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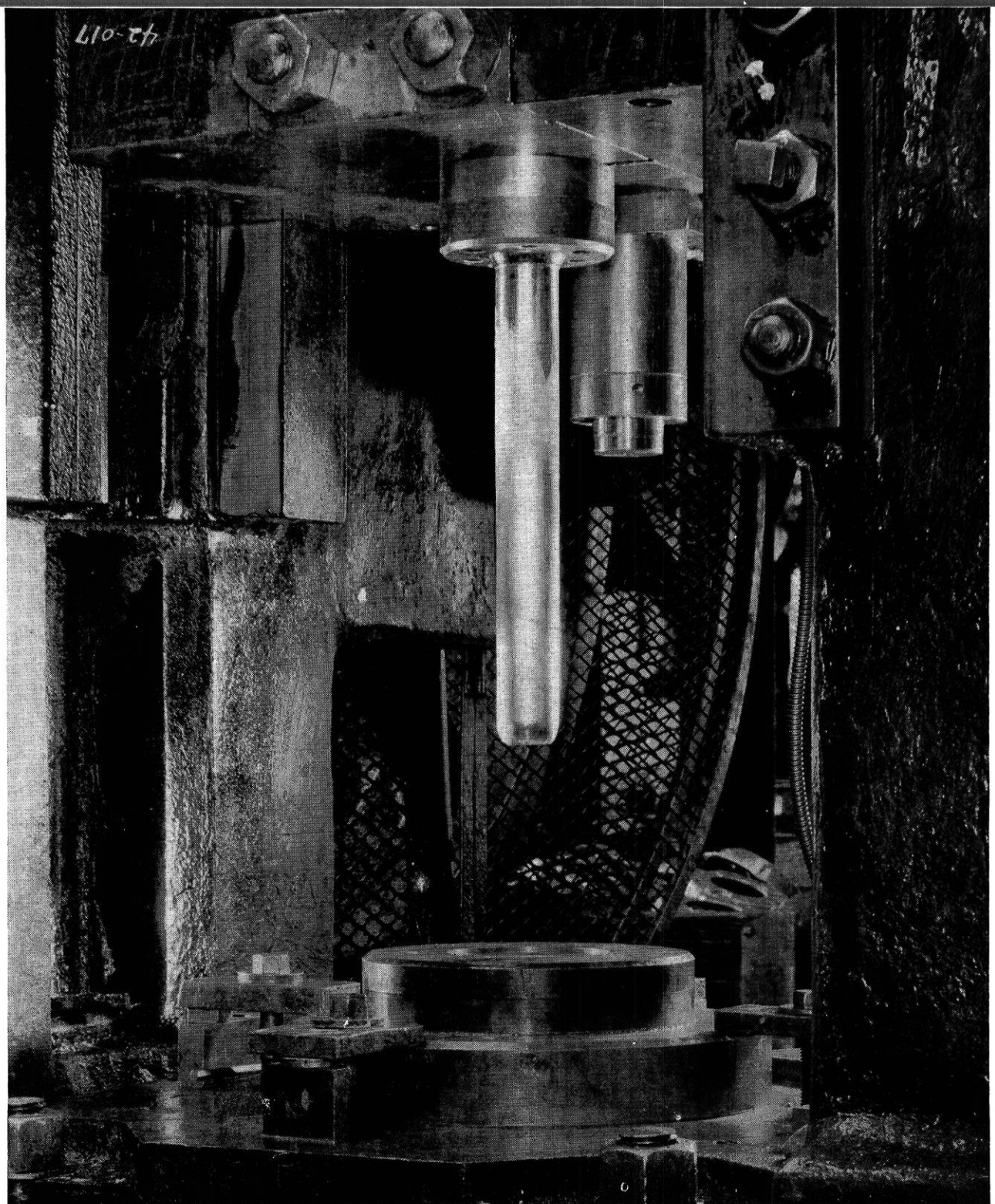
WISCONSIN ENGINEER

December, 1944



MEMBER ENGINEERING COLLEGE MAGAZINES ASSOCIATED

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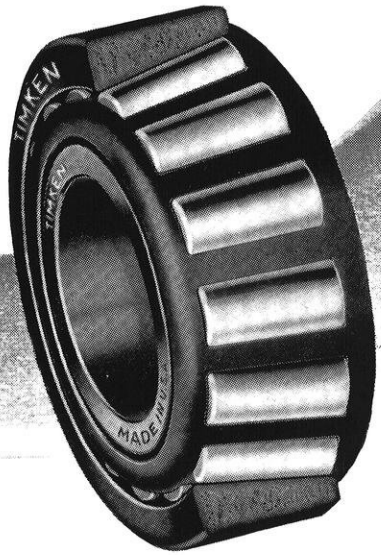

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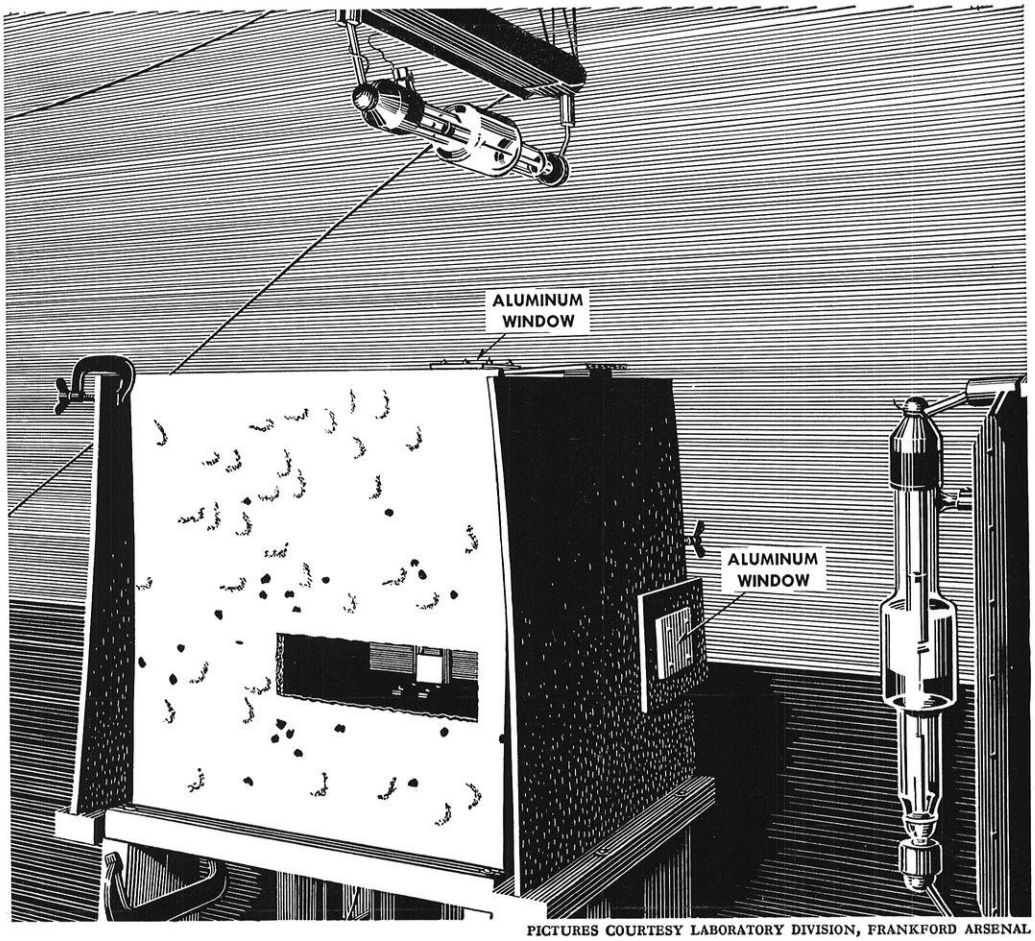
TAPERED ROLLER BEARINGS



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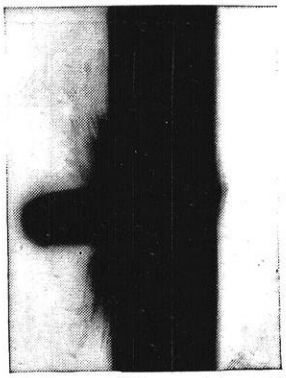
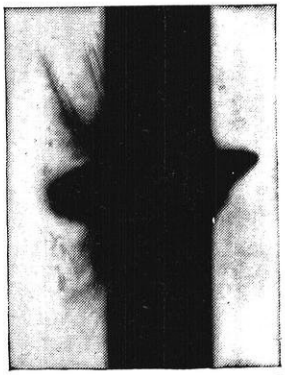


High-speed X-ray picture of cal. .30 bullet penetrating 1/2 inch thick armor



High-speed X-ray picture of same bullet 20 millionths of a second later

14,285 times quicker than a wink

Westinghouse research engineers have developed an ultra-high speed X-ray tube that makes possible X-ray pictures, taken at the terrific speed of *one-millionth of a second.* These pictures show armor-piercing bullets penetrating ½ inch of solid steel armor plate.

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Secret of this revolutionary X-ray is the new type tube that can handle a jolt of 2000 amperes, at 300,000 volts. This is applied in a flash by electrostatic condensers—creating a tremendous surge of *X-radiation.*

With this new X-ray, U.S. Army ballistic experts can "freeze" the image of a bullet, while it travels within a gun barrel at 2600 feet per second—or study the action of projectiles as they smash through armor plate.

When peace returns, this new example of Westinghouse *skill in research* will enable machine builders to study the strains in rapidly moving parts—improve performance and increase the life of peacetime products.

Westinghouse Electric & Manufacturing Company, Pittsburgh 30, Pennsylvania.

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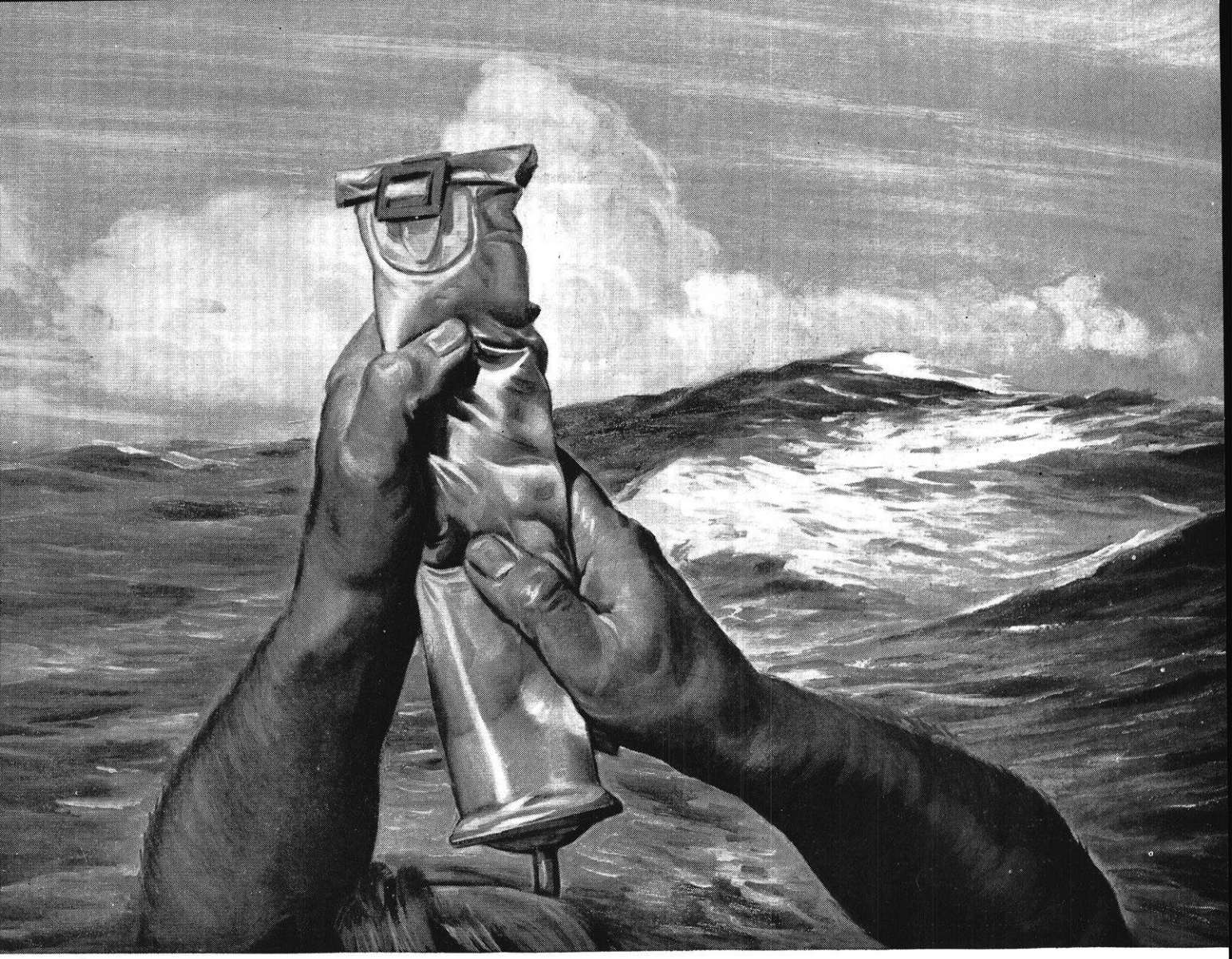
MAN-MADE HURRICANE BLOWS OUT ELECTRICITY. Engineers can now "blow out" electricity as easily as you extinguish the flame from your cigarette lighter. Circuit breakers built by Westinghouse unleash a 600-mile-an-hour blast of compressed air to snuff out powerful short-circuit arcs and prevent damage to vital electrical equipment on power lines. The hurricane of air can smother a 1,000,000-kilowatt electric arc in less than a hundredth of a second.

