

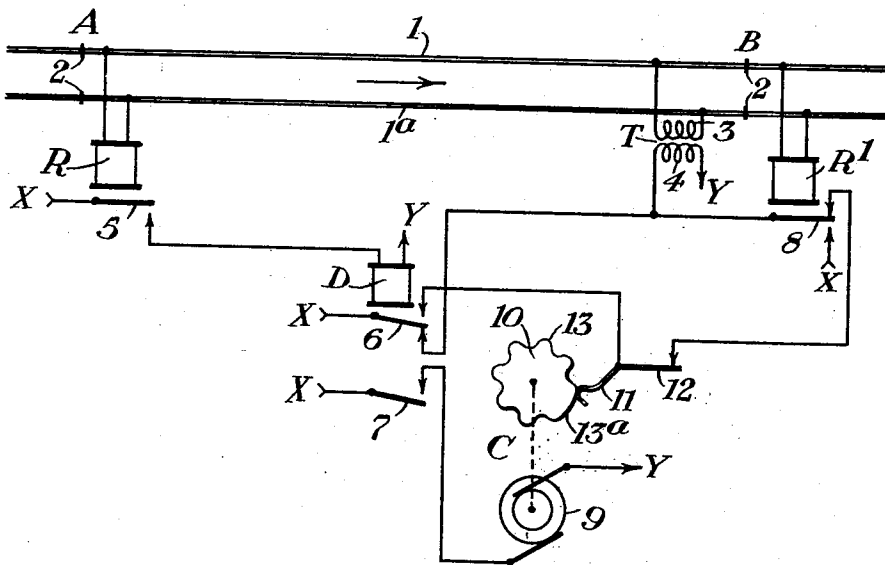
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RAILWAY TRAFFIC CONTROLLING APPARATUS

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UNITED STATES PATENT OFFICE

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RAILWAY TRAFFIC CONTROLLING APPARATUS

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My invention relates to railway traffic controlling apparatus, and particularly to automatic train control apparatus of the code type.

One feature of my invention is the provision, in systems of this character, of novel and improved means for insuring the pick-up of a track relay on coded current after the removal of a shunt across the track rails.

I will describe one form of apparatus embodying my invention, and will then point out the novel features thereof in the claim.

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

Referring to the drawing, the reference characters 1 and 1^a designate the track rails of a stretch of railway track along which traffic normally moves in the direction indicated by the arrow. These rails are divided by insulated joints 2 to form a series of track sections, of which only one complete section A—B is shown in the drawing.

Section A—B is provided with the usual track circuit comprising a transformer T, the secondary 3 of which is connected across the rails at the exit end of the section, and a track relay R connected across the rails at the entrance end of the section. The primary 4 of transformer T is normally connected with the terminals X and Y of a source of alternating current through the back point of contact 6 of a code relay D.

The current supplied to the track rails is at times periodically interrupted by a coding device C, comprising an electric motor 9 driving a cam 10, which cooperates with a follower 11 to operate a contact 12. This coding device is normally at rest, but is set into operation when relay D becomes energized, the circuit then being from terminal X, through front contact 7 of relay D, and the motor 9 to terminal Y. Relay D is provided with a circuit which includes back contact 5 of track relay R, so that relay D is deenergized or energized according as relay R is energized or deenergized.

When relay D becomes energized, the circuit referred to above for the primary 4 of transformer T is opened at the back point of

contact 6, and a new circuit for primary 4 becomes closed, this circuit being from terminal X, through the front point of contact 6 of relay D, contact 12 of the coding device C, front point of contact 8 of track relay R¹ for the section next in advance, and primary 4 of transformer T to terminal Y. When this circuit is closed and the coding device is in operation, the current supplied to the track rails of section A—B is periodically interrupted by contact 12. If the section in advance of section A—B is occupied, track relay R¹ will be deenergized, so that alternating current will be continuously supplied to the primary 4 of transformer T through the back point of contact 8 of relay R¹.

The operation of the apparatus under normal conditions is as follows: When a train moving toward the right enters section A—B, it will deenergize track relay R, and this in turn will cause relay D to become energized. Relay D will then set the coding device C into operation and will also interrupt the normal circuit for primary 4 of transformer T and will close the auxiliary circuit for this primary through contact 12. When the train leaves section A—B, track relay R¹ being opened, uninterrupted alternating current will be supplied to transformer T to again pick up relay R, with the result that relay D will become deenergized and the parts of the apparatus will then be restored to their normal positions.

If a shunt be placed across the rails of section A—B, and is removed while relay R¹ is energized, it becomes necessary for track relay R to pick up on the coded current, but in some instances the periodic interruptions of the alternating current supplied to transformer T may be too rapid to effectively energize relay R. This is particularly likely to occur in the case of what is known as the "180 cycle per minute" code of the present-day standard code train control system. In order to insure that the track relay R will pick up under this condition, I provide the cam 10 with one tooth 13^a which is considerably longer than the normal teeth 13, so that once during each revolution of the cam, contact 12 will be held closed for more than the normal length of time. The

length of the tooth 13^a may be such as to insure that relay R will pick up during the time that contact 12 is held closed by this tooth. I have found that one tooth of abnormal length in the cam 10 will not interfere with the normal operation of the train-carried apparatus used in the standard code train control system.

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

Having thus described my invention, what I claim is:

In combination, a section of railway track, a track circuit for said section including a source of alternating current and a track relay; a coder comprising a motor, a cam driven by said motor, and a contact operated by said cam for periodically interrupting the supply of current from said source to the track rails; and means for setting said coder into operation when said track relay becomes deenergized, said cam having a special tooth which is longer than the others whereby once during each revolution of the cam current will be supplied to the track rails for a longer period of time than normal, so that if the length of each normal tooth is insufficient to pick up the track relay when a shunt is removed from the rails the relay will pick up when said contact is operated by the special tooth.

In testimony whereof I affix my signature.

GEORGE W. BAUGHMAN.