

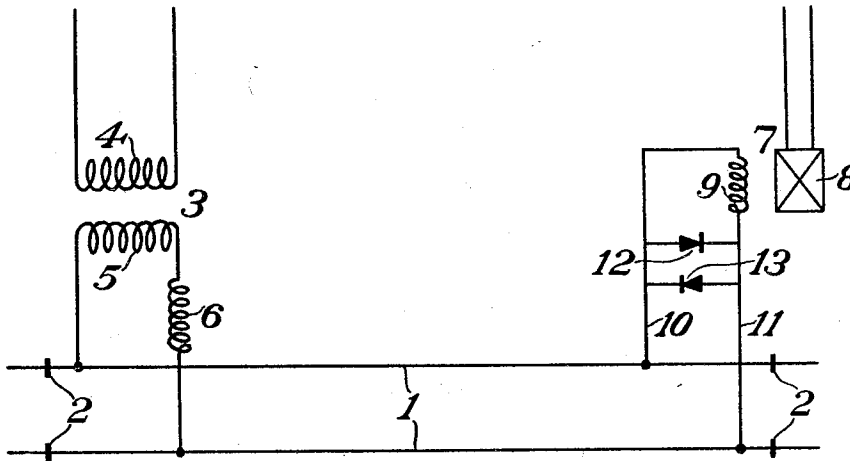
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TRACK SIGNALING SYSTEM FOR RAILWAYS AND THE LIKE

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INVENTOR :

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UNITED STATES PATENT OFFICE

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TRACK SIGNALING SYSTEM FOR RAILWAYS AND THE LIKE

Application filed August 14, 1928, Serial No. 299,602, and in Great Britain September 24, 1927.

My invention relates to track signaling systems for railways and the like and has for its object to provide an improved system of this character which shall be reliable and economical in operation.

In track signaling systems the resistance of the track ballast being a very variable quantity dependent to a large extent upon weather conditions renders it generally necessary to adjust the track relays so as to ensure their satisfactory operation under the worst possible ballast conditions with the result that for more favorable conditions the current actually supplied to the relay is higher than that necessary for proper operation. Such adjustment is open to several disadvantages involving under normally favorable conditions of the track ballast, a waste of energizing current when the block section is unoccupied the excessive current supplied to the relay winding also causing possible injury or rapid deterioration of the relay mechanism. Furthermore the adjustment of the relay in this manner to meet the most unfavorable condition of the track ballast reduces the maximum train shunt resistance necessary to ensure the de-energization of the relay under more favorable ballast conditions when a train or vehicle enters the block section.

According to the present invention these disadvantages are obviated by regulating the voltage impressed upon the relay winding connected to the train rails by connecting across the track rails at a suitable point one or more current rectifying devices preferably of the metal oxide type described for instance in Letters Patent of the United States No. 1,640,335 granted to L. O. Grondahl on Aug. 23, 1927.

It will generally be necessary to provide a pair of oppositely connected rectifying devices owing to the reversal of the direction of current flow in an alternating current signaling system or in the case of the direct current signaling system to enable the desired regulation to be effected when current of the normal or reverse polarity is supplied to the track rails in the well known manner

to enable three position signaling to be utilized.

The invention is illustrated by way of example in the accompanying drawing the single figure of which is a diagram of connections showing the invention as applied to an alternating current signaling system comprising a track relay of the two element type.

Referring now to the drawing, the track rails of a railway are indicated at 1 as subdivided to form a block section by means of insulated joints 2. Alternating current for signaling purposes is arranged to be supplied to the track rails 1 at one end of the block section through a transformer 3 the primary winding 4 of which is connected to a suitable source of alternating current, the secondary winding 5 of the transformer 3 being connected to the track rails 1 in series with a regulating impedance 6.

At the opposite end of the block section a track relay 7 is provided this relay being of the two element type having a local or independently energized winding 8 and a track winding 9 which is connected to the track rails 1 by means of conductors 10, 11. A pair of oppositely connected current rectifying devices 12, 13 of the type described in the prior specification above referred to are connected in parallel with one another across the conductors 10, 11 one of these devices being operative during the positive half wave of the alternating current voltage impressed upon the track rails 1, and the other rectifying device being operative for the alternate or negative half waves.

It will be evident that each of the current rectifying devices 12, 13 serves during its operative period to shunt current from the relay winding 9, the amount of current thus diverted being dependent upon the voltage impressed upon the terminals of the rectifying device. The resistance offered by the rectifying device to the passage of current there-through decreases as the voltage across the track rails 1 at the point of connection of the conductors 10, 11 increases, with the result that the voltage impressed upon the relay winding 9 is maintained substantially constant irrespective of variations in the track

5 rail voltage at this point due to variations in the ballast resistance. As a result the relay 7 can be adjusted for normal ballast conditions without risk of an excess of current being supplied to the relay when these conditions are abnormally favorable or of the relay failing to operate under abnormally unfavorable conditions.

10 The invention is evidently not limited to the particular arrangements or connections above described and illustrated which may be varied in order to meet particular conditions of operation as desired.

15 Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

20 1. A track signaling system for railways and the like comprising a relay connected across the track rails to which signaling current is supplied, in which current rectifying devices are connected in multiple across the track rails at a suitable point by conductors which exclude the relay, for the purpose specified.

25 2. An alternating or direct current signaling system as claimed in claim 1 in which two oppositely connected current rectifying devices are connected in multiple across the track rails at a suitable point by conductors which exclude the relay, for the purpose specified.

30 3. A signaling system as claimed in claim 1 in which each of the current rectifying devices is of the metal oxide type, for the purpose specified.

35 4. A track signaling system for railways comprising a source of signaling current and a relay connected across the track rails at spaced points, and two current rectifying devices oppositely connected in multiple across the terminals of said relay.

40 5. A track signaling system for railways comprising a source of alternating signaling current and a relay connected across the track rails at spaced points, and two current rectifying devices oppositely connected in multiple across the terminals of said relay.

45 6. A track signaling system for railways comprising a source of signaling current and a relay connected across the track rails at spaced points, and two current rectifying devices of the metal oxide type oppositely connected in multiple across the terminals of said relay.

50 7. A track signaling system for railways comprising a source of signaling current and a relay connected across the track rails at spaced points, and a current rectifying device connected across the terminals of said relay so that current of the polarity which operates the relay flows through the rectifier in its low resistance direction.

55 8. A track signaling system for railways comprising a source of signaling current and

a relay connected across the track rails at spaced points, and a current rectifying device of the metal oxide type connected across the terminals of said relay so that current of the polarity which operates the relay flows through the rectifier in its low resistance direction. 70

In testimony whereof I affix my signature.
LESLIE HURST PETER.

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