The Story

of

THE CANTON DIVISION

CHAMPION PAPER AND FIBRE COMPANY

Canton, North Carolina

From Forest to Finished Product

THIS BOOKLET briefly outlining the more important phases of pulp and paper manufacture, has been prepared for the information of those who are interested in our industry. May it also serve as a reminder of a pleasant trip for those whom we have been privileged to conduct through our mills.

We are happy to have you observe an industrial operation under our American system of free enterprise by men and women who live and work in a spirit of mutual understanding and cooperation.

H. A. Welder

DIVISION MANAGER

1953

Reuben B. Robertson
CHAIRMAN OF THE BOARD

Reuben B. Robertson, Jr.
PRESIDENT

H. A. Helder
DIVISION MANAGER

Champion History

The Canton Division is one of three major Divisions of The Champion Paper and Fibre Company, the country's leader in quantity production of quality white papers, coated and uncoated.

The Company had its inception in a desire on the part of a printer, the late Peter G. Thomson of Cincinnati, Ohio, to produce coated paper of improved quality. His original corporation, The Champion Coated Paper Company, began coating operations in 1894 at Hamilton, Ohio; and, in 1902, constructed its own paper mill adjacent to the coating operations.

Rapid expansion of business soon led to plans for a pulp mill. Instead of following the trend of that day of looking to the north as a source of pulpwood and the site for a pulp mill, Mr. Thomson had the vision of the potentialities of the South for the development of such an industry.

By the establishment of the mills at Canton, North Carolina, in 1906 Champion became the pioneer in the field of diversified pulp and paper production in the South. Canton was selected because of the combination of timber supply, intelligent labor, suitable water, and accessibility to other essential processing materials and to markets.

Operations began in January 1908 in the production of pulp by a subsidiary known as The Champion Fibre Company.

This was the first mill in the world to make white pulp from chestnut wood — after the extraction of the tanning materials, and the only one to operate on this continent. Due to the chestnut blight and the resultant lack of wood, the Extract Plant was abandoned in 1951.

In 1920 Champion at Canton started bleaching sulphate pine pulp and by 1925 was using such pulp in paper. This pioneering work led to a multi-stage bleachery in 1933-34 which was the first plant to produce high quality white pulp from Southern pine forests. It was also at Canton that the manufacture of bleached hardwood pulp cooked by the sulphate process was first demonstrated.

The construction of the world's largest book paper machine was started at Canton in 1933, and in 1947 a similar machine with even greater production capacity was installed.

A new activity was undertaken at Pasadena, near Houston, Texas in 1935, where a bleached pine sulphate pulp mill was constructed, and placed in operation in January 1937. In 1940 equipment for the manufacture of machine coated magazine paper was installed; subsequently a paper machine and a board machine were added by transfer from the Company's Hamilton Division, and a new paper machine was purchased and installed.

It was at the Houston Division that hydrogen was first utilized as a by-product from the production of electrolytic chlorine.

Thus the Champion organization today consists of three

plants producing paper, two of which also produce pulp. They have been known since 1936 as the Hamilton, Canton and Houston Divisions of The Champion Paper and Fibre Company. The general policy of the Company has centered on mass production of white papers. The three units employ approximately 8,000 people and produce two and one half million pounds of paper per day.

To assure adequate supplies of processing materials, deposits of fine white clay are mined at Sandersville, Georgia and deposits of lime are operated near Knoxville, Tennessee.

Champion's pioneering spirit in the integration of activities from Forest to Finished Paper has contributed extensively to the history of paper making not only in the South but in the world. In the field of coated paper in particular, Champion is without peer, and it was Champion who produced the first white paper in the Southwest.

Champion has had other "firsts" to its credit, such as the operation of high-pressure boilers for the production of steam and in the maximum utilization of high pressure turbine exhaust for such purposes as the cooking of pulp and similar uses.

Champion builds for the future too and is concerned with permanency of operation. A comparatively recent development in pulp making is the production of semi-chemical pulp, and Champion at Canton now has a plant sized pilot plant in operation to explore further semi-chemical possibilities.

FOREST CONSERVATION

To insure a continuous flow of more than 500,000 cords of pulpwood to the Canton Mill each year, The Champion Paper and Fibre Company has established a long-range program of reforestation, involving the acquisition of more than 250,000 acres of forest land in North Carolina, South Carolina, Georgia, and Tennessee, most of which has already been purchased.

Since this program has been in operation more than 11,000,000 pine seedlings have been planted on the properties acquired. Approximately 900 seedlings are planted on each acre of open land, making a total of more than 12,000 acres of pine plantations established on company lands to date. In addition, Champion purchases several hundred thousand tree seedlings each year for planting idle acres on private lands.

A comprehensive program of forest conservation has been established by the company to encourage the wise use of important natural resources by private timberland owners.

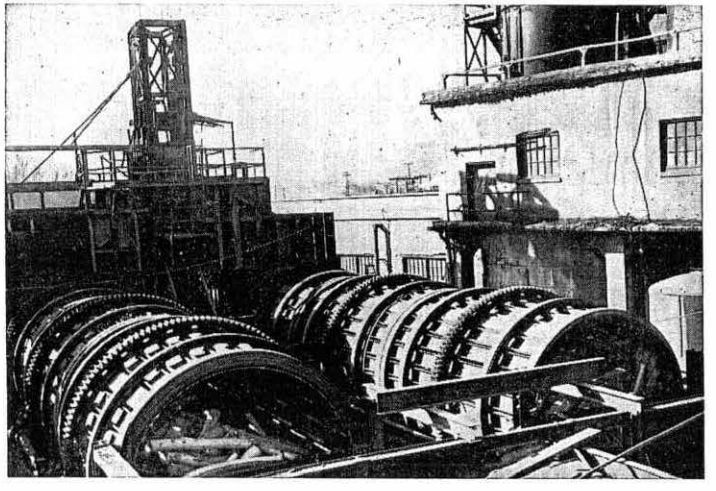
WOOD HANDLING

In order to maintain a continuous supply of reserve pulpwood to insure uninterrupted operation, it is necessary that we carry approximately sixty days inventory in our Canton woodyard. This reserve usually amounts to about 90,000 cords, enough to last six weeks to two months.

The wood yard consists of thirty acres of land and seventeen miles of railroad track. Four crawler cranes, three steam cranes and two diesel locomotives constitute the equipment for handling wood and other raw materials.

We receive approximately 100 carloads of wood each twenty-four hours. Most of this is delivered directly to two chipping areas, through an efficient "shipper to chipper" system, and the balance is stored in the wood yard.

Each day about 70 cars of pine wood go to the pine chippers, while about 30 cars of mixed hardwoods go to the hardwood chippers. This total of more than 1500 cords of wood used each day would extend over 2¼ miles in a stack 4 feet high and 4 feet wide.



BARKING DRUMS

The 5-foot sticks of rough pine and hardwoods used in the manufacture of pulp are first passed through large barking drums 12 feet in diameter and 45-50 feet in length. These drums rotate and tumble the sticks of wood against each other until the bark is removed. All wood then goes through the chippers where the sticks are rapidly cut into small chips by knives set in slots in huge discs that rotate at high speed.

