

Consolidation Cuts Costs

Savings of up to \$80,000 per year in maintenance and wages are accruing to the Terminal Railroad Association of St. Louis as a result of consolidating the controls of three interlocking plants into one new route-type interlocking machine. The three plants are on the Terminal line running east out of Union Station, through a tunnel under downtown St. Louis and over the Eads bridge into E. St. Louis, Ill. Beginning at the west and working east, is tower No. 3, an electro-pneumatic interlocking which is at the east end of Union Station. Next is an electro-pneumatic plant at the entrance to the tunnel (west end) at Poplar street. This is "ID" and is the location of the new UR control machine in a new concrete block tower; the relay and battery rooms on the first floor, and the control machine on the second floor. The third plant is at "MS" at the east end of the tunnel, which is at the west end of the Eads bridge. These three plants were locally controlled having electro-pneumatic switch machines and searchlight and colorlight dwarf signals.

ALTHOUGH THE CONTROL MACHINE is the conventional UR type, several features more or less exclusive to the Terminal Railroad are deserving of mention. One is a system of red call lamps for informing the "ID" leverman of the routes to line up for inbound trains to Union Station. On a portion of the control machine panel at "ID" are vertical rows of red lamps under

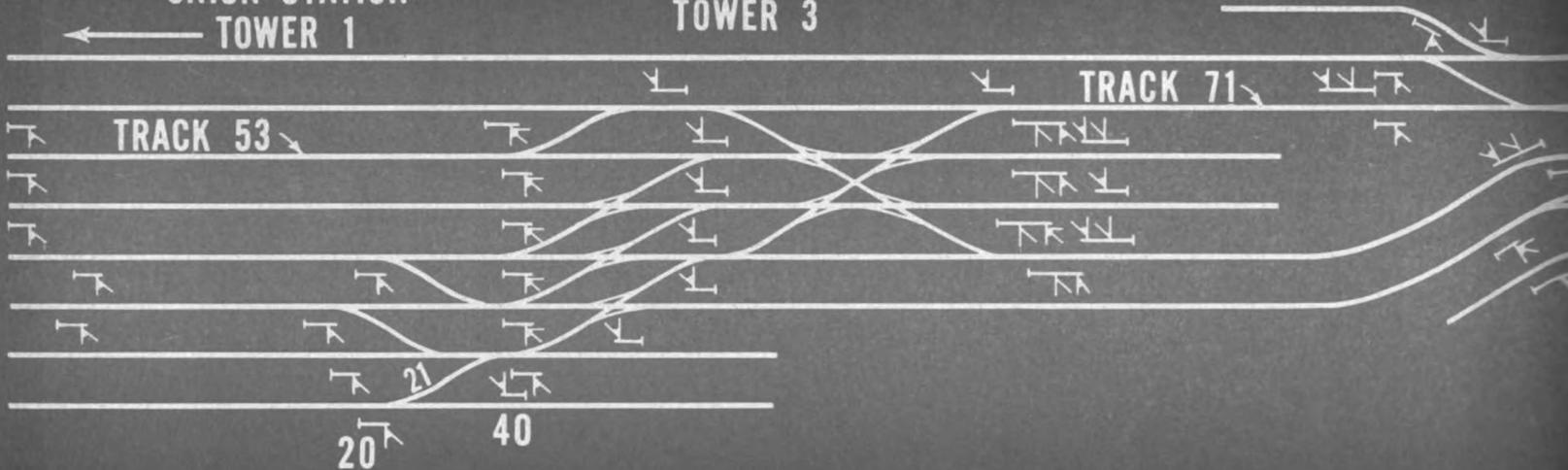
the track numbers on which a train may enter this interlocking. Each row contains four lamps, one for each track that a train leaves "ID" and enters tower No. 1 at Union Station. Here's how the system operates. Assume a train bound for Union Station enters "ID" on track 71. The leverman presses the "call" button under the vertical row under track No. 71. This action causes

a red lamp to be lighted on tower 1's panel under track designation 71. Tower 1 leverman desiring to have the train enter his plant on track 53, presses a cancel button (causing the red lamp to be extinguished) and presses a button under his track 53 designation. This causes the red lamp opposite the track 53 designation to be lighted on the "ID" panel. Thus "ID" lever-

UNION STATION
TOWER 1

TOWER 3

11 th ST



man is informed that the entering train is to be routed from track 71 to track 53, and accordingly presses the entrance button on track 71 and the exit button on track 53. Then he presses his cancel button under the vertical row containing the illuminated red lamp opposite track 53 designation, which extinguishes the lamp.

