plants, although under certain conditions it might be desirable and safe. The same rule for setting the time on such a release would hold good as for a high-speed route. The time must be sufficient for an approaching train to obey the home signal at Stop, or if for some reason it cannot stop, the route as previously lined up for it will still be held through the plant, when it reaches the home signal.

Electro-Plating

"Can nickel or chromium plating of relay and signal parts be performed economically in the average signal shop, or is it cheaper to have such work done by some commercial plating works? If handled in the signal shop, what is the best method? Which is better—nickel plating or chromium plating?"

Nickel Plating in Railroad Signal Shop

I. A. Uhr
Signal Engineer, St. Louis-San Francisco, Springfield, Mo.

We have had no experience with chromium plating in our signal repair shop, but have been nickel-plating small parts for the past six years. When signal companies discontinued giving relay and mechanism parts a lacquer finish and started nickel-plating them, we sent our parts out to a commercial plant for nickel plating. We were charged 10 cents per pound and had an average of 40 lb. per week. The cost was reasonable enough, but the work was unsatisfactory; the plating was entirely too thin, the finish was dull and had a bluish cast or color and sometimes a shade of various colors, due, I suppose, to the fact that there were all kinds of metal in the same batch with the signal parts.

It was decided to equip our shop for nickel plating, and an M. B. No. 2 oblique plating apparatus was purchased from Hanson & Van Winkle Company. It has given us very satisfactory results.

Scrap brass parts are accumulated until about 40 lb. are on hand, and are then soaked over night in lye solution. The first thing in the morning the parts are dipped in boiling water to clean off the lye, after which they are dipped for cleaning for about five seconds in a solution of half and half nitric and sulphuric acid. The parts are then given another bath in boiling water and are dipped in a 10 per cent solution of muriatic acid to kill the effects of the previous acid dipping. Then they are given a third bath in boiling water. They are now ready to be placed in the tumbler in the nickel-plating machine. The tumbler is started and a current of seven amperes is run through the nickel anodes and salts for a period of two hours, after which it is reduced to two amperes for a period of one hour, for the purpose of plating more slowly and thus giving a better polish. The parts are then removed from the tumbler and are dipped in cold water to clean off the nickel salts, then dipped in boiling water, and then placed in a shaker filled with saw-dust where the parts are dried. They are then ready for use.

The cost of the acids, lye and current is approximately $1.20; and the labor is $1.40; making a total cost of $2.60. (The cost of nickel salts is not included because these salts are used for seven or eight years, without renewal.) The nickel plating is done somewhat cheaper in our repair shop, but the greatest satisfaction is the fact that we have a better and more uniform job, and can handle it as it suits our conditions, thus reducing the time any apparatus may be held waiting for the nickel plated parts for complete assembly.

Nickel Plating Now Done at Commercial Works

B. J. Schwendt
Assistant Signal Engineer, New York Central, Cleveland, Ohio

We have done little or no chromium plating, as we have had no particular reason for it, nickel plating having so far satisfied all of our requirements. We find it possible to have this work done at some commercial plating works on a pound basis more cheaply than we formerly found it possible to do it at our shop, and the quality of the work is equally satisfactory and sufficiently good to meet all of our requirements.

As to whether nickel or chromium plating is better: In my opinion this depends upon the purpose to be served. On account of the longer process, chromium plating is more expensive and where the part is to be exposed to the weather or other more severe conditions than those which prevail inside a housing, it might be found good economy to chromium plate. A good example of this may be seen in the comparison between nickel plated and chromium plated automobile parts. Ordinarily chromium plating will outlast nickel plating on such parts and will also give a better appearance. However, the difference in appearance between chromium plating and nickel plating probably has little or no value for railway signaling purposes.

Automatic Dwarfs?

"Should the dwarf signals in terminal layouts be semi-automatic, particularly with reference to the "H" aspect? If so, should the call-on feature be used with such signals?"

Call-On Control Should Involve Deliberate Action on Part of Operator

A. R. Whitehorn
Commercial Engineer, General Railway Signal Company, Rochester, N. Y.

American Railway Association rules 501G and 602G will permit very flexible use of dwarf and call-on signals, provided the "proceed at slow speed prepared to stop short of train or obstruction" rule is respected. The purpose of these signals primarily is to facilitate train movements in congested areas, and to expedite switching, and such signals are often made use of in place of high signals, due to lack of clearance, particularly in terminals.

When used for the latter purpose, the temptation is great to break the rule by increasing the speed in order to maintain schedules, and for this reason it is the better part of safety to make them semi-automatic. When these signals are made semi-automatic, their usefulness for making switching moves, is lessened. Therefore, each layout must be given consideration as to the kind of traffic to be handled.

