

COPPER



BERTRAM B. CADDLE

SECRETARY
COPPER AND BRASS
RESEARCH ASSOCIATION
420 LEXINGTON AVE., NEW YORK

Photographic Souvenir
of the
COPPER & BRASS INDUSTRY EXHIBIT
at the
New York World's Fair 1939
Metals Building

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COPPER

COPPER & BRASS INDUSTRY EXHIBIT

MINING & METALLURGY COMPANIES

AMERICAN METAL COMPANY, LTD.
AMERICAN SMELTING & REFINING COMPANY
ALABAMA COPPER MINING COMPANY
COLUMBIA & MISSOURI COPPER COMPANY
COLUMBIAN COPPER INDUSTRIES CORPORATION
COPPER STATE COMPANY
KEMNITT COPPER CORPORATION
MAINE COPPER COMPANY
PACIFIC COPPER CORPORATION

WIRE & CABLE COMPANIES

AMMOCHA WIRE & CABLE COMPANY
COPPERWIRE WIRE COMPANY
GOSWALD CABLE CORPORATION
EDMUNDT WIRE & CABLE COMPANY
PHELPS DODGE COPPER PRODUCTS CORPORATION

COPPER & BRASS FABRICATORS

THE AMERICAN BRASS COMPANY
BROOKHURST BRASS COMPANY
CLARK BRASS & COPPER CO., INCORPORATED
C. G. HERRY & COMPANY
THE MILLER COMPANY
NATIONAL BRASS & COPPER COMPANY, INC.
MILLER BRASS CO.
THE NEW HAVEN COPPER CO.
PHELPS DODGE COPPER PRODUCTS CORPORATION
RE COPPER AND BRASS INCORPORATED
THE AVONING BRASS COMPANY
ROYAL MANUFACTURING COMPANY
THE TITANUM MANUFACTURING CO.
WOLVERINE TUBE CO.

COPPER & BRASS INDUSTRY EXHIBIT

MINING & SMELTING COMPANIES

AMERICAN METAL COMPANY, LTD.
AMERICAN SMELTING & REFINING COMPANY
ANACONDA COPPER MINING COMPANY
CALUMET & HECLA CONSOLIDATED COPPER COMPANY
CONSOLIDATED COPPERMINES CORPORATION
COPPER RANGE COMPANY
KENNECOTT COPPER CORPORATION
MIAMI COPPER COMPANY
PHELPS DODGE CORPORATION

WIRE & CABLE COMPANIES

ANACONDA WIRE & CABLE COMPANY
COPPERWELD STEEL COMPANY
GENERAL CABLE CORPORATION
KENNECOTT WIRE & CABLE COMPANY
PHELPS DODGE COPPER PRODUCTS CORPORATION

COPPER & BRASS FABRICATORS

THE AMERICAN BRASS COMPANY
BRIDGEPORT BRASS COMPANY
CHASE BRASS & COPPER CO., INCORPORATED
C. G. HUSSEY & COMPANY
THE MILLER COMPANY
MUELLER BRASS CO.
NATIONAL BRASS & COPPER COMPANY, INC.
THE NEW HAVEN COPPER CO.
PHELPS DODGE COPPER PRODUCTS CORPORATION
REVERE COPPER AND BRASS INCORPORATED
THE RIVERSIDE METAL COMPANY
SCOVILL MANUFACTURING COMPANY
THE SEYMOUR MANUFACTURING CO.
WOLVERINE TUBE CO.

According to historians copper was discovered by a tall savage tribe on the island of Cyprus off the Greek Coast. The people named this wild metal CYPRIAN in honor of their island home. Roman conquerors changed this name to "aes cuprum" which was gradually shortened to "cuprum" from which will derive the word "copper" and its chemical symbol, "Cu".

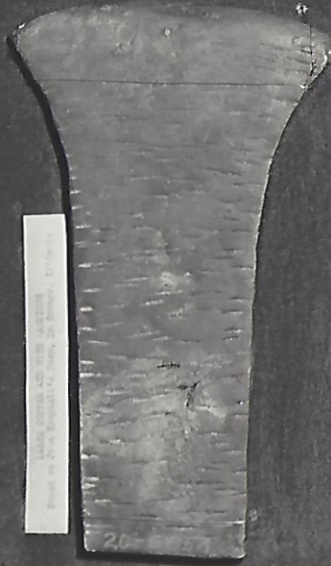


Copper played an important part in the life of the American Indians long before Christopher Columbus discovered the New World

Point of Arrowhead, New York



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Point of Arrowhead, New York



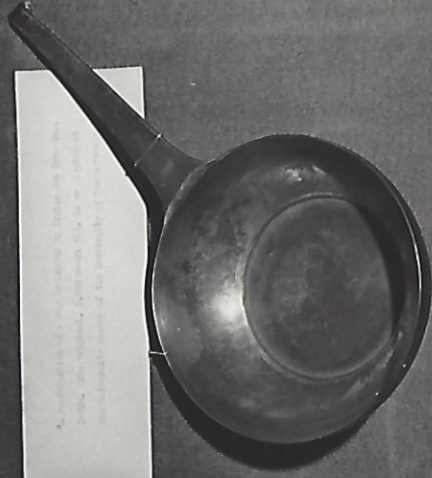
Point of Arrowhead, New York



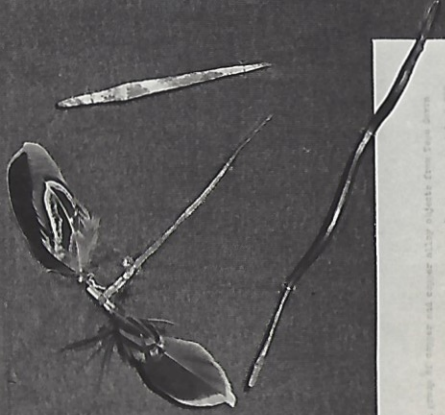
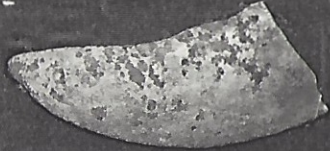
Point of Arrowhead, New York



Point of Arrowhead, New York



A group of copper and silver objects from the same four sources (see list of sources) and approximately 100 years old. In the foreground are a knife, a spear point, a small arrowhead, and a piece of a knife. In the background are a small arrowhead, a small knife, and a small spear point. These are the same objects as those shown in the illustration of the illustration of the illustration.



CASTING BRONZE DOOR FOR THE GREAT TEMPLE OF KARNAK, IN ANCIENT EGYPT



Over a long period of time in ancient Egypt a number of temples, halls and monuments were built on the site of the ancient city of Thebes on the eastern bank of the Nile. About 2700 B.C. the first temple was begun by Useratesen I, and extensive additions were made by Thothmes I and III. It was probably in the construction of the great temple of Amen, built by Ramses III, that the first bronze doors were cast. These are now known throughout the world as the famous bronze doors of the "Temple of Karnak".

