The

BUCKEYE STEEL CASTINGS COMPANY

COLUMBUS - OHIO

50th Anniversary

OPEN HOUSE

1902 B 1952

OCTOBER 25, 1952

Your Visit with "BUCKEYE"

Today we are celebrating the Fiftieth Anniversary of this steel castings plant, the first heat of steel having been poured on October 14, 1902.

A brief history leading up to this event begins with a partnership formed in 1883 to make small malleable iron castings in a plant covering only five acres of land located on Russell Street just off North Fourth Street in a section which is now the near north side of Columbus.

This partnership was changed to a corporation in 1886 under the name of The Buckeye Malleable Iron Company with Mr. W. F. Goodspeed as its first president, a man of broad vision who can be justly termed the founder of the Company. When the use of automatic freight car couplers was made mandatory under Federal law in 1893, replacing the dangerous and inadequate old style link-and-pin coupler, the Company entered this field and changed its name to The Buckeye Malleable Iron and Coupler Company. Subsequent experience indicated that malleable iron was not suitable for the severe service conditions to which automatic couplers and other railroad freight car castings were subjected, therefore it was decided to change the Company's product to cast steel. The Russell Street malleable castings plant, not being suitable for cast steel, was abandoned and sold. A new plant was erected in 1902 on this present site located south of Columbus and the corporate name again changed to The Buckeye Steel Castings Company. It is the fifty year operation of this steel castings plant that we are commemorating today.

When this plant was built a half century ago it occupied an area of 31 acres. Today it occupies an area of 86 acres within the triangular boundaries as shown in the view appearing in this booklet. Adjacent vacant lands containing an additional 184 acres owned by the Company are used for wasting foundry refuse and for future expansion. Buildings alone at the present time occupy an area of over 21 acres which is in excess of ⅔ of the entire land area of the original plant.

Equipment and facilities have in like manner increased over this span of years until at this time "Buckeye" is one of the largest steel foundries in the United States. To handle incoming and outgoing materials and supplies and to take care of storage requires within the plant area the use of two Diesel Electric locomotives and 65 freight cars as well as three locomotive cranes operating on eleven miles of track. The plant is equipped with six 30-ton open-hearth furnaces and 155 charging cars are employed to supply raw materials for melting. Fifty-two overhead cranes are required to handle the various loads incidental to the manufacture of steel castings on a large scale. Special equipment includes a one million pound test machine where full size castings can be tested to the breaking point; also an X-ray machine which can penetrate 2½ inches of steel.

The plant is largely self-sufficient as regards power requirements, however connections for securing electric power from outside sources are installed to provide for any possible emergency. The plant is also self-sufficient as regards water supply which is drawn from deep wells and treated in its own well-equipped Water Softening Plant similar to the one in use by the City of Columbus. By the use of its own Softening Plant no burden is imposed on Columbus water facilities and storage.

From a few hundred employees in the early years, it now requires from 1,800 to 2,000 employees to operate at normal capacity. Ownership of the Company in 1902 was vested in 68 shareholders which has now grown to over 2,000, quite a

number of our employees being holders of stock. Most of our shareholders live in Ohio and in Columbus but ownership is also represented in 40 of the other 47 states. The amount of investment in 1902 was $1,250,000.00 compared to $9,300,000.00 at the present time.

Buckeye is an important factor in the economy of Columbus, especially in the South Side community since its payrolls in a normal year amount to approximately $7,500,000.00 and it expends a like amount for materials and services in the same period of time.

Since the pouring of the first heat of steel in October, 1902, the total output of the plant during this 50 year period has been over 2,280,000 tons of finished steel castings requiring the use of over 3,000,000 tons of melting materials. If all this finished steel were poured into one block the size of a football field it would be twice as high as the Ohio State University stadium. This same quantity of finished steel could equip over 700,000 cars which is approximately 40% of the entire present freight car ownership in the United States. These cars if coupled together would form two trains each one longer than the distance from Maine to California.

During the first World War the Company, in addition to operating its foundry to capacity, engaged in the production of heavy forgings including billets for large size shells as well as forgings for 75 mm. guns.

During the second World War the Company did its full share by producing armor castings, certain Navy and Maritime castings, and other special castings, in addition to producing its regular type of castings for railroad rolling stock so necessary in time of national emergency.

The chief product of the Company in all its early years was the automatic railroad car coupler. Over the intervening years its product has been expanded in the railroad equipment field to include practically all castings required to be made in steel for freight cars and many for locomotive equipment. In addition to the regular automatic Standard

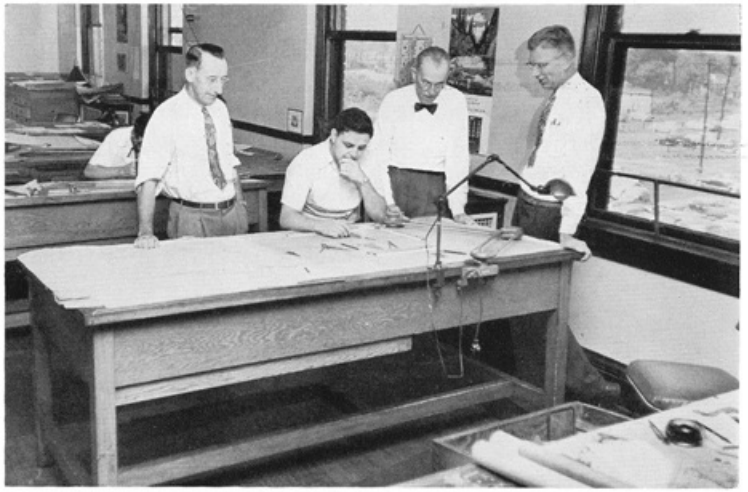
Couplers used on all freight cars, these products now include the Tightlock Coupler for use on passenger equipment, Side Frames and Bolsters for the trucks on all types of freight cars, Cast Steel Hopper Door Frames for hopper cars, Six and Eight Wheel Truck Castings for locomotive tenders and high capacity freight cars, Draft Yokes, Striking Castings and Center Filler Castings used in freight car center sills, and a variety of other large and small castings for freight cars. Many of the above products of the Company are pictured in this booklet. Buckeye has pioneered in the development of all of these castings. It is constantly conducting research towards better design of railroad freight car castings which will permit safer, dependable and damage-free service by the railroads of the country.

An excellent employee relationship over these many years has contributed much to the success of the Company. The organization of our employees known as the Twenty-Five Year Club is composed of those who have been in the continuous service of the Company for at least 25 years. It now has a membership of 272, eight of whom have been in service in excess of 45 years. A retirement plan for our employees has been provided as well as group life insurance and hospitalization benefits.

