

主编 李 健 黄开亮

中國機械工業 技術發展史

薄一波題



机械工业出版社
China Machine Press

中國機械工業 技術發展史

主編 李 健 黃開亮



機 械 工 業 出 版 社

提 要

本书是中国第一部较为完整的机械工业技术发展信史。

全书有导论、制造技术、产品技术和科教事业等四部分，分四十章。导论，主要是中国机械工业发展简史和中国机械工业的技术发展政策；制造技术部分，全面介绍了机械工业制造工艺、技术管理的发展史实和趋势；产品技术部分，按行业介绍了机械产品发展史实，重点介绍了机械基础产品和大型成套设备的发展；科教事业部分，介绍了机械工业科研、教育机构的发展沿革和成绩。

本书由国内百余位资深的专家、教授，结合本人丰富的实践经验，通力合作完成，对中国机械工业技术发展进行了系统介绍，并探讨了机械工业科学技术的发展规律，以及历史经验教训。

本书适合于广大机械工业制造企业、科研单位和高等院校的干部、师生，以及政府部门公务人员阅读和参考。

图书在版编目 (CIP) 数据

中国机械工业技术发展史/李健、黄开亮主编. —北京：机械工业出版社，2001.3
ISBN 7-111-08718-6

I. 中… II. ①李… ②黄… III. 机械工业—技术史—中国 IV. TH-092

中国版本图书馆 CIP 数据核字 (2001) 第 02299 号

机械工业出版社 (北京市百万庄大街 22 号 邮政编码 100037)

责任编辑：何发 郭锐

三河市腾飞胶印厂印刷·新华书店北京发行所发行

2001 年 10 月第 1 版第 1 次印刷

787mm × 1092mm $\frac{1}{16}$ · 102.75 印张 · 2600 千字

0001—1000 册

定价：240.00 元

研究我国
机械工业的技
术发展历史,促
进当代机械工
业健康发展,为
屹立世界之林
而努力奋斗



曾侯乙尊盘——商周时期铸造精细的青铜器
(湖北随县出土) 湖北省博物馆藏
Zenghouyi Jar——a precision bronze ware casted at shang zhou
period (unearthed in sui county Hubei) Museum of Hubei Province



西汉青铜鎏金长信宫灯
(河北满城出土) 湖北省博物馆藏
Gilded bronze lamp at Western Han Period (unearthed
in Mangcheng, Hebei) Museum of Hubei Province



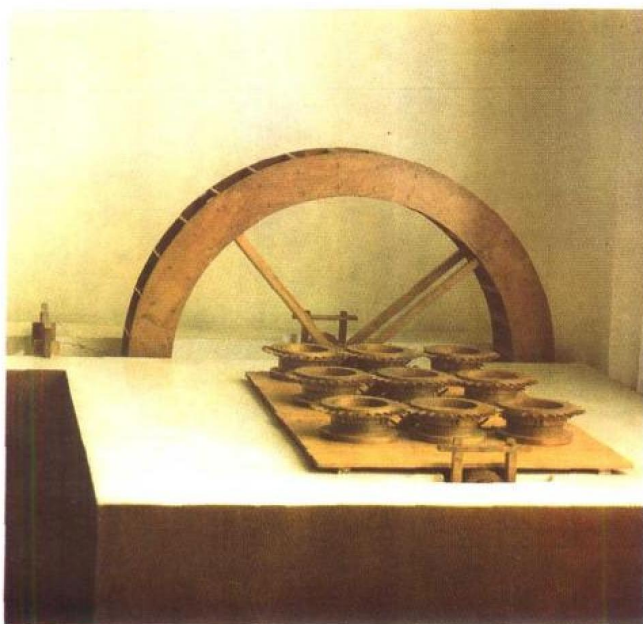
战国初期的青铜铸件——曾侯乙编钟(湖北随县出土) 湖北省博物馆藏
Bronze casting at Warring states Period —— Zhenghouyi Bells (unearthed in Sui County, Hubei) Museum of Hubei Province



宋代的大型铸铁件——山西太原晋祠内的铁人 于绍曾摄
Large iron casting at Sung Dynasties —— Iron-man in Jin Temple, Taiyuan, Shanxi, by courtesy of Yu Saozeng



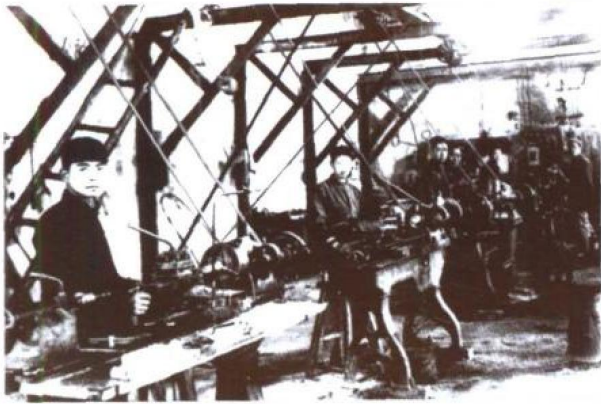
唐代银质被中香炉
来启斌摄 陕西省博物馆藏
The incense burner at Tang Dynasties Museum of Shanxi Province, by courtesy of Lai Qibin



水转连磨(复原模型)——中国古代由水轮驱动的食品加工机械 来启斌摄
Watermill (reconstructed model)—— grain processing machinery driven by water wheel # by courtesy of Lai Qibin



地动仪(复原模型)。为东汉张衡制造 来启斌摄
The earth detector (reconstructed model), made by Zhang Heng at Eastern Han Period by courtesy



中华人民共和国建立初期,我国机械工业企业使用的主要工艺设备——皮带车床

Pulley lathes, major manufacturing equipment used in machinery enterprises in early days when the People's Republic of China was founded.