SCREENS AND CHIP BINS

The chips pass over a series of screens which reject those of improper size, permitting the others to move on to storage bins which serve as reservoirs from which the chips can be drawn at the proper rate to meet production schedules.

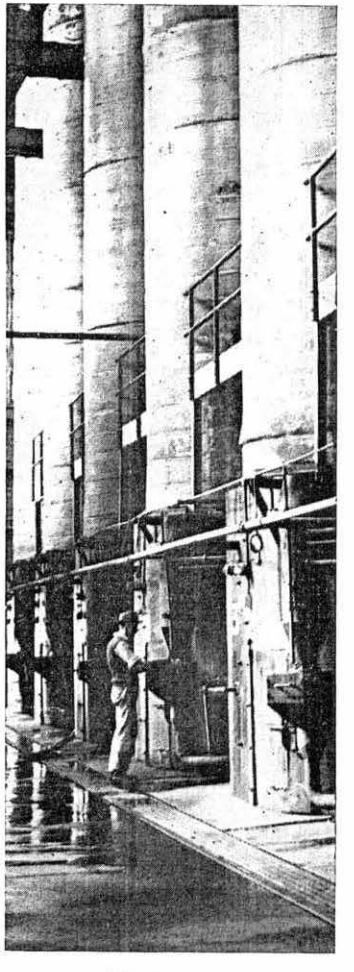
The bins for the pine chips, with a capacity of 203 cords, are located above ten pine digesters; and the bins for hardwood chips, with a capacity of 105 cords, are located above five hardwood digesters.

COOKING THE CHIPS

Fifteen cords of chips and 13,350 gallons of alkaline cooking liquor are placed in a digester and submitted to 120 pounds of steam pressure for three hours, or until samples of the chips indicate that they have been properly cooked.

Digesters, fifteen in number, are hollow steel cylinders 9 feet, 9 inches in diameter, 47 feet high, with walls 1¼ inches thick. Between 90 and 95 fillings of chips are cooked each 24 hours, averaging 8-9 tons of pulp per digester filling.

Wood is composed of cellulose, lignin, resins and fats. During the cooking process, the lignin, resins and fats are dissolved or separated from the cellulose fibres by action of the alkaline cooking liquor.



Digesters

BLOW TOWERS

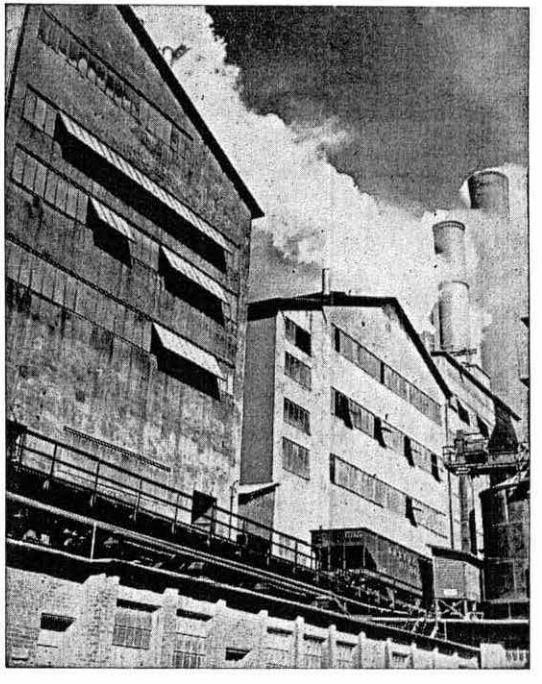
When samples of the chips indicate that they have been properly cooked in the digesters, the steam pressure therein is used to force the chips against baffle plates in a blow tower where they virtually explode and separate into tiny wood fibres or pulp.

The pulp is then washed to remove residual chemicals and ligneous materials. This solution, called Black Liquor, is sent to evaporators and thence to a chemical recovery unit. The pulp flows to a bleaching system over screens which reject any uncooked chips.

EVAPORATORS

The chemical solution used in cooking wood chips gains enormous quantities of water and ligneous materials during the cooking process, thus diluting the original cooking liquor by approximately 50 per cent. The excess water must be removed from this liquor by the Evaporators before the ligneous material can be burned in the Smelters.

Our newest Evaporators are Birmingham-Goslin, Sextuple effect. Over one million gallons of black liquor pass through the six effects in a 24 hour period, and over 35,000 gallons of water are evaporated per hour. Much of this water is recovered and sent to various parts of the mill for heating purposes.



Smelter Furnace Buildings

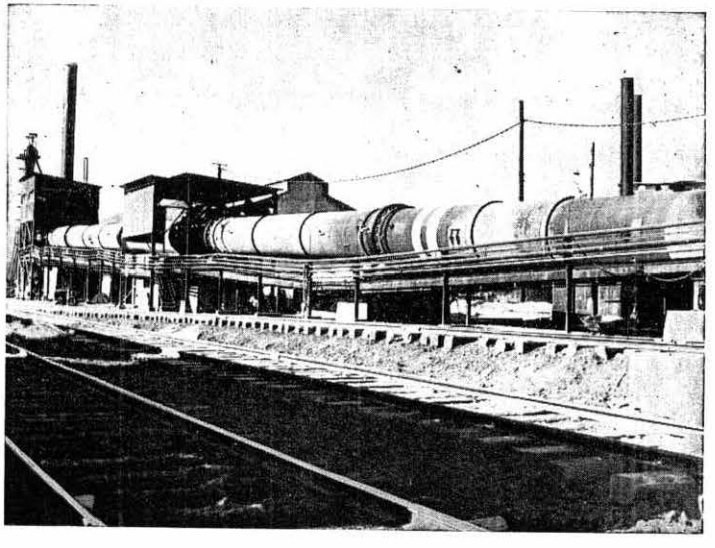
SMELTERS

The black liquor leaves the Evaporators at a density of 33° Baume and is pumped to a Disc Evaporator for further evaporation. At this point a make-up chemical, salt cake (solid) or glauber salt (liquid), is added to the black liquor before being sprayed into the smelter furnace. The heat generated by burning the ligneous material in these combustion units makes over 250,000 pounds of steam per hour.

The residue is called "smelt" and contains the recovered and make-up chemicals used in remaking cooking liquor.

OUR LARGEST LIME KILN

This tremendous machine, 317 feet long by 8 feet in diameter, was installed in 1947 to supplement three other lime kilns, and plays an important role in recovery of lime

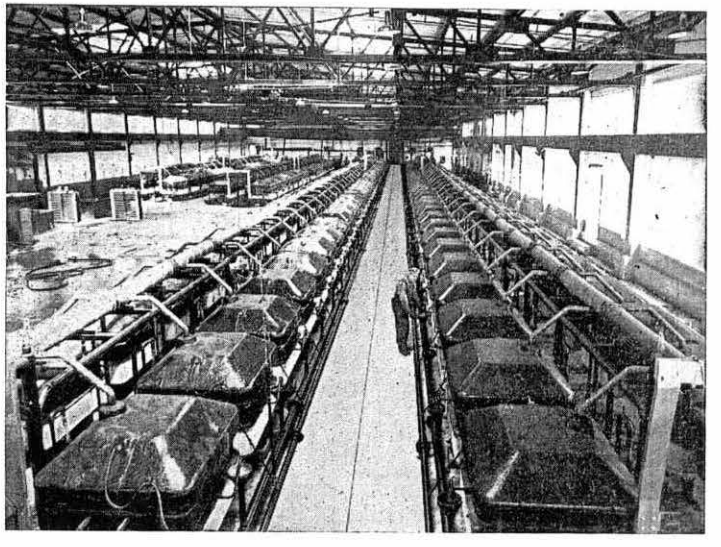


used in the making of cooking liquor. It is coal gas fired and has a daily capacity of 120 tons.