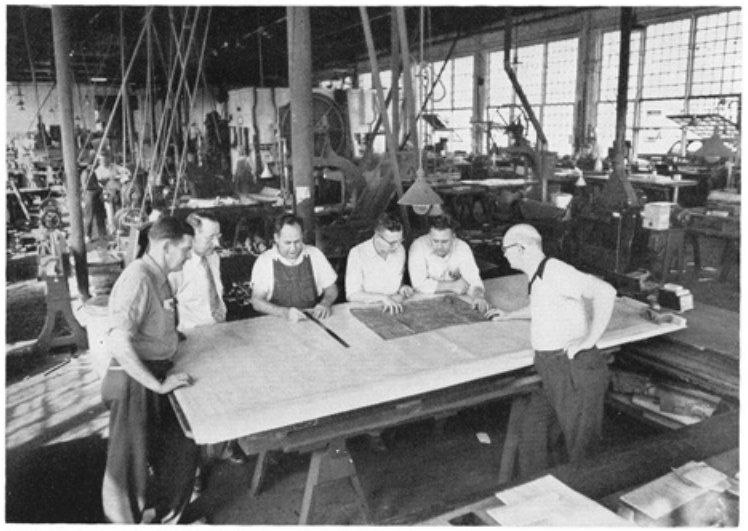
The leadership of the Company has been under the presidency of Mr. Wilbur F. Goodspeed from 1886 to 1905, Mr. Frank Rockefeller from 1905 to 1908, Mr. S. P. Bush from 1908 to 1927, Mr. J. C. Whitridge from 1927 to 1936, Mr. A. H. Thomas from 1936 to 1945, Mr. Geo. T. Johnson from 1945 to 1948, and Mr. F. H. Bonnet from 1948 to date.

The future prosperity of this Company is well assured as it continues its policy of developing new products and improving its established products. Fortified with a background of experience in the production of steel castings, with a splendid physical plant and with confidence that good employee relationships will be perpetuated, the unfolding of the coming years will see "Buckeye" continuing to occupy a position of leadership in the industry and rendering a constructive service to the country as a whole.

The following pictures of manufacturing facilities with explanatory notes will serve to round out the foregoing review of fifty years of progress in the production of steel castings.



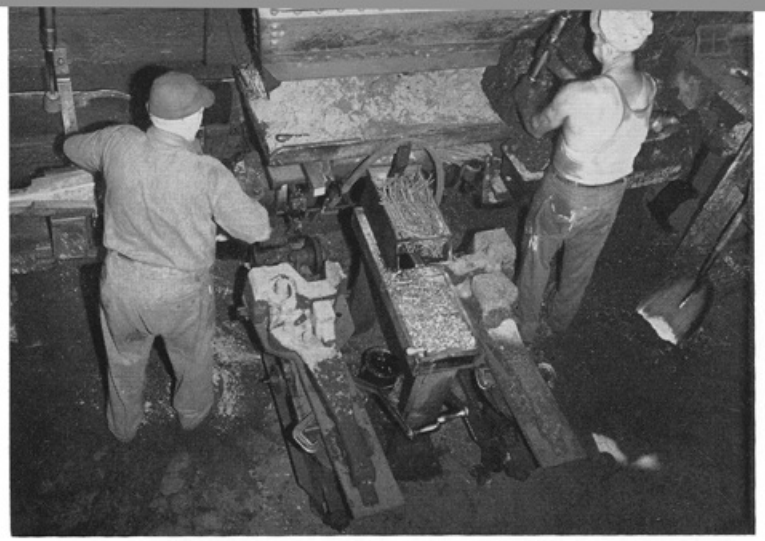
Engineering Design. A fundamental step in steel casting production.



Pattern Layout. Where Engineering Design is translated into patterns from which sand molds for castings will be made.

Looking north in the Pattern Shop, which is fully tooled to produce both wood and metal patterns, core boxes, and gages.

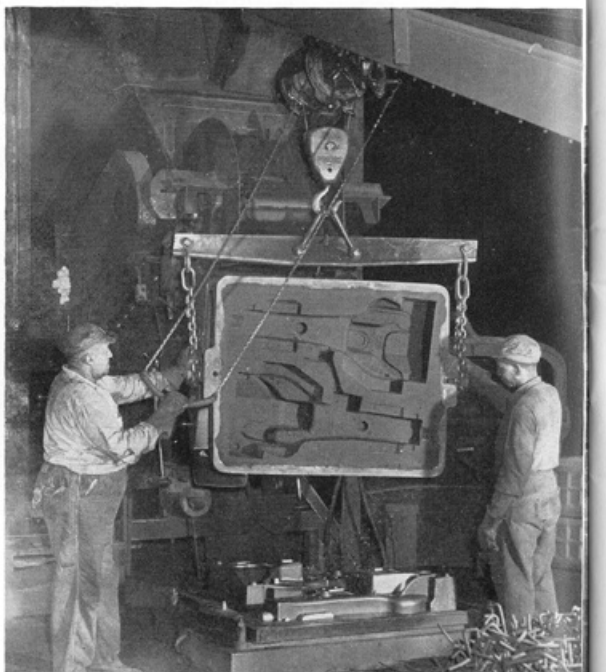
In this area of the Pattern Shop, patterns are mounted on molding machines prior to transfer to the Foundry.



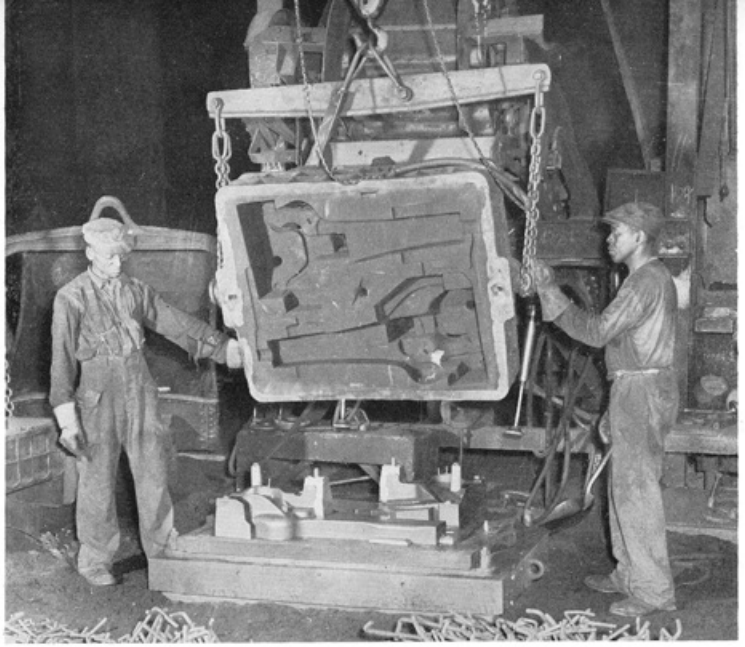
Cores play an essential part in almost all steel castings. Here we see two cores which will be placed back-to-back in a coupler mold. They will form the interior contour of the finished coupler.

Most cores are baked prior to use. This picture shows a rack of cores entering one of twenty gas-fired ovens. When baking is complete, the car and rack will be pulled from the opposite end of the oven, where the rack of baked cores will be picked up by crane and transported to the point of use.

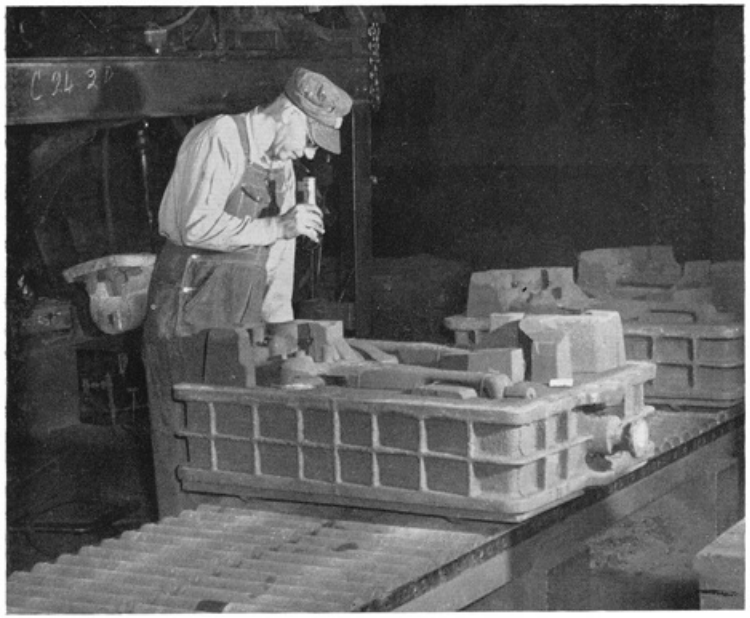
Looking west in the Transportation Bay. This extends the full length of the molding section of the Foundry. A number of loaded core racks may be seen, located adjacent to the molding stations.



