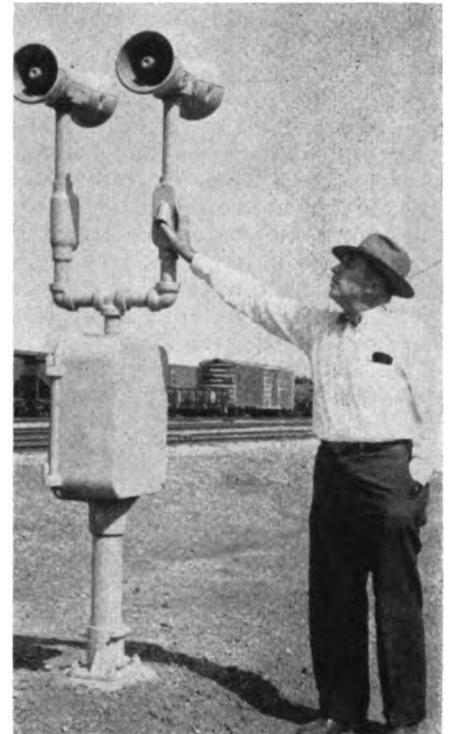


The yardmaster's office is on the top floor of a 50-ft. tower, and on his desk, he has a communications control console, by means of which he can set up connects with 9 paging speakers and 53 talk-back speakers, located over the west half of the entire yard area

One talk-back works with the east tower and the other works with the west tower



# Wabash Yard Moves Expedited

By New Interlockings and Communications

AT DECATUR, ILL., the Wabash has recently enlarged and entirely rebuilt an extensive freight yard, and has installed two modern interlockings, new signaling and several up-to-date communications systems, which save train time when entering and leaving the yard, and also expedite switching operations in the yard.

Decatur is the hub of the Wabash Railroad, with main lines radiating four directions, 113 miles southwest to St. Louis; 304 miles west to Kansas City; 173 miles northeast to Chicago and 375 miles east to Detroit, and 226 miles further east to Buffalo. On the line west to Kansas City, secondary main lines branch off Northwest to Des Moines and Omaha. Thus, from the standpoint of freight traffic, Decatur is the crossroads. Decatur is a city of approximately 70,000, in the center of a rich agricultural territory, with numerous industries, as well as mills for processing corn and soy beans. Thus, a large number of cars are delivered

**Moves into and out of both ends of two-mile yard are controlled by new interlockings—Communications include several intercom systems, paging loudspeakers, talk-backs, two main control consoles and remote-control voice recording and transcribing machines to "grab" car numbers**

and picked up at local industrial spurs in Decatur. Also at Decatur, the Wabash interchanges traffic with the Illinois Central, the Pennsylvania, the Baltimore & Ohio and the Illinois Terminal. The Decatur yards as a whole, receive about 2,000 cars daily, and the same number are dispatched. Of these totals, about 200 cars are local for Decatur, and the remainder are in through movement.

## Why a Flat Yard

Trains arriving in Decatur are made up of "blocks" of cars. For example, in a train from Detroit, perhaps the first 30 cars are for St.

Louis, the next 40 are for Kansas City, and the remainder are for Decatur and connections. Similarly, a train arriving in Decatur from St. Louis may have 50 cars on the head end for Chicago, then 30 cars for Detroit. When making up a train for departure for Chicago, for example, the cars in the trains from Kansas City and St. Louis are set over on a given track, and then the train for Detroit is made up of the other blocks of cars. Thus, the switching operations are primarily with blocks of cars, rather than with single cars or cuts with a few cars each. For this reason, after thorough study, the Wabash decided that a flat yard,

rather than a hump yard, would fill the requirements. The yard area, which is about 1½ miles long, extends in an east and west direction, the west end being near 22nd street, which is about 1 mi. east of the passenger station.

### Single Track Passenger Main

In the previous arrangement, which was smaller, a double-track main line was located through the center of the layout, with an eastbound yard on the south side, and a westbound yard on the north side of this main line. This arrangement was a handicap, because transfer moves between the two yards were delayed when waiting for passenger trains. A further factor was that this double track line was used primarily by only the passenger trains, a total of 12 daily. Therefore, as a part of enlarging and building the new yards, a single-track passenger main was located around the south side of the entire layout. This passenger main extends as an independent track for the entire 2½ miles between the interlockings at the two ends of the entire layout, and train movements on this passenger track are authorized by signal indication, under the control of the leverman for the Brush interlocking at the east end.

In the new layout, the receiving yards (five tracks for eastbound and five tracks for westbound trains) are located side-by-side down the center of the yard area. The westbound classification yards, with 15 tracks, lies to the north of the westward receiving tracks, and the eastbound classification yard, with 15 tracks, lies to the south of the eastbound

receiving tracks. Trains are made up on the longer classification tracks, and depart directly from these tracks. The main yard office, known as East Decatur, is at the west end of the classification yards, and the Brush yard office is near Brush College Road at the extreme east end of the yards. Cars for delivery to industries in Decatur and for interchange, are handled through a small yard which is north of the main line between the classification yard and the passenger station.