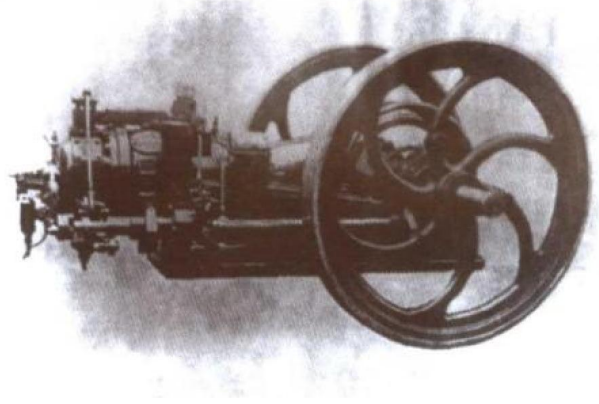
50年代末期,第一重型机械集团公司为包头钢铁公司制造的第一代1150毫米方坯初轧机

The first generation 1150mm Square Billet Blooming Mill manufactured by the First Heavy Machinery Group Co. in the late of 1950's for Baotou Iron & Steel Co.



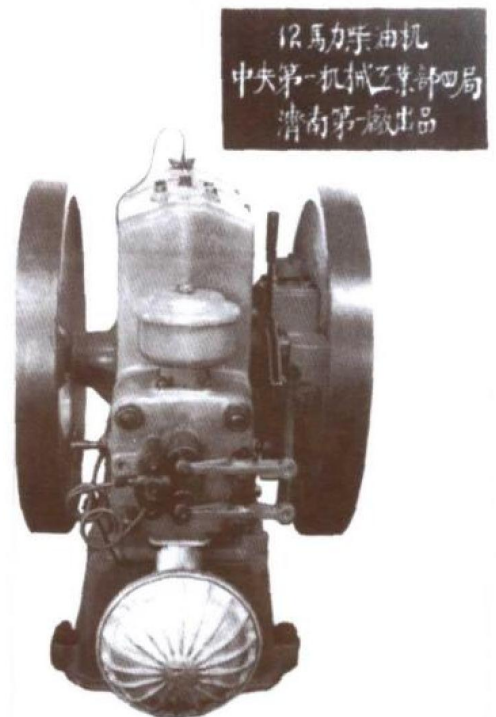
1950年9月,上海虬江机器厂(上海机床厂前身)制造的“虬13式万能工具磨床”

Qiu 13 type universal tool grinder made by Shanghai Qiujiang Machinery Plant (the former Shanghai Machine # tool Plant) in September of 1950.



中华人民共和国建立前,潍坊华丰机器厂仿制的12马力卧式柴油机

The 12 hp horizontal type diesel engine made by Weifang Huafeng Machinery Factory before the People's Republic of China was founded.



50年代初期,济南柴油机厂生产的第一批12马力柴油机

The first batch of 12 hp diesel engines produced by Jinan Diesel Engine Plant in early 1950s.



1956年7月13日，第一汽车制造厂生产的第一辆解放牌汽车下线

The first "Jiefang" (liberation) brand truck going off the production line by the First Automobile Works on July 13, 1956.



1958年5月21日，毛泽东主席和林伯渠副委员长在中南海怀仁堂后花园观看并乘坐了第一汽车制造厂制造的“东风”轿车，毛泽东主席笑着说：“坐了我们自己制造的小轿车了！”

On May 21, 1958. Chairman Mao Zedong and Lin Boqu, vice chairman of the National People's Congress inspected and rode on the "Dongfeng" (East Wind) brand passenger car produced by the First Automobile Works at the back garden of Huirentang in the Zhong Nan Hai. Chairman Mao smiled and said: "I've had a ride on the car made by ourselves".



1955年，上海电机厂制造的国产第一台6000千瓦汽轮发电机组安装于淮南电厂

The first home-made 6MW steam turbine generating unit made by Shanghai Electrical Machinery Works and installed in Huainan Power Plant in 1955.



