Spring 5-1927

Volume 36 - Issue 8 - May, 1927

Rose Technic Staff

Rose-Technic Institute of Technology

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Recommended Citation

Staff, Rose Technic, "Volume 36 - Issue 8 - May, 1927" (1927). Technic. 441.
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Glorifying the Nation's Press

Under the careful scrutiny of the Fine Arts Commission, the Board of Engineers, the Building Inspector, various civic organizations, the District Commissioners and Congress itself—the National Press Building is now being built in Washington, D.C., as a monument to the Press, and to serve as headquarters for the National Press and as an office building.

Congress set aside the height limitation of zoning laws by special act, so that the building could be of maximum usefulness and still conform with the symmetry of the adjacent skyline.

The financing of this undertaking has been very impressive—$6,000,000 worth of bonds were oversubscribed 300% by a mighty response from every section of the country.

The elevator installation consists of seven (7) Otis Gearless Traction Elevators with Unit Multi-Voltage Control and Car Switch operation at 450 feet per minute, six (6) of these elevators being used exclusively for passenger service and one (1) as a service elevator. There is also a small dressing room elevator and a sidewalk elevator.

OTIS ELEVATOR COMPANY

Offices in All Principal Cities of the World
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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.
The world accepts, with few exceptions, a man's own estimate of himself. What you think of yourself is transmitted through thought and action to the other fellow. Your own attitude of mind has much to do with the confidence others have in you.

Did you ever notice that the world is ever ready to help the man going up, and to kick the man going out?
Feasibility of Using the Oil-Electric Locomotives on the Pennsylvania Railroad

G. L. Mason, c., '28

With the competition of trucks, busses, and private automobiles, the railroads have many serious problems to meet. It is obvious that the most serious problem that faces the railroads of the United States is the continuously increasing cost of operation. On this account, any development that offers greater economies in operation should merit instant attention. There are several types of motive power available, but the internal combustion engine has many economic advantages. As this is true why not substitute the internal combustion engine for the steam engine?

The internal combustion engine has demonstrated its possibilities and its successful application in marine propulsion, but up to the present time its application to railway has been relatively limited.

In order to develop and realize these economies, several different corporations have undertaken the construction of a locomotive in which an oil-engine-driven generator furnishes power to railway motors, these motors being geared directly to the driving axles.

The internal combustion engine is the most efficient form of prime mover at present available. By its use the automobile and self-propelled cars have become possible. The electric drive has demonstrated that it offers the most easily controlled form of power transmission. The combination of the electric drive with the oil engine offer possibilities for far reaching development in railway transportation.

Acknowledgment

The author here wishes to offer thanks to the INGERSOLL-RAND COMPANY, THE GENERAL ELECTRIC COMPANY, Mr. H. T. bently of the C. & N. W. R. R., and Professor Wischmeyer of Rose Polytechnic Institute for the information and data that they have given me for the preparation of this article.

From actual practice the oil-electric locomotive is much more economical and cheaper than the steam locomotive. The C. & N. W. R. R. have one
oil-electric locomotive that has replaced two of four steam locomotives in the North Pier Area. This locomotive operated 24 hours a day, changing crews every 8 hours. The cost of this oil-electric is $36.23 a day while the same service with steam locomotives cost $42.42. For fuel oil the average has been $6.62 a day with an average of three cents a day for gasoline, making a total of $6.65 a day as compared with $20.47 a day for a steam locomotive. With this as a basis the oil-electric will cost $132.00 a year to operate and the steam locomotive $249.66 a year to operate; making a saving of approximately $120.00 a year. This example is not an exception; it is just one out of dozens of others just like it.

With a saving of $1200 a year in mind, The Pennsylvania System should:

1. Place the oil-electric locomotive into service on the St. Louis division within the next two years.
2. Place one oil-electric locomotive in switching service at Terre Haute, Decatur, Greenscaset, and Brazil.
3. Place the oil-electric locomotive in service on local passenger runs and put two new local passenger trains on each branch of the St. Louis division.
4. Place the locomotives, replaced by the oil-electric locomotive, in other branches of service where there is a scarcity or shortage of motive power.

The type of oil-electric locomotive tested and given the trials for this article is the type that is built jointly by The General Electric Company, American Locomotive Company, and Ingersoll-Rand Company.

The Oil Engine. The oil engine is of the vertical, six cylinder, four-cycle, single acting, variable-speed type having direct fuel oil injection. Cylinders, cylinder heads, and combustion chambers are completely water-jacketed.

Fuel oil is admitted by means of two opposed spray nozzles in each combustion chamber. To these nozzles oil is delivered under pressure by an injection pump, driven from the main shaft. No compressed air is used for fuel injection. Ignition is produced by the heat of compression only. One fuel injection pump serves all cylinders. The fuel oil distribution is obtained by a distributor timed to admit oil to the spray nozzles of each cylinder in their proper firing order.

The fuel oil for such an engine should be clean hydrocarbon oil, whose viscosity at 70° F. is not higher than 150 seconds Saybolt, and whose flash point is not lower than 150° F.

The lubricating system is entirely enclosed and of the force feed type. Lubricating oil is pumped to the moving parts of the engine by a gear driven pump in the crank case. Oil in contact with the cylinder walls is passed through a filter and returned to the crank case oil reservoir.

A closed cooling water system is used on the engine. The water is circulated by a centrifugal pump driven from the crank case. The temperature of the water in the engine jackets is regulated by a thermostatic valve, which controls the circulation of the cooling water from the engine to the radiators on the locomotive roof.

The Generator. The generator is a 600-volt, direct-current, compound-wound, commutating pole unit, separately excited. The generator, together with its exciter, is specifically designed for this service and is direct-connected to the oil engine. The combined characteristics of generator and exciter are such as to produce a machine of practically constant output. The voltage of the generator is regulated by the current demand of the traction motors, so that, making due allowance for the generator losses, the product of this current and voltage is equal to the engine power. The kw. output of the generator varies with the output of the engine, and at any position of the throttle it is constant throughout the whole working range of the power plant.

The Exciter. A 60-volt exciter is mounted on the same shaft as the main generator and serves to excite the field windings of the main generator. A 32-volt storage battery is charged by this exciter through one of the field windings in series. The exciter and storage battery circuit is controlled automatically by a switch on the main throttle of the locomotive.

The Control System. With this type of generator, the control of the locomotive becomes extremely simple. As no rheostats are used in the power circuit, the loss of power during acceleration is reduced to a minimum.

In operation, the electric control handle is set forward or backward motion, with the motors in series for speed below five miles per hour or in parallel for speeds above five miles per hour. The position of the throttle lever now determines the power delivered by the engine. The generator and motors transmit the power to the driving wheels, automatically adjusting the proportion of tractive effort and speed to the load of the locomotive, and automatically changing these proportions to suit the varying requirements of acceleration or grade.

Motors. The locomotives are equipped with motors mounted on the trucks and geared to the driving axles. These motors are of the series-wound, totally enclosed, commutating pole, split-frame type. As the axle brackets and suspension lugs are on the lower frame, the motors can easily be reached for inspection and repairs. A large hand hole, fitted with a dust-proof cover, is provided at the commutater end. Through this hole the commutater and brushes can be inspected. The armature is provided with self-aligning frictionless bearings.

Performance. Performance records have shown that the oil-electric locomotive may be operated at a fuel cost of from one-sixth to one-third that of an equivalent steam locomotive.

A 60-ton oil-electric locomotive was given a practical test in one railroad yard in the East. This locomotive was in switching service for a period of 68 days, handling three shifts per day. It received only such inspection as was possible at the time of changing crews.

From June 9th, 1924, to June 9th, 1925, the locomotive completed 2217 hours of railroad service, operating for a total of 5358 miles and averaging approximately 7 kw.-hours per gallon of fuel oil. During this period, the following average figures...
were obtained: load factor, 16.6%; power cost per locomotive hour, 34.3c; power cost per Kilowatt-hour, 1.41c.

The D. T. & I. R. R. have two locomotives in passenger service. Each car weighs 65 tons. Each locomotive has two power plants, each consisting of a 250 HP gas motor, direct connected to a 160 kw generator. These two locomotives handle a trailer which seats 78 passengers, an express car and at times a pullman. The schedule of these trains call for 37 stops in a distance of 118.4 miles in 4 hours and 45 minutes.

The operator's compartment is 13'10", mail compartment 15'1", and baggage compartment 41'6". Making a total of 60'5".

The Boston & Maine have 24 motors similar to that of the D. T. & I. R. R. and are now operating 2500 train miles daily with these cars.

Advantages Of The Oil-Electric Locomotive

The oil-electric locomotive has the acknowledged high thermal efficiency of the oil engine, which is 30%—35%.

It may be operated with a fuel cost of 1/3 to 1/6 that of an equivalent steam locomotive.