### Locations of Control Offices

At East Decatur, the yardmaster's office is on the top floor of a 50-ft. tower which is part of the East Decatur yard office building, and also houses the general yardmaster. Large windows in all four walls of his office allow the yardmaster to see operations in much of the yard. On his desk is a large communications control console, with an enclosed loudspeaker, and a separately mounted microphone. He can set up connections to paging speakers at 9 locations in his area. He can also make calls to or receive calls from 55 talk-back speaker locations in his area. Connections can be set up to use his microphone and loudspeaker for intercom communication with various other offices, including the chief dispatcher in the passenger station building, the yardmaster at Brush, the yard clerk's office, the telegraph operator in Wabic interlocking, and the telegraph operator in the Brush interlocking, as well as the general yardmaster.

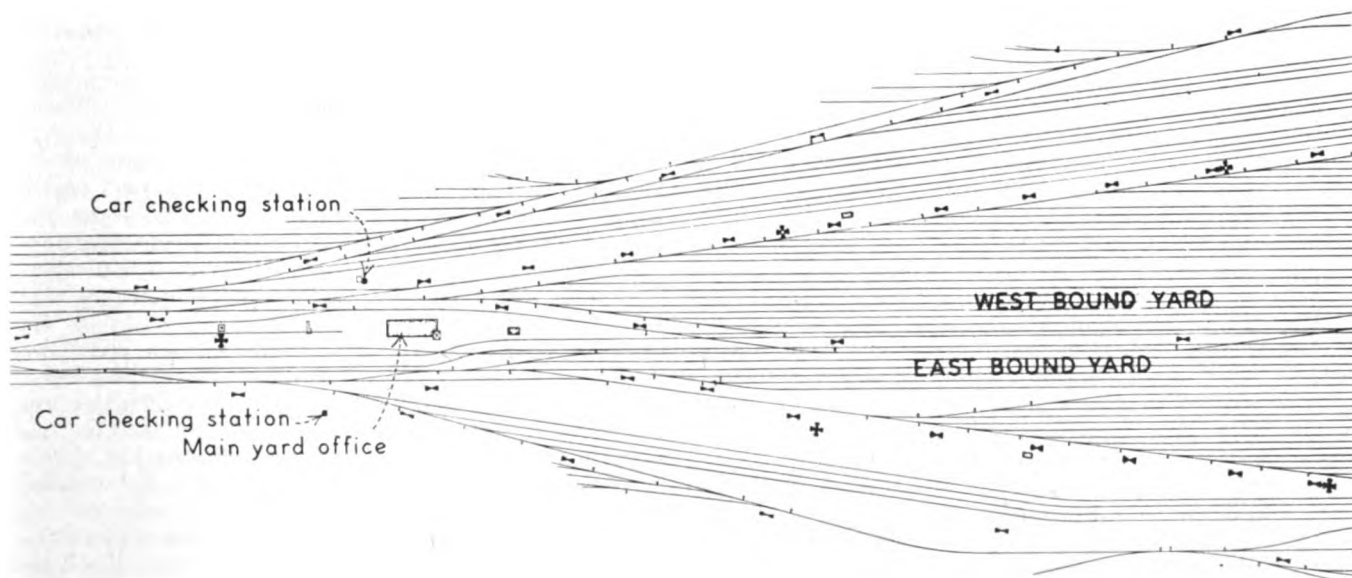
At the Brush yard office there is a 45-ft. tower, the top floor of which



Pagers on elevated platform

is the office of the yardmaster who has charge of operations at the east end of the yard area. On his desk also is a large communications control console, with an enclosed loudspeaker and a separately mounted microphone. He can connect with 10 paging speaker locations and 54 talk-back speaker locations in his area. Connections can also be set up for intercom communication with various other offices, including the yardmaster at East Decatur, the telegraph operators at Brush, the yard clerks at Brush, the chief dispatcher at the Wabash station, and the general yardmaster at East Decatur.

At some locations, such as the ice



Plan of west half of the yard, showing locations of the yard office, paging speakers and talk-backs



Car numbers spoken into this phone



Are recorded on this voice-writer

docks, operations and men employed may necessitate communication with not only the yardmaster at the Brush tower office but also with the yard clerk at Brush. At such locations, for example, at the ice dock, there are two pairs of talk-backs, on a mast with two uprights, one pair is connected to the console at the Brush yardmaster's office, and the other pair is connected to the yard clerk's console at Brush yard office.

Smaller consoles, with enclosed loudspeakers, and with microphones, are located on the interlocking machines for Wabic interlocking and Brush interlocking. The towerman at Wabic has two small consoles, one at the left and the other at the right of his interlocking machine. The console at the right is for intercom communication with the chief dispatcher, the telegraph operator at East Decatur, telegraph operator at Brush yard, and at Mercer street tower, and the Illinois Central yardmaster. Also this console is used in the intercom telephone service with the signal maintainer when he plugs his pocket-sized telephone set in receptacle in signals and switch machines. At the left, alongside the interlocking machine at Wabic interlocking, is a small console so that the leverman can connect to any one of the 10 talk-back speakers along the tracks within home signal limits of the interlocking, two of which belong to Illinois Central and one to the Baltimore & Ohio.

A small office, which handles local cars to be set up or picked up at industries in Decatur, is located at Woodford street on the north side

of the main track east of the passenger station about 3,500 ft. A console in this office connects with 8 talk-back speakers and two paging speaker locations along the tracks used in switching these local cars.

