Winter 2-1933

Volume 42 - Issue 5 - February, 1933

Rose Technic Staff
Rose-Hulman Institute of Technology

ROSE TECHNIC

Vol. XLII, Number 5 FEBRUARY, 1933

Member Engineering College Magazines Associated

ROSE POLYTECHNIC INSTITUTE, TERRE HAUTE, INDIANA

6 o'clock means nothing to telephone service!

Bell System service must go on *all the time*. Day and night, Sundays and holidays, it must handle with speed and accuracy not only the usual traffic but also the unexpected rush of calls.

To meet this obligation, Bell System men tackle problems of many kinds. At Bell Telephone Laboratories, scientists develop new kinds of apparatus. At Western Electric, engineers find ways to make telephones, switchboards and cable more and more reliable. In the telephone companies, traffic engineers devise improved operating methods that make service faster, more accurate, more dependable.

Result: at noon or in the dead of night, the public reaches confidently for the telephone, knowing that Bell System service never stops.

BELL SYSTEM

TELEPHONE HOME ONE NIGHT EACH WEEK
. . . LOWEST RATES AFTER EIGHT-THIRTY

Surveying This Issue

WHEN darkness falls in an industrial center, huge, dingy steel mills take on a sort of glamour. A scene like the one on the cover may well thrill and inspire the engineers who have made possible the Steel Age.

KILL van Kull Bridge, shown on the frontispiece, is an important unit in the comprehensive development plan of the all-powerful Port of New York Authority. The Port Authority has charge of public civil engineering works throughout the Metropolitan area.

THIS month we again present an interesting faculty article. Dr. B. A. Howlett, Professor of Physics, has written about the construction and uses of a very sensitive photometer which makes use of the increasingly important photoelectric cell.

A ROTATING boiler that marks a definite advance in boiler design is described in this issue by Mr. Powell of the senior class. Apparently the diligent mechanical engineers have gained a little more ground in their eternal pursuit of the elusive stray BTU.

IN recent years many new engineering materials have made their appearance upon the market. Some of them were developed for very specialized purposes and remain comparatively unknown to the public. But one of the new materials has found such wide applications that it is almost universally known—that is, Stainless Steel. The present status of this important alloy is described by Mr. Holding, vice-president of the American Stainless Steel Co.

A NEWS item of considerable interest appears on page 16, while the 1933 football schedule is to be found on page 18.

—*J. G. B.*

THE ROSE TECHNIC

Vol. XLII

Number 5

CONTENTS

Engineering College Magazines Associated
Mr. Robley Winfrey, Chairman, Engineering Hall, Ames, Iowa.

MEMBER MAGAZINES

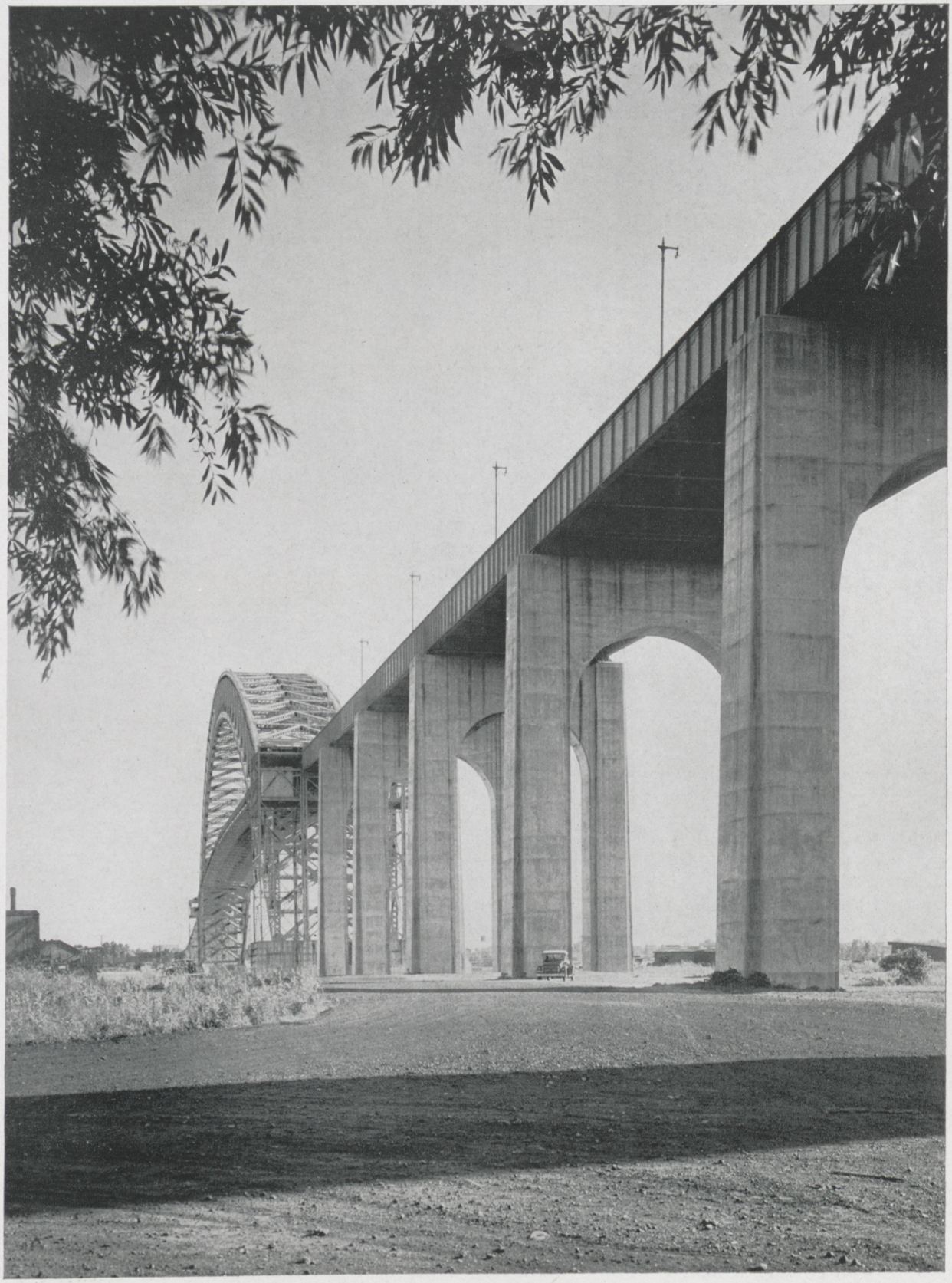
Auburn Engineer
Colorado Engineer
Cornell Civil Engineer
Illinois Technograph
Iowa Engineer
Iowa Transit
Kansas Engineer
Penn State Engineer
Kansas State Engineer
Marquette Engineer
Michigan Technic
Minnesota Techno-log
Nebraska Blue Print
Ohio State Engineer
Oregon State Technical Record
Purdue Engineer
Rose Technic
Sibley Journal
Tech Engineering News
Tennessee Engineer
Pennsylvania Triangle
Wisconsin Engineer

Subscription, per year, $2.00

Address all communications to THE ROSE TECHNIC, Terre Haute, Indiana.

Entered in the Post-office at Terre Haute as second-class matter, as a monthly during the school year, under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized December 13, 1918.

Published Monthly by the Students and Alumni of Rose Polytechnic Institute



The Arehitectural Record

Kill van Kull Bridge

THE ROSE TECHNIC

THE TECHNICAL JOURNAL OF THE ROSE POLYTECHNIC INSTITUTE

Volume XLII FEBRUARY 1933 Number 5

The Design and Use of a

Photoelectric Photometer

By Dr. Berton A. Howlett,

Professor of Physics, Rose Polytechnic Institute

THE author has found a modification of the instrument described by Morey of such usefulness in the physical or chemical laboratory that a description of its construction, faults, and uses might be valuable to those interested in science and engineering.

The photocell used in the circuit is a highly sensitive caesium tube produced by the General Electric Research Laboratories. The bridge amplifying circuit to which the photocell is coupled is similar to one recommended by DuBridge. Fig. 1 shows a diagram of the circuit used. The input resistance, R_1, was made from alundum cement, manganese dioxide and water glass. The circuit consists essentially of an equal ratio arm Wheatstone bridge in which the impedance of the FI154 tube is balanced by the resistances R_4 and R_5. The two equal arms, R_7 and R_8 are of 10,000 ohms each. The telephone jack J_1 makes it possible to plug in a meter for this preliminary balance. A 112-A tube is used to amplify the unbalancing of the bridge due to light falling on the photocell, P. A second jack J_2 allows the connection of a microammeter or galvanometer to read any change in plate current of the 112-A tube, from which the steady current has been balanced by the battery B_8, and the variable resistance R_{10}. All of the circuit except the batteries is inclosed in a heavy brass box, mounted in a brass frame so that it may be rotated around the axis of the optical system. The knobs of R_2, R_3, R_4 and R_{10} extend through one side

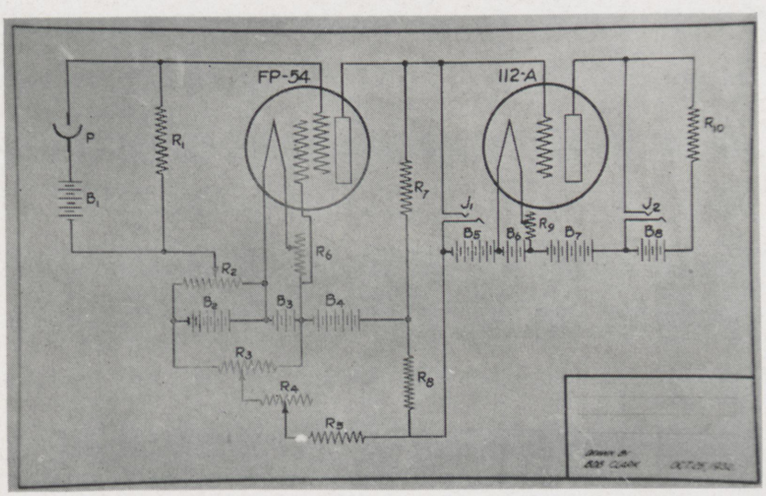


Fig. 1 Circuit Diagram

P, Photocell: R_1, 4.23 x 10^9 ohms; R_2 and R_3, 400 ohm potentiometers, R_4 2500 ohm, R_5 20000 ohm fixed resistance; R_7 and R_8, 10,000 ohm fixed resistances; R_6, 50 ohm; R_9, 6 ohm; R_{10}, 2500 ohm variable. B_1, 90 volts; B_2, B_3, B_6, 6 volt storage batteries; B_4, 2 volt storage cell; B_5, 9 volts; B_7, 135 volts; B_8, 4.5 volts.