It requires very little water, and therefore eliminates costly watering stations and the trouble due to bad water conditions.

It makes possible the elimination of coaling plants, ash pits, turn tables, expensive roundhouses and hostling service—all required for steam locomotives.

It eliminates the necessity of increased expenditure for heavier shop machinery, because of its smaller mechanical parts.

Its availability for service is approximately 80%, or double that of a steam locomotive.

Its operation is practically noiseless and smokeless.

100 Ton Oil-Electric Locomotive hauling trailing load of more than 1 200 tons. Test made at meeting of Railroad Representatives at Erie works on December 1, 1925.
The Mississippi Flood Control Problem

Facts Concerning Area Drained

J. B. Smith, e.,'28

PROBABLY the most serious economic problem confronting this country to-day is the problem of controlling the flow of the Mississippi River in the time of abnormal rainfall. The task is an enormous one, not only from a financial standpoint, but from an engineering standpoint as well. Whatever the difficulties to be surmounted, the problem must ultimately be solved. The United States cannot rightfully boast of its enormous wealth or of its engineering skill, while, on an average of every two years, the mighty Mississippi overflows its banks and spreads destruction and ruin among the people who live along its course.

Surely the time for inaction has passed. Since the modern system of recording river levels was established at Cairo, Illinois, in 1858, there have been thirty floods of a serious nature, and with each, the realization that something must be done to curb the powerful stream. As yet little has been done. It is true that levees and revetements have been built in great numbers, and it is true that it is due to these improvements that the Mississippi flood situation is a problem rather than a national disaster. These levees have been built, but the annual appropriation of ten million dollars is miserably inadequate for the proper control of the Mississippi. The government engineers have done well with what they have had to work with, but they are held in check by the small appropriations.

The Mississippi River drains an area of 1,285,000 square miles, or nearly half the total surface of the United States. Emptying into this storm-sewer are 240 tributaries. Ever since August, 1926, each of these 240 tributaries has been pouring an ever increasing flood into the Mississippi owing to abnormal rains last fall. On top of this came the added torrents from the heavy spring rains and from the melting of the winter’s accumulation of snow and ice. The result has been that the capacity of the mainstream has been taxed to the limit, and the crest of the flood has either washed over, or burst through the restricting levees. Up to date, 300,000 people have been forced from their homes by the turbulent river, and have suffered enormous losses due to the destruction of property and goods. It has been estimated already that a thousand million dollars has been the loss to agriculture, and another thousand million dollars loss has been suffered in the mercantile business in the flooded area. How can the United States be content with present day efficiency and economy with such an enormous waste occurring due to inadequate control of the country’s drainage system?

As the situation now stands, Louisiana, Arkansas, Missouri, Tennessee, Mississippi, Kentucky and Illinois are receiving the full effect of the flood waters of twenty-five states. The city of New Orleans alone owes now $15,000,000 to the farmers whose land was recently flooded to save the city from the drainage of twenty five states. Such a situation as this is truly a national one. After the disastrous floods of 1913, it would seem that a progressive nation like the United States would take advantage of such a lesson and take steps to prevent such disasters in future years. However, since the war, economy has been the political keynote, and as a result, the country has suffered from too much economy. Where $200,000,000,000 was needed, only $10,000,000 was available, so the residents of the lower Mississippi valley suffer incalculable losses of property and life besides the two thousand million dollar loss to agriculture and business. On top of this, there will be a great amount of repairing and rebuilding to be done to levees when the flood finally subsides.

The chief interest of engineers turns in the direction of the ways and means of controlling the river, and there are several interesting considerations to be taken into account. Obviously there are two things which can be done, (1) prevent the flow of flood waters into the Mississippi during the periods of heavy rains, (2) control the flood water by means of dikes after it gets into the river. The latter, the control of the flood waters by means of artificial dikes or levees, is the system which has been in use in the past. The levee system, as we have it now, has in practically every flood, proved itself a failure as a permanent means of holding in check the father of waters. Studies of the peculiarities of the Mississippi have shown that this silt-bearing river keeps filling itself up, and lifting itself above the surrounding ground, so that from the river the land slopes away, falling about six feet for the first mile. If this channel is restricted between levees, no matter how high, eventually the river top them. The earth levees, as they are built, have been shown to have an insufficient factor of safety, the government having been content to build levees on the basis of average high water figures rather than on maximum values.

The other consideration is of great importance—the prevention of the flow of the flood waters of the tributaries into the Mississippi. This could be accomplished by means of huge reservoirs of such a size that they would be able to accommodate a large proportion of the flood water that would ordinarily go rushing down towards the gulf. This stored water would be available, in time of little rainfall, for increasing the volume of the river to the benefit of river transportation and for irrigation as well as for the generation of electric power. Large areas of river bottoms would necessarily have to be abandoned, but it is probable (Continued on page 28)
Does Business Want the College Man

Ray R. Davis E. E. '27.

The question which arises in the minds of college students, particularly those who are nearing the completion of their college careers, is the all-important one of "what to do when I get out." To the engineering students, the possibilities may be limited to three major fields:—business, production and transportation. The purpose of this article is to discuss the attitude of the business world toward the college man and vice versa.

The opportunities in business for the man with a college training are exceptional and numerous; that is, they would be if it were not for the fact that such a great number of business men are prejudiced against the college man.

It seems that the business world's opinion of the college man is a direct result of the attitude of the graduate toward business. Generally, the man who has just completed four years of study in the "intellectual realm" and who has just been presented with the "old sheepskin" has the idea that he knows just about all there is to be known and that he is in a position to command almost anything he likes. In reality, the young "grad" knows practically nothing,—his mind has just received a high degree of training and he needs plenty of that old practical teacher-experience. Furthermore, the graduate, passing out of the easy and carefree college life, is not accustomed to the hard knocks of life. He may think that he is well able to care for himself, that he is able to cast off all ties of dependence, acquired throughout his college life, and be a successful man of the world. He wants many things which tend toward making life pleasant—a car, or his favorite hobby. Not infrequently he wants to get married as soon after graduation as possible and often he has debts incurred in school to be paid off. For these reasons, as well as a spirited ambition, the college graduate is almost unwilling to take a job with a nominal salary and is always pressing his employer for advancement.

As I stated before, the business man's opinion of the college man is a direct result of the college man's attitude toward the business world. The successful business man, having attained his success and position through years of hard work is unwont to take a man into his organization who does not perform his duties faithfully and await patiently his reward in the form of increased salary and advancement. Actually, he has no use for the man who is continuously nagging for a "raise" and pressing him for advancement. He resents these actions, considers them as insinuations that he is unable to determine whether or not a man deserves a "raise" and advancement. Therefore, I say, the average business man does not want the college graduate. In fact, it is known that a group of big business men in choosing a man for a junior executive position were heard to voice the opinion that they would take anything but a college man.

On April 15, after several weeks of rather hurried preparation, the Rose debating team consisting of Fred Andrews, Ray Harris, Herman Moench, Carl Ploch, Morris Shattuck, and Abe Silverstein, accompanied by Professor Carl Wischmeyer, made the trip over to Indianapolis for the debate before the section meeting of the American Society of Mechanical Engineers on the proposition "Resolved, that the Boulder Dam Project should be developed and operated by the United States Government."

The debate was held following the banquet at the cafeteria of the Chamber of Commerce Building at 6:15 P. M. before an audience of about fifty people, Purdue taking the affirmative side of the question and Rose taking the negative, with Morris Shattuck, Herman Moench, and Raymond Harris speaking in the order named. The constructive speeches were seven minutes long and the rebuttal ten minutes, Shattuck taking the rebuttal for Rose. The method of approach of the two teams was quite different and there was no direct means of scoring, but Professor Claude Siffritt of the Public Speaking Department of Butler, who acted as judge, pointed out very fairly, in a short resume of the debate following the affirmative rebuttal, the superiority of the Purdue team as a whole and therefore awarded the decision to that team. Professor Scott of Purdue, who coached the Purdue team, and is head of the Department of Public Speaking at Purdue, made a plea, in a short talk following the debate, for more stress on training in public speaking in the modern engineering col-

(Continued on page 27)
Mining Chilean Nitrate by New Methods

The chief method employed thus far in mining Chilean nitrate has consisted of hand labor. Fortunately for the farmers who use fertilizer, and for Chile who draws such a large part of her annual revenue from the exploitation of the nitrate fields, a new system of mining, the so-called "caliche" has been devised by American experts in combination with improved processes for the subsequent extraction of the nitrate at the mill.

We are authoritatively informed that by the hand methods widely prevailing in mining "caliche," anywhere from 15 to 25 percent of the nitrate-bearing materials is left in the ground, and from the remainder that reaches the plant for treatment, an average of not more than 65 percent is recovered for marketing. Furthermore, so it is said, "caliche" containing less than 15 percent of nitrate cannot be mined by hand and made to yield a profit.