#### Locations of Loudspeakers

The paging speakers have horns 21 in. in diameter, and are rated at 25 watts. These paging speakers are in groups. Each group is mounted on a plank platform 5 ft. 6 in. square, 23 ft. above ground, on top of a treated pine pole. The purpose of the platform is to provide a safe and convenient place for a man to install and maintain these speakers and the matching transformers. At each of these locations, there are three or four paging speakers, one pointed in each direction. In the yard as a whole, there are 20 of these pole-mounted platforms, spaced about 1,200 ft. apart.

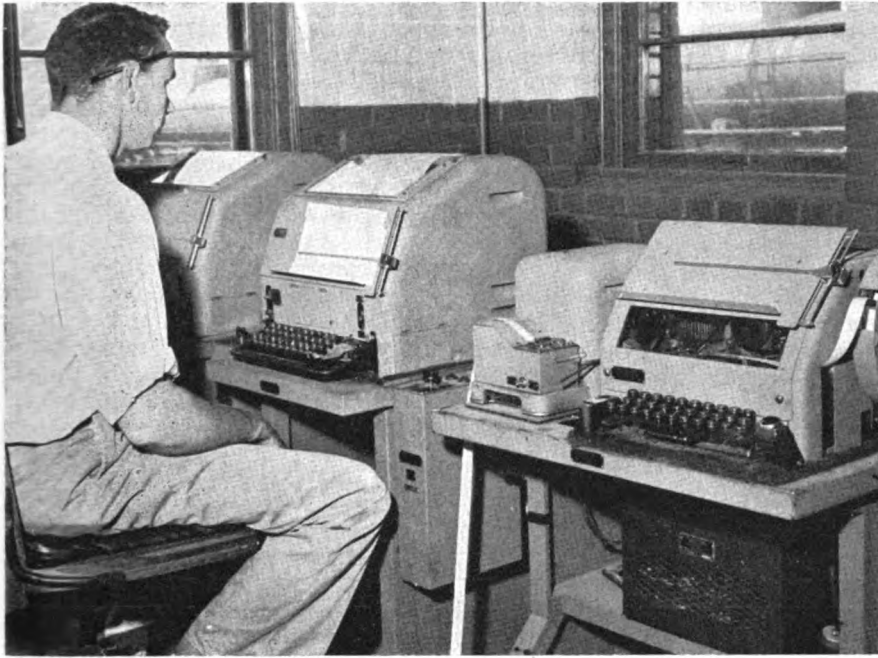
The talk-back speakers, which have 8 $\frac{1}{2}$  in. horns, are rated at 15 watts. Two such speakers, pointed in opposite directions, are enclosed in a castiron protective cover which has a compartment for the impedance matching transformers. The castiron housing fits on top of a 2-in. pipe mast 8 ft. high, set in a castiron base casting which is fastened by anchor bolts to a concrete foundation. A fitting which forms part of the mast encloses a pushbutton switch which is used by switchmen to call the yardmasters. The yardmasters, as a whole, operate 109 pairs of talk-back speakers. These speakers are spaced about 175 ft.

apart along the leads where drilling moves are made back and forth when switching cars in and out of the classification tracks. Other talk-back speakers are located near numerous outlying switches, ice docks, stock pens, car repair tracks, and other places where men are normally located when working in this yard.

The large paging speakers can be heard several hundred feet. A possible objection to using these large speakers, during night hours, is that the sound may carry so far that residents in the vicinity might be disturbed. Therefore, special circuits and controls were installed so that groups of the talk-back speakers can be used to put out calls when paging some men who should be working in a certain area.

#### Benefits of the Loudspeaker System

In the previous yards at Decatur, the yardmaster spent most of his time walking from one part of the yard to another, in an effort to contact switching crews, car repairmen and other forces. With this method, he had difficulty in keeping up with changing conditions, and, in too many instances, he was busy correcting troubles, rather than being prepared to foresee difficulties and eliminate them before they caused delays. Now, the yardmasters stay in their elevated offices, and, by means of conversations back and forth between them, and between them and various men working throughout the yard, every operation is closely supervised, so that delays are minimized. For example, the yardmaster



Advance consists are Teletyped to yards ahead

can keep in touch with each yard crew in his territory, to receive information on the progress of work underway, and to issue new instructions based on changing conditions. Or, he may tell a crew to clear a lead so that an approaching train can pull in without stopping.

If a minor defect is found on a car, this information is given by talk-back speaker to the yardmaster at once, and he, in turn, calls the car men. Thus, in numerous instances, repairs are made quickly, and the car leaves on schedule, whereas, under previous operation, they could have been delayed several hours.

In many instances, cars of fruit or other perishables are re-consigned en route. By means of the new communications systems, this information on re-consignments is handled quickly, thus avoiding delays previously incurred to get a car out of a train, after it was ready to depart. When a westbound train is approaching the east end of the receiving yard, the yardmaster, using the microphone in his office, talks through the paging speaker which is near the locomotive, to announce the number of the track in the receiving yard on which the train is to pull in. In most instances, the head brakeman should be able to throw the switch in time so that the train need not be stopped. This saves time, as compared with that previously lost while the train stopped so the brakeman could use a wayside phone to call the yardmaster.

The fact that the yardmasters have contact with both the front and rear

ends of trains when entering or when leaving the yard, makes it possible, by means of the loudspeakers, to relay information from the rear to the front or vice versa, thus obviating delays, especially in adverse weather when hand signals cannot be seen easily.