A thick sludge fed into the upper end of the kiln gradually works its way to the lower end of the rotating drum. Coal gas entering the lower end is ignited and heats the kiln, driving off carbon dioxide and water in the sludge, leaving lime as the recovered chemical, to be used again for making fresh alkaline cooking liquor.

ELECTROLYTIC BLEACH PLANT

63 tons of chlorine, and 70 tons of caustic soda, are made daily in 240 Hooker Type "S" Electrolytic Cells. These chemicals are made by passing direct current through a saturated solution of sodium chloride (common salt). The



Hooker Cells in the Electrolytic Bleach Plant

electric current breaks up the salt, forming chlorine and caustic soda. The chlorine is made into chlorine water and calcium hypochlorite (Lime Bleach), which are used to bleach the pulp. The caustic soda is evaporated to a 50 per cent solution, purified, and shipped in tank cars and tank trucks to customers. Most of it is used by the textile industry.

The Bleach Plant uses each day 115 tons of salt, 40 tons of lime, and 180,000 K.W.H. of electricity.

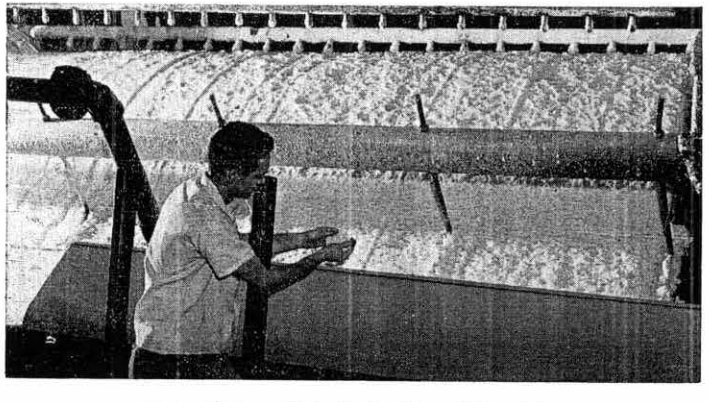
BLEACHING THE PULP

Wood pulp as it comes from the digesters is dark brown. After washing and screening it becomes a somewhat lighter color. This unbleached pulp can be used for the manufacture of wrapping papers, bags and other products.

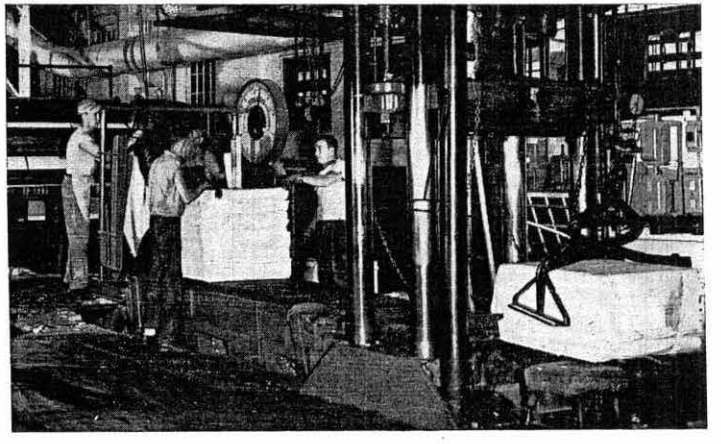
To make the pulp white, it is necessary to bleach cellulose fibres. This can be done by mixing chlorine water with the raw pulp, by adding other bleaching agents or by the combination of both chlorination and other bleaching agents.

Two chlorination towers, 58 feet high and 15 feet in diameter, are used to give the pulp its first bleaching.

There are two bleaching systems for pine pulp. One produces very bright white pulp by a six-stage process, while the other operates in three stages to produce pulp of suitable whiteness for many products. Both systems employ direct chlorination, followed by caustic extraction and hypochlorite treatment.



Pulp Being Washed After Bleaching



Baling Dried Sheets of Pulp for Shipment

PULP MACHINES

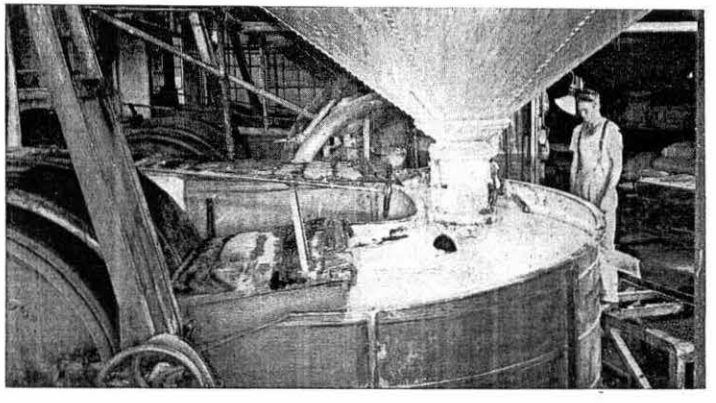
Slush pulp from the bleaching system is washed and delivered directly to the paper and board machines or to storage chests. Any excess pulp is put into condition for storage or shipment by running it over pulp drying or wet-lap machines.

The wet end of the pulp drying machine is similar in operation to that of board machine described on page 18. As much water as possible is removed from the pulp sheet by pressing. As the sheet of pulp continues on over the steam heated dryers, it is gradually dried until it contains approximately 15 per cent moisture.

The dried pulp is slit and cut into sheets, and packed into bales for shipment or storage. Finished bales are 30 x 30 x 16 inches and weigh 450 pounds.

STOCK PREPARATION

Clay, rosin size, alum, starch, dyestuffs and other chemicals are mixed with the pulp in Beaters or Hydrapulpers to prepare it for use in making paper and paperboard.



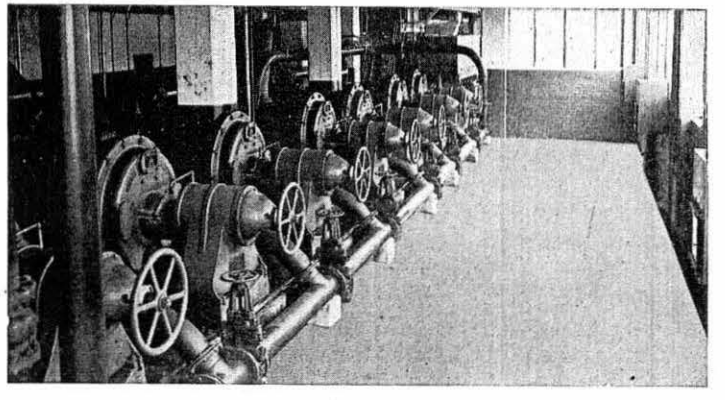
BEATERS

The Beater is a machine consisting of a large oval tub containing a "midfeather" partition and a "paddlewheel" roll that revolves against a bedplate. The pulp is put into the beater and water added so that the mass can circulate freely around the midfeather, passing between the roll and the bedplate. Capacities of the 28 beaters vary from 1,000 to 2,900 pounds.

