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RAILWAY TRAFFIC CONTROLLING APPARATUS

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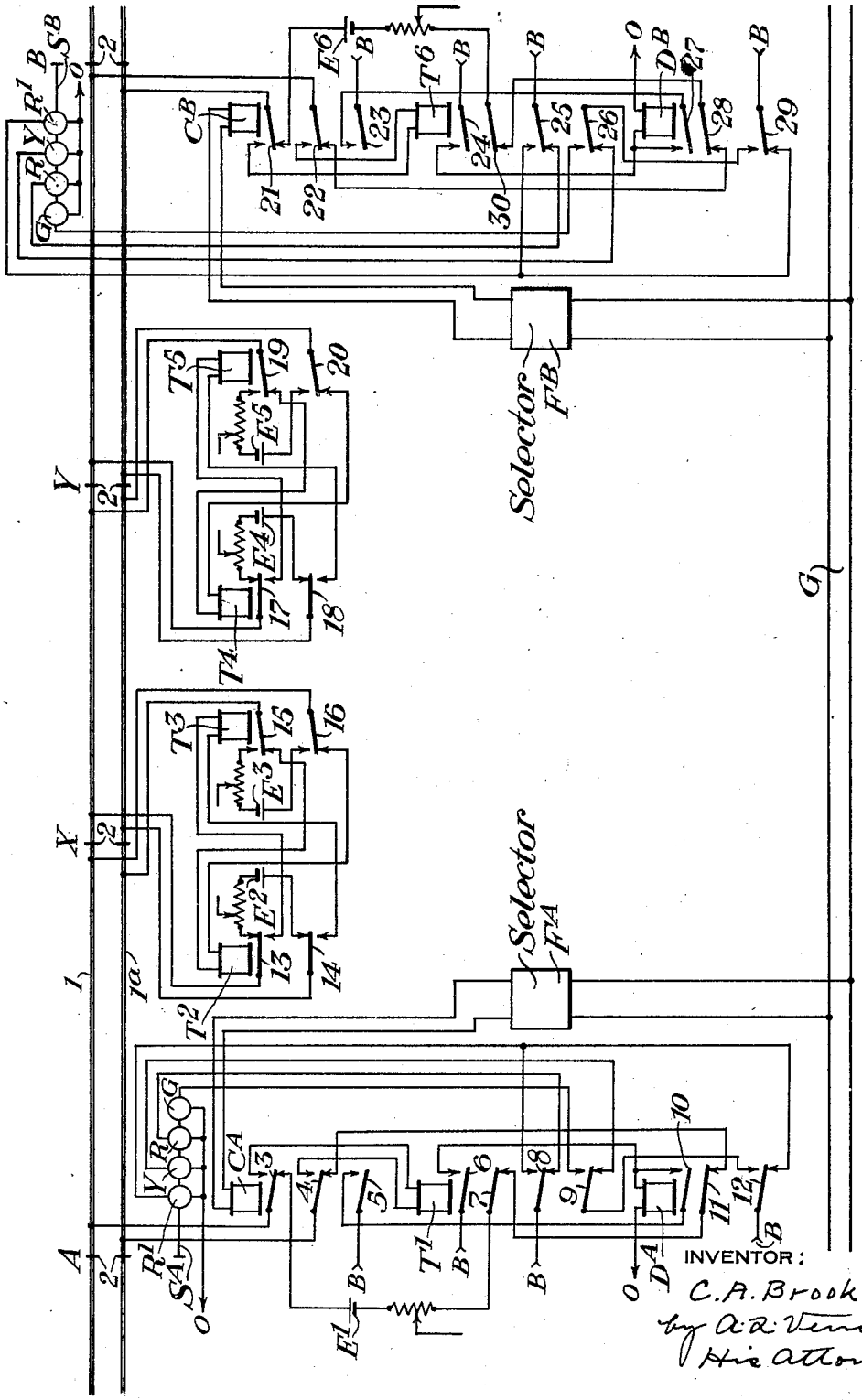

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RAILWAY-TRAFFIC-CONTROLLING APPARATUS

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My invention relates to railway traffic controlling apparatus, and has for an object the provision of novel and improved means for the control of traffic over stretches of single track between passing sidings.

