

flashing or moving light is a bait to attract the motorist's attention. But it must awaken him to the seriousness of the occasion; and this can be done only by displaying a banner lettered with the word "STOP."

The flashing light, necessarily operating on an open circuit, is connected to its electrical source through the back contact of a track relay; while the banner mechanism, operating on a closed circuit so as to display the warning by gravity, is connected to the same electrical source through the front contact of the track relay. In this arrangement we have a device that lives up to the three requisites of a crossing signal, namely: the flashing light to attract attention, the definite warning, "stop," and the closed-circuit banner mechanism, which, in the event of a failure of any part of the device, will cause the display of the stop indication.

It is a known fact that many motorists willfully disregard crossing signals. If an accident occurs the railroads are usually blamed, when in reality it is the result of carelessness on the part of the motorist. The motorist should be made to obey crossing signals as he is made to obey police-operated traffic signals in city streets. Let the various state legislatures take it upon themselves to inspire the officers of the law with the energy, vigilance and courage necessary to enforce the law requiring proper observance of highway crossing signals; do this and the number of accidents at such crossings will be very greatly reduced.

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#### STOP or PROCEED vs. STOP and PROCEED

TO THE EDITOR:

A. H. Rudd's article in the *Railway Signal Engineer* of September commences with an excellent abstract defining the purposes which a modern railway signaling system should be made to serve. The main discussion, however, consists of an emphatic denunciation of the stop and proceed rule.

Analysis of some of the points made by the author raises a number of interesting issues which are not readily disposed of, and in several instances it is quite difficult to trace how the facts lead to the conclusions reached. Let us consider Mr. Rudd's contention with the case which is at once simplest and most typical, viz., a double-track line equipped with upper-quadrant three-position automatic block signals.

The author says: "Some of us believe . . . the stop and proceed signals should be eliminated; and stop signals displayed *only where stops are required*," describing this condition as follows: "i. e., when protection is needed against opposing movements, and at grade crossings, junctions and crossovers where side collisions might otherwise occur."

What is the proper point to stop a train which has entered a block occupied by a preceding unit? Safety demands that a sufficient interval be preserved at all times between trains, and it is generally understood that signals are located with due regard for the efficient performance of this function. It indeed seems incredible that the author intended to exclude the stop signal from the situation that I mention. Surely he does not mean that the only stop signal should be those auxiliary or reserve instruments, torpedoes, flags, and the like.

"Let us tell the engineman to stop only when necessary and when we say stop let us mean it. Less variations in stops and all real stops. *Stop-and-Stay*; this because it is *necessary*."

Now both the "real" stop and the stop-and-proceed indication have been barred from our case. Accordingly

our three-position signal must become a two-position indicator (proceed slowly, prepared to stop short of train or obstruction, or clear), affording less information than it did formerly. And Mr. Rudd has explicitly advocated supplying the engineman with as much knowledge as possible concerning the track ahead.

But suppose that only the stop and proceed rule is eliminated, and we substitute a "stop-and-stay" indication. What is the result? *Hold* trains where they had paused. And yet we are given to understand in definite terms that the stop and proceed rule works against the expediting of traffic.

Continuing, the article points out that the reason for the *stop* in the regulation criticized is "because it is presupposed that without it the second requirement (proceed at slow speed, prepared to stop short of train or obstruction) may be disregarded." It is my belief, however, that there are other important factors effective. The stop and proceed rule is superior to the proceed at slow speed indication, for:

1. *It makes unmistakable* the requirement that the engineman bring his train under control. There is a fundamental difference between making a stop and reducing speed. The first is a fact incapable of modification; slackening of speed to an estimated rate per hour is an act in which judgment is an important element, and it is well known to what extent judgment varies with individuals.

2. *It compels* the attention of the train crew to an irregularity in the running of the train.

Furthermore, a desirable feature of the stop-and-proceed rule is that it automatically tends to space trains as nearly as is consistent with safety. It is to be questioned if the time consumed by the stop could generally be advantageously utilized. For without the stop the train would commonly close up too quickly upon the preceding unit and would summarily be required to halt.

We have now reduced the issue to the question of what is ordinarily the more desirable place for the stop, at block limits or anywhere within the block. The answer seems unmistakable.

Possibly shortening the length of blocks may sometimes be a better means of accomplishing what Mr. Rudd and every other progressive transportation man is seeking than would abolition of the stop and proceed rule. The advisability of contracting blocks, however, is dependent upon a variety of factors, and often the presence of special operating conditions is decisive. Moreover, expense of re-installation is not always an incidental consideration.

To my mind the stop and proceed rule is at present the method par excellence of keeping trains moving with a maximum of safety where dense traffic conditions prevail. The three indications now in general use I believe satisfy all the requirements which Mr. Rudd sets forth. In brief, the 45-degree indication keeps a train moving when it is safe, the 90-degree indication stops a train when a stop is necessary. It is the *stay* that is useless. Perhaps I may suggest that it would be interesting to know of a collision in which the stop and proceed rule has been at fault.

Given additional precautions, I will not deny that the proceed at slow speed direction, as Mr. Rudd would use it, is worthy of experiment. For example, let the engineman approaching a block which is occupied reduce speed to a prescribed rate, at the same time whistling for the attention of the conductor, or preferably a regularly appointed brakeman, of his train. Responsibility might be divided between the engineman and the brakeman for the conduct of the train according to special regulations, from the time of passing the entrance of the occupied block until the passing of the first clear signal. Trainmen would

be enjoined to respond to the engineman's call, with notice to proceed into occupied block only when satisfied that necessary speed reduction had been effected. Also instructions might provide that such brakemen remain upon car platform ready to communicate at once with engineman if the required caution were not being exercised. A further check would be produced if brakeman noted on a special form the time of passing entrance and end of block, noting whether or not block was found occupied.

