ary circuit which may be desirable. This circuit derives part of its energy continuously from the battery, depending on the adjustment of the resistor between the rectifier and the battery. This resistor can be adjusted to compensate for the load imposed by the normally-energized circuit, shown dotted, but allowing a 5 m.a. drain on the battery. The application of the rectifier output to the operating load can be adapted to any type of crossing-signal circuit arrangement.

▼ ▼ ▼

Avoiding Light-Out Signal Failures

"What methods are used to safeguard light-out failures in color-light signals, caused by a broken filament in the normal-burning light? Please answer for searchlight type signals having but one lamp and for multiple-unit color-light signals."

Light-Out Relays Utilized

R. A. Sheets
Signal and Electrical Engineer,
Chicago & North Western, Chicago

In addition to the careful observance of manufacturers' recommendations concerning the proper handling, testing and voltage adjustment to prevent failures of electric lamps used in color-light signals, two different methods are used to safeguard light-out failures on such signals:

Where multiple unit color-light signals with single-filament lamps are used as automatic block signals governing movements at speed, a light-out relay is placed in series with the filament of the normally-burning light, generally the green light (Proceed indication). In case of a burn-out of the filament, the light-out relay becomes de-energized and transfers the light indication to the yellow or "approach" signal unit. Where the yellow or approach indication is the indication normally displayed by the signal the greater proportion of time, an auxiliary light unit displaying the yellow approach indication is provided as a reserve. This light-out arrangement is not provided for in dwarf or slow-speed signals, nor on interlocking signals having two or more lights normally burning red. The circuit arrangements are shown in Fig. 1a and 1b.

Where searchlight type signals with double-filament lamps are used, the high-wattage filament is in multiple with a low-wattage filament, and this in itself provides considerable protection against light-out failures. However, in order that an additional safeguard might be secured, it is the practice on the North Western to place a light-out relay in series with these

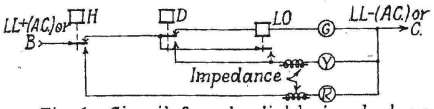

Fig. 1a Circuit for color light signal where the Yellow indication is used as a reserve for the Green.

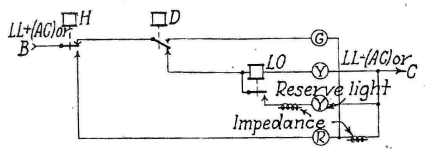

Fig. 1b Typical circuit for color light signal with a reserve Yellow light unit for use where the signal normally indicates Yellow.

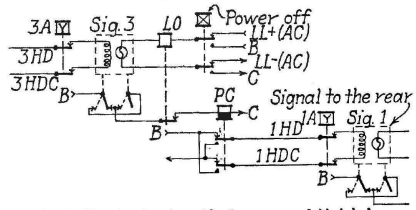

Fig. 2 Typical circuit for searchlight type signal.

Lighting circuits in use on the North Western

filaments, this light-out relay having a drop-away high enough to insure that when the high-wattage filament burns out, the light-out relay will drop. This light-out relay controls the circuit of the next signal to the rear in such a manner that when it is de-energized an "approach" indication is displayed by the signal to the rear, thereby regulating the approach of a train up to the signal that has the light out, or the light with only the low-wattage filament burning. This circuit is shown in Fig. 2.

For other answers to this question see page 385 of the July issue.

THE NUMBER OF PERSONS killed at highway grade crossings in the month of May, as reported by the Association of American Railroads, was 108, as compared with 140 in May, 1934; injured, 297, as compared with 303.

Accident Report

(Continued from page 476)

According to the record the C.R.I. & P. train covered the distance from Mediapolis to the crossing, 7.3 miles, in 10 minutes, or at an average speed of 43.8 m.p.h., while the M. & St.L. train covered the distance from Monmouth to the crossing, 41.6 miles, in 1 hour and 50 minutes, or at an average speed of 22.7 m.p.h. Furthermore, Engineman Herman of the C.R.I. & P. train said that his train had not yet reached the C.R.I. & P. distant signal when he first saw the M. & St.L. freight train, and that it looked as though that train was then coming out of a dip; the dip in the M. & St.L. track is located about 500 ft. west of the M. & St.L. distant signal, and, therefore, according to this statement also, the M. & St.L. freight train was the first train to enter the limits of the automatic electric interlocking plant. The foregoing corroborates evidence given by six members of the M. & St.L. train crew, all of whom stated that the home signal governing movement of their train displayed a clear indication.

While Engineman Herman and Fireman DeFore, of the C.R.I. & P. train, both stated that the C.R.I. & P. home signal displayed a proceed indication for their train, there was no other evidence to that effect. The engineman said that the light went to green when his train passed the distant signal, and he called the indication which the fireman acknowledged, although the fireman said he did not see the signal until the front end of the engine was only a short distance from it.

The destruction of some of the signal apparatus as a result of the collision made it impossible to re-establish the operation of the plant at the time of the accident, and, therefore, a positive conclusion cannot be reached. However, the test of the undamaged apparatus disclosed that it was in proper operating condition, and this fact together with the fact that the M. & St.L. home signal cleared properly for the approaching train, and the record of proper operation of the plant since its installation, supports the opinion that the C.R.I. & P. home signal was displaying a stop indication which was not properly observed or obeyed.

Conclusion

It is believed that this accident was caused by failure of Engineman Herman of C.R.I. & P. Train No. 63 properly to observe and obey a signal indication governing the movement of his train over a railroad crossing.