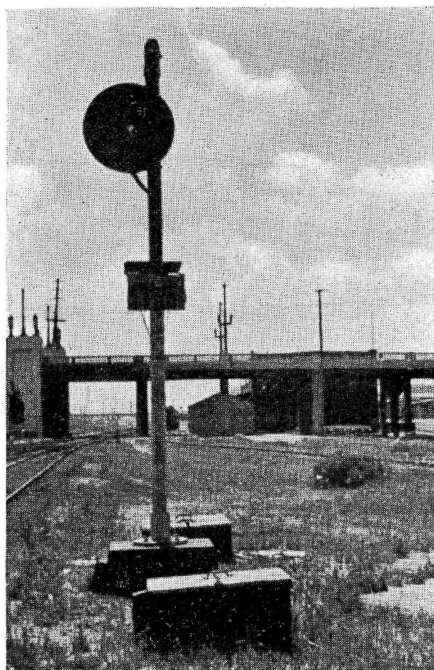




Signal 1412F near South Junction is typical of the signals used

THE MAIN LINE of the Atchison, Topeka & Santa Fe runs through Cajon Pass of the San Bernardino mountains to San Bernardino, from which point two separate lines extend about 65 miles, to Los Angeles, the western terminus of the system. One of these lines runs from San Bernardino westward through Riverside and Fullerton, entering Los Angeles terminal from the south, while the second line runs westward from San Bernardino through Pasadena, entering the Los Angeles terminal at the north end. This terminal layout, which is about two miles in length, is just west, and along side of, the Los Angeles river. During the past year or two several viaducts were built to carry street traffic over the Santa Fe tracks and the river, as well as the Union Pacific tracks on the east side of the stream. The construction of these viaducts resulted in numerous track changes. In the present track layout the double-track through freight line is located on the west bank of the river; and at North Junction and South Junction, which are

Automatic Interlockings of *Involving Spring*

Santa Fe installation at Los Angeles
permits practically all trains
to pass without stopping

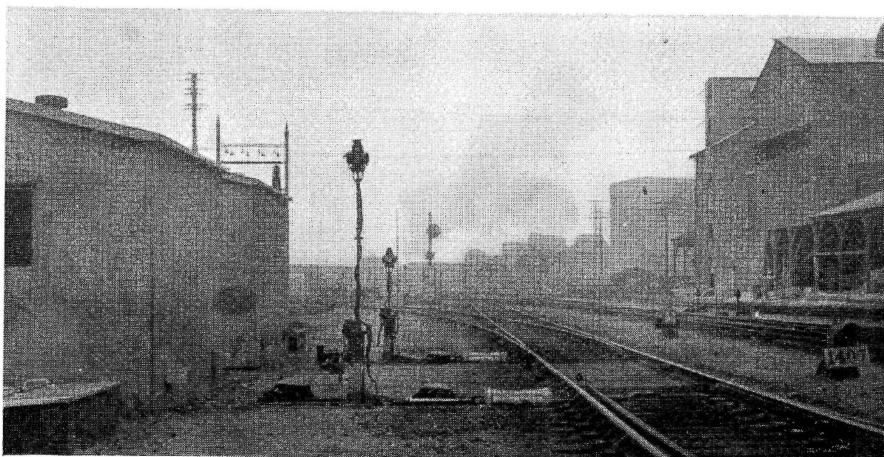
By *W. F. Price*

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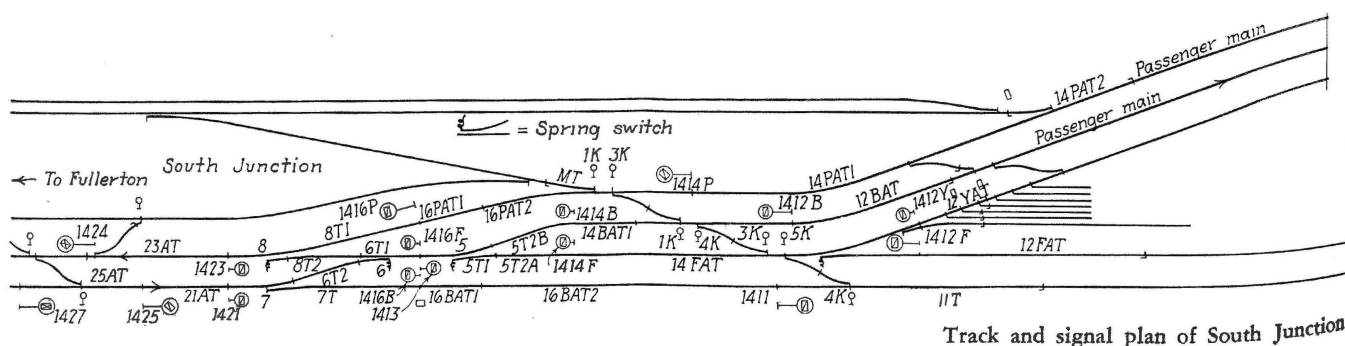
two miles apart, the two-passenger-main tracks diverge westward to the passenger station, the yards being located in the area between the freight and passenger main lines. An additional freight yard is located at Hobart in the southern outskirts of Los Angeles on the line via Fullerton. Trains made up at Hobart for north-bound movement, as well as south-bound trains for Hobart yard, are run through the Los Angeles terminal layout on the through freight tracks

without entering the Los Angeles yard.