#### Amplifier Equipment

The amplifiers for the paging speakers and the talk-back speakers are in sheet-metal cases on the floor below the yardmaster's office at the main yard office, and on the floor below the yardmaster's office at Brush tower at the east end. This equipment at each tower includes: (1) microphone pre-amplifier; (2) a receiving amplifier for incoming speech; (3) a 20-watt amplifier for outgoing speech; and (4) a standard 60-watt amplifier for paging speakers. The amplifiers in each tower are in duplicate. If the set in service fails, the standby can be cut in by throwing a small switch. The microphones on the consoles are of the dynamic type, designed for voice frequencies. These microphones are made by the R. W. Neill Company.

The amplifier equipment at each tower is normally fed from 120-volt a.c. commercial supply. The relays and local circuits, including lamps in the console, are fed 24 volts d.c., from a rectifier associated with the equipment. If the incoming a.c. commercial power fails, a relay is released which automatically starts an Onan gasoline engine driven a.c. generator which, at 1800 r.p.m., will deliver 13 amp. at 115 volts, single

phase. This will take over the load to the communication systems at both towers.

The paging and talk-back speakers, as well as the control consoles and amplifier equipment on this project were furnished in packaged form by the R. W. Neill Company.

#### Car Number Recording

As an incoming train from the north or east approaches the east end of the yard near Brush Tower, a yard clerk either picks up a telephone hand set, at a window of the yard office, or goes directly across the tracks to a telephone booth which has four glass windows extending down half way in the booth. A telephone hand set is mounted in this booth. On this telephone is an indicating light which will show a red light if the recorder is turned on. This red light is an indication that a recording is being made. This is done by push-to-talk button in the hand set. If, for some reason, there is no disc in the machine, or the a.c. power is off, no light will appear at the remote stations. Directly on the telephone is a push button which, when pushed, rings a telephone at the recorder station, whereby an inside clerk answers the telephone, and communication is carried on to determine if the recorder is OK, or to give other information.

All south and westward trains from the north and east are actually recorded on a recorder at the main East Decatur yard. The recorders are connected by the present communication cable. As a train is leaving the yard at Brush Tower, going east or north, there are two locations whereby a clerk can record the engine number and all cars in the outbound trains. At the Main Yard, the procedure is identical for northward and eastward trains. These are recorded in the yard clerk's office at the Brush yard office.

This system has been helpful in locating "No Bill" cars, and also saves the outside yard clerk from actually walking over the train to make these checks. Soon after a recording is made, the record is placed in a transcriber equipped with a speaker or ear phones as described, and played back to check and correspond with the train consist, also for checking waybills. Also, advance consists are made from this list and Teletyped ahead to the next station.

A two-conductor insulated 4-inch lay communication twisted pair, extends from each control tower to talk-back and paging location in the respective areas. In addition to the



pair in service, each speaker location is protected by running one spare to each such location and looping this wire into each speaker mast, without cutting the wire. These wires are No. 16 gage, 26 strands of No. 30 tinned copper. Each conductor is insulated with a 0.030-in. wall of polyethylene and the pair has a 0.030-in. outer jacket of polyvinyl chloride. A total of 717,973 ft. of this twisted pair, made by Simplex Insulated Wire & Cable Company, was used in this installation.

These insulated wires were buried in trenches about 10 in. wide and 36 in. deep. In all open spaces, these trenches were dug by a power ditching machine. Where no rocks or old buried ties were encounter-

ed, the machine would dig about 130 ft. of trench an hour. A layer of sand 3 in. deep was placed in the bottom of the trench. The wire was placed on this sand, and about 3 in. more sand was placed on the wires. The high level wires, going to the paging speakers, were placed on the opposite side of the trench from the two-way talk-back circuits. (Cables for signal work, as will be discussed later, were also buried in the same trench with the communications cables, where one trench would serve.) Wires coming down from the control towers are terminated in junction boxes at the ground level. Junction boxes are also located at various places about 600 ft. to 800 ft. apart.

erated through this interlocking every 24 hours.

The Wabash passenger station is west of the IC crossing. When Wabash passenger trains make their station stop, they are standing west of the IC tracks. There are five tracks through the station area extending across the IC. A train on any of the five tracks can reach either the eastbound or westbound freight main or the passenger main through this interlocking. Tracks 1-2-3 are used for passenger trains. Tracks 2-3-4 are used for through freight trains. The No. 5 track is used principally for yard movements and switching movements at freight house and the IC transfer. No. 1 track is also used for B&O freight trains.

By eliminating the crossing stop at the IC crossing, freight trains can now be routed over one of the tracks in the station area around a passenger train standing at the station, causing no delay to passenger train, nor blocking of important street crossings, and saving considerable time for these freight trains.

## New Interlockings

Just east of the Wabash passenger station in Decatur, the five tracks of the Wabash are crossed at grade by three tracks of the Illinois Central. Previously, no interlocking was in service at this crossing; all trains being required to stop before proceeding over this crossing. This caused delays, not only to trains, but also to pedestrians and roadway vehicles on the numerous streets which cross the tracks at grade in this vicinity. Therefore, as part of the overall improvement program, a new electric interlocking was installed to protect

train movements over this crossing of two railroads, and also to include the operation of one crossover on the IC, as well as one single switch and five crossovers on the Wabash, as shown in the plan.

