G. W. NISTLE, E. INSKIP & B. W. BRADY.

BLOCK SYSTEM FOR RAILWAYS.

APPLICATION FILED JUNE 15, 1908.

928,274.

Patented July 20, 1909.

3 SHEETS—SHEET 1.

Fig. 1.

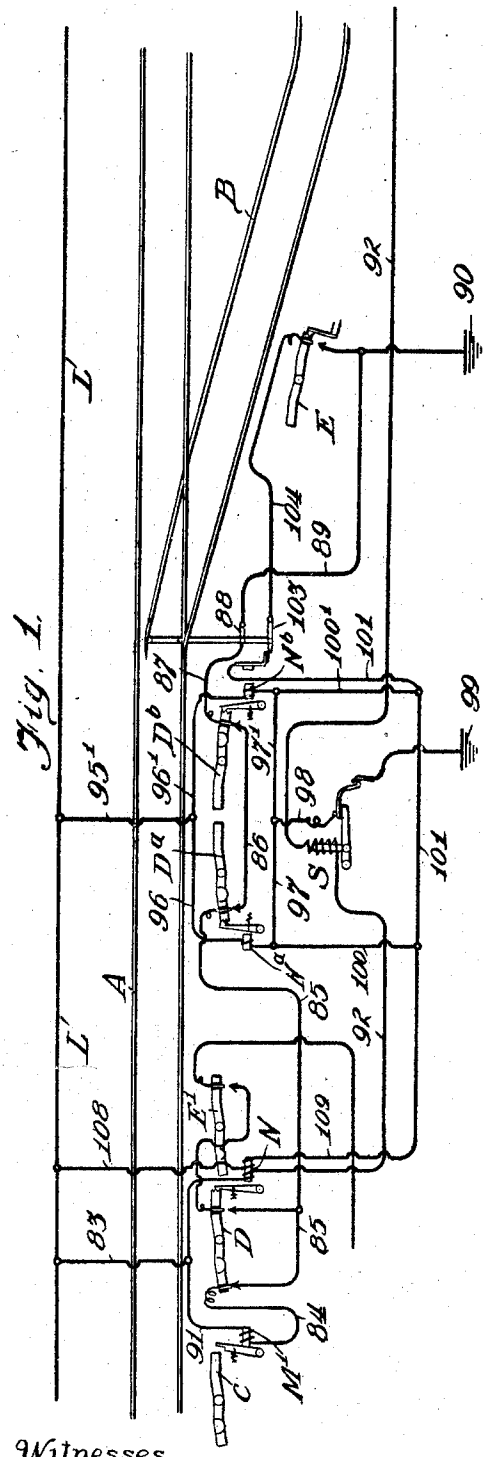


Fig. 2.

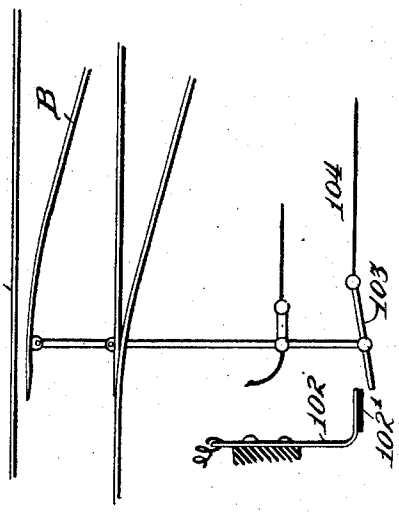
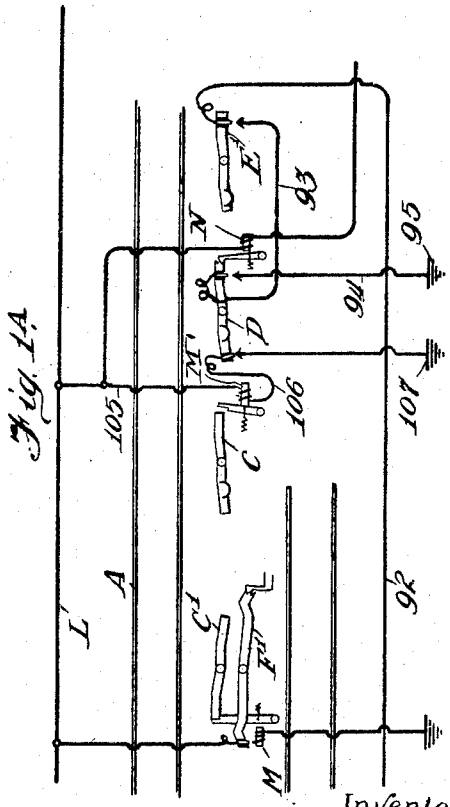


Fig. 1A.