PERSEUS HOLDING THE HEAD OF MEDUSA,
BY BENVENUTO CELLINI. 16TH CENTURY



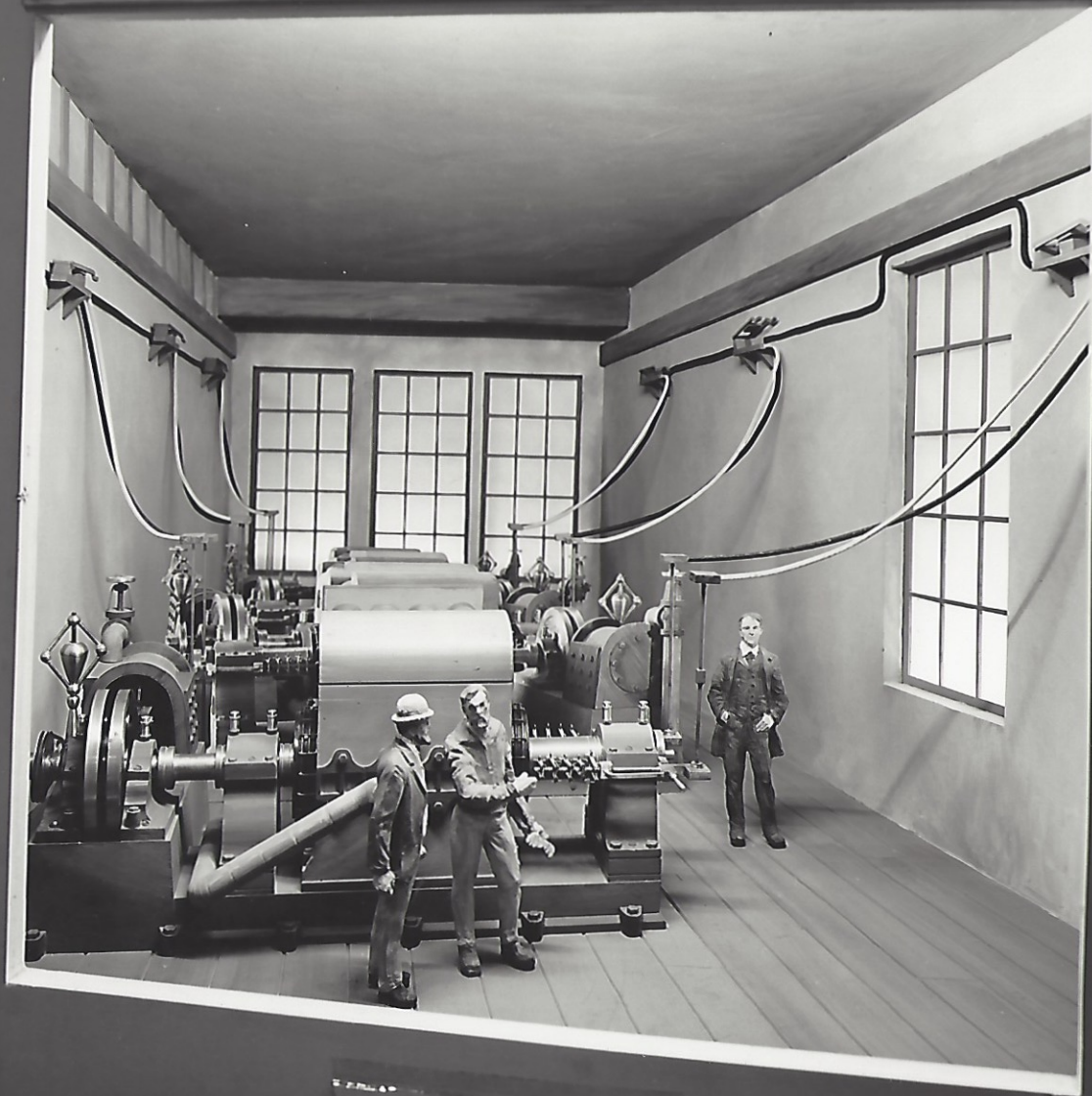
Benvenuto Cellini, famous Italian sculptor, in the 16th century cast a statue showing Perseus holding the head of Medusa. Legend says that Cellini was short of copper and made up the shortage by adding his pewter cooking utensils. He thus added tin to the copper and accidentally produced a very superior bronze.

1831 - THE FIRST BRASS CRAFTSMEN WERE SMUGGLED IN BARRELS FROM ENGLAND INTO AMERICA. IT WAS A VIOLATION OF ENGLISH LAWS FOR THESE WORKMEN TO LEAVE THE COUNTRY



In 1831 the first brass craftsmen were smuggled in barrels from England into America. English laws prevented these workmen from leaving the country but such laws did not prevent America's infant industry from importing English workmen.

FIRST ELECTRIC POWER STATION IN THE WORLD
PEARL STREET, NEW YORK CITY. 1882.



Electric power became available for lighting in 1878 when Edison perfected the incandescent bulb, with a carbon filament. On the 4th day of September 1882, the world's first central power station was constructed by Edison at Pearl Street, New York City.



UNDERGROUND METHOD OF COPPER MINING



This illustrates deep copper mining in the United States. Deposits of copper are often found at a depth of a mile or more. The ore is hoisted to the surface in elevators known as skips. The time it takes to travel and back to the surface is about 10 minutes.

SPECIMENS OF COPPER ORE FROM THE COPPER MINES OF THE GREAT SOUTHWEST OF THE UNITED STATES

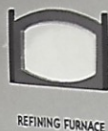




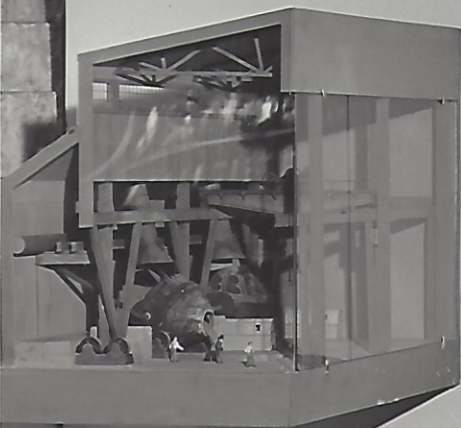
METHOD OF OPEN CUT OR SURFACE COPPER MINING

This model shows the typical
method of open cut or surface
mining. It illustrates the
various stages of the process,
from the initial excavation to
the final extraction of the
ore.

ORE TO



METAL



COPPER ALLOYS

The principal natural characteristics of COPPER are durability-excellent electrical conductivity-high thermal conductivity-workability-red color. These can be changed by alloying copper with other metals.

