

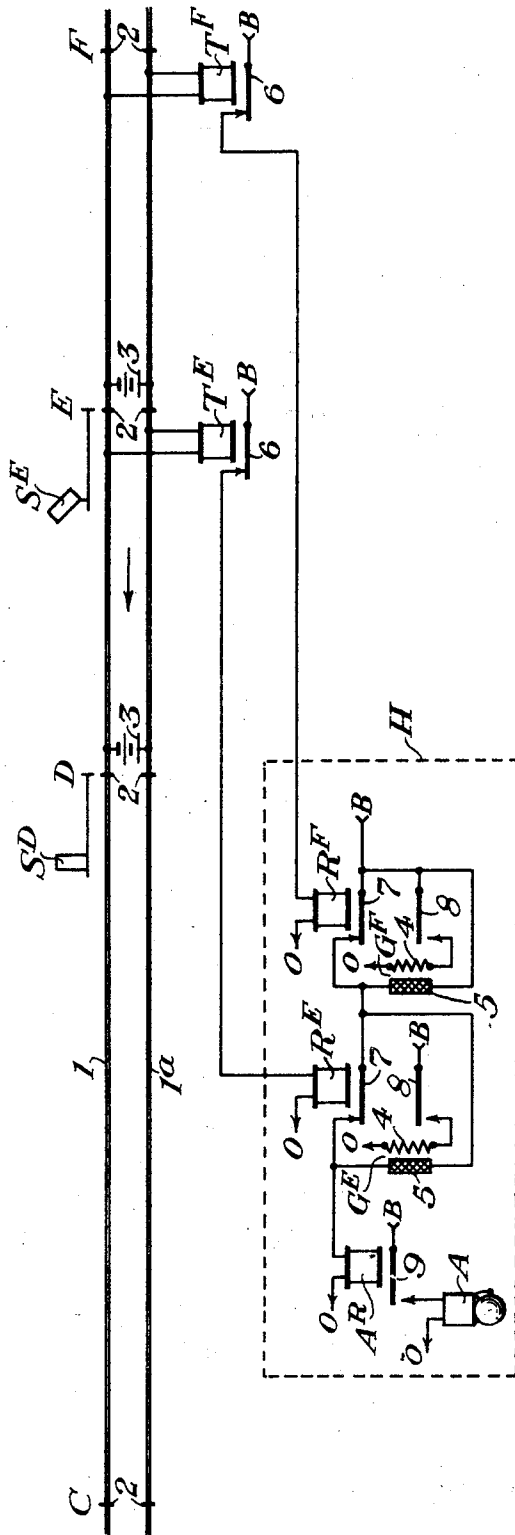
Jan. 20, 1931.

L. E. SPRAY

1,789,566

TRAIN ANNUNCIATING APPARATUS

Filed April 17, 1928



INVENTOR :

Lester E. Spray,
by A. R. Vennell
His Attorney

UNITED STATES PATENT OFFICE

LESTER E. SPRAY, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO THE UNION SWITCH & SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

TRAIN-ANNUNCIATING APPARATUS

Application filed April 17, 1928. Serial No. 270,700.

My invention relates to train annunciating apparatus, that is, to apparatus for announcing or indicating the approach of trains in an interlocking tower or other central location.

I will describe one form of apparatus embodying my 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 my invention.

Referring to the drawing, the reference characters 1 and 1^a designate the rails of a railway track along which traffic moves in the direction indicated by the arrow. These rails are divided by insulated joints 2 to form a plurality of track sections C—D, D—E, E—F, etc. The section C—D is included in an interlocking plant, and this plant will comprise switches, signals, etc., controlled by an interlocking machine located in a tower which is indicated by the dash lines H. One of the signals of the interlocking plant is designated by the reference character S^p, but the other switches and signals are omitted from the drawing.

Track section D—E is provided with a track circuit comprising a battery 3 and a track relay T^E. Track section E—F is provided with a similar track circuit comprising a battery 3 and a track relay T^F. Located in the interlocking tower H are two repeater relays R^E and R^F. Relay R^E is provided with a circuit which includes a front contact 6 of track relay T^E, and a source of current the terminals of which are designated by the reference characters B and O. Repeater relay R^F is similarly controlled by a front contact 6 of track relay T^F. It will be seen, therefore, that each repeater relay is normally energized, and becomes de-energized when a train occupies the associated section of track. These repeater relays are referred to in the accompanying claims as "train operated relays."

Also located in the interlocking tower H is an annunciator A, which, as here shown, is an electric bell. This bell is controlled by an annunciator relay A^R in such manner that the bell rings when and only when the relay

A^R is de-energized, and this is accomplished by providing the bell with a circuit which includes a back contact 9 of relay A^R.

The annunciator relay A^R is provided with a circuit which passes from terminal B of a source of current, through front contact 7 of repeater relay R^F, front contact 7 of repeater relay R^E, and the winding of relay A^R to terminal O of the same source of current. It follows that relay A^R is energized, and that the bell A is therefore silent, when both of the repeater relays are energized. Associated with each repeater relay is a thermo-sensitive relay designated by the reference character G with an appropriate exponent. Each thermo-sensitive relay comprises a heating element 4 and a thermo-sensitive element 5. The circuit for the annunciator relay A^R is provided with a branch around front contact 7 of relay R^F, which branch includes the thermo-sensitive element 5 of relay G^F. The heating element 4 of relay G^F is provided with a circuit which includes a back contact 8 of relay R^F and a source of current. Similarly, the annunciator relay circuit is provided with a branch around front contact 7 of relay R^E, which branch includes the thermo-sensitive element 5 of relay G^E, and the heating element 4 of relay G^E is provided with a circuit including back contact 8 of relay R^E and a source of current.