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 track rails of a stretch of railway track over which traffic at times moves in both directions. These rails are divided by insulated joints 2 to form a block A—B, and the rails of this block are further divided by similar insulated joints to form a plurality of track sections A—X, X—Y and Y—B.

Located at the point A is a signal S^A which governs traffic moving toward the right through the block A—B, whereas, traffic moving toward the left through this block is governed by a similar signal S^B located at the point B. Each of these signals comprises a proceed lamp G, a caution lamp Y, and a stop lamp R, as well as an auxiliary stop lamp R^1.

Located at the point A is a selector relay C^A, and located at the point B is a similar selector relay C^B. These relays are controlled from a distant point through the medium of a despatcher's control line G and selectors F^A and F^B. The control of these relays forms no part of my present invention, and it is sufficient to state that each relay is normally de-energized but that either relay may be energized at the will of the despatcher through the medium of the selectors F.

Each end of each track section is provided with a track battery and a track relay. The track batteries are designated E^1, E^2, etc., whereas, the track relays are designated T^1, T^2, etc. The battery E^3 and the relay T^2 are associated with the right-hand end of section A—X, the battery E^2 and relay T^3 are associated with the left-hand end of section X—Y, the battery E^5 and relay T^4 are associated with the right-hand end of section X—Y, and the battery E^4 and the relay T^5 are associated with the left-hand end of section Y—B. It is also understood that the battery E^1 and relay T^1 are associated with the left-hand end of section A—X, whereas, the battery E^6 and relay T^6 are associated with the right-hand end of section Y—B.

As shown in the drawing, both of the selector relays C^A and C^B are de-energized. Battery E^1 is connected with section A—B, the path being from the upper terminal of this battery through the back point of contact 3 of relay C^A to track rail 1, and from track rail 1^a through the back point of contact 4 of relay C^A, back contact 11 of a stick relay D^A, and back contact 7 of track relay T^1 to battery E^1. Track relay T^2 is connected with the rails of section A—X, through the back points of contacts 15 and 16 of track relay T^3, so that track relay T^2 is energized. Battery E^2 is therefore connected with the rails of section X—Y through the front points of contacts 13 and 14 of track relay T^2, so that track relay T^4 is energized, the latter relay being connected with the rails of section X—Y through the back points of contacts 19 and 20 of track relay T^5. Battery E^4 is connected with the rails of section Y—B through the front points of contacts 17 and 18 of track relay T^4. Battery E^6 is also connected with the rails of section Y—B through the back point of contact 21 of relay C^B, back point of contact 22 of relay C^B, back contact 28 of a stick relay D^B, and back contact 30 of track relay T^6. Track relays T^1, T^3, T^5 and T^6 are disconnected from the rails.

Lamp R of signal S^A is lighted, the circuit being from terminal B of a suitable source of current, through the back point of contact 8 of relay T^1 and lamp R to terminal O of the same source of current. Lamp R^1 of this signal is also lighted through a circuit which includes the back point of contact 12 of relay D^A. Lamp R of signal S^B is lighted by virtue of a circuit which includes the back point of contact 26 of relay T^6. Lamp R^1 of signal S^B is also lighted by virtue of a circuit which includes the back point of contact 29 of relay D^B.

I will first assume that the despatcher desires to allow a train moving toward the left to pass through the block A—B. To do this, he causes selector relay C^B to become energized, thereby disconnecting battery E^6 from the rails of section Y—B and connecting relay T^6 with the rails of this section through the front points of contacts 21 and 22 of relay C^B. Track relay T^6 will then become energized, because track battery E^4 is connected with the rails of this section. A pick-up circuit for relay D^B will then be closed, which circuit passes from terminal B, through contact 24 of relay T^6, and the winding of relay D^B to terminal O. The stick circuit for relay D^B will then become closed, which circuit passes from terminal B, through contact 23 of relay C^B, contact 27 of relay D^B, and the winding of relay D^B to terminal O. It follows that relay D^B will remain energized as long as selector relay C^B remains energized, even though track relay T^6 may open. The circuit for the stop lamp R of signal S^B will then become opened at the back point of contact 25 of relay T^6, but the auxiliary lamp R^1 of this signal will remain lighted because of a second circuit which includes the front point of the same contact. The proceed lamp G of signal S^B will become lighted by virtue of a circuit which passes from terminal B, through the front point of contact 29 of relay D^B, front point of contact 26 of relay T^6, and lamp G to terminal O. When the train enters section Y—B, track relay T^6 will become de-energized, whereupon, the proceed lamp G of signal S^B will be extinguished, and the caution lamp Y of this signal will become lighted because of a circuit including the front point of contact 29 of relay D^B and the back point of contact 26 of relay T^6. As the train enters section X—Y, it will de-energize track relay T^4, thereby disconnecting battery E^4 from the rails of section Y—B, and as the train enters section A—X it will de-energize track relay T^2, thereby disconnecting battery E^2 from the rails of section X—Y. It follows that signal S^B will continue to give the caution indication as long as the train occupies any part of block A—B.

