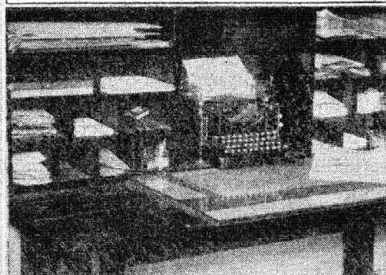
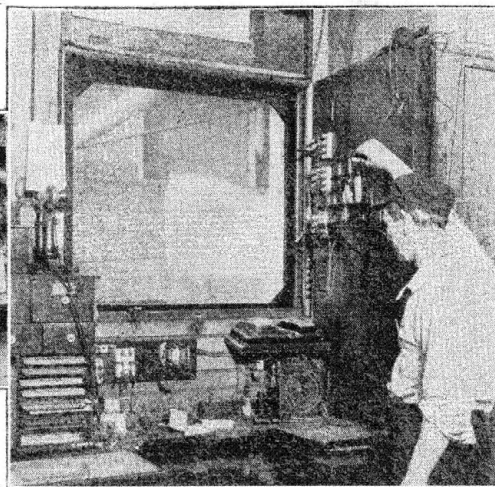


# What's the



# Answer?



An open forum for the discussion of maintenance and construction problems encountered in the signaling field. *Railway Signaling* solicits the co-operation of its readers both in submitting and answering any questions of interest.

### To be answered next month

- (1) *Who handles the repair of motor cars on your road?*
- (2) *What is the best method of determining the proper charging rate for batteries in an a.c. floating system?*
- (3) *How do you adjust track circuits to obtain maximum life from primary batteries?*

## Semaphore or Light Signals?

*For new installations of automatic signals, do you prefer semaphore or light signals? On single track? On double track?*

### First Answer

**I**N my opinion it is not a question of what the signal engineer prefers, but what is the most suitable for expediting the traffic with the least possible delay under all weather conditions. If the road operates in territory where, in late fall, winter or early spring, an occasional heavy wet snow storm with high wind plasters the signal and lenses with snow, making the light indication indistinguishable, then I believe that the semaphore signal is the most suitable. When the light indication is indistinguishable, due to the light being out or otherwise, with the electric headlight the engineer is able to see the position indication given by the semaphore arm. The semaphore signal provides both the color-light signal and the position signal indication.

Chicago.

F. E. JACOB

Signal Engineer, Chicago & Western Indiana.

### Second Answer

**I**T is our opinion that the color-light signal is an admirable double track signal, and should be installed for double track purposes. For single track we believe the semaphore signal to be preferable to the color-light signal, particularly on account of the superior information afforded the maintenance of way workers and motor and hand car operators. The indications of the semaphore signal can be read from either side, which feature adds additional protection to maintenance

of way workers, and enables such men to work to better advantage along the track. Our maintenance of way department is strongly in favor of the semaphore signal, and I think they are right in their opinion that the semaphore signal is more desirable than the color-light signal for single track.

Louisville, Ky.

A. R. FUGINA,

Signal Engineer, Louisville & Nashville.

### Third Answer

**I**HAVE no preference for either. As the Northern Pacific is all signaled with semaphore signals, it would be foolish for us or any other road where the majority of their signals are the semaphore type to change to light signals.

I am a strong believer in semaphore signals. This method of communicating information to a moving train appears to me to be the safest and best, as it is entirely feasible that an engineman on a fast moving train might pick up a wrong light in these days when so many electric lights of various colors are being used in all parts of the country. If, however, there is a semaphore arm in connection with the lights, the engineman will have a double indication, the lights and semaphore. During the daytime, there is certainly no argument against the semaphore signal; and at night with the present headlights the semaphore arm can be seen for a great distance and on a single track where we always have an overlap, and in a great many cases on double track with an overlap, the semaphore arm would be seen with the aid of the headlight in sufficient time for the engineman to govern his train according to the indication it gave.

Another disadvantage with light signals in countries where there is a great deal of heavy and drifting snow, is that in many cases the snow would drift in and cover the entire light. In such cases, we would then be entirely without the lights but with a semaphore we would still have the arm to be governed by.

Those who advocate light signals claim the elimination of all mechanism trouble. On the Northern Pacific we experience very little mechanism trouble. On the other hand, with light signals, it is necessary to install one or two relays to take the place of the circuit controller on the signal and while the little mechanism trouble might be eliminated by installing light signals, new troubles of burnt out light bulbs and the additional relay troubles will be added.

On single track, the semaphore signal is much preferable. It is not alone the trains that are governed by these signals but also signalmen, sectionmen and bridge men, in fact every one who runs a motor car

is governed entirely by the semaphore arm. The number of motor car accidents on single track are reduced by installing semaphore signals. With light signals, particularly where there is approach lighting, the men do not have this help to show them when a train is approaching either way and would consequently have to do a great deal of flagging.