With the new mining methods and the new process of treating the "caliche," it is now commercially practicable to work deposits containing as low as 6 percent of nitrate and to extract 90 percent of the nitrate in the raw material. These technical developments promise to effect revolutionary changes in the Chilean nitrate industry and, at the same time, to make it possible for the industry to compete effectually with the nitrates manufactured by the advanced processes used in the fixation of nitrogen from the atmosphere.

Japan Exploits Her Shale Oil Deposits

After protracted and satisfactory laboratory work conducted at the Fushun Collieries, Fushun, Japan, the first fire was built in the latter part of 1926 under an experimental shale-oil distilling furnace at that plant. This furnace is 3 ft. in diameter and 50 ft. high, and has a capacity of 40 tons. It is of the internal heating type, and is so designed that the gas will be returned to the furnace for reuse. An appropriation of about $2,000,000 was made for this initial undertaking.

If the 40-ton furnace comes up to expectations—that is, if it yields an oil equal in quality to that produced by the original 10-ton test furnace, the plan is to build 47 additional 40-ton furnaces at an expenditure of from $2,000,000 to $2,500,000. Present indications are that the work of construction will begin.

It was found at the Tokutama fuel depot that by mixing one part of the shale oil produced at the Fushun Collieries with two parts of crude Borneo oil, that a product was obtained that would entirely be satisfactory for marine purposes. Besides shale oil, of which an annual output of 25,000 tons is expected when the plant is completed, by-products such as crude paraffin, sulphate of ammonia, and coal tar will be obtained. The shale from which the oil is extracted is found in great quantities at the Fushun Collieries; and because it lies between the coal seam and the overburden, it can be mined at a low cost. It is said that the successful exploitation of these deposits will make Japan far less dependent than she now is on outside sources of heavy oil.

Curative Powers of Artificial Light

The carbon arc lamp gives light nearest approaching sunlight, according to the determinations of the Bureau of Standards. The curative effects of sunlight have been fairly well established in the recent past by direct experimentation with various animals, including human beings; and consequently, widespread efforts are being exerted to...
utilize this beneficial effect. Due to the times that sunlight is not available, it is desirable to find a substitute which can act in its absence; accordingly, research was conducted by the Bureau looking to the discovery of a source of ultra-violet light that has most nearly the same spectral energy distribution as has the sun.

It was found that the light of the carbon arc comes nearest being like sunlight. Some types of carbon electrodes give a much closer approach to the solar spectra than others. It was also found that the spectral quality of the energy radiated depends largely upon the size of the carbon and on the current used.

A gas-filled tungsten lamp, so research has revealed, is low in ultra-violet radiation, and most of this is absorbed by the clear glass globe. The quartz mercury lamp shows 6 percent of wave lengths shorter than 290 millimicrons. These short wave lengths have a high germicidal action and are absent in ordinary sunlight. The conclusion drawn from this study was that the high-intensity arc, using 90 to 125 amperes, will be used in therapeutic treatments. It was declared, however, that by employing the right kind of metal-cored carbon electrodes at the right working distances the same relative proportions of ultra-violet and total radiation can be obtained from a 20-ampere arc as from a high-power installation. All requirements of light therapy can be met in this way.

Introducing X-Ray Into Industry

To-day the microscope is a common tool in both research and control laboratories. In many organizations micrographic record of representative samples are routine practice. Now other pioneers are introducing industry to X-rays. In one research program now being followed it has been decided to make an X-ray pattern of every specimen which a micrographic record is taken. These may disclose nothing valuable or they may unlock the door to invaluable information. It may not be an idle dream to think of the time when an X-ray pattern will be as common as is the micrograph to-day; that is, where technical control prevails.

Where they can be used, X-rays furnish industry a powerful tool. X-ray equipment should not be installed until the adaptability of X-rays to the problem in hand has been demonstrated, and not unless the benefits derived justify the costs. This would seem to make the tool unavailable to the organization with a small problem or a temporary difficulty. Fortunately, however, it is possible to evaluate any proposed use of X-rays without too great expense.

Electric Apparatus for Remote Measuring of Gas Pressure

The working of this device depends on the so-called "Aegir" principle, which avoids completely the use of mechanically moved parts in the trans-

mission. The fundamental idea of the procedure is as follows: Water or an alkaline solution is a conductor of electricity. When a bar or rod-shaped resistance connected to a source of current is inserted in water forming the return to the source of current, the intensity of the current flowing through the resistance will vary according to the depth to which the resistance is immersed. The latter is so dimensioned as to give readings directly of the height of the water level on a suitable indicating instrument.

In this apparatus, for remote measure of gas pressure, the latter is made to bear upon a column of water much in the same way as in a liquid pressure gage. This water gage consists of a resistance material which is indifferent to chemical and mechanical influences. Changes in the conductivity of the water or influences due to the connection between the water and the measuring instrument practically do not affect the results, even if the distance is fairly large. As regards the electrolyte employed, it is important that solutions of exactly the same composition should always be used in refilling; otherwise the resistance will change and the measuring instrument will record different readings. Ordinary alternating current is used as taken from any light or power supply system; it is an important feature that the fluctuations of the voltage in the primary circuit are not transmitted to the measuring instrument by the transformer used. The power consumption of the apparatus is exceedingly small. One wire connection and a good earth return between transmitter and receiver are necessary. The piping of the gas supply will serve as an earth return.

A New Appliance for Dewatering Jobs

The Ingersoll-Rand Company of New York has announced a new portable air compressor and water pump outfit. It consists of a gasoline-engine-driven compressor and an air-driven pump. It is particularly designed for dewatering jobs, but can be used for the elevation of water, for removing the overnight accumulations in ditches and excavations, for cement gun service, for furnishing water to concrete mixers, and similar jobs. The new outfit, it is stated, fills a long-standing demand for a truly portable pump. The pump is positive in action, requires no priming, and will handle very muddy water. It can also be regulated to any desired capacity within its maximum, by adjusting the amount of air admitted.

Although a compressor is usually available (since it is needed on most jobs), the advantage of having an air-driven pump mounted on the compressor is at once apparent, as this arrangement eliminates the gas or oil engine formerly necessary to drive the pump. A Type Twenty Gasoline-Engine-Compressor is used with a Cameron Air-Driven Pump.
of the many Rose men graduated and now in the engineering world, quite a few have affiliated themselves with the General Electric Company. They have been, as a general rule, very successful in their connections with this large concern. At a recent luncheon meeting of the Rose Alumni Chapter at Schenectady, New York, the accompanying picture was taken. Although there are forty-five graduates of Rose Poly employed in the General Electric Company's Schenectady works, only eleven were able to attend this particular affair. It is very interesting to read of the activity of these Rose men in their chosen work. Following is a brief account of those in the picture:

First Row:

C. W. Ellis, '26, a Student Engineer in the Testing Department of General Electric Schenectady works.

G. H. Pfeif, '05, (B. S.) (E. E.), was a Student Engineer, "On Test" 1905-1906; in the General Supt.'s office, 1909-10; in the office of Vice President and President of G-E in 1910-22 and is now the Director of Industrial Relations, with headquarters at Schenectady.

J. T. Stone, '24, (B. S.), was first employed as a Student Engineer in the Testing Department and in October, 1925 was transferred to the D. C. Engineering Department where he remained a year then was again transferred to the Industrial Engineering Department. He is enrolled in what is know as the Departmental Plan which requires practical work in various departments of the engineering and commercial offices before the student is sent out to district offices.

C. W. Falls '18, (B. S.), entered the Testing Department in 1918, remained until 1920 and was transferred to the Induction Motor Engineering Department. He is enrolled in what is know as the Departmental Plan which requires practical work in various departments of the engineering and commercial offices before the student is sent out to district offices.

D. R. Warner, '26, (B. S.), is a Student Engineer in the Testing Department.

Second Row

P. F. Stokes '10, was first employed by the National Lamp Works which position he held until 1921. From 1921 to '23 he was Manager of the Shelby Metal Products Company. In 1924 he returned to the employ of the General Electric Company in the Vacuum Tube Department which position he holds at the present time.

H. E. Witty, '26 (B. S.) is a Student Engineer in the Testing Department.

C. B. Wilson, '22 (B. S.) who was "On Test" 1922-23, is now an engineer in the A. C. Department of the G-E Schenectady Works.

W. H. Waltman '24 (B. S.) was on test in 1924-25. Radio Commercial Department 1925-26. Industrial Control Engineering 1926-27. He was just recently transferred to the Industrial Department.

G. B. Henry, '18, (B. S.) graduated as a chemist. He enlisted in U. S. Army in 1918. 1920-21 Illinois Steel Company. 1921-23, University of Wisconsin, with the degree of "E.E." He was employed by the G. E. Company in 1923 and at present is in the Industrial Control Sales Department.

