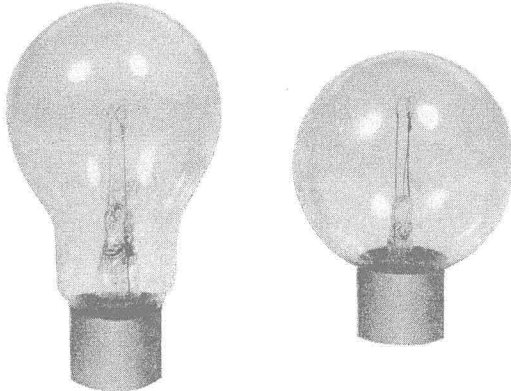


of the front lens of the doublet is to gather into the beam portion of the light that which would be lost with only one lens. These lenses may be colored or the front of the system may be covered with a colored roundel. The usual practice is to use a colored lens. To increase the contrast between the bright lens and the surroundings, an artificial dark background is supplied as shown. To overcome the effect of direct light from the sun a deep

to a large measure on the exactness with which the light is located with respect to the lens system. To insure this accuracy which is not possible in the manufacture of the lamp, the signal manufacturer "sweats" a sleeve, containing two or more pins, on to the pinless base supplied by the lamp manufacturer so that the lamp can be used in a special accurately located bayonet socket. The "sweating" of the sleeve is done in a microscopic jig which locates the light source in the exact position. As it is expensive and difficult to focus a signal lamp properly in the field, this accurate location of the filament with respect to the base pins, enables the signal maintainer to renew a burned out signal lamp with the minimum of labor, at the same time assuring a properly focused signal lamp.



Left—10-Volt, 18-Watt Lamp of the Type in General Use for Color Light Signals
Right—12-Volt, 6-C. P. Lamp Used in Position Light Signals

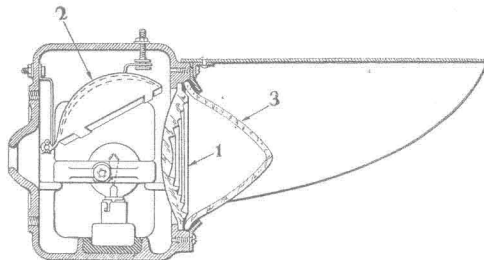
hood is mounted over the front lens. This hood produces a deep shadow on the face of the lens which may materially increase the apparent brightness of the signal.

The development of the light signal has been so rapid that standardization has not been feasible, particularly from the standpoint of the light source specifications. The field has been gradually cut down, however, until today a comparatively few lamps are needed to meet light requirements. Following is a list of lamps in general use for color light signals:

Volts	Watts	Bulb	Base	Filament Construction	Light Center Length
8	10	PS-16	*1825	2 C-2	2½ in.
8	18	PS-16	1825	2 C-2	2½ in.
10	18	PS-16	1825	2 C-2	2½ in.
10	30	PS-16	1825	2 C-2	2½ in.
10	40	PS-16	1825	2 C-2	2½ in.

*Medium bayonet base without pins.

These lamps are all supplied with a double filament, both parts of which operate simultaneously. As the movement of traffic is dependent entirely on the proper



Construction of Light Units Used in Position Light Signals

functioning of the light source, a possible source of train delay would be the failure of the lamp in the signal. In the case of the two-filament lamp the chances of both halves of the filament failing at the same time are remote. When one half of the filament fails, enough light is emitted by the other half to give a signal indication and to prevent the stopping of the traffic. At the same time the brightness of the signal is reduced enough to attract the attention of the signal maintainer.

Owing to the small amount of energy which is used to give the indication, the success of the signal depends

The Position Light Signal

The position light signal, which was developed by A. H. Rudd, chief signal engineer of the Pennsylvania Railroad, avoids the use of color by indicating the position which a semaphore blade would take by a combination of bright light sources. The complete signal is made



Position Light Signals Avoid the Use of Color

up of seven of the light units, so connected electrically to relays controlled by the track circuits that the combination lighted at any one time gives the effect of a semaphore blade.

Referring to the diagram, the essential elements of the optical system are the lens marked 1, the reflector marked 2, and the conical cover glass, marked 3. The lens is of special design known as the inverted half toric, which gives a distribution of light so that the signal is uniformly bright to the engineman even though his locomotive be under the signal. This effect is further increased by the use of the mirror, marked 2. The conical cover glass is designed to prevent a "phantom" indication caused by reflection of the sun's rays from the face of the lens. This cover glass is made with a lemon color so that the emitted light will penetrate fog and smoke better. The specifications of the light source used with this signal are as follows:

Volts	Candle Power	Bulb	Base	Light Center Length	Filament Construction
12	6	B-16½	*1825	2¾ in.	C-3

*Medium bayonet base without pins.

