St. Louis-San Francisco

Installs Centralized

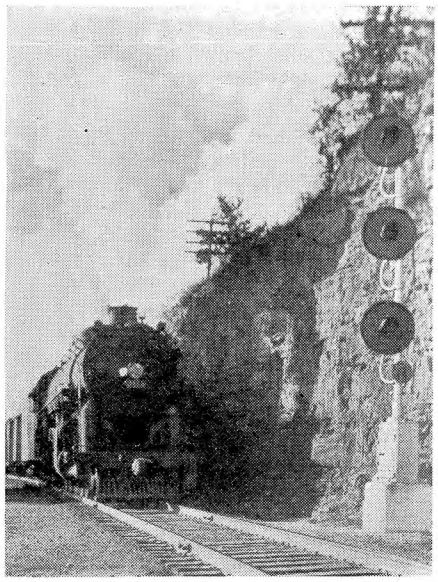
THE St. Louis-San Francisco has installed centralized traffic control on 47 miles of single track between Dillon, Mo., and Swedeborg, on the line between St. Louis and Springfield, Mo., Dillon being 105.6 miles west of St. Louis. The reason for installing centralized traffic control was to increase track capacity and save train time in this territory where heavy grades and curves cause slow train speeds as well as extra movements of helper engines.

Heavy Grades and Curvature

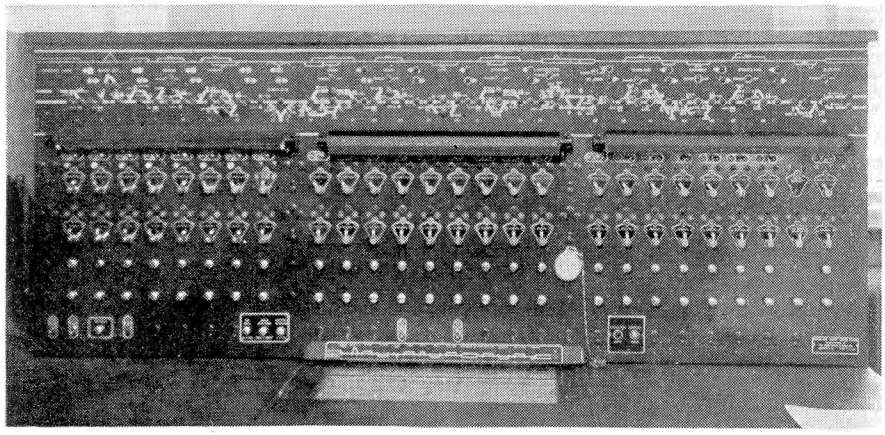
Between St. Louis and Springfield, 239 miles, the St. Louis-San Francisco crosses the Ozark mountains, the line being located for the most part on ridges with comparatively light rolling grades, an exception being that between Dillon and Swedeborg the line descends into the valley and crosses the Gasconade river, then climbs back to the top of a ridge again. Starting at M.P. 107.5, which is about two miles west of Dillon, the grade descends westward to M.P. 117 at Piney. In this section, between Dillon and M.P. 111 at Rolla, the grade is fairly uniform, an average of 1.04 per cent for 7,100 ft., 0.08 per cent for 8,700 ft., and 0.51 per cent for 4,300 ft. From Rolla west, 6 miles, the grade varies from a minimum of 0.8 per cent up to a maximum of 1.8 per cent. Furthermore, within this 6 miles there are 13 curves, one of which is 6 deg., one 5 deg., four between 4 deg. and 4 deg. 30 min., five between 3 deg. and 3 deg. 30 min., and two 2 deg.

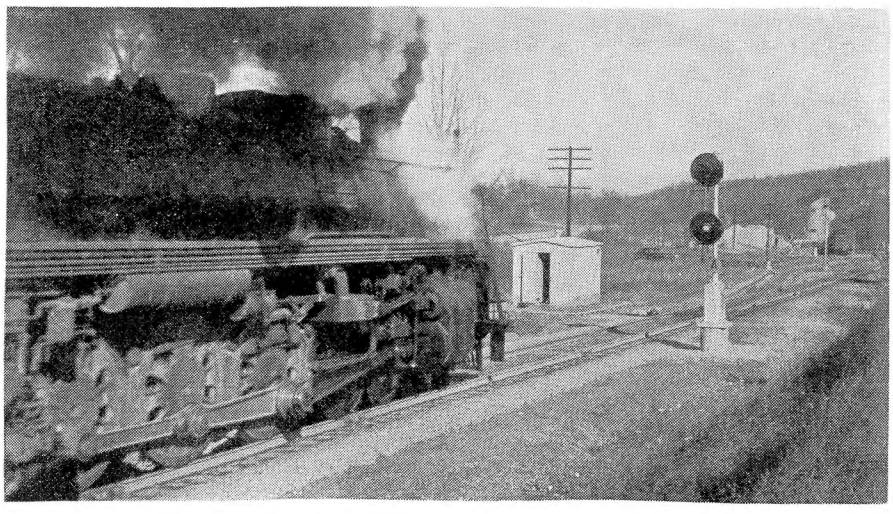
Between M.P. 117 and M.P. 125 at the west end of Jerome, the line follows down the valley of the Little Piney river and crosses the Gasconade river, the grades and curvature in this 8 miles being comparatively light. Starting at the west end of Jerome, the grade ascends westward for about 8 miles to M.P. 133.5 near Dixon Wye, an exception being 2,800 ft. of 0.5 per cent descending grade westward between M.P. 131 and 132. The grade is broken into 24 sections in this 8 miles, the longest section being 5,600 ft. of 0.84 per cent through Franks. Some of the maximums are 1.88 per cent for 3,900 ft., 2.06 per cent for 1,100 ft., and 2.54 per cent for 700 ft. The curvature is very sharp, including four 3-deg. curves, one 4-deg., four 5-deg., four 6-deg., twelve 8-deg., and two 10-deg. curves. As a result of the heavy grades and curvature, the through freight trains, as well as passenger trains with more than 10 cars, require helper locomotives eastward from Newburg to Dillon and westward from Newburg to Dixon Wye.