REPRESENTATIVES OF 257 PRE-WAR PROFESSIONS. businesses, and trades are now employed at the Westinghouse operated Naval Gun Plant at Louisville, Kentucky. Included are: former circus performers, several embalmers, a former professional hill-billy musician, and a pipe-organ builder. Despite their unusual peace-time occupations, all here have been able to learn the amazing high precision needed in making Naval guns.

A NEW GUNSIGHT LAMP that enables American gunners to aim *directly into the sun* and yet fire with deadly accuracy has been developed for the Army and Navy by Westinghouse Lamp Engineers. Former gunsight lamps allowed gunners to aim within only 15 degrees of the sun, leaving a dreaded "blind spot."

FREE . . . "Engineering Highlights of 1944"—a 32 page book, filled with interesting articles on new developments in electrical research and engineering in wartime. Write: Westinghouse Engineer (EC-124).



Life  FROM A PLASTIC BAG!

THE MAN ADRIFT here is drinking sea water. But it is sea water that he has made drinkable by chemicals and a filter contained in a VINYLITE plastic bag*. The plastic—produced by CARBIDE AND CARBON CHEMICALS CORPORATION—has been made possible by the availability of synthetic organic chemicals, in which this Unit of UCC specializes.

But the story behind VINYLITE plastics is far more than just the history of another chemical development.

Rather, this unusual substance is indicative of the way man can learn—through years of uninterrupted research in the basic and applied sciences—to make better material than nature. It is one more confirmation of the continuing progress that is achieved by co-ordinating research, development and engineering.

The importance of VINYLITE plastic in helping to solve such vital needs as fresh water at sea is typical, in terms of human progress, of the stature already attained by many of the 160 synthetic organic chemicals that CARBIDE AND CARBON CHEMICALS CORPORATION now has in commercial production.

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**There are good reasons why a VINYLITE plastic is used in desalting bags. It can't mildew or rust. It is strong and tough, scuff-proof and shock-proof. It is chemical-resistant and sun-resistant. It is lightweight, transparent and flexible. It is non-flammable and cleanable . . . Engineers and executives interested in this material are invited to write for the booklet P-12 "Vinylite Plastic Sheet and Sheeting."*

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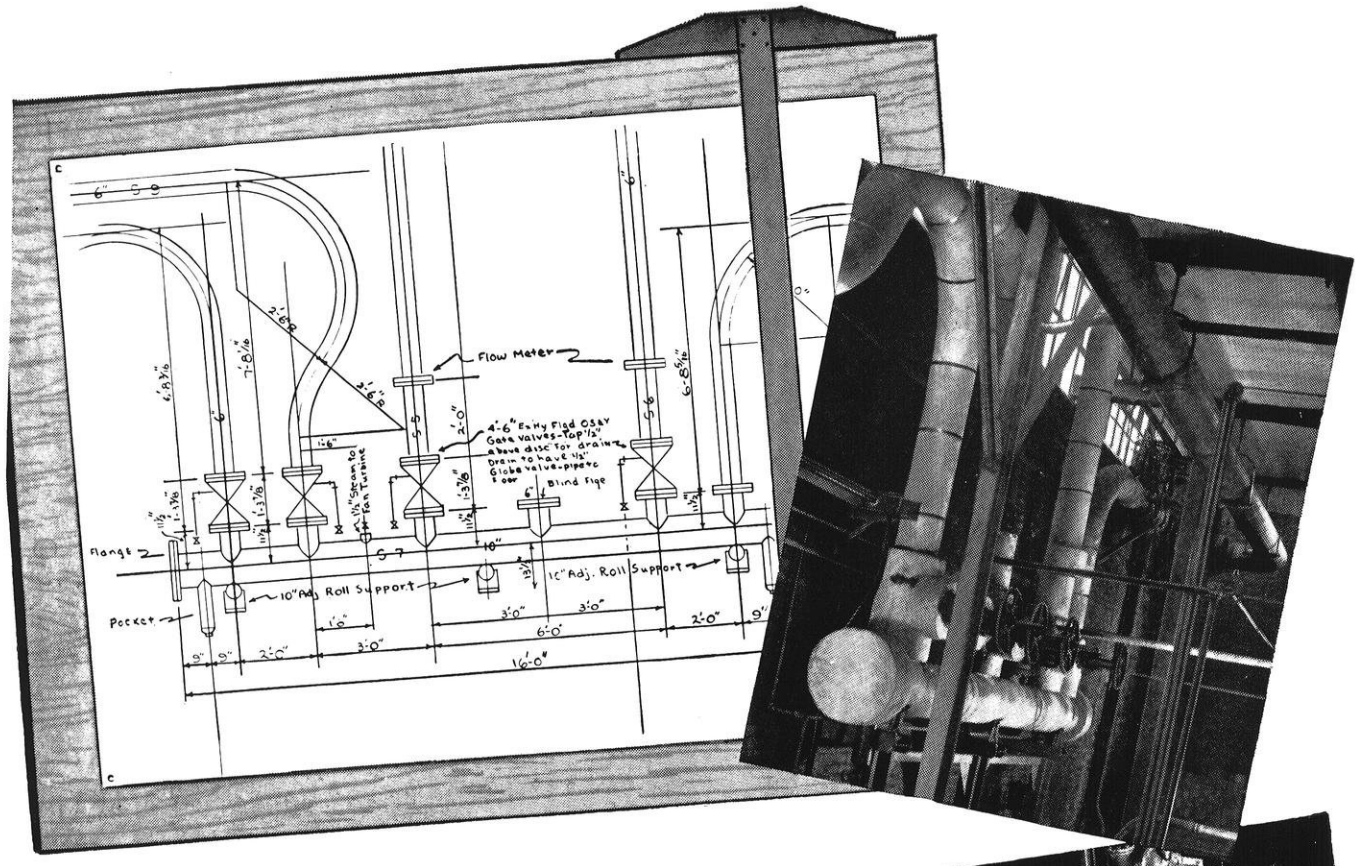
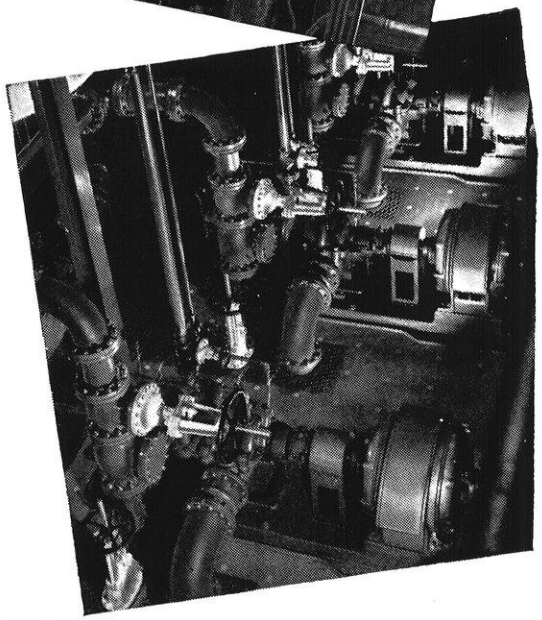


You can't take piping *for granted*

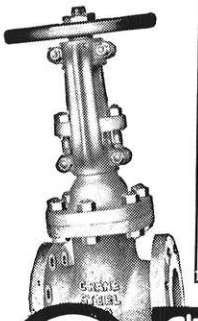
WHEN you draw a piping line on a blue print—when you indicate a symbol that means a valve—remember that ultimately those lines and symbols will have to be translated into hard metal, and that those lines you draw will have much to do with determining the success or the failure of the engineering project.

The parts that make up any piping system are many. But each one of these parts—the pipe, valves and fittings; the traps, joints and gauges; the flanges, unions, gaskets and insulation—is part of the complete Crane line.

When you are writing specifications, keep this fact in mind: Crane's single source of supply, Crane's experience, and Crane's reputation for high quality will do much toward assuring the success of the systems you design.



HERE'S ENGINEERING DATA TO HELP YOU



Crane engineers have prepared several important books and treatises on piping systems. These include the Crane Catalog, *listing more than 48,000 piping items and containing valuable engineering data*—Piping Pointers Manual, *packed with piping information*—Flow of Fluids *and* Combating Corrosion, *two technical papers of value to any one laying out pipe lines. This material is available from the following persons in your school, for reference.*

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PROF. G. L. LARSON, *Mechanical Engineering*
PROF. B. G. ELLIOT, *Mechanical Engineering*
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WISCONSIN ENGINEER

Founded 1896

Volume 49 DECEMBER, 1944 *Number 4*

MEMBER OF ENGINEERING COLLEGE MAGAZINES ASSOCIATED

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In This Issue . . .

COVER . . .

The huge press is found in the Wisconsin Metal Process Company, Racine, Wisconsin. It is used for the drawing of cartridge cases for the army and navy. This press is equipped with the "Eason stripper system" which makes possible the drawing of steel cartridge cases.

—Courtesy Wisconsin Metal Process Company, Racine, Wis.
and
—Courtesy C. M. Eason Industrial Clutch Co., Waukesha, Wis.

FRONTISPIECE . . .

Christmas lighting. Using lighting effects to create a brilliant Christmas card addressed to everyone, this home makes use of several unique ideas. The lights in the shrubs, the candles by the door, the wreaths in the windows, and the silhouette of Santa and his reindeer combine to achieve this striking picture for the Yuletide season. *—Courtesy Westinghouse*

SANTA'S GIFT—

By the Editor

THIS is a story for all you good little boys and girls who have written to Santa Claus and have asked for a sliderule or the newest handbook or another book covering the theory of some new subject. (We just know that's what all of you have asked for!) And this is the story—as it wasn't—but might have been:

'Twas just two weeks before Christmas and the thriving little community of Claustown at the North Pole was struggling vainly against priorities and the WMC to get ever so much done before Christmas Eve. In the engineering department of Santa's biggest factory, everyone even down to little seven-year-old Sliderule was knitting his brows trying to think of something new or at least something that those little kiddies from the College of Engineering at the University of Wisconsin would like. But those people were a problem; they wouldn't accept just anything. It had to be something new and different.