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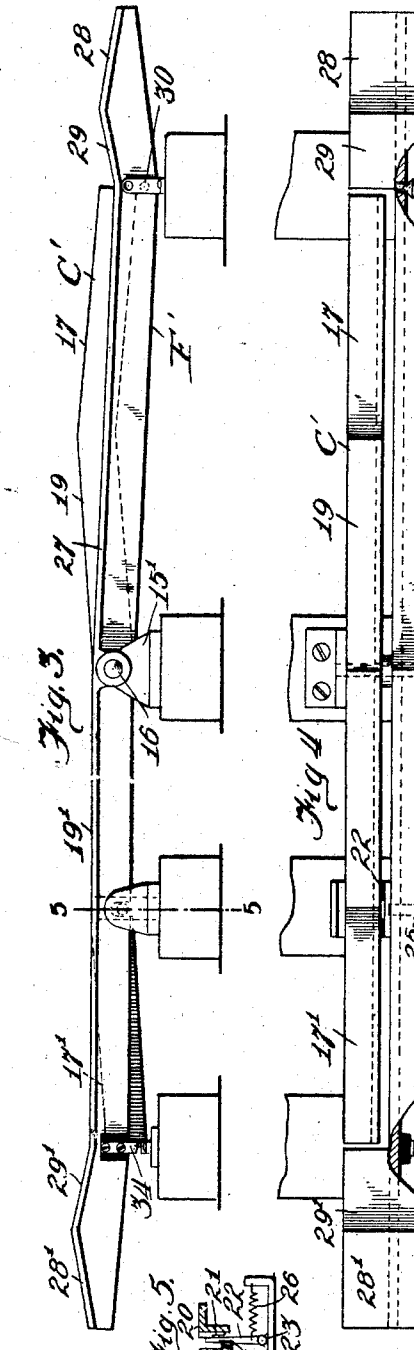
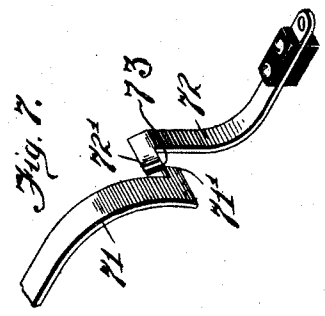
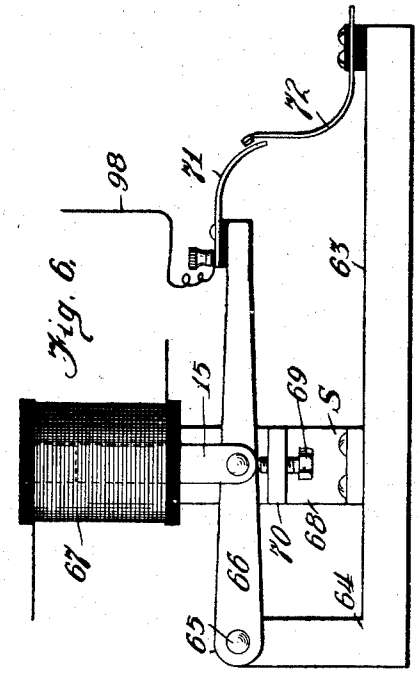
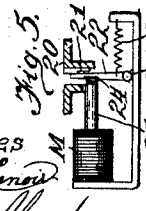
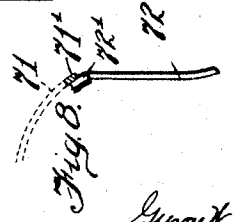
3 SHEETS—SHEET 2.