Between Dixon and Swedeborg, the grade is rolling, the longest and



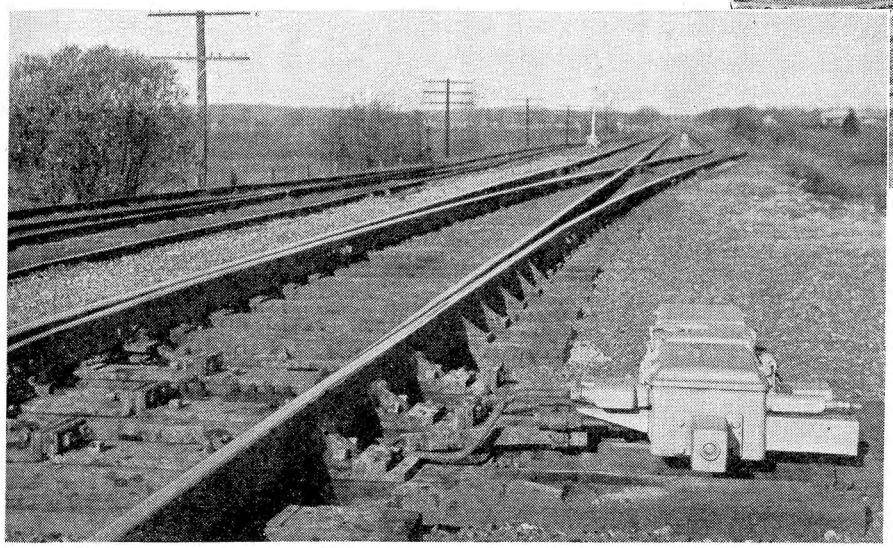
Right—Southward signal 4R at Newberg has a third unit for the call-on aspect Below—The C.T.C. control machine is located in the train dispatcher's office. Bottom—Westbound train at the west switch of the passing track at Jerome





Traffic Control

Saves train time and reduces number of helper locomotives on 47 miles of heavy grades on single track



Above—Eastbound freight train passing typical westward semi-automatic signal. Left—The power switch layouts include insulated gage plates and rail braces

steepest grades ranging from 0.83 to 1.38 per cent ascending eastward for about 2 miles between M.P. 139.5 and 141.5. Helper service is provided for heavy tonnage freight trains eastbound between Jury and Helm.

Up to 68 Trains Daily

Newburg, approximately 14 miles from the east end of C.T.C. territory, is a sub-division point at which engine crews change on passenger trains and is a terminal for all freight crews. All freight trains enter and depart from the yard. The schedules include five passenger trains each way daily between Dillon and Newburg, and four passenger trains each way daily between Newburg and Swedeborg. Counting additional sections of regular trains and extra trains, the normal traffic is now about 16 passenger trains daily. Four fast through freight trains are scheduled each direction daily, and, counting extra trains, a typical day included 13 freight trains westbound and 18 eastbound. A local freight train is operated eastward on Monday, Wednesday and Friday, and the opposite direction on the three other days of the week, excluding Sunday. The number of helper locomotives varies with traffic.

By reason of C.T.C. there has been considerable saving in helper expense; for example, in the month of July, 1943, before C.T.C. was installed, the number of helper engine crews worked was 493, number of trains helped per engine 2.63, and the average time of engines on duty was 8 hours 56 minutes. In January, 1944, after the C.T.C. was placed in service, the number of helper engine crews worked was 473, number of trains helped per engine was 2.67, and average time engines were on duty was 8 hours 5 minutes.

After the dispatchers get thoroughly familiar with C.T.C. system of operation it is expected additional saving will be made. On a typical day in October, there were a total of 47 through train movements and 21 light engine movements.

Prior to the installation of centralized traffic control, the train movements in this territory were authorized by timetable and train orders, with automatic block signal protection. Hand-throw switch stands were in service at the passing tracks, at the yard lead switches at Newburg, at the wye switches at Bundy Junction and Dixon Wye, and spring switches at the Newburg yard lead switches.

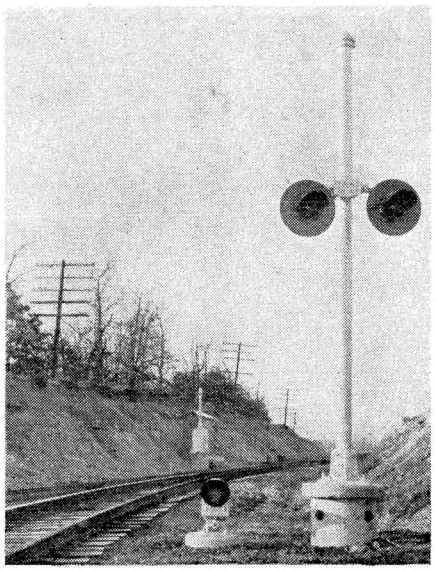
As traffic increased during 1942, the delays to trains were excessive on the sections between Dillon and Swedeborg. In addition to the heavy increase in normal traffic, this was further complicated by many short moves between Newburg and Bundy Junction, 2.4 miles west, at which point a branch line leads to Fort Leonard Wood. If some trains did not leave the yard at Newburg when planned, or did not make the time anticipated by the dispatcher, the entire operation was disrupted because there was no opportunity to issue and deliver new orders in time to take advantage of changing conditions.

On account of the heavy grades and curvature, the train speeds are low in both directions in this territory; a fact which increases the time-distance between trains, thereby limiting the track capacity. Furthermore, trains lost a great deal of time on ac-

count of stopping on grades to permit operation of hand-throw stands when entering and leaving sidings. When trains were numerous, there was not much chance to get the helper locomotives back as light moves from the tops of the grades down to Newburg. As a result, these locomotives and crews consumed a lot of time when waiting at the tops of the hills. In numerous instances trains ready to depart from Newburg had to wait until helper engines could return to Newburg from Dixon Wye or Dillon. Therefore, considered as a whole, the congestion on the Dillon-Swedeborg section was an important factor which might limit the capacity of the entire line between St. Louis and Springfield as well as points in Oklahoma, Arkansas and Texas. A conclusion, therefore, was that the centralized traffic control should be installed as soon as possible. The C.T.C. was completed and placed in service in short sections; Dillon to Newburg, August 27; Newburg to Jerome, October 15; Jerome to Franks, November 6; Franks to Dixon, November 20; Dixon to Jury, December 10; and Jury to Swedeborg, December 24.