The success of this signal, like that of the color signal, is dependent on the accurate location of the light source with respect to the optical system. A microscopic jig is used to locate the light source accurately with respect to

the base, with pins being "sweated" to the pinless base.

The use of this type of signal requires comparatively large amounts of power, so that the right-of-way is usually paralleled with an a. c. power line. However there are some installations operated from primary battery with approach lighting. Low-voltage signal transformers reduce the voltage to the proper value for the lamp. In some original installations means were provided to reduce the supply voltage so as to reduce the brightness of the signal at night, but experience has shown that this procedure is not necessary.

Recently one of the signal manufacturers has designed and manufactured a combination of the "color" and











ASPECTS POSITION LIGHT SIGNAL		
HIGH	INDICATIONS	NAME
1		STOP. STOP SIGNAL
2		STOP—THEN PROCEED AT SLOW SPEED WITH CAUTION. STOP AND PROCEED SIGNAL
3		PROCEED AT SLOW SPEED PREPARED TO STOP. SLOW SPEED SIGNAL
4		PROCEED WITH CAUTION PREPARED TO STOP SHORT OF TRAIN OR OBSTRUCTION. PERMISSIVE SIGNAL
5		PROCEED AT SLOW SPEED WITH CAUTION PREPARED TO STOP SHORT OF TRAIN OR OBSTRUCTION. CAUTION SLOW SPEED SIGNAL
6		PROCEED AT RESTRICTED SPEED. CLEAR RESTRICTING SIGNAL
7		APPROACH NEXT SIGNAL PREPARED TO STOP. APPROACH SIGNAL
8		APPROACH NEXT SIGNAL AT RESTRICTED SPEED. APPROACH RESTRICTING SIGNAL
9		PROCEED. CLEAR SIGNAL
10		APPROACH HOME SIGNAL WITH CAUTION. CAUTION SIGNAL

Diagram of Indications, Position Light Signal

"position" light signal so that not only position, but color also, gives the indication. This type of signal was devised by F. P. Patenall, signal engineer of the Baltimore & Ohio.

Growth of Electric Signal Lighting

As of January 1, 1924, there were 65,844 miles of track equipped with automatic signals. On this mileage approximately 20,780 or 31 per cent is equipped with oil-lighted signals. An estimate of the number of electrically-lighted signals places it at approximately 55,000. This figure does not include the electrically-lighted manual block signals because there is no available record of the number of this type. The electrically-lighted signal has come to stay, and the present practice of some of the large systems seems to indicate that the light signal will gradually become of more importance because of its economical operation.

Sudden Ravings

I

Whoever you are or wherever you're at,
Be a man or a mouse or a long-tailed rat;
Be, today, what you are—just sort o' live true—
For most folks have you pegged—as *you*.

II.

This does not mean you can't commence
To curtail a lot of crude offense
Against convention's edicts strict
With which your bone head plays conflict.
It does not mean you have to *stay*
A *Rube*, because you ran away
From a motley, rural, vernal crew
Who flourished where the burdocks grew.
It does not mean that manners tough
That go with a neck that's red and rough
Cannot be stepped on and subdued
To where less coarseness you'll exude.
It does not mean you can't expand
'Til you "*Savvy*" life and understand
That to get out from the common groove
You must first learn and then improve.
While in this transition be a mouse
Steal crumbs of knowledge—thru the house—
And when you reach your little nest
Cull out the bad and keep the best.
Before you brag, swell up or burst
Be all you claim and "*get there first,*"
Or, somewhere in this hectic land,
Some bird will call your little hand.

III.

On the other hand, cut out the slush;
Don't kid yourself and don't four-flush;
Don't fear to ask some goof who knows,
And who some inclination shows
To straighten out some little kink
That's put your thinker on the blink.
Remember, too, there is no doubt
That a lot of folks still ride about
In a flivver old—all full of dents—
With a name plate—reading—"Common Sense,"
When Ego toots and tries to pass
They hold the road and give her gas.
When you just feel like babbling dirt;
That nasty kind that's meant to hurt;
First, ask yourself if it is true
And will it help this thing called *you*,
Or is there any reason why
That you should pan this absent guy?
When this goes through your little bean
You'll shift and broadcast stuff that's clean.
Just play the game as best you can—
It's a good safe bet to be a *man*.

IV.

The intentions of this homely screech
Are not aimed at our homely breed
Alone, because they fit as well
To other birds in the personnel.
But homely truths oftentimes have worth
In keeping clay feet on the earth.
So whoever you are or wherever you're at,
Be a man or a mouse or a long-tailed rat;
Be, today, what you are; to yourself be true,
For life has you pegged and you are *you*.

—W. H. F.