Baltimore & Ohio freight trains, on the route between Cincinnati and Springfield, are operated on Wabash tracks through this Wabic interlocking. Pennsylvania freight trains, on a route between Terre Haute and Peoria are operated on IC tracks through this interlocking. About 200 trains and switching moves are op-

### Novel Features of Control Machine

This new Wabic electric interlocking is of the so-called all-relay type, controlled by a panel-type machine with a panel 36 in. wide and 54 in. high. On the white lines representing tracks on the illuminated diagram, red lamps indicate occu-



Signals are controlled by "push-to-turn" levers

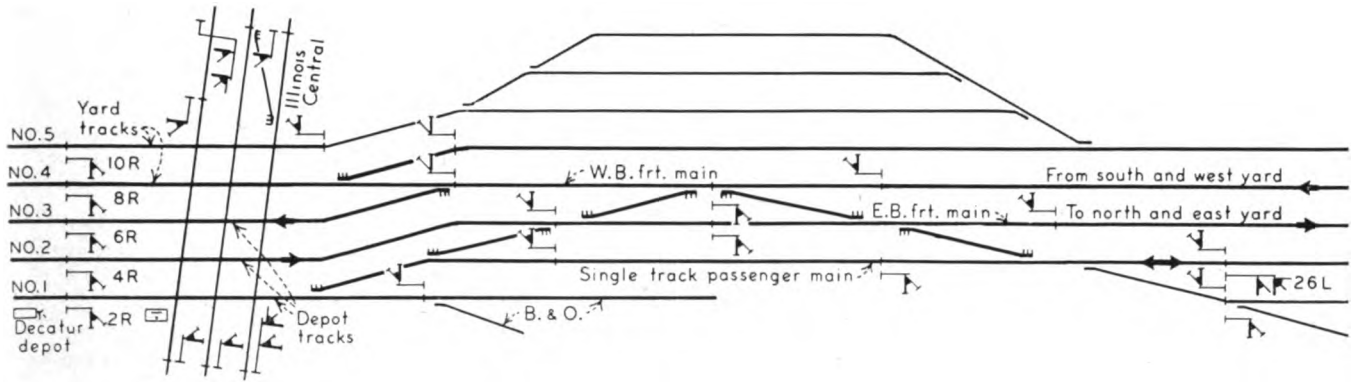


Fig. 1—Track and signal plan of Wabic interlocking near Decatur station

pancy of corresponding track sections, and white lamps, with arrows, indicate the departure end of routes being set up.

The one single switch and seven crossovers are controlled by eight conventional type miniature levers, which are in the top row. A green indication lamp, at the left over each lever, repeats the normal position of the corresponding switch, and an amber lamp, to the right, repeats the reverse position. A red lamp, in the center over the lever, is lighted when electric locking is in effect to prevent operation of the switch, even if the lever were thrown unintentionally.

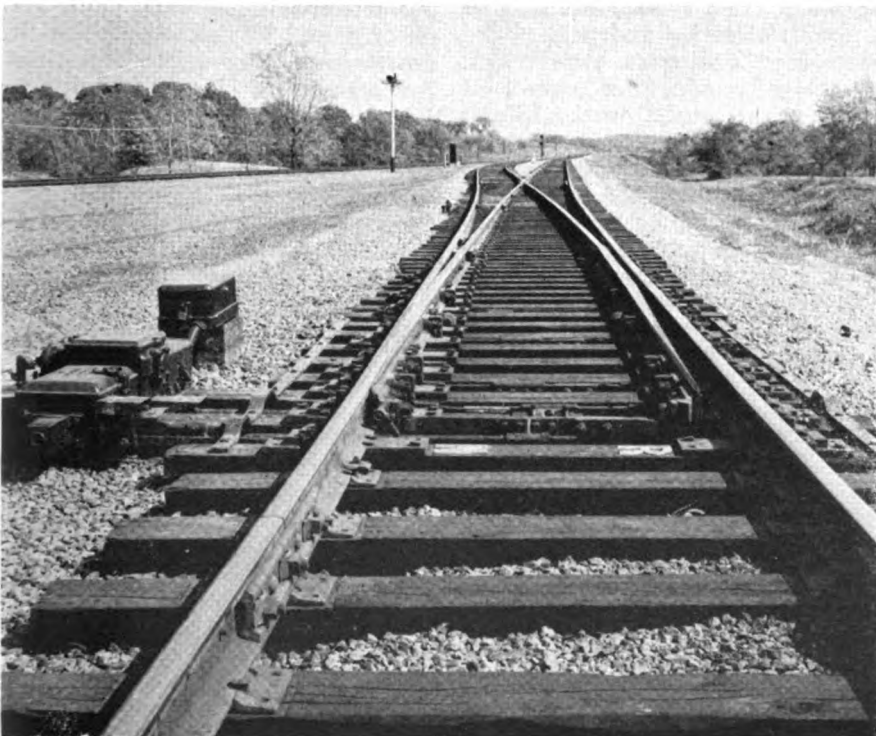
The 21 home signals on this interlocking are controlled by 12 levers which are in the bottom row. These levers are the so-called paddle type, which are pivoted at the center on a

horizontal shaft, extending into the face of the machine. The paddle is of black material, with a bright metal strip on the front edge. Normally, the lever is on center, with the edge vertical. Such a lever is turned 45 degrees to the left when clearing an "L" signal, or 45 degrees to the right to clear the corresponding "R" signal. However, each lever is so made that it must first be pushed in order to turn it. The complete operation requires four separate motions: (1) push, (2) turn, (3) release, and (after a check of the route) (4) a final push.