Changes in Passing Tracks

Certain changes were made in the passing tracks. The short passing tracks at Piney, midway between Sills and Newburg, and at Hancock, midway between Helm and Jury, were removed. At Franks and at Dixon there were formerly two passing tracks, one for eastward trains and one for westward. At Franks, the eastward siding was lengthened to 112 car capacity, and is now used by trains of both directions, the previous westward siding being used in emergency cases and by the local freight trains. At Dixon the eastward siding was lengthened from 81 cars to 112 cars and is now used by trains of both directions, the 62-car eastward siding being left in service for use in emergency cases and by the local freight trains. The 83-car single siding at Jury was



Special "E" and "W" signal at Dixon Wye

lengthened to 130-car capacity, the 81-car siding at Sills was lengthened to 148 cars, and the 71-car siding at Rolla was lengthened to 161 cars. The turnouts at all the passing sidings are No. 10.

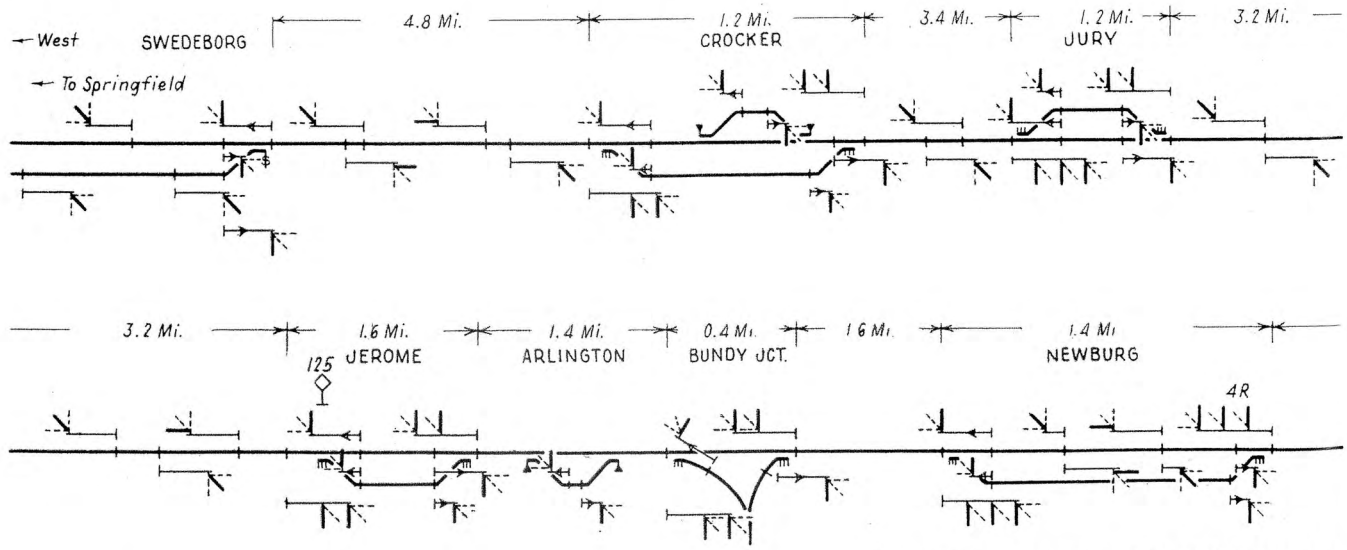
As a part of the centralized traffic control, power switch machines were installed at both ends of the single sidings at Dillon, Rolla, Sills, Jerome, Franks, Dixon, Helm, Jury and Crocker. At these power switches the conventional arrangement of C.T.C. semi-automatic signals were installed to direct trains to (1) Proceed on the main track, (2) Enter the siding, or (3) Depart from the siding.

At Newburg, a power switch machine was installed at the east end where the yard lead connects with the single-track main line, and a switch machine was installed at the west end where the yard lead connects with the main line. All freight trains enter and depart from the yard at these switches. The C.T.C. from the east ends at the east yard switch, and the C.T.C. from the west ends at the west yard switch, the intervening 6700 ft. of main track through Newburg, is excluded from the C.T.C. territory. Within these limits at Newburg, all trains are required to operate at 15 m.p.h. or less, and automatic block signal protection is provided.

If a westbound passenger train, for example, is approaching Newburg, the dispatcher by means of the C.T.C. control can control westward signal 4R to clear the top "arm" for the train to pull on down to the station under automatic signal protection. If the block is occupied so that the top "arm" of signal 4R cannot be cleared, then the dispatcher can control signal 4R to display a "call-on" aspect, red-over-red-over-yellow, to allow the westward train to advance on the main track at restricted speed.

At Bundy Junction, 2.7 miles west of Newburg, a single-track line branches off and extends to Fort Leonard Wood. Power switch machines and C.T.C. controlled semi-automatic signals were provided at the two switches where the wye connects with the main line.

At various short sidings, which are to be used only by the local freight trains, by work trains, or in emergency cases by through trains, the hand-throw switch stands were left in service, and electric locks were installed on these switches as a part of the C.T.C. protection, a total of 15 such switches



Track and signal plan of the C.T.C. territory

being included in the project. At each of these locations, a dwarf signal is located opposite the fouling point to govern train movements from the siding to the main track. A track circuit 3 rails in length is located just ahead of the switch. Occupancy of this track section will release the electric lock and permit trains to enter the side track with a minimum of delay.

