N. P. Interlocking at Minneapolis

Floating Charge Reduces Required Battery Capacity, Locking and Electric Lighting Circuits Simplified

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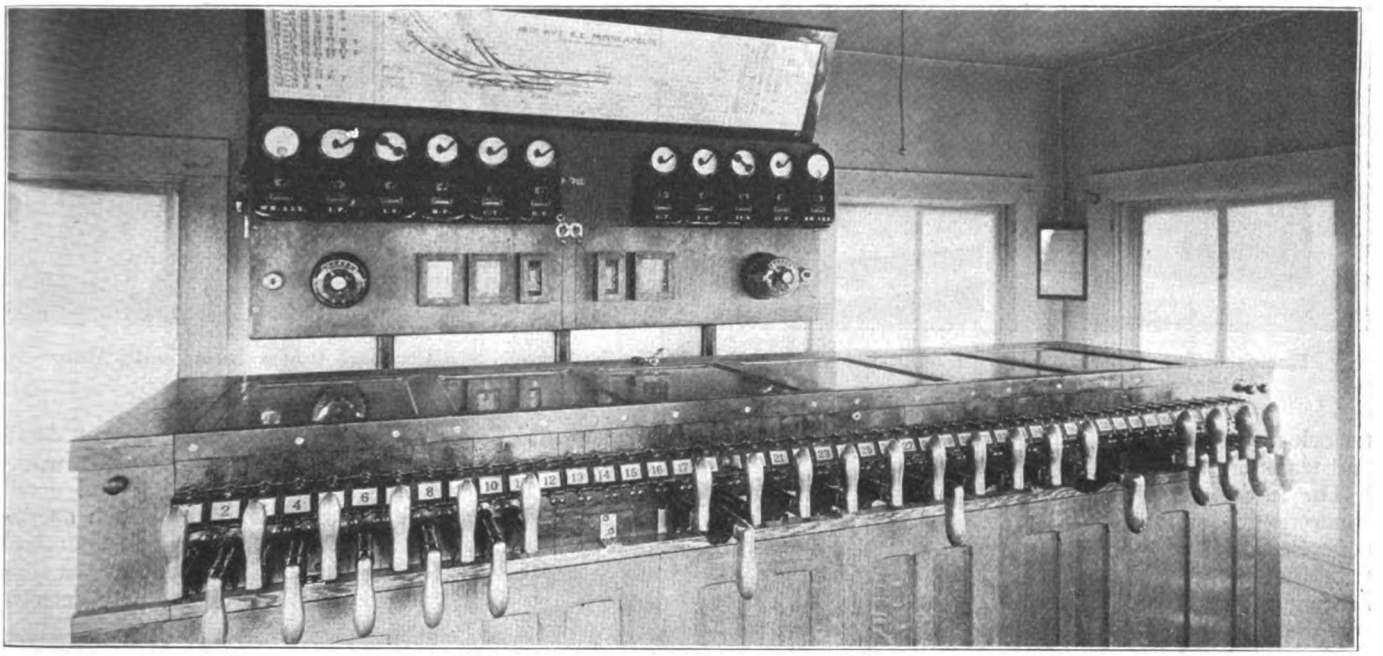
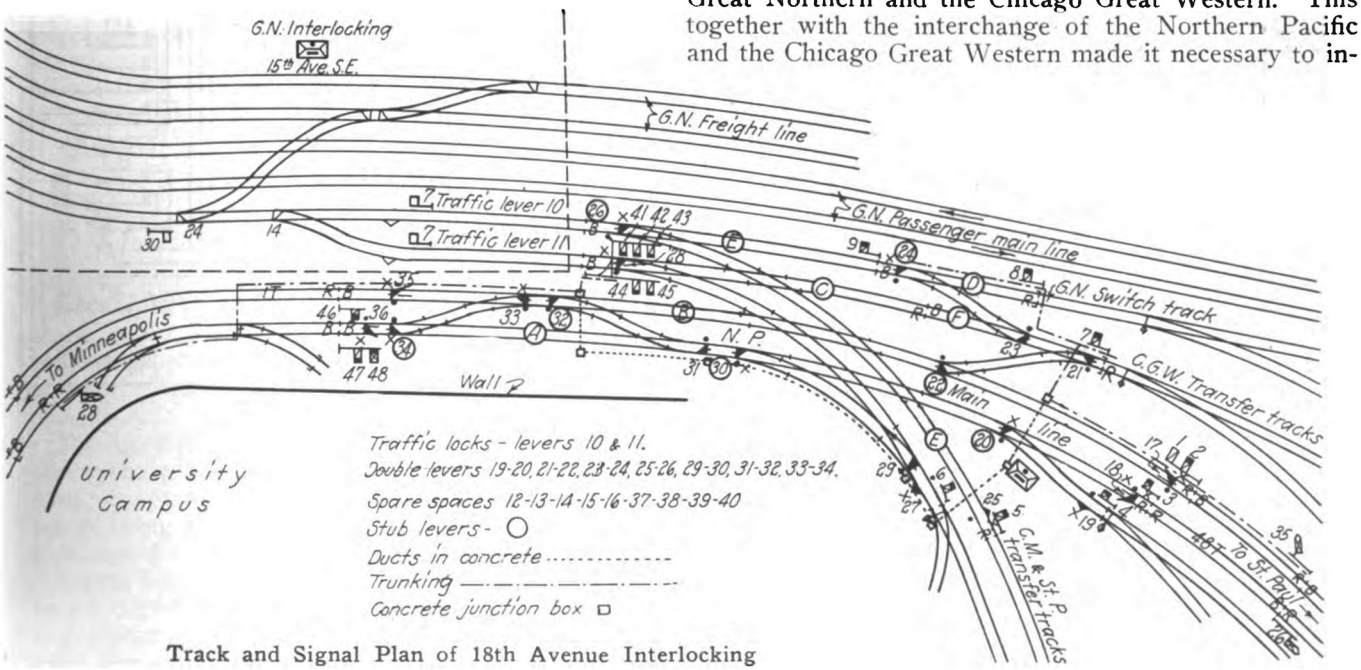
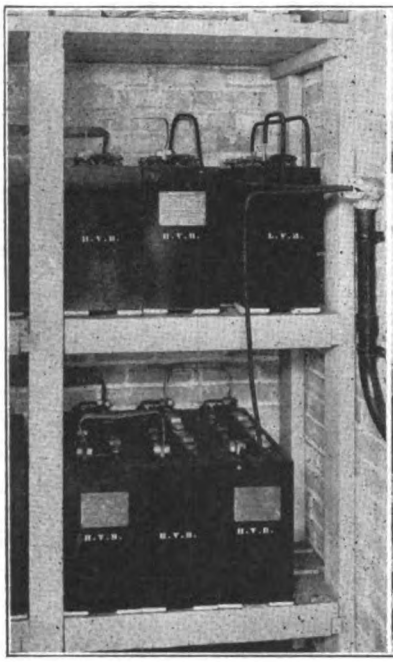


