

BLOCK AND INTERLOCKING SIGNALS

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649075256

Block and Interlocking Signals by W. H. Elliott

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

www.triestepublishing.com

W. H. ELLIOTT

**BLOCK AND
INTERLOCKING
SIGNALS**

Block and Interlocking Signals.

BY W. H. ELLIOTT, SIG. ENG.,
C. M. & ST. P. R. R.



WHAT THEY ARE FOR.
WHAT THEY DO.
HOW THEY DO IT.

LOCOMOTIVE ENGINEERING,
NEW YORK.

1896

Copyrighted, 1926, by SINCLAIR & HILL,
New York.

61412

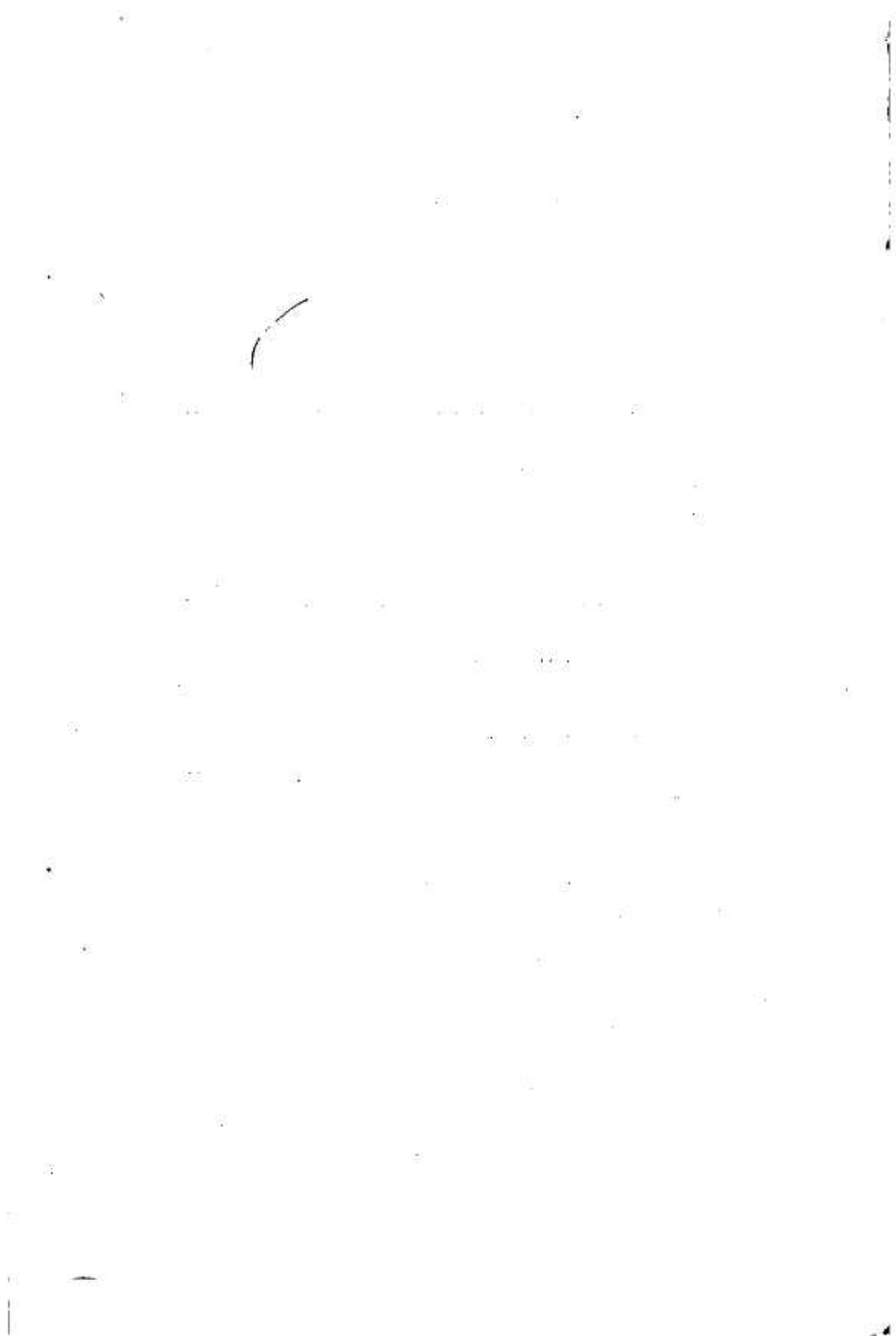
SSVE

.EL5

6415713

CONTENTS.