The advantages of this fast, easy system for instructing the "ID" leverman are more readily appreciated when one realizes that approximately 125 scheduled trains pass through "ID" every 24 hr, and in one three-hour period 125 moves were made through the plant. Thus the leverman must be "on his toes" all the time.

Clear Signals Against Each Other

For drill purposes over crossovers and through switches, opposing signals may be cleared against each other. For example, to drill

over crossover 21, a special signal lever 20-40 is turned right from Normal to SWG, thus clearing signals 20 and 40 to the yellow aspect.

The call-on aspect is provided on the signals governing westbound movements into "ID" over the Eads bridge. To control the signal to the call-on aspect, the leverman clears the signal then presses the call-on button. All moves through the plant are restricted to 15 mph. All signals are dwarfs and provide yellow and red aspects, with some giving the green aspect. The green aspect is used for some straight moves through the plant. In the tunnel the dwarfs are on pedestals for better visibility for the engineer.

Because of numerous switching moves through the plant, some of which are confined to the tower 3 area, the control panel is "cut" at 11th street (east end of tower 3 area). Thus for a straight or through move from Union Station to E. St. Louis, the leverman

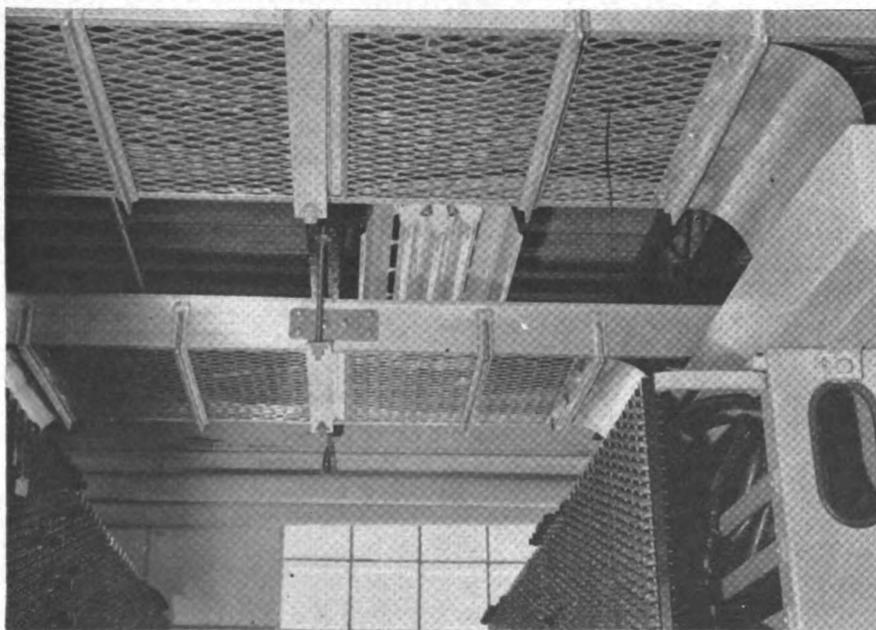
presses four buttons; entrance and exit at tower 3 and entrance and exit for the rest of the plant.

Other New Features

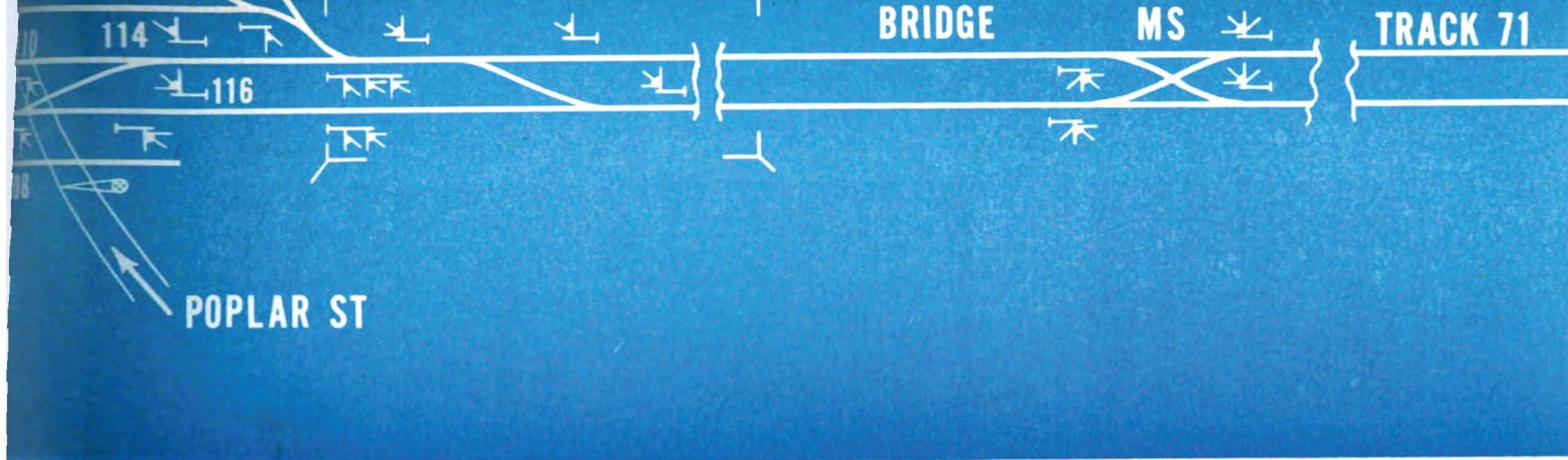
All switch machines were replaced with new A-5's, and the 100 lb rail at tower No. 3 was replaced with 115 lb rail. "ID" at Poplar street is a direct wire plant as is tower 3, but the latter is remote control on a non-vital basis. "MS" at the bridge is a single station of a 510 code control system. Also as part of the new interlocking consolidation, reversible polar coded track circuits were installed on the double track through the 4,700 ft tunnel and over the 4,000 ft bridge to provide for either-direction running on either track by signal indication. Formerly no track circuits were on this double track, and manual block operation was in effect: one block being the tunnel and the other block being the bridge. Watchmen at the Poplar street crossing have been replaced by flashing-light signals and short-arm gates, which are controlled automatically by track circuit occupancy.