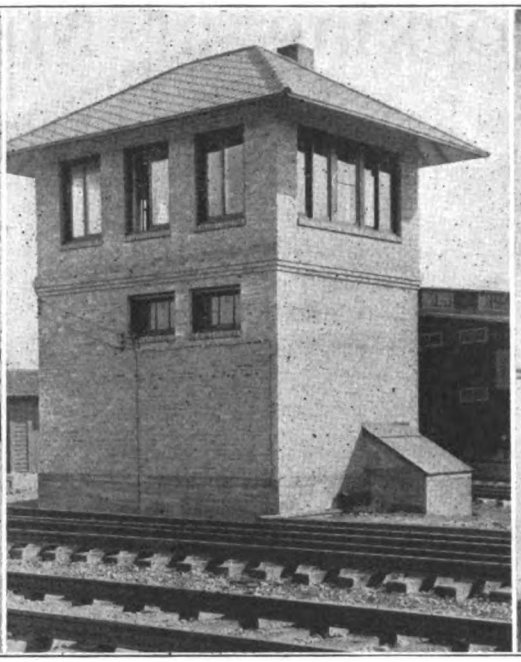
AN electric interlocking plant was recently placed in service by the forces of the Northern Pacific signal department at Eighteenth avenue, S. E., Minneapolis, Minn. Since the original construction in 1885 the Northern Pacific, Line-B between St. Paul and Minneapolis has passed through the campus of the University of Minnesota. About two years ago right of way was obtained and arrangements made to vacate this section and build a new line along the north side of the university grounds. This new section was placed in operation in February this year. The traffic carried by Line-B consists of the Northern Pacific freight transfer between the Twin Cities, together with all passenger and freight traffic of the Minneapolis & St. Louis. At Eighteenth avenue the new line crosses the transfer tracks of the Chicago, Milwaukee & St. Paul with the Great Northern and the Chicago Great Western. This together with the interchange of the Northern Pacific and the Chicago Great Western made it necessary to in-



