by the minority. If time is taken to translate the description of conditions in case 3 into ordinary language, used by operating men of the day, it is probable that many will find that they are, with a very simple system of signals, obtaining results which the language in case 3 would indicate could not be obtained without the use of the complicated scheme of signals recommended by the majority. The results of long experience have been to show that it is unnecessary, if not undesirable, to require or permit trains to run at excessive speeds over diverging routes at interlocking plants. To make such excessive speeds possible requires, in the first instance, the installation of adjuncts and additions to a simple system of signals, which must be accompanied by expensive and complicated electric locking circuits, approach locking, annunciators, releases, time locks, etc., to check and guarantee the more or less specific information which it is aimed to give the enginemen.

These adjuncts and complicated automatic checking devices are expensive to install, maintain and operate. They are subject to failure and do fail, in common with all automatic devices.

L. R. CLAUSEN,
Division Superintendent, Chicago, Milwaukee & St. Paul.

Chicago, Ill., April 29, 1911.

A DIFFERENCE OF OPINION.

To the Editor of the Signal Engineer:

The crossing-bell circuit using a 1/10 ohm relay, as shown on page 157 of *The Signal Engineer* for April, 1911, is unsafe, and any road attempting to use it may expect a crossing accident. A 1/10 ohm relay circuit in series with the track battery is unreliable and cannot be kept in adjustment. Wet-weather adjustment requires greater tension on the armature than that of dry weather. The most important criticism, however, lies in the fact that if a train has passed the crossing, but is still in the block, possibly a mile beyond the crossing, a following train will not cause the bell to ring, for the reason that the one-tenth-ohm relay circuit is opened by the four-ohm relay contact in the advance section.

G. H. DRYDEN,
Assistant Engineer, Signal Department, Baltimore & Ohio.

Baltimore, Md., April 21, 1911.

Editor's Note.—Mr. Dryden's letter was referred to Mr. Baxter, and he answered it as follows:

Replying to Mr. Dryden's criticism of the double-track bell circuit, published in the April issue of *The Signal Engineer*, page 157, I wish to say that circuits similar to that one, using the 1/10-ohm relay and involving the same principles, are in service at several points in the West. One near Sacramento, Cal., has been in operation for about three years, and is not giving any trouble.

It will be seen that the 1/10-ohm relay is made to release its armature by the breaking of the circuit at a point near the battery, which completely de-energizes the coils of this instrument, and permits of a low drop-away point. This allows the pick-up point, which is of the most importance, to be placed where it will give the best service; and, as the pick-up occurs when the battery is practically on short circuit, and a current of approximately one ampere is flowing, it may be placed at 600 milli-amperes. This is low enough to insure the pick-up when the four ohms ars cut out of the circuit, and is still high enough to prevent a pick-up due to excess leakage unless the ballast resistance gets considerably lower than three ohms. Any failure that might occur on account of low ballast resistance would be on the side of safety.

As for the criticism that if a train has passed the crossing, but is still in the block, a following train will not cause the bell to ring, this is met in part by the fact that the bell is necessarily located well within the block, in order to give sufficient ringing distance, and it is hardly probable that a train, after being stopped by the signal, waiting the required time and then proceeding slowly, would still reach the crossing before the preceding one had cleared the block. This condition is, of course, to be avoided as much as possible, but the fact remains that these circuits are being operated where the blocks are approximately one mile in length and the rules require trains finding a signal at stop to wait one minute and proceed under control.