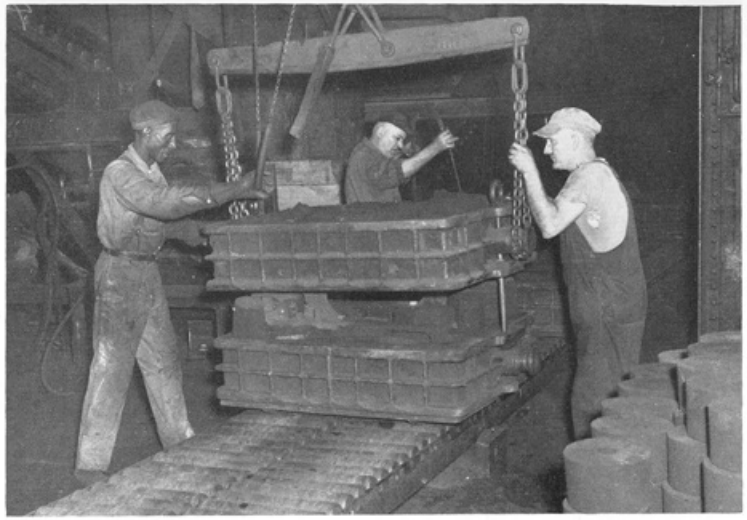
This pictures the drag—or lower half—of a coupler mold. The general outlines of the two couplers which will be cast in this mold are clearly visible. Specially prepared sand — called facing — is used at all areas which form the casting, while so-called "backup" sand is used for the balance of the mold. Ramming (packing) is accomplished by bumping the mold by means of an air cylinder and piston. The weight of the sand itself does the ramming.



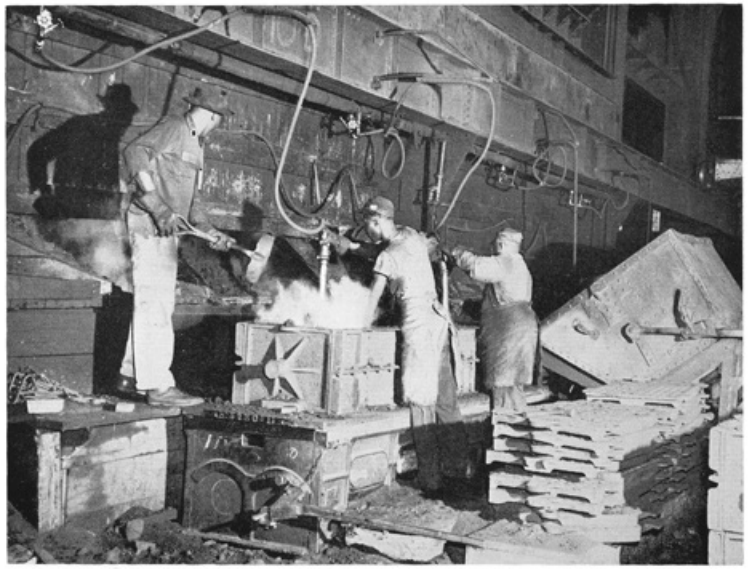
The upper part of a mold is called the cope. Here we see the cope half of a coupler mold.



Cores have now been set in the drag, and careful inspection follows.



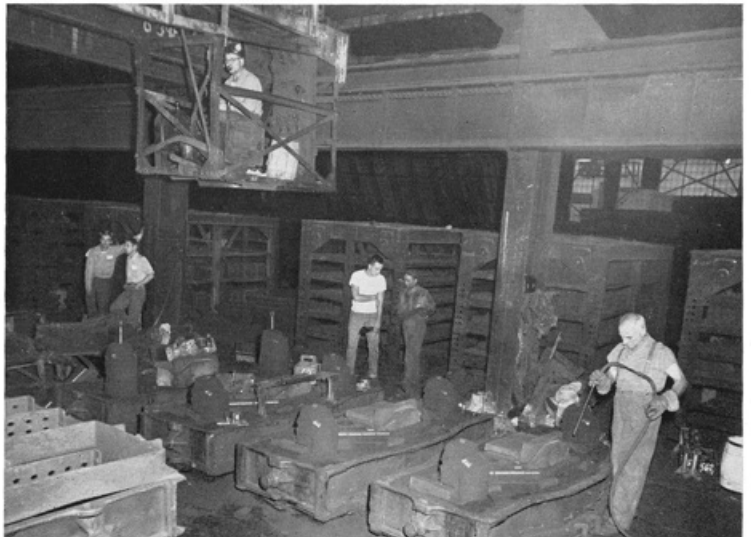
At this station the cope joins the drag to complete the mold. Clamps are applied to secure the cope to the drag and the mold is ready for transfer to the pouring floor.



Pneumatic rammers are used to pack the sand in molds such as the truck bolster drag pictured here. The outside casing or jacket is called a flask.

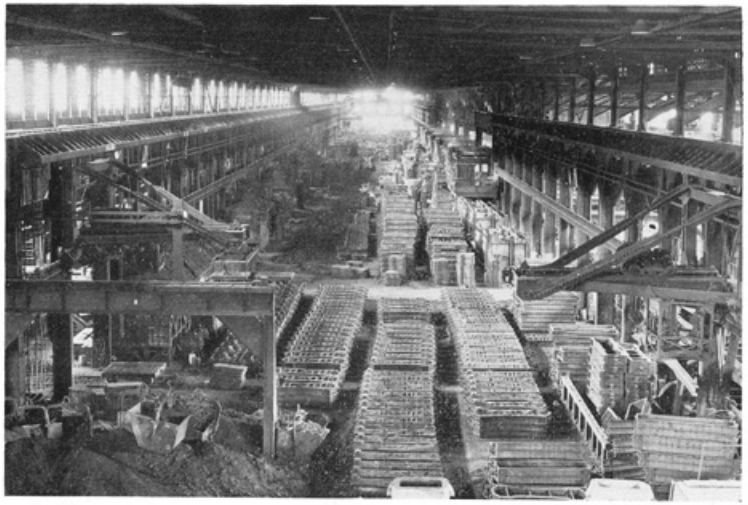
Truck side frame flask being located on pattern preparatory to filling with sand and ramming.

Truck side frame drags after setting cores.



Truck bolster drags after setting cores. A cope may be seen suspended from the crane preparatory to closing and clamping to complete the mold.

Looking west in the Pouring Bay of the Foundry. This building is 1500 feet long and is serviced by thirteen overhead cranes which range up to 60 tons lifting capacity.



Steel scrap is an essential raw material and comprises three-quarters of the furnace charge, with pig iron as the remaining one-quarter.