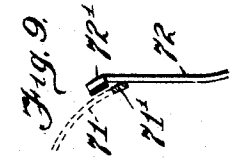












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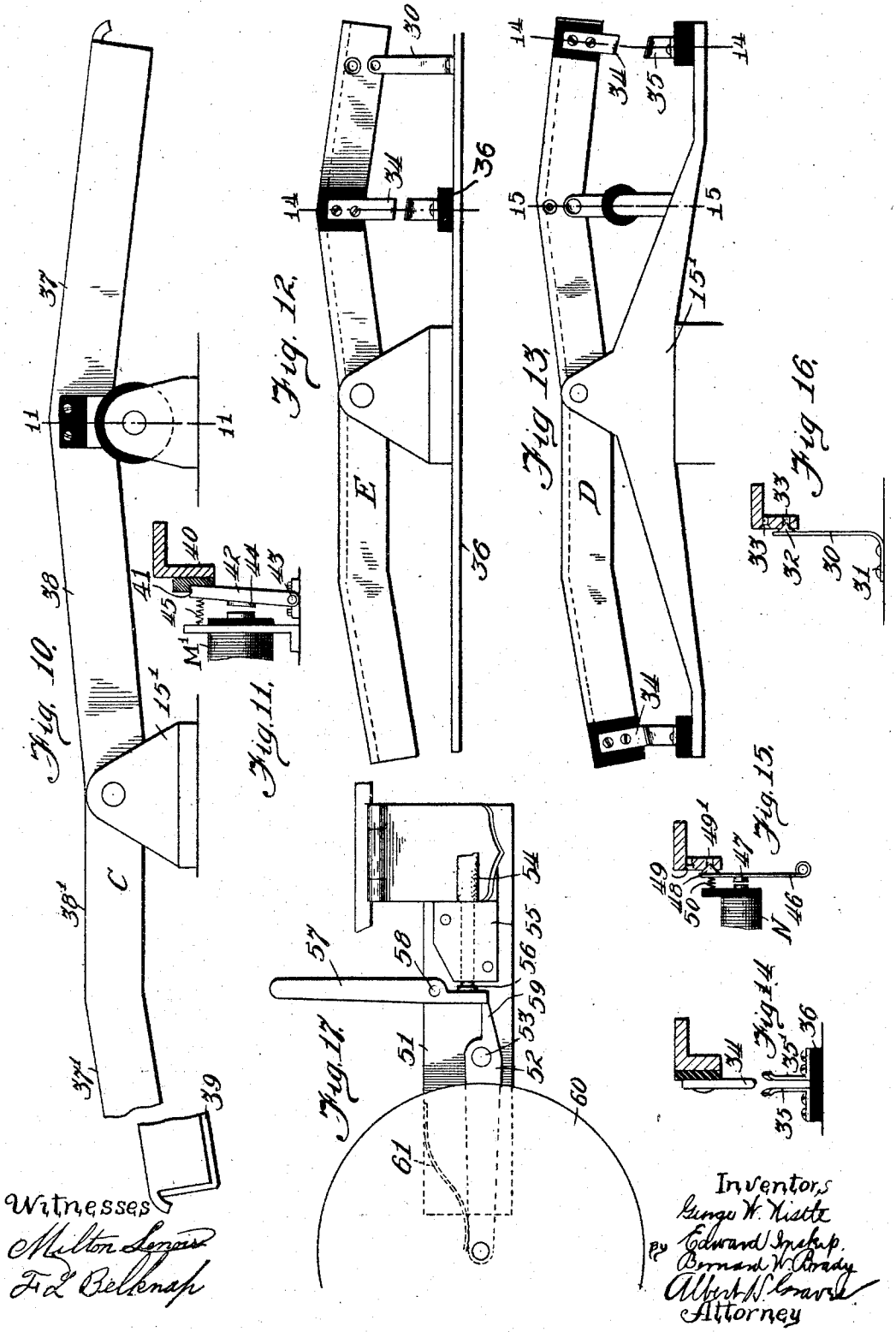
3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

GEORGE W. NISTLE, OF NORTH MUSKEGON, MICHIGAN, AND EDWARD INSKIP AND BERNARD W. BRADY, OF CHICAGO, ILLINOIS.

BLOCK SYSTEM FOR RAILWAYS.

No. 928,274. Specification of Letters Patent. Patented July 20, 1909.

Application filed June 15, 1908. Serial No. 438,494.

To all whom it may concern:

Be it known that we, GEORGE W. NISTLE, residing at North Muskegon, in the county of Muskegon and State of Michigan, and EDWARD INSKIP and BERNARD W. BRADY, residing at Chicago, in the county of Cook and State of Illinois, all citizens of the United States, have invented certain new and useful Improvements in Block Systems for Railways, of which the following is a specification.

This invention relates to improvements in block systems for railways, and refers more particularly to improvements in a system of that general type in which mechanism located along the track coöperates with mechanism upon the train to automatically arrest the latter in case the train be sent into a block, the mechanism of which is set at danger.

Among the objects of the invention are to provide a system which is substantially completely automatic in its arresting functions, and so constructed as to substantially eliminate the personal equation, thus reducing the danger feature to the minimum; to provide a system which is more particularly adapted for use in a block having a siding, whereby a train entering the block sets the block at danger but automatically returns it to cleared position when the train has entered the siding and the switches have been restored to closed position; to provide in such a system means whereby a train passing out of the siding immediately restores the block to danger position in order that it may protect itself while it remains upon the main track within the block; to provide in such a system simple mechanism for coöperating with the air-brake with which nearly all trains are now equipped, whereby said air-brake mechanism is brought into operation automatically in case the blocking conditions are such that this should be done; to provide in such a system novel arrangement and construction of the train-actuated instruments and circuit connections thereof, and in general to provide an improved construction of the character referred to.

The invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims.

