

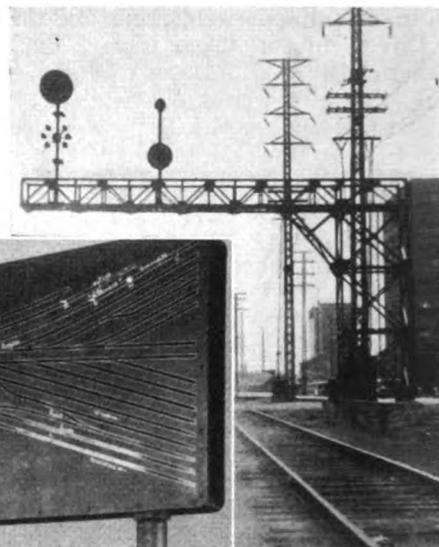
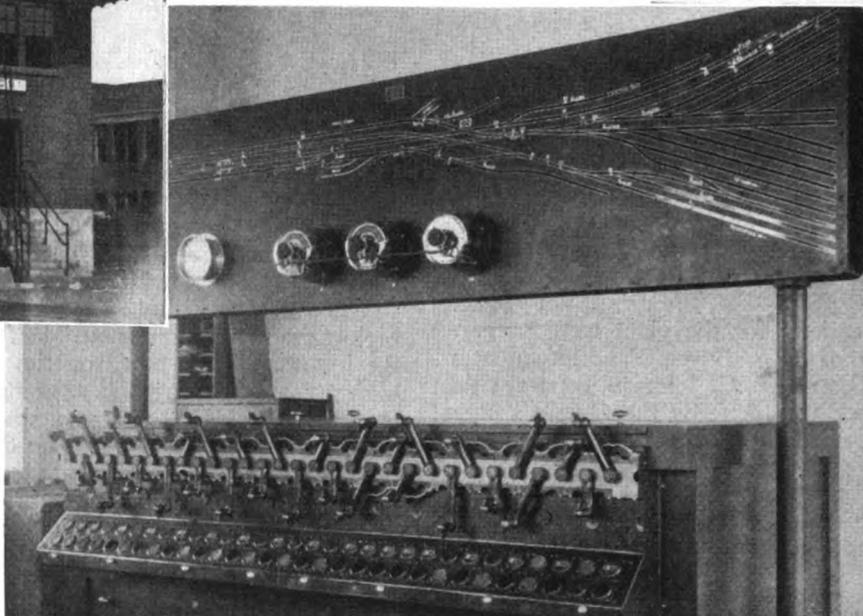
Power Interlocking Eliminates Delays

Reconstruction program involves installation of two electro-pneumatic plants on Norfolk & Western at Portsmouth, Ohio



The tower and electro-pneumatic train-order signal at Gallia street

Interlocking machine in the tower shown above



Position-light signal on a cantilever support

TWO electro-pneumatic interlocking plants are a part of the Norfolk & Western's recently completed program of construction of new facilities, additions and betterments in Portsmouth, Ohio. A new passenger terminal has been constructed, including in its area a new station and office building, 17 miles of track, a new overhead bridge and underpass, a new express building, a coach yard and building, a central heating plant, a water tank, a turntable, the two interlocking plants referred to, and other facilities, at a total cost of approximately \$1,000,000.

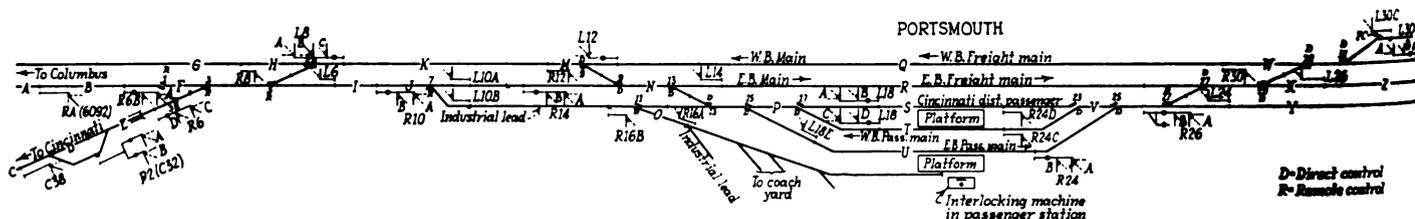
New Passenger Station

The passenger station and office building are combined in a beautiful structure which has given a new touch of beauty to the city. Resting on a solid concrete foundation, which in turn is supported by creosoted piles, this new building is substantially constructed. It has three main floors, as well as a basement and two attic floors.

