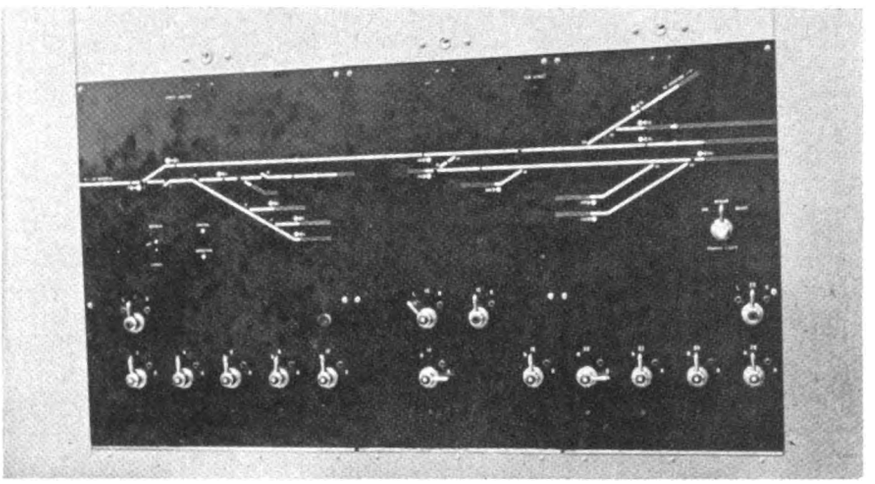
Southbound passenger train at North Junction goes over switch 2 reversed to hold the passenger main. North Junction is at the left of the control machine in the picture below

Two Interlockings Save Time and Money

Switchtenders replaced by electric plants at both ends of a yard save train time, improve safety and reduce expenses at St. Albans, Vt., on the Central Vermont

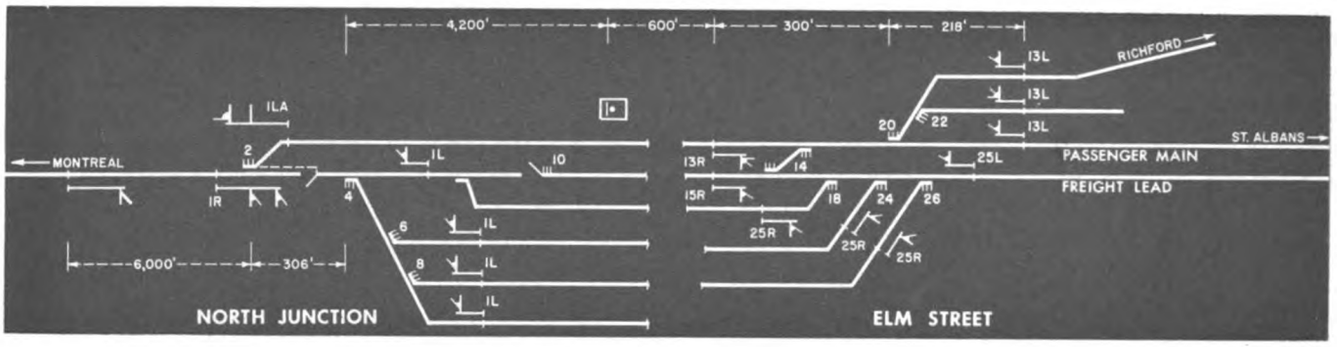
SOME NEW IDEAS and construction practices are included in a remotely-controlled interlocking project recently completed by the Central Vermont at St. Albans, Vt. One interlocking, known as North Junction, includes the switches and derails at the north end of the yard; and the second layout, known as Elm Street, includes switches at the south end of the yard as well as a junction leading to a branch line. Previously these switches were equipped with hand-throw switch stands operated by switchtenders, train movements being directed by hand signals. Thus the new remotely-controlled interlockings were installed to improve safety, minimize train delays, and reduce operating expenses.



For this project the materials cost about $115,600 and the labor $11.770, which including some operating expenses totaled $131,000 net cost. The annual cost, including interest and profit, depreciation, maintenance and operation, is $18.000. The annual savings, including wages of switchtenders which were transferred to other work, was $43,000 annually. Thus the net saving is about $25,000 annually which is a return of 19 per cent.

The traffic through St. Albans includes 6 passenger trains and 6 to 8 freight trains daily. A local freight is operated daily, except Sunday, on the Richford subdivision branch, 17.6 miles.

As shown in the plan, the layout at North Junction includes power switches and signals to route passenger trains through on the main track, as well as to route southbound freights from the main track to the yard tracks, or northbound freights from the yard tracks to the main track. In this part of the yard, the grade descends northward. In order to stop cars that might get



away in the yard, hand-throw derails had been in service for years at locations marked No. 2 and No. 10. Accordingly, these derails are now power operated.

The interlocking at Elm Street includes the junction switch to the Richford Branch, and switch from this branch to the engine house track, a crossover between the main track and the freight lead, and three switches from the freight lead to three yard tracks. The approximate distance from the Elm Street layout to the North Junction layout is 4,000 ft.

Both these interlockings are remotely controlled from a panel machine in the yard office which is about 900 ft. north of Elm Street.