This bothered everyone. Even Santa himself was kept awake far into the night trying to think of something. But no idea would come. Everything had been tried. A reward had been offered for the cleverest idea, but there had been no entries, even after the rules were changed so no box tops had to be sent in with each entry. It was also decreed that the person who thought of something would be knighted and have their resemblance transformed into the next shipload of tiny elfine dolls to be sent to the boys and girls in the Letters and Science course at the University of Wisconsin. They would accept such time-old gifts. But those engineers! They were a problem.

No Christmas lists had been sent in by these busy little people. They were too busy with their books and their research as to how much beer can be chug-a-lugged without causing dire effects on the structure under observation. It was a great field for research, one e.e. having made the great discovery that a pitcher of beer really is very frictionless and it can easily be downed in one gulp. But each and every one of the ee's, me's, che's, ce's and m & m's knew that Santa would not let them down.

Santa could not fail them! He was worried and his townspeople were worried, too. A tension was over the whole town—if they could not think of something soon, it would mean disaster! Santa had never failed anyone before and he never wanted it to happen. Even his little pet dog, "Fleas," went around in a perplexed daze.

Everyone was in the Christmas spirit.

A week passed and the tension increased. Everything but the very last minute preparations had been finished and put aside for packing—dolls, balls, games. But still nothing for the engineers. And it had to be something new. The civils were tired of playing with last year's construction sets. Besides, they now built bigger ones themselves. The electricals had laid aside their electric trains because they'd rather work in the labs with new power equipment. The mechanicals were no longer interested in the model machinery they had. At school they could work around on the real models. Mining and metallurgicals had packed away their little samples of ore. They had seen other samples at school and there were more of them. Ore was so scarce at the North Pole anyway! And the chemicals hadn't looked at their chemistry sets. The labs and equipment were worth a hundred chemistry sets. Yes, what to do?

Finally on the 23rd, the draftsmen, the inventors were giving it one last try. Everyone was in a bad mood. No-one had slept for days. Poor little Sliderule could no longer figure. Being only seven, he had been kept very busy running errands from one department to another. And he had to go to school, too. At Claustown, the boys and girls went to school all through Christmas, except just for Christmas Eve and Christmas Day when they jumped

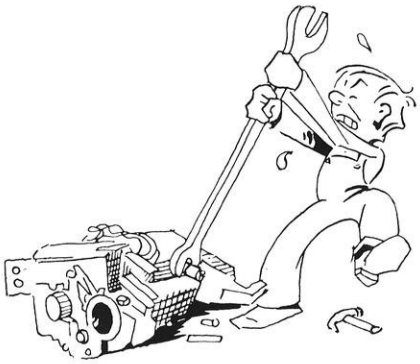
(Turn to next page, please)

SANTA'S GIFT . . .

(continued from page 7)

into Santa's new twin-motored EZ-2C plane and roared away with him to help deliver gifts all over the world.

Yes, Sliderule's mind was in a dither. In the back of his mind he kept thinking about that problem in arithmetic that day: finding the product of 75 glasses of beer times 3 people per 9 glasses. He wasn't very good in multiplying or dividing and the only way he could do it was by counting on his fingers, which he found was taking an awfully long time. And he didn't have time for that, with



Sliderule was kept so very busy.

his job at the factory, his father on the night shift and his mother away all day at the Hockleed Air Plant. And finally Sliderule could stand it no longer. He cried out in a shriek and fell to the floor.

"I can't do it! I need something or someone to do it for me. Help me, please!"

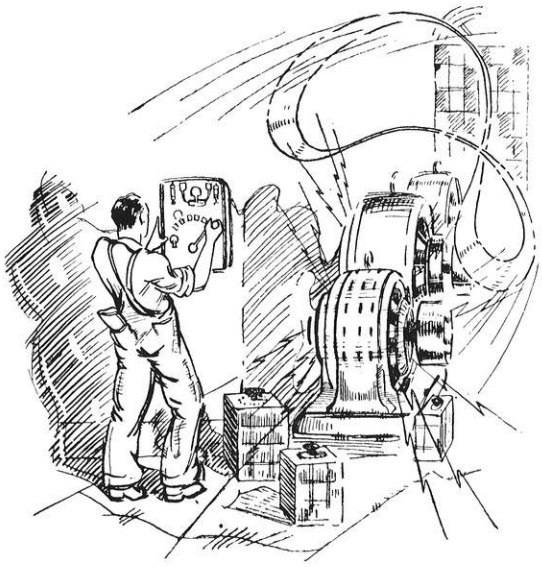
They took Sliderule to the hospital and Santa was informed of the accident. Suddenly a great idea struck him! If Sliderule, who was only seven, was bothered by multiplying and dividing such numbers, think what the kiddies at the College of Engineering were doing. Perhaps something could be made which would do all this work with a minimum of effort.

Immediately he summoned his chief engineers and inventors and draftsmen.

"I want a tool," he said, "something not too big, that can easily be carried around and that will multiply, divide, give functions of angles, logarithms, and anything else you can think of. Now get to work!

"We will make it like a rule, only there will be a center part that will slide on graduated scales. Do you see what I mean? The rest I leave up to you. But there's no time to waste. Those Wisconsin engineers must not be disappointed now!"

And so soon the plans were drawn up. Meantime, all the able-bodied men-folk of the town were out in the forest, getting the best wood from which to make these new sticks. It was still a mystery to many of them, how a stick would do all they said it could, — seemed impossible, and why wouldn't anyone rather have a new game anyway?



Everyone worked very hard to complete these new "sticks."

An hour before Santa's scheduled time to leave, the last stick was stowed away in the great big bag. Again everyone would be happy on Christmas Day. But everyone wanted to know what these sticks were going to be called. Santa answered that himself.

"If it had not been for Sliderule many people would have been disappointed this Christmas. Therefore, forever more in the future we will call this stick with which engineers of today and tomorrow will quickly and accurately solve complicated problems, the SLIDERULE!"

And because of this, every good little engineer at the University of Wisconsin woke up with a sliderule in his stocking. Today, they identify the engineer. And that night, down at the research department, every engineer there had his sliderule fastened to his belt as he took data on the buoyant effect of the different alcohols.

The Two Worlds

—*Theodore Nowak*

A First Prize Tau Beta Pi Essay

UPON reaching the end of his stay in engineering college, it is of interest to the student in looking back over the scholastic program which he has completed, to realize how it was designed to fit him to play a role in the world he is to enter. The first realization in looking over the four-year program is the striking degree of technical information—the ability to reduce nature to mathematical, physical, and chemical relations—that have been presented. It leaves him with the thought that for the first time in his life he has some really clear and accurate notions of the world which he lives in. The second realization, even more striking than the first, is the very meager knowledge of the social and economic problems that the scholastic program presented to him.

As a result of his four years of study, the student engineer finds himself living in two worlds; one, a world of science, the other, a world of ethics—of social, political and economic standards and problems of man. The two worlds differ completely in the solution of their problems, in the advancement of progress, and in the acceptance and willingness to make novel changes.

In the world of science a decision or solution is made on the basis of observation, application of fundamental laws that are expressed mathematically and through experimentation. In the world governing the relationship of mankind a completely different attitude and reasoning is applied in solving problems. Problems cannot be measured in mathematical laws, nor can they be reduced into fundamental laws as in the scientific world. On the contrary, the decision or solution of a problem is based upon precedents of the past, upon prejudice, upon monetary benefits or upon prestige.

The engineering student finds himself upon graduating a citizen of the world of science. He realizes that he only possesses technical information and training that prepares one to earn a livelihood. His past education was directed toward an improvement of the chances of personal worldly success and not for the purpose to fit him to play a part in the social or political betterment. He regrets that his scholastic program did not include the cultural subjects as literature or philosophy. It is true that he was given the privilege to choose a few courses approved by the engineering college here and there in economics, English, history, and psychology, but not many students cared for these "non-practical" subjects that were presented without any coordination or direction toward a unified goal or purpose. These electives fell short of anything designed to fit the student into social world.

Thus, without any knowledge of problems in the control of society, and the absence of cultural background—intellectual and literary enjoyment—the student engineer finds it difficult to differentiate problems which involve mathematical treatment and application of scientific laws and those that do not. The tendency therefore is to apply scientific treatment to all problems. Here is where the disastrous mistake is made. Engineering procedures directly applied to the control of society result in failure. It is not workable to treat human beings as though they were electrons or machines subject to invariable, simple, formulated laws which can be discovered, organized and readily applied with success. This is because man is romantic, artistic, poetic and mystical. He resents the cold scientific analysis—the reduction of life to the well substantiated laws of science.

Therefore, the student engineer in possession of only technical information is not capable of realizing social problems. He often becomes the "man in the shop," the "headline reader" and the man capable of satisfying his own desires. He is indispensable to society as a servant in creating ingenious mechanical and chemical devices but once created he has no control of nor interest in the social world's use of his creations. It is proper, therefore, to conclude that the student in engineering should receive preparation not only in scientific fields but also preparation for the exercise of worthy citizenship and the participation in the cultural interests of life so that upon graduating he can play a part in both worlds.

A NEWS BIT

A robot pilot has been developed by General Electric which is far superior to a human pilot in holding a plane on its course and in correcting for deviations from straight and level flight. Its advantages lie in relieving the human pilot of monotonous physical control and in its faster automatic reactions when the plane begins to move off course.

STEEL CARTRIDGE CASINGS *and the* HYDRO-STRIPPER

—Fran Tennis, me'46

THE world now knows that steel cartridge casings are at last a reality, but it does not realize the tremendous engineering difficulties that had to be solved to make this possible. Before the war we had excessive stocks of copper and its alloys, and it was then unthought of that some day we might have to look for a substitute due to the scarcity of these materials. After the world conflict started demands for copper and copper alloys immediately skyrocketed. We needed copper for bearings, for electrical appliances, for radios, for tanks, for ships, for shells, and many other contrivances essential to the war. The demand for copper could not be immediately met by home production, and due to the shipping shortages we could not readily import it from South America, notably Chile. It was, therefore, necessary to look for products that could use a copper substitute; among these were cartridge cases. The logical copper substitute in this line would be the more abundant steel since it had been experimented with during the last war by both the allies and the central powers without any great measure of success.

It was known in 1941 that the Germans had developed ways of making steel cartridge cases, but these methods were a closely guarded military secret. The United States, not to be outdone by their enemies, obtained the greatest cooperative efforts of American industry. The call to arms of American industry met response from every corner of the land. The largest corporation down to the smallest business offered freely their once guarded production knowledge and set forth collectively to solve this task.

Obviously the problems confronted were many: the maleability, the corrosiveness, the ductility, the brittleness, the hardness, the specific heat, and various other modules and coefficients of steel varied markedly with that of brass. The engineers therefore had many difficult problems to face. Because complete retooling was retardible, they began by a comparative process of steel to brass. First of all a good steel had to be found that was both fine-grained and durable. After much experimentation a carbon steel was developed having the following analysis: Carbon 0.24-0.34; Manganese 0.55-0.58; Phosphorous (max.) 0.04; Sulfure (max.) 0.045; Silicon (max.) 0.1. The steel thus formed was to be free of surface scratches, since they frequently caused rupture during processing or a point of weakness in the case that was likely to fail in the future.

