

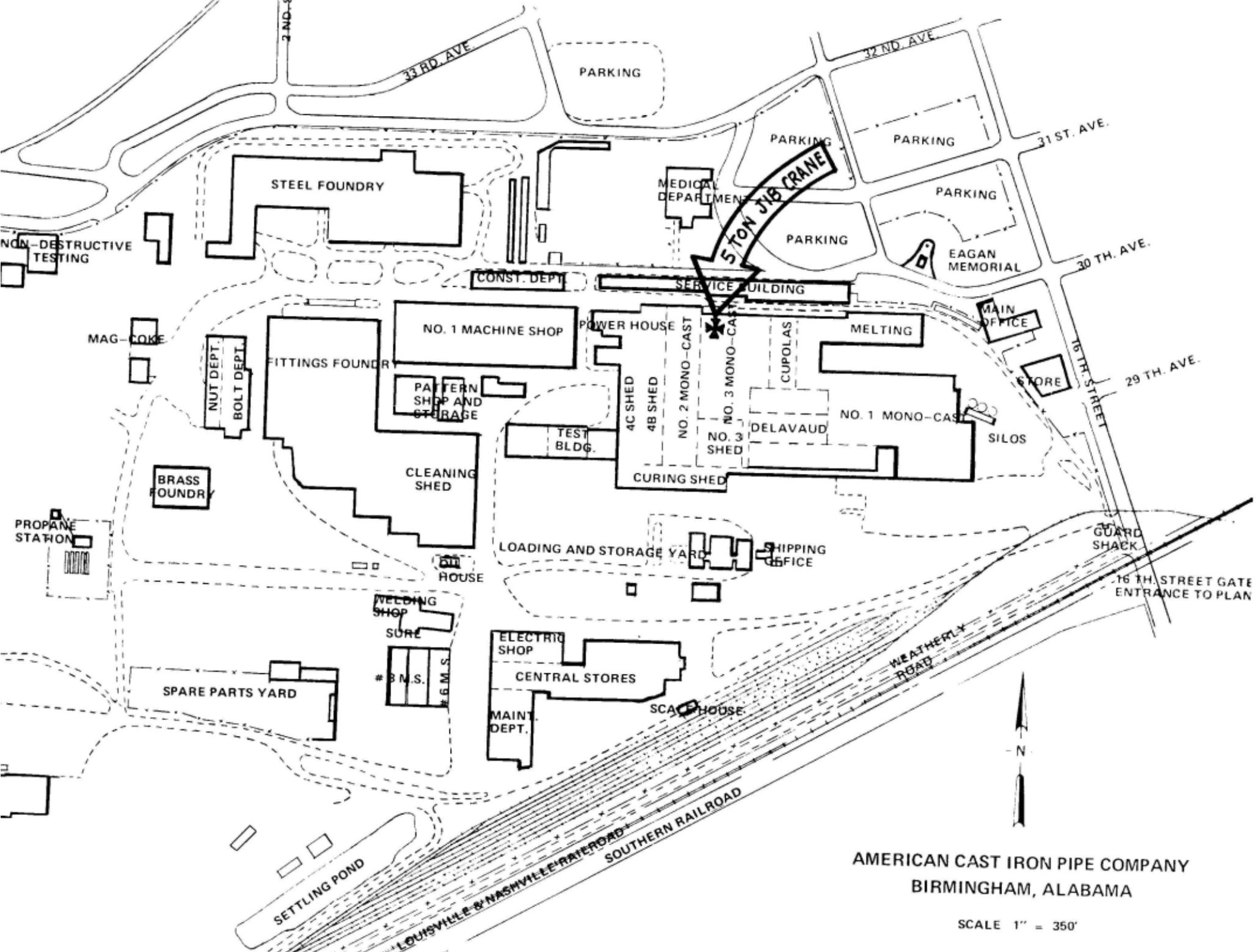
# National Historic Mechanical Engineering Landmark

## 5-ton "Pit Cast" Jib Crane

Thursday, March 31, 1977  
Birmingham, Alabama



The American Society of Mechanical Engineers



AMERICAN CAST IRON PIPE COMPANY  
 BIRMINGHAM, ALABAMA

SCALE 1" = 350'

## THE FIVE TON "PIT-CAST" JIB CRANE

Bored logs were used for water mains in the United States up to the beginning of the 19th century.