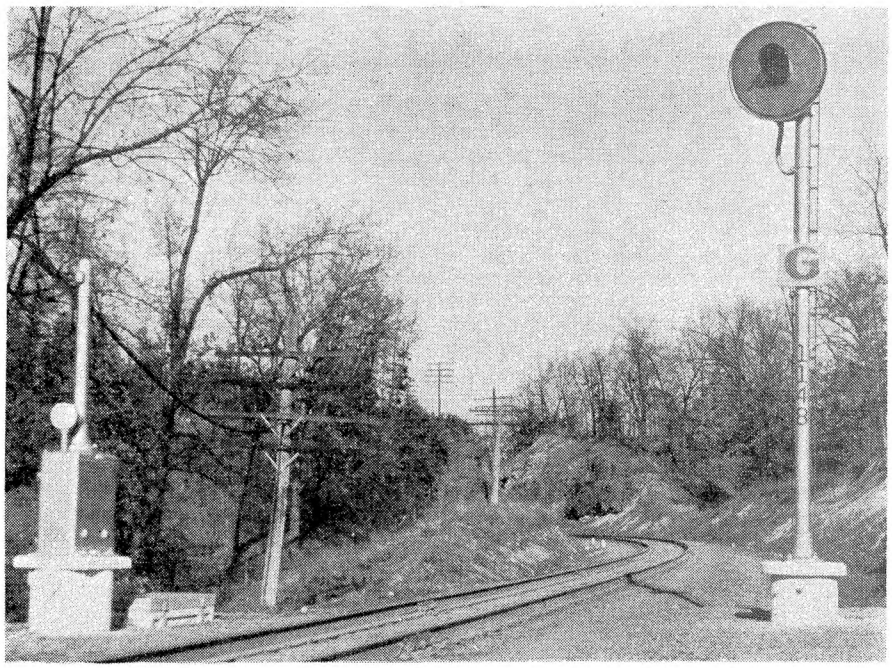
East or West Signals on Wye

An electric lock and a dwarf signal, as previously discussed, were installed at each of the main-line switches at the Dixon Wye which is used for turning helper engines before returning to the bottom of the grade. In addition, at a point near each dwarf, there is a special signal that looks like a highway crossing signal except that the cover glasses are clear. The letter "E" is etched in the glass of the left signal unit and the letter "W" in the glass of the right-hand unit. Both lamps are normally extinguished, so that neither letter is visible.

When the dispatcher in charge of the C.T.C. control machine wants a light helper engine on the wye track to enter the main track and go west, the letter "W" is lighted to direct the engineman to unlock switch and proceed westward from Dixon Wye, provided the dwarf signal, located at clearance point of the switch, indicates proceed.

Similarly the "E" rather than the "W" would be lighted if the helper engine is to proceed eastward.

Signals 16L and 16R, located 2,550 ft. and 2,700 ft., respectively, east of the east switch at Dixon Wye, are C.T.C. controlled. Absolute signals were provided at this location to make a separate block between Dixon and Dixon Wye and another block between Dixon Wye and Franks. This arrangement permits certain train movements to be made without delaying trains in the other block.



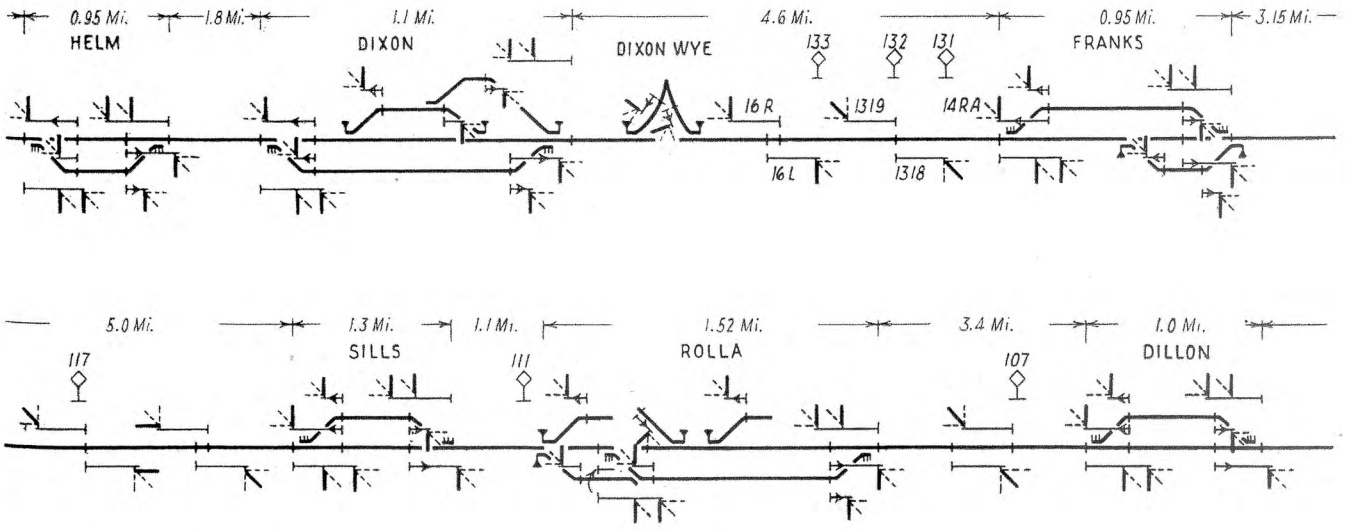
Intermediate signal with motor-car indicator on case at left

Two Types of Switch Machines

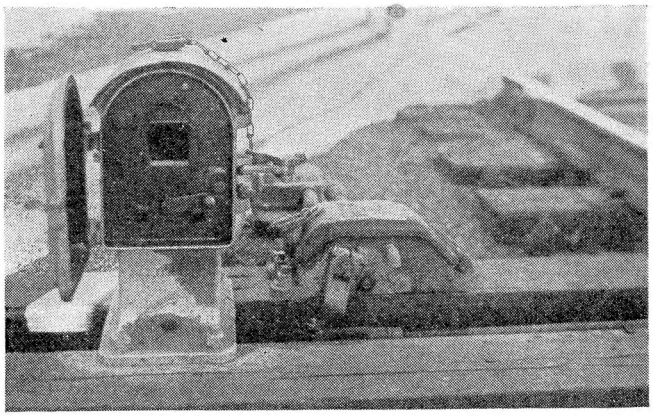
At those switches where trains may be required to set out or pick up cars, the switch machines are the M22-A dual-control type, but at other locations such as at the ends of most of the passing tracks the switch machines are the M2 type without dual control. This practice is in accordance with the War Emergency recommendation of the Signal Section, A.A.R.