E. F. Rickelman '25, (B. S.), who entered the employ of the General Electric Company as a Student Engineer has finished recently a course in Sales Training and is now employed in the Industrial Department.

Those members of the group who do not appear in the photograph are as follows:

A. H. Moore, '88, entered the Testing Department after graduation and at present is chairman of the Standardization Committee of the General Electric Company.

E. G. Waters, '88, who after graduation was employed by the Thomson-Houston Company as a salesman in the Washington, D. C. office, 1890-92, later manager of that Company's Pittsburg office, 1892-96, then Assistant to the Vice-President of the General Electric Company, New York City, 1896-1903, Manager of the Commercial Department of the British Thomson-Houston Company, Rugby, England, 1903-'06, is now Secretary of the Sales Committee of G-E with headquarters at Schenectady.

E. E. Gilbert, '89 entered Testing Department after graduation and is now Manager of the Turbine Sales Department, G. E. Company, Schenectady.

W. J. Davis, Jr., '92, (B. S. M. S.) (a brief account of activities are listed as follows:)

June 18-1892—employed in G. E. Testing Department, Lynn, Mass.
Feb. 20, 1893—D. C. Design Engineering Dept., Lynn Works
Feb. 6, 1899—Railway Engineering Dept., Schenectady.
August 1, 1908—Pacific Coast Engineer, San Francisco.
February 1, 1921—Railway Engineering Department, Schenectady, to date, 1927.

H. E. McDermott, '93 entered Testing Department after graduation and is at present located in the Calculating Department of the Schenectady works.

S. E. Johannesen, '93, (B. S. in C. E. '93, M. S. '95 E. E. '98, entered the Transformer Engineering Department, as Section Engineer, Distribution Transformer Department, 1906. From 1893 to 1894 he was employed in the Testing Department of the Wagner Electric Manufacturing Company, St. Louis, Mo. From '94 to '02, he was executive engineer in the Transformer Department of the same Company. From 1902 to 1906 he was Section Head, Air-Blast and Railway Transformers of the Westinghouse Electric and Manufacturing Company, Pittsburgh, Pa. From 1906 to 1922, he was Section Head of the Distribution Transformer Department of the General Electric Company, Pittsfield, Mass. From 1922 to 1927 he has been Section Head, Developments, Distribution Department, General Electric Company, Pittsfield, Mass.

E. P. Edwards, '99 (B. S.) entered the Testing Department of General Electric, November 1899. For some time Mr. Edwards was assistant manager of the Central Station Department but several years ago accepted the position as Manager of the Radio Department located at the Schenectady Works.

W. O. Henagen, '06, Radio Engineer, has been employed in the G. E. since 1918. During 1911-12 he was a member of the Telefunic Telephone Company, New York City. During several years following he was regularly enlisted in the Radio Service, U. S. Navy.

R. S. Sage, '07, was employed in the Testing Department 1907. 1909 to 1913 D. C. Design Engineering Department, 1913 he was transferred to the Industrial Engineering Department which position he holds at present.

O. G. Whitecotton, '07, was employed in the Testing Department 1907 to 1909; Switchboard Department 1909-10; Supervisory of Cost Department, 1910-11; Assistant Electrical Superintendent, Adirondack Power and Light Corporation, 1911-21; and from that time to present he has been Electrical Superintendent of the Adirondack
Power and Light Corporation, Schenectady District.

H. J. Madison, '10 entered test after graduation and is now employed in the Turbine Sales Department, Schenectady Works.

H. C. Uhl, '12, entered the Testing Department, 1912'13, from there he was transferred to the Induction Motor Engineering Department and in 1923 was again transferred to the Industrial Engineering Department. He is at present Assistant Engineer at the Atlanta office.

J. Scott Elliot, '13, E. E., whose first job after graduation was as a Student Engineer in the Testing Department of the General Electric Company, Schenectady, is now Manager of the Huron Gravel Company and may be reached at 812 Lake Court, Ann Arbor, Michigan.

G. W. Evans, '16 is with the Western Electric Company Schenectady (G. E. Works)

J. A. Wildermuth, '18 entered the Testing Department after graduation. He was later transferred to the A. C. Engineering Department and at present is employed in the Sales Department of the Burrel Manufacturing Company, Little Falls, N. Y.

I. R. Weir, '21, entered the Testing Department in 1921 was later employed in outside construction radio work and is now an engineer in the Radio Department.

O. E. Conover, '22, was employed in the Testing Department until 1923 when he went into the Direct Current Engineering Department, where he remained until February 1, 1925 when he became a member of the Central Station Commercial Department. Since September 1, 1925 he has been Treasurer and Manager of Modern Housekeeping Shop, Inc., Dealers in Electrical Appliances, Broadway and Smith Streets, Schenectady, N. Y.

R. B. Benett, '23, is employed in the D. C. Engineering Department, engaged in design and operation of such electrical equipment.

J. E. Albright, '23, was employed in the Testing Department June, 1924. He is now engaged in radio engineering.

O. H. Dunning, '25, is engaged in the Radio Engineering Department. He entered the Testing Department in 1925.

N. Whitecotton, '25, is also engaged in the Radio Department, in the commercial section. He is a former "Test Man".

M. Sato, '25, is a former "Test Man", and is now engaged in the Engineering Test Department at the General Electric, Erie, Pa. Works.

H. L. Willson, '26, is a Student Engineer engaged in the Testing Department, Schenectady Works.

H. E. Lewis, '26, is also engaged as a student engineer, and is at present located in the General Electric Erie Works, Erie, Pa.

G. W. Ashley, '26, another student engineer is engaged in the Testing Department of the Schenectady Works.

Alumni Notes

'92
Mr. Edson F. Folsom, who is a Life Insurance Counselor, has moved from Lakeland, Florida, to Tampa where he may he addressed at 919 First National Bank Building. Mr. Folsom received his M. M. E. degree from Cornell in '93.

'96
Orange E. McMeans, of McMeans and Tripp, Consulting Engineers and Architects, Indianapolis, is President of the Indianapolis Section of the Indiana Engineering Society. Mr. McMeans received his M. S. degree in '00 and his M. E. degree in '01.

'00
William H. Insley is President and General Manager of the Insley Manufacturing Company, at Indianapolis. Mr. Insley received his M. S. degree in '02, and his C. E. degree in '01.

'04
Walter S. MacNabb, Superintendent of Blast Furnaces, Indiana Iron and Steel Company, located at Asansol, India, is enroute home to Terre Haute for a short visit in this country. An interesting note concerning Mr. MacNabb is that he is responsible for the present Senior Shoot-up custom. In '04 at the close of his class, Mr. MacNabb lighted a five-inch cannon cracker—and—we now have the senior shoot-up.

'05
Lewis A. Snider, M. S. '06, M. E. '12, formerly of Snider and Rotz, Consulting Engineers, Indianapolis, has gone to Chicago where he has established the L. A. Snider Engineering Service Inc. The concern is described as a "technical advisory and informative service pertaining to all branches of mechanical, and sanitary engineering.

'06
K. D. White, who is Vice-President of the Walder Electric & Plumbing Company of Columbus, Georgia, paid a visit to the Institute on April 6.

'12
Mr. Harry C. Uhl, who is connected with the Industrial Engineering Department of the General Electric Company, of Schenectady, New York, has been transferred to Atlanta, Georgia. He has been promoted to Assistant District Engineer of this territory.

'13
E. Joseph O'Connell, Sales Engineer with the American Radiator Company, has been transferred from Kansas City to Los Angeles.
To the man who isn’t satisfied with first place

The man who wins a race can’t afford to get complacent over it. His next step is to improve on his own running time.

The electrical communication industry in America ranks first in the world, with exceptional facilities for research and constructive work.

But the men in this industry are never satisfied to let it go at that. No process, no matter how satisfactory, by whom devised or how well bulwarked by age, is here immune from challenge.

This dynamic state of mind must appeal mightily to men who are pioneers at heart.

Western Electric Company
Makers of the Nation’s Telephones

Number 68 of a Series
Poor Weather Hinders Spring Activities

Possibly the baseball and track teams did not have the success that was outlined for them at the start of the year, or was predicted for them when letter men and material were weighed, but in spite of several handicaps, the two squads have made themselves noticeable at times with their good work. The track squad, of course, came up to expectations in the largest sense and enjoyed some limited success. Loss of two of the most reliable point-getters put the squad in a big hole at the start of the year and cut down materially the number of points gathered. Then to make matters worse at a crucial moment another athlete was laid low and put on the shelf for the rest of the year.

The baseball team met with severe weather reverses at the start of the year and assumed a great handicap on the score. Then came along the realization that we needed our baseball diamond at once, for the fellows had to be carted to various other fields to get in their few hours of work. When we could use the lot in front of the school there was little to resemble a baseball diamond, for the rolling land and the new road to the National Trail cut out many opportunities for improvement of skill.

