

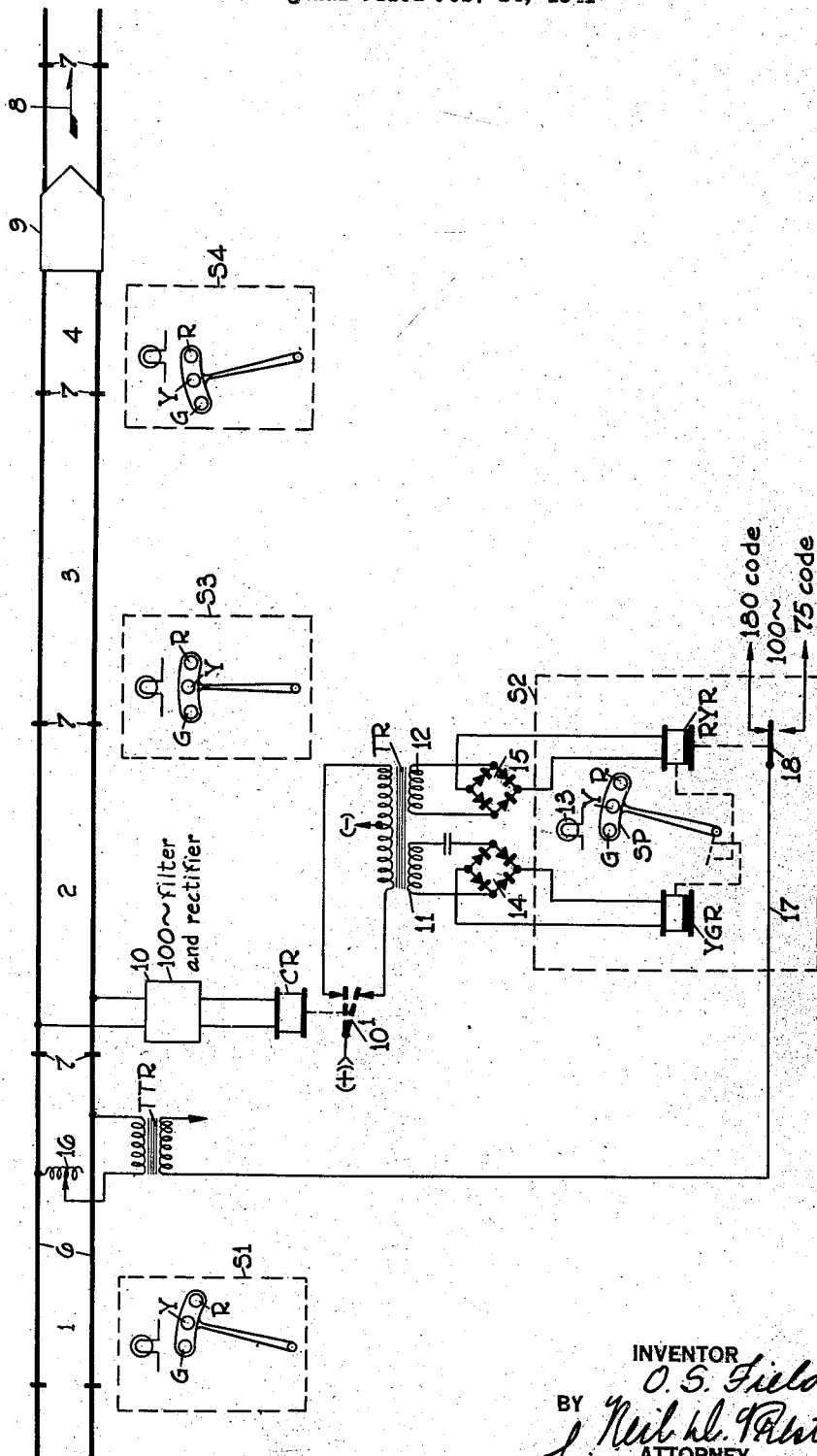
July 3, 1945.

