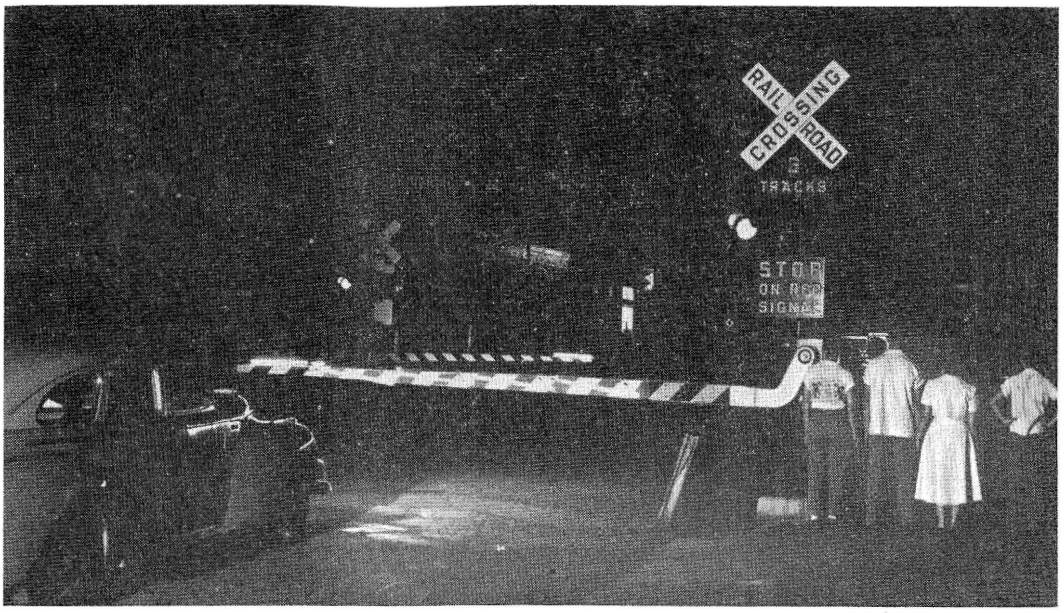


Neon-lighted automatic crossing gates and associated flashing-light signals in operation at night time on the Norfolk & Western at Bullitt Avenue, Roanoke, Va.

Neon Lighting for Crossing-Gate Arms

Norfolk & Western employs interesting, unusual and effective method of lighting highway crossing-gate arms, to provide distinct warning to oncoming highway vehicular traffic at 24 crossings on the railroad

AS a means of providing a very distinct warning to highway traffic in approach to important grade crossings on its system, the Norfolk & Western, during the past few years, has installed short-arm electric gates and flashers, with a unique arrangement of flashing neon lighting on the gate arms in lieu of conventional lamps.

