

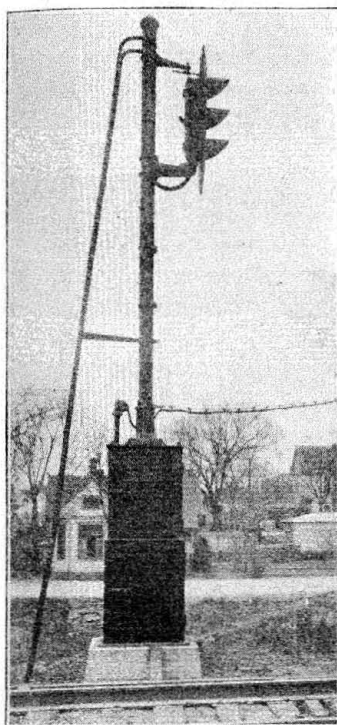
Semaphores Replaced By Color-Light Signals on 55 Miles of I. C.

Gas Mechanisms Removed, Poles Cut Off and Light Heads Installed

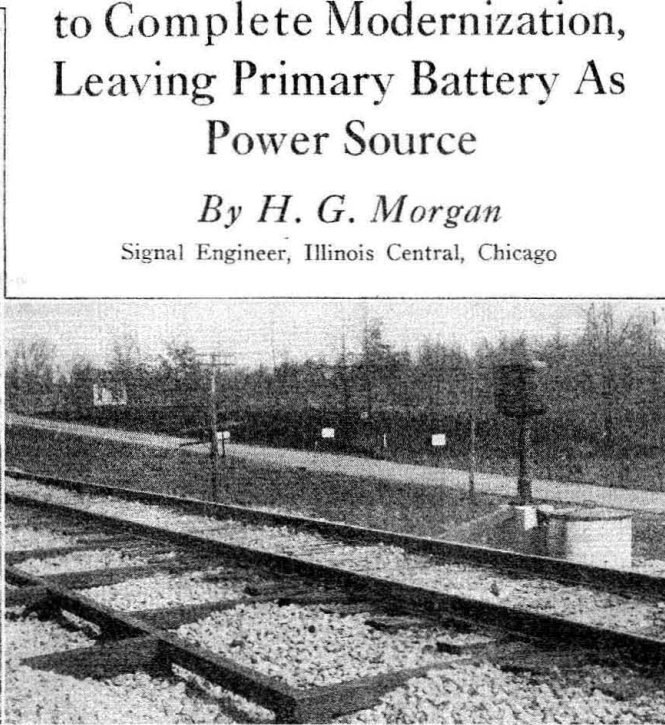
to Complete Modernization,
Leaving Primary Battery As
Power Source

By *H. G. Morgan*

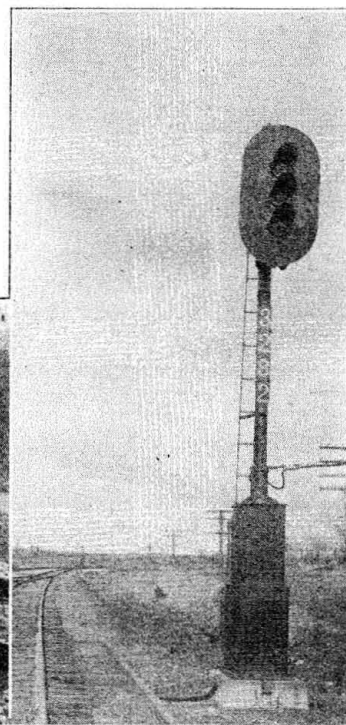
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Signal Mounting on Old Mast



No Changes Were Made at the Cut-Sections



New Light Signal in Service

IN 1924 the Illinois Central found it necessary to replace the electro-gas semaphore signals on its double track main line between Carbondale, Ill., and Illinois Junction, a distance of 55 miles. This was one of the earliest sections of the Illinois Central to be signaled. In 1898 Lattig signals were installed on the 28-mile section between Bosky Dell, immediately south of Carbondale and Dongola, the first motor-driven semaphore signals to be installed after the two trial signals on the Central Railroad of New Jersey. In 1903 the Lattig signals were replaced with Hall electro-gas signals and the installation extended to cover the territory from Carbondale to Illinois Junction.