O. S. FIELD

2,379,512

RAILWAY SIGNALING SYSTEM

Original Filed Feb. 14, 1941



INVENTOR
O. S. Field,
BY Neil W. Panton
ATTORNEY

UNITED STATES PATENT OFFICE

2,379,512

RAILWAY SIGNALING SYSTEM

Oscar S. Field, Rochester, N. Y., assignor to
General Railway Signal Company, Rochester,
N. Y.

Original application February 14, 1941, Serial No.
378,966. Divided and this application Novem-
ber 4, 1942, Serial No. 464,520

2 Claims. (Cl. 246—34)

This invention relates in general to railway signaling systems and has more particular reference to wayside signaling systems employing type SC search light type signals.

The type SC search light signal is constructed and operates as disclosed in the Field application, Ser. No. 361,060, filed October 14, 1940.

This application is a division of my pending application, Ser. No. 378,966, filed February 14, 1941, for Railway signaling system, now Patent No. 2,313,468 dated March 9, 1943.

This type SC signal has a single spectacle carrying a plurality of colored glasses through one of which at a time light from a single light source is directed to give a signal indication. The spectacle is moved to various indicating positions by two separate mechanisms or relays which also operate various contacts and because of this construction, many of the usually employed relays such as line relays, repeating relays, etc., generally used in signaling systems, can be dispensed with since the operating mechanisms of the signals themselves can serve the added function of these otherwise necessary relays.

Further objects, purposes and characteristic features of this invention will appear as the description progresses, reference being made to the accompanying drawing, showing solely by way of example, and in no way whatsoever in a limiting sense, one form of the invention. In the drawing the single figure is a diagrammatic representation of one form of the invention.

Referring now to the drawing, there is here shown a signaling system of the coded trackway type wherein code is placed on the track rails and no line wires are employed. A stretch of single track constituted by track rails 6 is divided into a plurality of isolated track sections by usual insulating joints 7 whereby to form the track sections 1, 2, 3 and 4.

At the entrance end of each track section, traffic being eastward as indicated by arrow 8, is a wayside signal designated by S, with a suitable suffix corresponding to the section with which it is associated. Section 4, as represented, is occupied by a vehicle 9.

Since the apparatus employed at each signal location is the same throughout the system only the apparatus at one location, that of signal S2, has been shown in any detail.

Connected across the entrance end of each section, as section 2, is a filter and rectifier 10 for passing current freely only if of a given frequency such as 100 cycles whereby not to pass the usual commercial frequencies and to rectify the

current so passed to energize a code following relay CR. Relay CR picks up and stays up while code current is flowing and releases, and stays released, between the separate code current impulses whereby to pick up and release for each code impulse to thereby operate its contact finger 10¹ between its front and back points and alternately energize opposite portions of the primary winding of a transformer TR in opposite directions. This causes code impulses to flow in the secondary windings 14 and 12 of the transformer at the same rate as the code received. These secondary portions of the transformer are employed to operate the light signal used in the system.

The light signal S2, here employed, is of the type SC search light form, and in brief, has a red-yellow relay RYR and a yellow-green relay YGR for operating a spectacle SP carrying colored roundels G, Y and R colored respectively green, yellow and red with reference to a light source 13 whereby to give various signal aspects. Each operating relay of the signal has an energizing circuit connected to a portion of the secondary winding of the transformer through full-wave rectifiers as 14 and 15. The circuit between the transformer-secondary and the rectifier of the yellow-green relay is tuned to substantial resonance at a frequency of 180 per minute whereby to cause the yellow-green relay to respond only to the 180 code. A lower rate code, namely, 75, is employed and since the circuit for the red-yellow relay is not tuned, this relay responds to each of the codes.

As disclosed in the application above referred to, the spectacle is biased to display the red indication when both operating relays are de-energized. It displays the yellow indication when the red-yellow relay only is energized and the green indication when both operating relays are energized.

Across the exit end of each section, as, for example, section 1, is connected the primary winding of a track transformer TTR in series with an adjustable reactance 16. The primary winding of this transformer is connected by wire 17 to contact finger 18 of the red-yellow relay to the front point of which finger is connected 180 code and to the back point of which is connected 75 code. This code can be formed in any usual or desired way, as, for example, as disclosed in the Preston patent, No. 2,122,379, granted June 28, 1938. The coded energy can, if desired, be direct current, in which case, coded direct cur-

rent is connected across the rails, and the relays CR are connected directly across the rails.