	PAGE
CHAPTER I. Block Signaling: What it is for, What it does, How it does it	1
CHAPTER II. Methods of Operation and Rules	17
CHAPTER III. Construction—The Telegraphic Systems.....	33
CHAPTER IV. Construction—The Controlled Manual Systems. ...	51
CHAPTER V. Construction—The Automatic Electric Systems	65
CHAPTER VI. Construction—The Automatic Electric Systems, continued .	83
CHAPTER VII. Construction—The Automatic Mechanical and the Staff Systems	101
CHAPTER VIII. Installation and Care of Automatic Electric Signals, with a Comparison of the Cost of the Different Block Signal Systems.....	123
CHAPTER IX. What They are For and How They are Operated....	143
CHAPTER X. For Junction Points and Drawbridges—Construction of the Improved Saxby & Farmer Interlocking Machine.....	165
CHAPTER XI. The Stevens Machine, and How a Switch is Moved and Locked.....	183
CHAPTER XII. Details of Construction.....	199
CHAPTER XIII. The Westinghouse Electro-Pneumatic and the Gibbs Electric Street Railway Systems.	220
CHAPTER XIV. Agreements, Contracts, Specifications, Installation and Repairs.....	241
CHAPTER XV. Switch Signals.....	257



BLOCK SIGNALING.

WHAT IT IS FOR. WHAT IT DOES.
HOW IT DOES IT.

By W. H. ELLIOTT,
SIGNAL ENGINEER, C., M. & ST. P. R.R.

CHAPTER I.

"What are we stopping for, conductor, out here in the woods? This is a limited train. What! stopped by a signal, a block signal, you say? Why, what is that? Oh, I see! You have a red blade projecting from the top of a pole to indicate to the engineer when the blade is moved up or down whether he may enter the block or not, the block being the piece of track extending to the next signal. So, then, when we are stopped by such a signal it means that another train is in the block, and we will have to wait until it has passed out."

And thus it is that to-day trains are being run through towns and cities, over mountains and prairie, through bridges and tunnels, in cuts and around curves with absolute safety, a fact not fully appreciated by the traveling public, but which becomes to the engineer, whose responsibility is lightened and from whom anxiety is removed, a guiding star, telling him that the track is his and that there will be no one to dispute it with him, for such little arguments, you know, are sometimes disastrous.

Block signaling, though limited in extent in this country, in proportion to the miles of track operated, is so rapidly being extended, not only from the natural increase of business and conse-



quent demands for a safe method of operation, but from the general knowledge being acquired of the advantages to be gained from such a system, that I believe an article on the subject would be both interesting and instructive. To the man well posted on signal matters, little that is new will be found, as this article is written more for those who are constantly guided by a signal, but have little idea of its construction.

The commencement of signaling may be said to begin with the use of the locomotive, for it soon became manifest that something would have to be devised, not only to prevent collisions between trains, but to give information to engineers regarding the position of switches and the right to go ahead. Many forms and devices were used in these early days, few of them being seen to-day, but which, as in the development of the locomotive, became stepping stones to things much better.

As each engineer pre-

1. Home Block Signal—"All Clear."
2. Home Block Signal—"Danger, Stop."
3. Distant Signal—"All Clear."
4. Home Block Signal—"Danger."

ferred his own devices to those of others, it followed, as a matter of course, that the practice was very varied, so much so in some cases that the safety signal on one road became the danger signal of another. Naturally enough, this state of things brought about many serious accidents, and finally resulted in a meeting being held by those interested, for the adoption of a standard form of fixed signal to be used by all the roads. The choice fell upon the "semaphore," a signal designed by Mr. Gregory in 1841, which indicates—by position and not by its form—whether the track is clear and the train has a right to proceed.

It was decided that a horizontal position of the blade should indicate "danger" or "stop;" a vertical position, "all clear" or "go ahead," and a position midway between these two, making an angle of forty-five degrees with the horizontal, "caution" or "proceed carefully."

Its construction was very much the same as that used to-day, consisting of a blade pivoted at the top of a pole and capable of being turned through about a quarter of a circle. The colored glasses for giving the night indications were carried in a separate frame pivoted lower down on the pole, instead of being held, as in modern practice, by the casting to which the blade is fastened. The blades for governing train movements in one direction were always put on the same side of the pole. In this country, the blade projecting on the right-hand side of the signal pole, as looked at from an approaching train, is the one that governs. In England, where all trains run on the left-hand track, signal blades projecting to the left side govern.

The signals were operated under what is called the "time interval system;" that is, not allowing one train to follow another into the block until the lapse of a certain period of time. When a train entered the block the signal was put at danger and kept there for five minutes, when it was pulled to a cautionary position, and after the lapse of five minutes more the signal was "cleared," giving the right to the next train to proceed.

Experience with this method of operation soon demonstrated that the principle was not correct. For while a train may have passed, a certain length of time, the signal gave no indication of how far it had gone. The many accidents occurring under this