The interlocking machine for the passenger station has been installed in the telegraph office on the second floor.

Portsmouth is on the Scioto division, which extends from Williamson, W. Va., to Columbus and Cincinnati. The Columbus district starts at Portsmouth and extends northward to Columbus, Ohio, while the Cincinnati district extends from Portsmouth westward to Cincinnati, and the Kenova district from Portsmouth eastward to Williamson. The new passenger station is on the Columbus district, approximately one-half mile north of the old station. The interlocking machine for the new station in that which was referred to as being located in the station and office building.

The second interlocking plant is at Gallia street, one mile east of the new station. Here, the Norfolk & Western's main line to Norfolk crosses a freight line of the Baltimore & Ohio, and here also is the entrance to the Portsmouth car retarder classification yard described on page 247 of the July, 1928, issue of *Railway Signaling*.

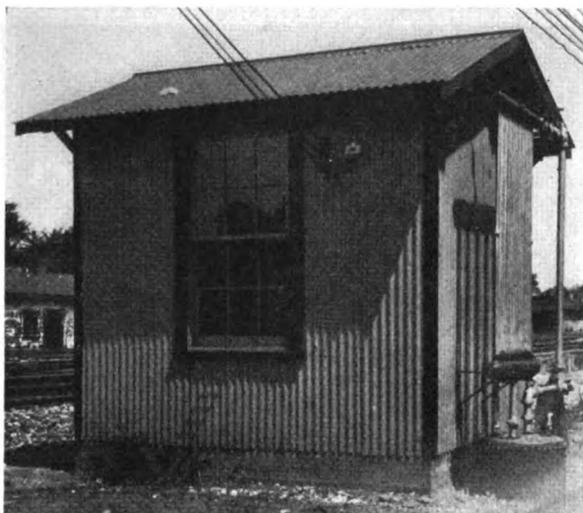


West end—Portsmouth Station interlocking

Formerly the tracks at Gallia street were so arranged that the N. & W. eastbound main track crossed the B. & O. one-half mile west of the site on which the new tower has been constructed, and all trains were required to make a safety stop at this crossing. In contemplation of the construction of the new interlocking plant at Gallia street, these tracks were relocated so that now the B. & O. track crosses both the eastbound and the westbound main tracks of the N. & W. at the tower. This rearrangement necessitated the installation of an entirely new eastbound main track, the former eastbound main being used now as a switching lead.

Freight Traffic Is Heavy at Gallia Street

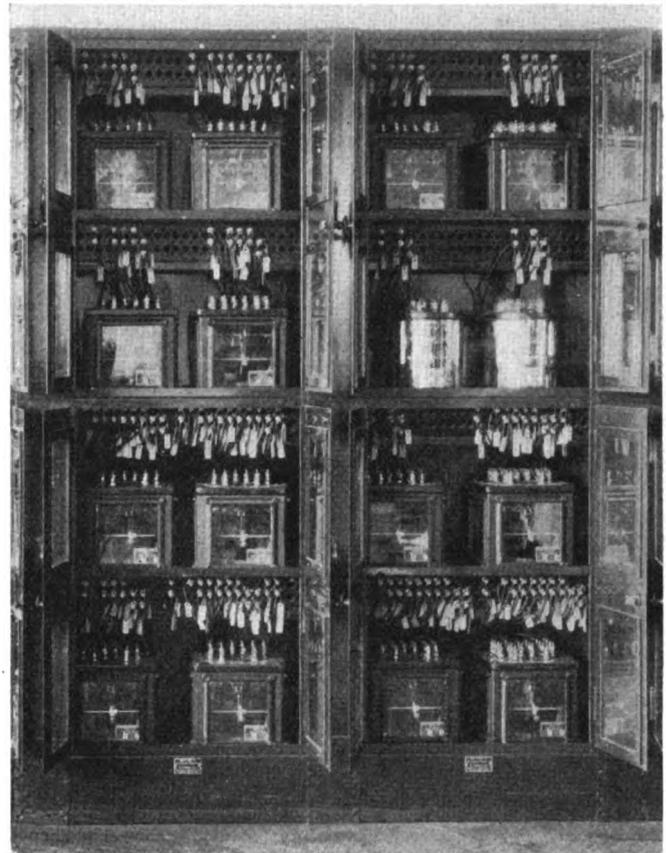
Under the former arrangement at Gallia street, all freight trains pulling into and out of the classification yard were compelled to slow down or stop in order to throw the switches. These freight movements were the



