

New Chicago & Alton Shops at Bloomington, Ill.

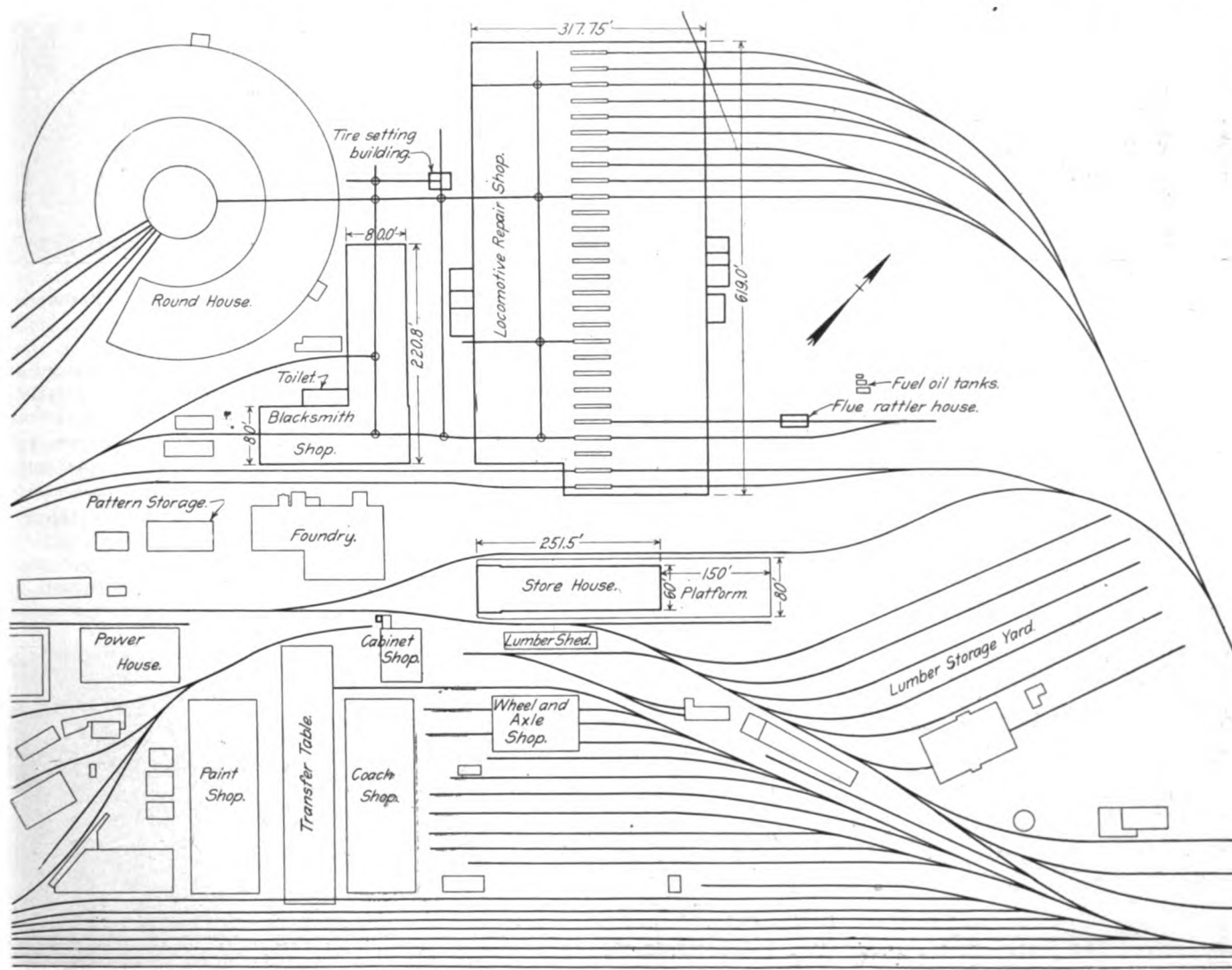
Increased Facilities for Heavy Repairs Provided by Construction of Three Large Modern Buildings

The Chicago & Alton has maintained car and locomotive repair shops in connection with its engine terminal at Bloomington, Ill., for many years. When the necessity arose for increased capacity in these shops some time ago, the advisability of removing these facilities from Bloomington was considered, but to prevent this the city agreed to furnish the land necessary for the enlargement of the shops and yards sufficient to care for requirements for some time to come. The new buildings just completed on this land, which adjoins the old site on the north, comprise a locomotive shop, a blacksmith

old buildings, the storage yard tracks and platforms are shown in the plan.

