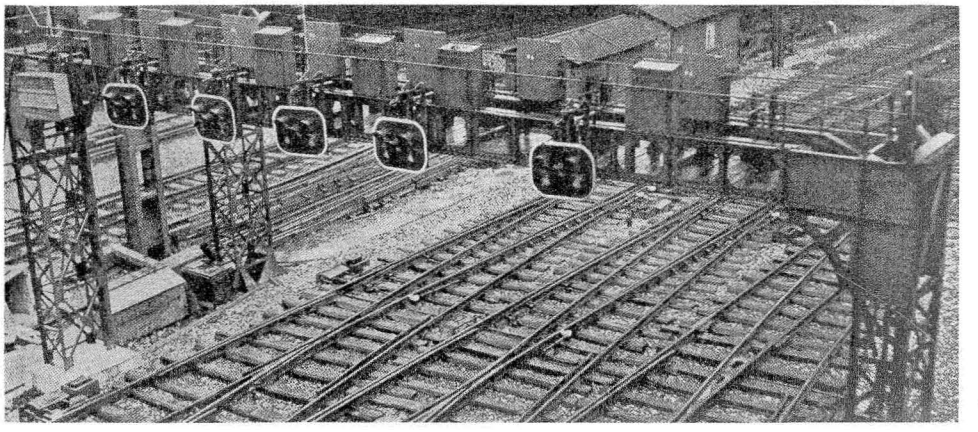
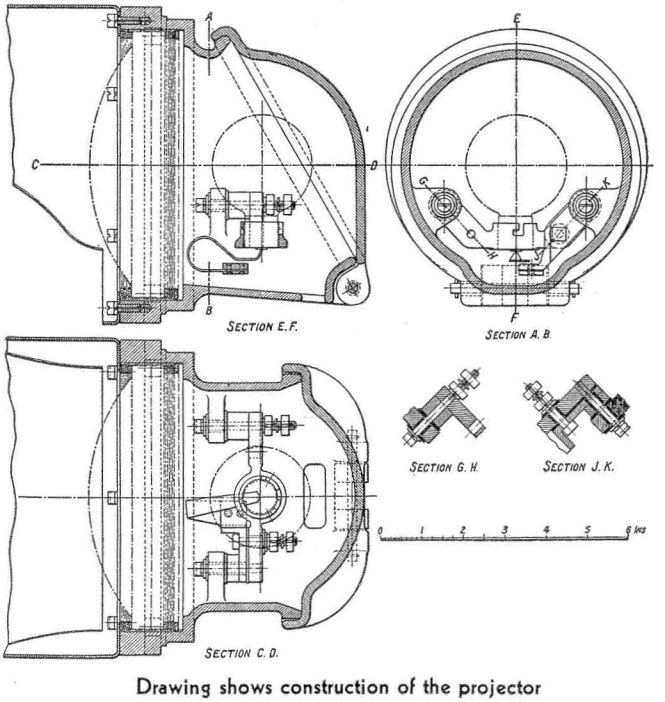
French Railways Adopt Color-Light Signals



Five-light units on a signal bridge

ONE of the first large signaling installations in France to include color-light signals was placed in service recently at the newly reconstructed Paris terminal of the Est Railway, according to an article in a recent issue of the Railway Gazette, London.

This type of color-light signal, consisting of five-light units as shown in the illustration, was developed by the Est Railway and has recently been installed on the suburban routes at Gagny, Pantin and Vincennes; also on the four-track main line between Nancois-Tronville and Lerouville. It is proposed to extend the color-light system to include the 37.2 mi. of double track from Lerou-



Drawing shows construction of the projector

ville to Noveant, and the 12.6 mi. of four-track from Mussey to Nancois-Tronville.

The illustration includes some of the new color-light signals at the Gare de l'Est, showing the combinations of hooded lenses by which the required lights or combinations are given. Detail drawings of a light unit are given. The units are fitted together in suitable combinations on signal panels fixed to metal standards, projecting arms, or bridges. Each unit consists of two super-posed lenses of uncolored glass, with a colored flat pane between the light and the lenses. The colors provided are red for "stop," green for "caution," and white for "line clear," though it will be easy to change the colors to red, yellow, and green, respectively, in due course.

The plant at the Gare de l'Est was installed by the signal department of the railway company, using equipment supplied by the Compagnie des Signaux et des Enterprises Electriques, the Societe d'Electricite Mors, and La Compagnie Generale de Signalisation. The lenses, it is understood, were obtained from America through French sources.

It is understood that measures are being taken toward the standardization of color-light signals on the French railways, the standard indications being:

MAIN LINES

One Green Light: Clear, proceed.

One Yellow Light: Caution. Next signal may indicate stop.

Two Horizontal Yellow Lights: Reduce speed (40 km. per hour for passenger trains and 20 km. per hour for freight trains). This signal can be followed by another with two vertical yellow lights (same meaning).

One Red Light: Permissive stop.

Two Red Lights: Absolute stop.

At junctions, directions are given by a series of arms, the uppermost applying to the left-hand route, and so on.

One (Slightly Bluish) Light: First direction given.

Two Vertical (Slightly Bluish) Lights: Second direction given.