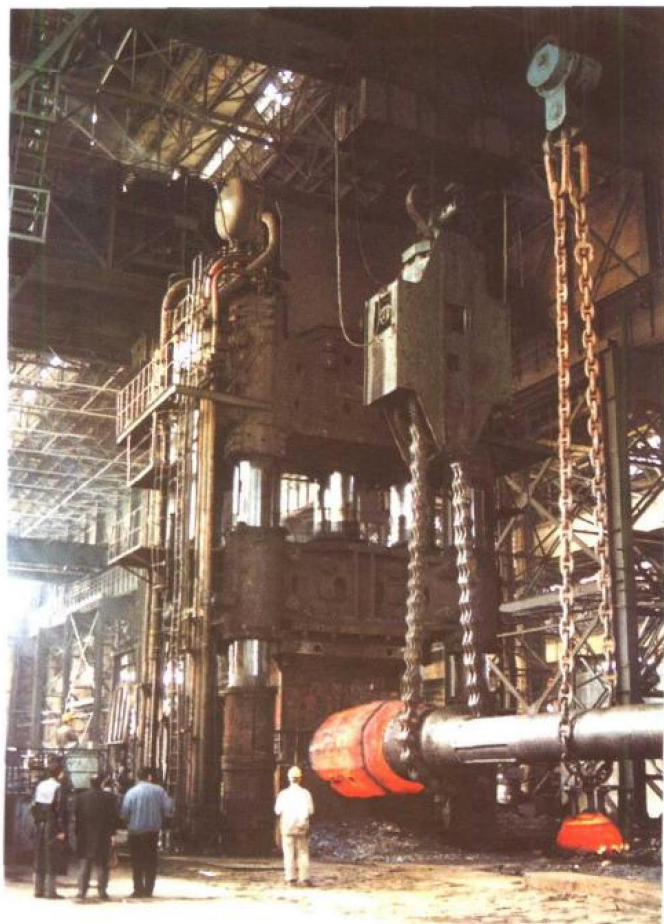
1958年，上海电机厂制造的世界第一台双水内冷1.2万千瓦汽轮发电机组，获国家科技进步一等奖

The world first 12 MW steam turbine generating unit with inner water-cooled and stator made by Shanghai Electrical Machinery Works in 1958.



1959年，第一拖拉机制造厂制造的第一台东方红牌拖拉机诞生出厂

The first "Dong Fang Hong" (East is Red) brand tractor was produced by the First Tractor Plant in 1959.

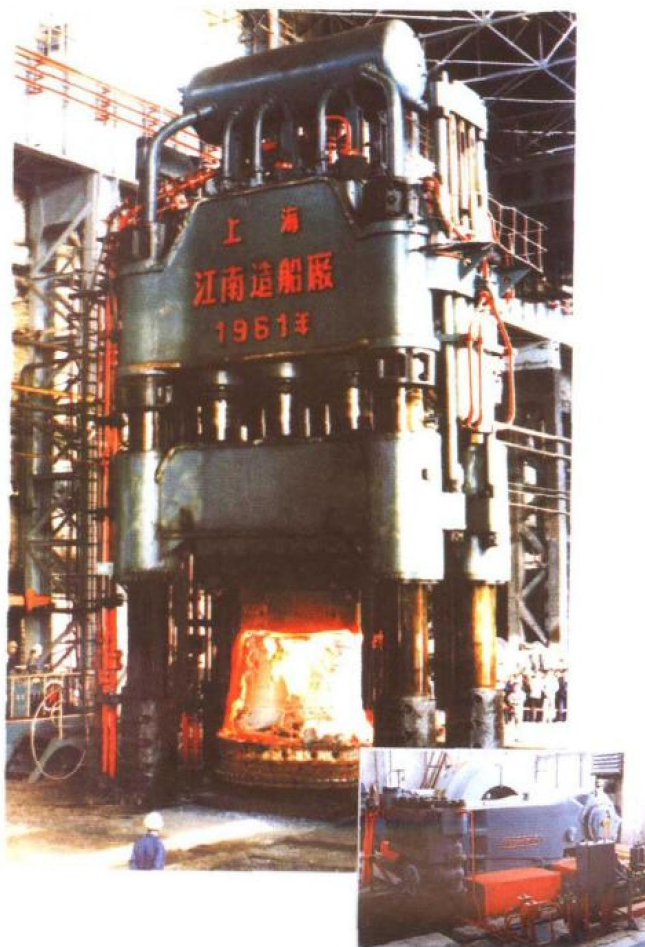


1962年，由第一机械工业部副部长刘鼎主持，立柱采用钢锭锻后电渣焊接，上中下横梁采用四包钢水合浇，沈阳重型机器厂和第一重型机器厂为主设计制造的12500吨锻造水压机

The photo shows a 12500 T hydraulic forging press. It was designed and manufactured mainly by the Shenyang Heavy Machinery Works and the First Heavy Machinery Works in 1962, which was under the direction of Liu Ding, Vice Minister of the First Ministry of Machinebuilding Industry. The master column for the press was made by a steel ingot, which was forged and then welded by the slag welding process. The top, mid-and-lower crossbeams were cast with four ladles of steel.