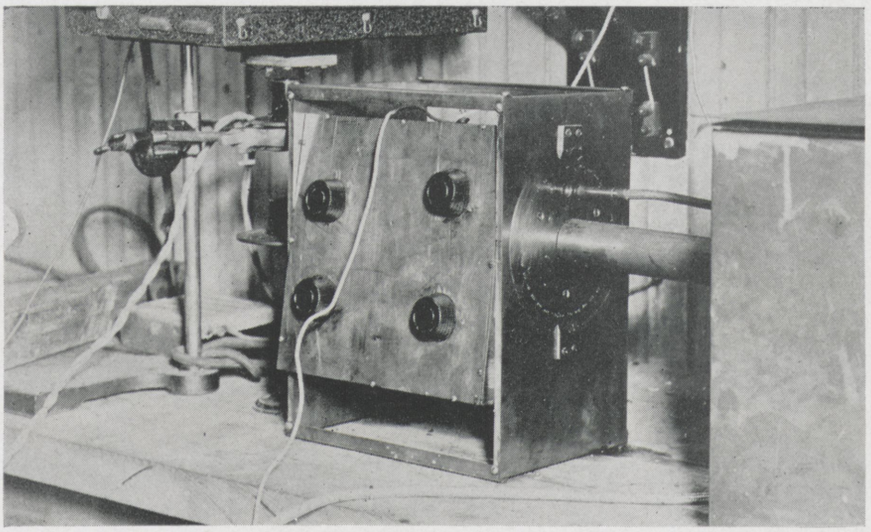


Fig. 2 A view of the instrument with battery box to the right

of the box to facilitate adjustment of the grid and plate voltage of the FI-54 tube, the balance of the bridge, and the normal current balance of the plate circuit in the final tube. All batteries are inclosed in a copper box shown to the right in Fig. 2. A large brass tube shields the battery leads between the boxes. Fig. 2 shows the control knobs on the box containing the circuit. This box is slightly tilted to show how it can be revolved around a horizontal axis. This view also shows a circular scale with verniers which show the angle of tilt to the nearest 5 minutes of arc. The two jacks are also mounted on the back of the scale plate. The figure shows the galvanometer plugged into J_2. Fig. 3 is a general view of the apparatus showing the tube on the left side which may contain a nicol prism or other optical parts between the source and the photocell. In the figure a solution cell is shown in front of the nicol for the study of perpendicular scattering from a vertical beam of polarized light.

Insulation and Shielding Important

In the construction of as sensitive an apparatus as this, great care must be given to high insulation of all grid connections and very careful shielding of all parts. The apparatus has about the same quadrant electrometer and must electrical sensitivity as a good be insulated accordingly. Slight changes in position or size of static charges on insulation or supports cause erratic disturbances. It was found necessary to support the tubes rigidly and to make all wire connections rigid enough to maintain their positions when the apparatus was rotated. It was also found necessary to cover all individual battery leads with metal braid and ground this to prevent static accumulation on the insulation. The circuit box should be nearly air tight to prevent the drifting of ions on to exposed parts. With these precautions the circuit becomes stable enough to use a reflecting galvanometer with a sensitivity of 2.53×10^{-9} amperes per mm. The input resistance, R_1, as constructed has a poor temperature characteristic and for the maximum sensitivity of the apparatus should be mounted in a constant temperature box. Magnetic shielding of the box would also be advantageous as the rotation of the box across the earth's field gives noticeable difficulty when trying to find positions of maxima and minima in the study of polarized light.

Instrument Has Many Uses

The uses of such an instrument are many and varied as it combines the properties of a photometer and a polarimeter. Its optical sensitivity as a photometer is such that even with a nicol of only 1 cm. aperture in the optical tube a standard candle at a distance of 10 ft. gave a deflection of slightly over 5 microamperes. Most photometric readings, even with color filters, could be readily made with a micro-ammeter as the measuring instrument. Relatively low intensity spectral lines can be directly compared with the galvanometer in use. This, of course, involves the use of the spectral characteristic of the photo-tube and its accuracy is dependent on the accuracy of that characteristic. The instrument can be used to measure very minute rotation of the plane of polarization and so has a wide field in chemical research. The author has done considerable work with it in studying the intensity distribution of polarized light scat-

(Continued on Page 19)

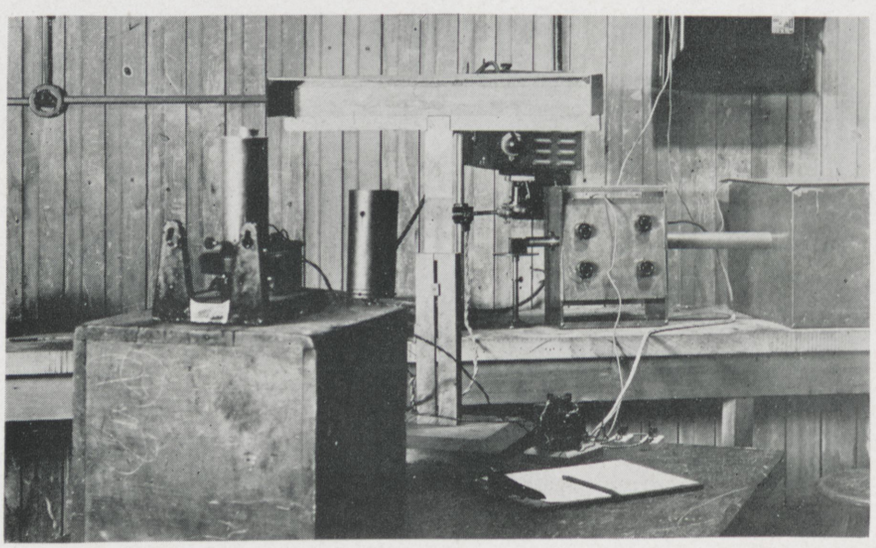


Fig. 3 A general view of the instument with tube for optical system extending from the left of the box.

A Rotating Boiler

Gives High Efficiency at Low Cost

By Russell A. Powell, m., '33

THE efficiency of the modern boiler plant has been improved by the introduction of the reheating cycle, regenerative cycle, or a combination of both. These cycles are in use within the limits of economic practicability. And now, a revolving boiler, intended to decrease floor space required and the initial cost of the installation, has been designed and is being given thorough tests.

One major improvement is the elimination of boiler feed pumps and the high pressure pipes and fittings which accompany it. The water is forced in by the centrifugal force created by turning the U-shaped tubes at turbine speed. In figure I, a diagrammatic representation of the experimental model, tube A is supplied with water at atmospheric pressure and tube B is heated. Since tube B contains a steam-and-water mixture much lighter than the solid water column in A, a definite pressure will be built up by centrifugal action. The experimental model was built to study this pressure-building effect. The force set up is calculated from the formula.

$$P = Mw^2r(d_w - d_s)$$

where M = mass of centrifugal column of unit cross sectional area.

r = distance of the center of gravity of the mass from the axis of rotation

W = Angular velocity in radians per second

$(d_w - d_s)$ = difference in densities of water and steam.

The difference in densities was assumed to be 62.4 pounds per cubic foot. The data obtained check very closely with the calculated values of pressure. With the experimental model, steam pressures up to 425 pounds per square inch absolute were obtained at 2200 R.P.M.

New Design Offers Advantages

Since the water is introduced at atmospheric pressure, high pressure pipes and fittings are eliminated. No regulation in the amount of water supplied is necessary, because the amount entering is regulated automatically by the rate of evaporation which in turn depends on the rate of heat supply.

The steam produced can be led through the hollow shaft directly to the revolving nozzles of the turbine. The steam is there expanded to a desired pressure and resuperheated, or it can be delivered to a low pressure turbine.

The rate of heat transfer is greatly improved by the movement of the boiler tubes. In the tests on the experimental model, at speeds of 1500 to 1600 R.P.M., the heat transfer coefficient was shown to be 52 BTU sq. ft. hour °Fahrenheit. Since better heat transmission is expected at higher speeds, such boilers may operate on a heating area only one-fifth or one-sixth that of the ordinary boiler.

In the proposed commercial installation, the tubes are arranged in the form of a helix, so that the hot gases are drawn down past the heating surfaces and forced out the flue. The boiler is fired from the top, and can be used wherever liquid, gaseous, or pulverized fuel is available. The ash is flung out when the gases first reach the rotating tubes, and is collected in troughs provided in the bottom of the setting. This ash may be blown out by a small flue gas blast. The work required to move the furnace gases may be neglected, since the turbulence created offsets this loss of efficiency by improving the rate of heat transfer. By means of the helical arrangement of the tubes, forced draft fans and induced draft fans are eliminated.