HYDRAPULPERS

The Hydrapulper is a large conical tank with ribs on the interior sides and a rotating ribbed disc at the bottom. Mixing of the pulp, chemicals and dyestuffs takes place as

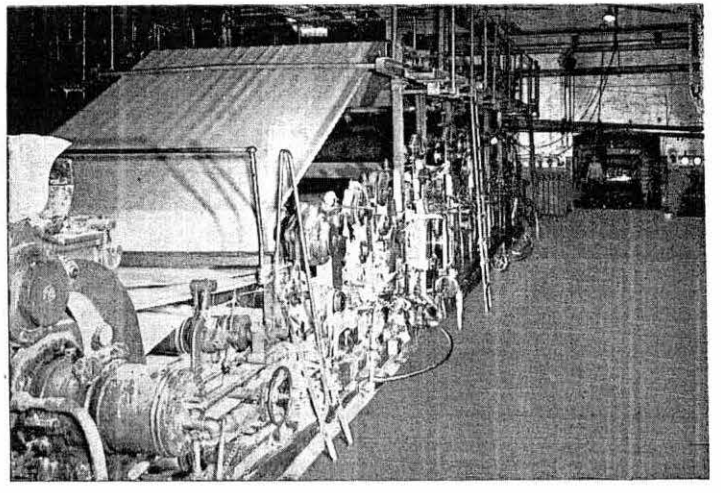
the mass is propelled around the tank, traveling upward at the sides and downward at the center in a powerful vortex or whirlpool. Four hydrapulpers are in use, two with a capacity of 4,600 pounds each, and two with a capacity of 2,500 pounds each.



THE JORDANS

The pulp stock which has been mixed in the beaters and hydrapulpers is refined and hydrated in machines called Jordans. The Jordan consists of a conical plug rotating at high speed within a conical shell. The outside of the plug and the inside of the shell are fitted with bars or knives. As the stock goes through the Jordan it passes between these knives and the fibres are cut or brushed out, to the degree required for the grade of paper to be manufactured.

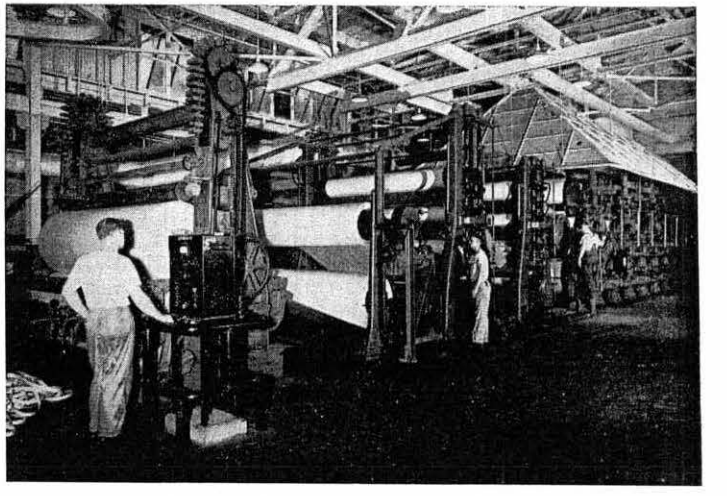
Each paper or paperboard machine has its own set of Jordans to keep it supplied with refined stock, the number of Jordans needed being determined by the width and speed of the machine.



Press Rolls, Endless Felts and Cylinder Vats

PAPERBOARD MACHINES

After refining in the Jordans, the dilution of pulp with water is pumped from a storage chest to a "Head-Box", which regulates its flow to machine vats. In each machine vat a partially submerged and revolving cylinder, covered with wire mesh, picks up the pulp from the water. The pulp is then transferred to an endless wool felt which is pressed against the top of the cylinder by a couch roll. Our Board Machines vary in the number of cylinders, some have 4, others 5. A layer of pulp is picked up from each cylinder in operation, thus building up a sheet of pulp to desired thickness on the felt. Press, suction and smoothing rolls take out excess water and press the fibres together to form the sheet of paperboard.