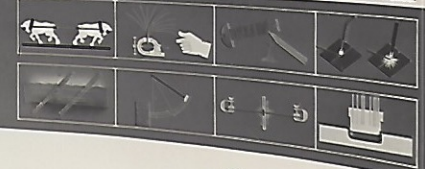
FOR EXAMPLE

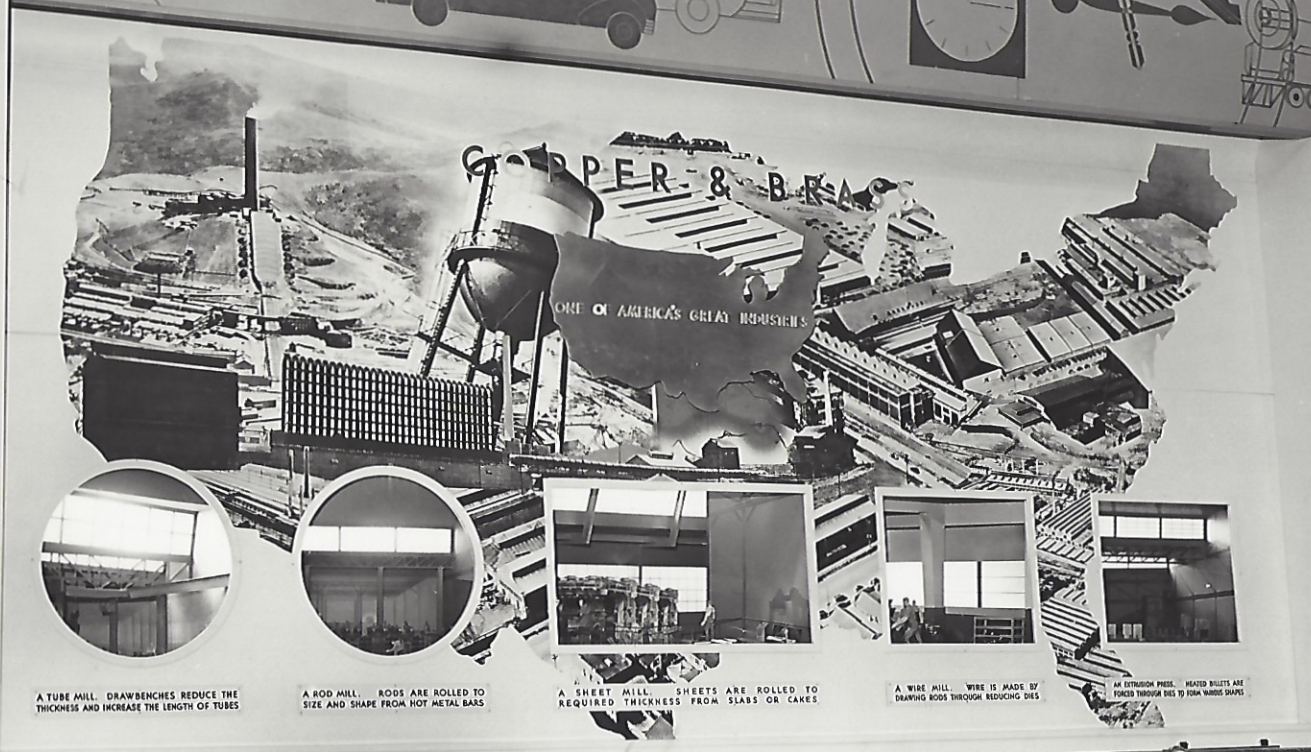
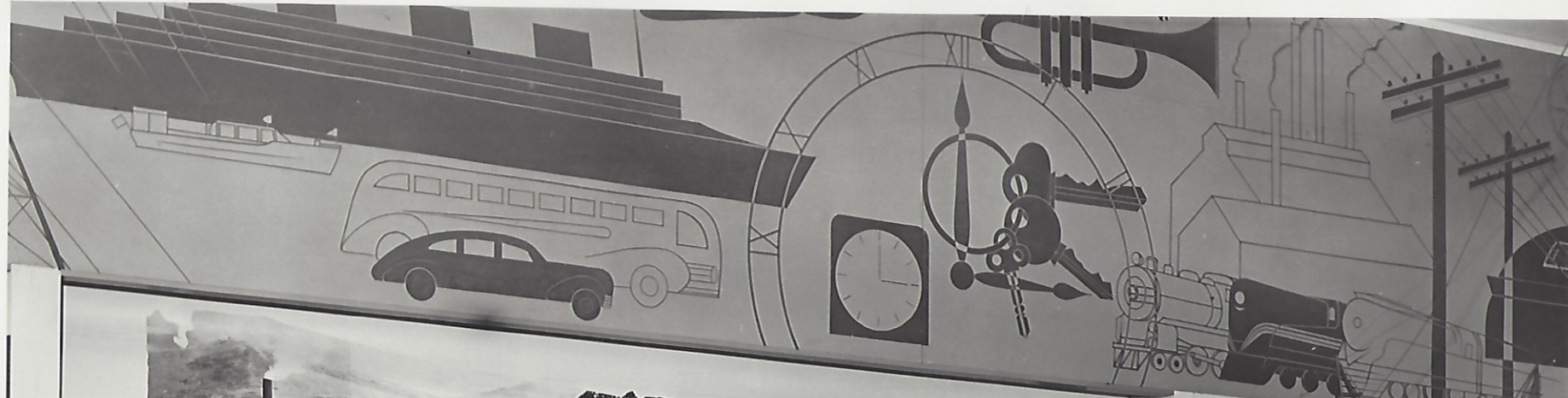


OTHER TYPICAL ALLOYS

- RED BRASS
- SILICON BRONZE
- PHOSPHOR BRONZE
- NICKEL SILVER

By alloying copper with other metals such as zinc, lead, tin, nickel, silicon, phosphorus and others, the following properties of the alloys are controlled:





A TUBE MILL. DRAWBENCHES REDUCE THE THICKNESS AND INCREASE THE LENGTH OF TUBES



A ROD MILL. RODS ARE ROLLED TO SIZE AND SHAPE FROM HOT METAL BARS



A SHEET MILL. SHEETS ARE ROLLED TO REQUIRED THICKNESS FROM SLABS OR CAKES

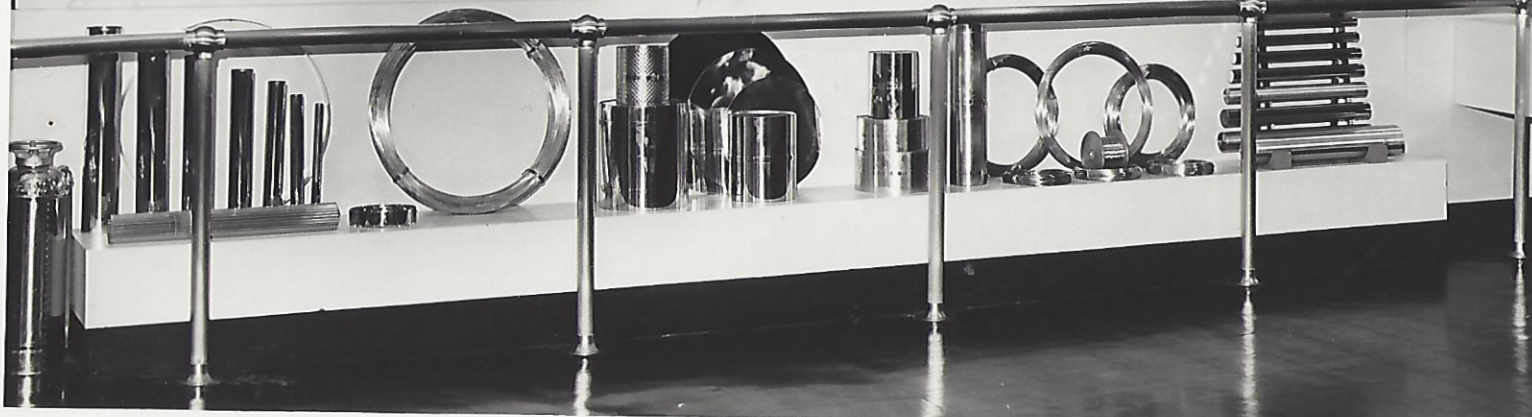
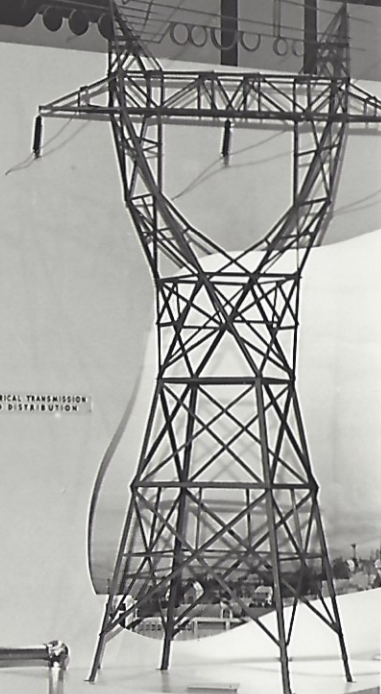


