SIGNALING ON THE ILLINOIS TRACTION SYSTEM

About March 20 the Illinois Traction System expects to put in service the first of the several installations of automatic block signals, that are now under way on its lines. This first installation extends from Peoria to Mackinaw Junction, a distance of 18 miles. About April 1 the stretch between Carlinville and Staunton, on the south end of the line between Springfield and St. Louis, will be completed; and during the early part of April the continuous protection which is being installed on 15 miles on the eastern end of the line near Danville, Ill., will be put in service. This stretch is the only one on which train operation will be governed by the signals only. On the other stretches the train dispatching methods now in use will be employed. Time cards and train orders are dispensed with on the protected stretch near Danville on account of the fact that the city cars run out over the interurban tracks for some distance, operating on a 20-minute schedule.

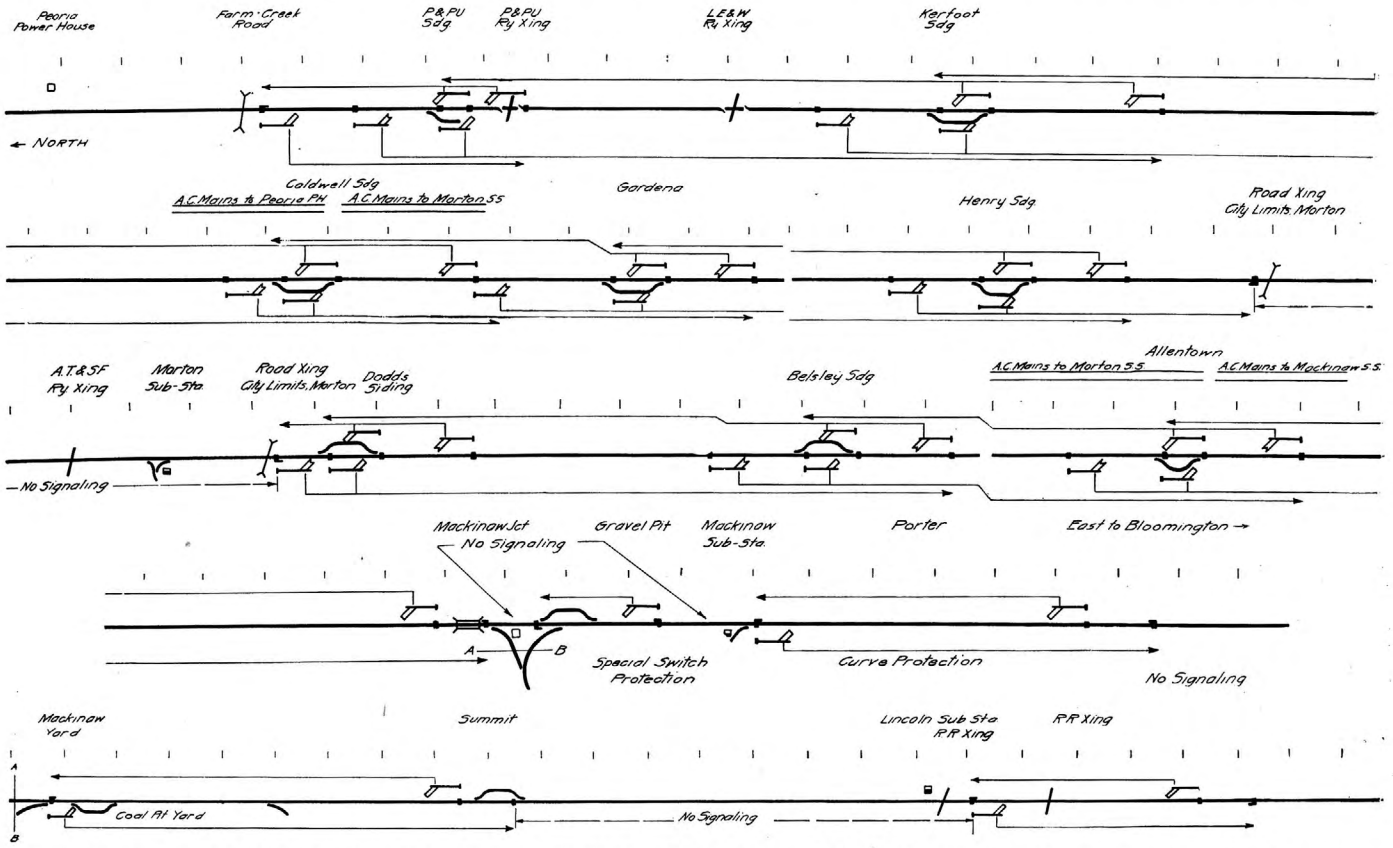


Diagram of Signal Locations and Control Sections on the Illinois Traction System between Peoria and Mackinaw Junction and Curve Protection South of Mackinaw.

