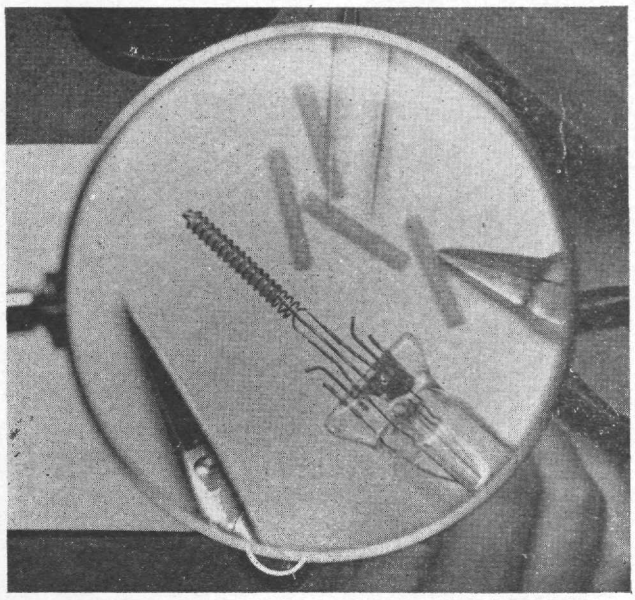
Engineering Shorts

SPAGHETTI—WAR HERO

Shades of M.E. 727! A use for all those "spaghetti presses" that were designed has been found! Spaghetti, uncooked, has been put to work to speed the manufacture of electronic tubes used for war communications.

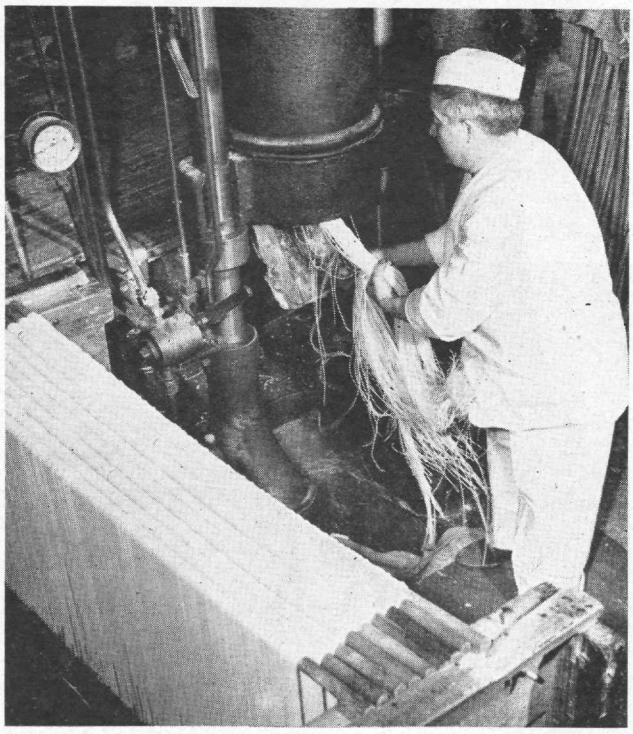
A stick of spaghetti placed inside a tiny wire coil supports the coil while it is being welded. A piece of steel was used before, but it was difficult to remove. Spaghetti can be burned out in a flash. Because of the important savings in time, man-power, and materials, this method produces 50 per cent more filaments than before.

Wire filaments for many tubes are coiled in the shape of a small spring, three-quarters of an inch long. When the coil was being welded to the rest of the tube mechanism, a steel piece was inserted inside the spring coil to support it and keep it in accurate alignment. This steel piece had to be split with a saw before it was inserted in the coil; otherwise, the piece was difficult to remove after the welding job because the coil tended to tighten around it. Sometimes the coil was jarred, and it had to be realigned. The whole job was very time-consuming and tiresome. William A. Hayes, a young electronics engineer at Westinghouse, tried everything he could think of, and then he thought of spaghetti. Now a little stick of spaghetti is inserted where the steel piece used to go. After the filament is welded, an electric current is passed through the coil to remove any impurities in the metal, and this burns up the sphaghetti in a flash. The time consumed is about one-fourth that when steel was used.



—Courtesy Westinghouse.

This is the filament with the spaghetti inserted.



—Courtesy Westinghouse.

Workman removing spaghetti from special die.