At each switch layout there are three 1-in. by 7-in. insulated gage plates, two of which extend and are attached to the switch machine, thus preventing lost motion. Adjustable rail braces are used on the first tie ahead of the point and the first two under the point.

At Newburg, the C.T.C. control machine is in the dispatcher's office which is located in a new 20-ft. by 45-ft. one-story fireproof building, constructed of concrete and brick. The illuminated track diagram near the top of the panel includes track-occupancy indication lamps, one to repeat each OS switch detector track circuit, one to repeat each section of single-track main line opposite a siding, and one to repeat each station-to-station block between two sidings. In a vertical line above each of the station-to-station block-occupancy lamps there are two white lamps, the lower



between Dillon, Mo., and Swedeborg



Low type electric lock on one of the hand-throw switches

one has an arrow pointing to the right (westward) and the upper one has an arrow pointing to the left (eastward). When traffic direction is established for a given station-to-station block, the corresponding traffic lamp is lighted, and stays lighted until the traffic direction is changed. After a station-entering signal has been cleared and a train has accepted and passed that signal, the traffic direction cannot be changed until the train departs from the station-to-station block.

A new feature of this C.T.C. control machine is that the toggle switches for the control of maintainers' call lamps are located above the switch levers, just below the florescent lighting units. A time code system, including two line wires, is used to send controls from the office to the various outlying power switches and semi-automatic signals, as well as to return the indications to the control machine. A telephone circuit is superimposed on the C.T.C. code line.

Changes in Local Circuits

The old semaphore automatic block signaling on this territory had been in service since 1910. These mechanisms were worn to the extent that, when installing the C.T.C., the semaphores were discarded, and new searchlight type signals were installed. The old mechanism cases were retained for use as instrument cases, the masts were cut to the proper height for mounting the new searchlight signals, and the old ladders were shortened.

The old signaling had been arranged and controlled on the overlap principle which required more intermediate signals under certain circumstances than the new intermediate signaling in the C.T.C. system. As a result, all of the signal locations were moved, which required new concrete signal foundations, that are of the pre-cast sectional type.

One three-aspect searchlight unit is used for each intermediate signal, for each main-line station-departure high signal, and for each leave-siding dwarf signal. As a general rule, each station-entering high signal has two searchlight units, the second "arm" normally displaying red except when the switch is reversed and the red-over-yellow aspect is displayed to direct a train to enter the siding. The station-entering signals at Newburg each have a third searchlight unit which is normally red, but is used to display the "call-on" aspect, red-over-red-over-yellow. Each C.T.C. controlled semi-automatic signal is absolute and is so designated by a letter "A" on the mast.

Track and Local Line Circuits

The previous automatic block signaling included d-c. neutral track circuits using 4-ohm relays on circuits up to 4,000 ft. long, and 2-ohm relays on circuits over 4,000 ft., the maximum being 4,900 ft. In the change over to C.T.C., these d-c. neutral track circuits were retained in service, although the signal and cut section locations were moved in many instances.

The line wires used in the former overlap controls were rearranged to provide two two-wire line circuits, one for the control of eastward signals and the other for control of westward signals. Each line circuits checks through front contacts of the track relays of its respective block. The conventional arrangement of absolute permissive block stick relays provide for the clearing of intermediate signals for a following train.

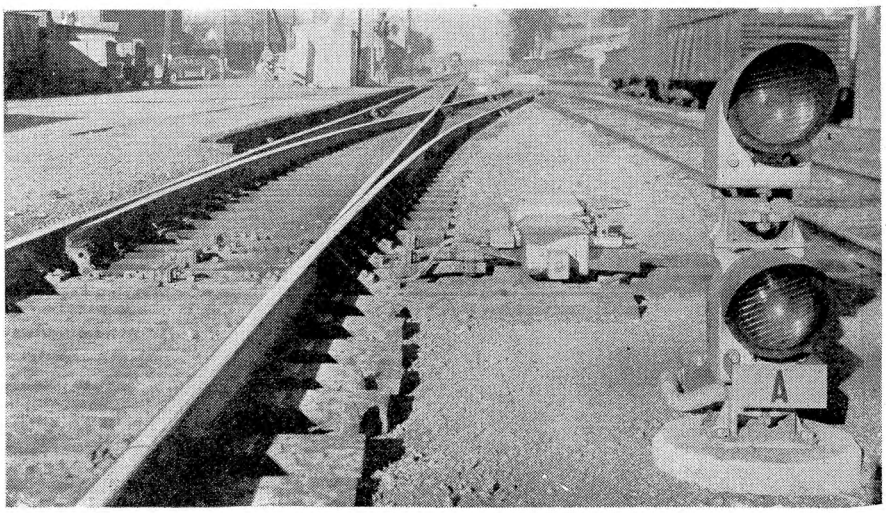
These A.P.B. line circuits also include the absolute control of opposing station-leaving signals for a station-to-station block between passing tracks. If a station-leaving signal is cleared, energy is cut off from the line circuit for all opposing intermediate signals as well as the opposing station-leaving signal. Thus if one station-leaving semi-automatic signal has been cleared, the opposing station-leaving semi-automatic signal cannot be cleared, regardless of whether the levers of the control machine are manipulated with such an intention.

After a train accepts a proceed aspect on a station-leaving signal and enters the station-to-station block, one or more track relays in the block are released until the train departs from the station-to-station block. In the meantime, the line circuit for the opposing station-leaving signal is open; therefore, that signal cannot be cleared even if the levers of the control machine were manipulated with such an intention.

The station-leaving signal for following moves can be cleared because the directional stick relays of the A.P.B. scheme cause the line circuit to be energized to the rear behind receding trains.