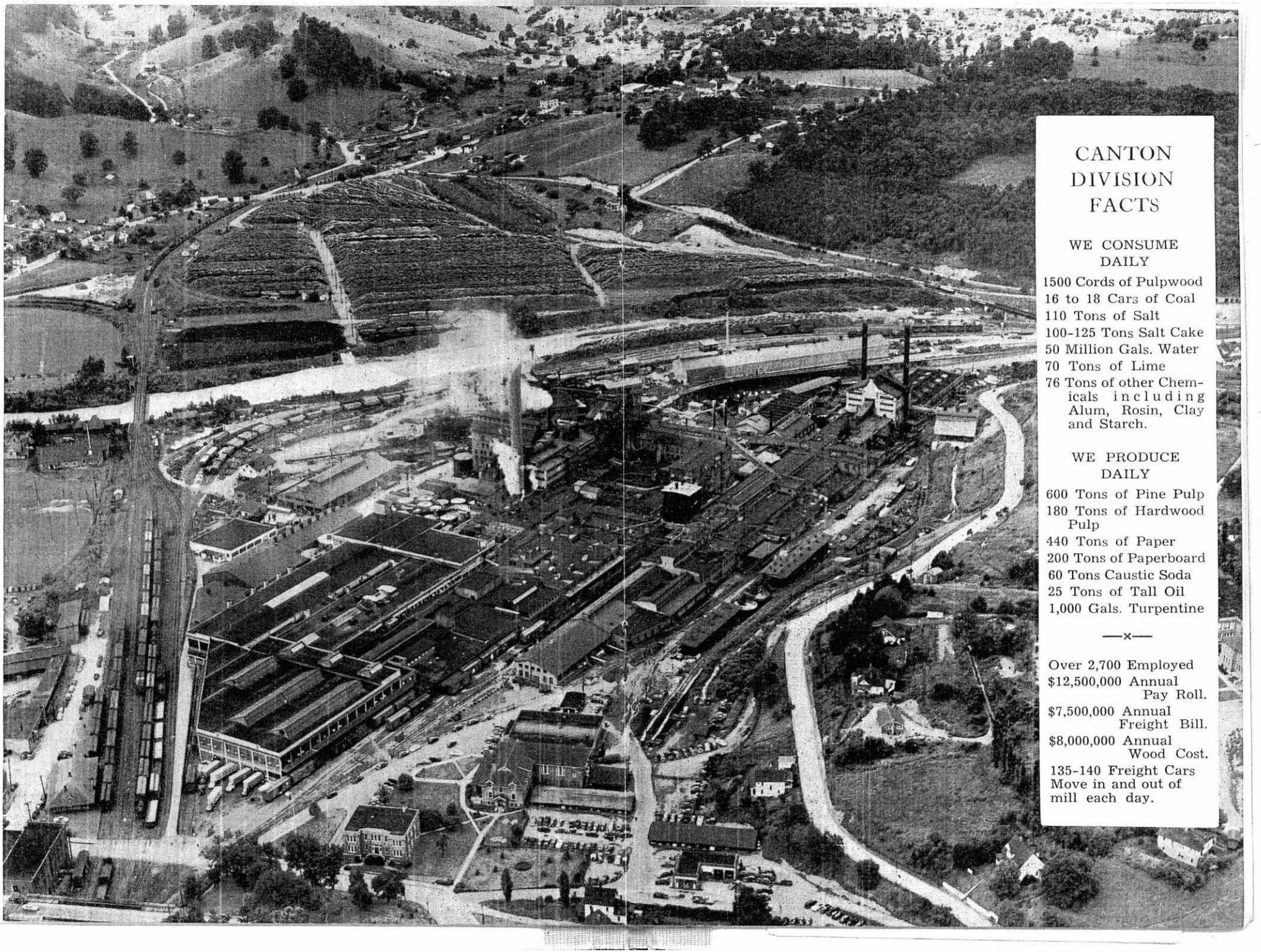


Winder, Calender Stacks and Dryers

The sheet then leaves the wet-end section and goes to the dryer section of the machine. Here steam is passed through hollow steel cylinders called dryers. As the sheet passes over these cylinders, water is evaporated from the sheet.

After passing over the dryers the sheet is run through calender stacks; here 100 tons or more of polished, chilled steel rolls, ground accurately to one half-thousandth of an inch tolerance, give the paper a uniformly smooth printing surface.

The Canton Mill has 3 Board Machines producing various grades of sanitary food container stock and specialty boards.



CANTON DIVISION FACTS

WE CONSUME DAILY

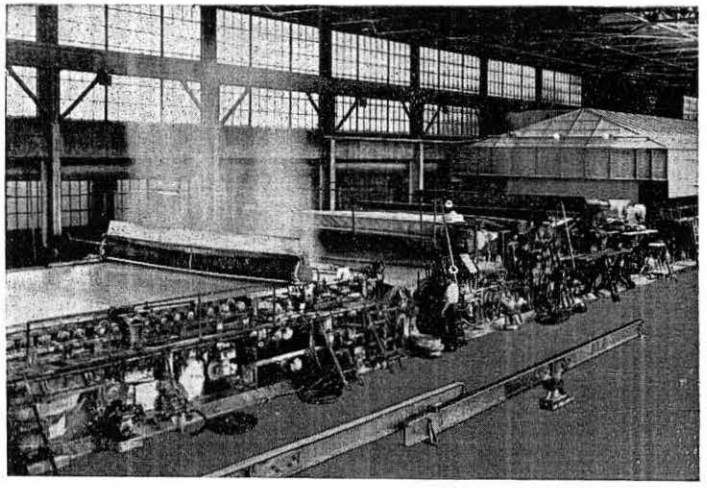
1500 Cords of Pulpwood
16 to 18 Cars of Coal
110 Tons of Salt
100-125 Tons Salt Cake
50 Million Gals. Water
70 Tons of Lime
76 Tons of other Chemicals including Alum, Rosin, Clay and Starch.

WE PRODUCE DAILY

600 Tons of Pine Pulp
180 Tons of Hardwood Pulp
440 Tons of Paper
200 Tons of Paperboard
60 Tons Caustic Soda
25 Tons of Tall Oil
1,000 Gals. Turpentine

—×—

Over 2,700 Employed
$12,500,000 Annual Pay Roll.
$7,500,000 Annual Freight Bill.
$8,000,000 Annual Wood Cost.
135-140 Freight Cars Move in and out of mill each day.



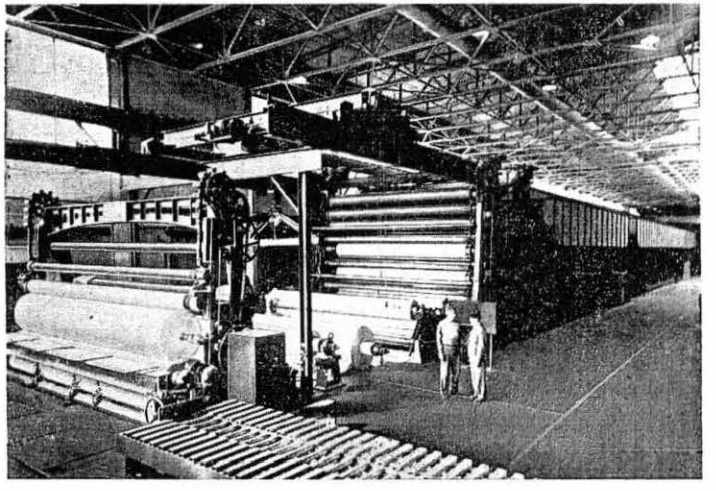
Fourdrinier Wire, Press and Smoothing Rolls

FOURDRINIER PAPER MACHINES

We have four Fourdrinier type paper machines at Canton producing many grades of fine paper. The principles of operation are practically the same for all Fourdrinier paper machines. Improvements made in recent years give advantages to the modern machines over older ones. In this brief description of Fourdrinier operation we will use our No. 11 machine as an example.

After beating and refining, the stock flows from the headbox, highly diluted, onto an endless, fine mesh wire screen known as the Fourdrinier wire.

Here by sidewise motion, coupled with swift movement forward, the scrambling of fibres forms a loosely matted web that tightens as 35 per cent of the water is drawn from it through the wire by gravity, capillary attraction, suction boxes



Winder, Calenders and Dryers

and suction roll. Additional water is removed as the sheet passes through hydraulic press rolls and smoothing press rolls.

From the smoothing press the sheet travels over and under a staggered series of dryers until it reaches the size press where a coating of starch is applied to both sides to give the paper strength, a better finish, and better inking qualities.

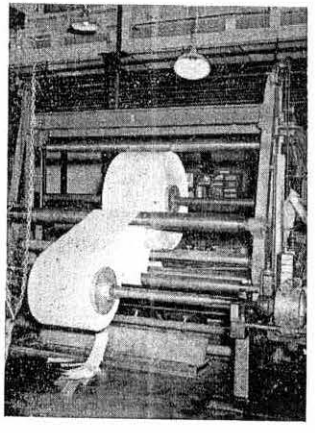
Then the sheet goes through another section of dryers and is finished by two calender stacks consisting of seven highly polished steel rolls, mounted one atop the other and revolving against each other under tremendous pressure to impart the desired surface smoothness in the finished paper.

The finished paper is wound on a reel as it leaves the calender stacks, then transferred to a winder which slits the sheet to width specified by our customers, and rewinds the paper into rolls.

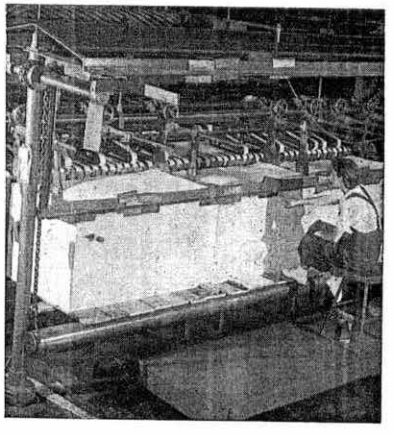
FINISHING

After the paper is manufactured, it must be cut to the size and packaged as our customers specify on their orders.