Mr. Hayes found out a lot about spaghetti. He found, among other things, that it can be machined on a lathe. It can be made with fair precision and is strong enough not to break if handled carefully. The first spaghetti he used was machined to the correct diameter on a lathe. Now the spaghetti maker uses a die.

BIG BRAIN

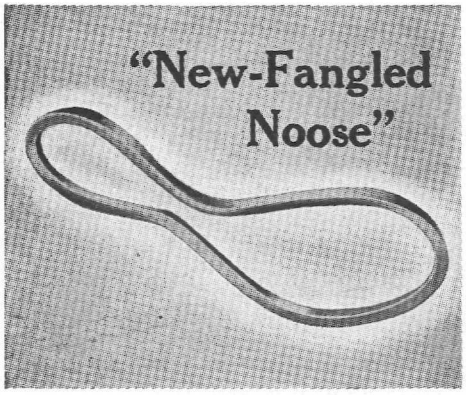
To power company officials, the "A-C Network Analyzer" is the solution for problems too involved for mortal man to work. The analyzer consists of a cabinet with a maze of dials and wires. It in no way resembles the generating stations, high-voltage transmission lines, transformers, or other equipment of the electric power systems that supply energy to factories and homes throughout the nation. All the same, this network analyzer can be made to act in the same manner as an actual power system, and in a few hours can perform calculations that ordinarily would require weeks or months.

(Please turn to page 20)

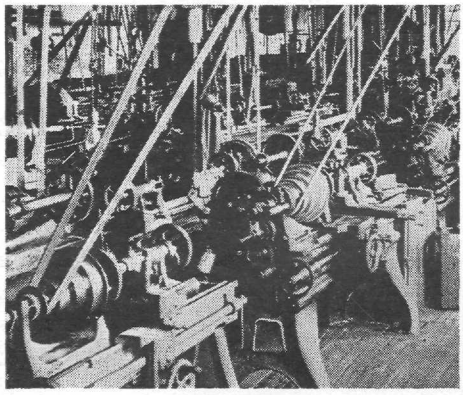
TEXROPE

- EVER HEAR OF IT?

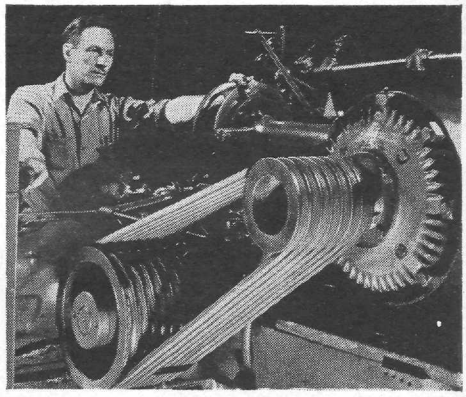
PROBABLY THE BEST EXAMPLE OF HOW ALLIS-CHALMERS STUDIES AN INDUSTRY'S PROBLEMS—EFFECTS PRIME ECONOMIES!



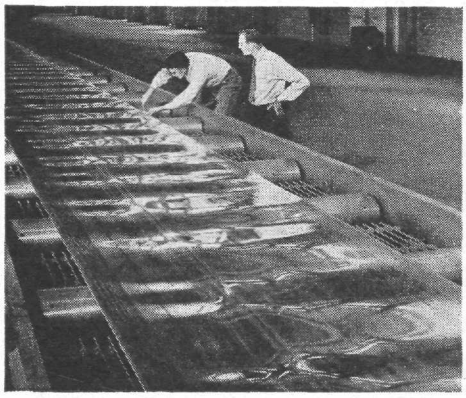
1 This is the heart of the simple Texrope Multiple V-Belt that solved a problem plant engineers had been studying for years — *power loss between motors and the industrial machines they drive.*



2 Multiple V-Belt Drives, invented by A-C, eliminated usual "jungle" of clumsy belts (shown above) driven by line shafts. Each machine could have its own motor and drive with better efficiency and economy.