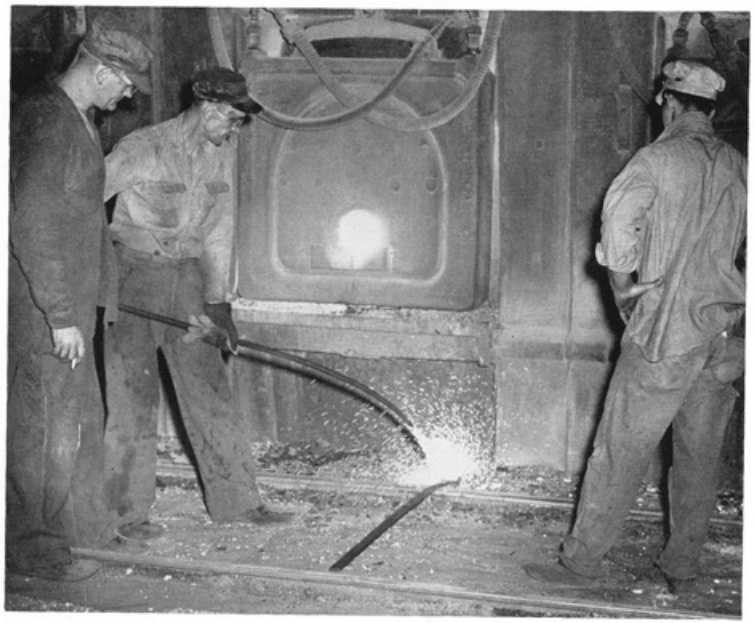
The upper photo shows a part of the scrap storage, while this picture indicates the method of loading charging boxes by magnet.

Scrap and pig iron contain impurities which must be removed by a flux or slag. Here a weighed amount of burned lime is included in the furnace charge to form the slag.

Loaded heat cars enroute to the Open Hearth Platform.

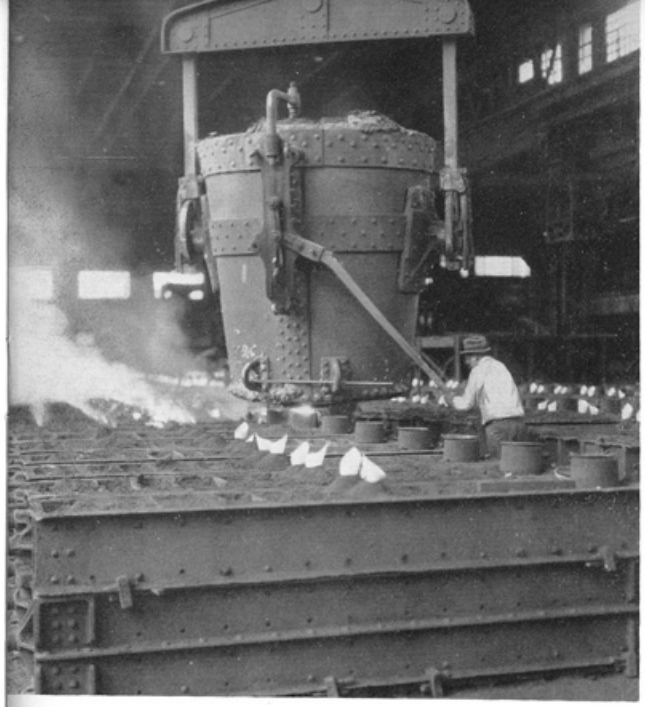
View west along the Open Hearth Platform. Six 30-ton basic furnaces are available to supply molten steel to the Foundry. Producer gas made from coal is used as melting fuel, and each 30-ton heat requires nine tons of coal for this purpose. Waste gases from the furnaces are pulled through boilers and the resulting steam supplies a part of our electric and compressed air power requirements.

Charging scrap into one of the melting furnaces. Six hours are normally required to charge, melt, refine, and tap a heat of steel.

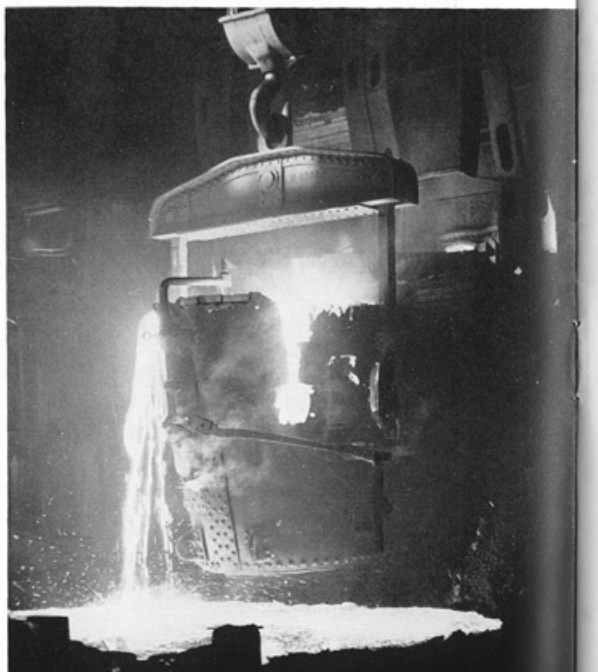


Frequent tests are made during the refining period. One or more will be analyzed in the Laboratory, before final alloy additions are made.

Tapping a heat. This view is on the Foundry side of the furnace and we see 30 tons of molten steel starting to flow from the tap-hole into the ladle. Temperature of the molten steel is close to 3000 degrees.

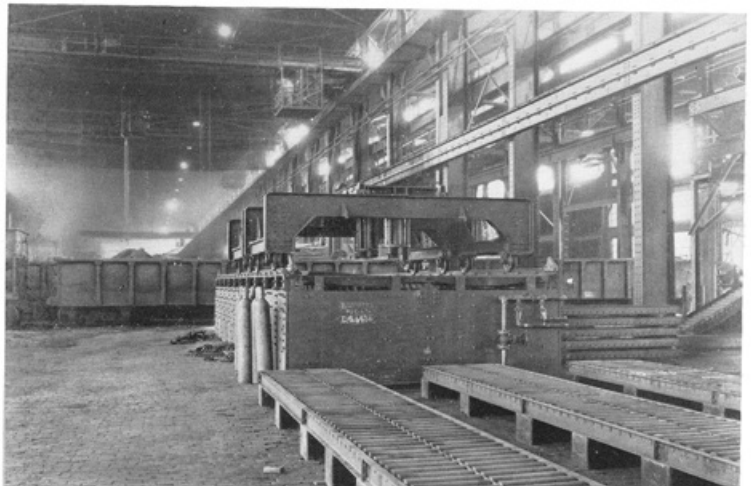


Pouring Molds. The steel flows through a fire-clay nozzle in the bottom of the ladle. The stream is opened or shut off by a stopper consisting of a steel rod protected by refractory sleeves and tipped with a graphite head which contacts the nozzle. This photo shows how the stopper is raised and lowered by an outside lever.