In the accompanying drawings—Figures 1 and 1[A] taken together show diagrammatically an embodiment of the system as applied to one track only of a double track railway, and having a siding opened at one end; Fig. 2 is an enlarged diagrammatic view of the switch mechanism, and showing more particularly the arrangement of the contact devices connected therewith; Fig. 3 is a side elevation of the combined levers which are adapted to arrest a backing train; Fig. 4 is a plan view of the construction shown in Fig. 3, parts being broken away to more clearly show details of construction; Fig. 5 is a sectional detail taken on lines 5—5 of Fig. 3; Fig. 6 is a side elevation of the solenoid operated lever and associated contact devices; Figs. 7, 8 and 9 are detail views showing the various positions of the devices shown in Fig. 6; Fig. 10 is a side elevation of one of the track instruments hereinafter designated the "blocking lever"; Fig. 11 is a cross sectional view taken on lines 11—11 of Fig. 10; Figs. 12 and 13 are side elevations of different track instruments which are actuated by the controller wheel carried by a train; Fig. 14 is a sectional detail view taken on lines 14—14 of either Fig. 12 or Fig. 13; Fig. 15 is a sectional detail taken on lines 15—15 of Fig. 13; Fig. 16 is a sectional detail of the friction latch mechanism shown in Figs. 3 and 12; Fig. 17 is a detail side elevation of the controller wheel and associated parts and their mountings, part of the wheel being broken away to reduce the size of the drawing.

In carrying the present invention into effect we employ a novel type of train-actuated circuit-controlling track instruments in combination with train-actuated blocking levers, electrically controlled by the contact controlling levers. Each of these track instruments has as its main feature a lever pivotally mounted upon its ends and provided with one or more tread surfaces whereby it is actuated by the passage thereover of a controller wheel carried by a train. This controller wheel is under certain conditions raised or forced upwardly by the blocking levers and thereby causes the venting of the train-pipe of the automatic air-brake mechanism of the train, and thus bringing about the arresting of the latter.

Various other novel features of construction and arrangement will hereinafter be more particularly described.

The system herein described is so ar-

ranged as to automatically place the block in danger condition when the train enters the same, and also automatically clears it when a train has either passed out of the block or into a siding and the switches are restored to closed position. The system is also so arranged as to automatically restore the block to danger when a train within the siding passes out onto the main track.

In the drawings, A designates as a whole a railroad track, B a siding, open at one end, and C, D, D^a, D^b, E and E′ train-actuated instruments which together form a coöperative set. F′ and C′ constitute a pair of combined levers which will permit a train to pass over them only in a forwardly direction. S designates a solenoid-operated switch.

Inasmuch as the several track instruments are differently constructed, and these differences involve different operations, the construction of said instruments will first be described.

Referring to Figs. 3 and 4, the instruments there shown are the combined levers C′, F′. Each lever is pivotally mounted at 16 on a base plate 15′, which is adapted to be secured to a cross tie or other suitable support upon the roadbed. Describing first the lever C′, it is made of angle iron so as to be both light and strong, and it is bent to provide oppositely inclined end tread surfaces 17, 17′, and downwardly inclined converging intermediate tread portions 19, 19′. This lever is mounted adjacent to the track and is adapted to be oscillated by the traversing thereover of the controller wheel carried by the train. The rear end of this lever is weighted so that its forward end will be elevated, except when depressed by the passage of the train. This lever serves the purpose of a blocking lever, and the downward movement of its rear end is positively controlled by a spring latch which is in turn controlled by a magnet M. Describing this latch mechanism, upon the inner side of the lever C′ is mounted a latch block 20, having a shoulder 21, with which is adapted to cooperate a spring-latch 22 pivoted at its lower end, as indicated at 23 and carrying an armature 24 which is acted upon by the magnet M. The magnet has a reduced core extension 25 which extends through an undercut part of the lever F′ to act upon the armature of the latch. A spring 26 tends to withdraw the latch from the magnet and into engagement with the latch block 20. Describing, now, the instrument F′, this lever comprises a relatively long central portion 27, downwardly inclined end portions 28, 28′, respectively, and downwardly inclined converging intermediate tread portions 29, 29′. The position of this lever is controlled by a friction latch mechanism at its forward end, which is adapted to hold the lever yieldingly in either of its two positions in which it happens to be left. Referring more particularly to Fig. 16, this friction latch mechanism comprises a spring plate latch 30, secured at 31 to a base plate end 32 which coöperates with the corresponding recesses 33 formed in the side face of the lever F′ and at suitable points corresponding to the two positions of the lever. This latch is adapted to be normally spring-pressed against the lever F′. Upon the rear end of this lever F′ is fixed a contact plate 34 (Fig. 14) insulated from the body of the lever and adapted to coöperate with a pair of contact plates 35, 35′ mounted upon a suitable fixed support 36 below the lever.

Referring to Fig. 10, the instrument there shown is the one designated C and which is adapted to serve as the blocking lever. This lever is similar in construction to the lever C′ before described, and is bent to provide oppositely inclined tread surfaces 37, 37′, at its ends, and intermediate converging tread portions 38, 38′. This lever is similarly mounted on a base 15′ and weighted at its end as indicated at 39. This instrument is provided at its forward end with a latch mechanism similar in construction to the latch mechanism of the lever C′. Describing this latch mechanism, and referring more particularly to Fig. 11, upon one side of the lever is mounted a latch block 40 having a shoulder 41 with which is adapted to coöperate a latch 42 pivoted at its lower end, as indicated at 43, and carrying an armature 44. This armature is acted upon by a magnet M′, which, when energized, draws the latch away from the block 40. This latch mechanism is adapted, when in locked position, to prevent the depression of the forward end of the lever by the controller wheel on a train, and thus set the air-brake, should the train try to pass over this lever when in blocked position.