Cartridge cases are drawn in huge presses. The original stock is a small round disk varying in diameter and thickness to the caliber of the cartridge to be produced. The first draws are known as the cupping operations and the following draws produce the cylinder with the desired length and thickness of walls as previously determined. The difficulties here lie in the lubrication and the stripping of the cartridge casing from the punch. With

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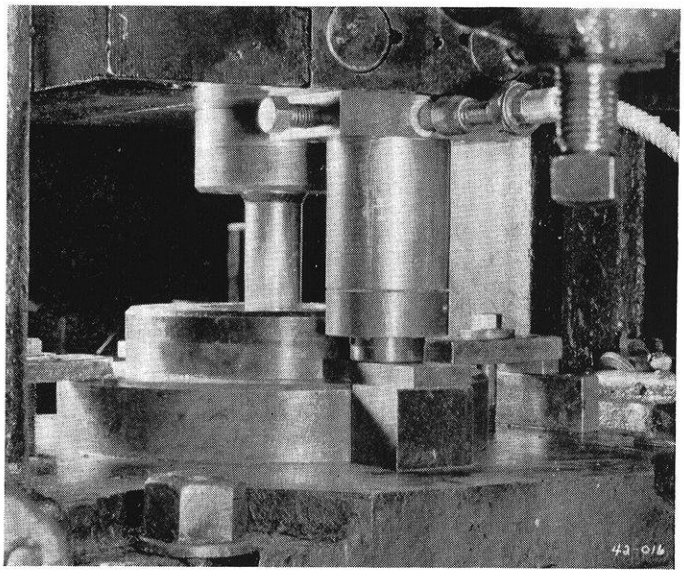
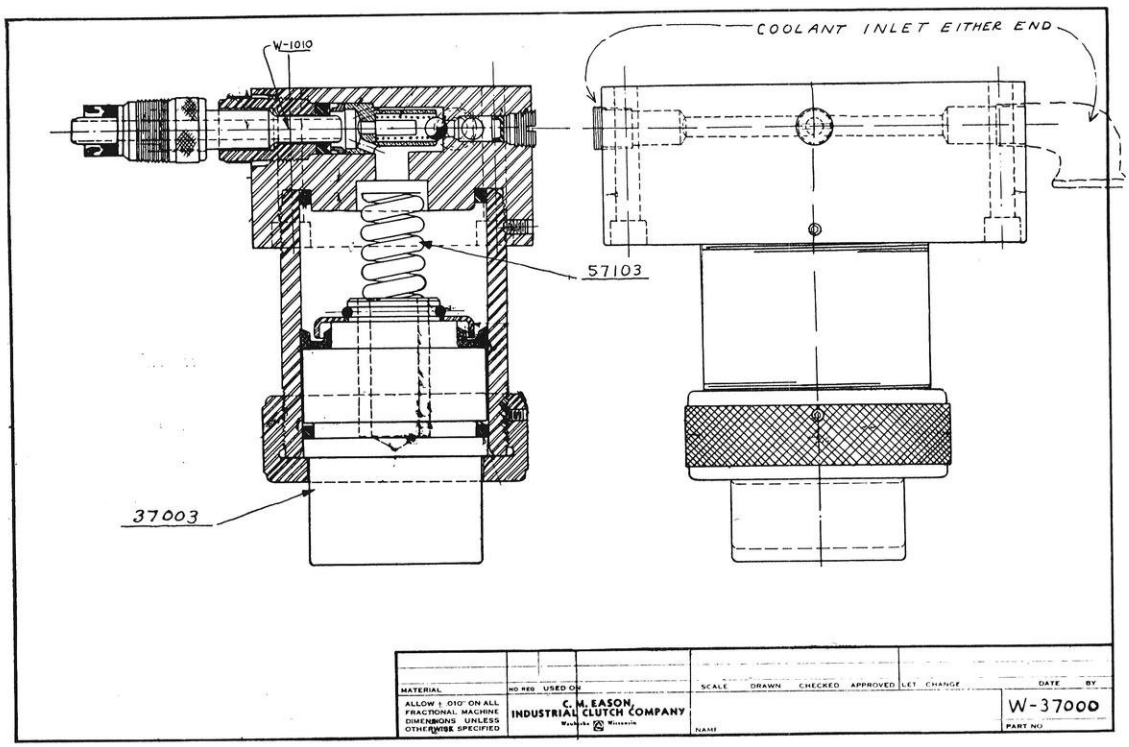


The illustration above shows the stripper assembly with the press nearly at the bottom of its stroke. The stripper plunger has already made contact with the stop block and a moment hence will develop the necessary hydraulic pressure to eject the casing (now inside the die block) from the punch.

The photograph on the cover of this issue illustrates the relative position of punch, hydro-stripper and die block before the initial draw begins.



brass it is relatively easy, but steel has a tendency to freeze on the punches, particularly during the last draws. This was one of the biggest problems and most difficult to attack, and was satisfactorily solved by C. M. Eason's Hydro-stripper at the Wisconsin Metal Process Company, Racine, Wisconsin.

Because the stripping process was the most difficult problem to be solved, and prior to its satisfactory solution, the entire steel cartridge casing program hung in the balance, it deserves more mention.

Early in the spring of 1942, Eason, the chief engineer of the Industrial Clutch Company, Waukesha, Wisconsin, was inspecting some of his clutches on the huge presses at Racine, when he observed the difficulties involved while stripping the steel cartridges. He was thoroughly familiar with hydraulics and hydraulic jacks and an idea flashed to his mind involving a revolutionary hydraulic principle of stripping whereby the punch and cartridge would be separated by a hydraulic force between the punch and base of the cartridge. Within three days the invention was drawn, speedily manufactured, installed and proved a success. Thus ended one of the greatest combined engineering feats of the war. Essentially the stripper is very simple, yet its pending success had some of the best engineers in this country baffled for weeks.

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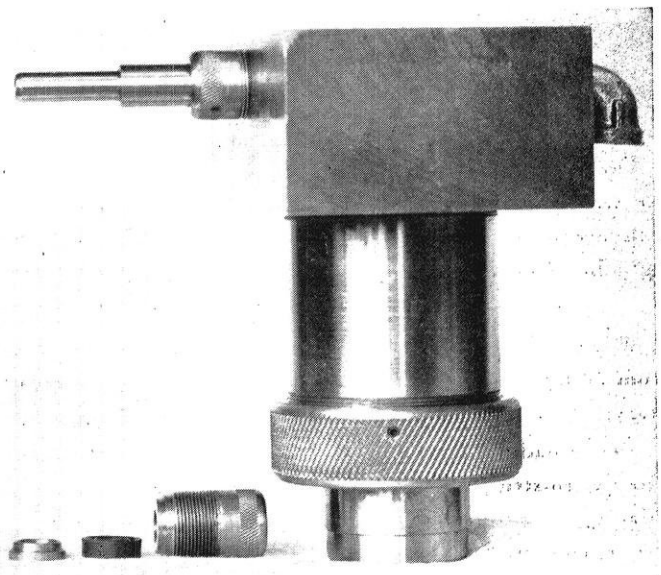
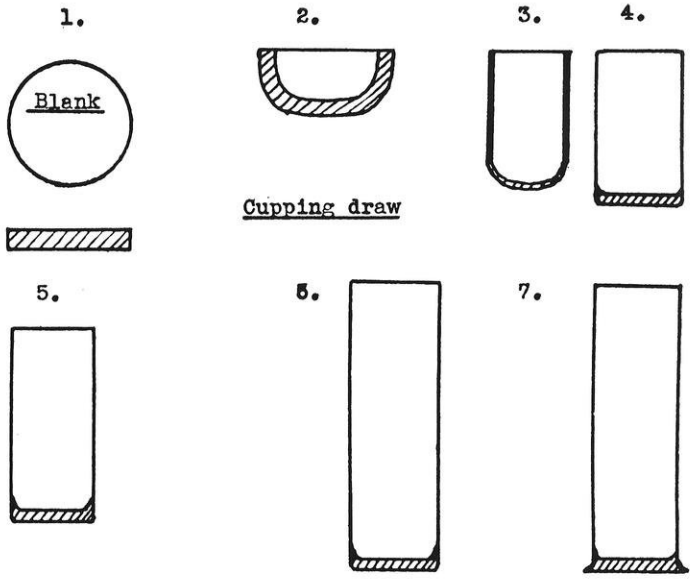


Hydro-stripper

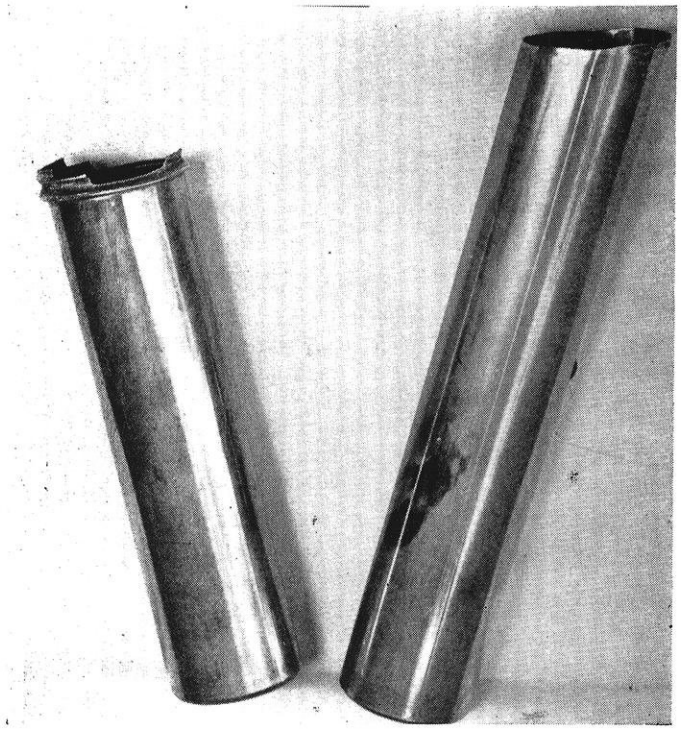
STEEL CARTRIDGE CASINGS . . .

(continued from page 11)

By examining the detailed assembly print of the W-37000 stripper it can be seen that the stripper is really a modified high pressure force pump, having a spring loaded intake valve with the discharge through the punch. It is mounted on the same ram as the punch. When the punch is near the end of its stroke the stripper plunger 37003, makes contact with a stop. A further continuation of the stroke causes the plunger to emit a hydraulic fluid through a connector tube W-1010 down through a hole in the center of the punch. A pressure is then reached between the punch and cartridge base at the extremity of its stroke (and starting back) that causes the cartridge to "pop off" from the punch. The hydraulic fluid also serves minutely as a lubricant and coolant.



The above sketches illustrate the drawing of a cartridge case from the blank to the last draw. Notice the cup formation in the first operation and the final flange in figure No. 7.



These 37 mm. shell cartridges, fifth draw, are both from the same press — the left hand scrapped case was made with use of conventional top stripper fingers only. The right hand case was made in the same punch and die set after the addition of the "Easton Stripper System."

This stripper system is applicable for any size shell case from 20 mm. to 105 mm., a three inch A.A., either steel or brass.

The reloading of the stripper is achieved automatically. The hydro-stripper is connected to the regular coolant circulating system. When the press ram is at the top of its stroke, coolant fluid is being pumped through the cylinder and the punch. When the ram descends and the punch seats in the case, the flow of coolant is momentarily cut off during that part of the stroke in which the drawing operation takes place. After the top of the casing has cleared the draw ring, the projecting piston of the stripper cylinder strikes on a stop block and a high pressure shot of fluid is driven down through the punch as previously described. The hydro-strippers have been built to accommodate the manufacture of steel cartridges from the 50 caliber to the 105 mm. and larger.

With steel cartridge cases now manufactured it left the group of engineers with just one more unsolved problem: that of providing a finish that was corrosion-resistant under all conditions. Copper plating and many other electro-plating processes were tried without much success —either it was defective to corrosion or costs were too great. Finally an idea was brought forth that resulted in lacquer film experiments. The varnish that was finally produced proved to be corrosive resistant, abrasive resistant, and furthermore, it was resistant to any tendency to adhere to gun chamber thus interfering with proper extraction of the casing. The herculean task was now completed. (It has been found since the original data was compiled, that lacquer peels off under the heat and pressure of the firing, and in this way could jam the guns. It was true that the lacquers developed gave better rust protection than any plating, but all steel cartridge cases now being made have a "zinc-di-chromate" plating which will not peel off in the guns and which gives a very high measure of protection to the steel.)

Army and Navy tests have proved that steel cartridges are now as good as brass and in many cases far superior.

The year 1944, however, we have produced enough copper to warrant a cancellation of further Army contracts, for the costs of manufacturing the steel cartridge is higher than that of brass. The Navy, however, continues to use them in ever increasing numbers.

The perfection of steel drawing leaves open post-war fields never before thought of, that formerly were dependent on other metals and alloys.

(Courtesy of the C. M. Eason Industrial Clutch Company, Waukesha, Wisconsin.)