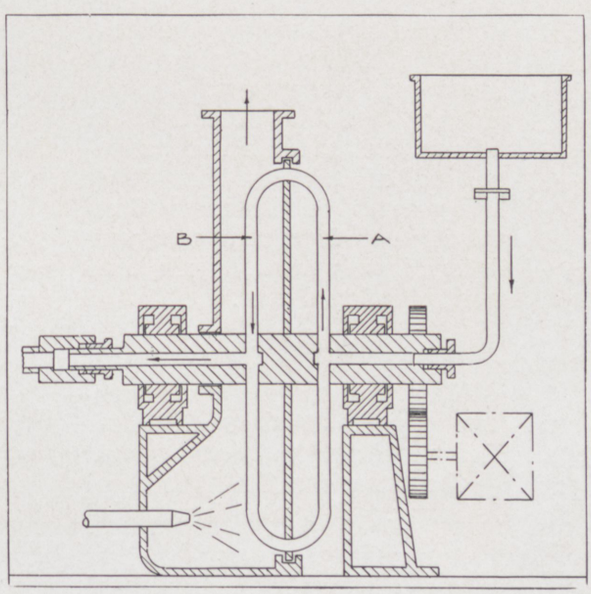
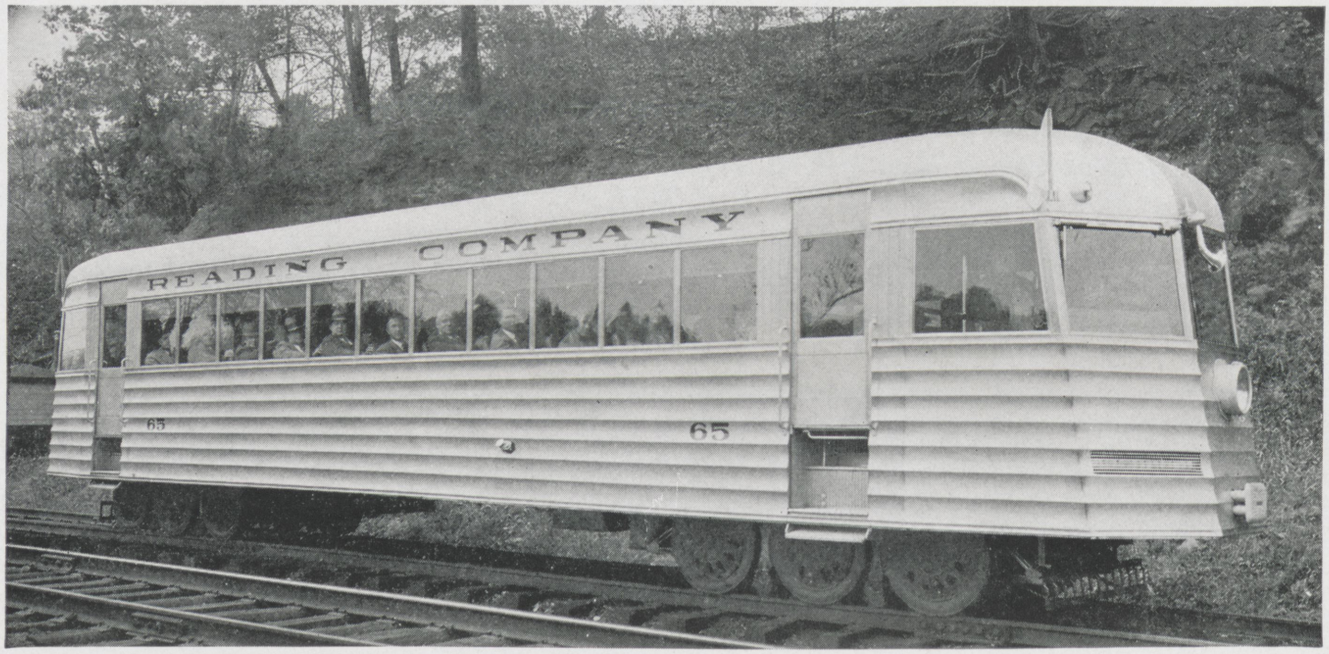


Fig. 1 A diagramatic representation of an experimental model

Construction Necessitates Care

Great care is required in the construction of a rotating steam generator to operate at 3000 R.P.M. Provision is made for the tubes to be wedged into longitudinal grooves in the shaft. The elements must be well made and the whole rotor balanced. Only good special materials need be considered, since the rotat-

(Continued on Page 19)



Cut Courtesy The Ry. Mech. Engr.

An unusual application of a unique material - a stainless steel railroad car

The Present Status of Stainless Steel

By J. C. C. Holding, '94

DEVELOPMENTS in the manufacture and application of corrosion resistant alloys of iron largely overshadowed other accomplishments in the field of metallurgy during the past decade.

The original Brearley United States Patent covering the use of chromium as an alloy to give corrosion resistance to steel was granted in 1916, but due to the World War and the consequent necessity of conserving available supplies of chrome ore, normal progress was retarded and only within the past ten years has any considerable commercial use of these alloys been made. As a matter of fact their most rapid growth in popularity has taken place in the last four or five years.

The total annual tonnage of Stainless Steel produced by all manufacturers operating under licenses from the patent owner reached 7500 tons in 1929 along with the maximum production of every thing else in industry. During the depression years 1930 to 1932 inclusive the decline of Stainless Steel tonnage consumed was not as great, measured in per cent, as the falling off in consumption of other types of steel. This is of course due to constantly expanding applications of the material so that the loss in tonnage through decreased manufacture of articles that were being made of Stainless Steel prior to the depression was partially offset by tonnage going into newly developed uses.

Stainless Steel Defined

These statements have reference only to genuine Stainless Steel made under patents owned by the American Stainless Steel Company. The Stainless Steel patents include only the original Brearley patent and some subsequent chrome-iron alloy patents involving variations in carbon and chromium content, issued to Haynes, Cox, Clement and Patch & Furness. These patents fully cover all of the straight chrome-iron alloys which have a sufficient chromium content to insure high corrosion resistance and they provide a wide range in chromium and carbon. The carbon in some of the Stainless Steels runs as high as 2 per cent while in others it is as low as can be obtained by commercial electric furnace practice. Chromium content may vary from 8 per cent up to 60 per cent. The very low carbon alloys of this group are usually called Stainless Iron, although they are in reality nothing more nor less than low carbon Stainless Steels.

It will be readily seen therefore that with such wide variations in analysis, genuine Stainless Steel should not be thought of as a single fixed alloy with

fixed physical and chemical properties because it has in fact an amazing range in properties. It may be hard, soft, tough, ductile or what not. It is a whole family of metals with one outstanding family resemblance—corrosion resistance—but whose individual members have widely different characteristics. A designer who has a corrosion problem to solve has therefore great latitude in the choice of his material. He can meet the specific physical requirements of the job, whatever they may be, without in the least sacrificing the corrosion resistance of the product he is designing. For instance, a grade of Stainless Steel is available that will make a perfect carving knife and an entirely different grade is available for the fabrication of a piece of chemical equipment. The first would not be suitable for the second application nor the second for the first. Nevertheless the physical requirements of both uses are perfectly met and the desired corrosion resistance is not sacrificed in either case.