1962年，由第一机械工业部副部长沈鸿任总设计师，采用全焊接结构、“蚂蚁啃骨头”加工，枕木和油压千斤顶起吊，上海江南造船厂为主制造的12000吨级自由锻造水压机

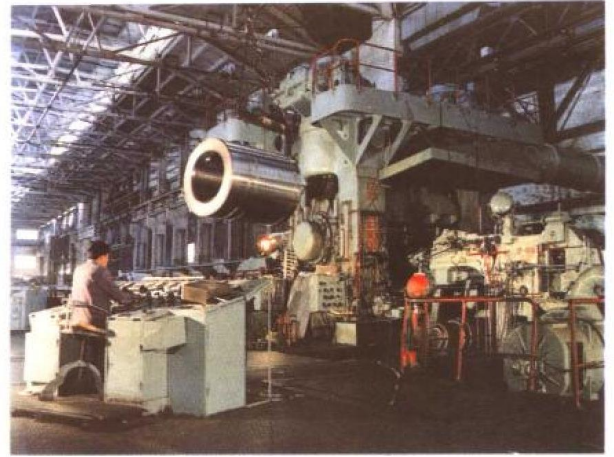
The photo shows a 12000 T hydraulic free forging press. It was made mainly by Shanghai Jiangnan Shipyard in 1962. The chief designer was Shen Hong, Vice Minister of the Ministry of Machine-building Industry. The complete welded structure was used. The manufacturing process used was of the so-called "ants gnawing at a bone". A number of small machine tools were employed to do the machining while wooden sleepers and jacks were used for lifting purpose.





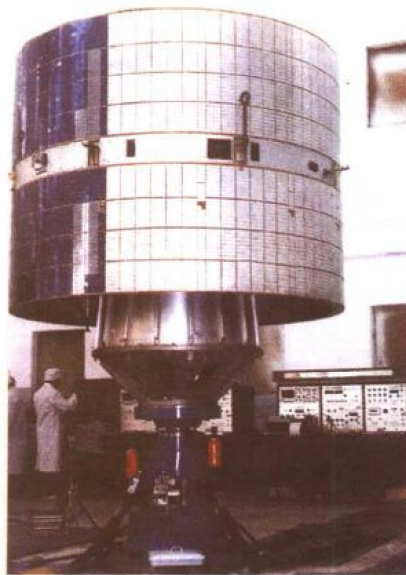
1967年，沈阳重型机器厂为西南铝加工厂研制的12500吨有色金属卧式挤压水压机（九大设备之一）

The 12500 T Non-ferrous Metal Horizontal Extrusion Hydraulic Press (one of the nine largest equipment) developed and manufactured by Shenyang Heavy Machinery Works for South-west Aluminium Processing Factory in 1967.



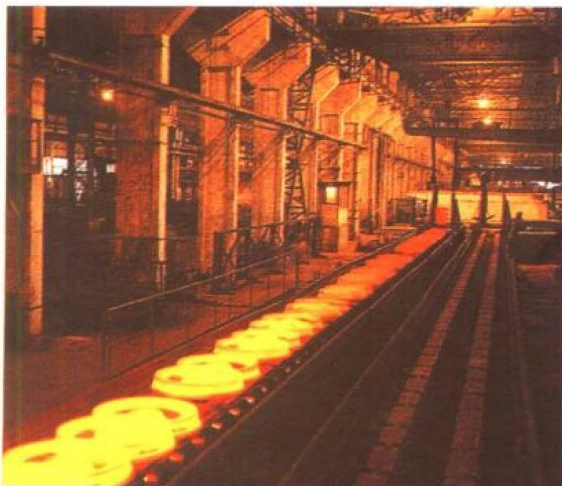
60年代，第一重型机器厂、太原重型机器厂为西南铝加工厂联合研制的2800毫米铝板轧机（九大设备之一）

The 2800mm Aluminium Plate Rolling Mill (one of the nine largest equipment) jointly developed and manufactured by the First Heavy Machinery Works and Taiyuan Heavy Machinery Works for South-west Aluminium Processing Factory in 1960.



1968年，北京机械自动化研究所等单位研制的20吨电液伺服振动试验台（正在进行卫星试验）

The 20T electro-hydraulic servo vibration test rig made by Beijing Machinery Automation Institute in 1968 was being used to test a satellite.



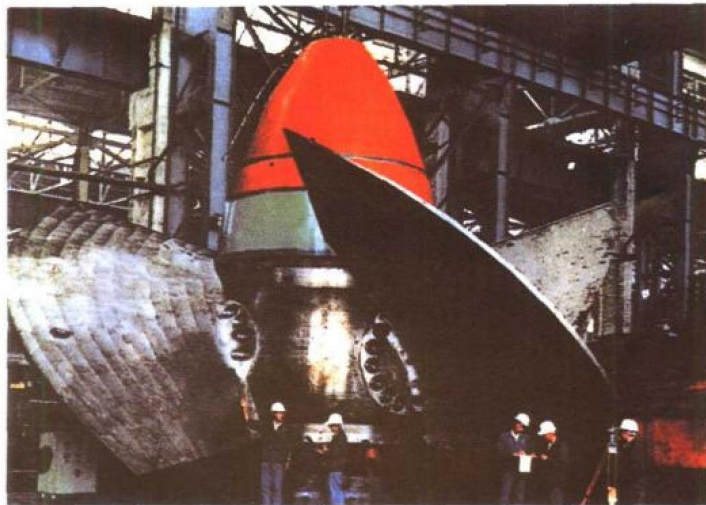
1962年，太原重型机器制造厂为马鞍山钢铁公司制造的我国第一套火车车轮压轧生产线成套设备

The first complete set of train wheel rolling line in China, made by Taiyuan Heavy Machinery Works for Maanshan Iron & Steel Co in 1962.