In Fig. 13 is shown the instrument designated D in the diagram. The shape of this lever is, or may be, similar to the shape of the lever C just described, and is similarly mounted upon a base plate 15′. The forward end of this lever is provided with a friction latch mechanism adapted to hold the lever yieldingly in either of its two positions in which it happens to be left. This friction latch mechanism comprises a magnet N arranged to act upon the pivoted latch member 46, carrying an armature 47 and provided with a conical or double inclined engaging end 48 which coöperates with correspondingly shaped recesses, as 49, 49′, formed in the side face of the lever and at suitable points corresponding to the two positions of this lever. This latch is held normally in engagement with the lever by means of an expansion spring 50 interposed between the latch and the head of the magnet spool. Upon either end of this lever D is

fixed a contact plate 34 each of which co-operates with a pair of stationary plates as shown in Fig. 14. The rear end of this lever carries a single contact plate 34 coöperating with a pair of contact plates 35, 35′; it being understood that these contact devices may be identical with each other.

The levers D^a, D^b, shown in the diagram, are, or may be, exactly like the lever D just described, with the exception that they are each provided with only one set of contacts, viz: on their read ends. For convenience, the magnetically-operated friction latch mechanisms are shown at the rear ends of the levers D^a, D^b, in the diagram, but the position of these friction mechanisms is obviously immaterial.

In Fig 12 is shown the instrument E. This instrument is in construction generally similar to the instrument D just described. It is provided, however, with only one contact 34 which is fixed at its forward end and co-operates with the stationary contacts on the base member 36. The friction latch mechanism may be exactly similar in construction to the friction latch which coöperates with the forward end of the lever F′, and is shown in detail in Fig. 16. It will be seen that this instrument E is adapted to remain in whatever position it may be left by the passage of the train. Inasmuch as it is to be shifted positively from one position to another, it is unnecessary to provide means for withdrawing this latch so as to permit the lever to return to normal by gravity. The instruments E′, shown in the diagram, are similar to the levers C, except that they are provided with a single contact device, shown in Fig. 14.

Next describing the controller wheel and its associated parts, and referring to Fig. 17, upon a suitable part of the train, as for example upon the journal box of one of the axles of the tender, is mounted a frame designated as a whole 51, and which in turn carries a lever 52 pivotally mounted between its ends, as indicated at 53. A pipe 54 connected with, and leading from, the air train pipe of the train extends through a suitable block or support 55 upon the frame 51 and terminates in a cap 56 which is normally held upon the pipe and tends to close and seal the latter by means of an upright lever 57 pivoted upon the frame, as indicated at 58. This lever is held in position to retain the cap 56 by an extension 59 of the lever 52; the arrangement being such that when this end of the lever is depressed it releases the lever 57 and vents the train pipe. Upon the longer end of the lever 52 is mounted the controller wheel 60, which coöperates with the several levers hereinbefore described. This controller wheel is provided with a relatively wide tread of sufficient width to simultaneously engage two of the levers of the track instruments which may be arranged in overlapping relation with each other, as the levers C′ and F′. The wheel is held against rising until it encounters a lever which is held positively in fixed position, by a relatively stiff spring 61 mounted upon the frame 51 and bearing upon the upper side of the lever 52. When the controller wheel has been lifted so as to release the lever 57, vent the train-pipe and so apply the brakes and arrest the train, the parts associated with the controller wheel may be restored to their normal position manually by the trainmen.

Referring, now, to Fig. 6, there is shown a solenoid-operated contact controlling device designated as a whole S. Describing this instrument, upon a right angled extension 64 of a suitable base plate 63 is pivotally mounted at 65 a contact controlling lever 66. This lever is electrically actuated by a solenoid 15 and solenoid spool 67. The spool is mounted upon a frame support 68 secured to the base 63, and the solenoid core 15 is pivotally connected to the lever 66 and extends within the spool as shown. In order to adjustably limit the downward movement of the lever 66 an adjusting screw 69 is provided which extends through a block 70 mounted upon the face of the frame support 68. Upon the outer end of the lever 66 is mounted, and insulated therefrom, a spring contact device 71 which coöperates with a somewhat similar spring contact 72 mounted upon the base 63 and insulated therefrom. These contact devices are so arranged that when the lever is in its normal lowermost position the contact devices are open. These contact springs are each provided with a shoulder portion 71′, 72′, respectively, as shown more clearly in Fig. 7. When the solenoid spool 67 is energized the core 15 raises the lever 66, and the shoulder 71′ of the spring 71 thereupon wipes by the shoulder 72′, thus making a momentary electrical contact between the two springs. As the upper spring wipes past the lower one, the former springs upwardly and the lower one downwardly, thus changing their positions relatively to each other. As the lever returns to its normal position by gravity the shoulder 71′ will now ride over the upper face of the shoulder 72′ but will fail to make any electrical contact therewith inasmuch as the upper face of the shoulder 72′ is insulated, as shown at 73.

