For sixty days the strike hung on. I nursed my gang of "copper heads" along until they were tame enough to eat out of my hand. "Red Nose" developed into a real pal. With him on my side, the rest of them just had to be satisfied.

The switchmen did not go out, but they did not lose an opportunity of acting "onery" at times. "Big Elphy," who was an engine foreman, proceeded to get "in bad" with the Pinkerton man. They said nothing, but watched him closely. One day, while pulling the Rep Track, Elphy strayed away from his engine and started strolling around the shops. The engine pulled out of the yard and the watchman closed the gate. When Elphy encountered the first guard he could not show a pass. The guard indicated that he had sneaked in and told him to climb the fence. Elphy clumb. Another guard on the outside saw Elphy's avoirdupois coming over, so he made him climb back. The first Pinkerton drove him out again. After Elphy had shinned up and down that eight-foot fence six times, he finally convinced them who he was and they let him go. After that the switchmen stayed with their engine when doing any work inside the enclosure.

Many funny things happened that took the edges off the hardships, but above all other advantages was the insight I secured as to the workings of unionism, when actually on an active strike.

At the beginning of the second month the old men began to come back in squads and asked to be reinstated. They were given employment at once. The Pinkertons were sent home. A few holes were opened in the fence. The strikebreakers began to leave in little parties. The cots were cleaned out of the shops, the commissary and free meals abolished, and things suddenly became normal.

Car 300 was pulled out of the stub track, and "Red Nose" Kelly bids us a fond good-bye in order to hurry up to Anaconda, where the miners were "shooting things up," and thus ended the only strike I was ever tangled up with.

In that sixty days the well-known wolf called "Starvation" nipped at a number of heels. With but little argument among themselves the rank and file came back and were kindly received by their respective foremen. No mention of the strike was made, except that the old men went on the pay roll as new employees. In the goodness of its hard old heart, the poor old railroad gave them an approximate increase of 10 per cent. The stores in the town immediately boosted their selling price 15 per cent in order to cover bad accounts and also because the increase in salary would allow these men to pry an additional profit from their customers.

The old pike struggled manfully along for a few weeks, threw up both hands and sank into the much-dreaded receivership. The expenses attached to the strike was the proverbial last straw that broke the desert pony's back.

Soon after this I was in Chicago. I met the Curly Wolf on the street. He looked seedy and hungry. He had lost job No. 188 a few days before because the foreman was a "bonehead." I fed him, listened to the exaggerated woes of unorganized labor and advised him to quit work and join the I. W. W.

I once saw a Billy goat after he had drank a bucket full of gravity battery solution. He had something in him that he didn't need. My impressions of unionism left me in a similar condition. So in order to rid myself of these internal feelings I met a bunch of the fellows one night at the "hole in the wall" and unloaded all the anti-unionism arguments that were in my system.

DRAFTING ROOM STANDARDS

By Chas. L. Sandrus,
Signal Foreman, P. R. R., Altoona, Pa.

THE preparation of plans and the record kept of work installed is one which universally affects the interest of signalmen. It has been the privilege of the writer to work on one of the large divisions of the Pennsylvania railroad where three methods have been tried; that is, where the field forces would install the work with very little detailed information from the office; where detailed plans would be provided and the work installed accordingly, but no provision made for having plans revised to show changes that were found necessary after the work was once placed in service; and where the field men are furnished with all detailed information before proceeding with their work, with an accurate record kept after same is installed. The first method referred to may seem to have some advantages from the fact that it suggests economy and less work on the part of the office force, and while this may be true in a measure, it was found to be very unsatisfactory on this division because a high standard of safety and efficiency is made impracticable; it is not consistent with good organization; it is meant to facilitate the work for the office force, where conditions are always most favorable and makes difficult that of the field forces who are usually exposed to the mercy of the weather, and when working reports, counting functions, etc., it is always necessary to obtain information from the field forces, which necessitates the loss of considerable time, and besides inaccurate information is received in many cases. These are some of the objections why the first method does not meet with the present requirements, and, therefore, must give way to something more desirable. As for the second method, it seems to have all the weak parts of the first and meets with considerable opposition because the plans are misleading and do not correspond with the work as in service. As for the third method, it seems to meet all necessary requirements and when once adopted the many advantages over the first two methods are evident.

The division on which I am now located adopted the last method several years ago, and to return to either of the first two would be very much like trying to railroad without rails. In planning new work, the course of procedure on this division is to first go on the ground where the work is to be installed and make a survey, then prepare a 1-in. = 40-ft. (this scale applies only to interlocking plans) scale drawing of the existing track layout. The signal arrangement is shown by the supervisor of signals, along with the type of interlocking machine desired, after which it is approved by the signal engineer. The circuit plans, locking and dog charts are then drawn. At this stage we are in a position to give the field forces all the necessary information for proceeding with the work, which can be completed in less time, at less expense, and with better results than where the above information is not furnished. The advantages of our present method over the former ones are obvious to the professional eye. To one with little experience in this line it will be of interest to know that the change was made on this division because the information which one has access to at all times exceeds that which otherwise could only be obtained by laborious research, and which in a short time would prove very costly, especially in these days when a small army of additional help is required to furnish the information for the Interstate Commerce and other commissions, which in itself has become very burdensome to the average corporation. The department officers know exactly what is going to be done before the

work is started, as it enables those in charge to see the end from the beginning and on a large road where the affairs of the various departments become so intertwined that one is largely dependent on the other, it makes it possible for an immediate definite answer to be given when there is a question asked concerning the work. When information is desired concerning the number and type of interlocking machines, the location of signal bridges, the number and type of relays, transformers, indicators, slow releases, etc., it can be obtained in a more satisfactory manner from the plans and with a much greater degree of accuracy than when the field forces are depended upon to give it.