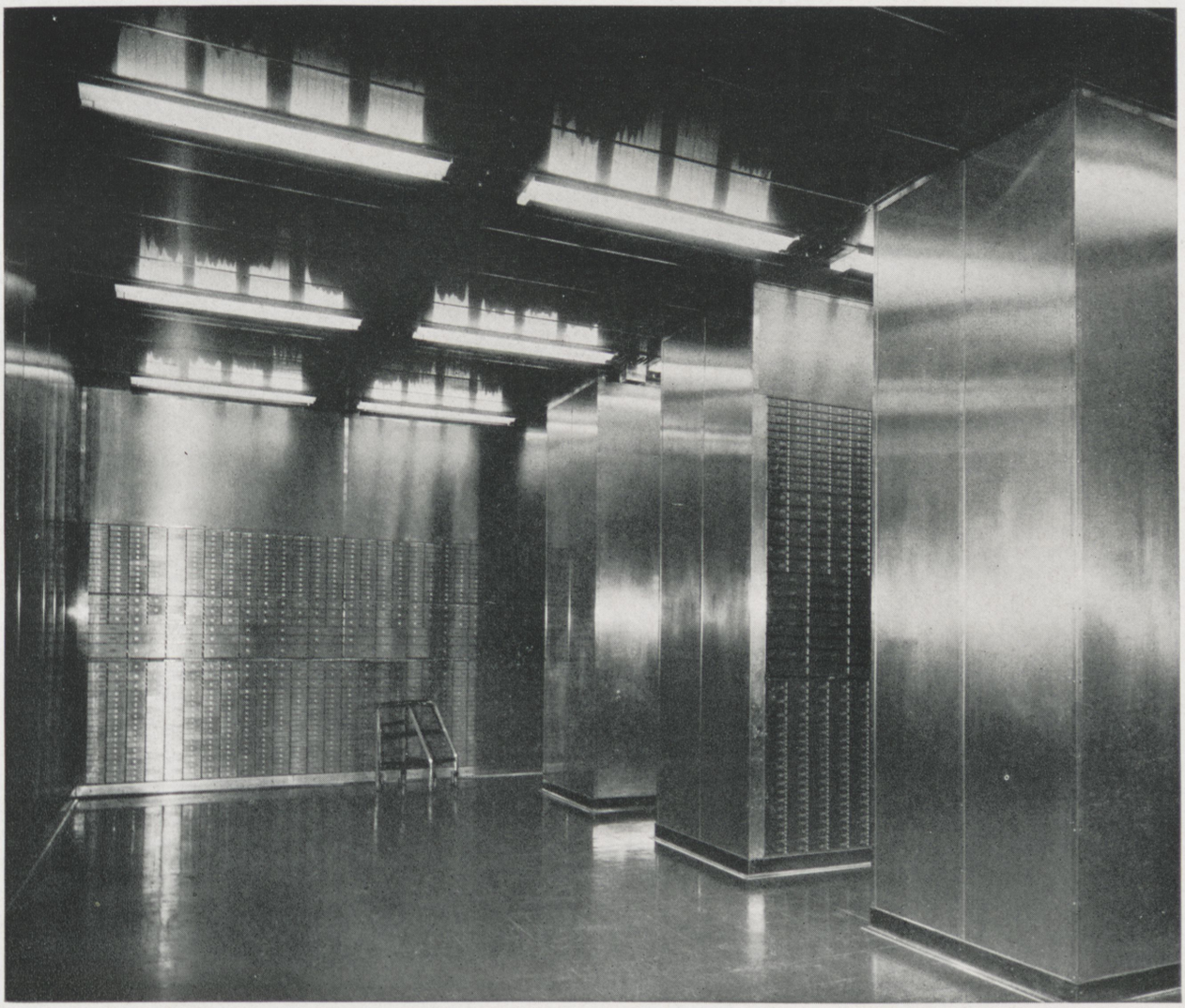
In addition to the straight chrome-iron alloys there is a large number of patented alloys containing, besides chromium, other alloying elements. Notable are the chrome-nickel-iron alloys whose composition and heat treatment are covered by United States Letters Patent issued in the name of Benno Strauss of Germany. Strauss's patent applications were pending in the Patent Office when the United States declared war against Germany. Two of them, referring to the composition of the alloys, were seized by our Alien Property Custodian for safe keeping. When the patents were finally issued in 1919 and 1920 they were assigned to the Chemical Foundation of New York which still holds them. The other two Strauss patent applications, referring to the heat treatment of his chrome-nickel-iron alloys, which were pending in the Patent Office at the same time, were not seized by the Government and in due course patents were issued direct to Strauss. These heat treatment patents are now held by the Krupp Nirosta Company of New York.

Other Corrosion Resistant Metals

The chrome-nickel-iron alloys as well as the Stainless Steels have a wide field of usefulness and their consumption has also increased rapidly. They are fre-

(Continued on Page 21)

In this Philadelphia bank, stainless steel is artistic as well as useful



Cut Courtesy The Architectural Forum

Published Monthly by the Students of Rose Polytechnic Institute

THE ROSE TECHNIC

A Magazine Pertaining to Engineering and Allied Sciences

Member of Engineering College Magazines Associated

JAMES C. SKINNER, GENERAL MANAGER

JAMES G. BROWN ..... EDITOR
HARRY L. McGURK ..... Associate Editor
JOHN J. HAGER ..... Assistant Editor
J. DUNLAP McNAIR ..... Contributing Editor
RICHARD K. TONER ..... Alumni Editor
JAY F. HALL ..... Ass't. Alumni Editor
HARRY H. RICHARDSON ..... Sports Editor
JOHN A. RITTER ..... Campus Editor

J. ROBERT MOTZ ..... BUSINESS MANAGER
JACK H. FOULKES ..... Advertising Manager
GORDON L. BURT ..... Ass't. Advertising Manager
JACK H. KELLER ..... Circulation Manager
EARLE B. BUTLER ..... Ass't., Circulation Manager
ROBERT H. SWOBODA ..... Research and Progress
ARTHUR W. HESS ..... Art Editor
JOSEPH H. DeWITT ..... Humor Editor

FACULTY ADVISERS

Professor ALBERT A. FAUROT, Mr. HENRY C. GRAY

ALUMNI ADVISER

ALLEN G. STIMSON

Prefabricated Houses

MASS production of steel houses composed of a few standardized pieces and designs is looming in the future as one of our largest industries. Elimination of the endless slums in most large cities is one of the admirable and easily attainable aims.

Automobile manufacture and sale has reached such a high development, of which the basic principles may be carried over so easily, that a great deal of the fundamental work is already done. Financing along similar lines to the sale of automobiles seems entirely feasible.

Some unpleasant monotony is feared; block after block of exactly similar, even congruent, houses does not sound very attractive. Yet the same argument could have been made against large scale production of automobiles. Different companies will have radically different general types of houses, and the permutations and combinations of units afforded by any one company will provide plenty of variety.

Of course, there will always be a market for the present type of construction, just as for custom-built automobiles, but thousands of people ride in "all three" cheap mass production cars and are satisfied.

Steel promises to be the basic material. One company's plans call for only four types of interchangeable panels to build the whole exterior portions of a house. These are a roof panel, a blank wall panel, and a door and a window panel. Special units such as garage doors are also to be provided. These panels will be pressed sheet steel, from one-sixteenth to one-eighth inch thick. The roof type will have small I-beams welded to the surface to give added rigidity.

Plumbing, gas, and lighting fixtures are all standardized to fit any arrangement of rooms and walls.

The idea will, of course, require "selling" to the public, but it seems a certainty that the industry will soon make itself felt throughout the country.

Engineering Education

Our contemporary "The Co-operative Engineer," published by the students of the University of Cincinnati carries a very significant article in the January issue, "The Meaning of an Engineering Education," by D. T. Michael, E.E. '31.

Mr. Michael, after talking with many recent graduates of engineering schools, finds that almost unanimously they state that the education they received was not quite worth all of the time that they spent acquiring it. In view of this indictment he presents several points which are very thought-provoking.

First of all he sets forth three fundamental purposes of education. First, students should be taught to think, that is to apply the so-called scientific method. Along with this should go a complete study of the English language, especially writing and public speaking.

Second, students should be taught to teach themselves. Regardless of how complete his technical training has been, every student will find problems which he must work out for himself without the aid of a teacher.

Third, an education should furnish a general background of knowledge.

Mr. Michael offers two specific suggestions to help bring about some reform. The subject of English should be advanced to the position of a major course rather

than a necessary evil. A course in Reflective Thinking should be offered. Dogmatic and highly specialized courses serve admirably to kill any natural inclination toward real personal thought.

In general, he believes that specialization is being carried much too far to the sacrifice of general cultural and basic technical subjects. In the phraseology of a recent assembly speaker, information is stressed, while knowledge and wisdom are neglected. Information must not be the goal of any college career, but it seems to be the trend of many technical courses.

These ideas are all sound and are interesting in that they show that even recent graduates are doing some thinking along such lines.

Introducing the Engineer

The public as a whole scarcely realizes that the engineer exists. Mr. John Public uses some of his products at every moment between arising and retiring, and even during the night. Yet he takes all these conveniences as a matter of course. If his automobile misbehaves he blames "them" for not building it better; if it functions perfectly, that is the way "they" should build them. That is all the credit or recognition he gives. Telephones, electric lights, heating, plumbing, skyscrapers, bridges, *ad infinitum*, might be added to this list.

The high praise and severe condemnation of Technocracy indicates that for the first time the engineer's importance has been driven home. The general opinion of an engineer is still that of a hob-nailed, coarse-voiced, tobacco-chewing ruffian who belongs in the backwoods instead of in the president's office. It would seem that the general horror and apprehension of the results if the government were turned over to engineers is due to this impression. Men who have been providing more fundamental needs than the government ever considers and have made a remarkable success of almost every endeavor are thought incompetent to fill the shoes of the politician.

It is time for someone to introduce Mr. Engineer.

A Golden Opportunity

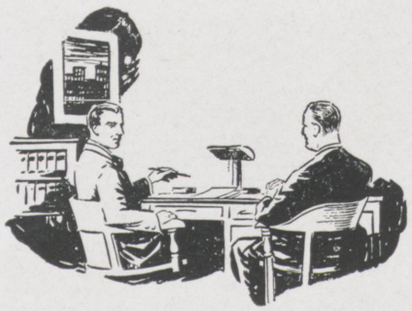
The genuine realization that an engineer must be more than a technician is only now beginning to show results. The subject has been preached for several years, but is now bearing fruit. Engineers are being trained along broader lines and are applying their training. Their interest in economics is especially significant.

The habits of clear and coherent thinking, instilled in college, are carried over and form a valuable original asset. Mutual discussion and criticism of each other's plans are expected and desired, a noteworthy contrast to the hesitancy often displayed by the public, the press, and the politicians. An engineer has an unexcelled opportunity for frankness in his reports.

Continual work with natural forces will have impressed him with the value of estimating the probable error in all observations. He will not only avoid overconfident statements and declarations himself, but will be able to find the flaws in the offerings of others.

The engineer was really brought into economics partly against his will in order to defend his honor against the claim of causing the worldwide depression. It has been and is still claimed that the Machine Age is back of all our troubles, and the engineer is undoubtedly back of it, so it is expected that he be blamed. Perhaps he is in a measure, though certainly not entirely, responsible, but however that may be, his opportunity to clear himself and establish a still more enviable reputation by leading the way out of the depression is a golden one.

J. D. McN.



ALUMNI

Edited by Richard K. Toner, ch. e., '34

Changes of Address

We continue this month in presenting to the alumni the various changes that have occurred in the occupations of their fellow graduates. As far as we know, this completes the revision to date, but we should appreciate notification of additional changes.

'25 C. E. Dahlquist is with the Prosch Boiler Works of Terre Haute.