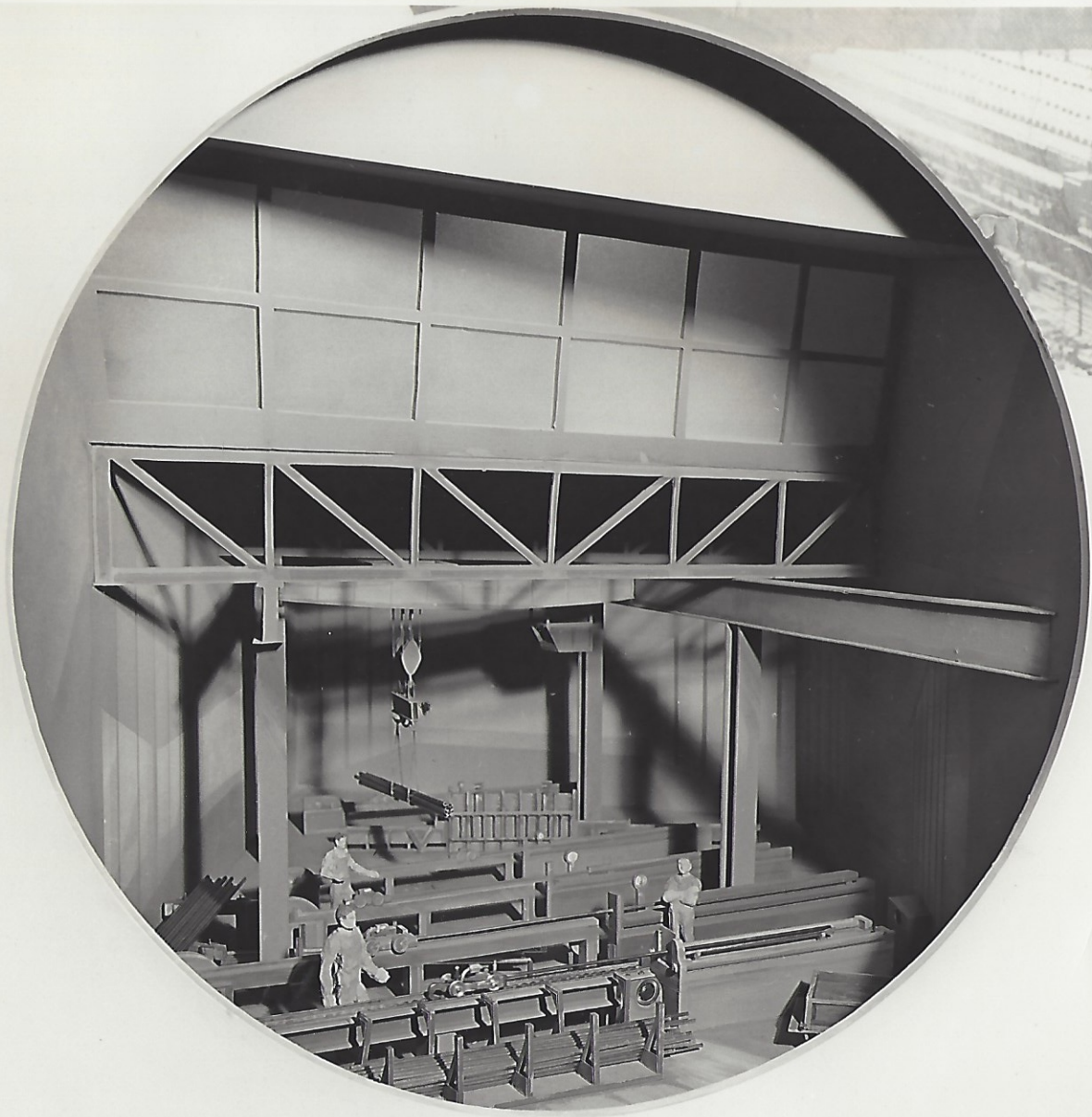
A WIRE MILL. WIRE IS MADE BY DRAWING RODS THROUGH REDUCING DIES



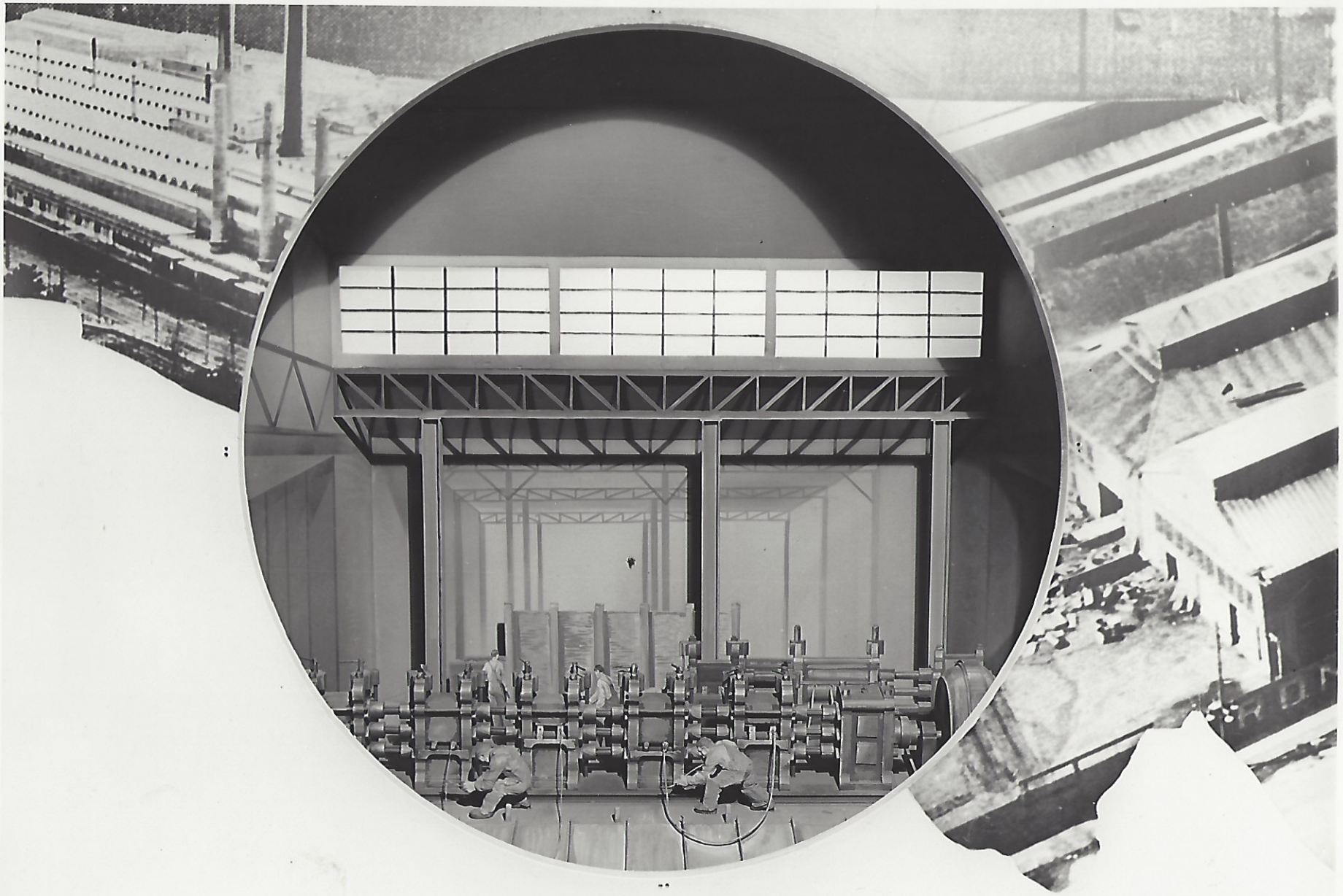
AN EXTRUSION PRESS. HEATED BILLETS ARE FORGED THROUGH DIES TO FORM WARE SHAPES