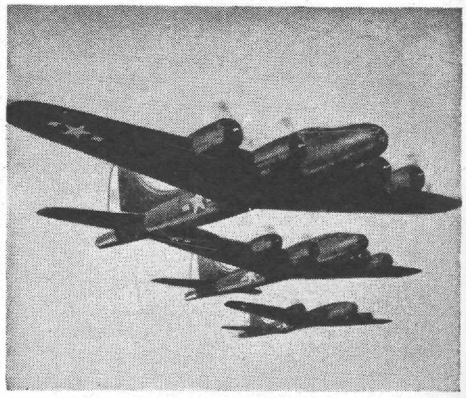


3 The whole field of power transmission was revolutionized. Today, Multiple V-Belt Drives, made by or under license from A-C, drive 75% of all industrial machines turning out U. S. war and civilian supplies.

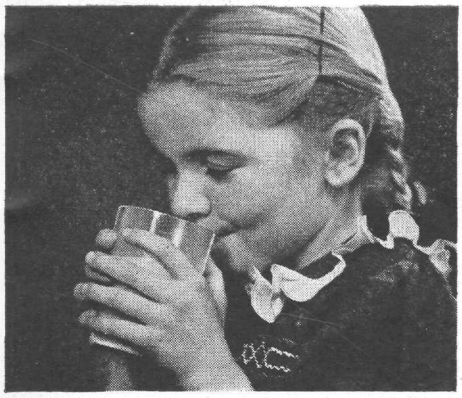


4 Just as typical as the Multiple V-Belt Drive is another important Allis-Chalmers' development in the electronic field that aids the vast aluminum industry—*the A-C Mercury Arc Rectifier.*

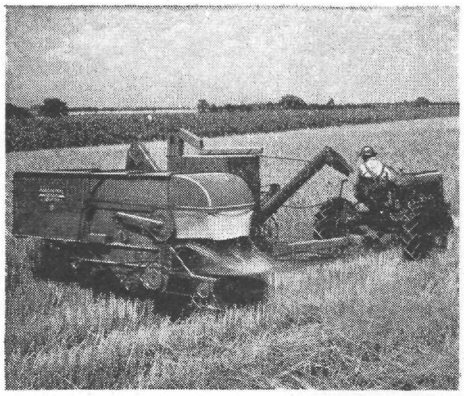
5 This giant electronic device inexpensively and reliably converts a-c to d-c current—the electric power needed for electrolytic reduction of light metals. Again Allis-Chalmers helped solve a major problem.



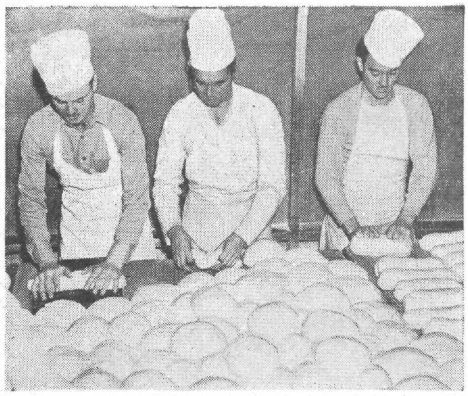
6 It helped assure the U. S. at war adequate aluminum supply for mass production of fighting planes. After Victory, it will help the light metal industries introduce a host of new products for America.



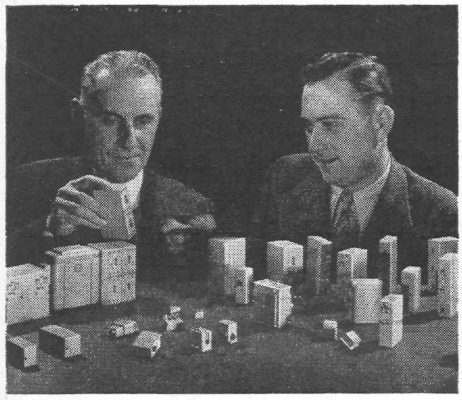
7 Speeding food to America's tables is another important Allis-Chalmers' job. Packers, shippers, processers, canners all draw on Allis-Chalmers' industrial experience for vital machinery and equipment.



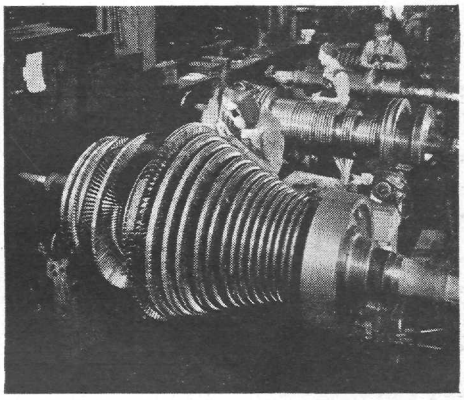
8 Even on farms, A-C engineering is at work. It produced the first low-cost tractor, the All-Crop Harvester, the One-Man Hay Baler—machines that mean big savings in time and manpower on family-sized farms.