W. R. McIntosh is now Associate Professor of Civil Engineering at the Speed Scientific School, Louisville, Ky.

Henry Iker is with the White Star Refining Co. of Detroit.

'26 Bruce Walsh, '26 medal man, is a law student at Georgetown Law School, Washington, D. C.

'27 Ernest Johnson, with R.C.A.-Victor, has been transferred to Detroit.

Fred Trautman is Manager of the Western Air Conditioning Co., at Colorado Springs, Col.

Milton M. Rubin has received his M.D. degree from Indiana University and is an interne in the City Hospital at Indianapolis.

'28 O. S. Calhoon is with the White Star Refining Co. at Trenton, Mich.

B. H. Van Vactor is with the Hudson Coal Co. at Scranton, Pa.

'29 Ralph Bailey, with Ohio Bell, has been transferred to Youngstown where he is Service Engineer.

'30 John Trueb is with the Public Service Co. of Indiana at Shelbyville.

Russell Martin is at Danville with Illinois Bell Telephone Co.

John Gibbens, with U. S. Engineer's Office, is Land Line Party Chief at Muscatine, Iowa.

Ernest Johnson, with Illinois Bell, has been transferred to Aurora.

'31 A. G. Stimson is taking the second year of the Advanced Course in Engineering, conducted by the General Electric Company, Schnectady, N. Y.

Kenneth Mason is with the National Malleable Castings Co. at the Indianapolis plant.

Richard Biller is chemist with the Crescent Products Co. of Terre Haute.

Paul Kunz, with the State Highway Commission, is Project Engineer at Huntingburg, Ind.

'32 Carl Kraemer is attending E. I. S. T. C. at Charleston, Ill.

Tom Stanley, a graduate of Rose in June, and who has been since that time at his home in Louisville, is confined to the Waverly Sanitarium in Waverly, Ky. for a rest cure. The Technic wishes him a speedy recovery.

Pittsburg Rose Tech Club

At a recent meeting of the Pittsburgh Rose Tech Club Mr. A. W. Worthington, '06, and Mr. W. W. Reddie, '12, were re-elected President and Secretary-Treasurer respectively.

In a letter received by the Technic from Mr. Reddie there is included a note of interest. Mr. Reddie says, "We are calling to your attention a matter of interest to our Club which may be of interest to the Technic and the alumni. Six of our members are listed in "Who's Who in Engineering.' These men are Frohman, Wiggins, Butler, Ducey, Worthington, and Leitch.—The Pittsburgh Tech Club takes a great deal of pride in this Honor Roll."

Here and There with the Grads

'89 Elmer E. Gilbert has retired from his position with the General Electric Company. Mr. Gilbert graduated from Rose in '89 as a Mechanical Engineer. He then took a position with the Thomson-Houston Electric Company in Boston. Following that he went to New York as an employee of the same company in the Isolated Lighting Department. At the conclusion of these services, he became affiliated with the General Electric Company. He soon became assistant to the General Manager of the Lighting Department, and since 1907 he has been Sales Manager of the Turbine Department. He may now be reached at 1017 Avon Road, Schenectady, N. Y.

We take pleasure in announcing the election of Alonzo J. Hammond to the presidency of the American Society of Civil Engineers. He is the first graduate of Rose ever to head one of the three leading engineering societies of the country. The Technic certainly congratulates Mr. Hammond on the distinction conferred upon him.

'90 S. S. Raymond, formerly mining engineer in Los Angeles, died last December while driving his car in Sonora, California.

'95 Charles R. Crockwell reports that he is living on his farm at Eolia, Missouri, getting a great kick but no money out of it.

'97 Robert A. Philip is now located in New York.

Walter Crebs is Superintendent of the Cincinnati Soap Company at Dayton, Ohio.

'01 Albert C. Lyon is Chemical Engineer with the Midland Chemical Laboratories, Inc., at Kansas City.

'06 Charles A. Cadden is Superintendent for the Natural Gas Pipeline Company at Geneseo, Ill.

'08 H. Earl Schmidt is Manager of Retail Sales, Shell Petroleum Company at Milwaukee.

'09 James Darst is Chief Inspector of the Electrical Department of the Weber Dental Manufacturing Company at Canton, Ohio.

Richard L. Smith, who is Assistant Military Attache at the American Embassy at Paris, is in charge of the construction of the new embassy building.

'11 R. Nelson Hickman is Supervisor for the Prudence Co., Inc., of Brooklyn, N. Y.

'12 C. Owen Fairchild, with Tagliabue Mfg. Co. of Brooklyn, has been made Director of Research.

Ben L. Heer is District Manager of Tire Sales for the U. S. Rubber Company at Los Angeles.

'15 Henry L. Coles, M.S., '15, and former instructor in chemistry at Rose, is Assistant Professor of Chemistry and Director of Research Institute at Wittenberg College, Springfield, O.

E. J. Hegarty is now Northeastern Merchandising Manager for Westinghouse in New York.

'19 W. E. Miller, with the York Ice Machinery Corporation, has been transferred to Cedar Rapids, Iowa.

'20 Herman Schlaman, with Anheuser-Busch, has been transferred from St. Louis to Cincinnati.

(Continued on Page 21)

We add to our Roll of Honor

George F. Nicholson

George F. Nicholson was born in Terre Haute, Indiana, October 10, 1883. He attended grade and high schools in that city and graduated from Rose Polytechnic Institute with a B.S. degree in Mechanical Engineering in 1906, and received a C.E. degree in June, 1921.

Mr. Nicholson spent the years 1906-07 in Old Mexico in the service of the Mexican Central Railway Company. His work included the location of railroad line through the mountainous country from Mexico City to Tampico on the Gulf Coast, and the location and construction of railroad line from Mexico City to Manzaniga on the Pacific Coast.

Early in 1908 Mr. Nicholson returned to the United States and located in the Pacific Northwest and became identified with the Chicago, Milwaukee and St. Paul Railway, from 1908 to 1910 as Resident Engineer in charge of railroad construction in connection with the building of their main line to the North Pacific Coast.

Entering the harbor planning and development field in the early part of 1910, he became associated with the late Virgil G. Bogue, New York Consulting Engineer, one of the foremost engineers of his time in city and harbor planning. For two years comprehensive development plans were investigated and reported on for practically all of the North Pacific Coast harbors, including Prince Rupert and Vancouver, B. C., Seattle, Tacoma and Grays Harbor, Washington, and Astoria, Oregon.

When the public port district was formed in Seattle, Washington, in 1918, Mr. Nicholson became Assistant Engineer in charge of all harbor construction work, and was appointed Harbor Engineer in 1916, which position he held for nine years before going to Los Angeles. He was appointed Executive Secretary in 1921, heading the Executive Staff for that port. During the time he was identified with the Port of Seattle the modern terminals were constructed, and he had the distinction of constructing the Smith's Cove Terminals, the largest commercial piers in the world at that time. He also acted as Consulting Engineer for a number of Pacific Coast ports.

In 1923 Mr. Nicholson spent eight months in Europe at the request of the Board of Harbor Commissioners of Cork, Ireland, in the preparation of a comprehensive plan for the development of the Ports of Queenstown and Cork. While abroad he visited and inspected all of the important ports of Europe.

On January 1, 1925, he was appointed Harbor Engineer for the Port of Los Angeles, which position he now holds. Considerable development work has been accomplished at this port during his incumbency, the latest being the recent construction and completion of the West Basin Terminal, probably the most modern terminal of permanent construction built in North America to date.

Mr. Nicholson is the author of numerous articles on general port matters, particularly on the durability of concrete and reinforced concrete in salt water, and last year contributed a study entitled:

(Continued on Page 21)

Research and Progress

Edited by Robert H. Swoboda, ch. e., '33

Concerning the Macon

When the great airship Akron was completed, its electric equipment was hailed as a marvelous development in light structure power installation. The Macon, its sister ship, soon to be completed has even better, more efficient and lighter electrical apparatus.

The most important change in the Macon's electric structure compared to that of the Akron is in the generating sets. On the Akron, all energy is generated at 115 volts, and radio equipment power is supplied by two motor generators. On the Macon there are three generators on the same shaft; two 1.5 k.w.—3000 volt units to supply the powerful radio outfits, and an 8 k.w.—115 volt unit for general power and light. All are direct current, but a small amount of alternating current can be taken from the 8 k.w. machine. The weight of the Macon's three units does not exceed 525 pounds, although the speed is but 2100 r.p.m.

The Macon's switchboard is lighter than that of the Akron. It handles two generators and 28 feeder circuits, is built of micarta plywood and weighs 130 pounds. Protective devices draw off static and induced charges that might accumulate in the structure and wiring.

Aircraft will be warned away from the big dirigible at night by eight running lights, red, green, and white on a flashing circuit. Code signals by light flashes visible for eight miles, even in daylight, are possible with a 500 watt trigger-operated searchlight weighing eleven pounds and four ounces.

An Electronic Pencil

Recent advances and improvements in the structure and application of cathode tubes are rapidly placing them in industry. The most modern and significant improvement is the one which enables a high intensity beam of sharp focus to be obtained. The Cathautograph or electric pencil is the first commercial development utilizing this advance.

It is a well known fact that when cathode rays strike a screen with a surface composed of Willimite or calcium tungstate, a marked local illumination or fluorescence results, lasting as long as the beam continues to strike the screen. By use of special salts recently developed for the coating of the screen, it can be caused to maintain its fluorescent glow as long as thirty seconds after the spot beam has been moved.

