Three automatic interlockers—two of which have a modified part-time manual control—installed at grade crossings of the main line of the Minneapolis & St. Louis with branch lines of the Chicago & North Western, in Iowa, have successfully demonstrated the adaptability of automatic control to complicated conditions. At each of these three crossings, there is a passenger station, and at two of the crossings there are several diverging tracks and switches within the limits of the clearing sections and home signals. The daily traffic on the M.\& St. L. approximates 20 freight and 6 passenger trains, most of which were required to make statutory stops at each of the three crossings. The traffic on each of the North Western branch lines is in the neighborhood of 4 to 8 trains daily. Because of the track complications mentioned, the total cost of the three plants was approximately $30,000, but this expenditure has been well warranted by the attractive savings that have been realized by both roads. The North Western is making an annual saving of 40 per cent on its investment, while the Minneapolis & St. Louis is saving more than 66 per cent on its investment, entirely by reason of the elimination of train stops. This is only one of many examples of this kind that could be mentioned here.

Quick Return on Small Investment

Of prime importance in considering the feasibility of automatic interlocking are its low first cost and the immediate and attractive return on the investment. Other advantages are: Low fixed charges for interest and depreciation; ease and low cost of maintenance; adaptability to existing or future installations of automatic block signals or centralized traffic control; greater safety of train operation; faster average train speed; and in some cases the opportunity to increase tonnage ratings. Despite present business conditions, a road is warranted in investigating prospective applications of automatic interlockings now, because such installations effect savings in operating expense, when replacing manual plants, that are independent of the volume of traffic, while the savings effected at crossings where train stops are eliminated, will increase as traffic picks up.

New Interlockers — Reversion to Single Track

THE type of control machine and the circuits requiring no mechanical locking, which were developed for centralized traffic control, were readily adapted to the consolidation of the control of two or more adjacent interlocking plants, thus reducing the number of levermen required. The Boston & Maine installed a centralized control installation at Winchester, Mass., including 17 miles of double-track line and four layouts which were previously separate interlockings. In 1932, the Dayton Union Terminals installed a centralized control type of interlocking which includes the entire terminal layout, involving what was formerly five interlockings and several layouts requiring switch tenders, such that a train director and operator on each shift now handle the work formerly requiring 39 men. A further advantage of this type of interlocking is that trains are operated by signal indication in either direction on all tracks without written train-orders, the control being concentrated at one point, thus eliminating delays and confusion.

The use of automatic signaling and centralized traffic control for directing train movements, has so increased the capacity of single track that not only is it possible to defer the construction of second track but in some cases sections of second track can be removed, thus effecting a saving in track maintenance of $1,000 or more per mile annually. For example, in 1932 the C. M. St. P. & P. abandoned second track on nine sections of line, totaling 200 miles, the signaling being converted for either-direction operation on the single track, and spring switches or interlocking being used at the ends of double track.

Another large road has plans for increasing the capacity of a single-track line, thereby deferring second-track construction. Passing sidings are to be located on a time-distance basis and power-operated switch machines or spring switches will be provided at each turnout, all train movements being directed by signal indication controlled from a central point.

Modern Highway-Crossing Protection

THE installation of highway-railroad-crossing automatic signals took on new life in the last decade as a result primarily of the extensive construction of improved highways and the resultant increase in the number of automobiles and trucks used. Not only have various state and city bodies required railroads to install these crossing signals, but the roads have voluntarily made many such installations, from 2,000 to 2,500 such signals being installed annually. Through the Joint Committee on Grade Crossing Signals, of the American Railway Association, standards have been established for the types of signals and related equipment. Thus, this field has come through a period of development in the last decade which sets the stage for continued steady activity.

The installation of highway-crossing signals or gates, with automatic or centralized-manual control, in place of crossing watchmen or gates operated locally by hand, will effect savings equivalent to 30 to 100 per cent on the cost of the improvements and at the same time will provide full 24-hr. protection as compared with part-time service otherwise.

During the last 25 years the rapid development of improved highways carrying fast-moving automobiles in ever-increasing numbers, has introduced an entirely new problem for the railroads. As individual cases