The New Method

Static . . .

Sorority girl: "I think it's positively disgusting the way those fellows in the fraternity house across the street give a show each night before they go to bed."

Roommate: "But looking down from the window I didn't see anything."

Girl: "I know, not from there. But leaning out over our fire escape you can see everything."

•

The scientific name for "Buck Fever" is "Triggermortise."

•

Wife (to drunken husband): "Dear, let's go to bed."

Husband: "Might as well, I'll catch hell when I get home anyway." **—Mis-A-Sip**

•

Newspaper item: "Mrs. Lottie Prim was granted a divorce when she testified that her husband had spoken to her but three times since they were married. She was awarded custody of their three children."

NIGHT BEFORE CHRISTMAS

—Revised

'Twas the night before Christmas
And through the whole plant
All workers were stirring
The machines sang a chant.
Each little plane-part was inspected with care
To make a bomber like the one in the air.
The shysters were nestled all snug in their beds
While visions of rich clients danced in their heads.
But me's with sliderules and girls in their jeans
All knew what hard work really means.
Soon out on the runway there arose such a sputter
An me spring from his lathe, a gal from her cutter
Away to the window they flew like a flash
Both half expecting to hear a great crash.
The moon on the breast of the new fallen snow
Gave a lustre like midday to objects below.
When what to their wondering eyes should appear
The bomber had landed, its image was clear.
Surely the chubby old pilot so nimble and quick
Who stepped from the cockpit wasn't St. Nick!
The motor grew weaker, then stopped with a sigh
He, with a deep chuckle and a twinkling eye
Took in the surroundings, the bright burning lights.
He whistled and marveled at all the picturesque sights.
He strode to the hangar and greeted them all
His booming voice echoed from wall to wall,
"I've filled your children's stockings with greatest care
But to miss you now would hardly be fair."
Here once again was old Saint Nick
And he hadn't changed the least little bit.
Still dressed in fur from head to foot
And covered o'er with ashes and soot
A bundle he still had upon his back
He looked like a peddler with his great pack.
His eyes how they twinkled! His dimples how merry!
His cheeks were like roses, his nose like a cherry!
His droll little mouth was drawn up like a bow,
And the beard on his chin still white as the snow.
"You didn't think I'd be stopping in tonight
But to forget you would be a terrible plight."
His eyes twinkled and his little round belly
Shook as he laughed like a bowl full of jelly.
"And to each of you I leave this war bond,
Of all of you, I'm terribly fond."
And laying his finger aside of his nose
And giving a nod, into the cockpit, he goes.
But they heard him 'ere he flew out of sight,
"Merry Christmas to all and to all a goodnight!"

—Anonymous

ALUMNI

Civils

INGERSOLL BRIDE DIES IN SAILING ACCIDENT

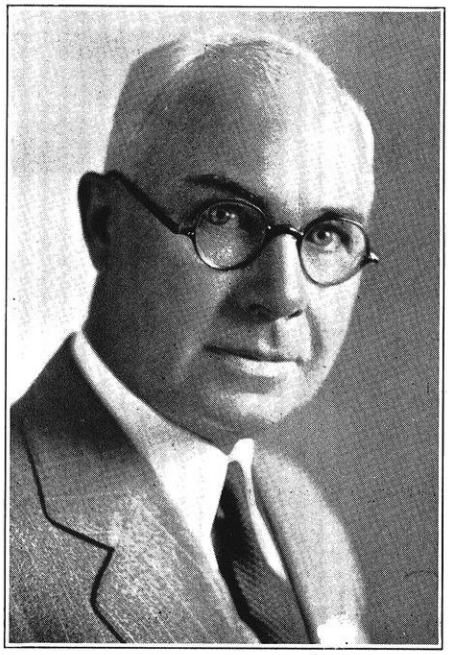
Helen Louise Holden, of Madison, died in a sailing accident at the harbor entrance of Buffalo, N. Y., on October 7, less than two weeks after she had become the bride of Alfred C. Ingersoll, c'42, son of Prof. L. R. Ingersoll and engineer for the Linde Air Products Company. The young couple were enjoying a Saturday-afternoon sail, in company with a third person,—a young man. An attempt to sail out into the open lake resulted in an overturned boat. The three clung to the boat, which drifted toward the breakwater at the harbor entrance. Finally they left the boat in an attempt to swim to the breakwater. In the attempt, Helen was dashed against the rocks by a huge wave and probably was killed instantly by the blow. Her body was recovered the following Wednesday.

McCULLOUGH, FRANCIS M., c'03, for many years head of the department of civil engineering at Carnegie Institute of Technology at Pittsburgh, has retired, with the title of "professor emeritus."

SAVAGE, JOHN L., c'03, chief designing engineer for the U. S. Bureau of Reclamation and world-renowned as a designer of high dams, is this year's winner of the **John Fritz Medal,** for "superlative public service, in conceiving and administering the engineering of mammoth dams, both in America and beyond the seven seas." This award, which has been rated the highest in the engineering profession, is devoted to the recognition of distinguished contributions in the field of applied science. The list of recipients includes many distinguished names.

HARZA, LE ROY F., c'06, president of the Harza Engineering Company of Chicago and one of the world's top-flight designers and builders of dams, was in Uruguay during the past summer in connection with the completion of the Rio Negro hydro-electric project in that country.

HOWSON, ELMER T., c'06, western editor of Railway Age, died in Chicago on September 1. He had gone to the Presbyterian hospital for a throat infection that was not considered serious. His death was unexpected and interrupted him in the full swing of numerous activities. He was a frequent speaker upon transportation matters, a field in which he was a recognized authority. He was a member of numerous technical societies, many of which he served as president. As chairman of the Committee on Cooperative Relations with Universities for the American Railway Engineering Association, he was the guiding spirit in the effort to bring about a close entente between the schools and the railways. In the death of Elmer Howson, the **Wisconsin Engineer** loses one of its early editors. He joined the staff of the Engineer early in his freshman year. During his junior year he was alumni editor, and during his senior year (Vol. X) he was editor.



John L. Savage

SCHNEIDER, GEORGE R., c'22, Lt. Col., Corps of Engineers, is author of a paper on the Norfolk Dam in Arkansas, which appeared in the November number of Civil Engineering.

SCHMIDT, LEWIS A., c'23, has opened an office in Chattanooga, Tenn., for consulting practice in foundation problems. He has been "construction-plant-designing engineer" with TVA for several years. Prior to that he had been with the Harza Engineering Company on hydro-electric projects.

LASCHE, RUSSELL H., ex-c'28, has been appointed director of engineering and research for the Fairchild Camera and Instrument Corp. of New York. He has been with the company for 15 years.

POST, MAJ. ARTHUR L., c'29, was killed in a plane crash on August 25 on Biak Island, S.W. Pacific. He had been awarded the Distinguished Service Cross last January for valuable information obtained in New Britain after he had been shot down over that island during the summer of 1943. He had spent more than 100 days in the jungle before returning to headquarters of his squadron.

HART, WILLIAM H., c'35, in September joined the staff of the American Institute of Steel Construction, Inc., at Milwaukee.

PAPE, VICTOR G., c'35, has returned from a period of service in Alaska with the U. S. Engineers and is working with the Goodrich Company at Akron, Ohio.

STIEMKE, PROF. ROBERT E., c'36, director of the engineering experiment station at North Carolina State College, has been commissioned a first lieutenant in the U. S. Public Health Service.

MICHALOS, JAMES P., c'38, who had been teaching at Montana State College, is taking graduate work in the School of Engineering at Yale University.

BARTZ, ELLWOOD L., c'40, assistant civil engineer in the U. S. Engineer Office in Honolulu, was married on August 3, in Honolulu, to Rosamond Kam Lin Lau, who is of Chinese ancestry. Her father was born in Honolulu. Her mother came from China. Rosamond was graduated from the University of Hawaii in 1939, with a B.S. in home economics. She has been teaching home economics.

CHRISTESEN, RUSSELL J., ex-c'43, first lieutenant and navigator in the Army Air Force, was in Madison on November 1, after completing 50 missions over Europe.

And then . . .

NOTES

—Mel Sater, ch'45

Mechanicals

ROSE, COMMANDER R. A. me'25, Assistant Professor, now on leave of absence from the University, has been transferred to the Naval Training School at Richmond, Virginia, where he was commanding officer at the Engineering Field at Norfolk, Virginia.

FELTON, HOWARD, me'29, is employed by the Adel Precision Manufacturing Co. at Burbank, California.

DICKIE, J. A., me'34, has left the Lockheed Aircraft Co. in California to take a position with the M. B. Manufacturing Co. in New Haven, Connecticut.

ERMENC, J. J., me'34, is now Professor in the Thayer School of Engineering at Hanover, New Hampshire. This school is associated with Dartmouth College.

STOESSEL, R. F., me'34, and **JUSTL, R. F.,** me'34, are employed by the Lockheed Aircraft Co. in California.

NYGREN, ERNEST J., me'35, joined the Kyle Corporation in September of this year.

PFANKU, HARLAN D., me'36, is with the Aluminum Company of America in Los Angeles, California.

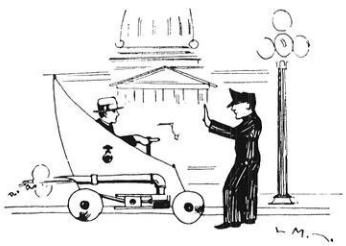
BURROUGHS, CHARLES W., me'38, who is associated with Procter and Gamble of Cincinnati, Ohio, became the proud father of a daughter on October 16.

STIEGLER, E. A., me'38, is also associated with the Procter and Gamble Co. of Cincinnati, Ohio.

LOHRMAN, 1st Lt. HENRY J., ex'41, recently served in England with the Air Transport Command, and has returned to this country.

FEIEREISEN, WILLIAM, S1/c, me '42, former instructor and recently with the N.A.C.A., is now in the navy taking radio technician training.

KUBOW, ROBERT, me'43, is with the Goodyear Aircraft Corporation in Akron, Ohio, working in the Loft Section of the Dimensional Control Department. Bob reports that Herb Johnson, Robert Nordley, Donald Kennedy, Marshal Reid, and James Kruger, all former graduates of the University of Wisconsin, are at the Akron plant.



S[illegible]IMER, DAVID, ex'43, now in the Officers' Candidate School at Fort Belvoir, Virginia, was recently engaged to Miss Catherine Tormey of Madison.

TAUSCHEK, MAX J., me'43, who is with the N.A.C.A., was recently the father of a daughter, Patricia Ann.

SHEPARD, Pvt. M. L., ex'44, is at the Aberdeen Proving Grounds in Aberdeen, Maryland.

WESTMONT, 2nd Lt. GEORGE A., ex'44, recently received his commission in the army at the Aberdeen Proving Grounds.

Chemicals

McCARTER, ROBERTS J., ch'40, has taken a leave of absence from the Universal Oil Products Company to accept a commission as Ensign in the U. S. Navy. He started his indoctrination at Tucson, Arizona, on October 25. During the past year, he spent considerable time in Arkansas and Oklahoma starting new petroleum plants designed by U.O.P.

LAVRICH, MILTON E., ch'42, spent six months with the Lockheed Aircraft in Burbank, California, doing analytical work. He is now with the Schenley Laboratories doing work with penicillin.

HARE, JAMES, ch'41, was captured at Corregidor and died in a Japanese Prison Camp.

TIMM, GEORGE J., ch'43, is with the Carbide and Carbon Chemistry Corporation as assistant department head in management and administration production of butadiene from alcohol. He visited here on the 11th of November.

BEYER, JERRY, ch'44, is an ensign in the U. S. Navy and is stationed at the Clinton Engineering Works near Knoxville, Tennessee.

BROWN, R. T., ex-ch'44, was recently hospitalized with polio. He later contracted chicken pox, but is improving satisfactorily.

CALDWELL, JOHN, ch'44, is an ensign and is also stationed at the Clinton Engineering Works. He was, however, hospitalized and returned to Columbus, Wisconsin, for convalescence.

