing 19.

In order to prevent the current from passing through the T-shaped member 14 and its connections, an insulating part 50 is interposed in the part 16 of this device a short distance from the member 26 which directly engages the contacts, since it is my object to avoid as far as possible any dissipation of the current.

In order to protect the lever 12 as far as possible from the weather, it is inclosed by a housing 51, in the opposite sides of which the fulcrum bolt 13 is supported. This housing is open at its extremities to allow the lever 12 to protrude therefrom, and the housing is made sufficiently large to allow the lever the necessary movement. In order to allow the inner extremity of the lever 12 to move downwardly the necessary distance in order to move the member 26 the proper degree to perform its function, the U-shaped bar 10 is cut away as shown at 52 directly beneath the lever.

As illustrated in the drawing the housing 51 is provided with bottom exteriorly projecting flanges 52 and 53 which are secured to a supporting beam 54 by means of bolts 55.

Having thus described my invention, what I claim is:

1. In a circuit make and break device, adapted for use in operating railway signals, the combination of arms pivotally connected with a relatively stationary support at their outer extremities, the inner extremities of the arms being jointed to permit a limited degree of movement, contacts, an operative connection between the said contacts and the connected extremities of the pivoted arms including a lever fulcrumed between its extremities, one extremity of which supports the pivoted arms in position to be depressed, the opposite extremity of the lever having a switch member insulated therefrom and adapted to engage the contacts, suitable means mounted on the train for depressing the said arms while the train is passing the section of track where the arms are located, and means connected with the lever for retarding the circuit breaking movement of the same.

2. In an apparatus of the class described, the combination of pivoted arms arranged in pairs along the sides of the track, and out of alinement with the track rails, each pair of arms having their adjacent extremities connected to permit a limited degree of vertical oscillation, a plurality of contacts, an operative connection between the contacts and the pair of pivoted arms, including a lever, one extremity of which normally supports the pivoted arms in a position to be depressed by applying the necessary force, the other arm of the lever being provided with a switch member adapted to engage the contacts, means mounted on the train and arranged to act on the pivoted arms to depress the latter for switching purposes, and a second means connected with the lever for retarding the circuit-breaking movement of the same.

3. In an apparatus of the class described, the combination of arms pivotally connected with a relatively stationary support at their outer extremities, the inner extremities of the arms being jointed to permit a limited degree of movement, a plurality of contacts, a lever fulcrumed between its extremities, one extremity of which normally supports the arms in position to be depressed, the opposite extremity of which is provided with a switch member adapted to engage the contacts, means mounted on the train and arranged to act on the pivoted arms, to depress the latter for switching purposes, and means connected with the lever for retarding the circuit-breaking movement of the same, for the purpose set forth.

4. In an apparatus of the class described, the combination with a member jointed to permit a limited degree of oscillating movement, and pivoted to a relatively stationary support at its extremities remote from the joint, a plurality of contacts arranged in sets, an operative connection between the sets of contacts and the jointed member, comprising a lever fulcrumed intermediate its extremities, one extremity of which is engaged by the said jointed member and supports the latter in the raised position, the opposite extremity of the lever being provided with a switch member adapted to alternately engage the contacts of each set, means mounted upon the train for depressing the jointed member sufficiently for changing the position of the switch member, and means pivotally connected with the lever for retarding the circuit-breaking movement.

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

WILLIAM J. COOK.

Witnesses:
F. E. BOWEN,
A. EBERT O'BRIEN.