ELECTRICAL TRANSMISSION AND DISTRIBUTION

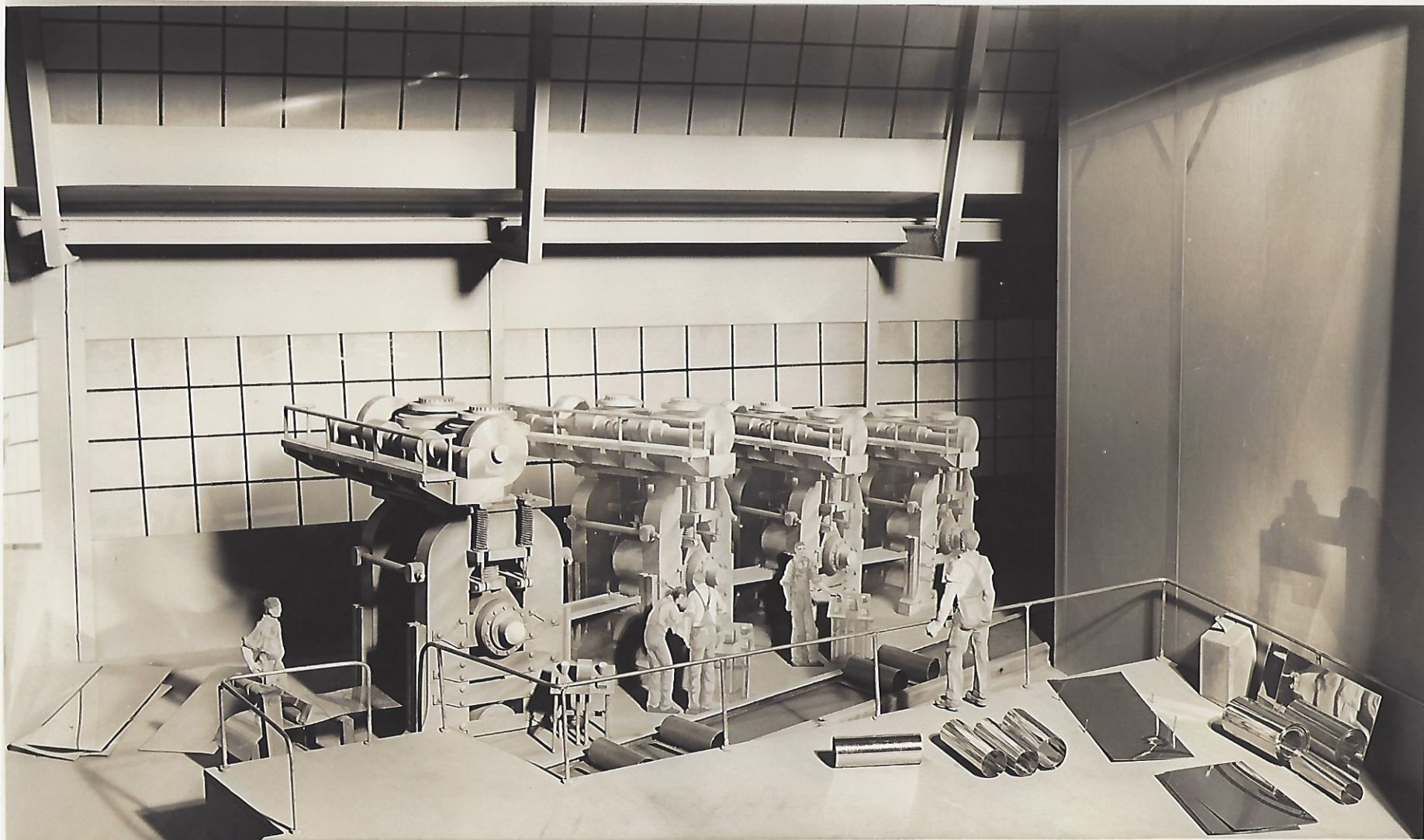




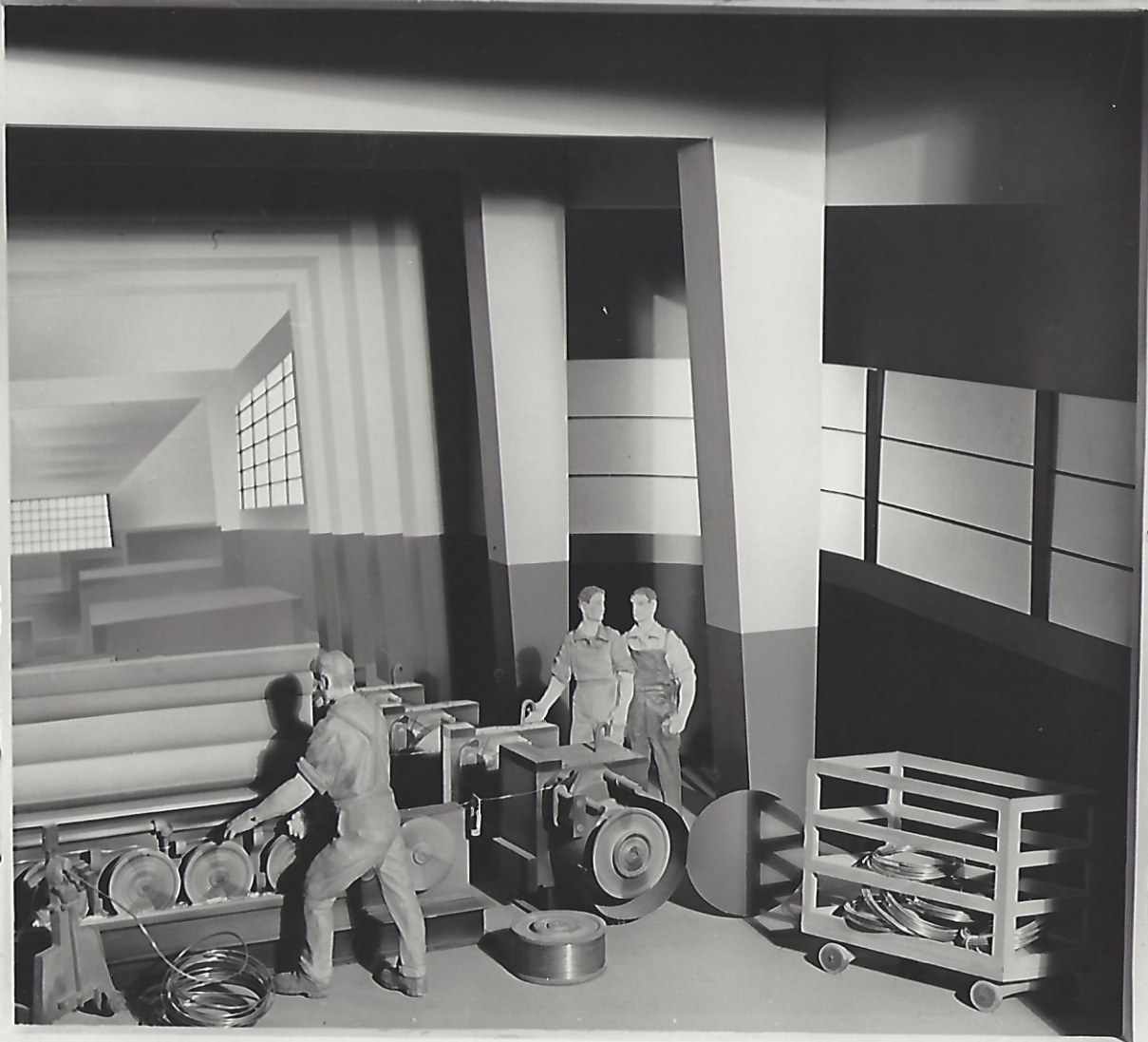
A TUBE MILL. DRAWBENCHES REDUCE THE THICKNESS AND INCREASE THE LENGTH OF TUBES