Block-Occupancy Indication

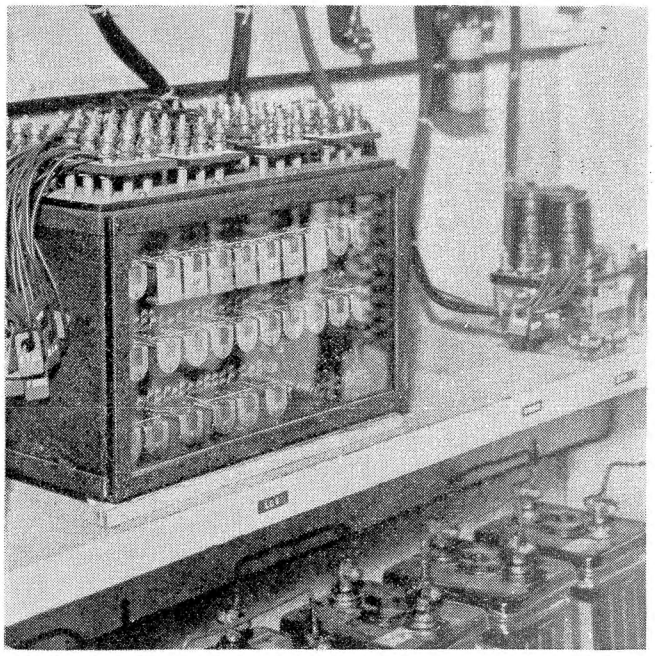
Referring to Fig. 1, the two-wire line control circuit for the westward station-leaving signal 14R at Franks extends through contacts of all the



A dwarf where space was not available for high signal

track relays to signal 1319 and detects track occupancy of the station-to-station block between signals 14R and 1319. Similarly the two-wire line circuit and the relay for 16L detects occupancy of the station-to-station block between signal 16L and signal 1318. These line relays for 14R and 16L are repeated in the control machine by relays 14RBK and 16LBK, respectively.

The diagram, Fig. 2, shows the circuits in the C.T.C. control machine, in the condition left after a westbound train from Franks to Dixon Wye had departed from the station-to-station block, and the following discussion shows how the controls are effected to change the direction of traffic and clear eastward signal 16L at Dixon Wye. In the circuit as shown, (1) relays 13TK and 15TK are de-energized, which indicates that the short detector track circuits 15T at Dixon Wye and 13T at Franks are unoccupied; (2) relays 14RBK and 16LBK are energized, which shows that the two two-wire line relays at the corresponding signals are both energized and, therefore, that the



Line coding equipment and storage battery in a concrete house at the west end of Rolla

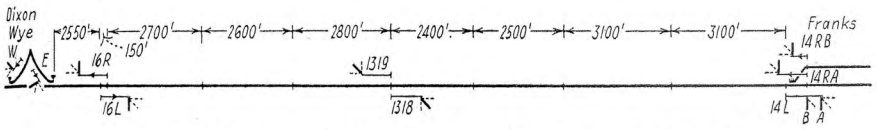


Fig. 1—Location of signals between Franks and Dixon Wye

station-to-station block is unoccupied; (3) relays 14RHK and 16LHK are de-energized, which shows that signals 14R and 16L are set to display the Stop aspect; (4) relay 14-16PR has its contacts to the left, which shows that the last train went west.

Relay 346S is a final station selection relay in the office code sending equipment, which picks up on the eighth step of the control code to the field station at signal 16L at Dixon Wye. Relay 15-16D, also included in the office code receiving apparatus, is known as a delivery relay which picks up on the sixteenth step of an indication code from the field.

When lever 16 is placed in the left position, with lever 14 in the normal or the left position, then relay 14-16PR will receive energy through one of its windings, and the contacts will be positioned to the "right" which is opposite to that shown in the diagram. This is a "KP" relay which remains in its last energized position even after energy is removed from the coil.

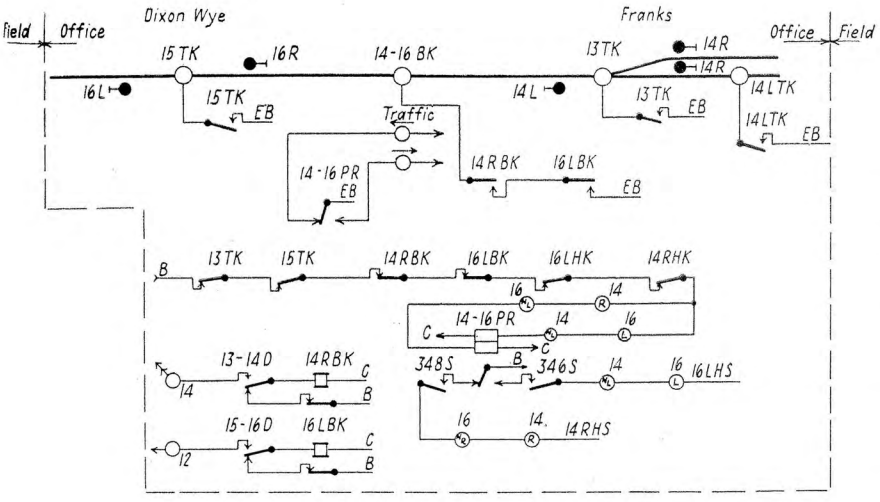


Fig. 2—Circuits in the control machine

After the control code has gone out to clear signal 16L, then the indication code comes in and relay 16LHK is picked up, thus opening the circuit for relay 14-16PR. A later step in the incoming indication code repeats the energized position of the line relay at signal 16L by placing energy on terminal 12 in the control machine, which, with relay 15-16D up, causes the station-to-station block indication relay 16LBK to be energized. On the final step of the incoming indication code, relay 15-16D is released but 16LBK sticks up through the back point of 15-16D. The clearing of signal 16L opens line circuit for signal 14R which causes this station to send an indication which drops out relay 14RBK.

When the eastbound train accepts and passes signal 16L, an indication code is sent to the office which releases block occupancy relay 16LBK, as well as signal repeater relay 16LHK. Battery feeds through back contacts of 16LBK and 14RBK in series to light the station-to-station block occupancy lamp on the track diagram. Relay 14RBK is not picked up until after the rear of the eastbound train clears the station-to-station block, and in the meantime the circuit for relay 14-16PR is open at a front contact of 14RBK; therefore, the position of the contacts of 14-16PR cannot be changed regardless of any manipulation of the levers.