In conclusion, I might say that the best signal indication would be a combination of light signals and semaphore signals. I understand that the New Haven has a combination as they did not want to depend entirely on light signals but wanted semaphore signals in addition. But, the whole country seems to have gone light signal mad and I am afraid they will wake up some day to find that this has been done without due consideration of the many advantages of semaphore signals.

St. Paul, Minn.

C. A. CHRISTOFFERSON,  
Signal Engineer, Northern Pacific.

#### Fourth Answer

**A**LTHOUGH we have no comparative figures on the cost of maintenance of light signals versus semaphore signals, from what I can learn the maintenance costs are about equal. However, the operation of the light signals is more costly. Signal engineers on some of the roads employing light signals claim cheaper maintenance and operation, but from the figures I have seen, they merely quote the actual cost of power consumed, which is misleading, as their figures do not include capitalization of the power line; replacement of burned out transformers, burned out relays (which for this work are very expensive) and the general maintenance of power lines.

An interruption of the light signal power line due to lightning, sleet or other causes will throw out the signal system, because the light will be out in each signal. With our unit scheme of semaphore signals, the interruption of one signal does not affect the others, and if the light on the semaphore fails, there is still the semaphore blade to guide the engineman both day and night, as he can see the blade at night on clear track by the aid of the head light.

The result of our experience with the electric lamps in the last eight months shows that we could expect many failures of light signals from burned out and defective bulbs.

It is claimed in favor of the light signals that it has no movable parts. Our records show that we do not have exceeding one mechanism failure in approximately a million operations and this can usually be traced to preventable causes; neither have we ever had a clear signal failure due to a mechanism failure. The semaphore also has the big advantage of being visible from the rear.

The cost of installation of light signals is far greater than semaphore signals, as the item of the power line for light signals, alone, is about equal to the total outlay for the installation of automatic semaphore signals, and then there is to be added the cost of the light signals, themselves, and their connections and auxiliaries.

Where primary batteries are used with light signals, the cost would be slightly under the cost of our present semaphore signals, but the maintenance cost is greater on account of the greater battery consumption.

On multiple track roads with dense traffic, like the Pennsylvania, they have short maintenance sections and very close maintenance, the a.c. position-light signaling system is economical, but our operating and other conditions do not require anything so elaborate. In other words, our signal system meets our conditions in the most economical manner.

I have therefore recommended that we continue the

use of our present scheme of semaphore signals, as it is the most practical, economical and efficient system.

Wilmington, N. C.

C. J. KELLOWAY,  
Superintendent of Signals, Atlantic Coast Line.

#### Fifth Answer

**E**VERYONE interested in signaling has, no doubt, due to the rapid advancement within recent years, asked themselves, "What goal do I desire to reach?" when changing or attempting to improve upon their present methods of signaling.

When the proposition comes up to make a new installation of automatic signals, a decision has to be made as to the type of signal; namely, semaphore or light. In the past, semaphore signals were used universally. Now, a decision is reached to make the proposed installation of the light type. If so, what goal is it desired to reach or what reason can be assigned for the change?

Does a semaphore signal carry with it expensive and difficult maintenance of a mechanism with moving parts? You hear so much about the moving parts in the mechanism of a semaphore signal and considerable stress laid upon this feature; then, on the other hand, you hear of a railroad which does not open the mechanism cases for periods of several weeks on account heavy snows or due to other local conditions.

It is then evident that the mechanism is reliable and requires very little attention. Mechanisms now in service for more than twenty years are apparently as serviceable as the first day installed. Experience has taught that mechanisms for semaphore signals require but very little maintenance. Economical and reliable in operation, mechanism failures in comparison with classification of other signal failures, carry the least percentage. They are almost unknown.

Visibility is a factor. At night the light signal has a longer range of vision, even greater than is required. The vision of a light in a semaphore type signal at night is ample and on tangent track indication of two or three signals in advance can be seen. A range of vision from signal to signal is all that is required. During the day the semaphore signal has the advantage in vision, both in distance and spread.

Approach lighting is generally used in light signals and an indication of the condition of block is shown only at the time a train is approaching the signal. A semaphore signal shows the condition of a block during the entire day and this information is used to a great advantage by signal, track, bridge and other employees engaged in the maintenance of roadway. On single track a dispatcher instructs the operators to advise him when trains show up in the block so he can postpone putting out train orders until just in time to have them ready when the train arrives. Signal maintainers, by their own observation in covering their territory or from information secured from telegraph operators or trackmen, obtain information about signals being out of order sufficiently in advance, at times, to clear the trouble before a train arrives.

Light signals have a greater penetration through fog and smoke and require less clearance; therefore, they are adaptable for installation in tunnels, in terminals and on multiple track railroads.

Make haste slowly to reach the goal of what it is desired to accomplish and before installing light signals on single track, it should be known what goal it is desirable to reach. If the goal is reached by use of light signals, be sure that something of more importance is not sacrificed.

Springfield, Mo.

I. A. UHR,  
Signal Engineer, St. Louis-San Francisco.