In addition to the above continuous protection, 10 miles of automatic block signals will be installed between Selbytown and Ridgley Junction, and curve protection will be put in at all the dangerous curves on the system, the most dangerous curves being equipped first. It is the intention to carry the continuous protection from Staunton to St. Louis as soon as possible.

The scheme of signaling is adapted to single-track requirements and provides for the operation of the passing sidings as shown in the accompanying diagram. The home signals are placed at each siding as shown, one signal opposite the point of the switch and one opposite the clearance point. Distant signals are located 1,500 to 2,000 ft. from the home signals. The method of operating requires that one of the cars at a meeting point shall proceed into the siding and then back out on to the main line when the other car has passed. It is not feasible to run through the sidings, although these are practically all double-ended, as the extensive coal and grain hauling and other freight business of this road necessitate the storing of cars on most of the sidings.

At various points where the lines run through the city streets which are paved and on which the speed must be reduced, the signaling is not carried through.

The curve protection to be installed provides for the single-end preliminary section, as shown in the sketch.

The Blake system of dispatchers' signals is now in use on 137 miles, and in about 60 days will be put in service on 88 miles more. Baird selectors, operating in conjunction with semaphores, are to be installed on 125 miles. These train dispatchers' signals will be used in the territory that is protected by automatic signals.

Having a fixed meeting point which cannot be changed except by the dispatcher, gives rise to a peculiar condition, which, however, is of very infrequent occurrence on account of the close adherence to their schedule on the part of the motormen. If, for instance, a south-bound (left to right on the plan) train is approaching Belsley siding and is delayed for some reason before it reaches the home signal, the train going in the opposite direction, which is meanwhile approaching the meeting point at Allentown, comes up to the distant signal for Allentown siding and finds it in the clear position. Instead of proceeding to the siding, however, it must then wait at the distant signal until that signal assumes the caution position, when it can proceed to the siding and get clear of the other train. The change of position of this distant signal in front of the motorman notifies him that the train he is to meet has passed into the controlled territory on the other side of the meeting point, and, as it has much farther to go than he has, it can be proceeding toward him while he is passing from the distant to the home signal and getting into clear. If this were not the rule the train that was delayed to the left of Belsley siding would be compelled to wait at the home signal at Belsley until the other train passed from the distant to the home signal

at Allentown, which, in case the meeting point were not changed by the dispatcher, would, of course, make the late train even more late. The motorman of the north-bound train, however, after waiting one minute at the clear distant signal, calls the dispatcher from the telephone booth (one of these is situated at each distant signal) and the dispatcher may change the meeting point.

On account of the weather conditions that are prevalent in the country through which the Illinois Traction System operates, and because of difficulty in sighting home signals, due to curves and foliage at many locations, it was not considered advisable to do away with the distant indication. For this reason distant signals are located as shown in diagram. The signal indications will all be given in the upper left-hand quadrant. Union style B mechanisms will be used throughout. The blades of the signals are about 15½ ft. above the rail. They clear the tops of the cars about 14 in. The signal posts are placed the same distance from the track as the pole-line. The signals are 4 ft. below the trolley brackets so that a clear view of them can be obtained by the motormen. The scheme of signaling to be used provides for double-rail return of the propulsion current, and induction bonds for each track section.

The installation of this signaling, 100 miles of which is to be completed and in service by mid-summer, is to be done under the direction and supervision of John Leisenring, signal engineer of the Illinois Traction System, and formerly signal engineer of the Hudson & Manhattan.

SIGNAL DEPARTMENT SHOPS OF THE NASHVILLE, CHATTANOOGA & ST. LOUIS

The Nashville, Chattanooga & St. Louis has, for the past 22 years, manufactured and finished all of its mechanical signaling and interlocking material, including complete machines with locking, buying only such material as it could not manufacture, such as pipe and steel wire. Its products in mechanical signaling include interlocking, block signals, train order signals, and distant switch signals. It has also manufactured and finished all of its own pneumatic signaling and interlocking material including complete machines with locking.