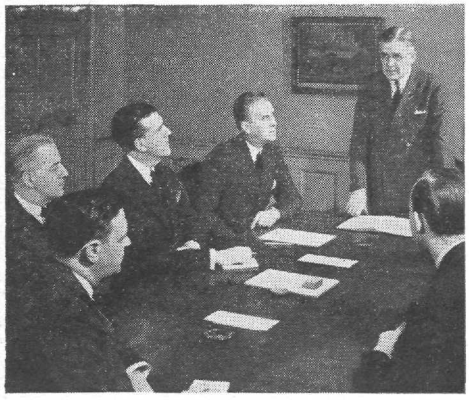
9 A large part of the flour for U. S. bread and pastry is milled by A-C machinery. In almost any kind of mill—flour, steel, textile, cement or lumber—you're likely to find a big share of equipment stamped A-C!



10 A-C "Know-How" aids *every* industry. Our scale model "Unit Sub Builder" Set saves time—helps you plan visually in working out more efficient power distribution in your plant.



11 Here you see just one small part of Allis-Chalmers' vast manufacturing facilities. In 8 huge plants, A-C builds the largest line of capital goods machinery and equipment in the world!



12 Call on this wide range of industrial experience in meeting new wartime cost and production problems. There's an Allis-Chalmers office nearby that can help you!

Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin.

TEAM UP WITH THIS "KNOW-HOW!"

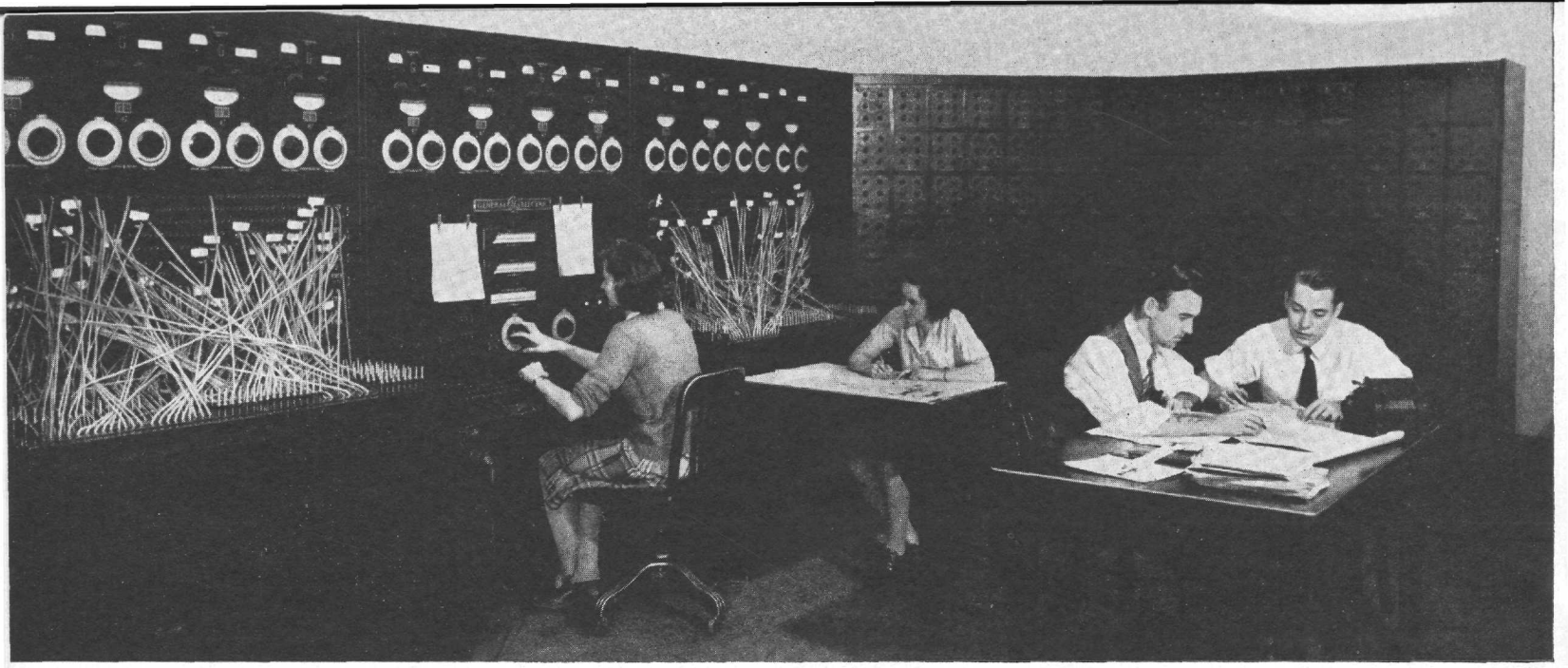
In this crucial period, when engineering skill is so urgently needed—put the Producer of the World's Largest Line of Major Industrial Equipment to work for you!