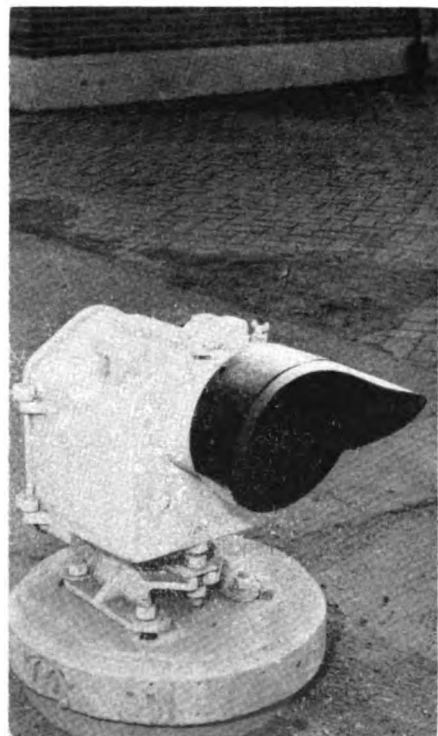
For example, when making a line-up, the towerman lines the switches for the track line up wanted; then he pushes the signal lever and turns it. Before further action, he looks to see that the white arrow exit lamp, which is then lighted on the dia-

gram, applies for the route which he intends to use. If so, he then pushes the signal lever. When the signal clears, an amber lamp, over the position of the lever, is lighted. If the correct route-exit lamp were not lighted, he would not push the signal lever, and thereby would avoid setting up electric locking that would, in most instances, delay trains. After a train has accepted and passed a signal, the towerman must return the signal lever to its normal position. The signal controls are on the "stick" principle, i.e. a signal will not automatically clear for a second train.

On account of the passenger station platforms and the numerous street crossings at grade in this area, all Wabash train movements are limited to a maximum of 15 m.p.h. Therefore, the best aspect displayed



At Brush, switch No. 5 is an equilateral turnout



Dwarf has flexible hood

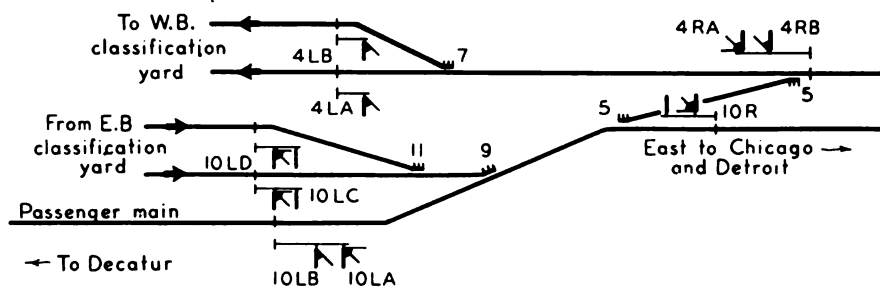


Fig. 2—Track and signal plan of Brush interlocking

by the Wabash home signals is "yellow," which indicates "Restricted Speed." All these Wabash home signals are searchlight-type dwarfs.

When switching, the proceed aspect must be used to direct moves into occupied sections, as for example to recouple onto the head end of a train after picking up cars. In order to clear a signal for such a "Call-on," the leverman manipulates the levers as previously explained, and then he pulls the button below the signal lever, and holds it in the pulled position until the train accepts the proceed aspect. Such a call-on control button is located under each signal lever.

A dead track section extends through the crossing, and this section is protected by a trap circuit designed according to Signal Section drawing No. 8042A, Fig. 4. The eastward Wabash home signals 4R, 6R, 8R and 10R, were located within 80 ft. of the IC crossing, so that eastbound passenger trains, when making the station stop, could pull up as far as possible, and thereby the rear would clear a busy street crossing west of the station platform. An engineer, in an attempt to stop the front of his locomotive exactly short of his home signal, may slide by just a few feet, in which case safety protection is established, but, in doing so, the trap circuit over the crossing locks out. To release this trap circuit lock out, the towerman waits until the locomotive is backed out of the home signal limits, and then he pulls the push button in the bottom row under the lever for that signal, and holds it in the pulled position for 10 seconds, thereby releasing the trap.

The five eastward home signals, which are dwarfs, are located in the station platform area. To prevent people from injuring their legs if they ram into metal hoods of these signals, special hoods, made of rubber belting material, were designed and installed on these signals to replace conventional metal hoods. As previously explained, the front of the locomotive must be pulled up close to one of these eastward home

signals when making a station stop. In order that an engineer could look from his cab down into the lens of such a signal to see the aspect, a portion of the upper left section of each hood was cut away.

The switch machines on this plant are of the d.c. type, operating on 110-volts, supplied from a set of 55 cells of 120-a.h. Exide lead storage cells, type BME-13. The control circuits, signal lamps, and other local circuits are fed from three sets of 5 cells of 240-a.h. Exide battery. Each track circuit is fed from two cells of the new type CG-500, National Carbon Company primary battery, in multiple. The normal voltage of these batteries is 1.3 volts. An adjustable resistor, in series, is set to feed about 1.1 volts at the rail. Then an additional resistor is inserted at the relay end, adjusted to the operating voltage of the relay.