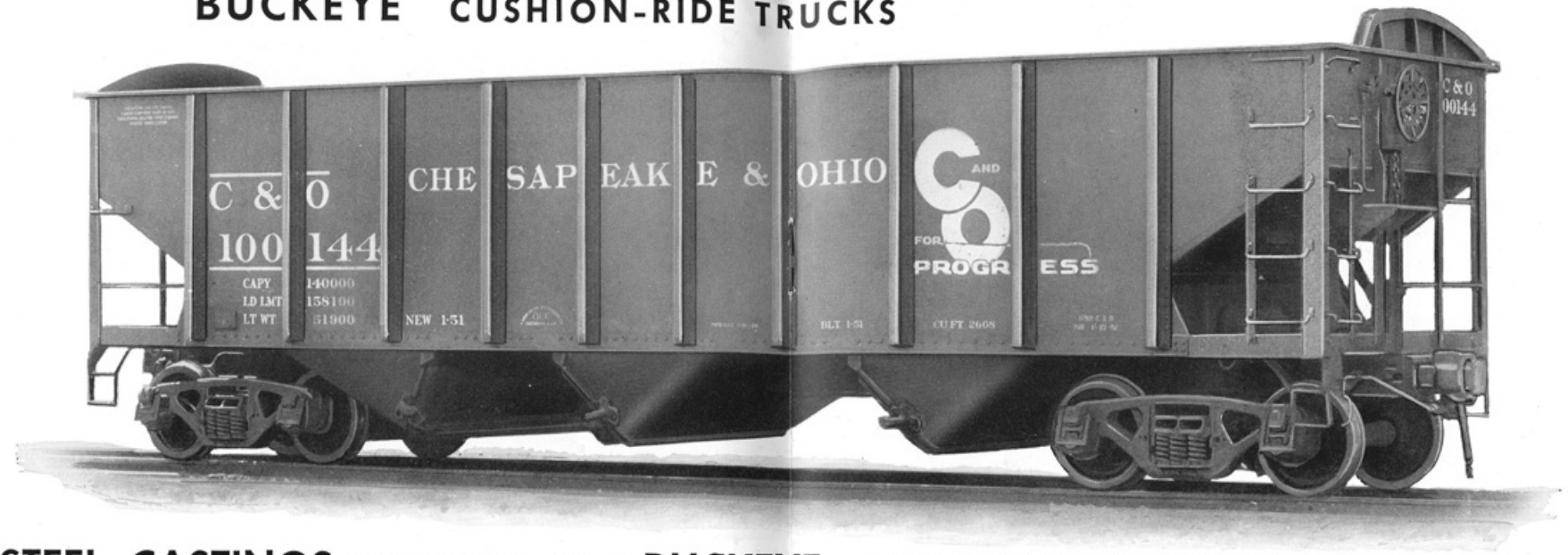


All of the steel is now in the ladle, and white-hot slag overflows into the pit. A blanket of slag remains over the steel in the ladle to serve as insulation while the heat is poured.

When castings have cooled after pouring, the copes are removed and taken to this shake-out, where the sand is removed by vibrators and falls into a hopper, which is part of the sand conditioning system. Castings are then removed and drags are shaken out in the same manner.



MODERN 70-TON HOPPER CAR - EQUIPPED WITH BUCKEYE CUSHION-RIDE TRUCKS



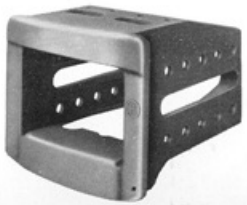
STEEL CASTINGS PRODUCED BY BUCKEYE FOR CONSTRUCTION OF THIS TYPE CAR

C-R TRUCK SIDE FRAME
(4 PER CAR)

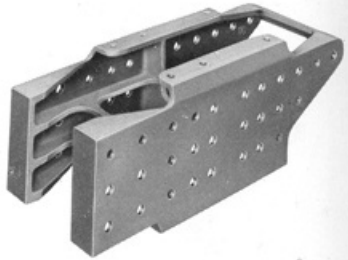
HOPPER DOOR FRAME
(6 PER CAR)

C-R TRUCK BOLSTER
(2 PER CAR)

FRICTION WEDGE BLOCK
(8 PER CAR)



STRIKING CASTING
(2 PER CAR)

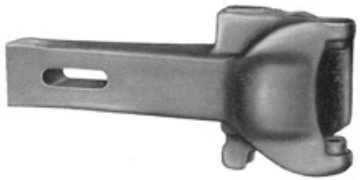


BOLSTER CENTER FILLER
(2 PER CAR)

DRAFT YOKE
(2 PER CAR)

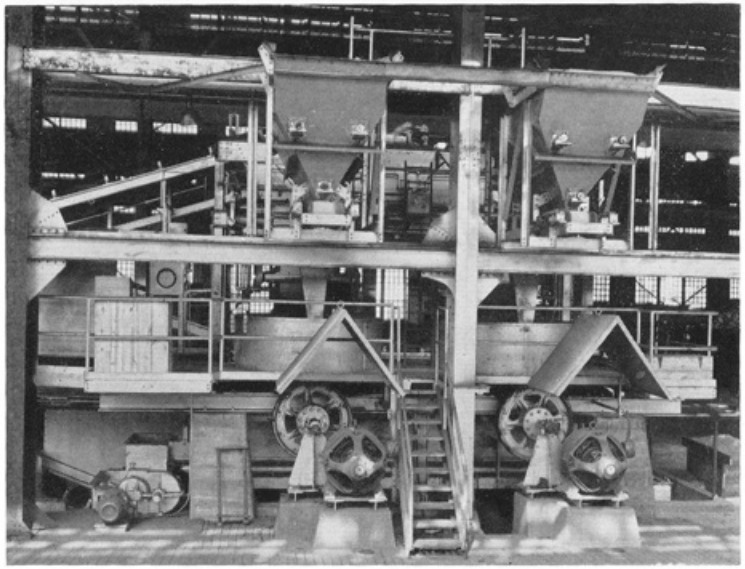
COUPLER KNUCKLE
(2 PER CAR)

KNUCKLE LOCK
(2 PER CAR)

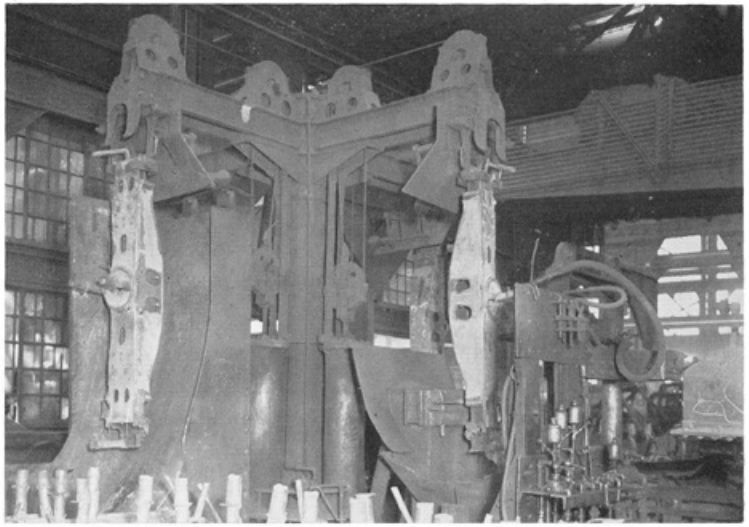


COUPLER BODY
(2 PER CAR)