Whistle Aids Switching

Air horns are located at "ID," the 11th street yard and at the west end of the tunnel. They are controlled by the leverman in the tower. In addition to the "4 shorts" for maintainer's call, other codes include five shorts for "all ok," one short for "stop train," and two shorts for "start train." These are especially helpful where a switch engine often pulls into the tunnel with a string of cars to clear a switch for a reverse move. With the engine 10 car lengths or so down in the tunnel and around an 11 deg. curve, the engineer is out-of-sight of his switchman or the



Aluminum wire chases carry wiring along the ceiling of the tower relay room



dwarf signal. "ID" leverman can sound one short on the horn to tell the engineman he is clear of the switch, and then sounds two shorts to tell him he can start moving when the switch has been positioned and the signal cleared.

Approach track circuits are on the two center tracks at the Poplar street crossing for control of the flashing-light signals and short-arm gates. The control circuits are broken over contacts of the approach stick relays of signals 108, 110, 114 and 116 so that the gates will not come down if the leverman has not cleared these signals for moves over the crossing. The two outer tracks being switching leads or sidings have only the positive section over the street. Crews are instructed to "creep up" on these positive sections and allow the gates to be lowered before proceeding over the crossing.

New Tower is Air Conditioned

The relay and battery room in the new tower at Poplar street is air conditioned. Edison nickel-iron alkaline storage battery is used throughout: code line has 12 cells of B2H (to "MS" crossovers at west end of Eads bridge); local battery is 12 cells of B4H; coded track equipment has 8 cells of B4H; 24 cells of B4H split provide non-vital circuits between "ID" and tower 3 area; gate battery for Poplar street consists of 11 cells of A6H; main machine battery consists of two sets of 12 cells A10H in parallel. All track circuits, outside the tunnel and bridge, are conventional d.c. fed by one cell of B4H storage battery.

Aluminum wire chases in the tower were furnished by Husky Products Co. of Cincinnati, Ohio. Plug-in type relays are used throughout except for certain plug-coupled shelf type relays. Non-vital relays are mounted in dust-

proof cases with glass doors. Okonite cable and wire was used, being direct burial, and is brought into the tower underground into a concrete raceway. Metal floor plates can be lifted out for access to the cable. Plug couplers are used between the control machine and the non-vital circuit relay racks, the circuits being in No. 22 copper wire.

The coded track circuit battery feeds are at "MS" between the tunnel and the bridge. Thus the circuits are fed to the relay at the west end of the tunnel and at the relay at the east end of the bridge. And on the off-beat, the code feeds back toward "MS" in the center.

Because of the considerable amount of dust and dirt in the area,

graphite is used on the switch plates and has been found to be effective. Union swivel front rods are used on the new A-5 electro-pneumatic switch machines. A switch point guard rail is also used being mounted outside the stock rail.

P-A-X phones are strategically located about the interlocking area inside instrument cases so that the maintainer can call the leverman or the signal engineer, or anyone else, if necessary, around the TRRASTL. Planning, engineering and installation work was done under the jurisdiction of Oscar E. Miller, signal engineer. Union Switch & Signal division of Westinghouse Air Brake Co. furnished the signal equipment.



View of "MS" crossovers looking east toward the Eads Bridge