In 1804, Philadelphia installed the first cast iron water mains. Excavations of these early installations of cast iron pipe reveal them to be in practically perfect condition.

In 1815 to 1817, the gas industry was started. Installations of cast iron gas mains were made almost simultaneously in Baltimore, Boston, New York, Louisville and Philadelphia.

Cast iron pipe used in these early water and gas systems were imported from abroad.

The first major casting of pipe in America took place at an iron furnace at the Weymouth Furnace on Great Egg Harbor River in New Jersey in 1819. It was the real beginning of the cast iron pipe industry in this country.

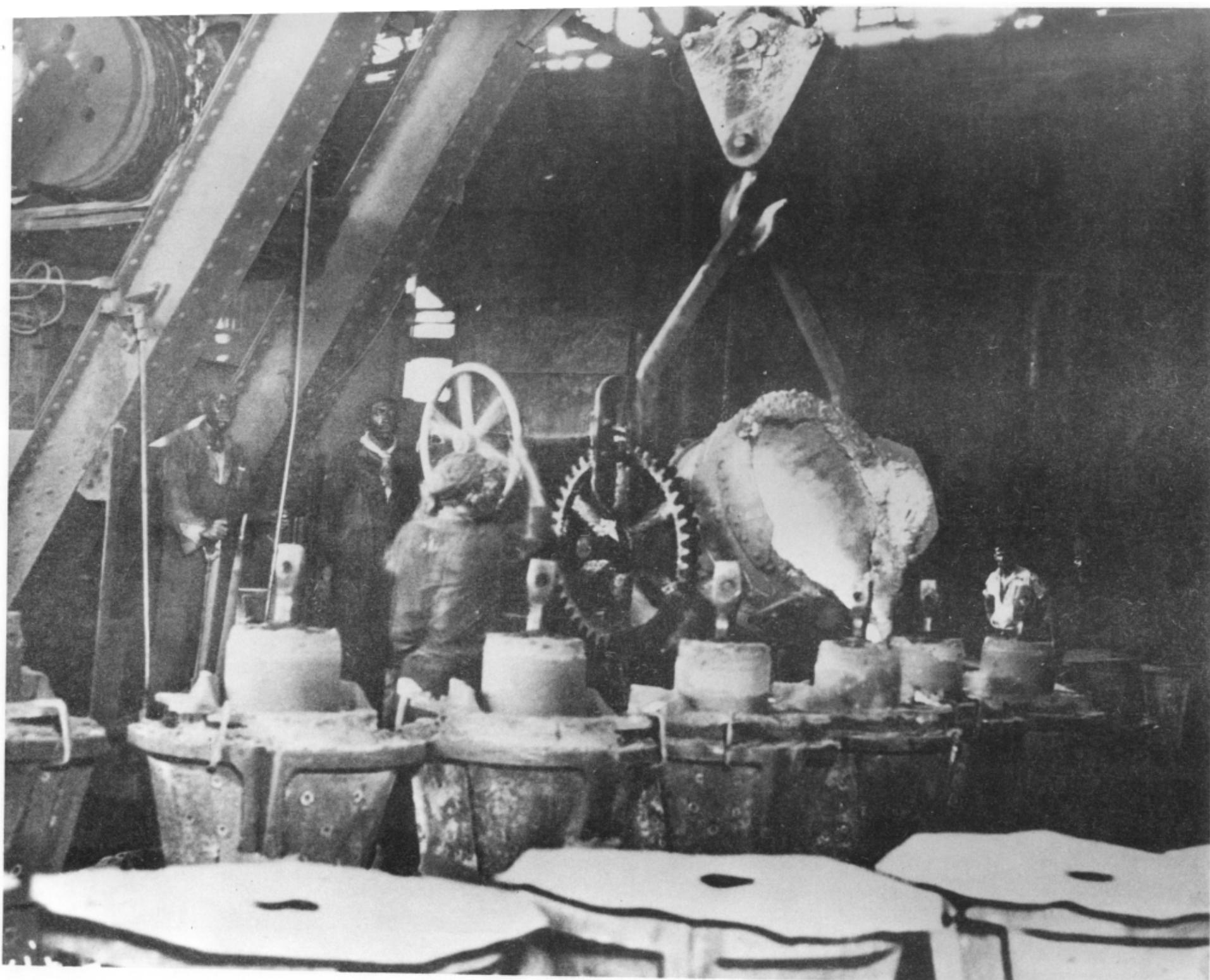
The first American pipe foundry, built solely for the purpose of making cast iron pipe, was constructed in 1834, in the town of Millville, New Jersey, although cast iron pipe had been made at the Millville iron furnace since about 1825. This first cast iron pipe was cast horizontally in 6-foot or 9-foot lengths, in green sand molds, using dry sand cores. The vertical dry sand (pit-cast) system gained favor as a method of producing cast iron pipe after 1850.