VICTORY NEWS

New "Streambarker" for Paper and Pulp Mills. First hydraulic barker ever designed for standardized production, Allis-Chalmers' new Streambarker not only eliminates hand cleaning of pulpwood logs but saves man-hours and money for mill operators by completely eliminating pulp loss from "broomed" log end.

Secret is water under 650 pounds pressure which removes bark as logs are revolved and propelled through the Streambarker. It handles logs 4 to 8 feet long, 4 to 10 inches in diameter. Write for Bulletin B-6341.

Hunting Defects is His Business! The man above is giving A-C motor shafts the "eagle eye." It's true he doesn't find many defects. But none that are there get by him!

Careful inspection of all parts is one more reason why you can depend on Allis-Chalmers motors for long-life performance!

New 80,000 kw Giant Bids for Record! So satisfactory was the first Allis-Chalmers 80,000 kw steam turbine generator installed at Port Washington, Wis., that the power plant became known as the "World's Most Efficient."

Today, Port Washington has a "sister" A-C turbine of same kw which promises to exceed even the original in performance due to modifications in design which increase capacity and reheat temperatures. By shipping sub-assemblies direct to the sites for field erection, commercial operation of this turbine was possible 60 to 90 days ahead of normal.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

FOR VICTORY
Buy United States War Bonds

You Can't Take It With You — *Thank Gosh!!*

—Mae Zimmerman, ch'46

"Good Bye Now" . . . "Anchors Away"

Frank Hyland, a graduate E.E. of last semester, is now residing at Great Lakes. His only comments on the subject are, "The clothes are either **too** small or **too** big," and "I miss the Wisconsin campus—namely June."

Eddie Fischer, Ch.E. 2 of last semester, got the urge between semesters and "enlisted" in the navy. He also is spending his winter at Great Lakes this season . . . it seems that everyone is doing it. Eddie is going to take a stab at radar.

Jack Houmes? Ah, yes, they finally got him, too. (We'd about given up hope.) Address? You guessed it—just mail it to Jack Houmes, Great Lakes, Illinois. Everyone knows Houmes. (Darn, no more chocolate doughnuts in calculus.)

The Technique of (here comes the punch line)

sleeping during physics lecture but looking as if you were awake and interested has been mastered by Bill Plummer—the engineer whose main ambition in life is to enlarge Great Hall for greater capacity. Bill's system is as follows (I report this from personal observation):

1. Place elbow of the right arm on the arm rest, and brace the chin with the right hand, fingers following the natural curvature of the face and thumb bracing the chin. (This gives the prof the impression that you are in deep thought.)

2. Train the eyes to open at regular intervals—either together or one at a time.

3. Wake yourself at 10-minute intervals and dash off madly all the signs and symbols that have been written on the blackboard.

For further instructions appointments may be made with William Plummer—office hours as yet have not been announced.

Or—inquire of Jim Hager.

It seems that quite a few of the Sigma Nus have become pin-happy lately. The girls? Ask the fellows if you haven't been informed because they will be more than happy to tell you.

Vern Barns, Ch.E. 2, was really hepped up about going deer (dear?) hunting the weekend of Thanksgiving. He came back beaming, but we never did hear what he got???

Editor's Note: And then there's the story of Mae (Campus Notes) who received a Psi U. pin the night of the Alpha Xi Delta formal, December 2. The lucky man? It's Jerry Wall, a chem engineer. Both chems at that.

Can Miracles Happen?

And the time clock last a whole game at the field house?

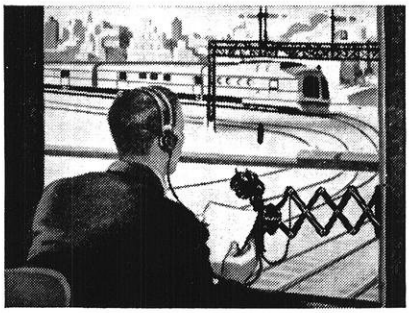
For those of us that were lucky (?) enough to get through Physics 51 a new system has been established in lecture. We now sit in alternate seats thus eliminating the necessity of two quizzes on the blackboard. Before when you couldn't do one quiz you could at least take a stab at the other one, but now you haven't got a fighting chance. (Of course, there's always the possibility of reading the assignment.)

And then there's that written contract two V-12's have with a certain Theta. Things like that can only lead to bloodshed . . . just ask one who knows.

Merry Christmas and a Happy New Year. Made your resolutions for the new year yet? Six days will give you plenty of time to thin' ' ·:t it.

1. Your telephone in peacetime reaches 95% of the world's telephones and over 26,000,000 in the United States today.

2. You fly with greater safety because of radio telephony between plane and ground —demonstrated by Western Electric in 1917.

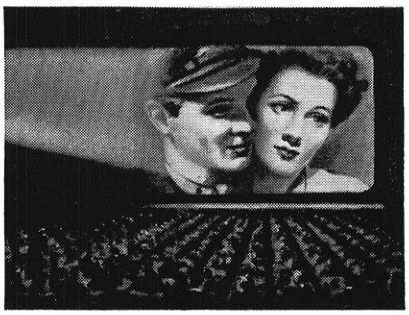


3. You ride more safely on the nation's railroads because of Western Electric train dispatching telephone equipment.

4. You hear radio news and entertainment. Since radio began, W. E. engineers have helped build broadcasting equipment.

Out of 75 years of manufacturing experience

5. You enjoy added protection today thanks to Western Electric inter-city police teletype, and radio in police cars.



6. You can enjoy talking pictures—made commercially possible back in 1926 by Western Electric development.

7. The hard of hearing can live more fully with a Western Electric hearing aid, perfected through telephone research.

8. You will enjoy television. This picture shows how W. E. equipment sent images by radio as long ago as 1927.

...come these contributions to better living

For many years, Western Electric engineers have devoted their skill to the production of telephones and the vast network of telephone equipment used by the Bell System. At the same time they have developed the manufacture of related products which also have contributed materially to better living. Some are pictured here.

Today Western Electric engineers are doing their greatest job—guiding the production of huge quantities of electronic and communications equipment that help our fighting men win battles—help save American lives—help maintain the vital home front communications networks, and bring nearer the day of final victory and peace.

When that day comes, the men and women of Western Electric will resume their 75-year-old job of making communications equipment to further enrich your life.

1869 1944

75TH ANNIVERSARY

Western Electric

IN PEACE...SOURCE OF SUPPLY FOR THE BELL SYSTEM.
IN WAR...ARSENAL OF COMMUNICATIONS EQUIPMENT.

ARMY E NAVY

Buy all the War Bonds you can—and keep them!

Answer To Women In Engineering

—John Houmes, USN, ex-ee'46

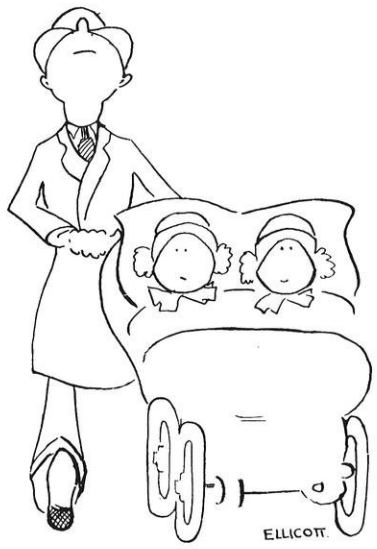
A FEW months ago, a female aspirant for the B.S. degree in chemical engineering wrote a very interesting and well written article on the woman's place in the field of engineering. This article is written as a partially buffered acceptance of the fact that there must be female engineers.

It is beginning to tire me, this continued squabble as to whether or not females should be and can be good engineers. I, personally, think that they shouldn't be, but they do have potentialities as engineers. I believe that most of the fellows agree with me in saying that. We have no resentment toward any females that go into engineering; however, we also agree that though they may be "lady engineers" as our sophomore colleague of the chemical engineering school defined her kind, they cannot be truly "women engineers."

I don't think that I've ever heard any of the fellows, when discussing females in engineering say, "She's not so dumb. It's one way to get a man." We don't as a rule, like to think of being married to a woman engineer. We want someone who will be a good, truly feminine, type of wife. This coming home at night and hearing what wifey dear did at the plant today after we have already spent a long hard day there ourselves would really make us down on females in industry.

Can't you just see the beautiful, nitric acid stained fingers with broken greasy fingernails trying to mix an angel food cake? I can just see my engineer wife looking at a sack of flour and saying, "That flour is not fine enough, the screen test I just ran on it only gave 71% through it on a 300 mesh screen and its conductivity is much too low. Hubby dear, won't you please make me a small ball mill for milling this horrid stuff?"

In all seriousness, we men engineers do not hold anything against women in engineering. In fact they may make very intelligent ones; however, we do not think it possible for any person, either male or female, to hold down two very important jobs at the same time and be able to make a success of both. We do not believe a woman can work hard all day and then come home, clean the house, make a good dinner, etc. It is too much to be expected of any human (or are women engineers human?). Also there remains the very important fact that in any happy family group there must be children and these children must be given a real mother's care. This day nursery stuff is not very hot stuff when it comes to raising children properly. This is evidenced by today's high juvenile delinquency which is caused in the main part by women in war work not taking care of their children. One of the parents should be at home to take care of the child and I doubt if any man would do that. It isn't natural.



First Word: "Papa."

No. We don't mind the lady engineers but if they must be then they have chosen their path—and let them follow it.

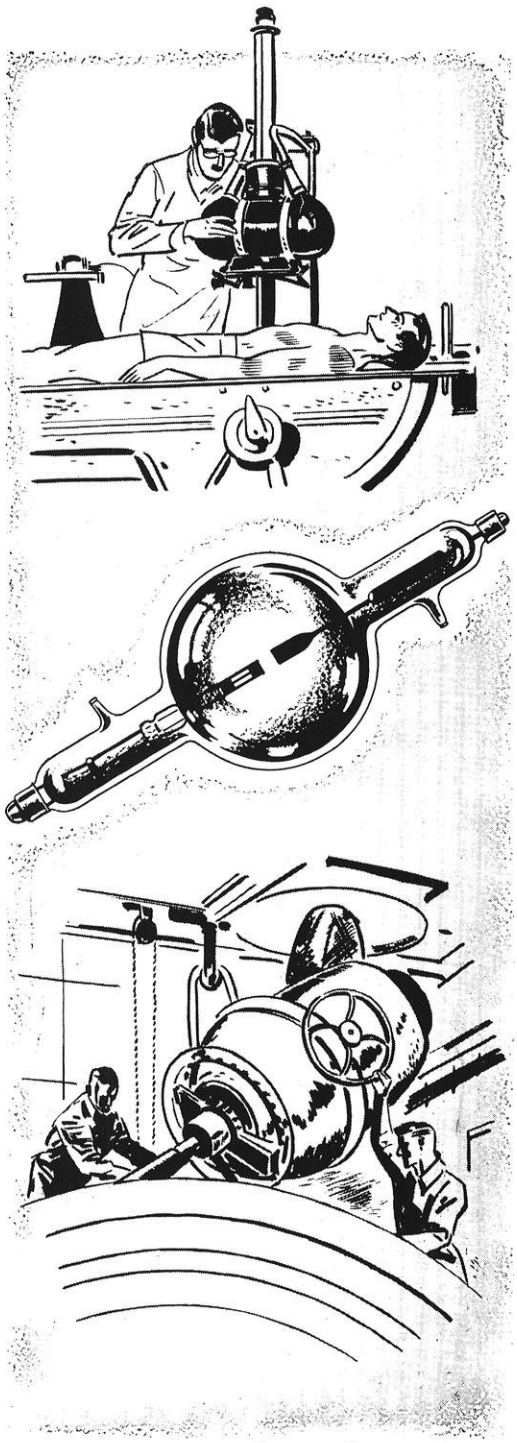
By the way, how in all thunderation does our noted colleague Miss Miller mix nitrogen, carbon, etc., and make an explosive mixture? She is a true genius and should see her local draft board immediately.