When the time came in 1924 for renewal of these signals, the old primary batteries had already been renewed with R. S. A. standard cells. Gravity battery on track circuits had been replaced with R. S. A. standard cells and the old slate back track relays had been renewed with modern relays. The problem, therefore, was to make the simplest change, benefitting as much as possible by what had been done before.

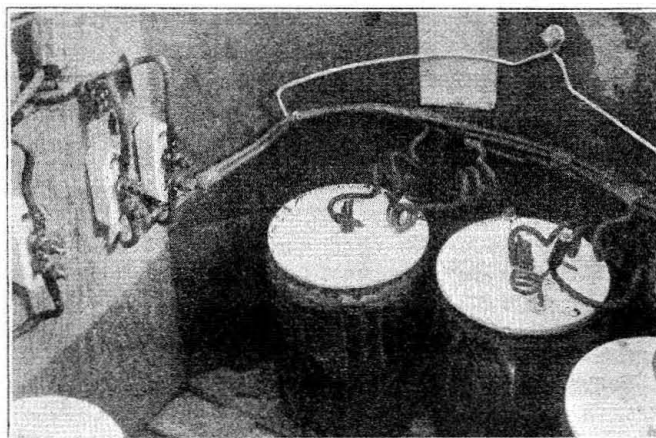
Decide to Use Color-Light Signals on Primary Battery

It was decided to use color-light signals mounted on existing poles, using the batteries already in place in the battery cases and housing the control relays in the mechanism cases. It was cheaper to install approach lighting than to put in a power line, and as most of the territory is fast track it was economical to operate on primary battery. In two stretches, through Anna, Ill., and through the yards at Mounds, Ill., where much

switching is done, it was found to be more economical to string a short a.c. power line, using 110 volts, to light the signals constantly, retaining the existing primary batteries as a reserve.

Why the 10-Volt, 18-Watt Lamp Is Used

The use of color-light signals with primary battery and approach lighting had been considered for some time.



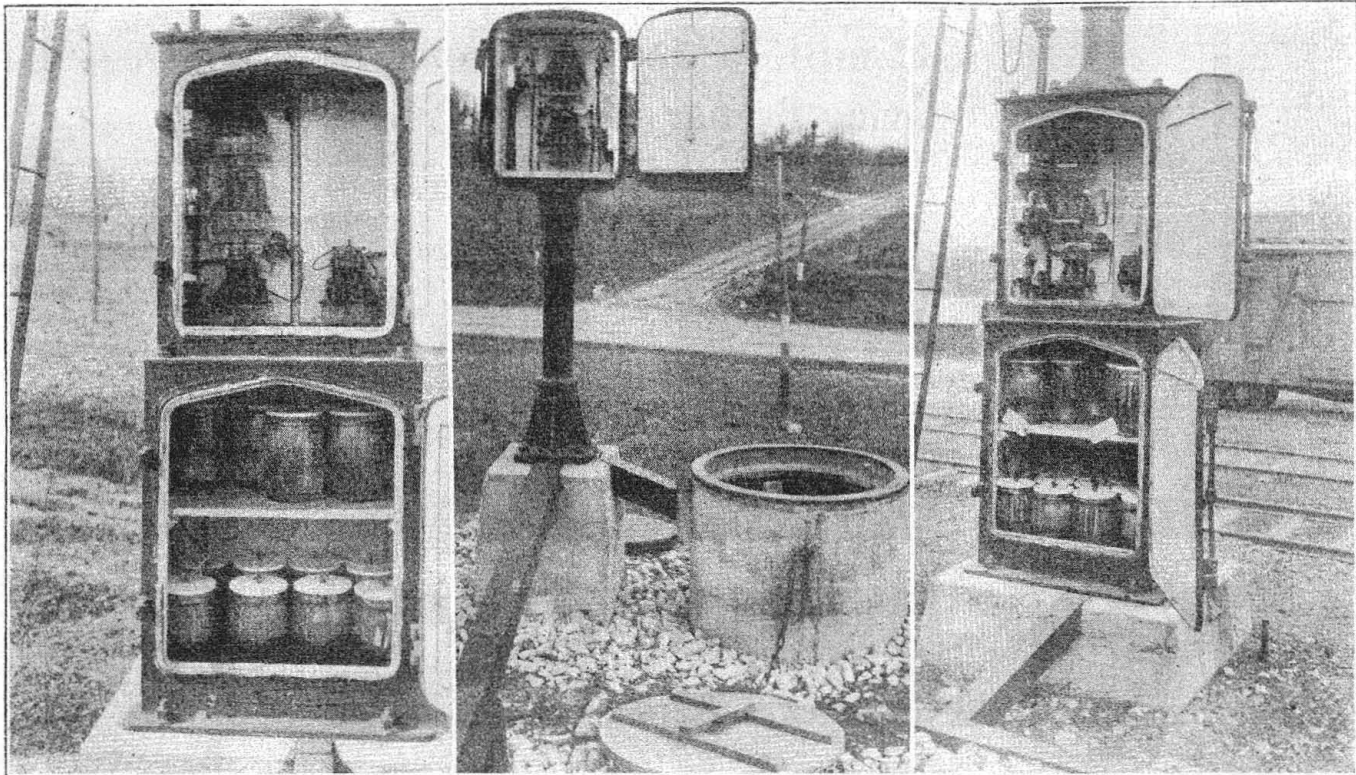
Track Battery in Small Tub at Cut-Section