One of the compressor houses

only one is in service, but the other is arranged to cut in automatically if the former should fail. Each compressor has a capacity of 25 cu. ft. a min., the air pressure being automatically maintained between 55 and 80 lb.

The interlocking machine for Gallia street is on the second floor of the new tower. It has 6 spare levers and 25 working levers, of which 15 control 12 switches and 5 derails, and 8 control 21 signals, while the remaining 2 are for check locking. An electro-pneumatic train-



Steel relay cabinets are used in both plants

cause of considerable delay and consequent expense. The new interlocking plant has, of course, eliminated these stops. In addition to the above freight movements, the Gallia street plant handles approximately 25 westbound and 20 eastbound through trains daily, including both freight and passenger trains.

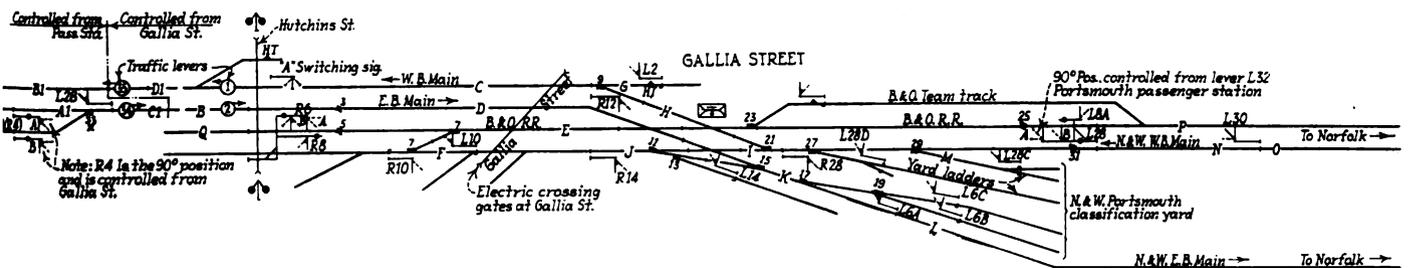
The double track between Gallia street and the station has a switching lead which is controlled by a lever in the passenger station. Check locking, also, is provided for either-direction movements on both tracks between these two points.

As shown in the illustration, a new two-story interlocking tower was constructed at Gallia street. On the first floor are the relay and terminal cabinets, toilet and compressors. As in the station plant, Union steel cabinets are used. The compressors are in duplicate; normally

order signal has been installed, and is controlled by a field-made switch mounted on the operator's table.

The Station Plant

Mounted in a projecting bay in the telegraph office on the second floor of the new station-and-office building, the interlocking machine for the station tracks is located to afford the operator an excellent view of the controlled territory. This machine consists of 4 spare levers and 31 working levers, of which 5 control 19 switches and 3 derails, 14 controls 42 signals, and the remaining 2 are for check locking. The relay cabinets, housing the relays,



East end—Gallia Street interlocking

terminals and other equipment, are in the same room with the interlocking machine and telephone and telegraph equipment.

