THE CONSTRUCTION OF DISTRIBUTION SYSTEMS FOR OUTLYING SYSTEMS AND SMALLER PLANTS.

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(Continued from last week.)

The best metal pin designed to pass through the arm is undoubtedly a design which has been placed on the market within the past year. This is of high carbon steel with bolt ½-inch in diameter. The shoulder is increased in diameter and drawn square, which not only stiffens the pin, but provides a wrench hold. The contact point with the arm is swaged out to form a good-sized shoulder, and the insulator thread is formed of a steel wire spiral which slips around in the insulator thread when expanding and contracting. This absolutely prevents insulator breakage and also that very annoying property of insulators to unscrew and become loose on the pin. These pins cost about three times that of a locust pin, but are an excellent investment, as, being hot galvanized, there is practically no limit to their life, and, while they may be bent, they will never break and drop the line. Another feature that makes them an economy is the small amount taken out of the arm for the pin hole. A wood pin leaves only 2 inches of wood out of a total of 3½ inches, while the steel pin leaves 3 inches, or 50 per cent. more, which not only adds to the strength of the arm, but also materially to its life. For heavier strains the same makers have recently brought out a clamp pin made of a bend of ¾-inch channel. A "U" bolt of flat steel is used to clamp this to the arm and insulator support is their usual steel spring thread. Such a method of fastening effectually does away with any possibility of the arm spliting and for heavy or important feeder lines makes an excellent job at very moderate increase in cost, the pin and clamp averaging complete about twenty cents.

For dead ending a line, particularly with large wire, the best pin made is an unsafe proposition and for such use some form of strain insulator with bolt right through the double arms should be used. The writer has not located up to date a device which can be purchased in the open market and which meets the requirements. We are using, however, a malleable iron clevis adapted to take a standard ⅝-inch bolt and using a porcelain spool insulator held in position by a ⅝-inch pin with cotters in each end (see Fig. 3). These can be made up cheaply in any shop and make a dead end that can't get away. We also use a ⅝-inch eye-nut where it is desired to head guy the arm, this placing no strain on the arms other than actually holding up the weight of the line.

The balance of pole hardware is now standardized, but, above all, should be hot galvanized only; plain iron for bolts or braces being both an expensive and dangerous proposition for use with treated poles, as they will not outlast the pole which should be the first part of the line to give out from age.

For taking off services and branch lines we are all familiar with the wooden side block and the reverse or buck arm. For junction poles at important corners the latter may be necessary, but for other places either is such an eye-sore that their use should be condemned in the strongest terms. For this purpose some form of metal spreader bracket should always be used. Various styles of malleable iron brackets have been on the market for years, but have defects which are too well known to need mention here. Fortunately it is now possible to obtain a full line of wrought steel brackets to meet every possible need. These are unbreakable, of light weight, and have a spring thread similar to the metal pins mentioned above. As the heaviest pattern of three-pin bracket costs only about one-half dollar, and a light two-pin about 20 cents, the cost is low enough to make their use general. For attaching to buildings the same line of brackets are available, together with a number of other styles adapted to building use only. With such fittings available there is no longer any excuse for unsightly and shipshod methods of taking off or attaching service leads.

A method of running secondary distributing mains which is finding favor within the past few years is that of dispensing with cross-arms altogether. The three wires of the system are carried in a vertical plane on brackets fastened directly to the pole (see Fig. 4). A three-pin metal bracket for this purpose will cost erected about 50 cents, which is less than the cost of a cross-arm. With this method of suspension the lines cannot swing together, and consequently, can be placed on very short spacing, decreasing the inductive drop on A. C. lines. A further advantage of this method is the ability to take off service lines directly from the line pins without crosses in the line. For dead ending

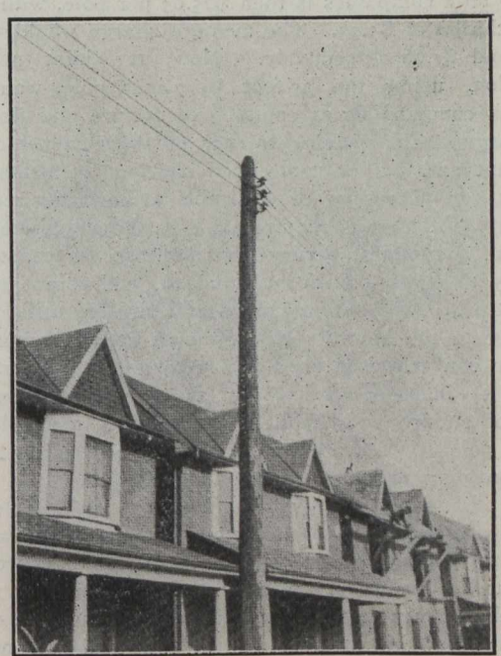

Fig. 4.—Vertical Secondary Distribution.

these lines a three-spool insulator bracket is used, secured to the pole with two ⅝-inch through bolts, forming an anchorage which will stay as long as the pole holds up. As we have a number of 500,000 C. M. mains carried on this type of bracket some idea of their strength can be realized. Reference to the illustrations will demonstrate the vast gain in appearance which can be made with this type of construction in comparison to the old cross-arm method.

Before going into the question of wires a few words on the subject of joint poles may be opportune. Aside from the beneficial effect of minimizing the number of poles on the highway, as regards public opinion, the joint use of poles offers great economy both as to first cost and upkeep expenses. The telephone or telegraph is found practically every place where electric light or power is required, and there is no valid reason why both classes of public service companies can not beneficially co-operate to utilize each other's investment to the maximum. Where both systems are on the same street, as they must be to supply service, there is always the chance of the two systems becoming crossed owing to falling wires. This is equally true irrespective as to whether they are on separate pole lines or on