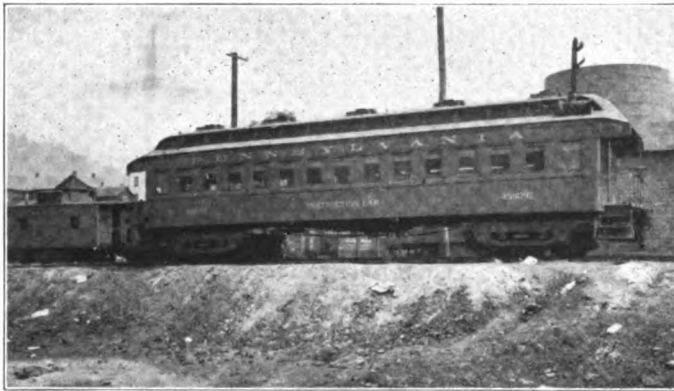


## INSTRUCTION CAR ON THE PITTSBURGH DIVISION OF THE PENNSYLVANIA.

*The success of this method of keeping trainmen in touch with the signaling on this division has attracted much attention to this car and its equipment.*

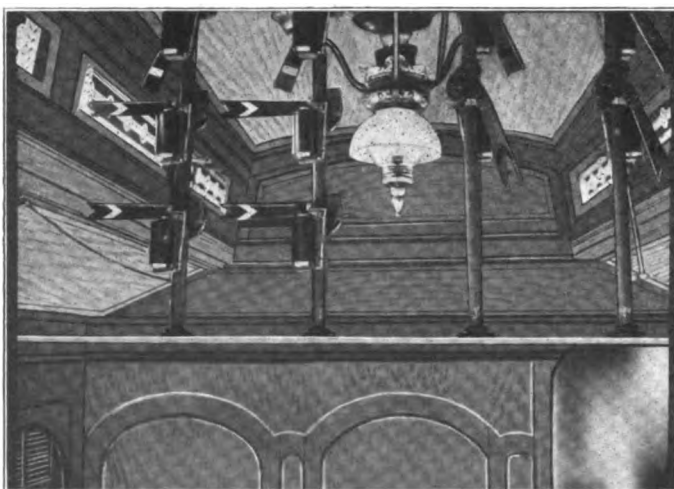
The rules of the Pittsburgh division of the Pennsylvania require all enginemen and firemen to report to a signal instructor at least once in six months, and other trainmen at frequent periods, for examination on their knowledge of the signals on the division. To facilitate this examination the instructor is provided with a well-equipped signal instruction car, which is stationed at convenient points along



The Instruction Car.

the line for periods of such length that it covers the division twice a year. The trainmen have taken kindly to the method, and in addition to the required examination, enginemen and trainmen alike come to the car to settle questions that may arise among themselves concerning signals or interlocking layouts, and also to be instructed whenever a change in signals is posted.

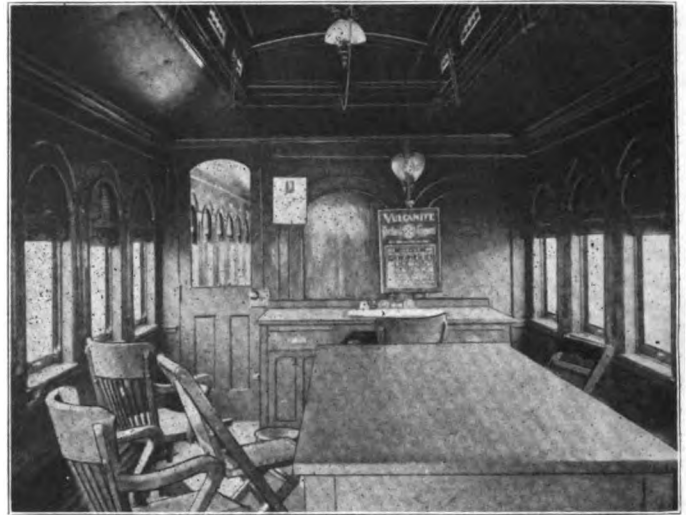
The car is a remodeled passenger coach, the interior having been stripped of furnishings and refinished throughout in oak. It is divided into two compartments by a partition, a door at one side furnishing a connection between the two. The smaller of the rooms thus formed is fitted



Model Signals Mounted in the Car.