Doubtless there are logical objections to such an innovation. Particularly radical would be the responsibility accorded the brakeman. Paramount in importance, however, is the insistence that understanding of signals shall be complete. Not only do those in the engine know what is taking place; they know that the train crew in the rear is bound to watch for any exception in the running of the train.

Assurance of proper signal indication observance increases with the number of observers.

But admittedly this plan is rather clumsy. Nevertheless I do think that these principles, of exchanging understandings, and of giving a larger place to the interest of the crew in the operation of the train, offer profitable material for discussion.

In conclusion let us remark that the stop-then-proceed rule has stood the test of years' experience. Let it stand—stop and think (they go together), then proceed—a good rule always.

Newton, Mass.

C. RADFORD SANDS.

### THE ELIMINATION OF THE DERAIL

TO THE EDITOR:

The subject of derails now claiming the attention of your readers through an article submitted by A. H. Rudd in your August issue is one that, "like the snowball going downhill," should gather weight and momentum and should be carried to a definite conclusion.

There are many who feel that Mr. Rudd has set up a target in the open that has been much shot at in secret with but few bull's-eye hits registered. If derails are necessary at crossing plants, why not use them at all main line crossovers and turnouts? The railroad commissions of New York, Pennsylvania, Ohio, Indiana, Michigan, Illinois, and perhaps in many other states, have approved interlocking layouts at crossover and junction points which have no derails in the main or high speed tracks and these commissioners are evidently satisfied that the signal protection is ample for such locations; yet who can say that the results of a side swipe at a crossover or turnout may not be as disastrous as a direct hit at a crossing?

Many drawbridge locations are protected by smash boards and devices other than derails, it being felt that it is the better practice to give an engineman added distance in which to bring his train to a stop, rather than derail the engine on a high embankment or into a location which is as bad or worse than the open draw. At many interlocking plants, derails are equipped with guide or guard rails which take away nearly all of the benefit of the derail—if it has any. Probably all readers can recall derailments at points where guard rails were used where the momentum of the train after being derailed has carried it over the railroad crossing. If the cost of derails could be diverted to automatic signals and other protection the movement of trains would be speeded up to the general betterment of service.

Consider the average crossing interlocking on a branch line where two single track lines cross without switches, crossovers or turnouts; by eliminating derails at such

places automatic protection in all four directions for some distance from the crossing could be provided at little added cost. Again, without attempting to steal a good signal engineer's fire, if such a plant had the derails eliminated, why not do away with the interlocking entirely and have the crossing automatically protected, at a large saving in maintenance and operation?

Cleveland, O.

G. E. B.

### WHY USE FORM "31" ORDERS?

TO THE EDITOR:

"Signals keep trains moving." This familiar maxim of one of your advertisers is endorsed by everybody. But there are many roads which have not as many signals as they would like, and so they continue to keep trains moving, as best they can, by dispatchers' orders. The dispatcher's office, however, has many handicaps which it is desirable to do away with, and the problem how to accomplish that important end continues to agitate progressive minds.

The stopping of trains, especially long and heavy freights and heavy and fast passenger expresses, for the single purpose of receiving train orders is a serious element of cost in the operation of a busy railroad; and the use of train order Form No. 31, with which stops are necessary because of the requirement that the conductor shall sign the order before it can be completed, is subject to increasing criticism. A few roads have for a number of years made almost exclusive use of Form 19, requiring no signature, and have thus greatly reduced the number of train stops, promoting celerity and regularity in the movement of trains, and thereby reducing expenses; while at the same time a satisfactory degree of safety has been maintained. The practice of these few roads has been commended and academically approved, and the advantages of the exclusive use of Form 19 have been discussed in considerable detail; and yet general practice is not much changed. Conservative railroad officers stick to Form 31—either because they believe that signatures are essential to safety or that the saving in delays is not of much value—and so the advocates of the non-signature form continue to address their arguments to deaf ears. Cannot something be done?

The main points of the argument against Form 31 are pretty clear; but, as already suggested, not a great many dispatchers (or higher officers, either) have got them well fixed in their minds. One fact needing to be emphasized is that the delays necessitated by getting signatures are growing worse, year by year, as very long trains are becoming more common. For a freight train of 85 cars it is impossible to take signatures and make delivery in less than 20 minutes, because the conductor, or someone, must walk the length of the train, either from the caboose to the engine or from the engine to the caboose.

The presence of the conductor in the telegraph office is to be regarded as at least a potential safeguard; and in giving up such safeguard, however small it may seem, the careful officer naturally seeks to assure himself that all other possible safeguards are kept in full force. There are two well-known safeguards which are not yet well enough appreciated: (1) The clearance card, to be given to the conductor in every case, bearing the numbers of all of the orders which he is required to receive at that point; and (2) the "middle order"; the placing of meeting orders at the station at which the trains are ordered to meet each other.

If we rigidly enforce the rule requiring clearance cards, every conductor will be constantly trained in habits of carefulness; and by having the cards numbered by the dispatcher, in the same way that he numbers train or-