Both squads were composed of under-classmen mainly, for there were very few seniors on either ensemble. Thus, it is almost safe in saying that the fellows should be well on the way toward a finished team at some time of their career, hoping that it will be the following year. Men who are just becoming acquainted with principles of engineering have formed the greater part of the teams and they should go over in big style later on.

To give complete records of the results of the Spring sports would require almost unlimited space, and with that being simply impossible, we must apologize giving the results in a summary such as follows:

**Baseball.**
- Illinois Central, 4; Rose, 3.
- DePauw, 6; Rose, 0.
- Wabash, 7; Rose, 6.
- Wabash, 9; Rose, 4.

**Track:**
- Triangular Meet—Butler, 75 1/2; Rose, 52 1/2.
- Oakland City, 7.
- Triangular Meet—Rose, 64 1/2; Indiana Central, 38; N. A. G. U., 32 1/2.
- Dual Meet—DePauw, 101; Rose, 25.
- Hoosier Relays—Earlham, 54 1/2; Muncie Normal, 51; Rose, 30 1/2; Central Normal, 16 1/2; Hanover, 12; Franklin, 5 1/2; Manchester, 5; N. A. G. U., 2.
- Little State Meet—Won by DePauw; Rose, 2 1/2.

Four New Records Set This Year

In spite of the bad weather that featured many of our track meets this year there were several records that fell to the wayside when our erstwhile track and field men got in some of their best marks. All told there were four old marks cracked, while two were equalled. The events in which new marks were made are as follows:

- 880-yard relay—New record, 1.33:3 minutes. Made by Wade Dean, Dunning and Hill at Hoosier Relays, May 7, 1927.
- 440-yard relay—Record, 44.4 seconds. Made by Reinking, Wade, McNault and Dunning at Hoosier Relays, May 1, 1926 and tied by Dunning, Reinking, Dean and Hill at Hoosier Relays, May 7, 1927.
- High jump—New record, 5 feet, 10 inches. Made by White, 29, at Indiana College, May 14.
- Two-mile run—New record, 10:47:1 minutes. Made by Fitch, 30, at Indianapolis, April 23.
- 440-yard dash—Record, 52.2 seconds. Tied by Muntee, 28, at Indianapolis, April 23.

Noteworthy Seniors Leave This Year

This year, as many other, found several seniors of true note due to leave our midst to take up their work in engineering in the various phases of that great type of work for which they have prepared themselves. Of course, they will be like numerous predecessors in that in a few years they will be more or less strangers to us or our incoming students so, we will take this opportunity to pay them a last tribute for the things they have accomplished for the benefit of the institution. Possibly they have done acts of note in other fields, such as fraternity or campus clubs, but we intend to honor their athletic merits only, since this is the sports section.

There are a few of the departing class who have won many-fold the number of awards that others have, and whose work is far more imposing when reviewed individually. But—no matter how many letters or awards a man earns, his work is not in the least any better than that of a single award man, when actual value to the school is concerned. It only signifies that his athletic prowess is greater and that he was capable of commanding more respect from the mentors and supervisors. The man who earns a lone letter, or the one who gains his award via the managerial route, has just as much school spirit, which is in the end, the only thing that counts and makes good and successful teams.

Thus, we pay tribute to each man who is leaving us with the distinction of having worked or played enough to be entitled to wear an "R," the official insignia of our school.

(Continued on page 22)
HOW MANY OF THESE QUESTIONS
CAN YOU ANSWER CORRECTLY?

The following questions pertaining to explosives or to industries in which explosives are used should afford some pleasure and instruction for those who follow the popular indoor sport of "Ask Me Another".

The answers* to these questions are published in the May, 1927 issue of The Explosives Engineer magazine.

Write us today for a free sample copy of The Explosives Engineer, and when it arrives see how many of your answers check with the ones given by the Editors.

| QUESTIONS | 1. (a) Who discovered nitroglycerin.  
(b) Who invented nitroglycerin dynamite? |
<table>
<thead>
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<tr>
<td>2. What blasting supplies should never be transported or stored with explosives?</td>
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<tr>
<td>3. What high explosive is a liquid?</td>
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| 4. (a) Who was the first director of the United States Bureau of Mines?  
(b) Who is the present director? |
| 5. What are the three ingredients of blasting powder? |
| 6. Does safety fuse burn slower, at the normal rate, or faster when tightly tamped in a bore hole? |
| 7. What electrical instrument is used for testing electric blasting caps and blasting circuits? |
| 8. Name two of the three methods of blasting boulders. Name first the method that requires the least amount of explosive and the one which requires the most explosive, last. |
| 9. What is the velocity of detonation of Cordeau-Bickford? |
| 10. When, where and by whom was coal discovered in America? |
| 11. What is the best connection for electric blasting caps when fired by a power circuit when ample current and voltage are available? |
| 12. What type of explosive is the most water-resistant? |
| 13. What is generally considered the best explosive ingredient for use in detonators? |
| 14. How many pounds of black blasting powder in a standard keg? |
| 15. Give the four conditions prescribed by the United States Bureau of Mines requisite for a Permissible explosive. |
| 16. Name three types of high explosives commonly used for industrial purposes. |
| 17. What magazine publishes a monthly digest of articles relating to drilling or blasting that have appeared in the technical press of the world? |
| 18. What are the standard granulations in which black blasting powder can be obtained? |
| 19. Name the secretaries of the following associations:  
(a) American Mining Congress.  
(b) American Institute of Mining and Metallurgical Engineers.  
(c) American Zinc Institute.  
(d) National Crushed Stone Association.  
(e) Associated General Contractors.  
(f) National Slate Association. |
| 20. What great railroad tunnel has recently been holed through? |
| 21. How should safety fuse be cut for insertion in a blasting cap? |
| 22. Of what material should a tamping stick be made? |
| 23. How should empty dynamite cases be disposed of? |
| 24. What state consumes more explosives than any other state in the United States? |
| 25. What explosive is referred to as "The New Aladdin's Lamp"? |

*Through the courtesy of the answers are also printed on page of this magazine.
Alumni Notee

(Continued from page 12)

The Alumni Editor is in receipt of a letter from K. E. Harmas, which suggests that Leroy Wilson, who is District Traffic Superintendent of the Indiana Bell Telephone Company, at Fort Wayne, explain just how he "got that way". Mr. Wilson has experienced marked success since his graduation. He is also honored as having been selected to be the General Secretary of the Theta Kappa Nu Fraternity.

Nouss, ex '22, is with the Southwestern Bell Telephone Company, at St. Louis, Missouri.

Buford W. Tyler Jr., who is with the Pennsylvania Railroad, has been moved from Bordentown, New Jersey, to Le Moyne, Pennsylvania, where he is Assistant Supervisor.

Samuel S. Forsythe, who was formerly with the Municipal Engineering Department at Lakeland, Florida, is now located in Galveston, Texas Mr. Forsythe is in the Valuation Department of the Santa Fe Railroad.

F. Ray Martin, who is with the Joseph E. Wilson Construction Company of Paducah, Kentucky, was among the recent visitors to the school.

Harold B. Hood, formerly a Junior Patent Examiner at Washington, D. C. is to go shorty to Cleveland to take a new job, the nature of which we are not cognizant.

During the past month Dan Cupid has been working overtime, with the result that his flying darts have found many marks in the Alumni of the more recent classes.

W. Roscoe McIntosh, who is the Assistant City Engineer for the City of Louisville, was united in the bonds of matrimony with Miss Helen T. Cromwell of Terre Haute.

Fred L. Bradford, now with the Dougherty Company, at Knoxville, Tennessee, and Miss Anna Jeanette Biel, of Terre Haute, were recently married. Harry L. Willson, '26, was the best man.

Frederick Matteson, formerly a draftsman with the Oil Refineries Company, of Robinson, Illinois, is now in Terre Haute working for his father. The firm is now F. L. Matteson and Son.

Michio Sato, Student Engineer with the General Electric Company, has been transferred from Schenectady to Erie, Pennsylvania.

Announcement has been made of the wedding of Peter Burt and Miss Esther Annakin. Mr. Burt holds a position as Instrument Man with the Louis ville Hydro-Electric Company, at Louisville.

Bruce Walsh, recipient of the Hemingway Medal, is with Westinghouse. He has finished his student course, and is in the General Engineering Department at Wilkinsburg, Pennsylvania.

The Junior Prom

O n the night of April 21, the junior class of Rose Polytechnic Institute entertained the Senior class with the annual Junior Prom.

The affair was held in the gymnasium of the school which was beautifully decorated in an Egyptian motif by Mr. Fread, a local decorator. Two spotlights playing on crystal balls provided weird lighting effects for several dances.