Considering the operation of the system as described above, it is clear that with section 4 occupied by a vehicle the code is shunted by the wheels and axle shunts from the code following relay for that block whereby its signal S4 is completely deenergized and hence displays a red indication.

With signal S4 having its red-yellow relay deenergized, code at the rate of 75 impulses per minute is applied to the exit end of section 3 whereby the red-yellow relay of signal S3 is energized, but its yellow-green relay is not energized, and hence, this signal displays a yellow indication.

With signal S3 having its red-yellow relay energized, code at the rate of 180 impulses per minute is placed on section 2 whereby to energize both of the control relays of signal S2 and cause it to display a green indication, all as illustrated. In like manner, section 1, and all sections to the rear thereof, providing there is no other occupancy, displays a green indication.

It can be seen from the above that in this system employing the type SC signal, the code selection for the block to the rear of a given block is controlled by the red-yellow relay, which relay also operates the spectacle. This relay, together with the yellow-green relay, is made sufficiently slow to release so that a momentary change of code does not change the signal aspect, and hence, several cycles of new code must have occurred before the signal responds. This cares for dead sections, crossovers, and the like.

It is furthermore apparent that with this type of signal, in changing of the code from the 75 rate to the 180 rate, to change from a yellow indication to a green indication, the red-yellow relay is momentarily deenergized but, due to its slow release characteristics it does not release but remains up so as to prevent a flash of the red indication while the signal is changing from yellow to green.

The type SA search light signal, many of which are in use, is of the polar type and has a spectacle biased to a middle position to display the red indication and is moved to either side of the middle position to display the yellow and green indications upon change in the polarity of energization. Thus, it is clear that such a signal could not operate in a coded trackway system of the type disclosed above.

With the type SC signal, however, a coded system having separate decoding relays corresponding to the operating relays of the type SC signal for controlling separate signal circuits, can be readily changed to a system as described above by replacing the decoding relays and the signal with its control circuits by a single unitary, self-contained signal of this SC type.

The above rather specific description of several forms which this invention can assume is given solely by way of example, and is not intended in any manner whatsoever in a limiting

sense. It is to be understood that various modifications, adaptations, and alterations may be applied to meet the requirements of practice without in any manner departing from the spirit or scope of this invention, except as clearly limited by the appended claims.

Having described my invention, I now claim:

1. In a coded railway signaling system, in combination, a section of railway track, a light signal at the entrance end of said section, said signal being of a type which has a member biased to a first position in which it conditions the signal to provide one indication, electro-responsive means associated with said member and effective when energized to cause movement of said member, a code following relay, means governed by traffic conditions in said section for at times supplying to said relay energy of one code frequency and at other times supplying to said relay energy of another code frequency, a decoding transformer, means responsive to operation of said relay by energy of either code frequency for varying energization of the primary winding of said transformer, means effective when said relay is responding to energy of the first code frequency to supply from the decoding transformer to said electro-responsive means energy effective to cause movement of said member to a position in which it conditions the signal to provide a second indication, and means effective when said relay is responding to energy of the other code frequency to supply from the decoding transformer to said electro-responsive means energy effective to cause movement of said member to a position in which it conditions the signal to provide a third indication.

2. In a coded railway signaling system, in combination, a section of railway track, a light signal at the entrance end of said section, said signal being of a type having a member biased to a first position in which it conditions the signal to provide a first indication, a first control winding effective when energized to move said member to a second position in which it conditions the signal to provide a second indication, a second control winding effective when energized to move said member to a third position in which it conditions the signal to provide a third indication, a code following relay, means governed by traffic conditions in said section for at times supplying to said relay coded energy of a first character and at other times supplying to said relay coded energy of a second character, a decoding transformer, means responsive to operation of said relay by coded energy of either character for varying energization of the decoding transformer primary winding, means effective when said relay is responding to coded energy of the first character for supplying energy from the decoding transformer to said first control winding and means effective only when said relay is responding to coded energy of the second character for supplying energy from the decoding transformer to said second control winding.

OSCAR S. FIELD.