The transmitting system consists of a pencil or stylus which is connected with two resistances so that as the pencil is moved a voltage is picked off the resistances which is proportional to the movement of the pencil. The receiver consists of a standard cathode-ray tube with two pairs of deflection plates, the tube having its fluorescent screen in the large funnel-top end.

As the stylus of the transmitter is pushed around writing its message, the receiver causes the intense beam of the cathode tube to be moved over the fluorescent screen reproducing the writing. By means of the improved screen about ten words can be written before the first word written fades from the screen.

The transmission from the source to the receiver can be accomplished over a three wire system or over radio circuits by modulating two separate tones on a single carrier. In the latter case, the receiver rectifies each tone and uses each one to operate a set of the deflection plates of the tube.

Some applications of special note would be communication between airplanes and ground stations, communication between small vessels not carrying a licensed operator and land stations, and cheap, large volume,

speedy communication between factories. A suggested use of importance to foreign countries such as China and Japan which still use character writing is its substitution for telegraphic code messages which are too complicated to fit their script characters.

Wind Turbine

Points beyond economic reach of utility company power lines, such as isolated farms and emergency landing fields may now have very cheap electric energy at a low installation cost of equipment. These points, however, must have a fairly well sustained air circulation. Backed by research and improvements not previously incorporated in windpower machines, this new equipment is extremely practical for use on the wheat plains of western United States.

The installation is a one kilowatt unit with a generator mounted on the mill shaft and operating thru a 9-1 step-up gear. The speed of the unit is practically constant at 12 r.p.m. for all wind velocites over 15 m.p.h., the constancy of speed being attained by automatic feathering of the hollow stainless steel airfoil.

The outfit consits of a single-wing wind turbine including a tower, a generator, and storage batteries, all at a cost of around $800, depending on the height of the tower and the voltage of the installation.

The Macon's New Hangar

The dimensions of the great structure, which is to house the new U. S. Navy dirigible will be approximately 1200 feet in length by 308 feet in width by 225 in height. Not only will this hangar be one of the largest buildings in the world, but it will be the largest building in the world without pillars or posts to support it. The hangar, which will be in Sunnyvale, California, will be shaped like an enormous archway, and will have the world's largest single unobstructed floor area, nearly 300,000 square feet, a space large enough to house five miles of freight cars.

The laying of the sheet steel battledeck mezzanine floors which run the entire length of the building, one on each side, is by far the largest job of structural welding ever performed in California. When completed the hangar will have more than seven miles of welding in its construction. The floors consist of 2 feet by 12 feet steel plates $\frac{3}{16}$ of an inch thick, welded together.

Revolutionary Airplane

News reports from Germany tell of a new type of flying machine which can hover in the air, ascend and descend vertically and fly forward and backward. It is the invention of Dr. Adolph Rohrback, head of one of Germany's leading aircraft companies.

In place of the usual wings, the machine is fitted with three-bladed revolving wheels which are rotated by the engine. The basic principle is said to have been known for a long time.

These wheels are reminiscent of the old steam boat days on the rivers. They revolve on an axle extending from the fuselage in both directions. Rotation of the blades develops a lifting as well as a propelling force, and the ship is not provided with a screw propeller.

That the principle was not applied up until now is said to be due to mechanical difficulties involved in changing the pitch of the blades from the cock-pit. Rohrbach engineers worked on the problem two years and arrived at a solution which was approved by the German Scientific Aeronautical Society.

The pitch of the blades can be so adjusted that only a lifting effect is produced, and the machine can thus make a vertical ascent. If the pitch is then changed, a propelling effort can be produced in addition. Even a backward propelling force can be produced.

Owing to the fact that the lifting and propelling wheels rotate at a speed of 400 r.p.m. the centrifugal force on their members is so great that it was an extremely difficult task to develope a control mechanism for changing the pitch of the blades that would be sufficiently strong and sufficiently sensitive.

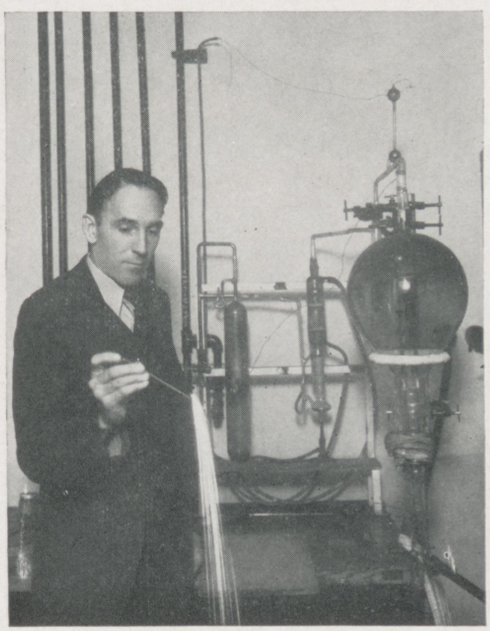
A full-sized plane having a span of 43 feet and a length of 46 feet is under construction. It is to be equipped with two 120 hp. motors and is expected to make its trial flight next summer.

New Electrolytic Production of Rare Metals

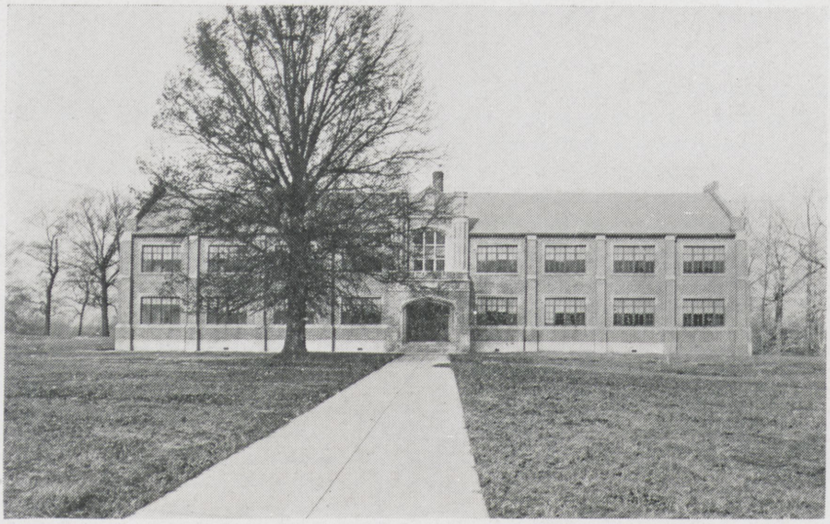
A new method of electrolysis for obtaining such rare metals as uranium, thorium, and tantalum in the pure state has been developed by Dr. F. H. Driggs of the Westinghouse Research Laboratories. Being continuous and therefore cheaper, this new process is expected to make rare metals available in larger quantities and at cheaper prices, thereby extending their industrial uses either separately or as alloys.

In this new process, a cathode is inserted in a liquid bath containing equal parts of sodium and potassium chloride to which has been added a quantity of potassium thorium fluoride when the metal thorium is desired. After powdered thorium has collected to a thickness of about one inch on the cathode, it is removed

(Continued on Page 22)



Uranium powder igniting when exposed to air



Campus Activities

Edited by J. A. Ritter, m., '34

Dormitory

WHO would have thought that the students residing in the dorm would take up that strenuous and nerve-racking game of ping-pong. Believe it or not (apologies to Mr. Ripley) that is exactly what they have been doing. Instead of the sessions and rambling around the dorm hunting for some excuse to keep from working, everyone congregates in the committee room in the basement after supper and cheer on the blood-sweating contestants. Undoubtedly, this mode of entertainment is just as efficient as any that can be thought of for the average fellow's excuse for "what to do" instead of study. It must be admitted that a student must study; still if he refuses, he might as well indulge in some pastime that will be helpful physically. No one will doubt the statement that ping-pong as played by experts is a very trying and tiring game. It really is devastating to the spectator's nerves to see a player dashing madly about striking at the elusive celluloid ball. It has been suggested that two beds be placed in the room so that the exhausted players may collapse upon them when they are no longer able to stand up.

It must be admitted that the real reason for the popularity of such a game as ping-pong was caused after due consideration of everyone in an attempt to find some harmless yet useful entertainment for the restless student. Let us hope that this alternative is a popular success.

●●

Flash:—Rose Polytechnic's new amateur radio station was in communication with New Zealand on January 26, 1933. The honor for the first communication around the world (12000 miles) is due Richard F. Carle who remotely controlled and operated the Rose Poly station seven miles away. The stations signals were reported to be very loud at that point and greetings were exchanged from a station experiencing winter weather to a station enjoying summer breezes.

●●

Rose Opens Radio Station

On Thursday, January 19 at 11:30 A. M., the new amateur radio station was formally put on the air. A short meeting of interested students was held at 11 A. M. and at that time a general discussion of the history of the radio station was presented by Howard Staderman. After thanking Dr. Prentice, Dr. Howlett, and the general student body for their cooperative interest, services, and the actual work of installation by the students, the meeting was turned over to Dr. Howlett. In his brief talk it was pointed out that this station is a benefit to the Institute from a scientific standpoint as well as an interesting feature for members of the club. In conclusion, Dr. Howlett stated that since this station would have national as well as world-wide range, the conduct of the operators of the station should represent the student body of Rose. Mr. Archer urged that any student who wishes to become a member of the club should do so in the near future in order to secure the entire benefits of the year's program. The meeting then adjourned to the operating room (in the basement of the electrical laboratory) where remote control switches were closed that formally put the station on the air. At that time a station was contacted in Indianapolis by Mr. Trusler. An inspection trip was then made to the transmitting apparatus located in the building near the lake. Moving pictures of the assembled student body were taken and these will be shown at a future meeting of the club. A code class is to be formed in the near future in which the code class instructions for Rose students will also be broadcast by phone and telegraph code to neighboring states.