Special Helpful Aspects

The signals are the color-light type. Signals 1LA and 1R are high signals, but the remaining ten home signals are dwarfs. Signals 1R displays YELLOW over RED for the route to the main line, or red-over-yellow for the route to the yard.

Dwarf signal 13L, on the passenger main track, displays green for the through move on the passenger track with signal 1L displaying the proceed aspect. If the crossover 14 is reversed for a move from the passenger track to the yard, signal 13L displays yellow. However, if 1L is displaying the red aspect, then 13L displays flashing-yellow.

A double lens signal lamp unit with white lenses is mounted facing north and south on the old ball signal pole at North Junction. This lamp is controlled by the operator in the yard office. When a northbound freight is ready to leave the yard, the operator controls the special lamp 1R to display flashing-white, thus telling the engineer that his crew is on the caboose, ready to go. If the operator wants a conductor to call the yard office on the telephone, the special lamp is controlled to display steady white.

The switch machines are all model 5C except two which are model 5D dual control. All switch machines are 24 volt d.c. operated with 24 volt d.c. control. These machines are operated by storage battery, each set consisting of sixteen 120 a.h. Exide lead cells, used also to feed control circuits, including the 28 volt circuit for the Syncrostep. There are no batteries in the control office. The 28 volt 120 a.h. switch machine battery at Elm Street, 900 ft away, is carried to the control office on No. 2 copper wire. This eliminates one complete set of batteries, rectifiers, etc. One 80 a.h. cell feeds each track circuit. Direct-wire circuits from the yard office to Elm Street layout are fed by a set of 120 a.h. cells.

A two-wire telephone circuit extends in the cables from the control machine to phones throughout the interlocking. Operator phones in boxes, painted yellow, are for use by conductors and trainmen when calling the operator. Also this phone circuit is connected to terminals in each switch machine, and in each of the instrument houses, so that the maintainer can use his portable phone to call the operator.

Good Construction Practices

Heretofore, the Central Vermont had very little signaling. Therefore, when faced with the new St. Albans project, a signal construction force was organized by C. J. Mullen, formerly with the General Railway Signal Campany. The work was done by the regular maintenance forces, including H. W. Sullivan, Foreman, J. F. Reynolds and R. F. Baker, Maintainers 1st Class, and H. R. Cross and E. Patnode, Maintainers 2nd Class. In addition, extra laborers were hired for the duration of the project. These men, with the aid of some machines, constructed the St. Albans interlocking in a period of about eight months.

The Canadian National Signal Instruction Car was sent to St. Albans from Montreal, and educational classes on the fundamentals of signaling, as well as modern circuits and equipment, were held evenings.

The machine of greatest help was a four-wheel drive Jeep. Attached to the rear is a Jeep-a-Trench ditch-digging machine which is operated by a power take-off from the Jeep motor. At the front of the Jeep is a 2-way ram hydraulic snowplow that is used to back-fill the trenches.

On long runs, the cable was laid out on the surface of the ground near where the trench was to be dug. The trench was 14 in. wide and about 36 in. deep. As the machine dug, it threw the dirt out on both sides of the trench. One man worked about 15 ft behind the machine to lay the cables on the bottom of the trench. After the ditcher had gone about 100 ft, or to a natural stopping place, the machine

Signal 13L (at left) governs northward moves on passenger main

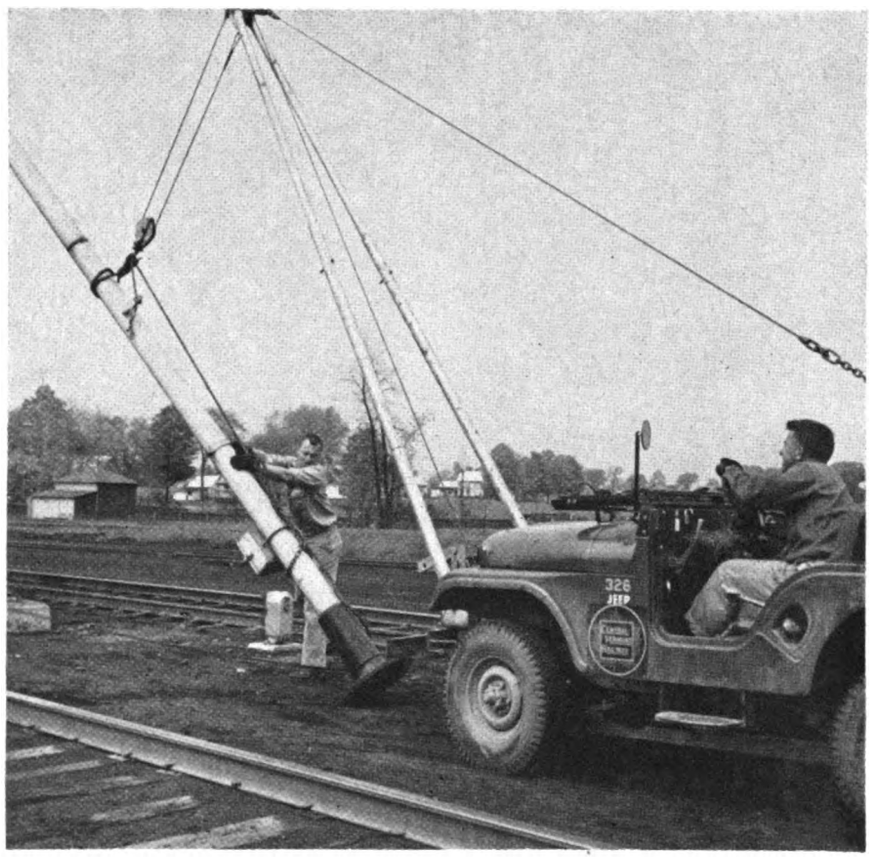
was turned around to use the plow blade on the front end to plow the dirt back into the trench. Thus no extended length of trench was left open for any considerable time. This reduced any hazard to employees.