To carry on this work there is a machine shop in the general shop grounds at Nashville, Tenn., in charge of a foreman who has from three to five men employed. This force is on the payroll of the superintendent of motive power and does such work as he may require when not engaged in signal work, but the latter is given preference over other business in this shop, and the foreman receives instructions from the signal engineer as to the kinds and amount of material required.

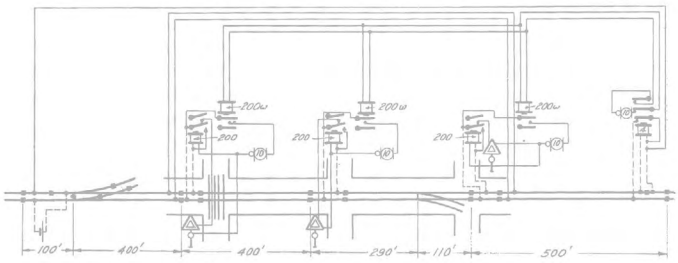
In addition to this shop, the signal department has another work-shop and storehouse of its own in another part of the grounds. This shop, about 40 ft. x 100 ft. in area, is equipped with pneumatic drill-press, forge, thread-cutting machine, and emery wheels. It is lighted with arc lamps, and is used for the construction crew to prepare the material for loading and do other odd jobs as the opportunity occurs. This building is surrounded by a yard in which is kept a stock of ties, trunking, and other lumber, and concrete foundations are made in and shipped out from this yard, which is provided with a loading track for the signal department's exclusive use. A part of this building is set apart for storing materials, mechanical, pneumatic, and electric. No part of the signal department's stock is kept in the general store; and as fast as requisitions are filled by the purchasing agent for materials which must of necessity be bought, this material is transferred to the signal storehouse where it is stored until used, being distributed only on orders from the signal engineer's office.

The signal department has not gone into electrical repair work as yet, but the advisability of doing this is being considered. Until recently, (about three years ago), this road did not have any electric signaling, but since then a considerable amount has been installed.

TRAP CIRCUIT FOR CROSSING BELLS

BY E. H.

Some time ago it was necessary to place three crossing bells on the line of the Santa Fe in the city of Beaumont, Tex., where the line runs down the center of a residence street. For two blocks where the bells were to be installed, the track was embedded in brick pavement. One bell was to be placed at each end of the pavement at cross streets, and one at a cross street in the center, making it necessary if the bells were to be installed in the regular way, to tear up the two blocks of pavement along the rails for bonding, and to relay all the pavement torn up, thus making it impossible ever to inspect the bonding, and a very hard job to repair broken bond wires. The drawing shows how we got around the taking up of the pavement. All that was necessary to be taken up was that in the center of the two blocks where



Trap Circuit for Crossing Bells.

the middle bell was located, in order to tap to the rail and install the Weber joints.

By using this trap circuit and stick relay at each bell, a train approaching from either direction starts all the bells ringing as soon as the engine passes the far end of the preliminary circuit, and each bell will cut out as the engine gets in front of the bell or passes on to the dead rail in front of the bell. Trains using tracks at this place never have occasion to stop and back up.

To prevent the accumulation of cinders and other foreign substances between the coil and porcelain base of choke coil lightning arresters, with the possible result of crossing two circuits or grounding them, it is a good plan to insert a piece of paper or thin steel between the coil and base and move it about until all foreign matter that may be present is removed.

The condition of the electric railways in Massachusetts is shown by the fact that of 78 companies reporting to the Board of Railroad Commissioners for the nine months ending June 30, 1910, only 35 paid any dividends, and only five paid seven per cent or over. The highest dividend paid was 10 per cent. It is significant that this condition exists in spite of the fact that the operating ratio was lower than in six of the past nine years, and the gross revenue per car-mile was greater in the year covered in the report than in the previous year.

It is said that the polarity of a circuit can be determined as follows: Wet a spot on a white pine board and insert in the wet place, at points about 2 in. apart, the wires which are connected to a plug inserted in the lamp socket. If the board turns green around one of the wires the current is direct, and the wire around which the green spot appears is positive in polarity. If there is no discoloration the current is alternating. Another simple test can be made by submerging in salt water the two terminals of the attachment plug used in place of the lamp. If the current is direct the negative terminal will gas freely. A lamp should be connected in series with one conductor of the plug cord to prevent accidental short-circuits.