The call-on feature can be used when these signals are

semi-automatic, but this control should be so organized that the operator, when he uses the call-on, knows, by reason of some deliberate action on his part, that it is the call-on that he is using, and it is highly desirable to provide a distinct indication to the engineman, by bringing into the aspect a marker indication which tells him that it is a call-on move which he is being permitted to make.

This is a subject of vital importance in railway signaling and is receiving much discussion today, particularly where plants are remotely controled, as is done on C. T. C. installations. This question deserves early and careful consideration by the A.R.A. Signal Section.

Bonds for Special Joints

"What is the most satisfactory type of bonding to use where joints are located in station platforms or street crossings?"

Prefers Two Bond Wires on Each Side of Joint, Under Angle Bars

Chas. K. Robison
Canadian Pacific, Westmount, Que.

From experience, I would say that four No. 8 A.W.G. Copperclad bond wires, using 3/8-in. duplex channel pins or 9/32-in. single-groove channel pins, are preferable to any other type of bonding in street crossings or station platforms. These bond wires should be located under the angle bars and in pairs on either side of the rail. Rail joints so located will not permit a ready inspection or replacement of bond wires, but, with four such bond wires installed, the margin of safety is good.

A good practice for the maintenance of bonding in crossings and platforms is to have the section foreman advise the signal maintainer when he expects to make repairs at such locations. The maintainer can then arrange to be there to inspect the bonding, and to renew it if the wires have been in service for any length of time.

Bonds at Crossings Should Not Be Near Head of Rail

Claude H. Cameron
Canadian Pacific, Toronto, Ont.

A satisfactory way to bond joints in crossings, platforms, etc., is to use two bonds on each joint, installed on the outside. The bonds should be so bent that they lie on the ties. If flat-laid rails are used for a flangeway, they should be removed before the bonds are installed. After the bonds are in place, the plug ends that protrude through the rail should be cut off; otherwise the flange rail, when replaced, will tend to loosen the plugs and force them back out of their holes.

Bonds that are installed in the head of the rail are seldom satisfactory for use in a crossing, as auto tire chains, horses' shoes, etc., tend to break the strands, and often the bond becomes broken at its weld or point of attachment.

Prefers Welded Rail-head Bonds

Leroy Wyant
Signal Engineer, Chicago, Rock Island & Pacific, Chicago, Ill.

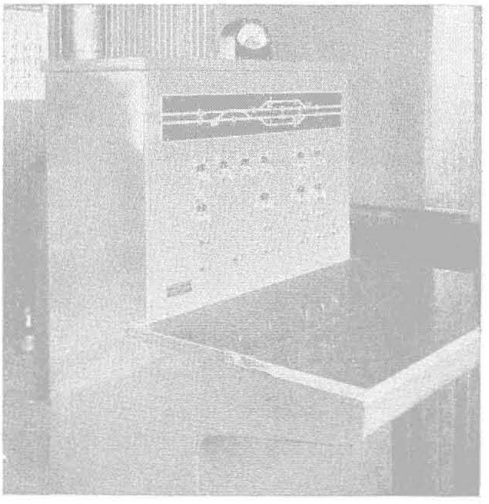
We have used almost every type and arrangement of bonding which has come to our attention, including welded rail-head bonds, rail-head stranded bonds applied with solid plugs, Verona spring plates applied behind angle bars, and four ordinary Copperweld bond wires behind the angle bars. Generally speaking, welded rail-head bonds are most satisfactory for the average location. They are accessible for quick inspection, and, with the rather wide distribution of welding outfits on our line, it is not much trouble, in most cases, to apply new bonds whenever necessary.

Lamps for Railway Signals

(Continued from page 166)

have been in service for a considerable time, signal lamps should not be removed and then replaced, as this also tends to loosen the base. This slight handling might cause the filament to break, as filaments which have been in service become fragile. Where practicable, therefore, signal lenses and reflectors should be cleaned without removing the lamp. For the same reason each class of lamp should have its individual replacement schedule instead of transferring separate lamps from one indication unit to another on signals having separate lamps for each indication.

Meeting adequately the needs of railroads, in increasing safe operating speeds and reducing the cost of transportation, are the primary objectives behind the perennial efforts of lamp manufacturers to improve life dependability, physical accuracy, light-source brilliancy and efficiency of their product. Yet the non-standardization continues to make it necessary that manufacturers keep up to tap, and up-to-date, too many types of lamps for the many designs used by American railroads today. Signal engineers are no doubt aware of this condition, and are just as anxious as the manufacturers to eliminate the unnecessary duplication of product. When the signaling fraternity can bring about greater standardization work along the lines already recommended from numerous quarters, the day of lower costs and higher levels of quality indication with signal lamps will soon become a reality.



CTC type of machine used for remote control of interlockings on the Big Four at De Graff, Ohio