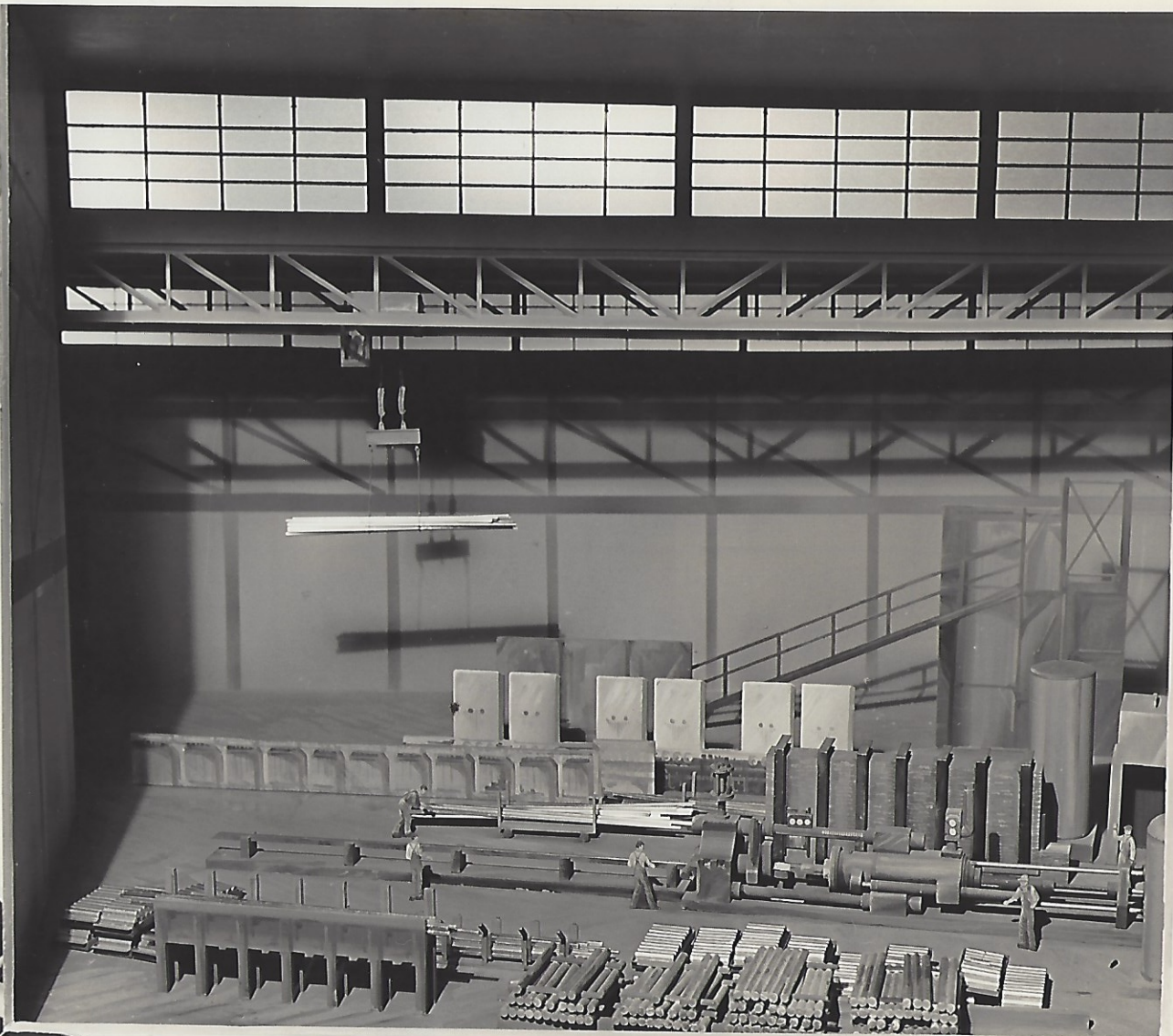
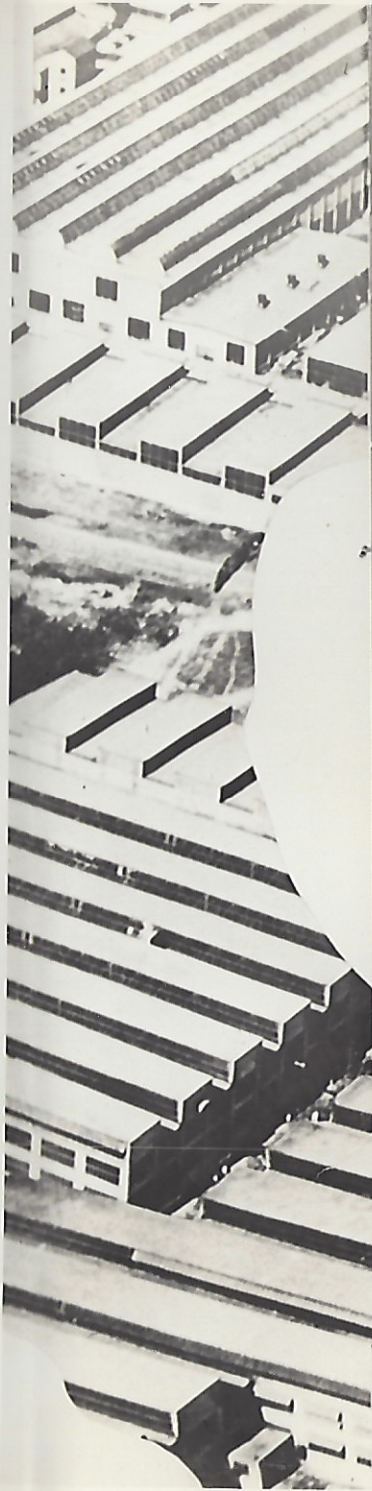
**A ROD MILL. RODS ARE ROLLED TO
SIZE AND SHAPE FROM HOT METAL BARS**



A SHEET MILL. SHEETS ARE ROLLED TO
REQUIRED THICKNESS FROM SLABS OR CAKES.

