

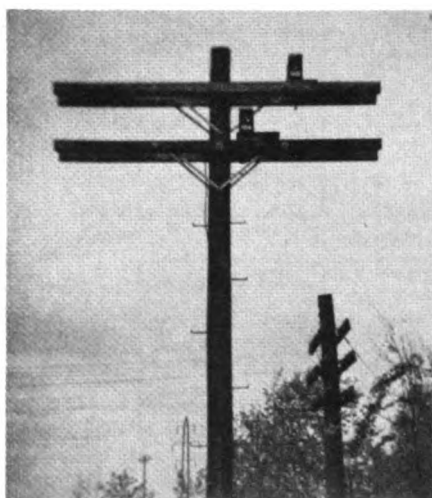
Electric Eye Catches High Loads on NYC

● A low clearance of a bridge over the New York Central mainline entering Buffalo, N. Y., from the west was responsible for a derailment due to a high load. This accident not only blocked the railroad tracks, but also damaged the overhead bridge. This has not happened again as the railroad has installed electric eyes at its Bay View tower to detect these high loads.

Two light sources are mounted on crossarms of a telephone pole opposite the interlocking tower. The sources send light beams horizontally across the four tracks toward the photoelectric cells mounted in the tower windows. The two light beams are 15 ft 10 in. and 17 ft 6 in., respectively, above the tops of rails.

When a train containing a car with a high load passes the tower, the high loaded car will interrupt one or both light beams (depending on its height). Interruption of the light beam causes a buzzer to sound and a light to light in a box on the operator's desk. If the load interrupts the lower light beam (15 ft 10 in.) an amber light is lighted. If the load interrupts the upper beam (17 ft 6 in.) a red lamp is lighted. The light or lights remain on and the buzzer continues to sound until the operator presses a reset button.

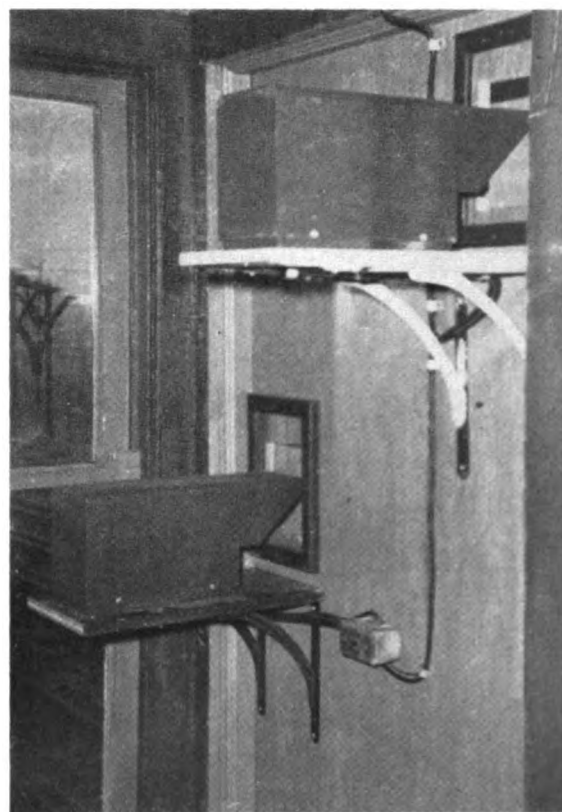
When a high load on an eastbound



Upper light source is 17 ft 6 in. above top of rail, and lower light source is 15 ft 10 in. above top of rail.

Electric eyes are mounted in the interlocking tower window opposite and at the same height above rail as the light sources. Hence light beams are in a horizontal plane parallel to the tops of the rails.

train is detected, the Bay View tower operator phones the dispatcher informing him of the height detected so the train may be routed to protect the high load. Because the high load actuated the detector, the tower op-



erator presses the reset button to shut off the buzzer and extinguish the indication light.

If a westbound train had a high load, the dispatcher would have rerouted it to avoid the low clearance

ELECTRIC EYE CATCHES HIGH LOADS continued

viaducts. As this westbound train passed Bay View it would actuate the detector, but the operator would simply press the reset button.