LOCOMOTIVE REPAIR SHOP

The locomotive repair shop is 619 ft. long and 317 ft. wide, covering an area of nearly $4\frac{1}{2}$ acres. The building is divided into five longitudinal bays housing the erecting shop, the machine shop and the boiler and tender shop, as well as the master mechanic's and foreman's offices, tool rooms and sub-store rooms. This combination of the various departments under one roof without partitions admits of such an arrangement of



Layout of Chicago & Alton Shops at Bloomington, Ill., Showing New Buildings Recently Completed and Their Relation to the Yards and the Old Buildings

shop, a storehouse, a tire heating building and a flue rattler building. A number of unique features were introduced in the design of these buildings, notably the placing in one structure of the several departments of the locomotive shop and the improved layout of the blacksmith shop. The general layout provides not only for existing and probable future needs but for the utilization as far as possible of the old shops and for the development of a well defined scheme that will ultimately utilize the tract in the most economical and effective manner. The arrangement of the new buildings and their relation to the

tools that work and materials may pass through the shop in an orderly and progressive manner with the least possible rehandling.

This building consists of a structural steel frame on concrete foundations with side walls of concrete up to the window sills and brick above that level; with the exception of the high walls of the central erecting bay which are of tile with stucco finish. The floor consists of a 4-in. sub-base of tarred rock well rolled and covered with a 1-in. layer of sand and tar in which is embedded an underflooring of 3-in. yellow pine overlaid by a

1 1/16-in. maple floor. The roof has wood purlins with 2-in. planks covered with prepared roofing. The building is well lighted as the combined window area of the side walls and the saw tooth and monitor roof construction amounts to over 28 per cent of the floor area. The artificial lighting consists of Tungsten nitrogen-filled lamps in 400-watt units spaced to eliminate shadows and the necessity for individual lamps on the machines except for inside work.

The shop is heated by an indirect blower system located in two specially constructed rooms outside of and immediately adjacent to the main walls of the shop and situated one on either side of the building about midway of its length. These

for the unwheeling of locomotives being of 150 tons capacity equipped with two trolleys of 75 tons each located on the upper runway, while the lower runway carries a 10-ton messenger crane. On every alternate column between the erecting pits jib cranes are provided for handling materials on the front ends of the locomotives.

Adjoining the erecting bay to the south is a 60-ft. bay in which are located the heavy machine tools which are served by a 10-ton traveling crane. South of this bay is another 60-ft. bay in which are placed the lighter tools. The heavy tools are all equipped with individual motor drive, while the lighter ones are arranged in groups driven by motors of 20 to 25 hp.



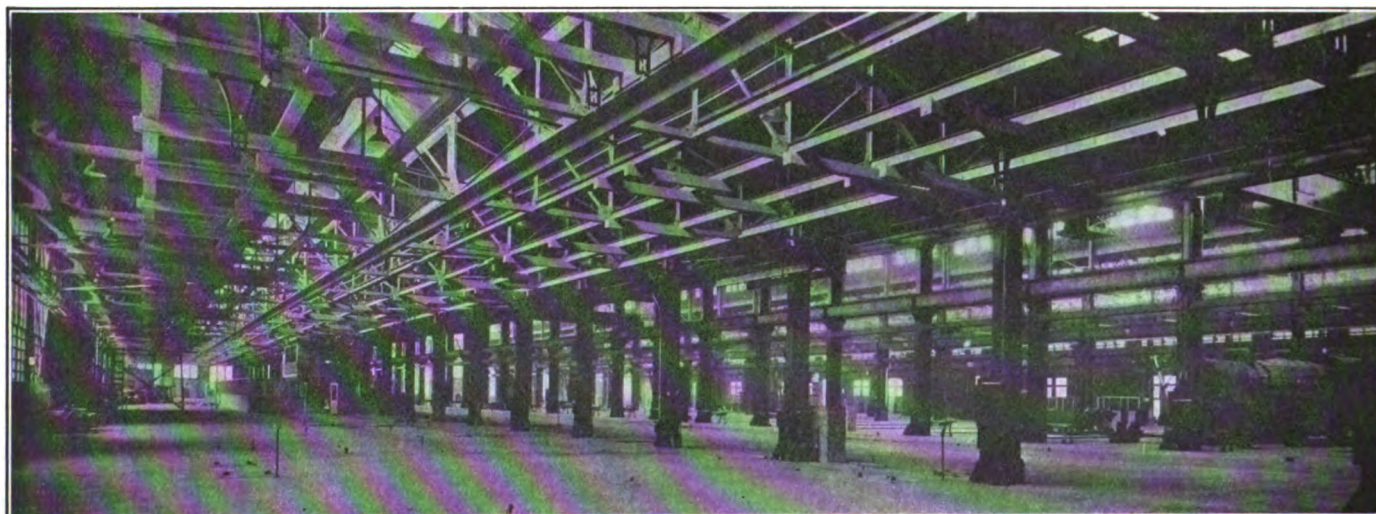
Looking Over the New Chicago & Alton Shop Buildings, Store House in the Foreground, Blacksmith Shop to the Left and Locomotive Shop to the Right