The American Cast Iron Pipe Company was incorporated and charter granted October 9, 1905. John J. Eagan was the first president. The operation of the new company featured production of pipe by the "pit-cast" method.

Plant operations began in 1906 with the production of 6", 8", 10" and 12" pit-cast pipe, 12-foot lengths, and fittings. The first cast was made on May 12, 1906, and the first carload of 6" pipe was shipped on May 19, 1906 to Atlanta Water Works, Atlanta, Georgia.

During construction of original plant facilities at Birmingham, Alabama in 1905-06, six jib cranes were installed for the production of cast iron pipe by the "pit-cast" method. These cranes were purchased from the Alliance Machine Company, Alliance, Ohio, and the Cleveland Crane and Car Co., Cleveland, Ohio.

The installation of these jib cranes at ACIPCO made them among the first to employ electric motors to power this type of equipment. Previously, jib cranes used in this method of pipe production were either manually operated, or operated by hydraulic cylinders making them slow and cumbersome. There is only one of these jib cranes remaining at ACIPCO now, and, although it is no longer used for the "pit-cast" process, it is probably the only remaining "pit-cast" jib crane



Part of the pit casting process

still in operation in the nation. It is a relic of the past located in the same spot and with very few modifications from the way it was constructed seventy-one years ago.

ACIPCO utilized D.C. electric motors to mechanize the hoisting, booming and swing actions of these jib cranes. The brakes, however, that controlled those actions were originally mechanical. Later, air brakes were installed, and still later electric brakes were utilized.

The cranes were operated in pairs, back to back, each serving a pit about twenty-five feet in depth. Pipe molds were placed vertically in the pits, lined with sand, and fitted with a core to form the interior of the pipe. After the pipe had been poured the mold was opened and the pipe extracted and removed from the pit, and the process repeated. The jib crane was the workhorse and key piece of machinery that made this process possible.

The jib crane itself is a mechanical marvel. The frame is a box girder design of riveted steel construction. There is a vertical pivoted mast and a horizontal swinging boom. These are joined together by diagonal brackets.

The forged steel crane hook is supported by a four-wheeled trolley car that rides on top of the horizontal boom. The trolley car is actuated back and forth on the boom by a heavy chain that passes over idler sprockets to a chain drum mounted on the vertical mast. This drum is actuated by gearing which is driven by an electric motor.