After the new track arrangements were completed consideration was given to the installation of power interlockings, controlled remotely, at North Junction and South Junction. However, on account of the numerous train movements, especially those involving switching, there was some question as to the practicability of using remote control for these junction layouts, and the installation of



View at North Junction looking toward passenger station



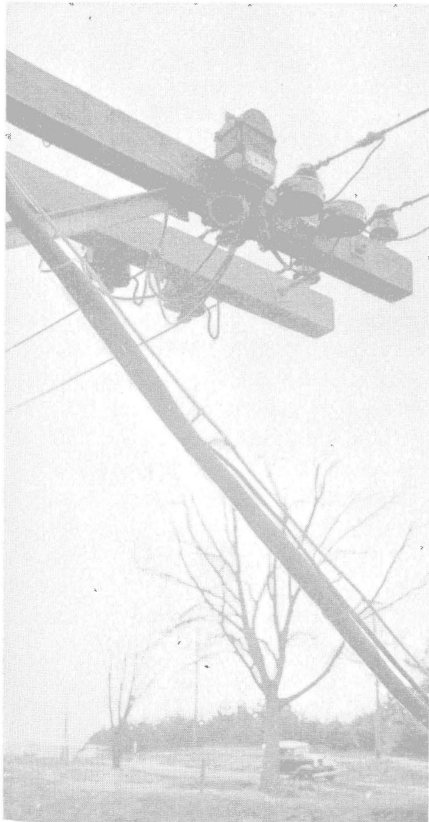
Track and signal plan of South Junction

an 11-volt, 11-watt single-filament lamp, which is normally fed from the a-c. service, the voltage being adjusted to about 10-volts at the lamp. The automatic signals, as well as the interlocking signals, are controlled for approach lighting, except that dwarf interlocking signals, having no track circuit in the rear, are continuously lighted.

At each signal location a large sheet-metal case, with a door on the track and one on the field side, is provided to house the battery and the instruments. Each of these cases has a partition dividing the case into two compartments, the one on the track side being used for relays, while the one on the field side is used for transformers, rectifiers and storage battery. The terminals and arresters for underground cables are located at the bottom of the partition, while the terminals for line cables are at the top. Jumper wires from these terminals run in back of the board, up and out through individual holes to the instruments.

Ordinarily at a signal location, a set of five KXHS-7 lead storage cells is provided for the signal operation and for line circuits. One cell of the same type is used to feed each track circuit. Type-K rectifiers of various ratings are used to charge these batteries.

The track connection wiring is in underground parkway cable which has



Line transformer and protective devices mounted on crossarm



Two-unit multiple-aspect signal in approach to interlocking home signal

outer covering of a non-metallic combination. A two-conductor No. 9 solid-wire cable extends from the instrument case out to a concrete riser set opposite each insulated rail joint. Each of these risers, as shown in the detail plan, has a section of 2 in. pipe 8 in. long set in the top of the foundation so that about 1 1/4 in. extends above the top of the foundation. A bootleg head is clamped to the section of pipe extending out of the top of the foundation. The details of the construction of this bootleg head are shown in one of the illustrations; in brief, the feature of this device is that it consists of two separate terminals, insulated from each other and from the pipe. Each of the two cable wires extends to one half of the bootleg head and a 5/16-in. stranded galvanized iron bond 4 ft. 2 in. long is clamped to the head and extends to a 3/8-in. plug driven into the rail. As shown in one of the illustrations, the bootleg outlet is set beyond the ends of the ties and the cable from the head is run across the end and along the edge of each tie, being held in place by Copperweld staples. The parkway bootlegs for both rails of a track are located on the field side, and at the location of the insulated joint on the far rail, stranded connections 10 ft. 4 in. long are used, being stapled to the side of each tie 1 in. below the top edge.

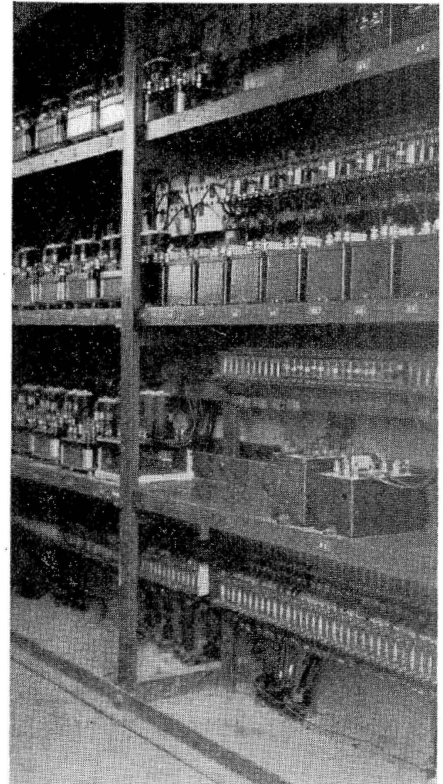
These installations were planned and constructed by signal forces of the Boston & Maine, the signal equipment being furnished by the General Railway Signal Company.

Santa Fe Automatic Interlocking

(Continued from page 474)

to which they connect and are tagged with fibre tags. Each hole is similarly tagged.

The signals on this installation are the Union Switch & Signal Company's searchlight type, and this company also furnished the relays. The power-off relays are of the ANL type. Neutral track and line relays are the DN-11 type, while the polars are the DP-14, and the time relays the DT-10 type. Fansteel electrolytic



Interior of instrument house

rectifiers and transformers are used for charging the storage batteries, the lighting transformers being the Union type W-10.

The spring-switch mechanisms are the Pettibone-Mulliken Company's mechanical-switchman type. Each spring-switch layout is equipped with two switch circuit controllers, one connected to the point, and the other to the throw rod. The circuit for the KR relay is selected through both of these controllers, thus insuring that the points are in proper position and that they correspond in position with that of the switch stand.

The cost of power for the North Junction layout is averaging about \$8 monthly and for the South Junction \$7 monthly. The maintenance charges are nominal, amounting to approximately the same as for a new automatic installation of the same size.