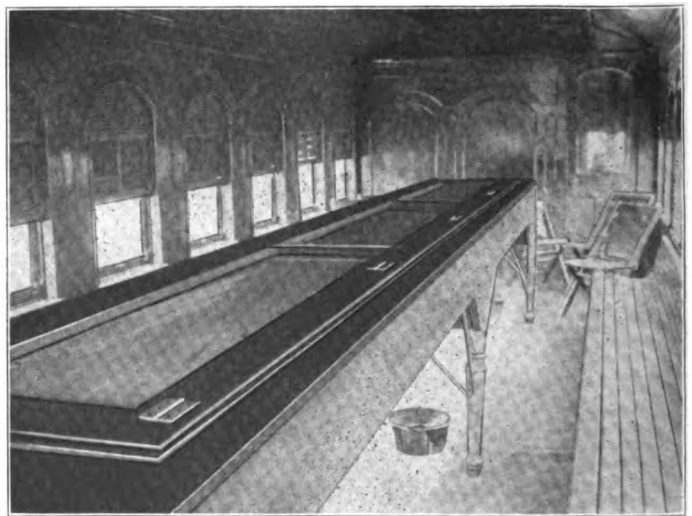
up as an office for the instructor. It has a table, desk, chairs, stove, and lavatory. The larger room is the instruction room. It is fitted with a glass top case 18 ft. long and about 14 in. wide placed in the middle of the car, with benches running the full length of the room on each side of the case. The case contains a line diagram of the tracks on the entire division, showing all signals,

signal bridges, switches, cabins, station fences, stations and way-stations. The diagram is made on blue print linen and lies directly under the glass top, being rolled on large wooden rollers at the ends of the case. A typical section of the diagram is shown in the drawing reproduced herewith. On the original, the passenger tracks are shown yellow, the freight, red, and joint tracks, green. Above the case are four  $\frac{1}{2}$  in. x  $2\frac{1}{2}$  in. steel bars representing signal bridges, which span the width of the car at the height of



The Instructor's Office.

the lower deck plates. To these bars are bolted model signals which are reproductions of the signals on the four bridges in one of the interlocking plants on the division, the layout of which is shown in one of the drawings. The view of the instruction room shown was taken before these signals were in place. The view of the signals on the bridge shows the arrangement of one of the model bridges. The models, which were furnished by the Union Switch & Signal Co., are made to a scale of 1 in. to 1 ft. and are operated by electro-magnets wound to a resistance of 80 ohms. The current is taken from dry battery, the control wires being



The Instruction Room.

carried to a switchboard in the end of the instruction room, and from there in trunking along the deck of the car and on the lower side of the supporting bars to the signals. The switchboard has a series of hand switches numbered to correspond to levers in an interlocker, and a painted manipulation chart which allows the instructor to set up any desired combination of signals. The control wires are so

looped through the switches, however, that it is impossible to get any combination of signals that could not be set up in the actual plant. All control wires are broken through a main battery switch which is normally open.

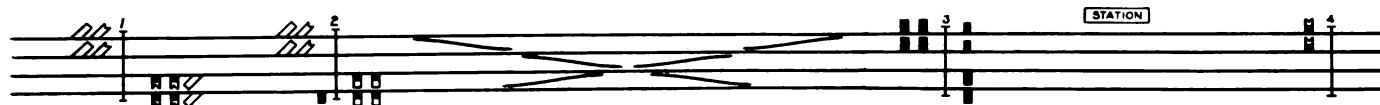
When an engineman reports to the instructor for examination, he is taken into the instruction room and examined orally with the aid of the diagram. The instructor may assume that the man is to run a given train over the division, and he will require him to point out all signals which would govern his movements and tell what indication he would

## INSTRUCTIONS TO MAINTAINERS FOR THE CARE OF MECHANICAL INTERLOCKING.

*The following instructions are being used as a basis for a standard form for all maintainers on a large road.*

### ADJUSTMENT OF SWITCHES AND DERAILS

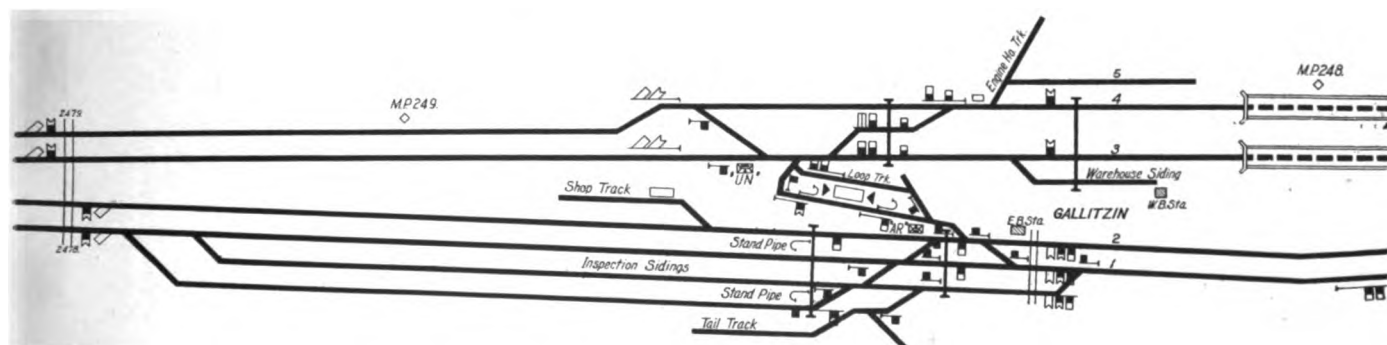
First try the lever in the tower and see how it works. Then go to the derail or switch and see that the gauge is standard, and that the point, rail, and throw rods are free