Music for the dance was furnished by Jean Goldkette's Victor Recording Orchestra of Detroit. This orchestra is claimed by many to be the best dance orchestra in the country. It is much in demand throughout the country for college dances and the junior class is to be congratulated in securing their services for the Prom.

At the front of the building the various fraternities had their rooms. These rooms, decorated in the various fraternity colors, were very pretty and during the intermissions were generally filled with the fellows and their girls.

Punch was served throughout the evening at punchbowls located along the long runway. The runway, connecting the front and rear of the building, was decorated in the school colors, rose and white.

Chaperons for the evening were the various members of the faculty and their wives.

The dance ended at 2 A. M. and everyone went away declaring that they would never miss another Prom.
Get work that you can respect, where they respect you.

Technical Industry welcomes the men from professional schools; believes in the value of their training; expects much of them, but no more than they must expect of themselves.

Some day you will come back—with every reason to be proud of yourself, we hope.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

Sales engineering is broadening work, well rewarded. As an expert in your own line you come into intimate touch with the technical problems in many other lines. Applications are invited from men ambitious to employ their professional training in the industrial sales field.
FRATERNITIES

ALPHA TAU OMEGA

AFTER a very strenuous "hell week," formal initiation was held Sunday, April 10. Indiana Gamma Gamma is pleased to announce the formal initiation of Pledge Brothers Allen, Brosman, Ehrenhardt, Garmong, Kessler, and Rockwood into Alpha Tau Omega.

Sunday night, following the initiation, the chapter house was the scene of much merrymaking and hilarity, for A. T. O. was holding another "open house." Rugs were rolled up, furniture moved back, and the Taus and their girls monkey-hopped to their hearts content. Open house has become a monthly feature of the chapter, and is looked forward to by every member.

Track season finds Brothers White, Allen, Rockwood, and Pledge Brothers Fitch and Zimmerman doing their bit to help make the well-balanced track team that Rose has this year. White is going strong in the field events, and he may be counted on to be a first class high jumper.

Bros. Crutcher and Reed are very much occupied by their positions as manager and assistant manager of baseball. Due to an extremely wet season they have had their hands full teaching the squad how to wade through mud successfully. Bro. Alexander is also on the baseball squad.

The chapter's activities are not confined to athletics alone. Bro. Hubert Carmack was one of the Juniors to be elected to the honorary society, E, an honor of which he may be justly proud. Carl Ploch was one of those on the team who journeyed to Indianapolis to oppose Purdue in a debate. After much planning and preparation, the annual Junior Prom was held April 21. The general committee in charge of the Prom was headed by Arthur Drompp, who worked hard and faithfully to see that all plans were executed properly. Brother Keiser was chairman of the music committee, while Bob Alexander was chairman of the favor committee.

Dan Cupid has been very busy among the ranks of the alumni of Gamma Gamma. Bro. Frank Swearingen and Miss Edna Tuemler were married March 26. Next in order was the marriage of W. Roscoe McIntosh to Miss Helen Cromwell. Fred Bradford and Miss Anna Jeanette Biel were married April 19. The active chapter extend its best wishes to these happy couples.

Among the recent visitors at the house were Brothers Harry Wilson of Erie, Pa., and Clarence "Swede" Anderson, who is situated a Oak Park, Ill.

SIGMA NU

BETA Upsilon of Sigma Nu announces the initiation of four pledges. The recipients of this honor were James Brevoort, Vincennes, Milo Dean, Brazil, and Edgar O. White and John Gibbons of Terre Haute. The formal initiatory service was held on Sunday, April 17.

The entire chapter is anticipating the annual Farewell dance which is given every year to the graduating seniors. The date set for this year is the night of the closing of final examinations. Needless to say, spirit should run exceptionally high on such a night as this, and fortunate it is that this is the case; for this affair is to furnish the impetus which sends our worthy seniors out into the world in search of success. And from all indications they will receive a notable send-off, as Baxter's Liberty Boys are to furnish "those chords like nobody can".

The Faculty-Dad's Smoker which was held on the night of May 13, was acclaimed by everyone as being highly successful. The guests wandered into the chapter house at about eight o'clock and as soon as the dads showed up, the session was begun. The evening was spent in consuming huge Havanacs, talking over old times, and generally getting acquainted. Ten o'clock saw the refreshments coming in, which consisted of the famous hot-dog, which always makes its appearance at such affairs. Along with coffee and much conviviality the dogs were much enjoyed. At the alarmingly late hour of eleven the crowd dispersed, and plans were immediately under way for a bigger and even more successful affair of this kind to be held next year.

Among other events in which high interest was manifested socially, was the spring weiner roast given by the chapter on Friday evening, May 20. The affair this year was held on Dr. Spurgeon's summer cottage site which is southeast of Terre Haute. Dr. Spurgeon, the chapter adviser, proved an excellent host and chaperon. With the dying away of the campfire, and the air fragrant with the odor of toasted marshmallows; as the mighty Sigma Nu cowboy song was poured forth into the ether, the entire chapter swore enthusiastically that this roast was by far the most successful in years. The camp was declared an ideal spot, and as Dr. Spurgeon has extended a standing invitation to Beta Upsilon, the problem of choosing a suitable site is forever answered.

On inquiring among the brothers for their summer vacation plans, there is revealed many colorful, varied and ambitious plans; but keeping in mind that plans do not always materialize, the summer activities of the chapter will furnish an interesting story in the fall.

(Continued on page 20)
"STEEL"  
Another Presentation on GRINDING  
by  
NORTON COMPANY  
WORCESTER, MASS

Snagging. Amid a great pyrotechnic display, superfluous steel is removed from castings with marvelous speed by means of grinding wheels and various types of grinding machines.

The rolling mill transforms steel ingots into billets, fashions steel rails, armor plates and structural steel—and here is the starting point for the thousands of labor and time-saving machines and the great engines of commerce.

The ponderous steel mill rolls, some 40 inches by 15 feet or larger and weighing around 35 tons, are finished to mechanical perfection on giant NORTON GRINDING MACHINES over 50 tons in weight.

NORTON  
Grinding Wheels  
Grinding Machines  
Refractories—Floor and Stair Tiles
and a master controller, which connects the traction motors in series or parallel for forward or backward motion.

A double-unit oil-electric locomotive has two oil-engine-generator sets which are placed side by side; otherwise it is the same as a single-unit type, with such modifications as are necessary with duplicate generator equipment.

**Summary.** With a saving of $12,000 a year by using the oil-electric locomotive; the oil-electric locomotive should be put in service as soon as possible, but due to the fact that it takes approximately one year to deliver a locomotive after the order is received; it would take about two years before the oil-electric locomotive could be put in service on the St. Louis Division.

As has already been said, one locomotive should be put in service at each of the following yards: Terre Haute, Decatur, Greencastle, and Brazil. The reason for this action is that one oil-electric locomotive will do the work of two to four steam locomotives in switching service. Officials of the C. & N. W. R. R. made a statement to The Wall Street Journal. I quote from the issue of October 18, 1926: "An oil-electric locomotive...........has shown a saving of practically 50% in operating and maintenance expense over steam locomotives doing the same work. The oil-electric will do the work of two to four steam locomotives, depending upon the circumstances. The oil-electric has actually done the daily work of two steam locomotives in the North Pier Area."

From the above statement one oil-electric would be able to do the work in the yards at Decatur, Greencastle, and Brazil. This would leave two steam locomotives at Decatur and one at Brazil. The locomotives that are left would be used on the hump and outlying districts at Decatur and the one at Brazil to do the work at Seelyville. By placing an oil-electric at Greencastle would be creating a new job. By creating this job a vast amount of money could be saved in a years time. There would be no roundhouse, coaling-expense, and money paid in overtime to road crews, especially to the locals and "nigger" locals. Very seldom do the locals and "nigger" locals put in much less than from six to eight hours between Green- castle and Lidendale. It is a known fact, that the Terre Haute yards need more switching power. With the addition of five switch engines from Decatur and Brazil and an oil-electric locomotive there would be no necessity to store freight trains on the main line because of the yards being sewed up; as there is very few days that pass without freight trains being held at E Y tower because of the yards being blocked, according to my personal observation.

Not having any figures, but from all appearances and the best of my knowledge, local passenger trains are operated at a loss on the St. Louis division. By placing the oil-electric locomotive on local passenger trains the cost of operation would be decreased by a large percentage. If two new trains are created on each branch, this will give better service to the traveling public and therefore local passenger sales will increase. If the railroads will give the traveling public some service, the public will patronize the railroads. As a whole the public does not prefer the electric railways and busses, but they are forced to patronize them because the railroads do not give them any trains that they can ride on. Therefore by placing two new trains into service and operating them with oil-electric locomotives, the local business will increase and at the same time the cost of operation will be increased.