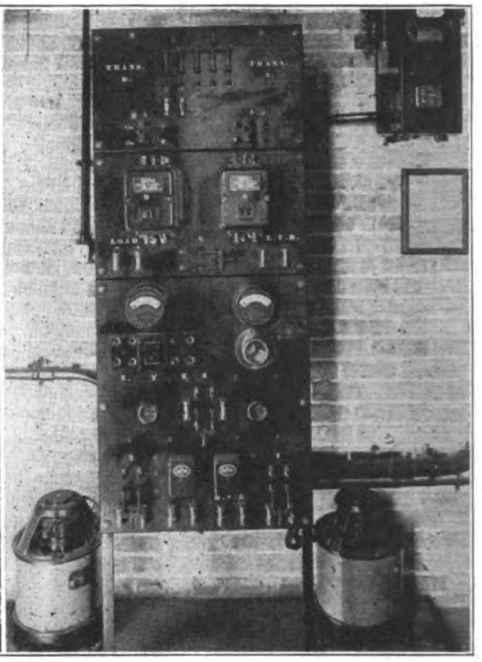
Track and Signal Plan of 18th Avenue Interlocking



Enclosed Type Storage Battery



Outside Wiring Terminates in Box Outside Tower



Compact Power Board with Motor Generators

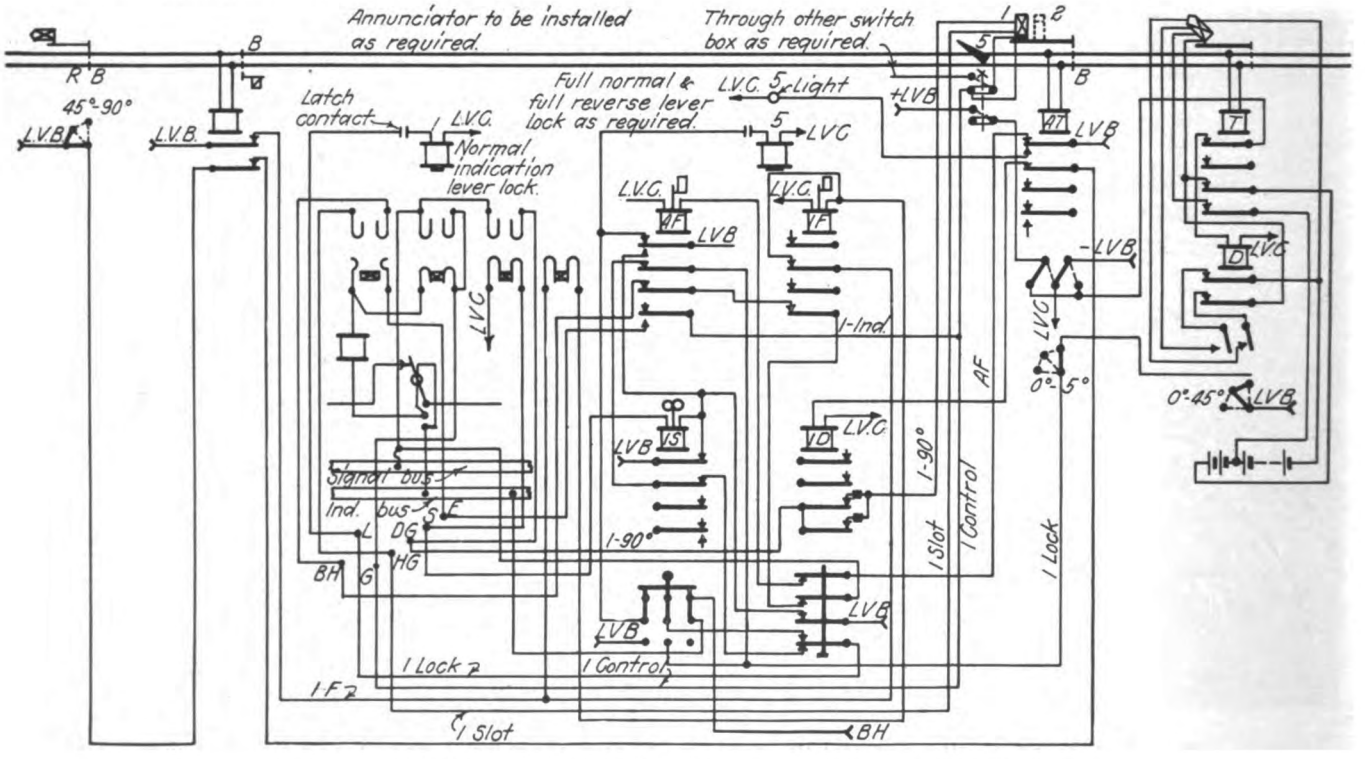
terlock these connections in order to handle the main line and transfer traffic properly.