As for the inhibiting influence of the female species' presence in classes, it is usually pretty nil. The fellow taking engineering usually has a rather high class mind and his humor has subtleness, it's true, but then for the narrow minded person, there are always two ways to take a joke.

ELECTRONICS

(FIRST OF A SERIES OF TWO ARTICLES)

—June Hartnell, ee'46



—Courtesy General Electric

ELECTRONICS is no new term; people have been talking about it for quite some time now. The war has brought it even more into the foreground of popular talk. Most of it, though, is hidden in the secrecy of war. The discovery of electronics might be said to have been caused as the result of one of those "accidents" which have led to numerous other discoveries. Just as Newton observed the apple falling and discovered the principle of gravitation and Archimedes observed the principle of buoyant effects.

One of the first "accidents" leading to the opening of the field of electronics was the discovery by Edison of what has come to be called the Edison effect—that is, the fact that there was a glow between filament terminals, being due to a current passing between them.

To begin with, electronics might be defined as the study of the electron, the methods of setting it free, thermionic emission, photoelectric effect, etc. The electron was definitely established by Thomson in 1893. Fundamentally, electrons make up the orbits of the atom and revolve about the center, the positively charged nucleus of the atom. When two nuclei with their electrons around each of them come close to each other, the outer circle of their electrons overlap and a new orbit is formed around both nuclei. When in this condition, the electrons are considered free because they are no longer bound to a single nucleus. They can then be made to flow from the hot filament where they are discharged to the plate. It is on this principle that the vacuum tube is built.

Soon after Edison discovered this effect, it was put into use. The grid was introduced into the tube to control the number of electrons flowing from the filament to the plate. The grid then in turn brought about the amplification of radio-waves, leading eventually to the building up of radio broadcasting. Electronics became, not the study alone, but the center from which hundreds of new ideas, discoveries and elements have spread. For example:

Television and radio are of today, but tomorrow we will have these two, even better, plus much more. Even now radio is something more. It is the weather, the means of police communication at all times, the fire watcher, the first minute news. And after the war when frequency modulation rids static from the airways, radio will take you everywhere, not only as a listener, but as an actual observer.

(Please turn to page 26)

ELECTRONICS . . .

(continued from page 22)

And of course the principle involved in the vacuum tube explains the principle of the rectifier. The electrons being emitted only when the plate is positive, thus in its very simplest form, a pulsating direct current is produced.

The x-ray has become priceless in the field of medicine, industry, agriculture. The x-ray was first observed by Roentgen in 1895. X-rays occur when electrons at a high speed strike a metal target. The faster they move, the more penetrating they are and the higher the voltage necessary to produce them.

With the x-ray, a doctor can more effectively fight cancer, gangrene, he can determine the presence of tuberculosis, and other ailments; he can determine whether bones are mending properly. In industry, the x-ray finds imperfections in castings, in rubber products, analyzes metals and alloys, finds foreign particles in food. Several million-volt x-rays are now in use in plants, finding defects that otherwise could not be found by any other known method. Many of these units are portable, allowing for their quick and effective movement about the plant.

Electrons in the form of x-rays may also be difracted as light can be. The grating must be much finer, though. This fact is utilized into the study of crystal structures. The crystal forms a natural grating. Many of the x-rays travel straight ahead and if recorded would be found to form a black spot in the center. Some are diffracted and these form some kind of a pattern around the center. These are the Laue spots, and are sharp, clear spots. However, sometimes hazy spots appear and they increase with a rise in temperature of the crystal. This is due to a change in the amount of diffraction. From these facts, much can be learned about the structure of a crystal.

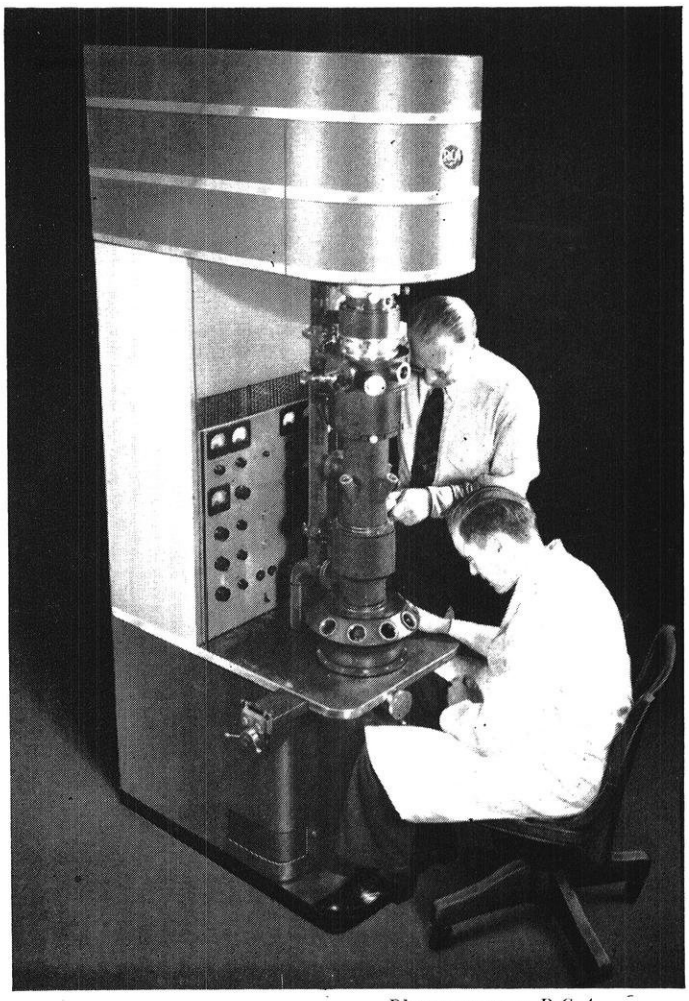
New types of fruit, vegetables, crops, and seed have been found because of the genetic effects of the x-ray.

An electronic microscope now reveals the character of various crop diseases. It helps save thousands of crops yearly.

The vacuum tube is used not only in radio, but also in lighting—switching on the lights when it is dark and turning them off again when it is light.

The fluorescent lamp is used extensively today. Here, the free electrons which were emitted hit the mercury atoms. The mercury atoms are in turn excited and ultraviolet light is given off which excites the material on the glass and produces fluorescence.

One classification of electronics might be into the study of ionic devices. The ions are the positively charged atoms or molecules. They can be formed from the electrons when the electrons get about fifteen volts of kinetic energy and strike the neutral molecules. The molecules are broken up into positively charged ions and free electrons. The ions are very important in neutralizing a charge of electrons and help to reduce the electrons in the gas space of an electric arc in switches of a high voltage system, thereby decreasing the arc.



—Photo courtesy R.C.A.

Electron Microscope

Seated at the microscope is James Hillier, who designed this instrument under the supervision of Dr. V. K. Zworykin (standing), director of the R.C.A. Electronic Research Laboratories.

Electronic science has given many beautiful answers to unexplained phneomena and problems. How it is being used in the war today we have not heard, but after the war it will all be publicized and told and utilized into our everyday life. The war has speeded up the research and work in this field. Although now we must wait until after the war to look behind the veil of secrecy, we do not have to wait the other years that ordinarily would have been necessary for this work.

Electronics has increased and widened the field of electrical engineering. The engineer can control once undreamed of power in his hands and have the knowledge that he has a hold, a real hold on electricity. But this is still only a start. Bigger things are probably still to come. Perhaps that is why scientists say:

"Electronics—a new science for a new world."

Bits of News of the Year

100 MILLION MAN-POWER OF MOTORS PRODUCED

Electric motors and generators of total horsepower equivalent to the muscle power of more than 100 million men were produced by General Electric during 1943, it has been announced by W. H. Henry, manager of the company's motor division, Schenectady, N. Y. The total of the year, 7,200,000 horsepower, is more than four times the output of 1939.

Included in this production, Henry pointed out, were hundreds of thousands of small light-weight motors and generators for bombers, fighters, and cargo planes. While the average horsepower rating is not high, these motors require large factory areas and many experts in design and manufacture. An outstanding example of special units required is the amplidyne, of which more than 100,000 were furnished.

More than 3,000,000 horsepower of last year's production was in the form of large motors, many of them propulsion types for Navy escort vessels, tankers, tenders, and submarines. Relatively small in number by comparison with the aircraft units, they bulk large in size, a typical tanker motor being rated 10,000 horsepower. Included in last year's production of large units was the world's strongest motor built for a steel mill and having a maximum torque of more than 4,000,000 foot-pounds.

"The manufacturing output of General Electric's 13 motor factories has kept pace reasonably well with incoming motor orders," according to Mr. Henry. However, the demand of certain sizes and types required for the war, has in some instances, exceeded production facilities. Just as rapidly as possible, facilities have been increased to meet these demands. **May '44—General Electric**

•

ELECTRICALLY-DRIVEN AIR LINERS ENVISIONED

Trans-oceanic air liners of the future may be powered by electric motors that will enable the giant ships to carry greater loads for longer distances at a substantial saving in fuel, members of the American Institute of Electrical Engineers were told at the recent Pacific Coast meeting.

The use of electric drive on multi-engined planes would eliminate much of the air resistance, or "drag," caused by engine nacelles built in the wings, or by engine and propeller mounted in the nose of the fuselage. In present day planes, this drag may waste from 20 to 40 per cent of the horsepower output of the engines. Because electric motors are much smaller than the modern gasoline engine, they can be submerged entirely in the wing structure, offering practically no resistance to air flow.

—Westinghouse

TEACHING OF TIMBER ENGINEERING GAINS 500 PER CENT IN NINE YEARS

A growing recognition of timber as a structural material is revealed in a survey conducted by the Timber Engineering Company, Washington, D. C., which disclosed that 188 engineering and architectural professors in 135 universities are teaching timber engineering. These figures compare to 31 professors in 23 universities shown in a similar survey in 1936.

Last year 333 professors in 187 technical schools, representing all states, were supplied upon request with 40,000 pieces of technical timber literature by the company. These teachers were asked whether they were teaching timber engineering and whether they planned to continue such courses after the war. Of the 224 who replied, 188 answered as above and 144 stated that they plan to continue.

Teco lays much of this renaissance in the teaching of timber engineering to the Army and Navy training program, but notes that the upward swing began years ago. A trend noted in the survey is the ground gained by timber engineering in eastern universities, a section in which it was formerly weak.

The company will offer a recommended course in timber engineering along with its usual proffer of complimentary literature to technical professors in September.

—National Lumber Manufacturers Association

STATIC . . .

by Bob Clayton and Fran Tennis

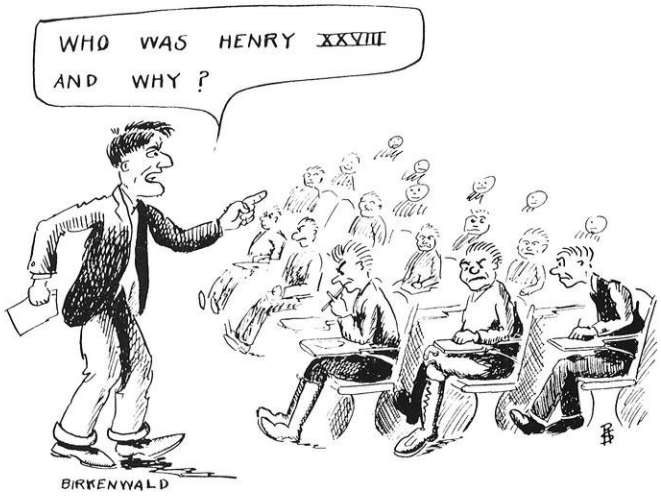
Country girl: "Paw's the best rifle shot in the country."
City slicker: "And what does that make me?"
Country girl: "My fiance."

•

"I always wanted to know how long girls should be courted."
The same as short ones. **—PUP.**

•

Insane Asylum Attendant: "A man outside wants to know if we have lost any male inmates."
Doctor: "Why?"
Attendant: "He says someone has run away with his wife." **—Spartan**



On the spot.

Static authors' jokes:

I put my trust and faith in you,
I thought I could rely.
But now I'm disillusioned . . .
I wish that I might die.