As has already been stated that the locomotives replaced should be placed in service where there is a scarcity of power and in this way better service can be given to the shipper. The shipper is going to do business with the railroad that gives him the best service. Therefore with better service as an outcome of more power there will be an increase in business over the entire division.
Dean, Freshman Athlete, to enter Annapolis. Jim Brevort, Another Freshie So Honored

Of all the promising athletes that Rose has had and lost at various untimely moments, the most colorful of all, in our recollection, is none other than Milo Dean—freshman star in every branch of athletics.

Milo is one of the slightest of men wearing a Rose insignia, but he is one of the great men of the season. He earned his letter in football, coming here directly from high school ranks to compete with college men, usually far larger and more experienced than he. Yet, Milo did his part in the test of manhood—football—and really earned his letter as well as any of the men of this year's football squad.

He qualified for the basketball squad and got in a game or two, but for some reason unknown to us he suddenly turned in his suit, although we would bank our life and poor reputation that he did this act because of a desire to take part in something other than basketball and which would be of greater value to him, not merely because of lack of school spirit.

Made Track Team

On the track squad this Spring, Milo was one of the individual stars. Meeting with some high-class competition, he turned in numerous markers, points that brought distinction to our team.

But Dean is leaving us, going to a place where he can serve a mightier purpose—his country. Yes, Milo is another Rose man who gets the opportunity to enter a U. S. institution—the Naval Academy. It is a mark of honor to gain admittance to that school, and it is a distinction for a Rose man to go to that school.

Jim Brevort, another freshman, received an appointment to the Naval school, also. Jim didn't lend the school his ability as an athlete, yet went over in big style in the class rooms.

Farewell, Dean and Brevort, we are glad of your stay with us and hope that you will continue in your new endeavors as well as you have at our own institution.

Thanks, Messrs Corp and Nancrede

We must extend our greeting to a pair of Sophomores—Corp and Nancrede—who had the initiative to get out rollers, rakes and the likes of things, take them over to the tennis ground and begin applying them to the clay long enough to get one of the new courts in tip-top shape. As it is now, we can pick up our raquets and round pellets and saunter over to the courts and enjoy a few games, thanks to their work that consumed several hours of labor. One freshman endeavored to get a group to aid them, but spirit or ambition to play tennis—when the courts are to be repaired—runs mighty low and the freshman in question gave up his

Steel Sheets that Resist Rust!

The destructive enemy of sheet metal is rust. It is successfully combated by the use of protective coatings, or by scientific alloying to resist corrosion. Well made steel alloyed with Copper gives maximum endurance. Insist upon

KEystone
Rust-Resisting
Copper Steel

Black and Galvanized

Keystone Copper Steel gives superior service for roofing, siding, gutters, spouting, culverts, flumes, tanks, and all uses to which sheet metal is adapted—above or below the ground. Our booklet Facts tells you why. We manufacture American Bessemer, American Open Hearth, and Keystone Copper Steel Sheets and Tin Plates.

Black Sheets for all purposes
Keystone Copper Steel Sheets
Apollo Best Bloom Galvanized Sheets
Apollo-Keystone Galvanized Sheets
Culvert, Flume, and Tank Stock
Formed Roofing and Siding Products
Automobile Sheets, Electrical Sheets
Deep Drawing and Stamping Stock
Tin and Terne Plates, Black Plate, Etc.

Our Sheet and Tin Mill Products represent the highest standards of quality, and are particularly suited to the requirements of the mining, engineering, and general construction fields. Sold by leading metal merchants. Write nearest District Office.

American Sheet and Tin Plate Company
General Offices: Frick Building, Pittsburgh, Pa.

DISTRICT SALES OFFICES
Chicago  Cincinnati  Denver  Detroit  New Orleans  New York
Philadelphia  Pittsburgh  St. Louis
Pacific Coast Representatives: United States Steel Products Co., San Francisco
Los Angeles  Portland  Seattle
Export Representatives: United States Steel Products Co., New York City
**Spring Clothes**

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**Of quality equal to Walk-Over Standards**

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Walk-Over Boot Shop
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attempt, hoping that the task would be accomplished anyway.

And it is! There have been any number of fellows getting in a few sets of games at odd moments, and they have been finding out that the freshmen of last year built a mighty fine court. It is for us to see that these courts are used—and taken care of for all time. Courts will become sadly in need of work when left to the ravages of rain, snow and boots of young soldiers when in extended order. The courts should be watched and used.

The writer is only a freshman; yet, he would be only to glad to be included in a number of other rhymes delegated to see that the remaining court is put into shape, if it is not done by the time this story appears in print.

What we need is more initiative such as Messers Corp and Nancrede possess! ! !

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**Noteworthy Seniors Leave This Year**

(Continued from page 16)

In a few years these awards will be treasured, that is, in most cases. As in other instances, it is possible that the “R” and gray sweater may be given a back seat in the “house of memory” and may be referred to as a letter. Yet, almost every man will regard the rose “R” and the gray background as something he treasures, not only because it signifies that he worked for his school but because it brings back all memories of his work. So, fellow engineers, let’s give them a hand. They are leaving us after four or more years as engineers and athletes.

Each man graduating with the honor or an athletic award being tendered him at some time is listed as follows:

Swalls—Track: two varsity, one numeral awards.

Booth—Football: manager sweater.

Brown—Football: three varsity, one numeral awards.

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The annual initiation exercises of Eθ, Rose’s honorary fraternity was held at 11 A. M. April 13, 1927. The ceremonies were held about the sun dial on the front campus with practically all men present. The following men; C. Muntz, H. Carmack, J. Goddard, H. Hayworth, C. Cash, and L. Montgomery were initiated into the fraternity. An idea of the responsibilities and high standards which the new members must uphold was stressed. After the initiation the Eθ pin was presented to each of the new members. A banquet is planned for some time in the future and all men are urged to attend.
Mississippi Flood Control Problem

(Continued from page 6)

that there is much suitable land which would not be of value for anything else. This system proved a decided success when engineers adopted it at Dayton, Ohio, after the 1913 overflow.

Another phase of the control of the flood waters before they reach the Mississippi is the effect of forests upon floods. It is contended that with the cutting out of the forest growth throughout the middle west, the flood situation has become more acute. Exponents of this idea show that forested land retains its moisture for a much longer time than do the open fields. The gradual seepage of the water into the tributaries may spread the effects of abnormal rainfall over several days or weeks, but there is not the same high peak to the flood owing to the sudden drainage of all the water into the river at the same time. This would seem to cause a more uniform flow throughout the times of heavy and light rainfall. Authorities, however, are somewhat skeptical of this idea, and opponents of the reforestation plan point to the fact that the great floods of 1844 and 1858 came at a time when much of the timber was still standing. However, at that time the levee system had not reached the same development that it has today, and it is possible that the effects of these floods would have been much greater had the land been deforested to the extent that it is now. The scientific control of the water in the tributaries should undoubtedly embrace a thorough research to determine whether or not reforestation is of any value in flood control.

The system of control of the flood waters of the Mississippi which will eventually be worked out will probably consist of both a levee system and a plan of controlling the flow of the tributaries, combined with some modification of the idea outlined by Theodore Roosevelt. Roosevelt, twenty years ago proposed that a 30-foot channel be dredged out and cleared of its age-old accumulation of silt, and that several of the winding bends be straightened out. Then, it was claimed, the stream would be able to handle any volume of water, and the deep channel would prove a big aid to river shipping.

The problem simmers down to this: Every improvement in drainage on the land in the north increases the flood risk for the residents of the lower valley, and it is high time that government engineers make a survey to determine what can be done to control that storm-sewer. A national program of flood control must be brought about. The United States was rich enough, and had the engineers, to build the Panama Canal, and the United States is rich enough, and has the engineers to control the Mississippi River—the more important problem of the two.

Resists Corrosion

This picture, taken in the salt marshes near Kearny, N. J., shows two lines of 30-inch Cast Iron Pipe replacing pipe made of other material. The alternate exposure to the action of salt water and air is a severe test.

While the pipe shown in the picture is subjected to unusual corrosive influences, all underground pipe must be able to withstand corrosion to a greater or less degree. Cast Iron Pipe has this quality. It does not depend on its coating to resist rust; the material itself is rust-resisting. The first Cast Iron Pipe ever laid is in service today at Versailles, France, after two hundred and sixty years' service.

The CAST IRON PIPE PUBLICITY BUREAU
Peoples Gas Bldg., Chicago

CAST IRON PIPE

Our new booklet, "Planning a Waterworks System," which covers the problem of water for the small town, will be sent on request.

SEND FOR FREE BULLETIN: "CAST IRON PIPE FOR INDUSTRIAL SERVICE" SHOWING INTERESTING INSTALLATIONS TO MEET SPECIAL PROBLEMS.
At Heze's Office

Adams: "What's good for a sprained ankle."
Heze: "From the looks of it you better try soap and water."