The interlocking tower is of brick construction with concrete floor and foundation. At the rear is a large concrete junction box for terminating the conduit and trunking. The lower story of the tower contains the heating plant, circular iron stairway and a separate room for the storage battery and charging apparatus. The upper floor contains the interlocking machine, indicator group, cabinet, operating switchboard and the towermen's facilities.

The interlocking machine is a 48-lever General Railway Signal Company Model-2 unit lever type with 9 levers for 9 high signals, 8 levers for 8 dwarf signals, 6 single and 7 double levers for 20 switch and derail movements, and 2 traffic lock levers, a total of 39 working levers and 9 spare spaces. The switch and derail levers are equipped with detector locks and each operating lever is provided with a lever light which is energized only when the track circuit in which the unit is located is deenergized. The traffic levers are provided with detector locks only.

Floating Charge Reduces Required Battery Capacity

Power for the plant is purchased from the Minneapolis General Electric Company as 220-volt 60-cycle current and is taken direct to the duplicate sets of Type U-60 Wotton motor generator sets which are used for

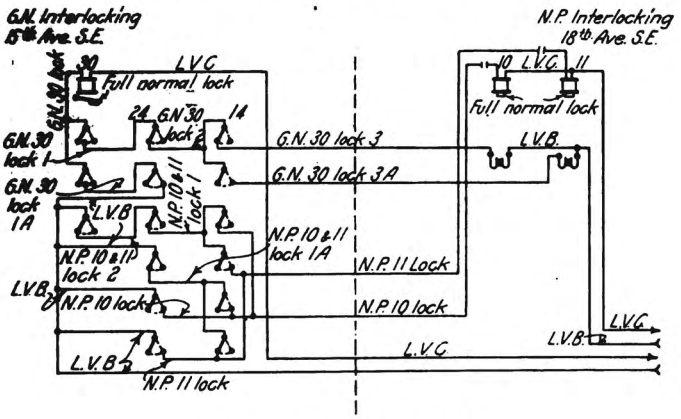


Typical Route and Detector Locking and High Signal Controls

the floating charge of the main storage battery. At the top of the power switch board on the back are located duplicate 220-volt 1-kva transformers with 110, 11, 12 and 14-volt taps. Magnar rectifiers operated from the 110-volt circuit for the floating charge of the low voltage storage battery. The switches for controlling the tower and signal lights are placed on this power board also. The main battery consists of 11 sets of 5 cells each and the low voltage battery of 1 set of 5 cells of 70-amp. hour Type MVS-5 Ironclad Exide storage battery.

Signal Control and Lighting Circuits

The high home signals are General Railway Signal Company's Model-2A top-post type with 40 deg. free run for indication purposes. The dwarf signals are Model-3 solenoid type of the same manufacture. All



Traffic Locking Circuits

signals are electrically lighted from the 10, 11, 12 and 14-volt taps of the auto transformers, a separate circuit being run for each side of the plant, controlled by a single-throw, double-pole switch on the operating switchboard, where a lamp at the switch indicates when power is on the circuit. The lights are turned off and on by the towerman morning and night. R. S. A. standard cast-iron lamps are used, each equipped with two 5-watt lamp bulbs burned in multiple at 10 volts.

