

to this work. While an investigation is under way, they might very properly be assisted and checked by representatives of the two sides.

The call for expert investigators is so imperative as to require little argument. In the first place the merits of the immediate issues need to be studied by those who possess the necessary qualifications, and all the facts that would be helpful in creating an enlightened public opinion should be disclosed. Mediators and arbitrators, limited as they have been in time, and restricted to issues directly submitted, have in most cases confined themselves to the immediate wage contract. As a consequence one adjustment has been of little or no assistance for the next. It might well be one of the functions of such a body to make the public realize that a reasonable wage is impossible of attainment. We need much enlightenment on such fundamental issues as the relation of wages to cost of living, and to railway operating efficiency. Such questions as the following are demanding intelligent answers: Is there any logical relation between railway wages and railway output? between wages and the capacity and efficiency of the plant? For example, is there any proper connection between a trainman's wages and an increase in trainload? between an engineer's wages and an increase in tractive power? Again, have the risks and responsibilities of trainmen increased or decreased with the introduction of modern operating tools and methods? Is the working life of a trainman shorter than that of his fellow worker in similar industries outside? How does the railway employee's wage compare with that of workers in other highly skilled occupations? Are the brotherhoods receiving wages out of proportion to those of other classes of railway labor? Is there and should there be any relation between railway wages and railway revenue? Is the question of fair wages involved with the questions of fair interest and fair profits?

A group of permanent investigators would develop skill in weighing evidence, would build up a body of valuable precedent, would accumulate an experience that would be enriched constantly with the passing of years. For these labor struggles move in cycles, and the issues that investigators had passed upon would appear again in familiar form as the basis for later demands. Moreover, these men would acquire facility in the presentation of the results of their investigations in terms that the public could understand. It is essential, if public opinion is to be invoked in aid of settlements, that the issues shall be freed of all technicalities and stated in a manner to arouse public interest and stimulate public discussion. The difficulty of such a task is often underestimated.

The success of the investigators in settling disputes during the progress of the investigation would depend upon the personality of the government investigators and their skill in building up a reputation for impartiality. The tendency would of course be for them to become increasingly unpopular as time went on, for their conclusions concerning issues investigated, if of a character to command public confidence, would frequently strike hard at the contentions of one side or the other. But whether these investigators are to be permanently acceptable to the opposing factions is not after all the controlling consideration. These are public questions and it is the public that demands enlightenment.

As already noted, such a plan would forbid strikes or lockouts during the period of investigation. After the results were published, this restraint would be removed. But the likelihood of a labor outbreak following the publication of the results of an investigation would be remote. The very fact that the contestants would be compelled to delay their conflict would have a tendency to develop a spirit of compromise. This is of great psychological import in any impending quarrel. Again, the territory involved is so vast, the leaders of the labor organizations are so mindful of their great responsibilities, the railway managers are so sensitive to public opinion and so watchful of their earnings, that strikes in any event are not at all probable in the future in connection with this class of controversies. More-

over, the probability of a strike is very greatly lessened when the public has once become thoroughly informed on the issues and is prepared to take a hand.

As for the amendment of our existing statutes covering mediation and arbitration, this may, except in details, properly be left until the results of compulsory investigation have been appraised. It has been suggested that the Newlands act should not be confined to employees in train service, but should be extended to include all railway employees; and it has been proposed that there should be some sort of co-ordination between the board of mediation and conciliation and the Interstate Commerce Commission in the matter of increased wages and increased rates. It may be, as has many times been suggested, that the Interstate Commerce Commission will be obliged eventually to give more attention to operating expenses and to take over the regulation of railway wages. It is clear that the commission at present is not disposed to fall in with the suggestion usually made by arbitration boards, and raise rates to compensate for the increased wages that the boards have awarded. That these boards have taken a sound position in insisting that they have no concern with the ability of a road to pay has already been conceded in this discussion. But the fact remains that the margin of railway net revenue is growing constantly narrower, and that the railways are contemplating with much concern the steady increase in wages which they are unable to check and the hardening of rates which they are unable to disturb.

No final solution of so perplexing a problem as that of the relations of capital and labor is to be expected within the near future, even in the field of public service corporations, but we can begin at once to study the whole question in a thoroughgoing fashion and with the use of the most highly developed scientific methods, and thus lay the foundation for a larger participation of the public in the settlement of disputes in which its interest is so fundamental.