The job of the Finishing Department is to sheet, trim, weigh, count, sort and package the paper products.



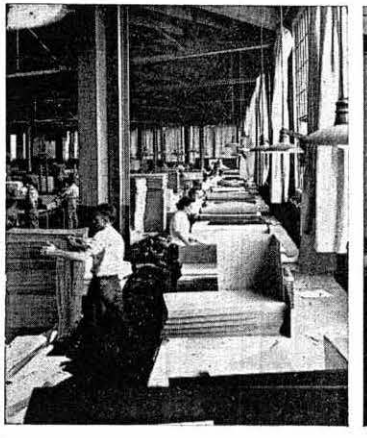
Rewinder



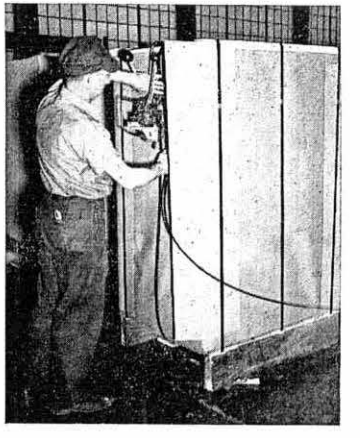
Cutter

Food Container stock from the Board Machines is cut to specified size on machine winders, weighed, wrapped and loaded directly into box-cars. Other grades of paperboard are sent to the Finishing Department for further handling. Rolls of paper as they leave the paper machine winders are hoisted to the Finishing Department floor by over-head crane or stored temporarily until the Finishing area can process the rolls for shipment.

In the Finishing Room, paper is sheeted on mechanical cutters capable of cutting as many as 12 rolls at one time. Trimmers are also used to cut paper to exact size and squareness. Mechanical and hand counting assure accuracy of shipments. During counting, any paper with defects is tagged and sent to the sorting line for further inspection and culling



Inspection and Counting



Skid Packing

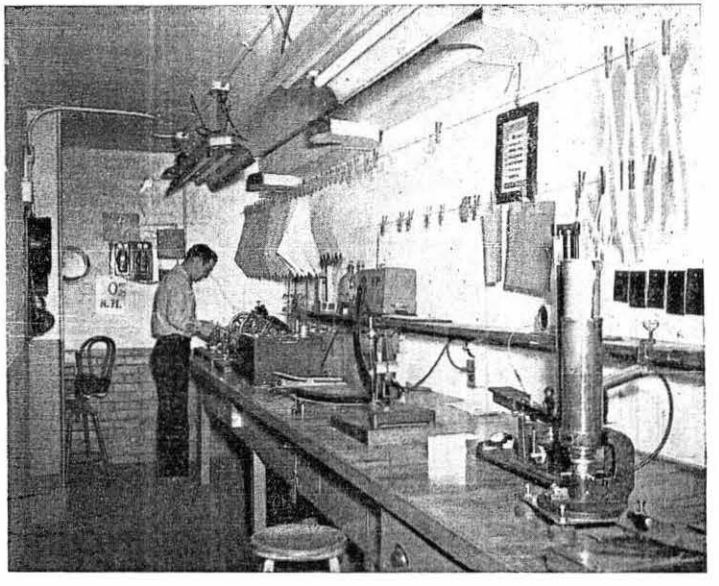
of defective sheets. Paper that passes inspection and meets customer's specifications is packaged as the order requires. This may be in rolls, skids, bundles or cartons.

The packaged product is then sent to Shipping Department where gasoline and electric jitneys are used to load the paper into box-cars or trailer trucks for shipment. The Shipping Department loads, on the average, 20 box-cars at 35 tons per car daily.

CHEMICAL LABORATORY

The Chemical Laboratory serves all operations. Raw materials are analyzed and the findings reported to those interested. Material in process, such as chips of wood, bleached and unbleached pulp, and cooking and bleaching solutions, require testing at many steps of the operations. This work is a laboratory function.

Fuel, flue gases, dyes, clay, sizing materials and many new products offered for use are the subject of laboratory study. The testing of pulp quality and chemical tests of paper, as well as the pre-shipping examination of our chemical products — Caustic Soda, Trostol and Turpentine— all come into the laboratory responsibilities. The constant watch over waste waters for loss of valuable materials is a laboratory duty of major importance.

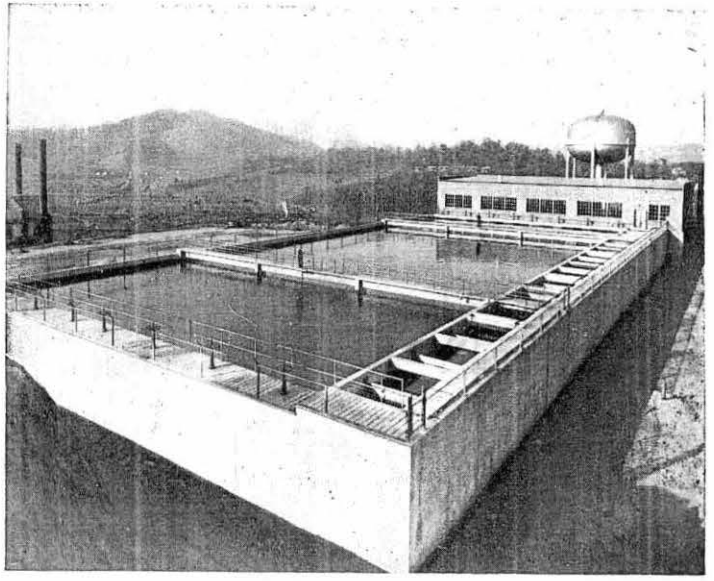


Paper Testing Room

INSPECTION

The function of the Inspection Department is to insure that established quality standards of finished products are maintained. Continuous checking and testing of the various physical and chemical properties of the paper during the manufacture reveal any variations in quality. The manufacturing department is kept informed of the test results and is able to take corrective action promptly.

During the finishing processes, the Inspection Department checks the product for general quality and appearance as well as for dimensions, weight, strength, color and other characteristics.