The circuits of the system which utilizes the mechanism just described will now be traced. Referring to the diagrammatic figures 1 and 1^A, the system is therein shown as organized for controlling a single track, *i. e.* a track over which a train normally passes in one direction only, as is usual where double tracks are employed. This single way track is, as shown, provided with

a siding open at one end only. It is to be observed that the several contact levers are all shown in their normal positions. The several levers and their magnets are designated by the same numerals used in describing these mechanisms. At the entrance to the block, the lever C is in unlocked position, so that it may be oscillated freely in either direction, inasmuch as the magnet M′, which withdraws the controlling latch 42, is at this time energized. The circuit which energizes this magnet extends from the feed line L by way of conductor 83, magnet M′, conductor 84, rear contacts of lever D to conductor 85, from conductor 85 to the contacts of lever D^a and conductor 86 to the contacts of lever D^b. From thence the circuit extends by way of conductor 87 to the manually operated switch contact 88, to ground at 90 by way of conductor 89. Inasmuch as the contact devices through which this circuit extends are all normally closed, the magnet M′ is normally energized, the latch withdrawn and the blocking lever C in cleared position. A train entering the block will thus freely pass over the lever C and next encounter the rear lever D, and as it passes over this lever depress its forward end, thus elevating its rear end. The forward end of this lever D′ will remain in this position by reason of its friction latch mechanism, inasmuch as the controlling magnet N is at this time deënergized and the latch free to engage the lever. The circuit which energizes the magnet N may be traced as follows: from feed line L to conductor 83, thence by branch conductor 91 through the windings of magnet N to conductor 92 to the forward end of the block, thence through the contacts of forward lever E′ to conductor 93, to the forward contacts of lever D and thence to conductor 94 and to ground at 95. This circuit is at this time broken at the forward contacts of forward lever D, inasmuch as this lever is in its normal position, *i. e.* having its front end elevated. It is to be noted that the conductor 92 of the solenoid spool 67, and the circuit just described, controls the contact devices 70, 71, as will hereinafter more clearly appear. When the train passes over the rear lever D to open the contacts at the rear end of this lever, the contacts remain open, as just described. This, of course, opens the normally closed circuit which controls the rear magnet M′, releasing its latch and setting the rear end of the block at danger; it being remembered that the rear contacts of lever D are included in the circuit of magnet M′. After the train has passed over the lever D, it next encounters the lever E′, thus clearing the block at the rear, as will hereinafter more clearly appear, but without performing any electrical function as far as the block in question is concerned. The train proceeding passes over the levers D^a and D^b, opening the contacts on the lever D^a, and first opening and then closing the contacts on the lever D^b, it being noted that these levers are arranged to extend in opposite directions. The contacts on the lever D^a remain in open position for the reason that its controlling magnet N^a is at this time deënergized.

The various circuit connections which control the magnets N^a, N^b, will now be traced. Describing first the circuit controlled by the solenoid-operated instrument S, this circuit extends from feed line L, conductor 95′, branches 96, 96′, through the windings of the respective magnets N^a, N^b, to conductor 97, 97′, respectively, thence by way of common conductor 98 to the contact devices 71, 72, to ground at 99. These contact devices are normally open, and it will be remembered are closed only on the energizing of the solenoid spool. This circuit, which includes this spool is, however, at this time open at the forward contacts of forward lever D, as hereinbefore described. The other circuit which controls the magnets N^a, N^b, extends as follows: from line L to conductor 95′, branch conductors 96, 96′, respectively, windings of the magnets N^a, N^b, to corresponding conductors 100, 100′, connected to a common conductor 101; from conductor 101 this circuit extends to a flexible contact spring 102, coöperating with manually controlled switch spring 103, conductor 104, contacts of lever E to ground at 90. This circuit is normally open at the contacts of lever E and also at the spring contact 102, as shown in Fig. 2. The operation of this mechanism will be more fully described in connection with a train passing onto a siding. It is sufficient to note at present that both the magnets N^a and N^b are thus normally deënergized. As the train passes on through the block and reaches the forward end thereof, its controller wheel encounters the combined levers C′, F′. When it meets these levers it will first depress the rear end of the lever F′, thus closing the circuit which energizes the magnet M, withdrawing the blocking latch and placing the lever C′ in unlocked position. While the rear end of the lever F′ is still depressed, the controller wheel encounters and rides safely over the lever C′. The controller wheel as it rides forwardly next depresses the forward end of the lever F′, lifting the rear end thereof and thus breaking the circuit controlled by the contacts of the lever F′, whereupon the blocking latch mechanism returns to normal position. It is, of course, apparent that a train can pass over these combined levers only in a forwardly direction inasmuch as a backing train will never be able to close the contacts of the lever F′ in order to place the blocking lever C′ in