Control of Electric Locks

The two two-wire line control circuits are used also in the control of the electric locks on the hand-throw

switches, as well as the dwarf signals governing moves from these turnouts to the main line. A telephone booth is located near each of these switches so that the conductor of a train on the siding can secure permission from the dispatcher to enter the main line. Referring to Fig. 3, under normal conditions the two two-wire line circuits, 22LH3-22LRN from the east and 20RR4-20RRN2 from the west are energized, and the switch repeater relay NWP is energized. When the conductor or trainman has secured permission, he opens the door of the electric lock and operates a push button which releases relay NWP. Contact fingers 1 and 2 of this relay open front points that open the line circuit causing signals governing into that block to be held at stop. The back points of these two contacts of relay NWP connect the incoming energized line circuit from the west to the coil of relay WBP.

Contact fingers 3 and 4 of relay NWP open front points that cut the line circuits to hold the next eastward signal at Stop. The back points of contacts 3 and 4 of relay NWP connect the incoming energized line circuit from the east to the coil of relay EBP, the front contact of WPB in this circuit having been closed as explained above.

Battery 53GB feeds through front contact 1 of relay EBP, through a reverse contact in the push button, and through the coil of the electric lock WL, thus energizing the lock, which permits the conductor, or trainman, to reverse the lock lever and then throw the switch to the reverse position. Furthermore, the electric lock will not be released if either of the semi-automatic signals had been cleared for a train to enter the station-to-station block including the hand-throw switch, and until all such signals governing into that block display stop indication and their approach or time locking relays are energized, or if a train had accepted a proceed aspect and entered the station-to-station block. After a westbound train passes the next signal west of the switch, the directional stick relay will operate to feed westward on the line circuit to energize relay WBP, so that the lock can be released behind a receding train.

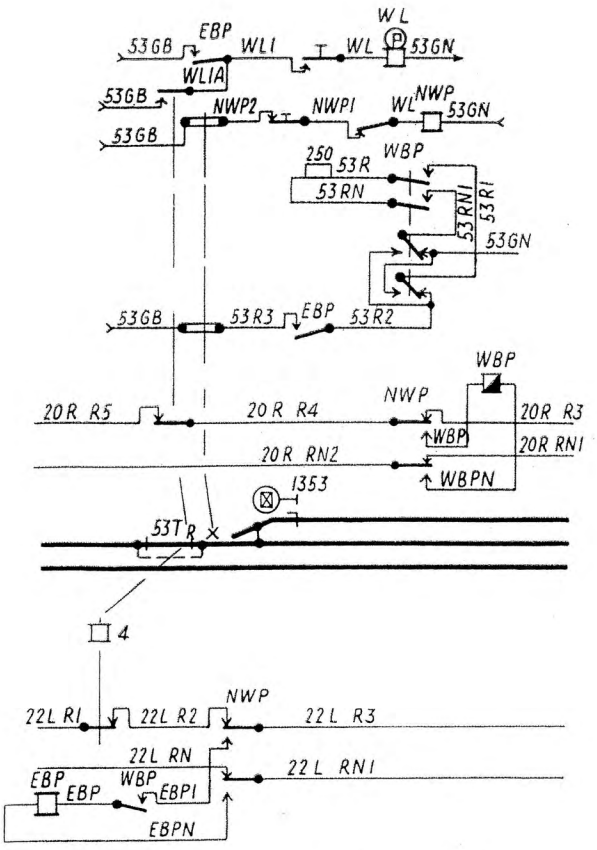
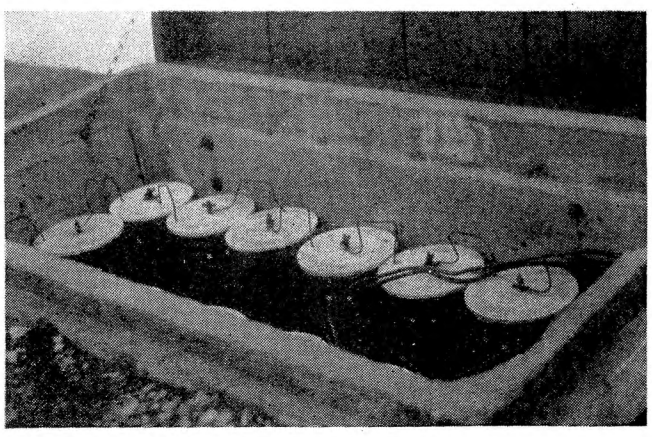


Fig. 3—Circuits for controlling electric lock

To energize the relay to clear the dwarf signal, battery 53GB feeds through a reverse contact in the switch circuit controller, through a front contact of relay EBP, through polar and neutral contacts of WBP to the coil of mechanism relay 53R. The yellow aspect would be displayed on the dwarf if a westward train ahead had cleared the next automatic signal to leave the stick relay up. The green aspect would be displayed if two or more automatic blocks ahead are unoccupied. The red aspect would be displayed if the immediate block were occupied, or if the eastward station-leaving signal at the next station west of the switch has been cleared, or if a train had accepted and passed that signal.



At intermediate signal locations the sets of primary battery are continued in use

Control of Motor Car Indicators

These two two-wire line circuits are normally energized and feed in opposite directions, all of which make it practicable to use these circuits also to feed normally energized indicators to provide information to men on motor cars concerning the approach of trains. For example, at the first cut section west of signal 1319, there is a 78-ohm DNL relay in series with the westward line circuit. This DNL relay has a front contact which is in series with the coil of a 670-ohm indicator which is thus connected across the two wires of the eastward line circuit. When the dispatcher lines up to clear either of the station-leaving semi-automatic signals governing moves into this station-to-station block, the energy is cut off of the line circuit for the opposite direction thus releasing the motor car indicator, which will not pick up again until the train has passed the indicator and has receded beyond the next intermediate signal, at which time the direction stick completes the feed of the circuit to the rear. Circuits based on the same general principles are used to control normally-burning