Five sets of compressors are used in the station plant. Three sets are located in compressor houses of the type shown in the illustration, while the other two are in ordinary signal cases. All compressors are in duplicate.

A-C. Operation and Control in Both Plants

In both plants, the railroad company's standard position-light signals are in use. Both plants, also, are of the straight a-c. type, excepting the use of d-c. relays for the highway crossing signals. TV-40 relays are used for switch-repeater circuits, while Model-15 relays are used in the other a-c. circuits, including the track circuits. The control wires are in aerial cable.

An unusual feature found in these plants is the extensive use of test jacks which are provided for the purpose of isolating and thereby readily locating grounded circuits. The jacks are installed in the place of terminals

note. When the switch movement is located so far from the interlocking machine that the voltage drop would be too great under direct control, a remote-control method is employed, using a relay at the switch location to open and close the control circuits. All of the switches and derails in the Gallia Street territory are directly controlled. The code designations on the track and signal plan show which of the other switches are direct- and which are remote-controlled.

Two street crossings have been eliminated and all of the remaining crossings have been equipped with wig-wag flashing-light signals. Nine of these signals were installed between the Gallia Street plant and the station plant, making a total of 15 highway crossing signals in Portsmouth, all of which are controlled automatically.

Installed by Railroad Forces

The construction of these plants, as well as two others recently completed at Columbus, Ohio, and Bannan, was performed by the Norfolk & Western's regular signal



Signal construction forces—J. O. Trump at the right, seated

and wherever terminals might ordinarily otherwise be used. The maintainer, in locating grounds, simply opens the circuit at the test jack by inserting an insulating plug, and thus determines which side of the jack the ground is on.

Two types of switch control are used: direct and re-

department forces, supervised by J. O. Trump, signal inspector, under the direction of D. W. Richards, signal engineer. One man was added to the maintenance force as a result of the installation of the two Portsmouth plants. The Union Switch & Signal Company supplied all of the materials and designed the circuits.

Treated Timber for Signaling on the Santa Fe*

THE first treated wood used by the Atchison, Topoka & Santa Fe was creosoted piling treated at a plant at Galveston, Tex., in 1875, for use in the construction of the Bay bridge into Galveston. Our first crossties were treated at Las Vegas, N. Mex., in 1885, but it was not until 10 years later that we began to treat lumber and piling for inland use. Beginning with 1895, the amount of lumber and piling treated has increased steadily until in 1930 more than 19,000,000 bd. ft. of lumber and 895,000 lin. ft. of piling went through our plants.

During the past five years the signal department has used an average of approximately 588,000 bd. ft. a year of treated trunking and capping; a total of 3,800,000 ft. b.m. having been turned out at Santa Fe plants since 1923. All trunking and capping has been manufactured as well as treated at the treating plants, the sizing and grooving being done on a timber sizer at one operation by the use of special knives. The lumber is purchased in the proper sizes for manufacture in the rough and is worked to finished sizes and treated after four to six months' seasoning.

We have now started to manufacture, in the same

manner as the trunking, a special molding for the protection of switch wiring. In use it is nailed to the sides of the switch ties.

In addition to these special items, the treating plants furnish the signal department with creosoted Southern pine poles which are roofed, grained and bored before treatment. The poles range from 30 to 40 ft. long, although both shorter and longer lengths are often required. Signal pole stubs are 10 ft. long, with tops not less than 8 in. nor more than 10 in. in diameter, bored for two ¾-in. bolts and roofed at a 45-deg. angle. In addition to the bolts, wire is used to bind them to the poles which they are to reinforce, and which are untreated. During the past five years, an average of 90,870 lin. ft. of poles and 18,280 lin. ft. of stubs, or 2,000 pieces, have been turned out by our plants. All signal material, including poles and stubs, receives an 8-lb. Reuping treatment with a 50-50 creosote-petroleum mixture

*Abstracted from a paper presented by R. S. Belcher, manager of treating plants, A. T. & S. F., at a meeting of the American Wood Preservers' Association at Philadelphia, Pa.