cleared position. The controller wheel next encounters and rides freely over the forward blocking lever C inasmuch as the magnet controlling the latch mechanism associated with this lever is normally energized. The circuit of this forward magnet M′ extends as follows: from line L to conductor 105 through the winding of magnet M′, to conductor 106, thence through the rear contacts of forward lever D (normally closed) to ground at 107. When the wheel reaches the forward lever D, it will ride over the rear end of the latter without performing any electrical function, inasmuch as it already is in its normal position, *i. e.* with its rear end depressed. When the wheel depresses the forward end of the lever, however, it will break the circuit which energizes the forward magnet M′ and set the block it is just entering at danger; at the same time it will close the contacts on the forward end of lever D. The wheel next passes over the lever E′ pressing the forward end of the latter. This closes the circuit heretofore described which energizes the rear magnet N, which thereupon withdraws its latch and permits the rear lever D to return to normal position. At the same time the magnet N^a and N^b will be momentarily energized and their latches withdrawn inasmuch as the closing of the above circuit operates the solenoid S and momentarily puts on the ground 99. The closing of the solenoid-controlled circuit of these magnets permits the contacts of the lever D^a, which were opened by the passing train, to return to normal closed position by gravity, as heretofore described. Assuming, now, that a train which has fully entered the block, desires to pass onto the siding, and that the switch is open for that purpose. As the train passes over the levers D^a, D^b, it leaves the contacts on lever D^a in open position, the block, however, being already in danger position through the opening of the rear contacts on lever D. When the train is entering the siding the switch contacts 88 and 103 are, of course, open. As the train passes onto the siding the controller wheel encounters the lever E and closes the contacts controlled thereby. Assuming, now, that the train desires to remain within the siding, in order to permit another train to pass through the block, the switchman merely closes the switch, whereupon the block is automatically restored to normal cleared position, as will now be described.

Referring to Fig. 2, it will be noted that the flexible spring contact 102 is provided upon its lower face with an insulating block 102′. It will thus be seen that when the switch is in closed position the switch contact 103 is insulated from the flexible contact 102. However, as the switch was being closed, after the train had entered the siding, the contact 103 wiped over the uninsulated face of the spring 102 and momentarily established circuits which energized the magnets N and N^a, withdrawing the respective latch members and permitting the levers D and D^a to return to normal. The circuit of the magnet N thus established may be traced as follows: from line L to conductor 108, windings of the magnet N, branch conductor 109 to common conductor 101, thence by way of coöperating switch contacts 102 and 103 to conductor 104, and thence by way of the contacts of the lever E to ground at 90. The circuit of the magnet N^a extends from line L to conductor 95′ through the windings of the magnet N^a to conductor 100 and thence over conductor 101 to ground, as above described. The contacts on the rear end of lever D and D^a being thus restored to normal closed position, the magnet M′ is energized and the block restored to normal. After a second train has passed through the block, the switch may again be opened to permit the train on the siding to return to the main track. When the train backs out of the siding it opens the contacts on lever E and restores that lever to the position in which it first found it. As the train backs onto the main track it first opens the contacts at the lever D^b, thus opening the circuit of the rear magnet M′ and placing the block again in danger position in order to protect itself from the rear. After the switch is closed the first train can pass out of the block. As it passes over the levers D^a it opens the contact on this lever, which remains open for the reason that the circuits which energize the magnet N^a are open. The contacts of the lever D^b are first opened and then restored to normal closed position. The contacts of the lever D^a remain in open position until the train passes out of the block, thus opening the circuit of the magnet M′ and keeping the block in danger condition. As the train passes over the lever D in the forward end of the block it closes the contacts on the forward end of this lever, unless they are already in this position. These contacts remain closed by means of the associated friction latch mechanism. As the first train now passes over the lever E′ it mementarily closes the contacts associated with this lever, thus closing the circuit which energizes the instrument S. This circuit may be traced as follows: from line L by way of conductor 83, to conductor 92, thence through the windings of the solenoid instrument S to the forward end of the block, through the contacts of forward lever E′ and the contacts of forward lever D to ground at 95. As soon as the solenoid instrument S is energized it operates its lever, which puts on the ground 99, energizes the magnet N^a, which thereupon withdraws its

latch and permits the lever D^a to return to normal. The block is now cleared at the rear.

We claim as our invention:

1. In a railway block system, the combination with a length of track, of a blocking lever pivotally mounted between its ends adjacent to one end of said length of track, locking mechanism controlling said lever, a normally energized magnet controlling said locking mechanism, a second lever associated with said length of track, normally closed contact devices controlled by said lever, and circuit connections including said magnet and said contact devices whereby said blocking lever is electrically controlled by said second lever.

2. In a railway block system, the combination with a blocking lever, of a locking mechanism associated with said lever, a magnet controlling said locking mechanism, a contact controlling lever, electrical contact devices controlled by said latter lever, circuit connections including said magnet and said contact devices, and a third lever similarly controlling a second set of contact devices, said second set of contact devices being likewise included in said circuit connections.