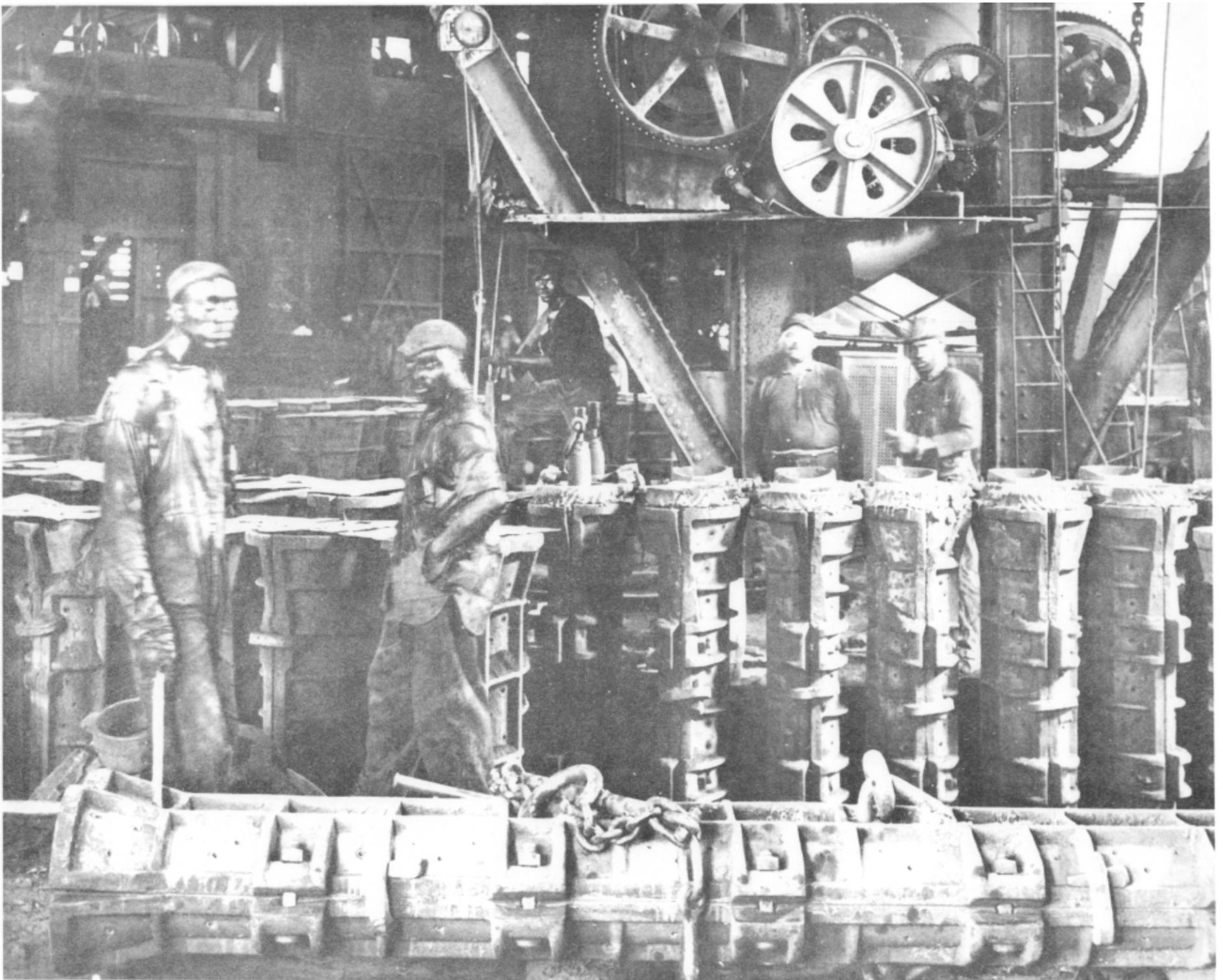
Hoisting is accomplished similarly by having a heavy chain, which is dead ended at the outer end of the boom, pass over a series of sprockets mounted on the trolley car in such a way as to allow vertical movement of the hook. The other end of the hoisting chain also passes over idler sprockets to a second chain drum mounted on the vertical mast. This drum also is actuated by gearing which is driven by an electric motor.

An unusual feature of this jib crane is that the load can be moved in and out freely without any change in hook elevation, since, as the trolley moves along the horizontal boom, the hoisting chain passes freely over and under the hoisting sheaves without changing hook elevation.

The swinging action of the boom is accomplished by a shafting arrangement and a ring gear which is fixed at the top pivot of the mast. By the use of spur and bevel gearing power is transmitted through shafting from a third electric motor mounted on the mast to a pinion gear which travels around the ring gear at the top. A full circle of motion is possible with this arrangement.

As previously mentioned, six of these jib cranes were installed in 1905 for the "pit-cast" method of producing cast iron pipe. When the centrifugal method of producing cast iron pipe was introduced at ACIPCO in the twenties the old pits were filled up and the jib cranes were put to other uses, such as production of cast iron fittings, service and storage work, and general maintenance work.