The relays and storage battery are on shelves in a room on the ground floor of the tower. The relays are of the shelf type on coil springs, and are set on  $\frac{1}{8}$ -in. sponge rubber mat to absorb vibration and prevent the relays from sliding on the shelves. All the relays for the control of switches and signals on the Illinois Central tracks are on separate shelves, which are separated from the Wabash part of the room by a partition made of heavy wire grating. A separate outside door leads to the Illinois Central section, and that road is responsible for the maintenance and testing of the equipment in this room, and on its tracks within home signal limits. Thus, in so far as is possible, each road does its own work and therefore, there is no monthly billing for these items.

#### Brush Interlocking at East End

At the extreme east end of the new yard, a new interlocking, known as Brush, was built to include connections from the double track main line, from the east. to: (1) the new single track passenger main around the yard; (2) leads into the eastward yard; and leads out of the

westward yard to the double-track main line east. This interlocking includes five single switches and seven home signals, five of which are dwarfs, and two high signals. The control machine for this interlocking is located in the operator's office on the ground floor of the Brush yard office, which is about 1,600 ft. west of the interlocking layout. In so far as control of the Brush interlocking is concerned, this control machine is similar to the one at the west end, near the passenger station, as previously explained. However, in addition to controlling the interlocking itself, this Brush machine also controls signals for authorizing train movements in either direction on the new single track passenger main around the south side of the yard. This train operation by signal indication includes eastward signal 26L at the extreme right on the plan of the Wabic interlocking.

#### Spur Crossings

The machine in the Brush office also controls electric locks and home signals on the single-track passenger main line at three layouts, in each of which this passenger main track is crossed by a single track spur, leading from the yard to an industry on the south side of the passenger track. One of these layouts, at Staley, includes fixed crossing frogs, and at each of the other two, at Burwell and at Lukey, the crossing is accomplished by two single switch turnouts. The plan Fig. 3 shows the layout at Burwell. The high home signals 20R and 20L, on the main track, are controlled by lever 20 on the Brush machine. Normally, the lever is on center, and the two signals display the Stop aspect. If a switch engine crew on the spur track wants to make a move across the main track, the conductor calls the towerman. If time is available for the move to be made, the leverman throws a lever which unlocks the electric lock on the lever of the type SL-25 hand-thrown switch-and-lock machine at the east switch. Release is indicated by the lighting of a lamp at the switch. A member of the crew then throws the switch machine. This causes the facing-point lock on this east switch to be unlocked by the slide bar, and from this slide bar a pipe connection extends to the west switch to unlock the facing-point lock on that switch. Then, as the man continues the movement of the operating handle, the east switch goes over, and a pipe connection to the west switch throws that switch, so that both switches are thereby re-



Industry track crosses main with two switches

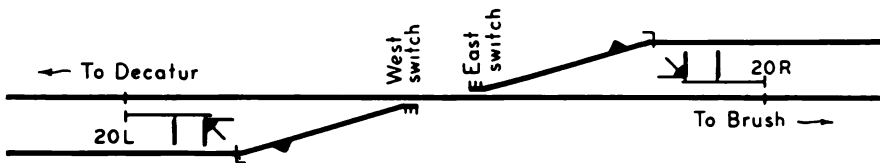


Fig. 3—Plan of Burwell crossing

versed. Then the man goes to the west switch, and throws the hand-throw switch-and-lock machine which is pipe connected to both derails, to remove them from the track; this pipe line is connected to bolt-locks, which lock both switches in the reverse position, and, of course, the lever cannot be thrown unless both switches are in the reverse position. A low target with an electric switch lamp at each derail is connected by a rod to operate as the derail moves. Thus, when both derails are off the track, the targets show that the route is lined up for the switch engine to proceed across the main track and on over to the spur leading to the industry, or vice-versa from the industry spur across the main track to the yard. When the move is complete, a member of the crew places the switch lever at the west switch normal, and then he places

the lever at the east switch normal, and observes that it is locked in this position by the electric lock.

A point of interest, in the manipulation explained above, is that both switches are thrown by the same lever, so that having entered the layout on the lead from the yard, for example, the switch engine cannot go down the main track beyond the limit of the switches. Furthermore, when the main track between switches is occupied, the electric lock is effective in preventing operation of the switches.

At Staley, where the spur crosses the passenger main on fixed frogs, a jack-knife type ground lever stand, located near the crossing, is pipe-connected to operate the two derails on the spur. An S1-25 type electric lock locks the lever of this stand in the normal position. When the towerman unlocks the electric

lock, a member of the switch crew can throw the lever over, and thus remove the derails from the track, so that the switch engine can proceed across the passenger main. Then the lever is placed normal, and locked.

The signals 20 R and 20L, on the main track at Burwell, are controlled by lever 20 on the Brush interlocking machine. These signals normally display the stop aspect, and the towerman must manipulate the lever to clear one signal, or the other, for each passenger train. Thus, from one viewpoint, these are semi-automatic absolute signals for authorizing train movements, the same as eastward signal 26L at the right end of the drawing of Wabic interlocking. Therefore, the home signals at Staley, Burwell and Lukey, can all be used to "block" following passenger trains on an absolute basis. This feature is an advantage when necessary to hold trains to prevent congestion, either at the station or at the east end.