1961年，太原重型机器制造厂制造的我国首台4m³挖掘机

The first 4m³ excavator made by the Taiyuan Heavy Machinery Works in 1961.



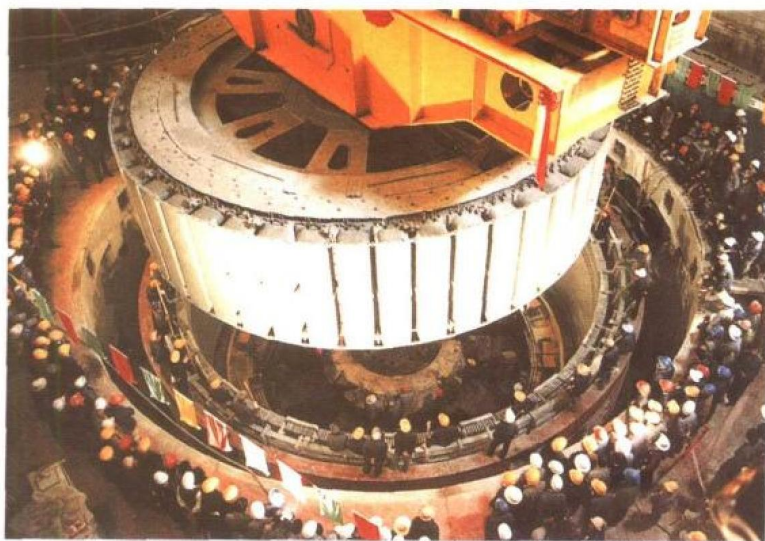
1979年，东方电机厂为葛洲坝水电站制造的17万千瓦轴流式水轮机转轮正在组装

The runner of 170MW Kaplan hydroturbine made by Dongfang Electrical Machinery Works for Gezhouba Hydropower Station is being assembled at the Plant in 1979.



葛洲坝水

A bird's-eye view of Ge.



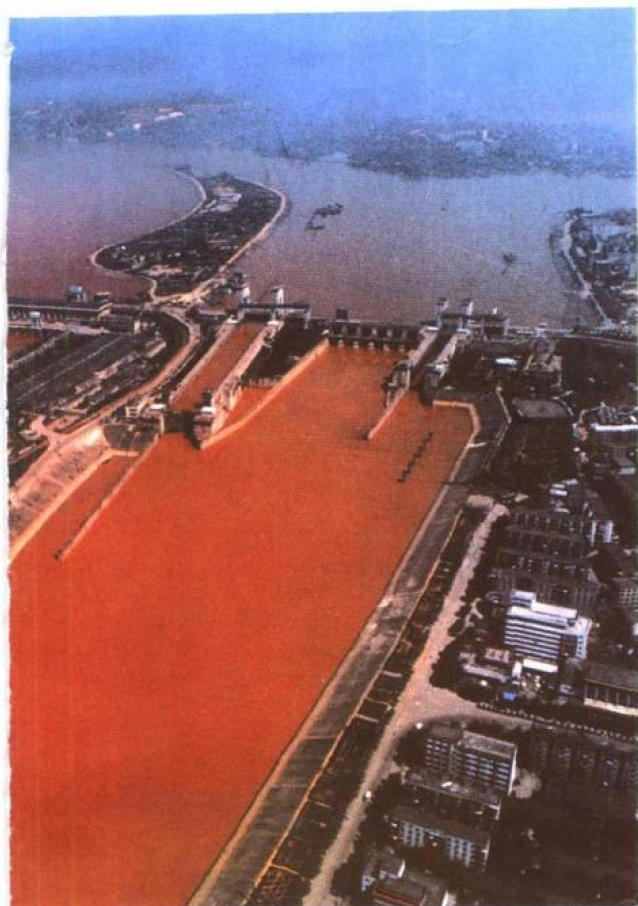
80年代，东方电机厂制造的32万千瓦水轮发电机的直径11.8米、重878吨的发电机轮子正在吊装

The 320MW hydropower generating unit rotor was under installation in 1980s. This rotor, with 11.8m of diameter and 878T of weight, was manufactured by the Dong Fang Electric Machinery Works.

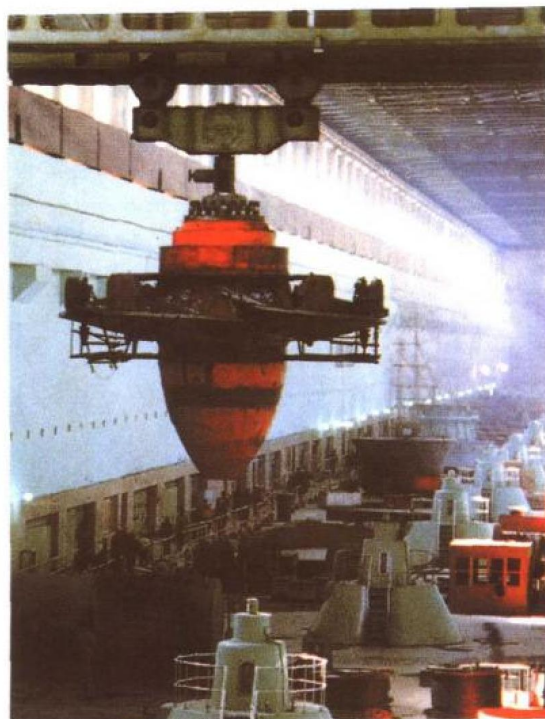
8



70年代，太原重型机器厂制造安装在葛洲坝水
2 × 250T bridge crane was manufactured and insi



电站鸟瞰图
Gezhouba Hydropower Station



1980年，哈尔滨电机厂制造的12.5万千瓦轴流式水轮机正在葛洲坝水电站安装

125MW kaplane hydro-turbine made by Harbin Electrical Machinery Works was being installed at Gezhouba Hydropower Station in 1980.