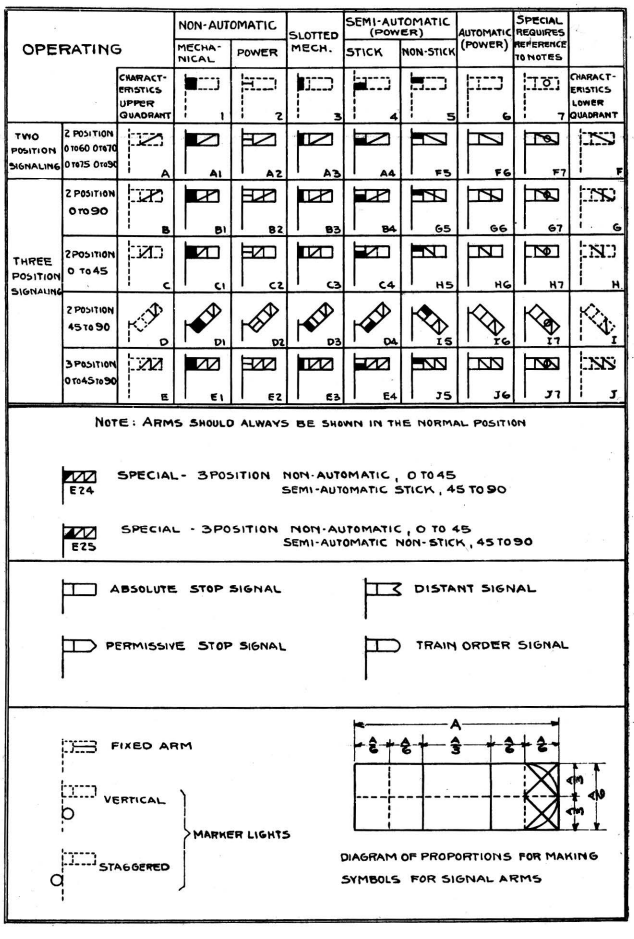
Sacramento, Cal., April 30, 1911. S. L. BAXTER.

SUGGESTIONS AS TO THE STANDARD SYMBOLS.

To the Editor of the Signal Engineer:

There are some points in the criticism of and suggested changes in the Railway Signal Association's proposed standard signal symbols in the April issue of *The Signal Engineer* which do not entirely meet with the approval of the writer. This is particularly true in regard to the circle shown with every signal blade. It has always been the contention that whenever a signal symbol was shown with no circle it indicated that the lights for all arms on this particular signal were located in a vertical line, while signals having staggered lights would have the location of these lights indicated in the symbol by circles. This is good practice, as it simplifies an interlocking plan, where, as a rule, all signals have vertical lights, by leaving out all lights (circles), and the Railway Signal Association has followed this practice in its proposed symbols to good advantage.

The great advantage of leaving out all unnecessary circles will be plainly evident to any draftsman who has had experience



Suggested Standard Symbols.

on interlocking plans drawn to a scale of 12 in. to 100 ft.—the standard scale in most signal departments. The tracks are drawn to such a small scale as to leave very little space for the signals. In fact, the size of a signal arm on an interlocking plan at this scale is $\frac{1}{16}$ in. wide by $\frac{3}{16}$ in. long. Thus the circle will be $\frac{1}{16}$ in. in diameter, and the hole made by the bow-pen in the tracing cloth will interfere with the placing of any lines or shaded quadrants inside of it, as suggested in the April number, page 131.

Even if a draftsman is successful in making a circle of this

size, leaving only a very small center hole, the distinction between the different ways of controlling the signal, which is indicated inside of the circle, will be so small as to be hardly noticeable, especially after a blueprint of the tracing has been made.

The writer would suggest that, instead of employing circles, the space thus occupied be used with advantage to indicate how the signals are controlled, while the remaining part of the blade would indicate the different aspects which the signals display, as shown in Fig. 1. By substituting a square for the circle more space is available for the indication of the controlling power. It might be argued that it will be as difficult to draw the circle inside of the blade which requires special note; but in this case it can be drawn after the signal symbol is completed, which is not possible with the other symbols. The writer has also tried to improve upon the two special symbols, as shown on the opposite page.

As an example of the inconsistency of the proposed standards, it is said on page 131 of your April issue: "It will be noted that a marker light is shown by a circle. If a signal arm were used instead of a light, as is standard practice on some roads, it would be necessary in the case of the vertical light to remove the circle and substitute an arm, but in the case of staggered lights it would be necessary to leave the circle and add the arm, and in this case the signal arm would show a circle at the left."

Certainly it would serve no purpose to leave the circle in case an arm was added to the symbol with the vertical lights, as, where no circle is shown, the lights are vertical, and *vice versa;* and where one circle is shown the lights are staggered.

April 29, 1911. J. B. A.

THE ABSOLUTE—PERMISSIVE SYSTEM.

To the Editor of the Signal Engineer:

This is to call attention to the fact that the series of signal aspects and indications shown on page 145 of your April issue, while in accordance with the hurriedly prepared paper as originally presented by the writer, was subsequently revised in a number of details, all as shown in the appendix, which formed part of the paper as finally revised and from which the article as it appears in your paper was supposed to have been taken. The writer therefore wishes it understood that the series of aspects and indications as shown is not in accordance with his wishes. He also desires to call attention to the fact that the title of, and the short statement which precedes, the article as it appears convey the impression that it all has to do with the Absolute-Permissive block system, which is not the case, only a very short space being devoted thereto (see page 148, descriptive of Figs. 20 to 29, inc.). W. K. HOWE.