rooms are large enough to be divided, a part of the space being used for lavatory and locker rooms for the men. The blower system consists of two 240-in. steel plate exhaustor type fans direct-connected to horizontal throttling engines. These fans draw air through 20,200 sq. ft. of Vento heaters and discharge it through concrete underground ducts to register boxes located along the outside walls and on interior columns. The Vento heaters are supplied by high pressure steam transmitted from the power house about 1,000 ft. away at 125-lb. pressure, which is reduced in the fan room to 1 1/2 lb. The exhaust steam from the fan engine is also used in the heaters. A suitable system

North of the erecting bays are two 60-ft. bays devoted to boiler and tank work. These two bays are served by traveling cranes, one of 15 tons capacity and the other in the boiler assembling bay of 40 tons capacity, each equipped with two trolleys. The hydraulic riveter is centrally located in the boiler shop with a tower constructed especially for it and is served by its own 25-ton crane.

BLACKSMITH SHOP

The blacksmith shop is of brick and steel construction on concrete foundations similar to that of the locomotive shop. It



General View of the Interior of the Locomotive Shop Taken from the Light Machine Bay

of piping is provided for distributing live steam, compressed air, fuel oil and water for fire protection, drinking and hydraulic pressure throughout the shops.

The erecting bay, located in the center of the building, is 75 ft. wide, center to center of columns, and contains 28 pits. It is served by two traveling electric cranes on two levels, the crane

is an L-shaped building 80 ft. wide, one wing being 200 ft. long and the other 300 ft. long. All the steam hammers, ranging in capacity from 300 lb. to 6,000 lb., are assembled in the 200-ft. wing, and the forges and small power tools in the 300-ft. wing. The roof trusses on the former wing are 10 ft. higher than those on the latter in order to provide the 30-ft. headroom required

for the jib cranes and hammers. A space 100 ft. long has been partitioned off in the longer wing for use as a tinshop temporarily until this space is required for blacksmith work, when the tinshop will be removed to other quarters.

In the general design special care was taken to provide a layout that would afford opportunity for an orderly progression of the work through the shop, and ease and economy in transporting materials or parts to the point of final use in the locomotive shop with which it has suitable track connections.

Excellent ventilation is provided by the monitors in the roof in addition to the means for removing smoke and gases from the forges. A lavatory is located in the angle of the "L" in an addition just outside the main building, which includes both toilets and washroom facilities for the men.

STOREHOUSE

The two-story brick storehouse is located east of the locomotive shop and separated from it by a 95-ft. storage yard. This building is 60 ft. wide and 250 ft. long without a basement, the first floor being on an earth fill affording facilities for handling and storing heavy materials on a level with the car floors. A wooden platform 10 ft. wide on concrete piers extends the entire length of the building on both sides, and a large storage platform 80 ft. by 100 ft., with the floor laid on an earth fill, is provided at the north end.

Ample storage bins, arranged in transverse rows to give a maximum of light in the aisles, are provided in the house. The second floor, where the lighter materials are stored, is served by an electric freight elevator of 5,000 lb. capacity, while a chute is provided by which small packages made up on requisition can be transferred to the first floor for delivery. At one end of the building is provided office space for the general storekeeper and his clerks, adequate toilet facilities and a first-aid hospital.

To permit the erection of the new buildings and the laying of some of the tracks it was necessary to remove two rather old buildings of stone masonry. These were of considerable size, one of them being two stories high, but they were successfully moved with their contents intact.

These new shop buildings were designed and constructed by Westinghouse, Church, Kerr & Co., New York, acting in co-operation with H. T. Douglas, Jr., chief engineer, and J. E. O'Hearne, superintendent of motive power of the Chicago & Alton, the actual field construction being in charge of P. J. Watson, assistant engineer.