3. In a railway block system, the combination with a length of track and a siding, of blocking mechanism associated with said length of track, train actuated mechanism likewise associated with said length of track and controlling said blocking mechanism, and other train actuated mechanism associated with said siding and also controlling said blocking mechanism.

4. In a railway block system, the combination with a length of track and a siding, of a blocking lever pivotally mounted between its ends adjacent to said length of track, locking mechanism controlling said blocking lever, a magnet controlling said locking mechanism, train-actuated contact devices associated with said length of track, circuit connections including said magnet and said contact device, and a second set of train-actuated contact devices associated with said siding, and likewise included in circuit with said magnet.

5. In a railway block system, the combination with a blocking lever pivotally mounted between its ends, of locking mechanism controlling said blocking lever, a magnet controlling said locking mechanism, a contact controlling lever, a set of contact devices controlled by said latter lever, circuit connections including said magnet and said contact devices, and friction latch mechanism associated with said contact controlling lever for holding the latter yieldable in one or more positions.

6. In a railway block system, the combination with a length of track, of a set of levers at each end of said length of track, each set having a blocking lever pivoted between its ends, locking mechanism associated with said lever, a magnet controlling said locking mechanism and a second lever pivotally mounted between its ends, electrical contact devices controlled by said lever, a source of electric current, and circuit connections including said magnet and the contacts controlled by said second lever whereby the latter controls the blocking lever electrically.

7. In a railway block system, the combination with a length of track, of a set of levers at each end of said length of track, each set having a blocking lever pivoted between its ends, locking mechanism associated with said lever, a magnet controlling said locking mechanism, a second lever pivotally mounted between its ends, electrical contact devices controlled by said second lever, a suitable source of electric current, circuit connections including said magnet and the contacts controlled by the said second lever whereby the contact lever controls said blocking levers electrically, a lever pivotally mounted adjacent to said siding and adapted to be actuated by the traverse thereover of a traversing member carried by a train when the latter is upon said siding, electrical contact devices controlled by said siding lever, circuit connections including said latter contact devices and one of said magnets whereby said siding lever controls one of said blocking levers electrically.

8. In a railway block system, the combination with a length of main track and a siding connected with said main track, self-acting blocking mechanism at the entrance of said block or length of track, circuit connections controlling said blocking mechanism, a suitable source of electric energy, contact devices associated with said main track and controlling part of said circuit connections, train-actuated contact devices associated with said siding and controlling part of said circuit connections.

9. In a railway block system, the combination with a length of main track, of a siding connected with said main track, a blocking lever at each end of said block or length of track, self-actuated locking mechanism associated with said blocking lever, a magnet controlling said locking mechanism, a contact controlling lever at the entrance end of said block, electrical contact devices controlling said lever, a source of electric current, circuit connections including said magnet and a contact controlled by said controlling mechanism, whereby the latter controls the contact lever electrically, a contact lever associated with said siding, electrical contact devices controlled by said siding lever, and circuit connections including said magnet and said latter contact device whereby said blocking lever is electrically controlled by said siding lever.

10. In a railway block system, the combination with a length of track and a siding, blocking mechanism associated with said length of track, train-actuated mechanism associated with said length of main track for placing said blocking mechanism in blocked condition, and other train-actuated mechanism associated with said siding for restoring said blocking mechanism to normal condition.

11. In a railway block system, the combination with a blocking lever, of locking mechanism associated therewith, a magnet controlling said locking mechanism, a set of contact controlling levers associated with said length of main track, circuit connections including said magnet and the contact devices of said contact controlling levers, mechanism associated with each of said contact controlling levers for holding the latter in the position in which they are left after the passage thereover of a traversing member carried by a train, and means for restoring said contact controlling levers to normal position.

12. In a block system for railways, the combination with a length of track and a siding associated therewith, of a blocking lever associated with said length of main track in advance of said siding, locking mechanism associated with said blocking lever, a magnet controlling said locking mechanism, a contact controlling lever associated with said length of track, a pair of oppositely disposed contact controlling levers likewise associated with said length of track, circuit connections including said magnet and the contact devices of said several levers, locking mechanism associated with each of said contact controlling levers, a magnet controlling each of said latter locking mechanisms, a fourth contact controlling lever associated with said siding, and circuit connections including the magnets of the locking mechanisms associated with said contact controlling levers and the contact devices of said siding lever.

13. In a railway block system, the combination with a train-actuated lever associated with said track, locking mechanism associated with said lever, a magnet controlling said locking mechanism, a set of contact devices, circuit connections including said magnet and said contact devices, and an electrically operated instrument controlling said contact devices.

GEORGE W. NISTLE.
EDWARD INSKIP.
BERNARD W. BRADY.

Witnesses:
F. L. BELKNAP,
EMILIE ROSE.