电站的2 × 250吨桥式起重机
Installed by Taiyuan Heavy Machinery Works in 1970s.



80年代，哈尔滨电机厂为岩滩水电站制造的第一台水轮发电机组的转轮直径8米、蜗壳进口直径10.8米的蜗壳进行预安装

In 1980s, the first hydro-power generating unit, with 8m of rotor diameter and 10.8m of volute inlet diameter, was under pre-installation manufactured, by Harbin Electric Machinery Works for Yan Tang Hydro-power Station.

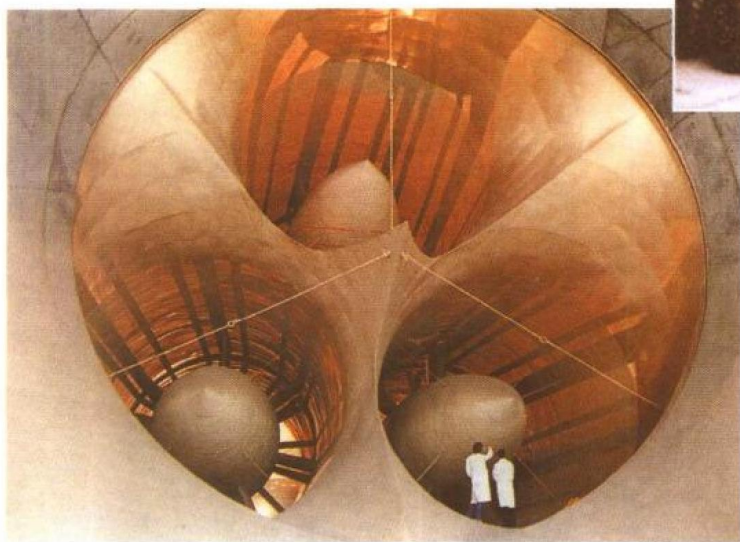


1965 年，第一汽车制造厂制造的第一批红旗牌高级轿车
The first batch of Hongqi sedan produced by the First Automobile Plant in 1965.

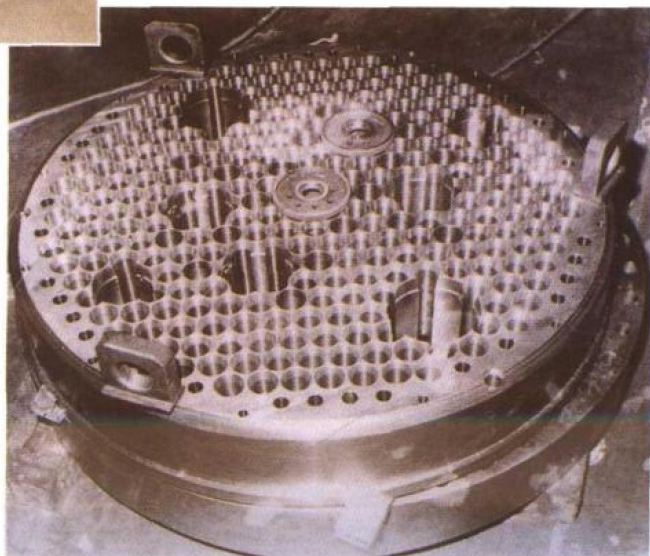


1977 年，第二汽车制造厂生产的第一批 2.5 吨越野车
The first batch of 2.5T cross-country truck

Produced by the Second Automobile Plant in 1977.

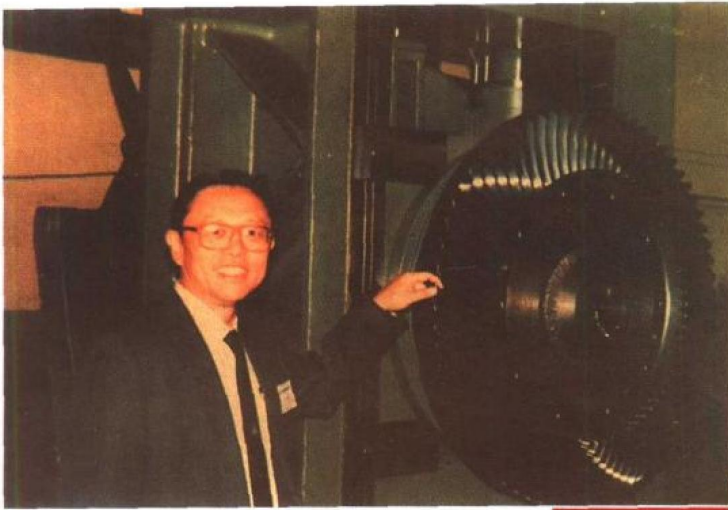


1980 年，东风电机厂等制造的 $6 \times 8\text{m}$ 风洞
The wind tunnel of $6 \times 8\text{m}$ was made by Dongfeng Electrical Machinery Works in 1980.