Rochester, N. Y., May 5, 1911.

RELEASING ELECTRIC DETECTOR LOCKING.

To the Editor of The Signal Engineer:

I would like to get from your readers opinions on the advisability of providing means of releasing electric detector locking at interlocking plants where detector bars are not used. Some roads make it necessary to call a repairman to release the machine if the detector locking fails, others provide a seal instead of a lock on the electric lock case and require the signalman to furnish an explanation every time the seal is broken, and hold him responsible for anything that may occur, while still others provide some sort of slow release,—sometimes sealed, sometimes not sealed. The argument against any means of releasing is that with such a device in operation a switch or derail might be moved under a train even though no signal could be cleared. On the other hand, if no means are provided, serious delays are likely to occur before the repairman can get to the tower. The fundamental question is this: Should we trust the signalman sufficiently to allow him, in emergencies, to operate a plant without detector protection, making him personally responsible for the consequences, or shall we accept delays to traffic?

Chicago, Ill., May 8, 1911. W. H. ARKENBURGH.

INDIANA RAILWAY COMMISSION MEETING.

The Railway Commission of Indiana held a meeting on Thursday, May 4, 1911, with the committee appointed some time ago to investigate and report on block signals. The members of the committee are Arthur W. Brady, of the Indiana Union Traction Co.; Will G. Irwin, of the Indiana, Columbus & Southern Traction Co.; Robert I. Todd, of the Terre Haute, Indianapolis & Eastern Traction Co.; and M. H. Hovey, block signal expert in the employ of the commission.

The committee, together with members of the commission, made an inspection of the installation of single-track automatic block signals recently put in by the Kinsman Block System Co. on the line of the Terre Haute, Indianapolis & Eastern, just west of Indianapolis. The installation comprises two signals of the three-position upper left-hand quadrant type, operated by short track sections, counter devices being used. The block covers the distance between two passing tracks. Three line wires are required for the operation of the signals. The signals stand in the clear position, and a train approaching the block operates the signal at the entrance end, causing it to move to the 45-deg. position, this movement being a positive indication that the signal at the opposite end of the block has moved to, and is set in, the stop position. The signal at the entrance end of the block remains in the caution position, and a second car upon approaching the block at the same end causes the signal to move to the clear position and immediately return to the caution position, indicating that a second train had been counted into the block, and also that the block was already occupied by a car moving in the same direction. The car will be counted out upon leaving the block at either end, and both signals assume the clear position when all cars have left the block. The signals are operated by a top-post mechanism recently designed by the Kinsman Block System Co., and the signal is cleared by a rotating armature operated by the trolley current.

On Saturday, May 6, the commission inspected the installation of single-track automatic block signals on the New York, Chicago & St. Louis, between Dunfee and South Whitley, just west of Fort Wayne, Ind. This installation comprised a number of three-position upper right-hand quadrant signals spaced about one mile apart, and so arranged that a train upon leaving one station sets all signals between that station and the one toward which it is going, in the stop position for opposing movements, at the same time allowing for a close follow-up movement. With this arrangement it is impossible for two trains to meet between passing sidings. The first signal on each side of a passing siding is provided with a second fixed arm ,and the rules provide that no train shall pass this signal when it is in the stop position except upon instructions from the dispatcher. Telephones are installed so that communication with the dispatcher may be had. This installation has been in preliminary operation for about three months and is reported to be giving very satisfactory service. The signals were installed by the American Railway Signal Co., Cleveland, Ohio.

S. M. Ransome in "Machinery" recommends the following method for restoring blueprints that have been over-exposed: The over-exposed print should be taken from the washing tank as soon as it is discovered that it has been exposed too long, and, while still wet, laid face upward on a table. An unexposed dry piece of blueprint paper should then be laid over the wet one, with its printing side down. The back of the unexposed piece should then be rubbed with a piece of cloth or with the hands. This brings the two printing surfaces into intimate contact, and when the dry piece is removed it will be found that the over-exposed print is perfectly clear and of a rich blue color. In fact, the color obtained by this method is generally better than that secured by the original exposure and development. The only objection to this scheme lies in the necessity for wasting a good piece of blueprint paper for each print of this kind.