ELECTRIC INTERLOCKING AT AULON, TENN

An all-electric interlocking plant has recently been put in service at Aulon, Tenn., at the crossing of the Nashville-Memphis main line of the Nashville, Chattanooga & St. Louis with the Illinois Central's line leading to its new yard in South Memphis, and with the main line of the Louisville & Nashville, all of which are double tracked. The Union, a single track belt line railway, also crosses the L. & N. at this point. The tower is a two-story brick structure. The machine is of the G. R. S. unit-lever type, containing 88 spaces, having 53 working levers operating 61 functions. The power for the plant is furnished by the Memphis Consolidated Gas & Electric Company, at 220-volts, a. c., with a frequency of 60. For the electric lights, both in the tower and in the signals, and for one winding of the track relays, the current is transformed to 110 volts. The track circuits are alternating current, but for the mechanisms and control d. c. is used. Emergency power is supplied by Edison storage battery A-4-H type, consisting of 90 cells of 150 a. h. capacity. This is available for the operation of the interlocking machine and all switch and signal motors, as well as for lighting purposes.

The high signals are G. R. S., model 2-A, with top-post mechanism, mounted on iron posts, working in the upper quadrant. Home signals have three positions wherever there is another home signal in advance; otherwise, they operate in two positions. The home signals are semi-automatic, the 45 to 90 deg. positions being controlled by the track circuits, so that after a train enters a section the signal cannot be cleared by the leverman until the train passes the insulated joint at the end of the track circuit for that section. Distant signals are two-position, operating from 45 deg. to 90 deg., each distant signal being operated by a lever in the tower and also controlled by a circuit breaker on the home signal in advance. The dwarf signals are G. R. S., model 3, solenoid type, working in two po-

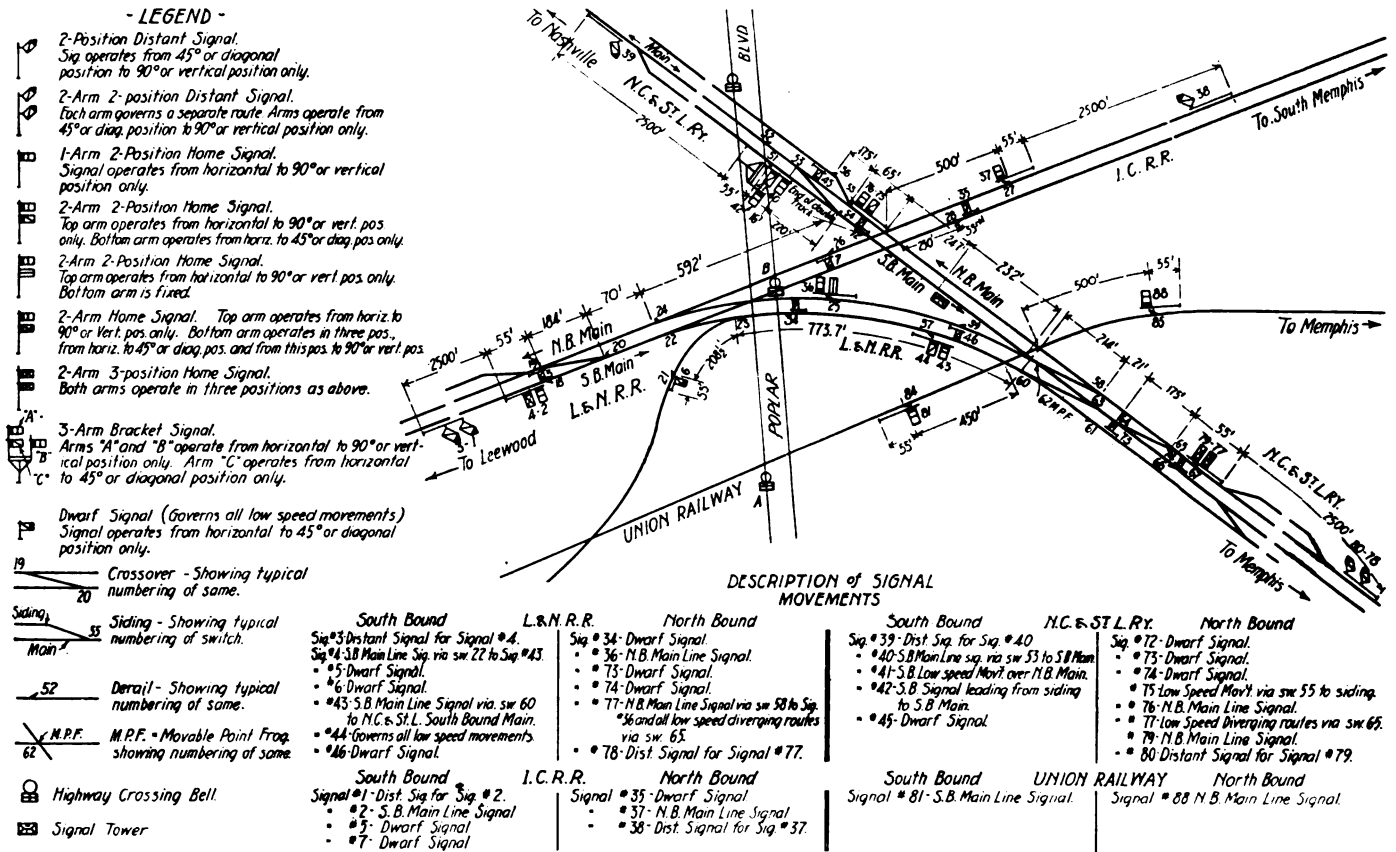
sitions, 0 to 45 deg., and are controlled entirely from the tower. On the top of the tower there is a low-voltage electric horn for giving signals to call the attention of switching crews, and also for calling the maintainer when he is needed. The night indications of signals are green for proceed, yellow for caution and red for stop. Derails on the high speed tracks are Morden lifting type and on low-speed tracks of the Hayes type. Both detector circuits and 53-ft. detector bars are used.