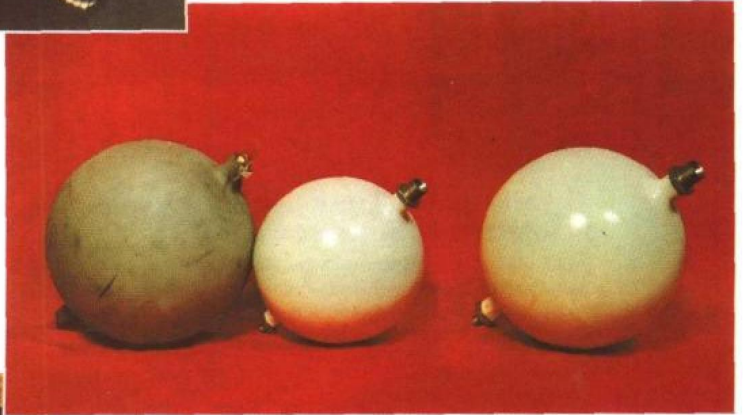
1977 年，第二重型机器制造厂等单位制造的高通量工程试验堆堆内构件栅格板

The high flux tubing plates of the reactor internals for the engineering testing reactor, made by the Second Heavy Machinery Works and others in 1977.



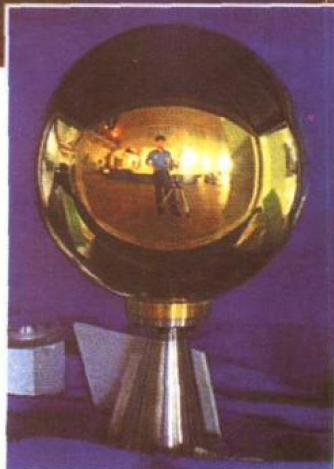
1980年，成都工具研究所黄潼年主持首创提出的齿轮测量创新技术，具有国际领先水平，获国家科技发明二等奖

In the Chengdu Tool Research Institute, Huang Tongnian invented a new technique about gear measurement, which was leading the international level, and won the Second Class National Science & Technology Invention Award.



1985年，北京机电研究所研究的钛合金高压球形无缝气瓶超塑成形技术。获国家发明二等奖

The spherical seamless tanks processed by the super-plasticity forming technology. This technology has been developed by Beijing Mechanical and Electrical Technology Research Institute and won the Second Class National Invention Award in 1985.



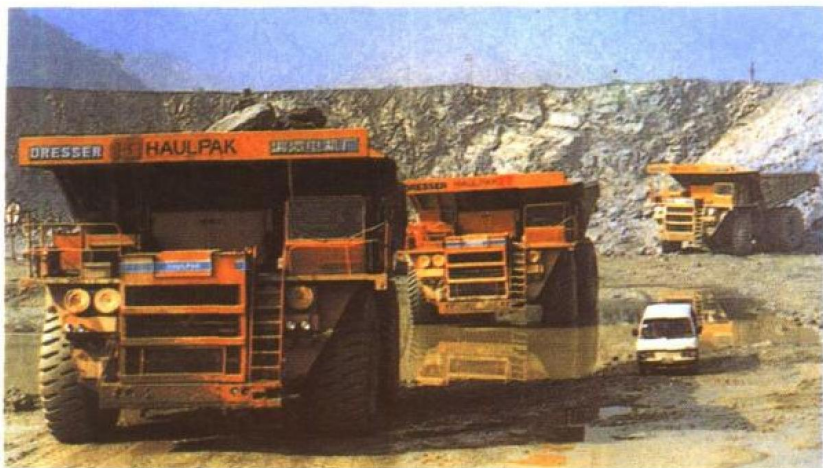
1986年，北京机床研究所研制的超精密轴系和JCS-027超精密车床，获国家科技进步一等奖

The ultra precision shaft type parts and JCS-027 ultra precision lathe developed by the Beijing Machine-tool Research Institute, were awarded with the First Class National Prize for the Advancement of Sciences and Technology in 1986.



80年代，西仪集团有限责任公司为哈尔滨伊兰煤气工程制造的自控系统控制设备

The down-right photo shows the control room of the automatic control system for Yilan Public Gas Project in Harbin, manufactured by Xiyi Group Co.Ltd., in 1980s



1987年,湘潭电机厂与美国德莱赛公司合作生产的154吨电动轮自卸车,在平朔露天煤矿使用

The 154 T Motorized Wheel Dump Trucks coproduced by Xiangtan Electrical Machinery Works with US Dresser Corp. are working at Pingshuo Open-pit Coal Mine in 1987.



70年代,中信重型机械公司制造的AS9/500型竖井钻机

Model AS9/500 Shaft Drill Rig manufactured by Zhongxin Heavy Machinery Co in 1970s.