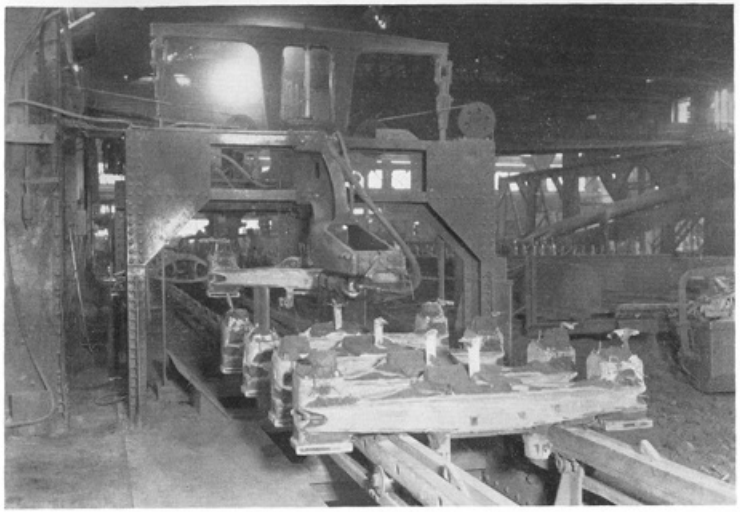
KNUCKLE THROWER
(2 PER CAR)



Sand from the shake-out hopper is cleaned and re-mixed in the automatic mills and contingent equipment pictured here, and then re-enters the molding cycle.



This unit, known as a Bolster Slogger, was developed by BUCKEYE to remove core sand by use of a pneumatic hammer.



This special equipment was designed by BUCKEYE to remove cores from truck side frames. It also employs a pneumatic hammer similar to the Bolster Slogger.

Looking north in the Frame Finishing Building. This is directly connected to the Foundry at the far end, and is 1250 feet long. Truck side frames in the foreground are ready for final inspection and gaging.

Bolster Finishing Bay. This adjoins the Frame Finishing which may be seen on the left. Heat treating equipment in the Frame and Bolster Finishing Department includes nine car type annealing furnaces and two quench tanks. Either of these tanks could serve as a family size swimming pool — far too deep for wading, however.

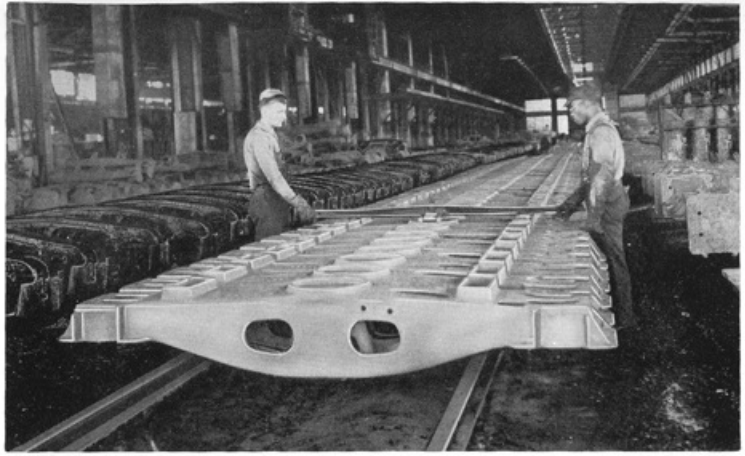
Continuous Shot Blast. Castings are conveyed on an endless chain through an enclosure where high velocity streams of shot remove adhering sand and scale. Compressed air propels the shot through nozzles which are entirely controlled and directed from outside the enclosure.

Chipping Truck Side Frames. Air-hammers using hardened steel chisels are used in this important finishing operation.

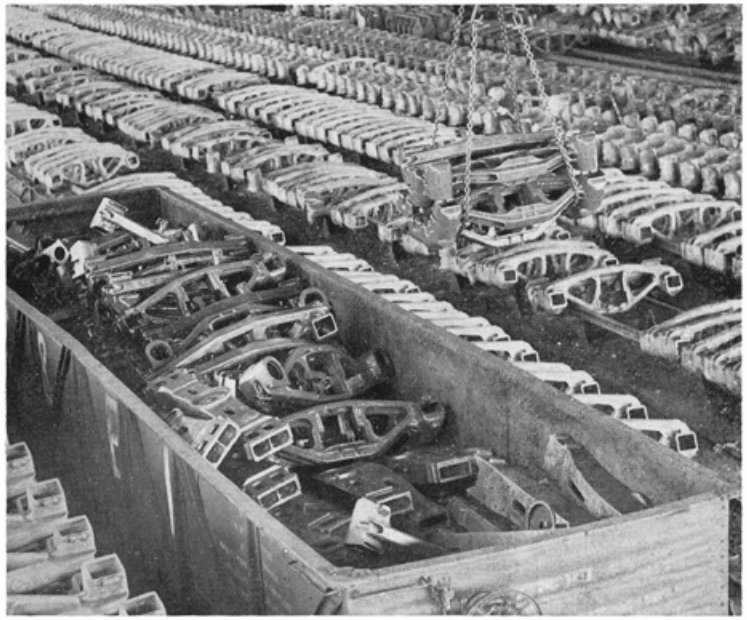
Grinding Bolster. Various types of grinders are used to smooth objectionable rough spots.

Welding surface imperfection on brake-hanger of truck side frame.

Gaging Side Frame to meet strict dimensional specifications and insure proper alignment when the frame becomes a part of a freight car truck.



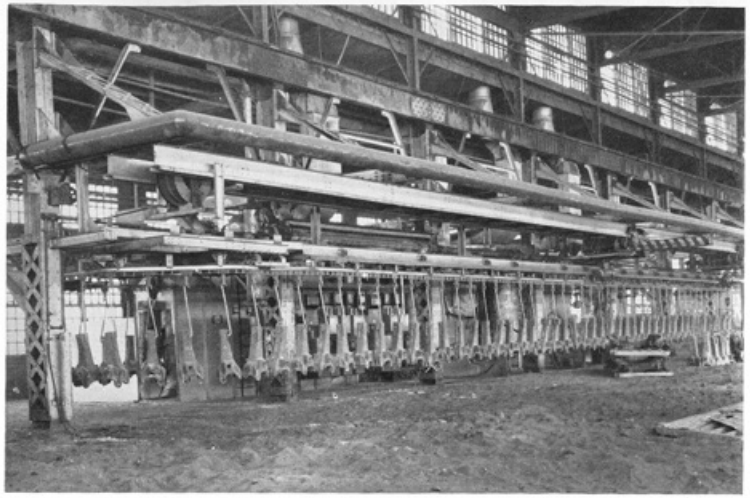
Gaging Truck Bolster.



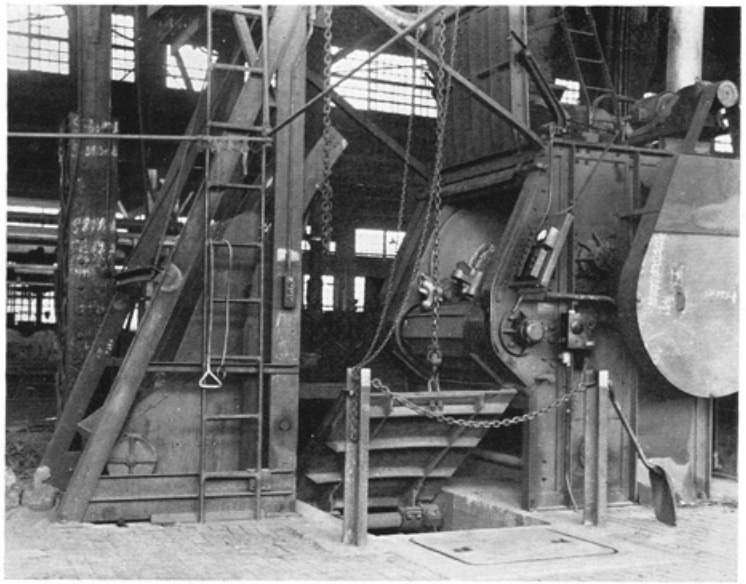
Loading car of truck side frames and bolsters for shipment.