"Lock me in cell 56."
"Why?"
"Father used to have it."

Cannibals are said to enjoy college boys: They're so easily stewed.

On the B. & M.

Conductor: "I've been on this road ten years now, and I know what I'm talking about."
Passenger: "Ten years, huh? What station did you get on at?"

Prof: "You haven't learned very much in this class, have you, Mr. Smith?"
Stude: "I admire you for your broad-mindedness in taking the blame like that, Professor."

Bandit: "Put 'em up, buddy, and if you move you're dead!"
Wise Frosh: "That's contrary to reason, my dear sir; if I move that's a sign I'm alive."

One Guy: "Do you suppose your son will soon forget all he learned at college?"
Other Guy: "I hope so! He can't make a living necking."

Home—Go!

"The next person to interrupt the proceedings will be sent home," declared the irate judge.
"Hurrah!" shouted the prisoner.

Nurse: "Mr. Maloney you are the father of quadruplets."
Maloney: "What?" Thim things that be running around on four legs.

First Burglar: "Where ya been?"
Second Burglar: "In a fraternity house."
First Burglar: "Lose anything?"

GR-R-
He who eats in a dog wagon faces the wurst.

"BEWARE, BOOTH"

A convenient way of blowing out one's brains is by a continued use of the saxophone.

QUICK, WATSON!

A great discoverer
Was Silas Orleans;
He found some pork
In his pork and beans.

WELL PUTT

A recent college graduate applied at the local butcher shop for a job. The butcher looked him over carefully and then said, "We need an energetic young man to run the slicing machine. Have you ever had any experience?"
"I used to play golf."

Too: "What is a Scotchman?"
Teoo: "A person who eats salted peanuts on his way to a friend's house for a little drink."

Teacher: "Bobbie, why was it so hard for Paul Revere to complete his ride?"
Bobbie: "Because he passed too many houses where they had forgotten to pull the shades down."

Sarge, to R. O. T. C. engineer: "I'll impress upon you that you must be more respectful toward me. Why, I had two hundred and fifty men under me during the war."
Rookie: "You ain't got nothin' on me. I had twelve hundred people under me last summer.
Sarge, doubtfully: "What were you doing?"
Rookie: "I mowed the grass in a cemetery."
CODY'S STRAWS
All shapes and braids at popular prices

MEET ME BAREHEADED

BILL CODY
715 Wabash Ave. Terre Haute

QUESTIONS
“Are you laughing at me?” demanded the irate professor of his class.
“No,” came the answer in chorus.
“Well,” insisted the professor, “what else is there in this room to laugh at?”

HEARD AT FINALS
Freshman: “ ‘Smatter? You don’t expect me to stop cheating do you?”
Prof.: “Certainly not, but you know that your not supposed to smoke during exams.”

WIRE
automobile and airplane wires,
electrical wires, submarine cables,
bridge-building cables, wire rope,
telegraph and telephone wire, radio wire, round wire, flat wire,
star-shaped and all different kinds of shapes of wire, sheet wire, piano wire, pipe organ wire, wire hoops, barbed wire, woven wire fences, wire gates, wire fence posts, trolley wire and rail bonds, poultry netting, wire springs, concrete reinforcing wire mesh, nails, staples, tacks, spikes, bale ties, steel wire strips, wire-rope aerial tramways. Illustrated story of how steel and wire is made, also illustrated books describing uses of all the above wires sent free.

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Our Clothes are made to please and you have hundreds of patterns to select from, all new fashionable colors and latest designs.

ED SPARKS
715 Wabash
"BUILDER OF BETTER CLOTHES"

Rifle Range

THANKS to the untiring energy and perseverance of the military department Rose's outdoor rifle range is nearly completed. In fact, it is completed enough to permit firing on it, there being only a few minor details to finish up. When fully completed and equipped this range will be one of the best, if not the best in the state.

The range will be long enough to permit firing on the 100, 200 and 300 yard ranges and six men will be able to fire at once. The firing will be under the supervision of the military department and many precautions are being taken to prevent any accidents which might occur.

Due to the large part he has played in bringing the construction of the range to a successful conclusion, Sgt. Kearns was given the honor of firing the first shot on the range. As it rightfully should be, this was a pinwheel five thus initiating the range in the proper manner.

Noteworthy Seniors Leaving School

(Continued from page 22)

Sweeney—Football: two varsity, one numeral awards; baseball: three varsity, one numeral awards.

Reinking—Football: three varsity, one numeral awards; basketball: three varsity, one numeral awards; track: one varsity.

Dunning—Track: three varsity awards.

Hoffman—Basketball: manager sweater.

Staggs—Football: two varsity awards; basketball: numeral award.

Davy—Baseball: one varsity award.

Kadel—Track: one varsity award.

Kunz—Football: three varsity, one numeral awards.

Wade—Track: three varsity awards; basketball: manager.

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109 North Seventh Street
TERRE HAUTE
Rose-Purdue Debate

(Continued from page 7)

lege curriculm, remarking that some progress has been made at Purdue in this way, as demonstrated by the fact that about 460 students are enrolled in the courses under the Department of Public Speaking. The meeting was adjourned with a cordial invitation to return next year.

A number of prominent men in the engineering field including a few Rose alumni were present, Orange E. McMeans, Rose '96 and Dean Potter, of Purdue, who recently spoke before the assembly being perhaps the best known. Other Rose men present included Raymond S. Davis, '17, C. Derby McDargh, '25, and Carl H. Penno, '21. Following the debate, Mr. Davis, who is connected with the National Malleable and Steel Castings Co., of Indianapolis, conducted the team on a very interesting tour of inspection of this plant. The team returned with a sincere appreciation of the hospitality of the Indianapolis Section A. S. M. E. and of the experience gained, and with a determination to make the decision a different story if the debate is held again next year.

You remember this is the opening of the season for

**Straw Hats**

and

**Bathing Suits**

We are always pleased to show them to Rose students and their friends.

HALEY & QUINLAN
Clothiers, Furnishers, Hatters
728 Wabash Ave. Opposite Liberty Theatre

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Opposite Deming Hotel

**How about those Golf Trousers and Sport Sweaters? We have them!**

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**Freitag-Weinhardt & Co.**

Opposite Hotel Deming
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COURSES IN ARCHITECTURAL, CIVIL,
CHEMICAL, ELECTRICAL, AND
MECHANICAL ENGINEERING

HIGH STANDARDS OF SCHOLARSHIP
AND OPPORTUNITIES FOR PARTICIPATION
IN COLLEGE ATHLETICS

TERRE HAUTE, INDIANA
"What's the future with a large organization?" That is what college men want to know, first of all. The question is best answered by the accomplishments of others with similar training and like opportunities. This is one of a series of advertisements portraying the progress at Westinghouse of college graduates, off the campus some five—eight—ten years.

Frenger Game Here to Sell

W HEN R. F. Frenger was at New Mexico State, in 1915, automatic control for substations, hydro-electric generating plants, railway and mine sub-station systems, was a hazy dream. Even five years later, when Frenger was working in the Switchgear Sales Section of the Westinghouse Company, automatic switching was far, far away.

Today, however, Frenger, still in his thirties, finds himself in effect the Sales Manager of an automatic switching business—a business that runs up into seven figures every year.

Frenger came to Westinghouse to sell. He expected to sell steam apparatus, since he had taken an M. E. degree.

After a period in the Westinghouse sales school, he became interested in switching apparatus. He spent months on the engineering side of the work. He spent several years as a sales specialist in the Westinghouse Chicago Office.

Then, as automatic switching grew in importance, Frenger grew along with it. Today he is head of the Automatic Switching Section of the Switchgear Sales Department.

Frenger's work is pioneering in a very real sense, for the automatic control business, lusty as it is, still is in its infancy. Engineering ways and means must be supplied as well as specialized sales skill. The whole world is the market.

Not long ago Frenger ran out to San Antonio to help the local Westinghouse salesman land an order that puts the San Antonio sub-stations under automatic control. When the Holland vehicular tunnel opens, and connects Manhattan with the Jersey shore, Frenger can point to the traffic signaling system as coming from his section.

At Cleveland one man in a downtown office building turns off and on eleven different sub-stations scattered throughout the city and its suburbs to operate the railway system—all without leaving his chair. Frenger's section again.

It is another case of a well trained man in a pioneering organization.
Any industrial worker who moves things by hand is doing work that Electricity can do for about 2 cents an hour.

More than 60 per cent of the mechanical power used by American industry is applied through electric motors. But the electrification of the tasks performed by man power has hardly begun. Electric power not only saves dollars; it conserves human energy for better purposes and raises standards of living. College men and women may well consider how electricity can lessen the burdens of industry and of farm and home life.