The Lay-Out of the Interlocking Plant, the Signals of which are Reproduced in Miniature in the Instruction Car.

receive from each one. Or the instructor may turn the diagram to various interlocking plants, and, assuming that the signals are set up in a given combination, require the man to tell what route he would expect to find cleared and how he would handle his train. All special conditions can be covered by such questions, and it is possible for the instructor to determine very definitely the extent of the

from rocks, dirt and cinders; see that braces are in good shape and that wedges are in same; that all bolts are tight, crank stands solid, and cranks working freely; that the points fit the stock rail; and that the lock rod and main connecting rod do not bind on the ties. Also see that the ties are properly tamped and that the heel is on the level. Have the tower man throw the derail or switch and use a switch tester



Typical Section of the Line Diagram—No. 1.

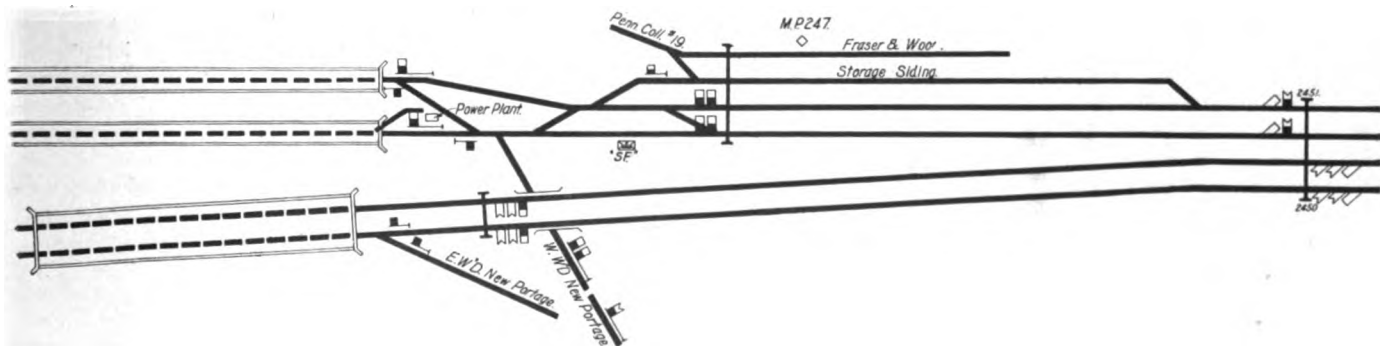
man's knowledge. The model signals are used in instructing enginemen from unsignaled branches who rarely run on the main line, and also in illustrating signal combinations in answering trainmen's questions.

A. Pitcairn, a retired engineman, is the instructor in charge of the car. The equipment and method of operating the car were worked out under the direction of E. J. Clark, supervisor of signals on the Pittsburgh division. An examining board has charge of the men's examinations, the

of standard design to see if bridges and derails are properly adjusted. If they lock with  $\frac{1}{4}$  in. obstruction between the point and stock rail, a closer adjustment must be made. All lock nuts and bolt fastenings must be kept tight and free from rust so that lock rods can be adjusted.

### ADJUSTMENT OF DETECTOR BARS AND FACING POINT LOCKS

Facing point locks should be adjusted so that they pass through the lock rod 8 inches. Switch and lock movements



Typical Section of the Line Diagram—No. 2.

board including the train master, the passenger train master, the freight train master, one assistant train master, the road foreman of engines, the division engineer, the division operator, and the supervisor of signals. The instructor reports both to the road foreman of engines and to the supervisor of signals.

should be so adjusted that the detector bar is at least  $\frac{1}{2}$  in. above the ball of the rail before the movement is unlocked. When the lever is on center the detector bar should be at least  $\frac{3}{4}$  in. above the ball of the rail, and when the switch or derail is properly locked the detector bar should be  $\frac{1}{8}$  in. below the top of the rail. All hook-bolts, web-bolts, clips