Looking south in Coupler Building. While couplers and draft yokes comprise the largest tonnage finished in this building, many other types of medium and small castings are cleaned and finished here.

Here we see an annealer load of coupler bodies which have just been taken out of the furnace in the immediate background.



Shot Blast — essentially a duplicate of the installation described in connection with Frame and Bolster Finishing.



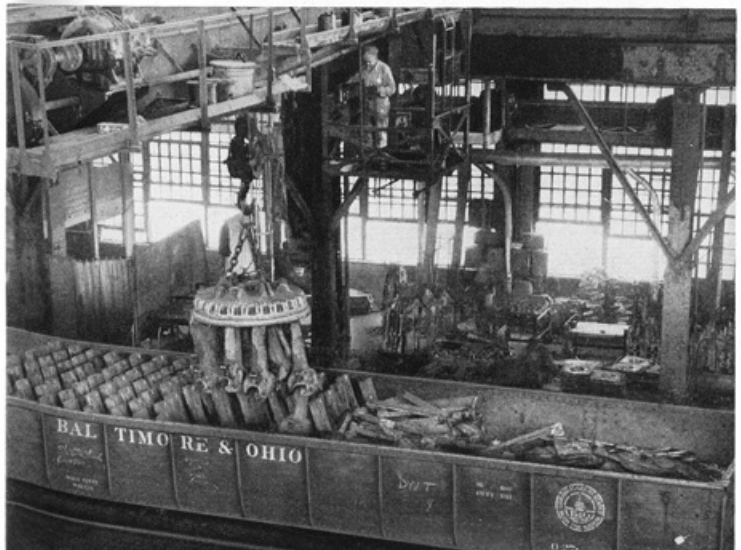
Wheelabrator — Used for shot-cleaning small castings inside a revolving drum. In this machine the steel shot are mechanically thrown, rather than propelled by air pressure as in the case of the Shot Blast.

Fitting Coupler. — In this operation the knuckle, lock, thrower, pin, and operating linkage are assembled into the coupler body, and tested for proper operation.

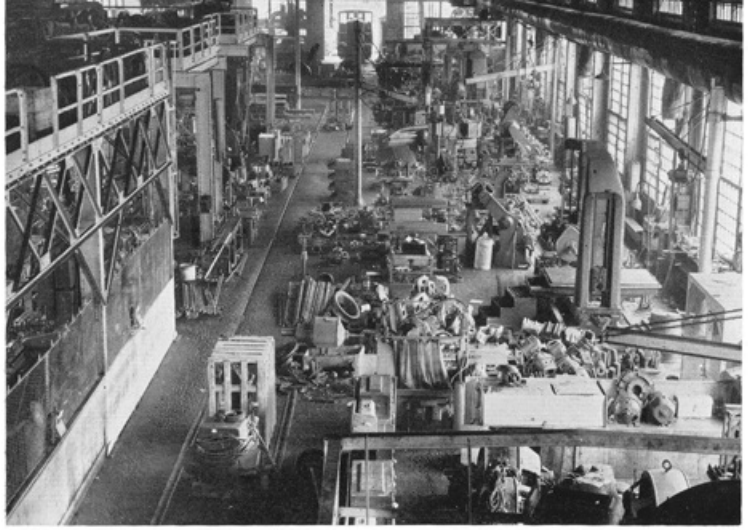
Gaging Draft Yokes.

A section of the Shipping Platform showing couplers and various draft castings awaiting shipment.

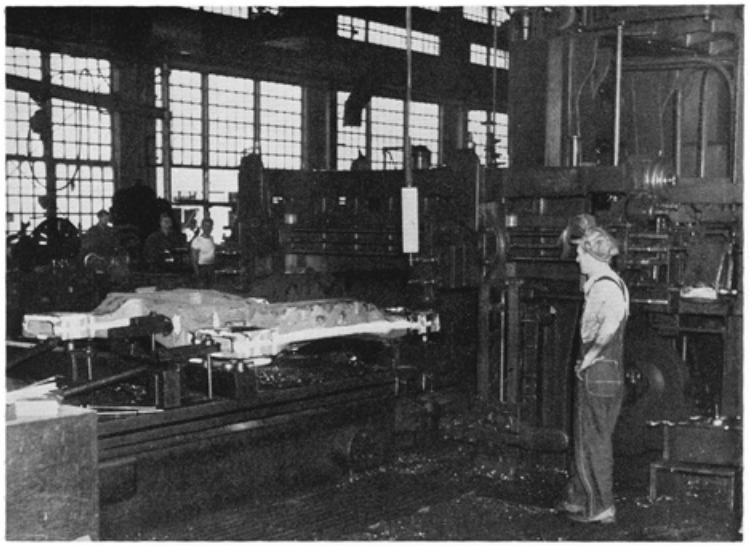
Another section of the Shipping Platform — practically a solid mass of couplers ready for shipment.



Loading couplers for shipment.



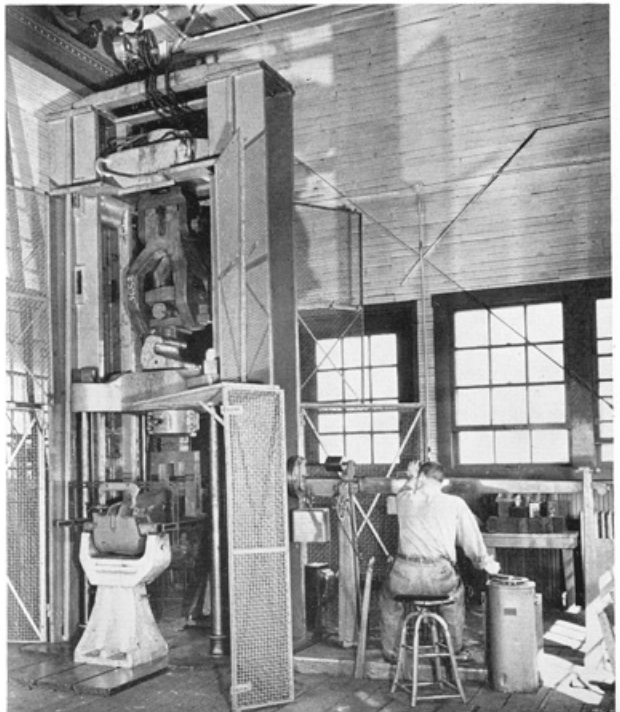
Looking south in Machine Shop. Mechanical and electrical maintenance for the Plant are centered here, together with a considerable volume of production machining.



