When we first started using these houses, we lined some of them with ceiling but we are no longer doing this and I believe that, if proper ventilation is provided, no trouble will be experienced with dampness.

Where instrument cases are placed on solid concrete foundations, we have noticed that considerable moisture would gather on the surface of the concrete. This can be entirely eliminated if a coating of pitch is run in over the top of the concrete under the instrument case after the case has been placed, thus sealing it completely.

I have not seen or heard of any cases where relays in concrete houses have sweated. The only reason I have to offer for this is that good ventilation is provided in the type of house which we use.

I do not know of anything that has been done to prevent altogether the sweating of relays enclosed in iron cases and the only way that this can be eliminated would be to have the temperature on the inside of the case approximately the same as on the outside, as the difference in temperature is what causes the sweating. I believe that the sweating condition will be found to prevail much more when the temperature outside of the case becomes higher than that on the inside, and that the reason why we have not experienced difficulty with concrete houses sweating is due to their being larger on the inside and to the fact that the ventilation is such that the temperature on the inside is approximately the same as that on the outside.

Waterproofing Compound

G. E. Beck

Chief Signal Inspector, New York Central, Cleveland, Ohio

The question suggests that the floor of the concrete house is porous and that the concrete did not contain waterproofing compound, or that the waterproofing was not successful, assuming that the dampness is not caused by reason of the walls sweating. If the dampness in the house is in excess of what will normally be cared for by proper ventilation of the house, it will be necessary to treat the floor with a waterproofing coating. I have used with success, in concrete battery wells, a wash coat of cement and waterproofing compound, applied with a brush. There are a number of waterproofing paints on the market for use on concrete floors.

Uses Roofing Paper

J. P McGill

General Signal Inspector, Big Four, Indianapolis, Ind.

To avoid dampness and have perfect insulation of concrete relay houses, and battery housings, I have found it a good policy to use a heavy roofing paper such as "Mule Hide". First, clean the concrete thoroughly, giving it a heavy coat of PB insulating compound or paint, before applying the roofing paper. One layer is sufficient, except on floors of relay houses, where we have installed two layers, with insulating paint between the first and second layers. This keeps out the moisture and provides perfect insulation.

Frank R. Schmidt, New York Edison Company, uses calcium chloride crystals to absorb the moisture. In damp locations, he says, "We have made up a tray of sheet lead and filled this with crystals of calcium chloride ($CaCl_2$). This salt absorbs a very considerable quantity of moisture and is able to maintain a very close degree of balance between absorption when the air is moist and evaporation when the air is dry. It is necessary to replenish this material occasionally in very damp places."

C. T. C. Studies

"In contemplation of installing centralized traffic control on single or double track, what factors must be taken into consideration in a study to determine its feasibility? How can the operating results be predicted? How should allowance be made for the possibility of long-continued periods of low-traffic conditions?"

Graphic Train-Charts Are Used

G. H. Dryden

Signal Engineer, Baltimore & Ohio, Baltimore, Md.

In order to determine the feasibility of installing a centralized traffic control system on single track, it is necessary to consider the following factors; First, whether the traffic is sufficiently heavy to warrant the added cost, taking into consideration train delays, overtime, and cost of operation, under existing methods; and second, the cost of centralized traffic control and improved passing-siding facilities.

Some of the important points to be considered are enumerated as follows: (a) Are the passing sidings so located that they will provide reasonably uniform time spacing between the several sidings? Are all sidings of sufficient length to hold, between running and back-up signals, the longest train intended to be hauled over the division. Are the sidings located at points where trains being held will not block public highways? (b) Water and coaling facilities should be located preferably at points where trains held at controlled signals may take water and coal while making train meets, without blocking traffic. (c) Install laps at points where it is necessary to meet two trains and allow a third train to pass. (d) Install leads to passing sidings which will permit trains to enter at medium speed. (e) Install signaling to conform with A.R.A. signal Section requisites.

Operating results may be predicted by comparing graphic train charts to show the number of trains that can be handled, taking into consideration scheduled passenger and fast freights in comparison with similar charts showing present operation. The number of train stops, the amount of train delay at meets, and the calculated running time may be obtained from these charts. The operating savings comprise direct savings through the elimination of block operators, savings in train hours, and savings in train stops.

It is impossible to determine what allowance should be made to cover the possibility of long continued periods of low traffic conditions.

Pick the Weak Spots First

E. B. De Meritt

Signal Engineer, Central of Georgia, Savannah, Ga.

There is no question as to the feasibility of centralized traffic control. That question was settled some years ago when railroads began operating trains on signal indication without regard to the superiority of trains. The question now is one of economy only, and this requires a careful study of operating conditions in the particular territory under consideration. The number of train-order offices that can be closed, and the economy resulting from this source, can easily be determined. The vital question is, how many train hours can be saved? That is, how much delay time can be avoided?