Poplar boulevard, which crosses all four railroads, is a street on which there is a dense traffic, many automobiles using it, especially at night. Realizing that the occupants of automobiles might frequently fail to hear the ringing of the ordinary crossing bell, and fail to note the approach of trains, a signal of the Brach type was installed—the "automatic flagman." This gives both a visible and an audible warning. It contains eight stationary electric lamps with red lenses showing on the street in both directions. These lamps are automatically lighted one after the

gine to move over the crossing; but since the signals go to stop automatically as soon as the leading end of a train passes them the control wire is looped in multiple through the back contacts of all the track relays in the circuit which include the sections of track crossed by the street; so that the bell continues to ring, through the track relay control, after the signal has gone to stop, and until the train has passed the crossing.

Previous to the installation of this plant, the numerous switches were operated by switchtenders and by trainmen, using hand signals. Six switchtenders were employed regularly, three of whom were operators. Switches were only lined up for through trains. Freight train and switching crews had to throw the switches themselves and also protect their trains by flags, when necessary.

The instructions for trainmen were formulated with special care and were accompanied by large scale charts prepared by the signal engineer of the Nashville, Chattanooga & St. Louis.



The horizontal position of the blade by day, or a "Red" light by night, indicates "STOP." The diagonal position of the blade by day, or a "Yellow" light by night indicates "PROCEED WITH CAUTION." The vertical position of the blade by day, or a "Green" light by night indicates "PROCEED"

Descriptive Chart Prepared for Trainmen; Electric Interlocking at Aulon

other in a manner to give the effect of a swinging red lantern. Above the lights in large lettering, is the sign, "Railroad Crossing," and a large locomotive-type bell, which sounds as trains approach.

The unusual conditions under which the "automatic flagman" and bells were to operate were taken into consideration, and special circuits were designed to meet these conditions. As all the railroad lines cross Poplar boulevard, a proceed indication must be given by a home signal in every case before it is necessary for the automatic flagmen to start operating. The control circuits for the automatic flagmen were therefore looped in multiple through the circuit breakers on all of the home-signal levers which govern a route over the crossing. The contacts on the levers are normally open; that is, when the signals are at stop; and they are closed when the lever is changed to clear a signal. Thus the automatic flagmen would continue to operate only so long as there is a signal clear to permit a train or en-

This chart, which is illustrated, was posted on the bulletin boards of all the roads several weeks in advance.

The apparatus was furnished and installed by the General Railway Signal Company, under the supervision of G. S. Pfisterer, signal engineer of the Nashville, Chattanooga & St. Louis. The rubber covered wire, of which there is 160,000 ft., was furnished by the Kerite Insulated Wire & Cable Company, New York

RAILWAY EXTENSION IN ITALIAN NORTH AFRICA.—The 20-mile railway from Azizia to the foot of the Garian mountains in Tripolitania was opened to public use on January 21, 1915. This is known as the Azizia-Henscir el Abeat division, and in addition to the terminal towns serves stations at Bir Cuca, Laim Aimirat and Cave. The two trains that formerly operated daily in each direction between Tripoli and Azizia, now run to Henscir el Abeat.

Generated at University of Illinois at Urbana-Champaign on 2022-06-12 21:16 GMT / https://hdl.handle.net/2027/uc1.c2632272 Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google