(Continued on Page 22)

Fraternities

Alpha Chi Sigma

Iota of Alpha Chi Sigma takes pleasure in announcing the election of the following officers for the second semester: Master Alchemist, Richard K. Toner; Vice-Master Alchemist, J. Dunlap McNair; Reporter, Henry Douglas; Recorder, Tom Batman; Treasurer, John Moore; Master of Ceremonies, Robert Swoboda.

The chapter appreciates the fine work the retiring officers have done and it believes the incoming officers are capable of "carrying on."

Alpha Tau Omega

Gamma Gamma is pleased to announce the pledging of the following men: John Bradley and Gordon Burt of the class of '35, and Francis Blair, Oscar Brosey, James Campbell, William Creal, Edward Denehie, Louis Duenweg, Harry Garmong, Harold Hall, Edward Howard, James Hufford, Houston Johnson, William Kasameyer, Raymond Laughlin, Edward Leever, Charles McDonald, Paul McKee, Albert Mewhinney, Wilmot Moore, Daniel Overholser, Joseph Ross, Niel Salisbury, Warren Sentman, Wayne Staats, Joseph Walker, and Charles Whitesell, all of the class of '36.

Sigma Nu

Beta Upsilon of Sigma Nu is pleased to announce the pledging of H. F. Richardson, D. Colburn, R. Spain, and E. Mann. A banquet was held at the chapter house Friday, February 3, and these men were presented with their buttons.

We congratulate the other fraternities on their successful rush season.

Tau Beta Pi

The Indiana Beta chapter of the Tau Beta Pi held its monthly dinner meeting at the Elk's Club, Thursday evening, January 19. After the dinner the chapter went to the home of Dr. Frank Wiedemann on South Sixth St. who gave a most interesting talk upon life in the South Sea Islands, illustrated by several reels of moving pictures. These pictures were taken by Dr. Wiedemenn himself while on his travels. The evening's entertainment was one of the most interesting of Tau Beta Pi's dinner meetings.

Theta Xi

During the past few weeks, the chapter house has been a scene of great activity. The brothers have done a great deal of work and their efforts have been rewarded by a completely redecorated house. New curtains for the entire house were given the chapted by the Mothers' Club.

The following men were elected officers for the coming term: Trussler, Keifner and Mayrose.

Theta Kappa Nu

The Theta Kappa Nu Mothers' Club held its regular meeting at the chapter house, Friday afternoon, January 20. We are very grateful to the mothers for their interest and assistance in the chapter functions. Their help was indispensable in the successful rush week enjoyed by the chapter.

Many alumni visited the chapter at Christmas including, Charles Lotze, Doc York, Fred Andrews, Chester Stock, Wayne Bovenschen, Paul Scofield, Jim Lawyer, Stan Davis, John Fairhurst, Max Sherwood, and Charles McGillivray.

SPORTS

Edited by Harry Richardson, m., '35

BECAUSE of the limited amount of time available in which to complete the intramural basketball season, the schedule and team arrangements had to be completely reorganized. In the original system there were four teams in each department, thus making sixteen teams which were divided into two leagues of eight teams each. This necessitated a large number of games and consequently required a great amount of time.

To meet the time difficulty, Coach Brown rearranged the system. In the revised system there are eight teams, two from each department, which constitute a single league. This means that there will be considerably fewer games to play in the comparatively short time.

The arrangement is similar to that used during the intramural baseball season last spring. The seniors and sophomores in each department constitute four departmental teams and the juniors and freshman together make up the other four teams.

Under the present system there is a better chance that the more experienced ball players get on the same teams. This insures better teams and more experienced competition. A better brand of ball is being displayed and the scores show it.

Of course it is difficult to mention the possibilities of each team in this column but I would like to mention the teams that are coming out on top. The civil A's have three former Rose lettermen on their team together with several squad members. The civil B's have been coming along almost as well even though their roster contains but one former letterman. The mechanical A's have two former lettermen on their list, besides several former high school players. The mechanical B's have one former squad man on their team together with several high school stars (?) just fresh from high school.

There have been several big upsets according to the "big dope" and there are going to be a good many more of them. The civil B's took over the mechanical A's in one upset, and then the mechanical A's turned around and licked the civil A's who beforehand had been the heavy favorites. I expect the civil A's to beat the civil B's which will give a three way tie between these three teams. I think that the whole thing will end up with everybody in a tie for either first or second place.

Football

Since the completion of the 1932 football schedule, Athletic Director Brown has been busy arranging a schedule for 1933. His efforts have been rewarded and he has presented this tentative schedule:

Sept. 23—Oakland City—Here
Sept. 30—Hanover—Here
Oct. 7—Gary University—Gary (Night Game 7:30 P. M.)
Oct. 14—Wabash — Crawfordsville
Oct. 21—Evansville—Evansville
Oct. 28—Open Date—
Nov. 4—Earlham—Richmond
Nov. 10—Indiana State Teachers College—Stadium (Night Game)

Most of these teams are not foreign to previous Rose football schedules, but this schedule contains some of the toughest teams in Indiana Secondary Colleges. Gary University is new to a Rose schedule, and, according to all reports, they have a clean, hard-fighting aggregation. Negotiations are being carried on with Southeastern Missouri State Teachers College of Cape Girardeau, Mo., and Union College of Barberton, Ky., for a game on Oct. 28. Southeastern Missouri State Teachers College is a new name in this city, but Union College has the team that almost busted up our last Homecoming.

Even if there is an open date in the schedule, it is going to be tough sledding for the diminutive Rose squad during the 1933 season.

Whoever is satisfied with what he does has reached his culminating point—he will progress no more. Man's destiny is to be not dissatisfied, but forever unsatisfied.

Young men are fitter to invent than to judge, fitter for execution than for counsel, and fitter for new projects than for settled business.—Francis Bacon.

Photoelectric Photometer

(Continued from Page 6)

tered from fluorescent and non-fluorescent solutions. It has also been used to measure percentage of polarization of light from such solutions. In this work with low intensities its high sensitivity is very essential.

For student work where the micro-ammeter can be used in place of the galvanometer, the instrument is more simple to operate than an ordinary photometer or polarimeter. It has been used to check the cosine squared law of Malus and to measure the variation of percent of polarization of light transmitted through a plate at different angles of incidence besides the usual experiments in polarized light. Its widely variable sensitivity and general stability except under extreme conditions make it a very useful instrument in either the physical or chemical laboratory.

Rotary Boiler

(Continued from Page 7)

ing mass is comparatively small. The shaft is heat treated and is well protected from heat strains by the tubes set around it. At steam pressures of 1400 to 1700 lbs. sq. in., the peripheral speed is 525 ft. sec., which is far below the range common in turbine construction. The stresses in the steam generating elements will be 16,000 to 17,000 lbs. sq. in. These can be adequately handled at the prevailing temperature of 660° F.

Operation Described

In the proposed unit, water entering the hollow shaft passes first to preheater tubes and then to longitudinal tubes, where the steam is generated. The high pressure steam is passed from collector tubes through a U-shaped superheater tube, from where it passes through an insulated collector tube to the high pressure turbine. From the turbine the low pressure steam is led through stationary superheater tubes surrounding the fire chamber.

The unit is assumed to be capable of evaporating 18 metric tons per hour while operating at an efficiency of 85%. By expanding the high pressure steam from 1700 lbs. and 716° F. to 355 lbs. the turbine should generate 850 KW. 200 KW will be used to drive the steam generator, provide fresh air, and create turbulence, leaving 650 KW. to be delivered as useful work. In the intermediate superheater the steam led from the turbine at 355 lbs. sq. in. is reheated to 842° F. This steam is then expanded in a low pressure turbine.

The difficulties encountered in operating the intermediate superheater in conventional super-pressure installations is eliminated by the unit construction of the boiler and turbine, since no regulation of either steam or water circulation is necessary. Since the only regulation used is the rate of heating, the whole auxiliary equipment used with super-pressure steam is entirely eliminated and rapid changes in output are made possible.

The installation of a fresh air blower on the shaft of the boiler makes the moving of the air and flue gases entirely automatic. The air preheater is placed inside the furnace jacket, thereby eliminating all fresh air and hot air piping.

Installation Costs are Reduced

It is claimed that this installation is about 60% cheaper to build and set up than a conventional unit of the same size (18 metric tons per hour), and that the costs for a high pressure unit are lower than the present cost of a conventional low pressure unit for the same output. A large decrease in the first cost will be effected because of the compactness of the unit and the smaller structures required to house it. Another large saving lies in the elimination of pumps, fans, pipes, and fittings as outlined above. From these statements it is evident that rapid progress is being made in the field of boiler design.

It is much easier to be critical than correct.—Benjamin Disraeli.

Spontaneous Effervescence

Edited by Joseph H. DeWitt, c., '35

A PLAY

In one act, one time, and one opus.

Time: It is now 11:52.

PLACE: Call 5060 and ask for Sparky.

(Characters, in order of appearance).

E Pluribus Unum
A plumber
Mysterious man from Kokomo
Sparky
Sparky's right hand man
Helen of Troy
Father Time
Reaper Man (with scythe)
One grand piano (Chickering)

Act I

(Enter, Mysterious man from Kokomo, with a mop and a bucket hidden under a long black cloak. His shoes squeak as the clock ticks. On second thought, he is barefooted.)

Voice from grandfather clock: So I sez to Poil, Poil ol' gal, bz-z-z-z————

2nd voice from under the table: You goddam nitwit, whyinell didn't you return my heart finesse????