Delay time avoidable with centralized traffic control may occur in three ways: Waiting time in the yard for orders before starting; slow running due to entering and leaving sidings or because of a slower train ahead; and time spent on the passing tracks. A reasonably accurate estimate of the delay time that can be eliminated by C.T.C., and therefore of the operating results obtainable therefrom, can be made by plotting train movements from the dispatcher's train sheets, and then replotting the same train movements as they would be made under centralized traffic control. The assistance of the trainmaster and a dispatcher, thoroughly familiar with the territory, is essential in this work.

Usually there is a short territory where most of the delay time occurs. This is apt to be adjacent to the terminal, where trains are unable to get in or out ahead of a superior train that does not make its expected time. By relieving conditions at such spots by installing C.T.C., it is often possible to improve operating conditions on the entire district. One of the greatest advantages of this system is that a short installation is just the first step and can be added to without change when traffic increases to such an extent that additional territory must be equipped.

If the study shows that the installation will produce a meager return over and above its carrying charges during a period of low traffic, it is certain that it will pay handsomely when traffic increases, as delay time increases seriously with increased traffic.

A. H. Rice, signal engineer, Delaware & Hudson, states that, with centralized traffic control, traffic can be moved at greater speed and at less cost than under old methods of operation; that the operating results can be determined by a study of any C.T.C. installation; and that no allowance should be made for low-traffic periods.

Automatic Interlockers

"What type of interlocking would you install at a railway grade crossing on one line of which it is not feasible to use track circuits?"

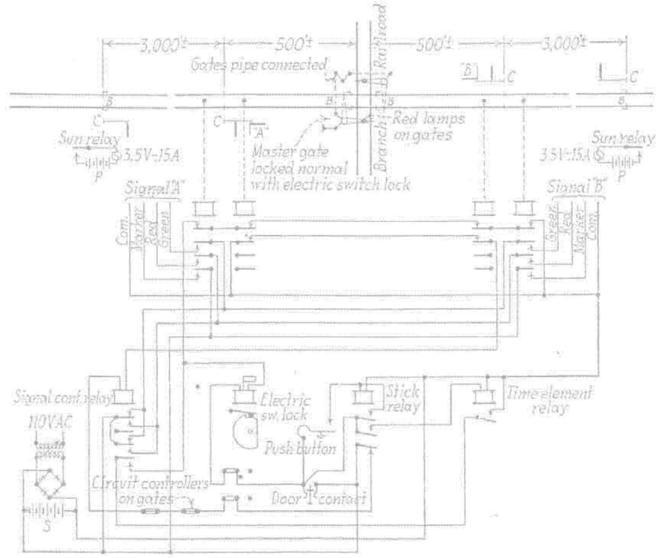
Gate-and-Signal Plan

T. H. Kearton
Superintendent of Signals, Chicago Great Western, Chicago, Ill.

We have a few crossings with industry or switching tracks that are protected only by crossing gates, and several branch line crossings that are protected by automatic interlockings. However, there are certain crossings with branch or unimportant lines where gates alone would not provide adequate protection and where, because of conditions inimical to the operation of track circuits on the branch lines, it would not be feasible to install automatic interlockings.

The sketch shows a scheme of gate-and-signal protection which we propose to install, if it meets with the approval of all concerned, for just such locations. This arrangement consists of two single-track gates locked normally across the branch line by an electric switch lock and connected so that they will operate simultaneously. The protection on the important line consists of two home signals and inoperative distant signals of the color-light type. The operation is as follows:

Trainmen on the branch line, upon opening the door of the housing for the electric lock will cause the indicator-type lock to pick up and release the gates, providing there is no train approaching on the conflicting line within the limits of the distant signals. The trainman can then move the gates across the other line and



Scheme involving two single-track gates locked normally across the branch line by an electric switch-lock

signal his train over the crossing. When the lock is reversed, the home signals assume the "stop" position, and when the gates are placed in their normal position and locked by the electric lock, the signals will again go to "Clear".

In case the electric lock fails to pick up when the trainman opens the door, due to a train approaching or failure of a track circuit, the trainman pushes the button, thereby picking a stick relay and starting a time-element relay to operate. After a predetermined time interval, the electric lock will release. When the stick relay picks up, it puts the home signals at "Stop".

This scheme could be worked out in automatic signal territory, and, I believe, will provide adequate protection with certain speed restrictions. The installation would cost approximately $3,000.

Crossing at Interlocking Plant Presented Similar Problem

R. C. Charlton
Signal Engineer, Oregon-Washington Railroad & Navigation Company, Portland, Ore.

We operate and maintain a terminal interlocking plant within the limits of which there is a paved main thoroughfare in the center of which are located the tracks of a foreign road used for switching purposes only. The pavement and switching tracks cross the two main tracks of the terminal plant at an angle of approximately 60 deg.

The pavement makes it almost impossible to install track-circuit protection on the switching line but, fortunately, the switching line, after it crosses the main tracks entering the terminal, diverges from the pavement sufficiently so that it is practical to locate a derail on one side of the crossing.

The switching motors always approach our crossing from the opposite side and on that side we have located a color-light signal whose normal indication is Stop. The foreman, after the motor has stopped at this signal, walks over the crossing to where the derail is located. At the