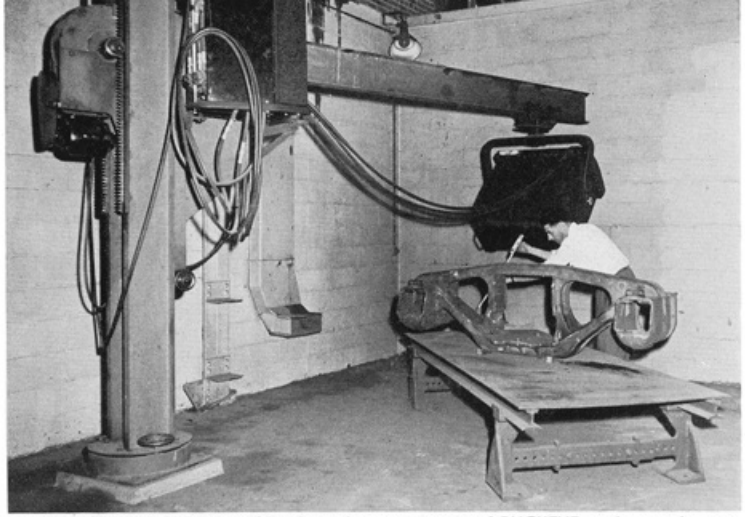
The Unit Bolster being machined in this planer will see service in South Africa as part of a locomotive six-wheel tender truck. Outstanding service records of six and eight-wheel trucks of BUCKEYE design and manufacture have led to wide distribution both here and abroad, wherever extremely heavy loads must be carried safely and reliably at high speeds.

Castings leave the Plant enroute to the car builder.

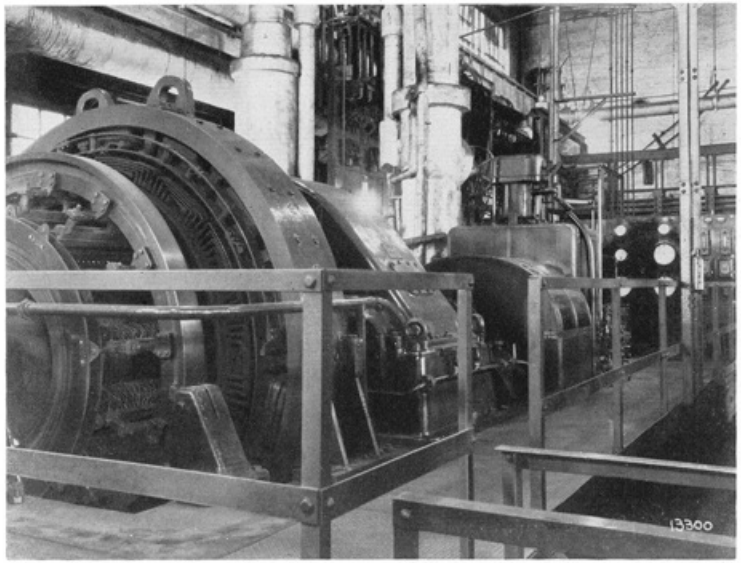
The building on the left houses a Test Machine in which full size sample or production castings are regularly tested.



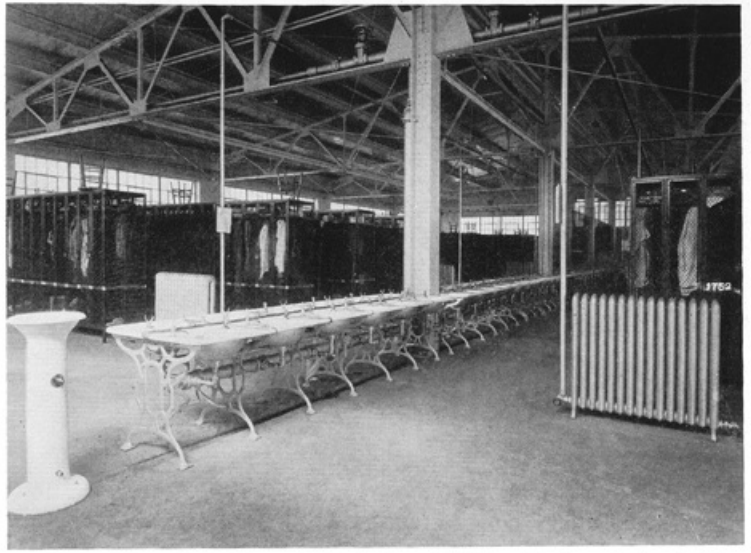
Here we see a Truck Side Frame undergoing test. A load of 1,000,000 lb. can be applied in this machine, either in compression or tension. Side Frames, Bolsters, Couplers, Knuckles, and Yokes are regularly tested to destruction to insure a high factor of safety over shocks and loads encountered in service.



This 250,000 volt X-Ray machine is an important part of BUCKEYE testing equipment. It can "see" through 2½ inches of steel and records its findings on photographic films.



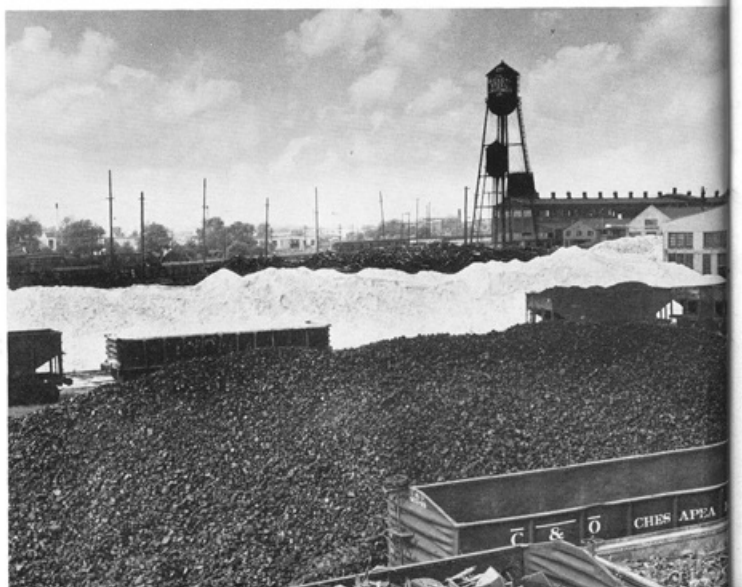
Steam Turbo-Generator. One of several units in the Power House which supply electric current for plant operation. Compressed air, another major power requirement, is furnished by large air compressors. Coal-fired boilers supply 80% of the necessary steam, consuming between 2500 and 3000 tons of steam coal per month; while waste heat from the open hearth furnace stacks accounts for the remaining 20%.



A view in the Main Locker and Wash Room Building. Equipment also includes adequate shower bath facilities.

A section of the Plant Dispensary. Trained professional personnel are on duty day and night in this necessary adjunct to any modern manufacturing plant. Facilities include the latest developments in medical technology and equipment.

Water Softening Plant. In an average year BUCKEYE uses around 150,000,000 gallons of water, drawn from its own wells. Over two-thirds of this water is softened and otherwise treated in the facilities pictured here.



Raw materials for steel casting manufacture — fuel, silica sand, scrap. Large stocks are maintained at all times, which insure continuous production and employment.

THE BUCKEYE STEEL CASTINGS COMPANY

2211 PARSONS AVENUE

COLUMBUS, OHIO

Officers:	John H. McCoy	Chairman of the Board
	F. H. Bonnet	President & General Manager
	R. C. O'Kane	Vice President
	W. W. Matchneer	Vice President
	W. J. Bennett	Vice Pres., Secretary & Treasurer

Directors: F. H. Bonnet
Alexander C. Brown
John W. Galbreath
George T. Johnson
John H. McCoy
R. C. O'Kane
William P. Tracy

PRINTED IN U.S.A.