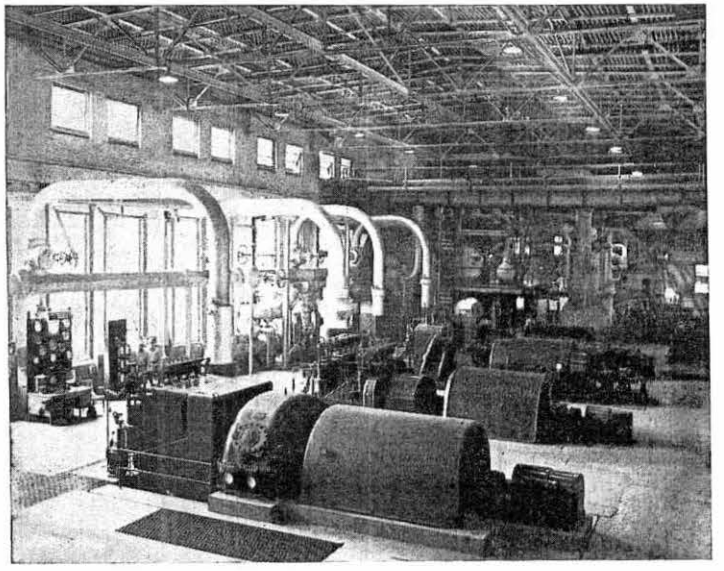


Filter Plant

WATER

At peak production, Champion uses 50 million gallons of water per day, which is equivalent to that used by a municipality of 500,000 people. Our water source is the Pigeon River, having a 150 square-mile drainage area to Canton, and a supplementary reservoir, Lake Logan, having a capacity of 650 million gallons.

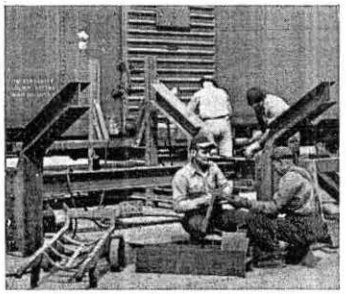
Purification methods are essentially those of any municipality treating surface water. Champion's modern filter plant can be seen on the hill just to the north of the mill.



Turbine Room

STEAM AND POWER

Steam for power and other functions in the process of pulp and paper making is produced by three huge boilers. 900,000 pounds of steam at 400 pounds pressure, and a temperature of 700 degrees F. can be developed per hour. To make this steam, 120,000 gallons of water are used per hour, and 16 to 18 carloads of coal are pulverized and burned each twenty-four hours. Electrical power produced by Champion steam turbines, which generate 50,000 k.w. of electricity per hour, would be sufficient to supply power to a city of 100,000.



Iron Workers

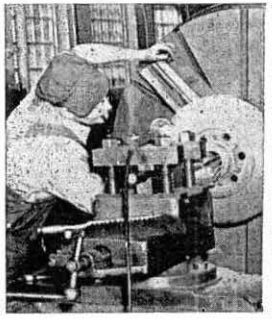
Jordan Repair

REPAIR, MAINTENANCE and CONSTRUCTION

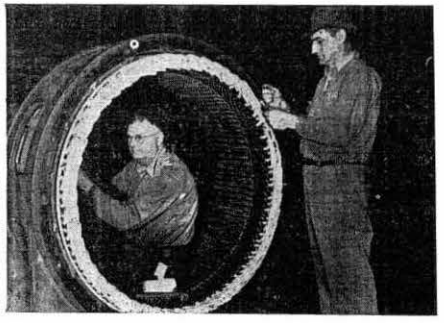
For Champion to maintain its leadership in the pulp and paper industry it is necessary that it have a well rounded and diversified mechanical department.

The Repair, Maintenance and Construction Department is responsible for new construction, repairs and replacements, and routine maintenance and service for continuous 24 hour per day plant operation.

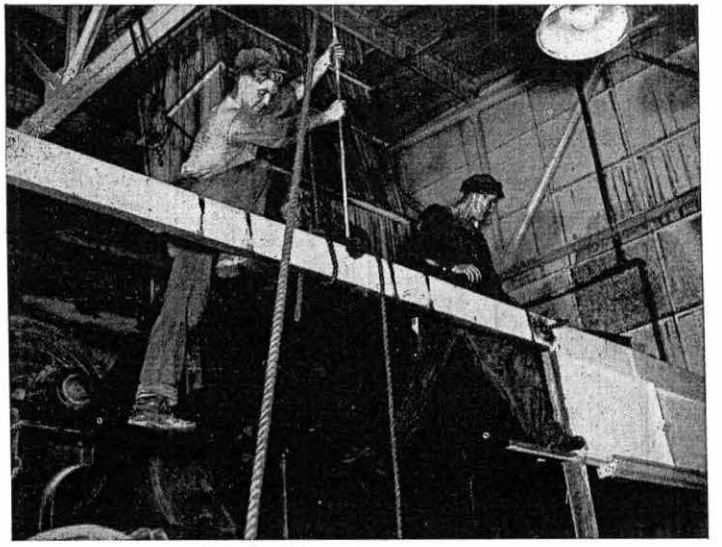
This department is staffed with qualified and experienced engineers who are capable of dealing with the many tech-



Machinist



Electrical Repair

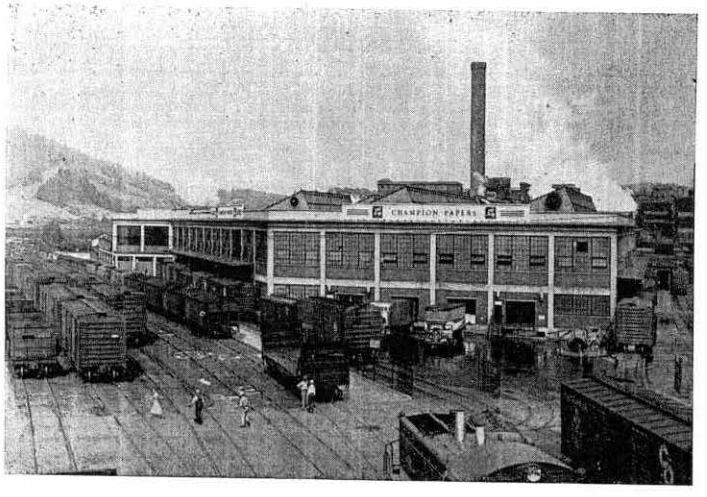


Machine Hood Erection

nical problems encountered in the design, construction, maintenance and operation of the plant.

The workers in this department represent nearly all of the skilled mechanical trades, there being foundrymen, pattern makers, machinists, welders, ironworkers, sheet metal workers, millwrights, pipefitters, carpenters, riggers, oilers, truck drivers, concrete workers, painters, electricians, and also mechanics with special training in the care of some special equipment items.

To improve and maintain this working force, Champion provides a special Mechanical-Electrical Apprentice Training Program to train young men in the skills required in the mechanical trades.



TRANSPORTATION

140 freight cars enter or leave the mill each day bringing in raw materials and transporting our products to all parts of the world.

25 cars are used each day for shipment of pulp, paper and paperboard. In addition to rail shipments, ten trailer trucks leave the mill daily, each loaded with an average of 10 tons of paper. Daily shipments of caustic soda, tall oil and turpentine require 2 tank cars, each with a capacity of 8,000 gallons, and 5 tank trucks, each with a capacity of 2,500 gallons.

The freight bill paid by Champion for inbound and outbound shipments of the Canton Division amounts to more than $7,500,000 annually.

CHAMPION PAPERS

TRADE MARK

Known The World Over!

A part of the production from each of Champion's three divisions, Canton, Hamilton and Houston, is earmarked for foreign countries. This export trade has been developed gradually over the past 30 years and has played an important role in the company's growth.

Today the familiar Champion trade-marks, such as Ariel Bond, Kromekote Cast Coated paper, Refold Enamel and Wedgewood Offset, are well known throughout the world. Many Champion grades are sold abroad, and printers on every continent are putting them to a wide variety of uses.