The electric eye high load detector operates as follows (see circuit diagram). A rapid change of the light level impinging on the photo cell, such as a high car interrupting the light source, causes the normally open contacts of the electric eye amplifier relay to close. This causes the relay in the alarm system to become energized, closing its contacts, which actuates the buzzer and indication lamp. The electric eye amplifier relay contacts then open. The reset button (a

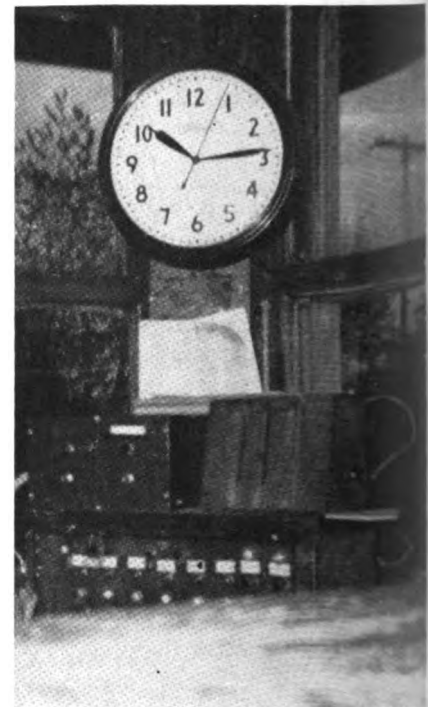
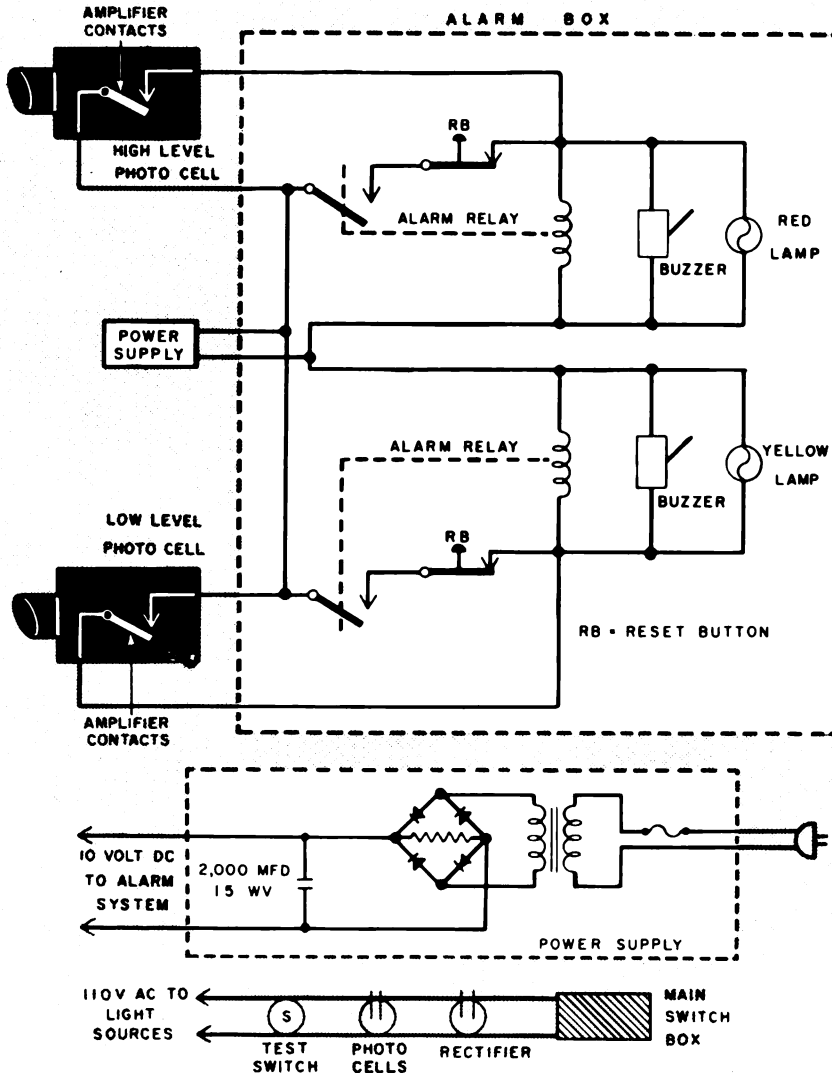
normally closed switch) and the alarm relay contacts form a stick circuit which keeps the alarm relay energized until the reset switch RB is opened. Through the contact on the alarm relay the light and buzzer remain operating until the reset button is operated and this stick circuit is opened. Everything then returns to normal until the unit is once again set into operation by a fast light level change. The time constants of the amplifier circuit are such that slow changes in light level, such as passage from day to night, do not cause the amplifier relay to operate.

The system is tested once during

each trick by operating a toggle switch that cuts off the light source.

The system has operated successfully for several months, having detected many high loads. Materials for this detector cost less than \$500. Thus prevention of one derailment by a high load more than paid for this electric eye high load detector. While the Bay View installation began on a test basis, it is now "in service." The NYC plans to install additional detectors.

The system was engineered by R. L. Straw, Communications Engineer, under the jurisdiction of P. S. Hughel, Superintendent of Communications.



When high load breaks light beam, buzzer sounds and indication lamps are lighted—amber for the lower light beam and red for the upper beam.

Circuit diagrams for the alarm system, power supply and power distribution of the New York Central's high load detector.