ALLIS-CHALMERS

PRODUCER OF THE WORLD'S LARGEST LINE OF MAJOR INDUSTRIAL EQUIPMENT

A-C

Tune in the BOSTON "POPS" Every Saturday, over the Blue Network, Coast-to-Coast 8:30 P.M., E.W.T.



This is the "big brain." —*Courtesy General Electric.*

It is a sort of "proving ground" for the pet schemes and ideas of engineers; it checks the operation of generating stations and transmission lines before they are built. Condensers, generators, transformers, circuit-breakers, and regulators are ordered after the analyzer has proved that the material is necessary and of proper design to fulfill all the requirements. Thus it can be seen that the analyzer prevents many costly errors.

New uses for this modern electrical brain are continually being found, such as the answer to problems dealing with fluid flow, a-c machine analysis, electro-magnetic fields, elasticity, quantum mechanics, and dynamics.

COLD STORAGE LOCKERS

A cold storage locker plant lets both the farmers and the townspeople make large savings in their annual food bill and at the same time lets them enjoy the tastiness of fresh foods at a time when they are most desired. It provides greater utilization of home-grown vegetables, berries, and meats. By purchasing large quantities of food (bulk), the city slicker can effect a great economy in cost by sticking them in the "freezer" until he wants to enjoy their goodness. Actual reports from government records show that a family using refrigerator locker service can save $75 to $100 per year.

Lockers are operated in two ways: "sharp freezing" and complete. The sharp freezing plants have one room held at zero or below, and the other, the complete job, has separate rooms for chilling, aging, cutting, quick-freezing, and storage of food in lockers. The complete plant gives proprietors the chance of earning from $25 to $35 per locker per year. Sharp freezing plant operators may earn from $5 to $18 per locker for the one-room plant.

The modern complete refrigerated food locker plant consists of four or five main rooms, in each of which a separate service is rendered; in addition, most plants have a small office and machine room. In the chill room, meat is thoroughly cooled to remove all body heat, and is aged before being cut and frozen. Temperature here is 32-36°F. When chilled and aged, the meat is taken to the room where it is cut into steaks, chops, etc. All cuts except those to be cured are wrapped and stamped with date, locker number, and description of cut. Processing of fruits and vegetables can be done in the same room.

The separate cuts, fruits, and vegetables are next placed in the freezer room. This can be of either the blast type, using overhead coils through which the air is forced by a blower, or the shelf type, with coils arranged along one or both walls. In the blast freezer, the meat is preferably placed on wooden trucks and passed under the coils. The meats are frozen in 3 to 6 hours, giving all the advantages of *quick* freezing. Temperatures of 30 to 50 degrees below zero are common in blast freezer rooms, not homes.

So get yourself a farm, and eat well all year 'round!

Maw: "You know, I have a sneaking suspicion that the people upstairs don't like to hear Mortimer practicing on his drum."

Paw: "Why, how's that?"

Maw: "Well, today I saw the man give Mortimer a knife and he asked him if he knew what was inside the drum!"

U. S. Marine Corps Photo

Combat wire moving up in a hurry!

Every unit ties in by telephone to report on contact between companies, and to discuss the next move. That means combat telephone wires must be laid down with every forward push. And communications crews must work continuously repairing breaks in lines torn by tanks and amphibians and blasted by artillery and mortars. Our Armed Forces still have urgent need for huge quantities of communications equipment of all kinds. That's why there is a wait for home telephone service.

BELL TELEPHONE SYSTEM

"Service to the Nation in Peace and War"