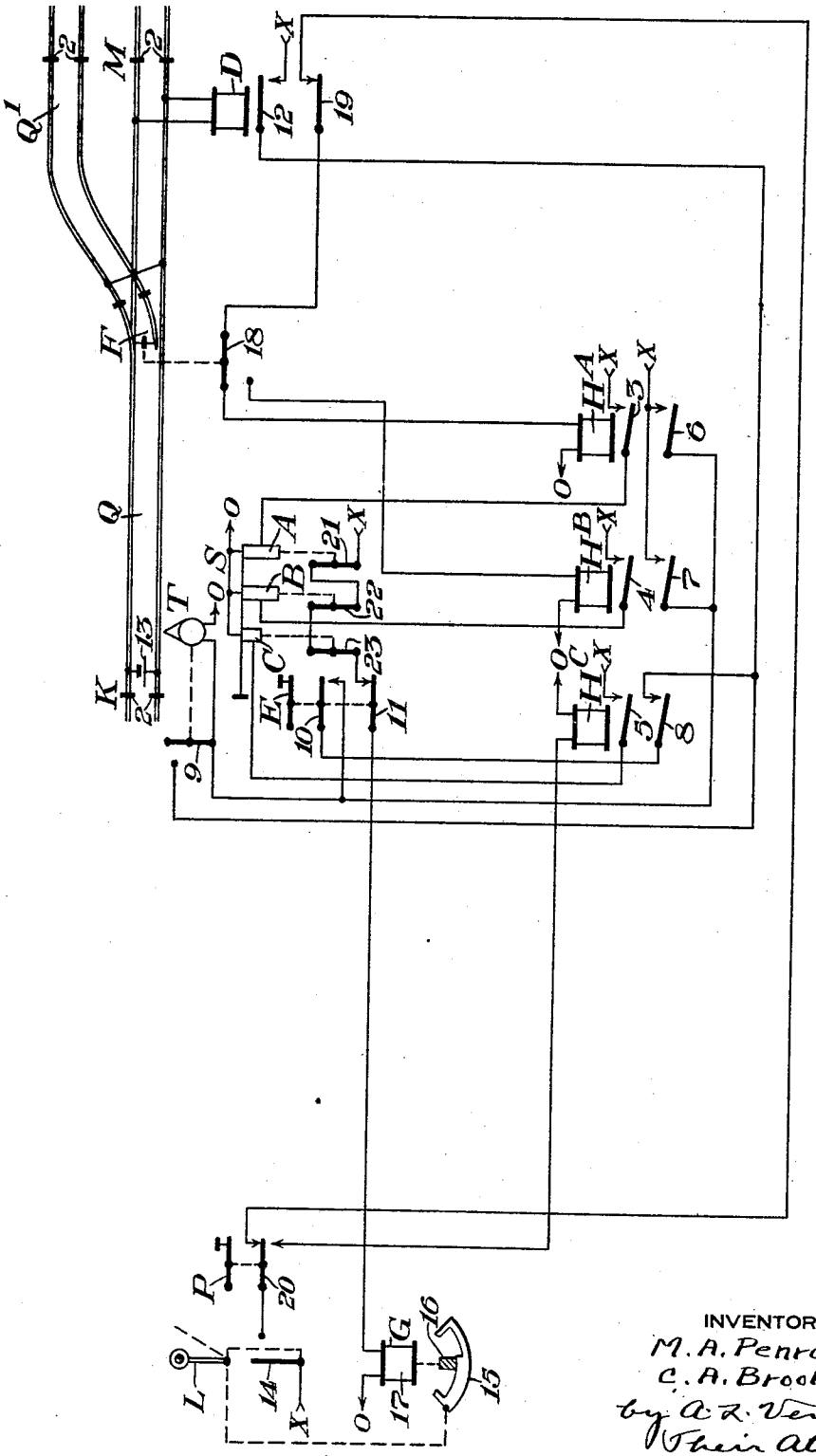
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RAILWAY TRAFFIC CONTROLLING APPARATUS

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RAILWAY-TRAFFIC-CONTROLLING APPARATUS

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Our invention relates to railway traffic controlling apparatus, and particularly to apparatus of the type involving a signal and a train stopping device associated therewith. One feature of our invention is the provision of means for requiring a train to come to a full stop before passing the signal when the signal gives a certain restrictive proceed indication.

We will describe one form of apparatus embodying our invention, and will then point out the novel features thereof in claims.

The accompanying drawing is a diagrammatic view showing one form of apparatus embodying our invention.

Referring to the drawing, the reference character Q designates a stretch of railway track, which stretch is divided by insulated joints 2 to form a track section K—M. Located in this section is a switch F leading into a side track Q^1. The section K—M is provided with a track circuit comprising the usual track battery 13 and track relay D.

Located at the point K is a signal S governing traffic moving toward the right into the section K—M. This signal comprises a high speed arm A, a low speed arm B, and a calling-on arm C. These three arms of the signal S are controlled by three signal relays H^A, H^B and H^C, respectively, through the medium of front contacts 3, 4 and 5, by virtue of which arms A, B or C will be moved to the proceed position according as relay H^A, H^B or H^C is energized. Associated with the signal S is a train stopping device T which, as here shown, is of the trip arm type, and which, as usual, is biased to its active position wherein it will cooperate with train-carried apparatus for causing an automatic application of the brakes.