The distant signals are Model 2A low voltage, base of mast type, equipped with two-cell hold clear coils and approach lighting operated from the 16-cell motor battery. The lamps used on these signals are the doublet lens type equipped with 13.5-volt, 3.38-watt rebased lamp bulbs. The voltage for these lights is cut down to 8.5 to 9 volts and the current consumed while in operation is about 0.175 amp.

The plant is equipped with detector locking track circuit instead of detector bars, special trap circuits being provided for the long dead sections over the frogs for the transfer tracks. The Great Northern plant at Fifteenth avenue is rather close to the new N. P. plant, therefore, in order to eliminate the possibility of the operators in the two plants clearing signals for the same route at the same time, traffic locking is provided between the towers and telephones installed to aid in the operation.

The insulated wires for the plant functions are run in Orangeburg fiber conduit set in concrete where the main runs pass underneath the main tracks, concrete junction boxes being placed at least every 300 ft. All wires are terminated on R. S. A. porcelain terminals at the tower junction box, and all other junction boxes where leading to the signal functions. The railway's standard trunking placed on stakes about 12 in. above the ground is used for all other wire runs.

Adjustable Rail Brace Backing

A NEW butt-strap or adjustable backing for rail braces has been invented and patented by Fred Rapp, assistant signal supervisor of the New York Central, Albany, N. Y. In ordinary practice, a rail brace is backed by a straight butt-strap riveted to the tie plate, and when it becomes necessary to take up wear on the rail brace and butt-strap, the rivets holding the butt-strap to the tie plate must be removed and the butt-strap replaced by one which is wider, or the old strap can be moved toward the rail brace to make up the amount of wear.

In place of the ordinary butt-strap, this new device uses a stationary thrust resisting member, 8, as shown in the illustration, which is fastened rigidly to the tie plate by the rivets, 9, in the usual manner. The member, 8, has a thickness greater than the thickness of the base of the usual rail brace, and the side adapted to lie next to the rail brace is notched out on an angle (as illustrated in the drawings) to provide space for the insertion of a wedge member, 10.

The wedge member, 10, is provided with a series of

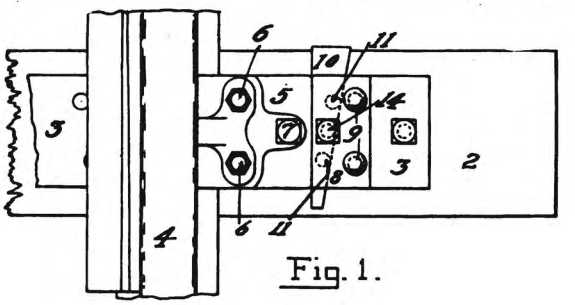


Fig. 1.

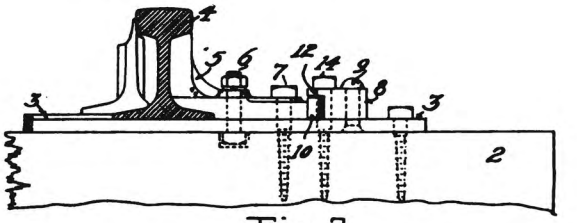


Fig. 2.

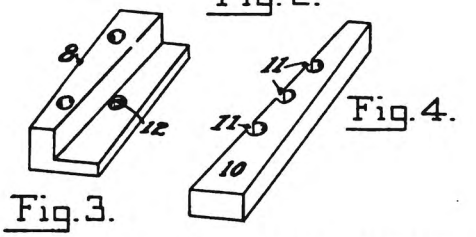


Fig. 3. Fig. 4.

Rail Brace With Adjustable Backing

openings, 11, 11, adapted to come into alignment with the opening 12, in the stationary member, 8, so that when the wedge member, 10, reaches the proper point, a lag screw 14, may be inserted through the opening 12, and one of the openings 11, and screwed in adjusted position. An opening must, of course, be provided through the tie plate to pass the lag screw.

This new device can be used not only for new work, but for making repairs on old tie plates where the rail brace and butt-strap becomes worn. For drawing in wide gage two size wedges are used, No. 1 and No. 2, the No. 2 being ⅛ in. wider. Adjustments can be made in steps ⅛ in. to ¼ in. and the adjustments on wedge No. 2 can be increased in steps ⅛ in. to ⅜ in. This device is manufactured by the Signal Accessories Corporation, Utica, N. Y.