One by one, as methods changed, and other equipment was installed, these old workhorse jib cranes were removed until today there is only one left in

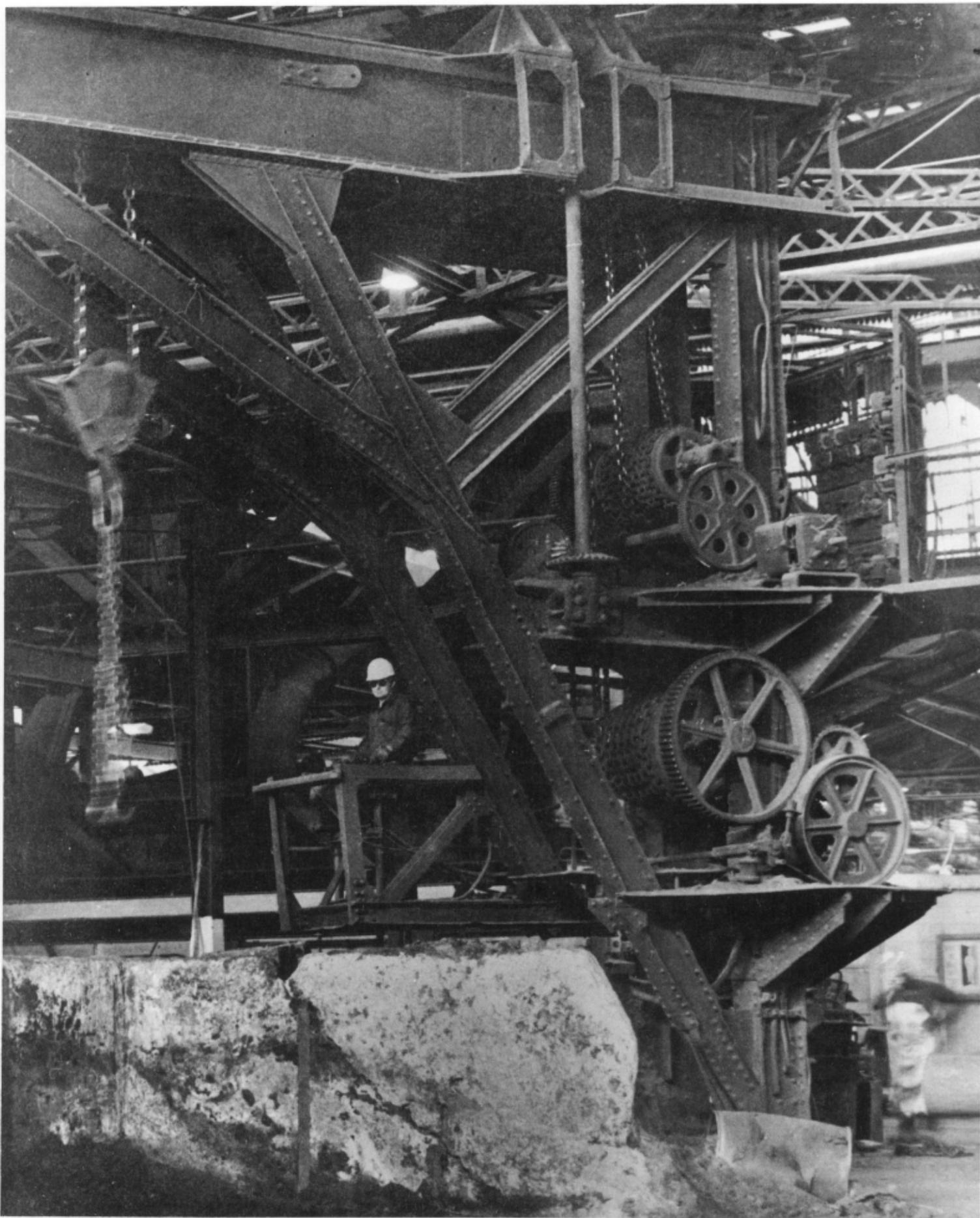


During the early days of the crane's operation.

service. It is now used as a general purpose service crane.

The significant thing, however, about this honorable old piece of machinery is that it has been in constant service at ACIPCO since 1905.

The contribution that this "pit-cast" jib crane has made toward the development of the nation would be incalculable. Untold miles of pressure pipe have been produced by its operation that have provided fresh water and/or sewage disposal for cities and towns all over America, speeding their growth and enhancing the quality of life of their citizens.



The crane as it is used today, in general service