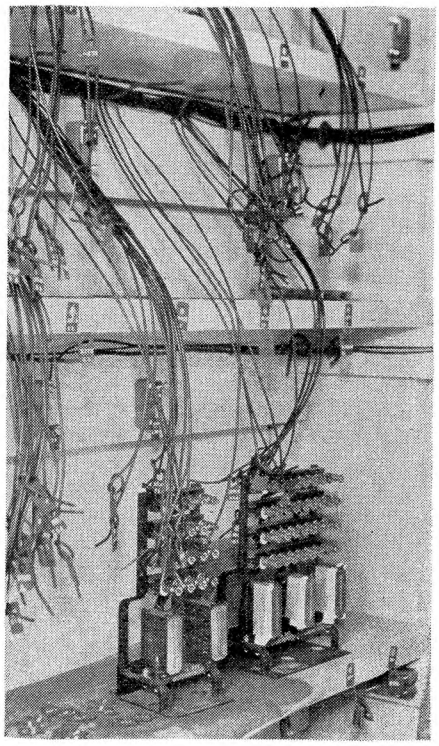
light-type motor-car indicators at power switch locations where a-c. power and storage battery standby are available to feed the lamp. Similarly the series connected DNL relays can be used to approach light signals but in most instances the sighting distance is so short that direct track relay control of approach lighting is adequate on this territory.

Power Supply

The previous automatic block signaling was operated from primary battery using 4 cells of Edison 500-a.h. cells to feed each track circuit and 16 cells of the same type to operate each signal and feed line circuits. As a part of the new project, a 550-volt single-phase a-c. power distribution circuit was extended over a portion of the territory. The line transformers, 550/120 volts, are rated at 1/2 KVA at each power switch location, and at 100 VA at each electric lock location.

Intermediate signals are approach lighted from 16 cells of primary battery.

At each electric locked switch, the 16-cell primary battery was used, and

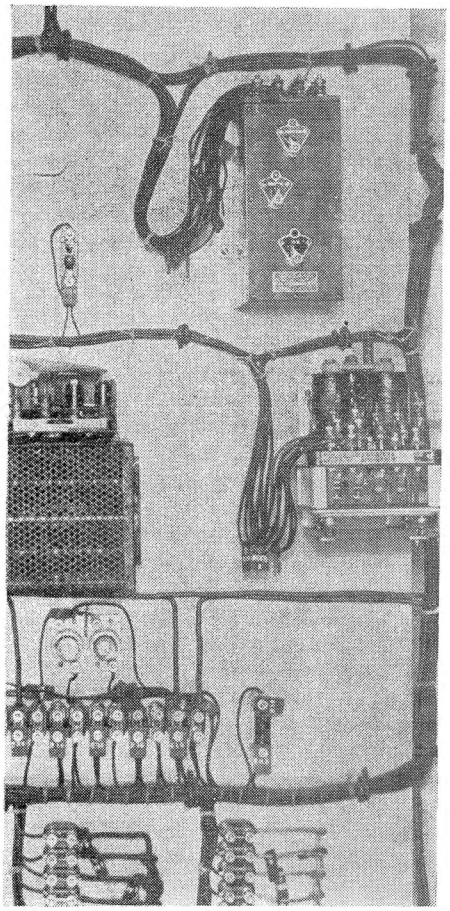


View with wiring in progress

a rectifier was connected across the battery to take all but about 10 m.a. of the load. The track circuits were left on primary battery.

At the power switch locations there is a set of 13 cells of Exide DMGO-9, 80-a.h. storage battery which operates the switch machine and feeds the local line circuits as well as the line coding apparatus. Also this battery is used to approach light the controlled signals when a-c. power fails.

Portion of panel at the rear of a concrete house showing the special case with levers for local control of the units



Pole Line and Line Wires

The signal line wires are on a bottom arm of the pole line which also carries line wire for railroad telephone and telegraph circuits. As a general rule there are eight line wires on this bottom arm, and all these wires are Copperweld with weatherproof covering. The four local signal control line wires are No. 12, the two C.T.C. code line wires and the two 550-volt a-c. power distribution wires are No. 8.

On account of the fact that all the signals are at new locations, new underground cable was installed throughout. The seven-conductor cables are No. 14, and the track connections and motor operating wires are single-conductor No. 9. The wiring inside the instrument houses and cases is No. 16 flexible except for switch feed circuits which are multiple No. 16. The insulated cables and wires are of Kerite manufacture.

Instrument Houses and Cases

The old semaphore mechanisms, cases, masts and ladders were taken out of service and shipped to the signal shop at Springfield, Mo. The cases were cleaned by sand blasting, and then repaired if necessary by welding. New terminal boards and wiring as required were installed at the shop for shipment to a particular location in the field.

A concrete house 8 ft. by 10 ft. is provided for the instruments and battery at each field station at a power switch. These houses were wired complete with relays in place at the shop in Springfield. The relays, code equipment and batteries are on shelves on the side walls, these shelves being made of 2-in. plank. On the rear wall of each house there is a large panel of ¾-in. plywood on which are mounted the cable terminals, rectifiers, transformers, power-off relay, and a special case with levers exactly like those on the C.T.C. control machine at Newburg. These levers permit local control, greatly facilitating testing and in addition, if the C.T.C. code line fails, a man can be sent to the field station or stations which are beyond the limits of the dispatcher's control to handle the controlled switch and signals. By breaking a lead seal and throwing a master lever on the small case in the field house, the local control is placed in effect, so that the levers can be used to control the switch and the semi-automatic signals. One of these special panels is shown in one of the illustrations.

Telephone in House

The outside door of each of these houses opens into a small compartment used as a telephone booth, and a second door from this booth opens into the house proper. By means of a three-way knife switch, the telephone can be connected to either the regular telephone train dispatching line or to the telephone circuit which is superimposed on the C.T.C. code line.

This C.T.C. installation was planned and installed by signal forces of the St. Louis-San Francisco under the direction of R. W. Troth signal engineer, the major items of equipment being furnished by the Union Switch & Signal Company. At the present time the project is being extended from Swedeborg, 22 miles west to Sleeper, so that the entire territory from Dillon to Sleeper will total 69 miles all controlled from the C.T.C. machine at Newburg.