80年代,第一重型机器厂和湘潭电机厂引进美国P&H公司技术合作制造的2800XP型挖掘机,斗容23立方米,在平朔露天煤矿使用(两千万吨级露天矿成套设备)

Model 2800XP Excavator with bucket volume of 23 m³(open-pit mine complete plant with production capacity of 20 million tons/year)co-produced by No.1 Heavy Machinery Works and Xiangtan Electrical Machinery Works with the imported technology from P & H Corp. of USA is working at Pingshuo Open-pit Coal Mine in 1980s.



90年代初,沈阳重型机械集团有限责任公司与德国塔克拉夫公司合作为内蒙古平庄矿务局元宝山露天煤矿制造的大型连续开采成套设备。图为中方生产的3600m³/h斗轮挖掘机

The large continous mining compelet equipment produced by Shenyang Machinery (Group) Ltd Co. and a German Co. for Yuanbaoshan Open-pit Coal Mine which is under administration of Pinzhuang Mining Bureau in Inner Mongolia. The photo shows 3600m³/h bucket excavator produced by Chinese side.



90年代中期,太原矿山机器集团有限公司研制的我国首台3.3kV大功率交流电牵引采煤机,部分技术达国际90年代初水平,该机已在兖州、大同煤矿使用,日产达1.5万吨,是煤矿高产高效综采机械化主要设备之一

The electrical hauling coal cutter was produced by the Taiyuan Mining Machinery Group in the early of 1990s, which is the first powerful 3.3kV AC electrical hauling coal cutter in China, and its technical level partially reaches 90s international standard. This machine has been used in YangZhou, and Datong coal mines, the daily capacity reaches 15000 tons. With high productivity and high efficiency, it is a comprehensive mechanized coal mining equipment.



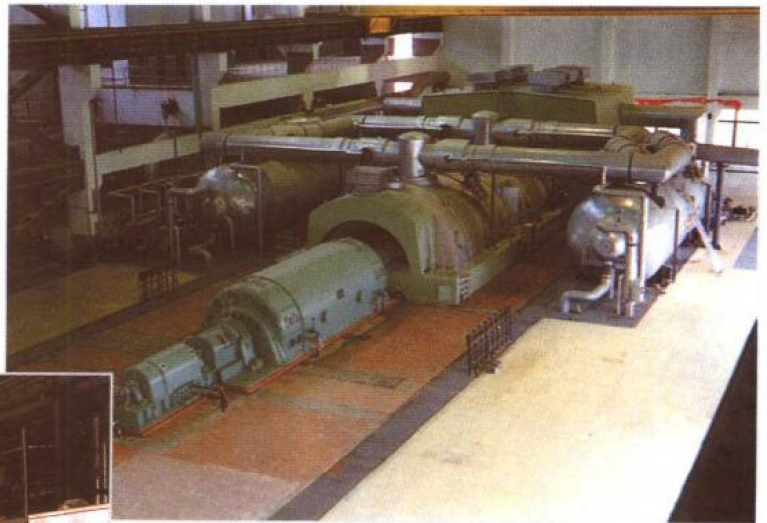
1996年，兰州石油化工机器总厂研制的国内首台6000米电驱动沙漠石油钻机，获国家科技进步一等奖

The picture shows the first 6000m electric driven Desert Drilling Rig made by this Works, which won the State Prize of First Class for the Advancement of Science and Technology in 1996.



90年代初，大连起重机厂制造的250/100+10t核电站环行起重机

250/100+10T circular crane for nuclear power station produced by Dalian Crane Works in 1990s.



1991年，上海电机厂为秦山核电站制造的31万千瓦核电站汽轮发电机运行并网发电

310MW Steam Turbine Generator for the Qinshan Nuclear Power Station was made by Shanghai Electrical Machinery Works in 1991.



80年代末期，哈尔滨电机有限责任公司引进美国西屋公司技术并与之合作制造的60万千瓦发电机在安徽平圩电厂运行

The picture shows that the 600MW generator made by Harbin Electric Machinery Co.Ltd company in cooperation with Westinghouse of USA and with their technology is under operation at Anhui Pingwei Power Plant in 1980s.



90年代初，中国第二重型机械集团公司为宝山钢铁公司制造的1580毫米热连轧机

The picture shows 1580mm Hot Strip Continuous Rolling Mill made by China National Erzhong Group Co. for Shanghai Baoshan Iron&Steel Co. in 1990s.



90年代初，中国第一重型机械集团公司为宝山钢铁公司制造的1450毫米板坯连铸机

The picture shows 1450mm Slab Continuous Caster manufactured by China First Heavy Industries (CFHI) for Baoshan Iron and Steel Co in 1990s.



1991年，中国第一重型机械集团公司为宝山钢铁公司研制的1900毫米板坯连铸机成套设备，获机械部科技进步特等奖

The 1900mm continuous slab casting machine was designed and manufactured by First Heavy Machinery Group for Baoshan steel Co and won the Special Science & Technology Progress Award of The Ministry of Machinery Industry.

90年代，第一重型机械集团公司为齐鲁石化公司制造的首台千吨级热壁加氢反应器

The first thousand ton class Hot Wall Hydrogenated Reactor manufactured by China First Heavy Industries(CFHI) for Qilu Petrochemical Corporation in 1990s.