I made you my ideal, you see,
And so I copied you.
I should have copied someone else
For now I'm flunking too . . .

If it's funny enough to tell, it's been told; if it hasn't been told, it's too clean; and if it's dirty enough to interest a "frosh," the editor gets kicked out of school.

•

Harry (over phone): "Is Emily in?"
Maid (also over phone): "She's taking a bath."
Harry: "I'm sorry, I have the wrong number."

•

Honestly, we'd like to sneak jokes like these in somebody else's column.

•

Dr. Elton (inquiring after the boy who had swallowed a half-dollar): "How is the boy today?"
Anxious Mother: "No change yet."

•

A woman's past is either scandalously indecent or shamefully uninteresting.

•

And when you get through with that cigarette wipe the ashes off your teeth.

•

He loved her so much he worshipped the ground her father discovered oil on.

•

"Mother, are there any skyscrapers in heaven?"
"No, son, engineers build skyscrapers."

•

If all the girls that didn't neck were gathered in one room, what would we do with her?

•

Englishman: "I say, what are they doing?"
American: "They're dancing."
Englishman: "They get married later, don't they?"

•

Marc Anthony: "I want to see Cleopatra."
Slave: "She's in bed with laryngitis."
Marc: "Damn those Greeks." **—Texas Ranger**

•

More . . . look on page 28 . . .

Dinner guest: "Will you pass the nuts, professor?"

Professor (absent-minded): "I suppose so, but really I should flunk most of them."

Practical Engineer

Rastus had been arrested for speeding. It was his fifth offense and as he was presented to the judge, he muttered something that sounded suspiciously like an oath.

"Repeat that!" thundered the judge.

"Ah didn't say nothin', jedge."

"You did say something and I want you to repeat it."

"Well, all Ah says, jedge, was, 'God am de Jedge, God am de Jedge'."

•

"We had the honor system in our school, but the faculty had to cut it out."

"Why?"

"Well, the profs had all the honor and we had all the system."

•

A newspaper found a man in Arkansas who lived so far back in the hills he had never seen Mrs. Roosevelt.

•

Enginearly Definitions

Chlorine—a dancer in a night club.

Carbon—a storage place for street cars.

Barium—what you do to dead people.

Boron—a person of low mentality.

Mole—a subterranean fur-bearing animal.

Catalyst—a western ranch owner.

Centimeter—a hundred-legged worm-like animal.

Flask—a measuring vessel carried on the hip and graduated in fingers.

Electrolyte—a thing which when it is dark you turn on and it gets light.

The teacher was giving the pupils problems in arithmetic. Little Willie's father was a tavern-keeper, so she said to him:

"Willie, if your father had a full barrel of rye whiskey and a half-barrel of bourbon whiskey, how much whiskey would he have for sale?"

Willie did some rapid calculating and replied positively, "One hundred gallons."

"Why, Willie," exclaimed the teacher, "that isn't right!"

"I know it," shrugged Willie, "but dad gets away with it."

•

Most engineers call a spade a spade . . . until they drop one on their toes!

•

Pome . . .

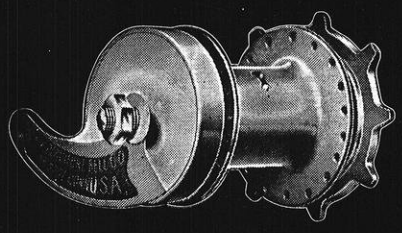
You have things to be learned
If you think I feel spurned,
You conceited and lowest of cads.
I once thought I loved you,
But now I have dubbed you
This summer's most boring of fads.

Now I hate you, I hate you,
I loathe and detest you,
For with my affections you've tampered.
Handsome brute that you are,
Chase your girl at the bar;
As for me, I refuse to be pampered.

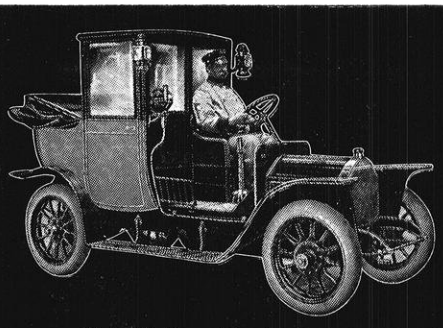
And excuses won't help,
You lascivious beast,
I'll never forgive you again.
Your roses I'll curse—
As love from a purse,
And I'll damn you for all your sin.

But if by chance—
You know of a dance
Where supper is served with the wine,
Oh, my darling,—
My sweet adorable one,
Why don't you phone me sometime?

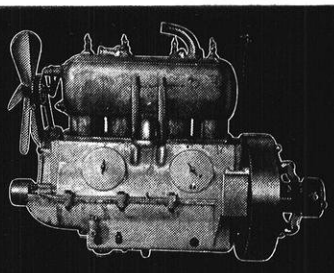
—Chaparral



First Bicycle Coaster Brake



First Yellow Taxicab



First Engine with Cylinders Cast en Bloc

Famous "Firsts"

by NEW DEPARTURE

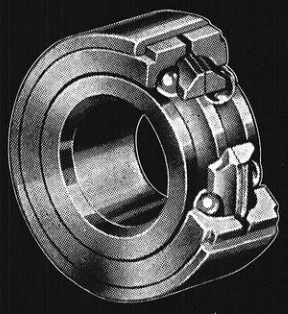
The name New Departure aptly describes an organization whose thought and action has ever been in advance of its time.

A partial record of the "new departures by New Departure is reported on this page.

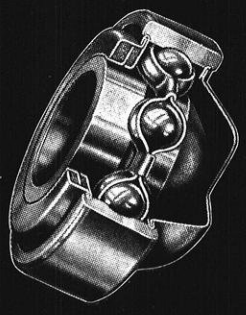
Well over 200 million New Departure ball bearings are in this war, and we will stay with this task until the job is done.

But your postwar plans for anti-friction bearings might well take advantage of New Departure's creative engineering.

New Departure, Division of General Motors, Bristol, Connecticut. Detroit, Chicago and Los Angeles.

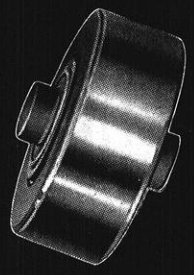


First Dual-Purpose Ball Bearing

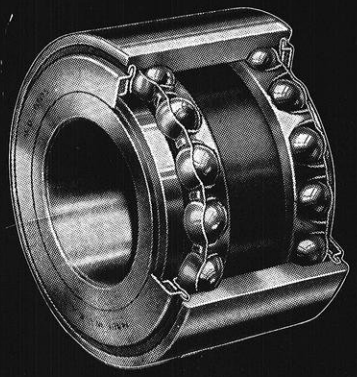


First Conveyor Roll Bearing

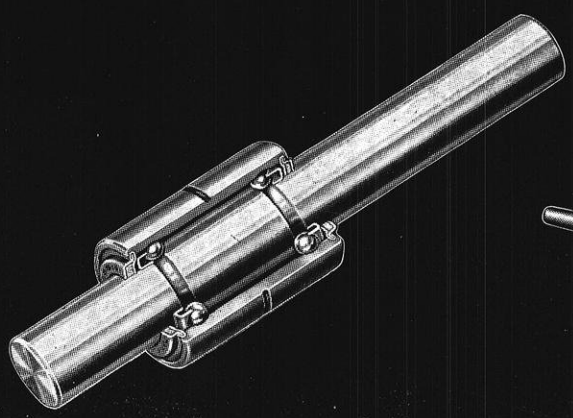
First Self-Sealed Bearing Lubricated-for-Life



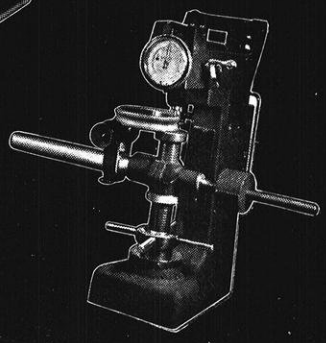
First Successful Treadle Roll Bearing for Textile Looms



First Self-Sealed Lubricated-for-Life Mine Car Bearing



First Pump Shaft Bearing Self-Sealed and Lubricated-for-Life

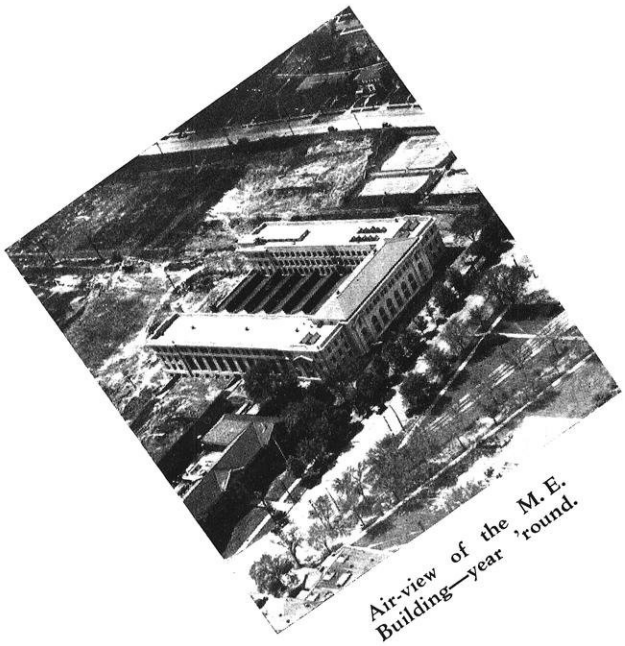


Rockwell Hardness Tester

LOOKIN' INTO

Flash back into the old year.

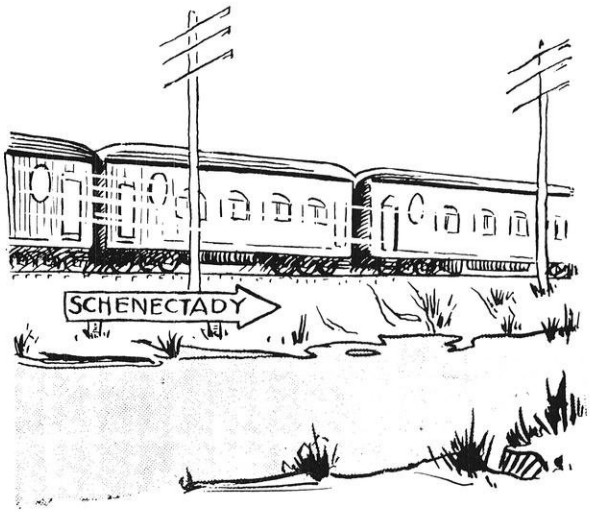
March and St. Pat's Day



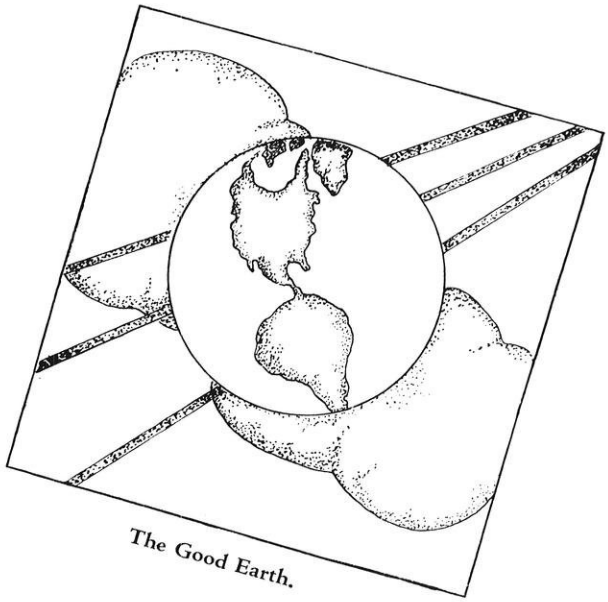
Air-view of the M. E. Building—year 'round.

Study, study all the time.

BACK 1944



Last train for Schenectady.



The Good Earth.

Swing out at
St. Pat's Dance.

Summer
frolic (?)