COMBINATION THROUGH CLASSIFICATION AND TERMINAL YARD*

BY W. C. COPLEY

Freight Trainmaster, Pennsylvania Railroad, Altoona, Pa.

The following description covers actual practice in a supposedly well designed, operated and organized yard—a main line yard on the Pennsylvania Railroad located between Chicago and New Jersey, consisting of more than 200 miles of track and having standing room for over 10,000 cars; it handles 6,000 cars per day of through business, about equally divided as to directions, and 3,500 inter-yard movements exclusive of the through business; that is, cars to and from the shops, transfer warehouses, and industrial and public delivery sidings. This makes it a combination through classification and terminal yard. The 6,000 cars of through business means that that number of cars are despatched from the yard, or in other words the cars are counted only once on the outgoing trip. The terminal or inter-yard movement of 3,500 cars per day represents each movement of a car within the yard after it has been classified and placed in the classification yard up to the time it is returned to the hump for a re-classification for final despatching from the yard.

When a train arrives in the receiving yard, the road con-

ductor delivers his card manifests to the assistant yardmaster in charge of the movement in the direction the train is going, who counts the manifests and marks on his train register the engine number, the arrival time in the receiving yard and the number of manifests representing cars in the train. The manifests are then turned over to the assistant yardmaster's clerk, who takes out any for cars he may have "hold" or "change" orders for. He also takes a book record of all the city delivery cars in the train. The manifests are then turned over to the reconsigning clerk, located in the same office, who represents the freight agent. This clerk picks out those for any bill-of-lading or reconsignment cars he may hold orders to re-bill. About 200 cars per day of this class of freight pass through the yard, 75 per cent of which are changed or re-billed before the cars are classified, while the remaining 25 per cent go to the hold-track to await disposition. The manifests are next turned over to the conductor or car-marker, who takes them into the yard, passes along the train and compares the numbers and initials with the cars as they stand to make sure that each car is represented by a manifest.

While the manifests are being thus handled the car inspectors make a thorough inspection of the train under blue flag protection, making any slight repairs which can be made in the receiving yard, and marking for the shop any cars with defects that cannot be thus repaired. As the car marker compares the manifests with the cars in the train, he chalks the front end of each car for the track on which it is to be placed in the classification yard beyond the hump; he faces down the manifests for any cars he may mark for the shops. Upon returning to the assistant yardmaster's office he makes out a shifting slip for the use of the leverman in the tower, who operates the switches from the hump to the classification yard; he then removes from the pack the manifests for cars for the shop, sealing them in an envelope marked "Shop cars out of train of Engine ———." The manifests for the other cars are sealed in a separate envelope, which shows the engine which brought the train to the yard, the number of the track on which the train was received, and the time it was marked. He then pins his switching slip to the envelopes containing the manifests and places the entire pack in a pigeon-hole in the assistant yardmaster's office, representing the track in the receiving yard that the train is on.

The train is now prepared for classifying over the hump. The manifests are given to the man in charge of the hump engine; the engine is placed back of the train and the manifests are delivered to the conductor in charge of the hump, who in turn delivers the switching card to the leverman, and forwards the manifests for the train, still sealed in the envelope, to the assistant yardmaster at the despatching end of the yard; he sorts the pack, placing the manifests in pigeon-holes representing the tracks on which each respective classification of the various cars in the train is made. The manifests for shopped cars are turned over to the shop car clerk in the tower at the hump; it is his duty to take a book record of the face of the manifest, including the date, the number of the engine bringing the train into the yard, and the time the train was shifted, which, of course, gives the time the car was delivered to the shop.

The shop cars are delivered direct from the hump to the interchange track between the main classification yard and the shop repair tracks. A shop engine then places them on the repair tracks, which hold from 15 to 25 cars each. The shop car clerk takes the numbers of the cars standing on the repair tracks and then returns to the tower, picks out the manifests for the cars undergoing repairs, as they stand on the repair tracks, and marks on the back the number of cars on the track, as well as the track number on which the cars stand, checking cars already entered in the book as going to the shop, giving the time and date. After the cars have been repaired, the shop engine pushes them out through a depressed track beyond the hump; the hump conductor goes to the tower and gets the manifests representing that track, chalks the cars for their respective tracks and makes out a shifting slip the same as had been done

*Received in the contest on The Operation of Terminal Yards. Other papers in this series appeared in the issues of October 9, October 16 and October 30.