The operation of the apparatus is as follows: When sections D—E and E—F are both unoccupied, relays R^E and R^F are both energized, so that relay A^R is energized and the bell A is silent. When a train enters section E—F, relay R^F becomes de-energized, so that the normal circuit for relay A^R becomes opened at contact 7 of relay R^F. The resistance of the thermo-sensitive element 5 of relay G^F is so high that this element does not transmit sufficient current to keep relay A^R energized, with the result that the latter relay opens and bell A begins to ring. The circuit for the heating element 4 of relay G^F is closed, however, by back contact 8 of relay R^F, and after a given interval of time the resistance of element 5 becomes low enough to transmit sufficient current to permit relay A^R to become energized, where-

upon bell A ceases to ring. As the train enters section D—E, relay A^R again opens due to the opening of contact 7 of relay R^E, and after a given interval of time this relay again closes, due to the reduction in the resistance of element 5 of relay G^E.

The parts are so proportioned that when a train moves at normal speed, bell A will stop ringing before the train passes out of section E—F, and will again stop ringing before the train passes out of section D—E.

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 claims without departing from the spirit and scope of my invention.

Having thus described my invention, what I claim is:

1. A system for indicating the approach of trains, comprising a section of track, a normally energized train controlled relay associated with said section and arranged to be de-energized when the section is occupied, an annunciator relay, a circuit for said annunciator relay including a front contact of said train controlled relay and a source of current, a branch around said front contact including the thermo-sensitive element of a thermo-sensitive relay, a circuit for the heating element of said thermo-sensitive relay including a back contact of said train controlled relay and a source of current, and an annunciator controlled by said annunciator relay.

2. A system for indicating the approach of trains, comprising a section of track, a normally energized train controlled relay associated with said section and arranged to be de-energized when the section is occupied, an annunciator circuit including a front contact of said train controlled relay and a source of current, a branch around said front contact including the thermo-sensitive element of a thermo-sensitive relay, and a circuit for the heating element of said thermo-sensitive relay including a back contact of said train controlled relay and a source of current.

3. A system for indicating the approach of trains, comprising a section of track, a normally energized train controlled relay associated with said section and arranged to be de-energized when the section is occupied, an annunciator circuit including a front contact of said train controlled relay and a source of current, an annunciator operated while said annunciator circuit is open, and means controlled by said train controlled relay for closing a branch around said front contact in said annunciator circuit after said relay has been de-energized for a given interval of time.

4. A system for indicating the approach of

trains, comprising two sections of track, two normally energized train controlled relays one associated with each section and each arranged to be de-energized when the associated section is occupied, an annunciator circuit including a front contact of each of said relays and a source of current, two thermo-sensitive relays one for each of said train controlled relays, a branch around the front contact of each train controlled relay including the thermo-sensitive element of the associated thermo-sensitive relay, a circuit for the heating element of each thermo-sensitive relay including a back contact of the associated train controlled relay and a source of current, and an annunciator controlled by said annunciator circuit.

5. A system for indicating the approach of trains, comprising two sections of track, two normally energized train controlled relays one associated with each section and each arranged to be de-energized when the associated section is occupied, an annunciator, means for setting said annunciator into operation when the relay associated with the first track section becomes de-energized, means controlled by the relay for the first track section for stopping the operation of said annunciator before the train leaves the first track section, means for again setting said annunciator into operation when the relay associated with the second track section becomes de-energized, and means controlled by the relay for the second track section for stopping the operation of said annunciator before the train leaves the second track section.

6. In a system for indicating the approach of trains, comprising two sections of railway track, a track circuit including a track relay for each section, two normally energized repeater relays controlled by said two track relays respectively, an annunciator, means for setting said annunciator into operation when either of said repeater relays becomes de-energized, and means controlled by each repeater relay for stopping the operation of said annunciator before a train passes out of the associated track section.

7. A system for indicating the approach of trains, comprising a section of track, a train controlled relay associated with said section and having a normally closed and a normally open contact, an annunciator relay, a circuit for said annunciator relay including said normally closed contact and a source of current, a branch around said front contact including the thermo-sensitive element of a thermo-sensitive relay, a circuit for the heating element of said thermo-sensitive relay including said normally open contact and a source of current, and an annunciator controlled by said annunciator relay.

8. A system for indicating the approach of trains, comprising a section of track, a train

controlled relay associated with said section and having a normally closed and a normally open contact, an annunciator circuit including said normally closed contact and a source of current, a branch around said front contact including the thermo-sensitive element of a thermo-sensitive relay, and a circuit for the heating element of said thermo-sensitive relay including said normally open contact and a source of current.

9. A system for indicating the approach of trains, comprising a section of track, a train controlled relay associated with said section and having a normally closed contact which is open when the section is occupied, an annunciator circuit including said normally closed contact and a source of current, an annunciator operated while said annunciator circuit is open, and means controlled by said train controlled relay for closing a branch around said front contact in said annunciator circuit after said contact has been open for a given interval of time.

10. A system for indicating the approach of trains, comprising a section of track, a train controlled relay associated with said section and having a normally closed contact which is open when the section is occupied, an annunciator, means for setting said annunciator into operation when said contact opens, and means controlled by said train controlled relay for stopping the operation of said annunciator after said contact has been open for a given interval of time.

11. A system for indicating the approach of trains, comprising a section of track, a train controlled relay associated with said section and having a normally closed contact which is open when the section is occupied, an annunciator, means for setting said annunciator into operation when said contact opens, and means controlled by said train controlled relay for stopping the operation of said annunciator before the train leaves said track section.

In testimony whereof I affix my signature.
LESTER E. SPRAY.