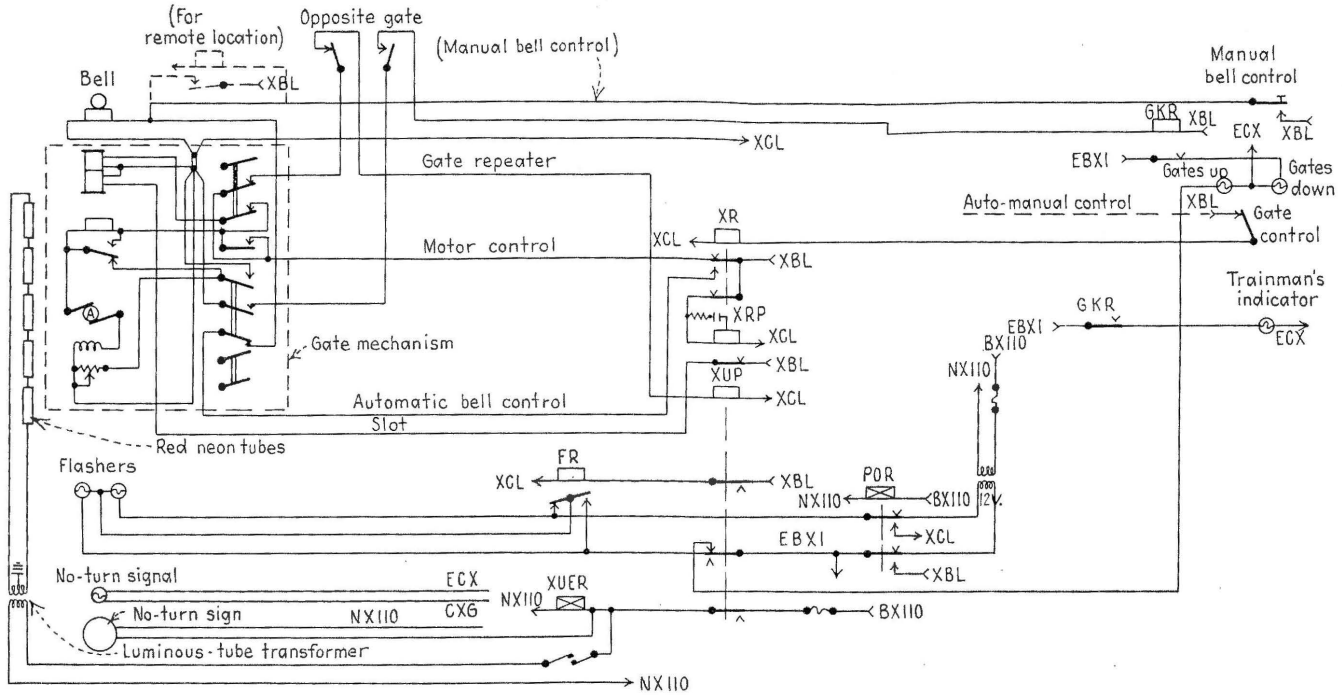
Four to Seven Neon Tubes On Each Arm

Each arm is equipped with four to seven red neon glass tubes. These tubes, which are 15 mm. in outside diameter and 42 in. long, with a band on one end, are mounted on the outside of the arm in a zig-zag fashion, so as to form the pattern of the symbol for a streak of lightning when lighted. Breakage of the tubes from shock or vibration is minimized by the use of glass insulator supports, each of which fits into a coil-spring base on the gate arm. This neon lighting, according to the railroad, provides a more distinctive and effective indication and warning to motorists approaching the crossings than individual flashing lamps. Since its introduction, the neon lighting has met with general public approval, and accidental gate breakage, resulting from motorists running into the arms, has been minimized to a great extent. Maintenance problems encountered with the lighting are said to be negligible, aside from the somewhat higher cost which has been off-set by the less-breakage record of the gates.

Short-arm gates and flasher-signal assemblies, with the neon-lighting feature on the gate arms, are now in service at 24 crossings in four states through which the railroad operates. These crossings include Lake Avenue, in Norfolk, Va.; Liberty, Commerce, Main, Saratoga and Wellon Streets, Suffolk; State Routes No. 258 and 610, in Windsor; Main Street, Waverly; Twelfth Street, Lynchburg; State Route No. 12, Boyce; Bullitt Avenue, in Roanoke; Union Street, Salem; Giles Avenue, Dublin; Washington (U. S. Route No. 11) and Jefferson Streets, in Pulaski; Main Street and the station crossing, Rural Retreat; U. S. Route No. 11, Marion; and State Route No. 609, in Richlands, Va. Similar installations are in service at East Main Street, in Durham, N. C.; Virginia Street (U. S. Route No. 11) and Wilson Boulevard, Hagerstown, Md.; and at Scioto Street, in Lucasville, Ohio.

At each of these crossings there are two gate and flasher assemblies, the gate arms extending over the approach lanes of the highway only, thus facilitating exit of vehicles which might possibly be on the crossing after the gates have commenced to lower. Short sidewalk gate arms are in service at some locations where a number of pedestrians use the crossings. Each flasher and gate assembly includes, from top to bottom, a bell, standard crossbuck sign, number-of-tracks sign, the flashers, "Stop on Red Signal" sign, and the gate mechanism. All sign lettering is studded with clear glass reflector buttons to increase visibility at night. The gate arms are painted black and white.