Curtain

J. A. M., '34

BELIEVE IT OR NOT

On Monday, January 16, 1933, Dr. C. P. Sousley dismissed his Section C Calculus class ten minutes before the hour was up. It really should have been fifteen minutes early, as Dr. Sousley's classes do not get out until five minutes after the hour.

Section A was also blessed on this day, as they did not have to attend.

A minister went into a library the other day and asked for "The Kentucky Cardinal." He demurred when the librarian began to look under "Religious."

"This cardinal was a bird," protested the minister.

"I'm not interested in his personal habits," said the librarian.

The most diverting sight of the cold months was a Boy Scout and a Camp Fire Girl who had grown up and married, arguing to determine which would go and build a fire in the furnace.

Wife: "You used to call me sweetheart before we were married. Now you don't call me anything."

Hubby: "That shows my self control."

TECHNOCRACY GOES FOWL

The old hen arose early one morning and began to forage for breakfast. As she passed by the open kitchen door she spied an incubator in the kitchen.

"Aha. So this is the machine age, eh. And they've made that thing to cut me out of a job. Well. I'll fix that."

So she went back to the hen house and called to the rooster.

"Hey, you. Come down off your perch, big boy; I'm tellin' you something right now. I'm the bird that supplies the eggs for that machine in the kitchen. After this, when you want to see me, you've got to bring two angle worms and a woolly worm or I won't even speak to you. Money is out. I'm a technocrat from now on."

Sweet Inquirer to hotel clerk: "How much are your rooms?"

Clerk: "Five dollars up to twelve."

Same: "How much for all night?"

Minister (at baptism): "His name, please?"

Mother: "Algernon Phillip Reginald Mortimer Duckworth."

Minister (to his assistant): "A little more water, please."

Broadmindness is the ability to smile when you learn that the ten bucks you lent your roommate is taking your girl to the prom.

—*Michigan Technic*

"Jimmy, I wish that you would learn better table manners; you are such a little pig at the table."

Deep silence on Jimmy's part, so father, in order to impress him more, added, "I say, Jimmy, do you know what a pig is?"

"Yes, sir," replied Jimmy meekly, "It's a hog's little boy."

—*Kan. State Engineer*

Office boy: "There's a salesman outside with a mustache."

Boss: "Tell him I have a mustache."

John: "Do you know anything about a television?"

Henry: "No, but I can tell a vision from the real thing."

Dr. White (disturbing Clay's slumber): "Young man, don't you have to take any notes in this class?"

Clay: "No sir, I have my father's set."

Stainless Steel

(Continued from Page 9)

quently spoken of as "stainless steels," but should not be so referred to, since the Strauss patents were issued some years after the Stainless Steel patents and these nickel alloys have no relation to the Stainless Steels except that in common with them they contain sufficient chromium to give them definite corrosion resisting properties.

It should be understood that none of the patents discussed mentions the name "Stainless Steel" in its text or claims. This is only a commercial name given to the straight chrome-iron alloys by the owner of these original patents. Having become "Stainless" conscious through extensive national and trade paper advertising of the name "Stainless Steel," the general public, and sometimes even metallurgists and other technically trained people, more or less indiscriminately refer to almost any corrosion-resisting alloy of iron as "Stainless Steel." This of course is not correct and is to be regretted.

As is always the case with patents covering extremely useful or popular articles the original Stainless Steel patents have been extensively infringed and even yet efforts to evade them are constantly cropping up. The owner has been almost continuously in the Courts protecting its rights. Some of the patents still have several years to run and it is barely possible that further extensions of some of them may be granted by Congress due to the restrictions placed upon their early commercial development during the war. Thus the complicated patent situation is liable to continue for some time.

George F. Nicholson

(Continued from Page 13)

"Use of Concrete and Reinforced Concrete in Maritime Navigation Works. Preservation of Such Works in Salt Water" to the XVth International Navigation Congress held in Genoa and Venice, Italy under the auspices of the Permanent International Association of Navigation Congresses.

He was married in 1915 to Miss Fayelle C. Fisbeck of Terre Haute, Indiana, who has since passed away. In 1930 Mr. Nicholson married Mrs. Enola Cossart of Los Angeles. Mr. Nicholson's three children are Dorothy, George, Jr., and Norman.

He is a member of the American Society of Civil Engineers and the Society of Terminal Engineers.

His hobbies are his family, golf, and outdoor sports.

Alumni

(Continued from Page 13)

'24 Alexander Sherwood is General Manager for K Q V Broadcasting Company Pittsburgh, Pa.

'28 James E. Goddard is with the U. S. Engineers' Office at Baton Rouge, La.

Research and Progress

(Continued from Page 15)

and replaced immediately with another cathode, the feature which makes this process continuous. In order to obtain the metal deposits it is not necessary to destroy the entire bath as in other processes.

In this process rare metals in the powdered state oxidize so rapidly at room temperature that extreme care must be exercised else the powdered metal will "go up in smoke."

As the cathode is removed from the liquid bath, the salty solution clinging to it temporarily protects it from oxidation. When the solution is washed away, however, the powdered metal must be preserved in an atmosphere of ether or in a vacuum. After it is pressed into bars, the rare metal does not oxidize at room temperature and can be handled freely.

To get these bars of rare metals in the molten or ductile state they are placed inside induction coils of vacuum induction bottles and subjected to high temperatures until they are suitable for drawing and working into alloys.

Now that rare metals are more readily available, their field of application in industry will be broadened considerably. Already they are used for the cathodes of certain photo-electric cells.

Uranium, for example, is light sensitive only at short wave lengths and is used in the photo-electric cells at meters which measure the strength of ultra violet radiations. Perhaps the most practical application of rare metals to date is in gaseous tubes such as those used in electric sign, radio tubes, and for some applications of interior illumination. Being radio active, uranium and thorium as electrodes cause gases to ionize at room temperatures and thereby permit lower starting voltages.

The March Rose Technic will contain an article by Mr. G. F. Nicholson—"San Pedro Harbor."

Campus Activities

(Continued from Page 16)

A. I. E. E.

The first meeting in the year of 1933 was held on January 9th with 29 students and two faculty members present. After the regular business had been attended to, a short program was presented. This consisted of two papers, one by Mr. E. J. Withers, entitled "Fuseology," and one by Mr. E. H. Schroeder, on the subject "No-fuse Circuit Breaker."

A. S. M. E.

In place of the regular business meeting the student branch went on an inspection trip through the Tribune Publishing plant on January 10th. The whole afternoon was spent watching the process of producing an evening paper, starting from the advertising room and ending at the press with the evening edition coming out folded, and ready for the newsboy. The trip included a tour of the composing rooms and finally a brief explanation of the preparation of the lead cylinders for installation on the press. All such work was done on modern machines and everything was accomplished quickly and systematically. The press installed in the basement of the Tribune Building is one of the latest types and turns out a large volume of paper per hour. Another interesting thing about the press is that it is set upon a concrete foundation which is lower than that of the building itself. This was found necessary when quicksand was discovered below the prospective site. The press can be operated by button control at any of the upright columns, thus assuring complete control of the machine at any time.

A. S. C. E.

At the January meeting a three-reel film entitled, "The Story of Rail Steel," was shown to the members. This film was sent to the local branch by the Rail Steel Bar Association of Chicago.

INDUSTRIAL PROGRESS

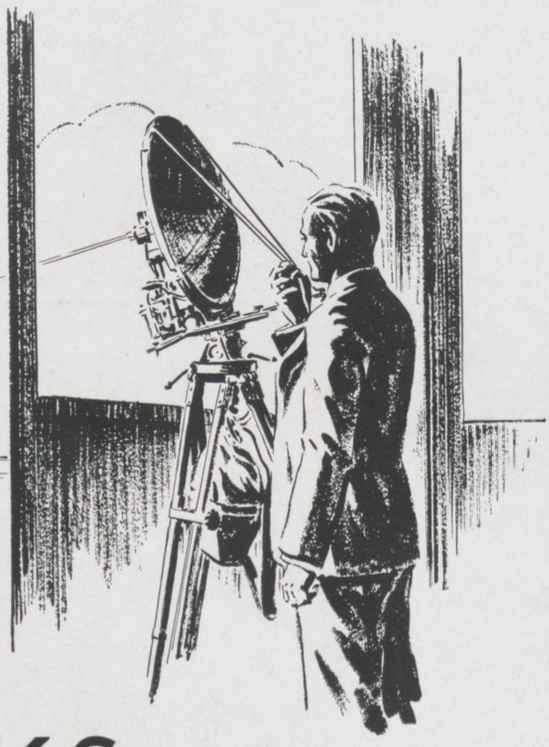
Demands Technically Trained Men for Leaders

CUT COURTESY THE ROTARIAN

Rose Polytechnic Institute

"A College of Engineering"

Terre Haute » » » Indiana



A Light Beam TALKS

FROM the flickering light of a neon tube on the skyline of New York City, a speech was sent to the *S. S. President Hoover,* 3000 feet away. The small neon tube changed the electric impulses from a microphone into light waves, which were directed to the ship in a narrow beam. A photoelectric tube in the center of a receiving mirror on the ship changed the light impulses back into sound, and the speech was heard on board.

The use of light that can be heard, and of sound that can be seen, has many applications. It can be used for speech communication; it can serve in fog to guide aircraft on their course and into port; and it can be used for radio and television broadcasting.

The development of future forms of transmission, whether in sound or light waves, will largely be the responsibility of college-trained General Electric engineers. To-day, these men are planning, producing, and testing electric equipment which will help maintain General Electric's leadership in its field.

95-926DH

GENERAL ELECTRIC