CANTON CHAMPION PAPER PRODUCTS

ENVELOPE PAPERS: A wide variety of unbleached, semi-bleached and bleached grades in all commercial weights. Used for business correspondence, pay envelopes, Church envelopes, heavy mailing and countless other uses.

BONDS AND WRITINGS: White and six colors used for all types of printed forms, letterheads, and circulars.

WHITE TABLET: For the manufacture of school tablets, note books, memo pads and stationery.

POSTAL CARD: Used by our Government to make the familiar postal card and by others for direct mail jobs and many other purposes.

OFFSET: Used for fine black and white and multi-colored printing. Many of the beautiful colored ads now being distributed by manufacturers of such products as automobiles, and refrigerators, are on Champion Paper.

MIMEOGRAPH: Used by schools and business firms for duplicating work.

PRESSBOARD: Used as covers for School Tablets and Blank Books and for the dividers used in Filing Cabinets.

MILK BOTTLE AND FOOD CONTAINER STOCK: For Milk Bottles, Ice Cream Cartons, Cups and other sanitary containers.

The three divisions of Champion make many papers for special uses too numerous to mention. Our papers are distributed from coast to coast and the name "Champion" is well known in many foreign countries.

CANTON CHAMPION BY-PRODUCTS

Champion has long advocated conservation of forest products. To this end, constant research is maintained in quest of useful products, other than pulp, from the wood used. At present Champion produces and sells in considerable quantity three by-products — tall oil and turpentine from pine wood, and caustic soda from the chlorine plant.

TALL OIL (Trostol): Pine wood contains resins and vegetable oils which are freed during the pulp making process. During the chemical reclaiming this mixture of resins and oils is separated from the washings and treated to produce a brown syrupy material which is called tall oil.

Champion has been making tall oil under the trade name of Trostol for 22 years. The 25-ton daily production goes into a wide variety of products such as flotation agents, core oils, asphalt paving, phonograph records, cleansing agents, paint, and printers inks. New uses are being developed steadily.

TURPENTINE: During the cooking of pine wood the turpentine and volatile oils are vaporized and passed from the digester (cooking vessel) to a condenser. The condensate, treated chemically, is re-distilled to produce clear, water-white turpentine of proper quality for many uses. It is sold at the rate of 1,000 gallons per day in tank cars and drums for use in paint, printers ink, and as a base for synthesis of perfume, insecticides, and similar materials.

CAUSTIC SODA: Chlorine for pulp bleaching is produced by electrolysis of salt, and caustic soda is obtained as a by-product. 60 tons per day of caustic soda are supplied to textile finishing plants. The quality makes it suitable for any use and it is supplied either as 50% liquid in trucks or tank cars, or as flake or solid in drums.

The Champion Family

This booklet has briefly shown the endless flow of wood into the mill, and some of the complicated processes, mechanical operations and services required to produce finished paper and by-products. However, it takes people to devise machinery, processes and methods, and to use them to make our products.

Many people, whom we like to call Champions, have helped Champion grow over the years, and have themselves lived and grown as members of our organization. Many sons and daughters of Champions have followed the lead of their parents in becoming permanent Champions.

Champion is proud of the long and friendly association of members of the organization, and has always given serious consideration to their security and well-being.

Champion has succeeded in being able to pay a high level of wages; and, by evaluating jobs, keeps applicable rates of pay in proper relationship. Special effort is rewarded by a Cooperative Earnings plan, and night work by a Shift Bonus. Fluctuations in current living expenses are compensated by a Cost-Of-Living Bonus that is adjusted quarterly. Long service is rewarded by a Service Bonus which starts at 5 per cent increase in base rate for each five years of continuous employment and goes up to 25 per cent increase in base rate for 25 years of continuous service. There are many other forms of recognition, including Service Emblems which are presented annually at dinner-meetings of each of the Five, Ten, Fifteen, Twenty and Twenty-Five Year Groups.

Every effort is made to provide Champions with a pleasant and safe work-life, to which the following activities contribute:

Application of all known safety measures to prevent injuries.

Competent medical staff and modern medical facilities.

Availability of hot foods and refreshments.

Allocating conveniently located areas for smoking.

Operation of an Employees' Store and Service Station.

Savings and loan service through a Credit Union.

Many athletic, recreational and social events sponsored by the Champion Y.M.C.A.

Cash awards for suggestions which are adopted.

Keeping informed through our monthly magazine, *Log*, our weekly bulletin, *Chips*, modern bulletin boards, and other special mailing pieces.

Providing training classes to teach more about each job.

Providing sense of security and protection of health by:

Retirement Income Plan
Group Life Insurance
Hospital Insurance
Group Sick-Accident Insurance
Vacations of one, two or three weeks after one, two or fifteen years of service respectively.

Each year all Champions are provided with a Statement of Policy to guide them in their relationships with each other.

MILESTONES IN THE HISTORY OF PAPERMAKING

700 B. C.

The first material resembling paper was made by the Egyptians in 700 b. c. It was called papyrus, after the papyrus plant from which it was made. This paper-like material was formed by splitting the stems of the papyrus plant and flattening them into sheets.

105 A. D.

Ts'ai Lun, a Chinese, announced the invention of papermaking to the Emperor in 105 a. d. The paper was made from mulberry and other barks, fish nets, hemp and rags. The Chinese retained the art of papermaking exclusively for several centuries. They became the first to separate fibres by chemical means. About 800 a. d. they were making paper from rags.

1150 A. D.

Papermaking first came to Europe in 1150 a. d. when the Moors brought the art to Spain. Paper was made in Italy as early as 1276. The art was introduced in Germany in 1320. England made its first paper in 1494. Almost 100 years later the art reached Holland.

1690 A. D.

William Rittenhouse, an immigrant from Holland, introduced the industry to America in 1690 when he built a mill near Philadelphia. The daily capacity of Rittenhouse's hand-operated mill was 250 pounds of linen paper.

1806 A. D.

Henry Fourdrinier, a London stationer, in 1806 patented

the paper machine which bears his name. The paper machine ended the laborious hand methods of the past and provided the impetus necessary to place the industry on its present high level.

1809 A. D.

A paper machine in which a wire covered cylinder revolved in a vat of pulp was invented by John Dickinson in England in 1809. This was the forerunner of our modern cylinder machine.

1852 A. D.

The Soda pulping process was invented in England in 1852, and was put into commercial operation in the U. S. in 1863.

1854 A. D.

Wood was first used in 1854, in groundwood form, for the manufacture of paper pulp.

1867 A. D.

The Sulphite pulping process was discovered by an American chemist named Tilghman in 1867.

1883 A. D.

The Sulphate pulping process was developed in Danzig in 1883 and the first sulphate mill in the U. S. began operation in 1907 at Orange, Texas.

1952 A. D.

Pulp and paper ranks sixth among the industries of the U. S. in value of total output. The industry produces over 26,000,000 tons of paper annually at a value of about 3½ billion dollars. It employs 250,000 persons in more than 800 mills and pays wages totaling about $700,000,000 annually.

The cover of this booklet is Champion Kromekote.
The inside pages are Champion Refold Enamel.