The gate mechanisms are design-



Typical neon-lighting and crossing-protection circuits

ed for operation on 12-volts d.c., drive up, and lowered by gravity. The control circuits for the protection at each crossing, generally speaking, are designed so that the flashers, neon lighting and bells go into operation about 30 sec. before arrival of the fastest train at the crossing. However, there is a 3 to 7-sec. period after this before the gates commence to lower, which serves a warning to motorists. Thereafter, the gates require about 12 sec. to lower; they rise in about 8 sec. when the crossing is clear. After gates have lowered from the 90-deg. position, the bells cut out. The flashers and neon lighting, however, continue as long as the gate arms are in any but the 90-deg. position.

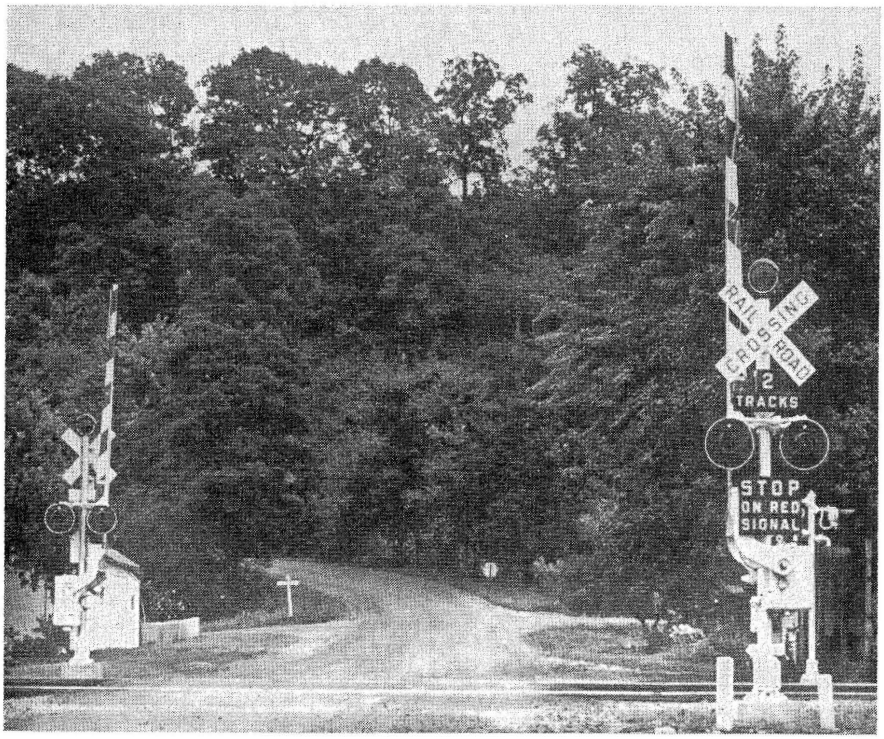
Neon-Lighting Circuits

The neon-lighting tubes on each gate arm are series connected to a standard heavy-duty type luminous-tube transformer, rated at 110 volts a.c. on the primary side and 7,500 volts, 30 ma. on the secondary side, which is mounted in a sheet-metal box on the arm. Connections between the tubes are made by means of specially-designed electrode caps which fit into rubber-cap insulators.

The accompanying drawing shows the typical circuits for a gate and flasher-signal assembly with the neon-lighted arms. The luminous-tube transformer for feeding and flashing the neon tubes is controlled directly by the XUER crossing-gate light relay, which is equipped with heavy-duty contacts to withstand arcing of the 110 volts a.c. The XUER relay, in turn, is controlled over contacts of the circuit controller in both gate mechanisms at the crossing, and a front contact of the XR main crossing-protection control relay.

Thus, when the XR relay is released automatically by an approaching train, or by manual control, the neon tubes are placed in operation, along with conventional flashers and bells. The tubes flash as long as the XR relay is down, and continue to flash after it has picked up, that is, as long as the gate-mechanism contacts in the control of the XUP relay are open with the gates in any but their 90-deg. position. The same operation applies to the conventional flashers, although the bells are cut out through the circuit controllers when the gates are lowered.

These gates and flashers with the neon lighting on the gate arms have been installed by the regular signal construction forces of the Norfolk & Western.



Neon-lighted automatic gates and associated flasher signals in Lucasville, Ohio