The relays H are controlled by a manually operable lever L, which will usually be located at a remote point, such as in an interlocking tower or despatcher's office. This lever L normally occupies a middle position, wherein it is shown in the drawing, in which position contact 14 is open, so that all three of the signal relays H are deenergized. When lever L is swung to the right, contact 14 will close, whereupon relay H^A will become energized, provided that track relay D is energized and the switch F is in the normal position. The circuit for relay H^A is from terminal X of a suitable source of current, through contact 14 of lever L, front contact 20 of a push button P, front contact 19 of track relay D, contact 18 operated by the switch F, and the winding of relay H^A to terminal O of the same source of current. If switch F is in the reverse position, relay H^B will become energized instead of relay H^A, the circuit being the same as before except that it includes contact 18 in the reverse position, and the winding of relay H^B. If track section K—M is occupied when lever L is reversed, the circuits for both relays H^A and H^B will be opened at contact 19, and, consequently, neither one of the signal arms A or B can be cleared. If the operator then depresses the push button P, relay H^C will become energized, the circuit being from terminal X, through lever contact 14, back point of contact 20 of push button P, and the winding of relay H^C to terminal O. Calling-on arm C will then move to its proceed position.

When relay H^A is energized to clear the high speed signal arm A, a circuit for the trip arm T will be closed, which circuit is from terminal X, through front contact 6 of relay H^A, and the operating mechanism for the trip arm T to terminal O. This will cause the trip arm to be moved to its inactive position, so that it will not cooperate with the train-carried apparatus, and a train may then proceed past the signal S without incurring an automatic application of the brakes. If relay H^B instead of H^A is energized, trip arm T will be energized by a circuit which is the same as before, except that it includes front contact 7 of relay H^B instead of front contact 6 of relay H^A. When the trip arm T is in its inactive position, contact 9 operated by this arm, will be closed, whereby when a train enters section K—M, a stick circuit for the trip arm T will become closed, which circuit passes from terminal X, through back contact 12 of track relay D, contact 9, and the operating mechanism of the trip arm T to terminal O. It follows that when the trip

arm is once moved to its inactive position it will remain in this position until the entire train passes out of section K—M.

When the relay H^c is energized to clear the calling-on arm C, the trip arm T will not become energized until a push button E is reversed. This push button is located in the trackway adjacent the signal S, and is to be operated by the motorman, thereby requiring that the train shall come to a full stop before passing the signal. The circuit for the trip arm T under this condition is from terminal X, through back contact 12 of track relay D, front contact 8 of relay H^c, back contact 10 of push button E, and the operating mechanism for trip arm T, to terminal O. After the trip arm is moved to its inactive position, it will be held in this position by means of the stick circuit traced hereinbefore. It should be pointed out that the trip arm T is located a short distance in advance of the point K, so that a train may proceed far enough into section K—M to deenergize the track relay D before it encounters the trip arm T.

It will be seen from the foregoing, that when the calling-on arm C is clear, it will be necessary for a train to come to a full stop before passing the trip arm T.

Associated with the lever L is a locking device G, comprising a segment 15 attached to the lever L, and a dog 16 controlled by a magnet 17 and coacting with the segment in such manner as to lock the lever L in its right-hand position unless the magnet 17 is energized. Magnet 17 is provided with a circuit which passes from terminal X, through contacts 21, 22 and 23 operated by signal arms A, B and C, respectively, front contact 11 of push button E, and magnet 17 of the locking device G to terminal O. Each contact 21, 22 and 23 is closed when and only when its associated signal arm is in the stop position. It will be seen, therefore, that when the lever L has been moved to its right-hand position to clear any one of the signal arms A, B or C, it cannot be restored to its normal position until such signal arm has been returned to its stop position, and unless push button E is in its normal poition.

Although we have herein shown and described only one form of apparatus embodying our invention, it is understood that various changes and modifications may be made therein within the scope of the appended claims without departing from the spirit and scope of our invention.

Having thus described our invention, what we claim is:

1. In combination, a railway signal having a main arm and a calling-on arm, a train stopping device associated with said signal and having an active and an inactive condition, means operating when said main arm gives a proceed indication to place said stopping device in its inactive condition, a manually operable member located in the trackway adjacent said signal, and means requiring manual operation of said member in order to place said stopping device in its inactive condition when said calling-on arm gives a proceed indication, thereby assuring that a train accepting a proceed indication given by the calling-on arm will come to a full stop before passing said train stopping device.

2. In combination, a railway signal having a main arm and a calling-on arm, a main relay and a calling-on relay for said two arms respectively, a train stopping device associated with said signal and having an active and an inactive condition, a track circuit including a track relay associated with said signal and stopping device, a main circuit for said device including a front contact of said main relay, a stick circuit for said device including a back contact of said track relay and a contact which is closed only when the device is in its inactive condition, a manually operable member located in the trackway adjacent said device and having a normally open contact, and an auxiliary circuit for said train stopping device including a front contact of said calling-on relay and the normally open contact of said manually operable member as well as a back contact of said track relay, whereby a train accepting a proceed indication given by the calling-on arm must come to a full stop before passing said train stopping device.

3. In combination, a railway signal having a main arm and a calling-on arm, a train stopping device associated with said signal and having an active and an inactive condition, means operating when said main arm gives a proceed indication to place said stopping device in its inactive condition, a manually operable member located in the trackway adjacent said signal, means requiring manual operation of said member in order to place said stopping device in its inactive condition when said calling-on arm gives a proceed indication, a lever for the control of said signal, a locking device for said lever, contacts operated by said signal arms and closed only when the arms are in stop positions, a normally closed contact operated by said manually operable member and opened when the member is actuated to place the stopping device in inactive condition, and a circuit for said locking device including said signal operated contacts and said normally closed contact all in series.

4. In combination, a railway signal having an element capable of giving a proceed or a stop indication, a train stopping device associated with said signal and having an active and an inactive condition, a manually operable member located in the trackway

adjacent said device, and means requiring manual operation of said member in order to place said stopping device in its inactive condition when said signal element gives a proceed indication.

In testimony whereof we affix our signatures.

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