Three Vertical (Slightly Bluish) Lights: Third direction given, and so on.

These signals are mounted one below the other on one post. For the extreme left-hand route, only the top arm is used. For the next route (from the left) the top and second arms are used, while for the third route all three arms are used, the same principle applying to the fourth route, if there is one.

On switching tracks and sidings the following indications are used: One violet light signifies an absolute stop and one white light signifies clear, proceed.

In this connection it will be necessary to eliminate the system used at present in France, in which red is the

color for "stop," green for "caution," and white for "clear." Yellow is used in sidings for "stop," bluish green for "backward," and white slightly bluish for "ahead." A system of flashing lights is used. When the lights are "slowly intermittent" they indicate "slow down," and when "rapidly intermittent" they denote "accelerate speed."

The change-over from the present red, green, and white for main-line signaling will be made gradually. The first step will be the suppression of the green temporarily, replacing it with yellow to mean caution; the yellow being at present restricted to shunting. After some time, green will again be introduced to replace white for "line clear." At present, violet is used to indicate direction at junctions. In the future this signal will be "white, slightly bluish."

Results of Centralized Control on N. Y. C.

By J. J. Brinkworth.

Division Superintendent, New York Central

THE development of the centralized traffic control system, brought out in 1927, was the biggest forward step in railroading that has been accomplished for a long time, as is proved by the excellent results being obtained. The first installation of such equipment was placed in service in July, 1927, on 40 miles of single track on the Ohio division of the New York Central between Stanley, Ohio and Berwick.

Trains of the New York Central and the Big Four are operated over this division, which is an outlet for lake coal traffic from the fields in Tennessee, Kentucky, Ohio and West Virginia. In 1926, 40 to 45 trains were handled daily and more than 150 train orders were issued daily, many train delays being occasioned. The management believed that the peak capacity had nearly been reached and consideration was given to the construction of second track. About this time the centralized traffic control system was developed and after considerable study it was decided to install this new system and thereby defer the second tracking.

The installation as installed by the General Railway Signal Company consisted of power-operated switches at both ends of 9 passing sidings, located approximately 3½ to 4 miles apart; also 3 miles of double track signaled in both directions, 32 dual-control switches, 57 home signals, 18 dwarf signals, and 30 intermediate automatic signals, all of which are controlled from the train dispatcher's machines located at Fostoria,

The signals are of the modern color-light type, with positive-stop home signals at the entrances of the outlets of passing tracks, and stop-and-proceed color-light intermediate signals. The home signals and siding switches are entirely controlled by the dispatcher, the intermediate signals being automatic. Each power-operated switch is equipped with a dual-control selector, which makes it possible to operate the switch by hand, after securing permission from the dispatcher. Telephones, installed at short intervals, permit quick communication with the train dispatcher. The dispatcher is in complete control of all trains in the territory; train orders, manual block system, superiority by rights, etc., being entirely eliminated. Many train stops are eliminated as it is possible to make many non-stop meets. It is needless to say that the services of operators are not necessary, which, in itself, means quite a saving.

The experience of the past few years seems to indicate a saving of approximately 40 min. in the running time of fast freight trains and approximately one hour in the running time of slow trains in the territory mentioned. Figures have been published through the Signal Section, A. R. A. indicating an annual return on the investment, over and above interest charges, of approximately 24 per cent.

A.R.A. REPORT

	Before C.T.C.	After C.T.C	Increase
Freight train speed	8.7	11.8	36%
Gross tons per train	3,000	3,066	2%
Gross ton-miles per train-hour	26,100	36,179	39%
Savings	24%		
With deferred int.	65%		

Cost	
Centralized traffic control	$455,000
Track Changes	84,200
	$539,200

Recently I dropped a note to the dispatcher at Fostoria, Ohio, who was with us at the time of the original installation, and still on the job, to ask him how things were going. Some of his comments are as follows:

Our non-stop meets are so regular that they do not attract much attention any more. Every engineman seems to think he should make non-stop meets.

We recently had a day with 55 train movements, which has been our heavy day—although I noticed no excitement about it. You can imagine what it would have been if we were operating under the train-order system!

We have learned many lessons during the three years that our centralized control has been in service, among which are:

(1) There appears to be no question that centralized traffic control is practical as it eliminates a large amount of train delay and other disagreeable features of single-track operation.

(2) It increases to a large extent, perhaps not less than 40 per cent, the capacity of a single-track line, and thereby, in many instances, should defer installation of second main track; likewise, under certain conditions on multiple-track territory, increased capacity can be obtained by reverse signaling for rush-hour periods.

(3) In studying single-track territory for a centralized control installation, we believe it desirable for best operating efficiency, that sidings be located approximately three to four miles apart, depending, of course, on the volume of traffic, and yet, as far as possible, existing siding locations should be used to avoid expense.

(4) Turn-outs should be not less than No. 16 and the length of sidings need be not greater than 1½ times the maximum length of trains. Some may consider longer sidings necessary and desirable, but we do not believe we can justify the expenditure greater than mentioned.

*Abstract of paper presented before recent meeting of the New England Railroad Club, Boston, Mass.