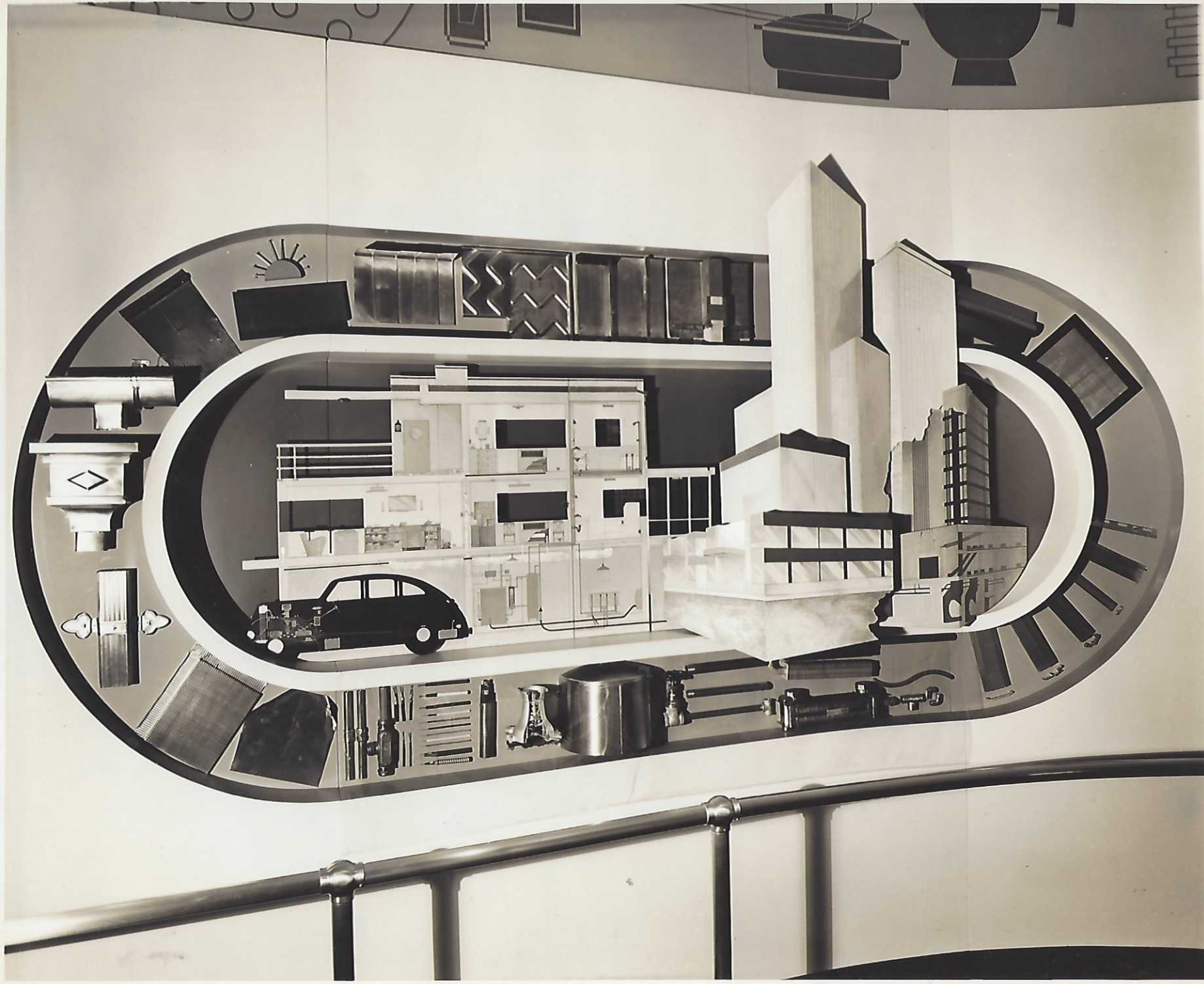


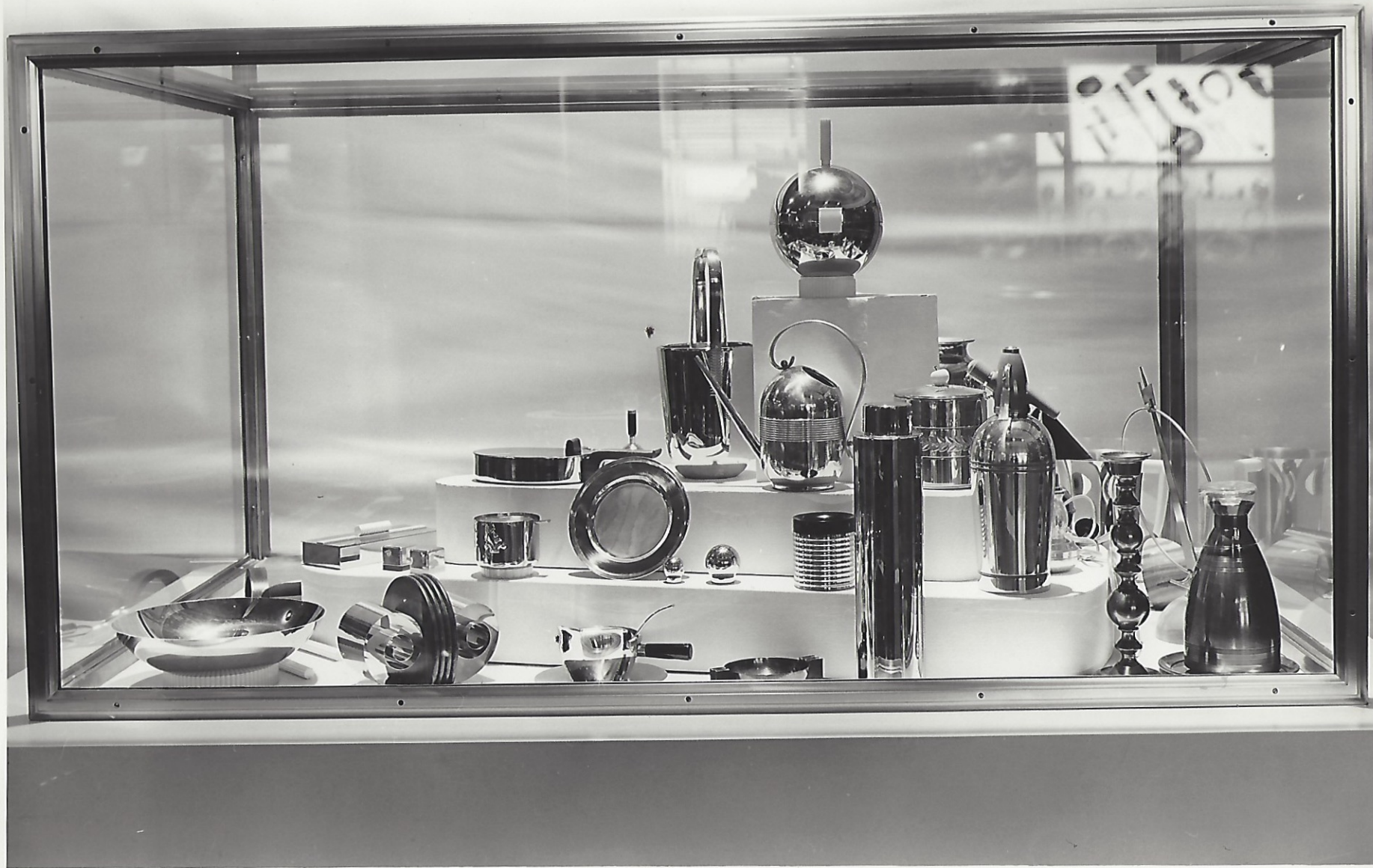
A WIRE MILL. WIRE IS MADE BY DRAWING RODS THROUGH REDUCING DIES

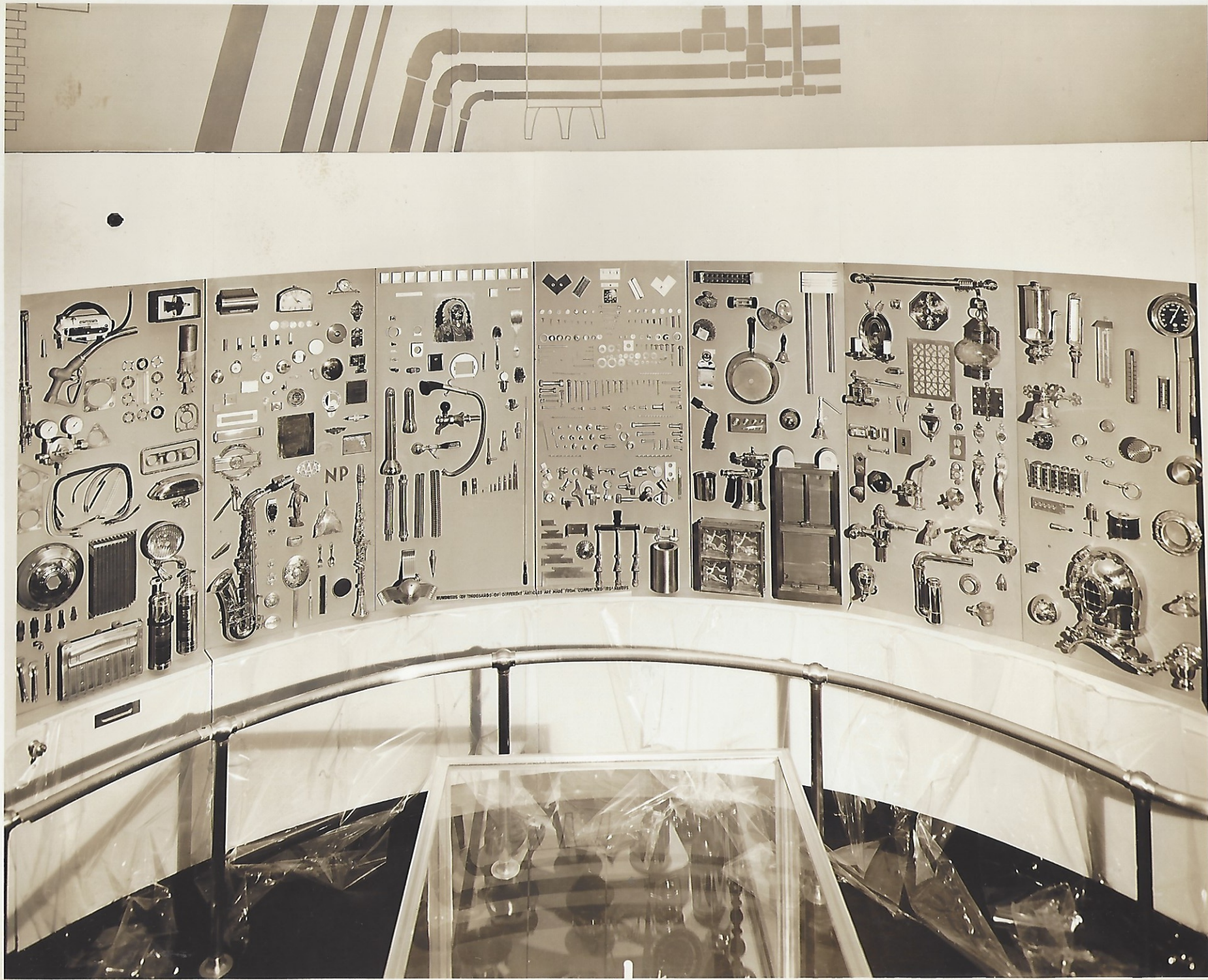


AN EXTRUSION PRESS. HEATED BILLETS ARE FORCED THROUGH DIES TO FORM VARIOUS SHAPES

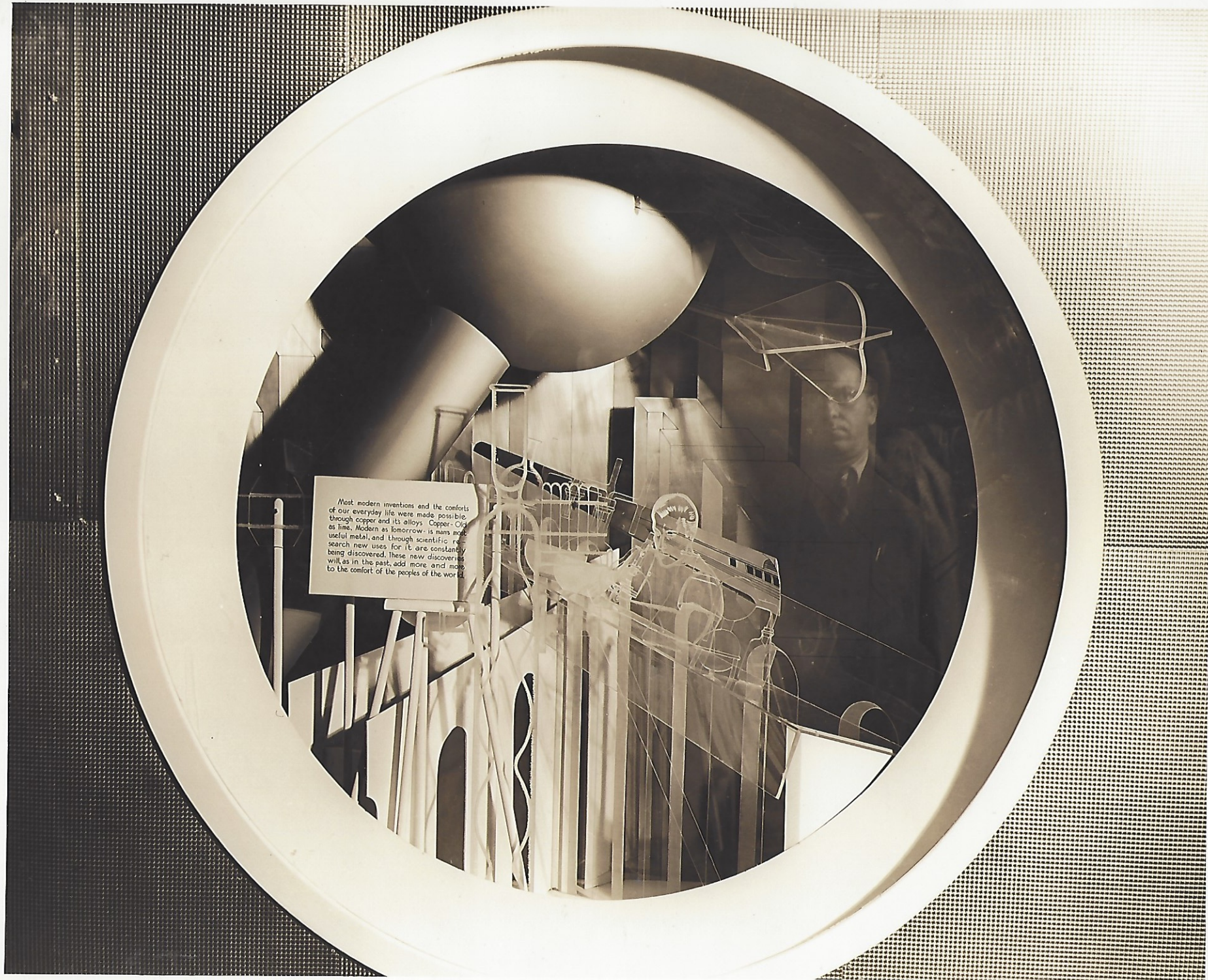








HUNDREDS OF THOUSANDS OF DIFFERENT ARTICLES ARE MADE FROM COPPER AND BRASS



COPPER ALLOYS

The principal natural characteristics of COPPER are durability-excellent electrical conductivity-high thermal conductivity-workability-red color. These can be changed by alloying copper with other metals.

FOR EXAMPLE

COPPER + ZINC = BRASS

OTHER TYPICAL ALLOYS

By alloying copper with other metals such as zinc, lead, tin, phosphorus and others, the following properties are obtained:



ELECTRICAL TRANSMISSION AND DISTRIBUTION











& BRASS INDUSTRY EXHIBIT

COPPER & BRASS
USE OF STEEL-CLEAR ENGINES

THEY ARE BOLDED TO
THE WALL OR CHAIRS

IN THE WALL, WHILE IS MADE BY
PUSHING ROSS THROUGH MOVING DISC

AN F-RODION P...
BY AN THROUGH...
TO FROM WALL...
PAGES