If the despatcher desires to permit a train moving toward the right to enter block A—B, he causes selector relay C^A to become energized, thereby connecting track relay T^1 with the rails of section A—X. Track relay T^5 will then be energized from battery E^6, track relay T^3 will be energized from battery E^5, and track relay T^1 will be energized from battery E^3. It follows that stick relay D^A will become energized by virtue of its pick-up circuit through contact 6 of track relay T^1, and will then remain energized by virtue of its stick circuit through contact 5 of relay C^A and contact 10 of relay D^A. The proceed lamp G of signal S^A will become lighted by virtue of its circuit through the front point of contact 12 of relay D^A and the front point of contact 9 of relay T^1. When the train enters section A—X, track relay T^1 will open, so that the proceed lamp G will be extinguished, and the caution lamp Y will be lighted by virtue of a circuit through the front point of the contact 12 of relay D^A and the back point of contact 9 of track relay T^1. This condition will continue as the train passes through the block for reasons pointed out hereinbefore in explaining the operation during the movement of a train in the opposite direction.

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. In combination, a stretch of railway track divided into sections, a track battery and a track relay associated with each end of each section, means for connecting the rails of each end of each two adjoining sections with the associated battery or the associated relay according as the relay for the adjacent end of the adjoining section is energized or de-energized, manually controlled means for selectively connecting the rails at the free end of each end section with the associated battery or the associated relay, and signals for said stretch controlled by the track relays associated with the free ends of the end sections.

2. In combination, a stretch of railway track divided into sections, a track battery and a track relay associated with each end of each section, means for connecting the rails of each end of each two adjoning sections with the associated battery or the associated relay according as the relay for the adjacent end of the adjoining section is energized or de-energized, a manually controlled relay at each end of said stretch, means for connecting the rails at the free end of each end section with the associated battery or the associated track relay according as the associated manually controlled relay is de-energized or energized, and signals for said stretch controlled by the track relays associated with the free ends of the end sections.

3. In combination, a stretch of railway track divided into sections, a track battery and a track relay associated with each end of each section, means for connecting the rails of each end of each two adjoining sections with the associated battery or the associated relay according as the relay for the adjacent end of the adjoining section is energized or de-energized, a manually controlled relay at each end of said stretch, means for connect-

ing the rails at the free end of each end section with the associated battery or the associated track relay according as the associated manually controlled relay is de-energized or energized, a stick relay at each end of said stretch, a pick-up circuit for each stick relay controlled by a front contact of the track relay for the free end of the associated section, a stick circuit for each stick relay controlled by a front contact of the associated manually controlled relay, and signals for said stretch controlled by said stick relays and by the track relays associated with the free ends of said end sections.

4. In combination, a stretch of railway track divided into sections, a track battery and a track relay associated with each end of each section, means for connecting the rails of each end of each two adjoining sections with the associated battery or the associated relay according as the relay for the adjacent end of the adjoining section is energized or de-energized, a manually controlled relay at each end of said stretch, means for connecting the rails at the free end of each end section with the associated battery or the associated track relay according as the associated manually controlled relay is de-energized or energized, a stick relay at each end of said stretch, a pick-up circuit for each stick relay controlled by a front contact of the track relay for the free end of the associated section, a stick circuit for each stick relay controlled by a front contact of the associated manually controlled relay, a signal at each end of said stretch, means for causing each signal to indicate proceed when the associated stick relay and the associated track relay are energized, means for causing each signal to indicate caution when the associated stick relay is energized and the associated track relay is de-energized, and means for causing each signal to indicate stop when the associated stick relay is de-energized.

In testimony whereof I affix my signature.

CHARLES A. BROOKS.