The value of providing the field forces with detailed information before beginning a piece of work was proved on a recent installation where 120 miles of four-track a.c. T-2 automatic motor signals were placed in service. Wiring plans for each bridge combination was prepared in the supervisor of signals' office, showing the wiring for each bridge complete, which included all connections from the 3,300-volt transformer to the most minute detail. The relay case at each bridge location had all track transformers, reactance coils, d.c. and a.c. terminals, relays, etc., shown in their proper relation, with the result that when the work was completed we had one of the most uniform installations to be found on any division of the entire system. Besides, we completed the work in less time than would have been possible had no plans been provided.

Perhaps the most extensively used plan among department officers is the one drawn of the entire superintendent's division to a scale of 1-in. = 1,000 ft., showing the interlocking plants as well as the intervening sections. This plan should show all tracks, switches, derails, bridges, bridge numbers, mile posts, track alinements, grades, etc. With the plan properly revised as changes occur, it will soon be found a great source of information. I believe the sooner signal departments awaken to the necessity of improved methods in drafting room practice, just then will all signal work be placed on a more efficient basis not only from an office standpoint, but from a construction standpoint as well.

I. C. C. Report on Accidents and Safety Devises

THE report of the Chief of the Bureau of Safety to the Interstate Commerce Commission for the fiscal year ending June 30, 1917, gives an account of the investigation of train accidents, collisions and derailments occurring during this period.

The Bureau of Safety investigated various safety devices submitted for examination and test. Tests were also conducted on train control systems. An abstract of this report of interest to signalmen is given below.

During the year ended June 30, 1917, this bureau investigated 80 train accidents, comprising 54 collisions and 26 derailments. In these accidents 174 persons were killed and 827 persons were injured. The collisions caused the death of 132 persons and the injury of 638 persons, while in the derailments 42 persons were killed and 189 injured. Twenty-one of these collisions occurred on block-signaled lines, 11 being on lines where automatic block signals were in use and 10 on lines using some form of manual block system. Thirty-three of the collisions occurred on lines where the train order and time interval system of train operation was in force.

In the collisions investigated which occurred on block-signaled lines, 63 persons were killed and 148 persons were injured, and in those which occurred where the time interval system was in force, 111 persons were killed and 679 persons were injured.

Eight of the 11 collisions which occurred in automatic block signal territory were due to the failure of enginemen to obey signal indications. In these eight collisions 30 persons were killed and 77 were injured. One of the collisions which occurred in automatic block signal territory was caused by an engine starting to make a cross-over movement in the face of an approaching train, due to the failure of a switch tender to note the position of a switch indicator. Two of these collisions occurred on single-track lines and were caused by errors common to the train-order system, one being due to an engineman forgetting a meeting order and running past a switch where his train should have taken the siding, having run past an automatic block signal in the stop position under a blanket order authorizing him to proceed without stopping for signals or flagging, issued on account of a number of the signals being in inoperative condition; and the other was due to an error of a telegraph operator in receiving and copying a train order, in this latter collision the automatic block signal rules being defective, as they permitted trains to proceed beyond a stop signal without flag protection.

Disobedience of signal indications on block-signaled railroads presents one of the most serious problems in connection with railroad accidents. Some of the most disastrous accidents are due to this cause and occur on roads equipped with modern systems of automatic block signals where trains are operated by trusted employees of long experience. The investigation of probably the most serious accident which occurred during the past year disclosed that the signal system in use was of comparatively recent installation and represented the highest development of automatic block signaling practice. The apparatus was surrounded with all safeguards necessary to insure its proper operation, and thorough inspection and tests of the signals at the point of accident demonstrated that they were in normal, operative condition. However, a collision, resulting in the death of 20 persons and the injury of 5 persons, was caused primarily by the failure of an experienced and competent engineman properly to observe and to obey block signal indications partially obscured by a dense fog. In this particular case the caution signal which the engineman called "white" was called "green" by the fireman and head brakeman; the fireman also crossed over to the engineman's side of the cab and asked him if the signal was not green. However, the engineman was so certain in his own mind that the signal was clear that he continued at undiminished speed, and when he saw the home signal indicating danger, which was visible for only a short distance on account of the fog, it was too late to stop before striking the preceding train, which was standing only a short distance beyond the signal. A contributing cause of this accident, as is frequently the case in accidents of this character, was the failure of the flagman properly to protect his train. As was stated in the report upon this accident, "the circumstances surrounding this collision point clearly to the conclusion, often reiterated in previous reports, that if accidents of this character are to be guarded against, some form of automatic device