In 1921 two test signals had been installed at Pulaski, Ill., which is in this territory, and various lamps had been tried.

All of the 85 new color-light signals between Carbondale and Branch Junction are the Union Style-R, equipped with 10-volt, 18-watt double filament lamps. This type of lamp was chosen because it was already in extensive use on the Illinois Central and had given very satisfactory service, and because it could be burned at 20 per cent under voltage and give a satisfactory indication eliminating the risk of lamp burn-outs due to peak

stations a counter on one signal would accurately record the performance of several adjacent signals. A list was prepared showing the signals equipped and the signals to which the readings of each counter apply. The new light signal counters are Railroad Supply Company No. 3,000, designed to work on 8 volts direct current.

This modernization of an old signal installation was not expensive, was handled without a charge to capital



Typical Case for Straight Primary Location

A Double Track Cut-Section

A C.-Primary Case with Cut-Over Relay

voltage of new batteries. Practically all of the lamps installed on approach lighting in December, 1924, are still in service.

Approach lighting was accomplished by using standard two-point, 500-ohm line relays. These relays had been relieved on another section of the road in connection with rebuilding another installation as present circuit standards require four-point line control relays. Approach sections were made to give full daylight range of signals. Owing to track curvature, many of the sections are the length of one track circuit, or about 3,000 ft., and about 20 signals are equipped with spreadlite lenses.

Fifteen cells of battery were used at each signal to operate both the signal and the line relays. Line relays are of 500 ohms resistance. Records show that batteries last approximately 140 days on approach lighting. There are about 30 train movements in each direction daily.

Where used as a reserve for the A.C.—Primary battery system with continuous lighting, the life of the battery is determined largely by the line circuit load. Apparently this life will be three or four years. In the A.C.—Primary battery sections, No. 6 A. W. G., D. B. W. P. copper line wire is used for transmission; with General Electric Type-M transformers and Valley cut-over relays.

In order to keep a performance record some of the signals were equipped with counters. Reference to counter reports of the semaphore signals, all of which were equipped with counters, indicated that between

account, and results have been satisfactory in every way. No change has been made in the maintenance force although the present arrangement is easier to maintain than the previous installation of semaphore signals.

Collision on C. & O. Due to Disregard of Signals

Failure of the engineman properly to obey signal indications was assigned as the cause of the rear end collision between two freight trains on September 15, 1925, on the Chesapeake & Ohio at Vanceburg, Ky., resulting in the death of two employees, in a report of the Bureau of Safety of the Interstate Commerce Commission recently issued. This accident occurred on the Cincinnati division over which trains are operated by time table, train orders and an automatic block signal system. Westbound freight train Extra 1222 passed Extra 1218 at G. N. Cabin, 16.4 miles east of Vanceburg, and was brought to a stop at Vanceburg interlocking, with the rear end of the caboose just west of the westbound home interlocking signal, where shortly afterwards, about the time the train started to move ahead, it was struck by Extra 1218. The latter train followed Extra 1222 from G. N. Cabin, passed the hold-out signal at Vanceburg, which was displaying a caution indication, passed the westbound home interlocking signal, which was displaying a stop indication, and collided with Extra 1222 while traveling at a speed estimated to have been between 5 and 6 miles an hour. The investigation of the commission disclosed that the accident was caused by the failure of the engineman of Extra 1218 properly to obey signal indications. He noticed the stop indication of the home interlocking signal, but apparently delayed placing the brake valve in the emergency position until it was too late to prevent the accident.