### Lunar Aspect

Wabash Rules read as follows:

Rule 287 Green under Lunar Name Low Clear; Indication: Proceed not exceeding medium speed for diverging movement to main track.

Rule 288 Yellow under Lunar; Name Low Approach Medium; Indication: Proceed at not exceeding medium speed for diverging movement to main track preparing to stop at next signal.

The two eastward home signals, 10LC and 10LD, in the Brush interlocking, are dwarfs that govern east-bound trains that are pulling out of the yard on the leads to the east-bound main track. If the switches are lined up, and signal 10LC is cleared, with two or more blocks unoccupied, the aspect will be green under lunar. If only the first block is unoccupied, but the second is occupied by a train of the same direction, the dwarf signal 10LC, displays yellow under lunar white. This aspect tells the engineer that the route is lined up for him to go out on the main track, and that the first block is unoccupied, so that as soon as the length of his train has passed over the turnout, he can increase to medium speed, prepared to stop short of the next signal. If the lunar white were not provided on this signal, a single green aspect on a dwarf home signal limits the speed not to exceed 20 m.p.h., all the way to the next automatic signal; a single yellow

*Continued on page 58*



Signal 10LC displays yellow-under lunar



# Wabash Yard

Continued from page 45

aspect on a dwarf signal is restricted speed, not to exceed 15 m.p.h., all the way to next automatic signal, which would needlessly delay the train, under the circumstances discussed. Thus, the addition of the lunar, on the dwarf, steps up the speed so that, in this respect, it is the same as a high signal after the train passes through the turnout. The lunar is normally dark, being lighted in the instances discussed only.

In the Brush interlocking, the switch No. 5 connects the double track, from the east, to the single-track passenger main around the south side of the yard. This is a No. 20 equilateral turnout, i.e. with one half the divergence each way. The points in this switch are 33 ft. long. Thus, the curvature is comparatively light, so that trains in either direction are authorized to make diverging moves through this turnout at maximum permissible speed.

The electric switch machines are of the M23A type with dual control.

The controllers are type DP-25, mounted in separate cases, on concrete foundations independent of the track or ties. The switch machines at Wabic have 110-volt d.c. motors that will operate a switch in 3 seconds or less. The switch motors at Brush have 24-volt motors, which operate a switch in about 7 or 8 seconds.

The switch rods are of the Racor vertical pin type. Four such rods are used in the 33-ft. points in switch No. 5 at Brush. Operation of each switch is eased by a pair of roller bearings midway along the length of the points. The switch plates are 1-in. by 7-in., and Racor adjustable rail braces are used on four or more ties, including the No. 0 tie.

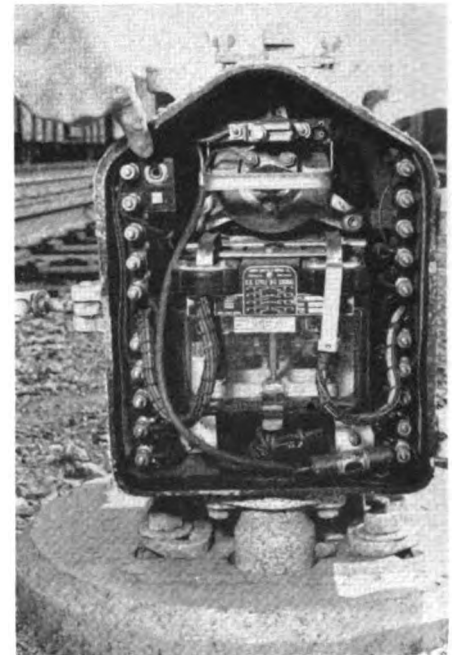
The signals are the searchlight type, using H-5 plug connected mechanisms. In each signal mechanism case, and in each switch machine case, there is a telephone jack receptacle which is connected to a two-wire telephone circuit extending to the control machine. Each maintainer has a pocket-size telephone hand set that he can plug in at the signals or switch machines to call the leverman, or to answer calls from the leverman.

The signal and interlocking equipment on this project was furnished

by the Union Switch & Signal, Division of Westinghouse Air Brake Company.

## Wiring Distribution

In these interlockings, the circuits from the cases to the rail are in single-conductor No. 9 to bootleg outlets, and from there to the rail in Roco stranded bond connections. The feed for the motors, from the battery to the switch machines, is on No. 6 wire. Other circuits are on No. 14 wire. All these circuits are in buried cable. From Wabic tower, a 12-conductor cable goes from signal 26 at Wabic to Staley, then a 27-conductor to Burwell, with a 27-conductor and a 19-conductor to



Telephone jack inside signal

Lukey, and two 27-conductor cables between Lukey and Brush. Between Brush tower and the Brush interlocking layout, there are one 27-conductor and one 19-conductor cable. All this is buried cable with mummy finish covering, and was made by the Kerite Company.

Where practicable, these interlocking cables were buried in the same trenches with communication cable, discussed before. Under tracks, the cables are run through lengths of 4-in. Johns-Manville Transite ducts.

The interlockings, signaling and communication systems in this new yard were planned and constructed by Wabash forces, under the jurisdiction of G. A. Rodger, superintendent of signals and communications. P. Brady, supervisor communications, had charge of the supervision of the communications construction.



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