Using this machine, a crew of four men dug the trench, laid the cable and back-filled the trench on about 700 ft daily. The 4,300 ft of trench carrying one 10-conductor cable between the yard office and North Junction was completed in five days. All cable on this project was furnished by the Simplex Wire & Cable Company.

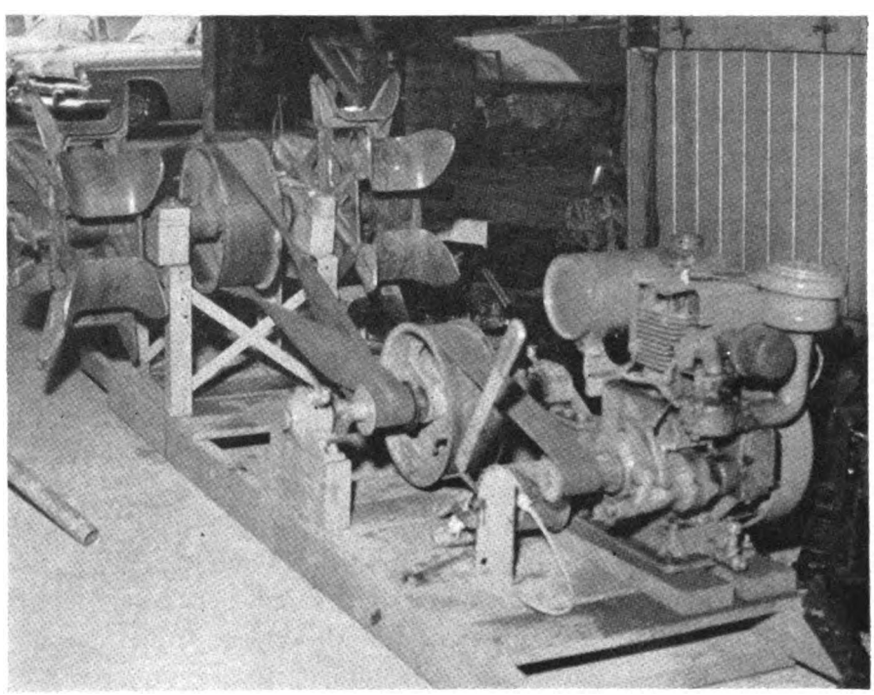
The front of the Jeep is equipped to mount a light-duty "A" frame 19 ft long, and a power winch with gear and clutch for operation by the Jeep motor. Thus this Jeep, with the "A" frame, was used to pick-up, and place the signals, cases, masts, switch machines and precast foundations, thereby expediting the work and eliminating much manual lifting. One item that was lifted, carried and set was a 1-ton concrete battery well. Because of the large tires and the four-wheel drive, this Jeep was easily driven up and down embankments, as well as across tracks. This Jeep, with trench digger "A" frame winch, front play blade and other attachments cost about $6,000; however, it paid for itself in reduced labor costs on this one installation.

On this project as well as on extensive sections elsewhere on this road there is considerable old iron line wire that is being replaced. To reduce the work of removing the old line wire, the crew planned and built a special pulling machine, as shown in one of the pictures. A wire reel is mounted on each end of a horizontal shaft that has a pulley that is belt driven from a 5 hp gasoline engine. When a wire reel is full, the pushing of a release arm allows segments of the spool to pivot, thereby allowing the coil to be removed. This whole arrangement of reels, shafts, belts and engine is on a platform 24 in. x 6 ft, which can be placed on a track push car or on a rubber-tired highway trailer, to be pulled by the Jeep.

Seven days before the cut-in, the switch machine controls and lock circuits only were connected, and the switches were operated from the control machine by the operator under instructions by phone from switchtenders. The switchtenders then checked the position of the switches and gave hand signals to direct trains or switching moves. During this time, complete operating tests were made. When time came to place the plant in service, the only work to be done was to connect the straps closing the circuits to light the signals.



A front end snow plow blade and a trench digger on the rear can be added to Jeep



Power driven reels for taking on old line wire can be hauled on highway truck

This interlocking was planned and installed by Central Vermont forces, under direction of C. J. Mullen, Supervisor Communications & Signals, the major items of signal equipment being furnished by the General Railway Signal Company.